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Frederick County Public Schools
Reach. Challenge. Prepare.

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ADDENDUM

April 23 2020

ADDENDUM # 2
Bid 20C12, Carroll Manor Elementary School Sewer Pump Station Replacement
REVISED DUE DATE: Thursday, April 30, 2020, prior to and no later than 2:00 P.M. at
https://secure.procurenow.com/portal/fcps

This addendum is being issued to provide additions, corrections, clarifications and answers to certain questions raised referencing the original proposal packages and any resultant contracts for the above bid.

1. Please be advised of the revised due date: ~~Monday, April 27, 2020~~ **Thursday, April 30, 2020, prior to and no later than 2:00 P.M. Bids will be opened and publicly read utilizing Skype Business (formerly known as Lync): (240) 236-6172 (FCPS) Conference ID: 7907906**

2. Revision to General Note 3 on the second sheet of the drawings: **"FCPS request the bidder include the cost to provide and install a 125 amp 208 volt 3 phase disconnect near the existing electrical pull box behind the school. The 125 amp 3 phase disconnect is to be connected to the electrical wiring in the existing pull box. The electrical services is to continue to the Proposed Pump enclosure. The continuation of the electrical services must be installed not less than 40" below grade between the new 125 amp 3 phase breaker and the proposed pump enclosure. The requested 125 amp 208 volt 3 phase electrical services shall be terminated in the pump enclosures. Additionally, provide and install a 1 ¼" PVC conduit from the Pump enclosure back into the main school building, this shall be installed to the closest point in the main school possible."**

3. This Addendum includes the following attachment(s):
   a. Specs #11310, Above Ground Pumping Station Package (29 pages)
   b. Revised Drawings (4 pages)

Thank you for your interest in bidding with Frederick County Public Schools and we apologize for any inconvenience this may have caused.

Sincerely,

Kim Miskell

Kim Miskell, CSBO
Assistant Purchasing Manager

KM/ab

cc: Tony Ray, Project Manager III, Construction Management

SECTION 11310 – ABOVE GROUND PUMPING STATION PACKAGE

PART 1 – General

1.01 SCOPE

A. Contractor shall furnish and install one factory built duplex suction-lift pump station. The station shall be complete with all equipment specified herein, factory installed in a fiberglass reinforced polyester resin enclosure.

B. Principal items of equipment shall include a factory built fiberglass enclosure containing two horizontal, self-priming, centrifugal sewage pumps, V-belt drives, motors, piping, valves, motor control panel, automatic liquid level control system, and integral wiring.

C. Factory built pump station design, including materials of construction, pump features, valves and piping, and motor controls shall be in accordance with requirements listed under PART 2 - PRODUCTS of this section.

D. Electrical power to be furnished to the site will be 3 phase, 60 hertz, 208 volts, maintained within plus or minus 10 percent. The electrical system connection to the enclosure has 10,000 AIC rating. has Voltage tolerance shall be plus or minus 10 percent. Phase to phase unbalance shall not exceed 1% average voltage as set forth in NEMA Standard MG-1. Control voltage shall not exceed 132 volts.

E. The pumping equipment shall be manufactured by The Gorman-Rupp Company, Mansfield, OH as supplied by Envirep, Inc., Camp Hill, PA (717-761-7884).

1.02 SUBMITTALS

A. Product Data: Prior to fabrication, submit the following to the engineer for approval:
1. Shop drawings providing layout of the mechanical equipment and anchor bolt locations, and indicating the use of Unified National Standard bolts and fasteners.
2. Electrical ladder logic drawings illustrating motor branch and liquid level control circuits to extent necessary to validate function and integration of circuits to form a complete working system.
3. Catalog cut sheets for major items of equipment, materials of construction, major dimensions, motor and v-belt drive data, pump characteristics curves showing design duty point capacity (GPM), head (FT), net positive suction head (NPSHR), and hydraulic brake horsepower.
4. Pump Manufacturer's v-belt drive selection calculation summary sheet showing corrected H.P. Per Belt, total H.P. developed, pitch diameter of sheaves, center distance between driver and driven shafts and combined arc-length correction factor applied to theoretical horsepower transmission per v-belt, and all calculations to demonstrate a minimum Safety Factor of 1.5.
5. Certified dimensional drawings indicating size, locations and the spherical solids passing capability of the primary recirculation port.
6. Pre-startup checklist to be completed by the contractor prior to pre-startup inspection.

7. Sample of service agreement and service agreement checklist for the specified equipment.
8. Interconnection wiring diagram showing the field wiring between the telephone dialer and the alarms.
9. Letter from pump manufacturer certifying that the pump(s), exclusive of the motor, base, drive, controls, or other associated components are constructed with cast iron, ductile iron, and steel that has been mined, melted, cast, machined, and assembled in the United States.

B. Certified Tests: Prior to shipment of the equipment from the pump manufacturer's facility, submit the following certified tests to the engineer for approval.
1. Certified copies of factory run pump performance tests.
   a. Tests shall be conducted in accordance with Hydraulic Institute Standards 14.6.3.4 Acceptance Grade 2B, or 14.6.3.4.1 for input power below 13 HP, at the specified head, capacity, rated speed and horsepower
   b. The performance tests will validate the performance of the equipment at the design head, capacity and speed.
2. Certified reprime performance test data in accordance with procedures herein specified.
3. Tests shall be certified by a registered professional engineer.

C. Certified System Performance Tests: All components, including the pumps, motors, and controls, will be tested as a complete working system at the pump manufacturer's facility. Tests shall be conducted in accordance with Hydraulic Institute Standards at the specified head, capacity, rated speed and horsepower. Factory operational tests shall simulate actual performance anticipated. Submit certified tests data to the engineer for approval.

D. Operation and Maintenance Manuals:
1. Operation shall be in accordance with written instructions provided by the pump system manufacturer. Comprehensive instructions supplied at the time of shipment shall enable personnel to properly operate and maintain all equipment supplied. Content and instructions shall assume operating personnel are familiar with pumps, motors, piping and valves, but lack experience on exact equipment supplied.
2. Documentation shall be specific to the pumping equipment supplied and collated in functional sections. Each section shall combine to form a complete system manual covering all aspects of equipment supplied by the manufacturer. Support data for any equipment supplied by others, even if mounted or included in overall system design, shall be provided by those supplying the equipment. Instructions shall include the following as a minimum.
   a. Functional description of each major component, complete with operating instructions
   b. Instructions for operating pumps and pump controls in all modes of operation.
   c. Calibration and adjustment of equipment for initial start-up, replacement of level control components, or as required for routine maintenance.
   d. Support data for commercially available components not produced by the system manufacturer, but supplied in accordance with the specifications, shall be supported by literature from the prime manufacturer and incorporated as appendices.
   e. Electrical schematic diagram of the pump control circuits shall be in accordance with branch, control, and alarm system circuits including interconnections. Wire numbers

and legend symbols shall be shown. Schematic diagrams for individual components, not normally repairable by the system operator, need not be included. Details for such parts shall not be substituted for an overall system schematic. Partial schematics, block diagrams, and simplified schematics shall not be provided in lieu of overall system diagram.

f. Mechanical layout drawing of the pumping equipment and components, prepared in accordance with good commercial practice, shall provide installation dimensions and location of all pumps, motors, valves and piping.

3. Operation and maintenance instructions, which rely on vendor cut-sheets and literature, which include general configurations, or require operating personnel to selectively read portions of a manual shall not be acceptable. Operation and maintenance instructions must be specific to equipment supplied in accordance with these specifications.
4. Telephone dialer instructions and interconnection wiring diagram showing the field wiring between the telephone dialer and the alarms.

E. Manufacturer's Field Performance Test Report: The manufacturer's technical representative shall inspect the completed installation, correct or supervise the correction of any defect or malfunction, instruct operating personnel in the proper operation and maintenance of the equipment. A written report covering the equipment startup shall be mailed from the manufacturer's startup technician directly to the owner. At a minimum, the report shall include:

1. Nameplate information.
2. Recordings of gauge readings, static discharge head, and total dynamic head for each pump.
3. Recordings of operating speed for each pump, measured with a tachometer.
4. Recordings of level control settings
5. Certification that equipment has been properly installed and lubricated and is in accurate alignment.
6. Certification that the v-belt drive system has been properly aligned using a laser alignment instrument and that v-belts have been tensioned using a belt tensioning instrument.
7. Results of electrical test include voltage readings and amperage readings of all motors.
8. Certification that the equipment has been operated fully loaded and that it operated satisfactorily.
9. Outline in detail any deficiencies noted, and proposed remedial corrections.
10. Confirm proper installation and operation of telephone dialer including actual tripping of each alarm input device, telephone reception, message programming, call out list, proper wiring, and instruction of operating personnel.
11. Confirm that all spare parts are on site. Include photographs of spare parts in startup report.
12. Include the following photographs in the startup report:
    a. Overall pump station job site
    b. Pumps and motors
    c. Discharge header piping
    d. Pump control panel – closed door
    e. Pump control panel – open door
    f. Wet well

1.03 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Upon request from the engineer, the pumping equipment manufacturer shall demonstrate the following:
   1. Proof of financial stability and ability to produce the pumping equipment within the specified delivery schedules.
   2. Evidence of the facilities, equipment, and expertise to demonstrate the manufacturer's commitment to long-term customer service and project support.
   3. Evidence of adequate local and factory spare parts inventory to provide timely delivery of spare parts
   4. Evidence that the pump manufacturer is an Underwriters Laboratories (UL) panel builder.
   5. Evidence that the pumps and pumping equipment are constructed, assembled and tested in the United States by the pump manufacturer. All pump parts including the casing shall be machined at the pump manufacturer's facility located within the United States.
   6. To ensure compatibility to existing tools and equipment, all pump internal and external nuts, bolts, and hardware, shall be Unified Thread Standard (UNC) per ASME/ANSI standards.
   7. Consideration will be given only to pump manufacturer's meeting the following qualifications:
      a. Twenty-five years minimum experience successfully producing pumping equipment of the type specified herein.
      b. A minimum of twenty-five installations of pumping equipment of the type specified herein in successful operation for a minimum of ten years
   8. Pump manufacturer must be ISO 9001:2000 certified, with scope of registration including design control and after sales activities.

B. Manufacturer's Representative Qualifications: Upon request from the engineer, the equipment manufacturer's local representative shall demonstrate the following:
   1. Evidence of adequate local spare parts inventory to provide timely delivery of spare parts.
   2. Evidence of established locally based factory-trained service personnel.
   3. Evidence that representative offers comprehensive equipment service agreements for the equipment specified.
   4. List of at least ten local municipalities with installations similar to the specified equipment.
   5. Evidence that the representative offers full-day operator training seminars on Centrifugal Pump Maintenance and Troubleshooting.
   6. Evidence that the representative offers technical design assistance and hydraulic recommendations for pump station design.
   7. Certification from manufacturer that the service technician has been factory-trained and is authorized for such duties by the manufacturer.

C. Pump Performance:
   1. Design and construct the pumps in accordance with standards of the Hydraulic Institute. The efficiency of the pumps, when operating under conditions of the specified capacities and heads shall be as near peak efficiency as practicable.

2. Design the pumps designated as self-priming centrifugal to pump raw sewage containing solids up to ten percent and stringy materials with a minimum of clogging. Pumps may be protected by screening equipment, but materials passing through may combine by a felting or balling process.

D. Source Quality Control:
1. Obtain pumping equipment, motors, motor starters, pump controls and appurtenances from the pump manufacturer whose responsibility it is to ensure that the pumping equipment is properly furnished, coordinated, and tested in accordance with these specifications. The products of third party packagers, assemblers or distributors shall neither be considered equal, nor shall they be acceptable.
2. The pump control panel including the level controls shall be constructed at the pump manufacturer's facilities. The pump manufacturer shall be an Underwriters Laboratories (UL) panel builder. The control panel shall meet all UL and Joint Industrial Council (JIC) standards.

1.04 MANUFACTURER'S WARRANTY

A. All components of the pumping equipment shall be manufactured, assembled and tested as a unit by the pump manufacturer. The pumping equipment must be a standard catalog item with the manufacturer. The pump manufacturer must assume system responsibility, i.e. the pumping equipment must be warranted by the manufacturer as described herein. Individual component warranties are desirable. However, individual warranties honored solely by the manufacturers of each component will not be acceptable.

B. The pump manufacturer shall warrant all equipment to be of quality construction, free of defects in material and workmanship. A written warranty shall include specific details described below.
1. All equipment, apparatus, and parts furnished shall be warranted for one (1) year, excepting only those items that are normally consumed in service, such as light bulbs, oils, grease, packing, gaskets, O-rings, etc. The pump manufacturer shall be solely responsible for warranty of the pumping equipment components when installation is made and use and maintenance is performed in accordance with the manufacturer's recommendation.
2. The pump shall be warranted for five (5) years from date of shipment.
3. Components failing to perform as specified by the engineer, or as represented by the manufacturer, or as proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer without cost of parts to the owner.

C. It is not intended that the pump manufacturer assume liability for consequential damages or contingent liabilities arising from failure of any vendor supplied product or part which fails to properly operate, however caused. Consequential damages resulting from defects in design, or delays in delivery are also beyond the manufacturer's scope of liability.

D. The warranty shall become effective upon the acceptance by the purchaser or the purchaser's authorized agent, or sixty (60) days after installation, or ninety (90) days after shipment, whichever occurs first.

1.05 MANUFACTURER

A. These specifications and accompanying drawings specify and show equipment and materials manufactured by The Gorman-Rupp Company, deemed most suitable for the service anticipated. The contractor shall prepare his bid on the basis of the particular equipment and materials specified for the purpose of determining the low bid. The awarding of the contract shall constitute a contractual obligation to furnish the specified equipment and materials.

B. After execution of the contract, the contractor may request to substitute equipment other than that specified in the contract. Substitutions will only be considered in the event that the equipment proposed for substitution is superior in construction and efficiency to that specified in the contract, and higher quality has been demonstrated by service in a sufficient number of similar installations.

C. In the event the contractor obtains engineer's approval of equipment other than that for which the system was originally designed, the contractor shall, at his own expense, make any changes in the structures, buildings or piping necessary to accommodate the equipment, and shall provide as-built drawings to the engineer.

D. It will be assumed that the cost to the contractor of the equipment proposed to be substituted is less than that of the equipment specified in the contract and, if substitution is approved, the contract price shall be reduced by an amount equal to the savings.

PART 2 – PRODUCTS

2.01 STATION ENCLOSURE

A. Description:
1. The station enclosure shall provide sufficient inside area for maintenance personnel to perform normal operation and maintenance inside, sheltered, and free from foul weather. The enclosure shall consist of a base to support the pumps and a cover. Minimum dimensions of the enclosure shall be eight feet by twelve feet and nine feet in height.

B. Materials:
1. The station enclosure shall be manufactured of molded fiberglass reinforced orthophthalic polyester resins with a minimum of 30% fiberglass, and a maximum of 70% resin. Glass fibers shall have a minimum average length of 1¼ inches. Resin fillers or extenders shall not be used. Major design considerations shall be given to structural stability, corrosion resistance, and water-tight properties. The polyester laminates shall provide a balance of mechanical, chemical, and electrical properties to insure long maintenance free life. They must be impervious to micro-organisms, mildew, mold, fungus, corrosive liquids, and gases which can reasonably be expected to be present in the environment surrounding the wet well. Wood core type enclosures shall not be considered acceptable and shall be basis for equipment rejection.
2. All interior surfaces of the housing shall be gel coated with a polyester resin. It shall be of suitable thickness and formulated to provide:
   a. Maintenance-free service

b. Abrasion resistance
c. Protection from sewage, greases, oils, gasoline, and other common chemicals.
d. Color fastness
e. Gloss retention

3. Interior surfaces of the enclosure cover shall be white for maximum light reflectivity. The base shall be of a darker color to de-emphasize the presence of dirt, grease, etc. Colors used for both portions shall result in a pleasing looking structure.
4. The pump station shall be furnished with 1" thick foam insulation which shall be applied to the walls, door, and roof to achieve an R-6 insulation factor. A gasketed seal around the door shall also be included.
5. The outside of the enclosure shall be coated with a suitable pigmented resin compound to insure long, maintenance-free life. The fiberglass enclosure shall be a regular product of the pump station manufacturer.

C. Enclosure Base:

1. Station base shall be constructed of pre-cast, reinforced concrete encapsulated in a fiberglass mold. The design shall resist deformation of the structure during shipping, lifting, or handling. Base shall incorporate drainage provisions, and an opening sized to permit installation of piping and service connections to the wet well. After installation, the opening shall serve as a grout dam to be utilized by the contractor. The base shall incorporate anchor bolt recesses for securing the complete station to a concrete pad (supplied by the contractor) in accordance with the project plans.
2. Holes through the base shall be provided for suction and discharge lines, air release lines, and level control line. Holes for the suction and discharge lines shall be provided with a grout dam incorporated in a grout retention cavity which the contractor shall fill at installation with suitable grout to seal each pipe-to-base joint against the entrance of hazardous gases from the wet well.
3. Station base shall incorporate a suitable flange designed for securing the pump station to the concrete pad in accordance with the station plans.

D. Enclosure Cover:

1. The enclosure cover shall be provided with a hinged fiberglass reinforced access door. Minimum dimensions of the door shall be 36 inches wide by 78 inches high for access by maintenance personnel to station interior. Door shall be a minimum 1 7/8 inch thick and shall be hinged with a minimum of two heavy duty stainless steel hinges to the enclosure cover. Door shall be furnished with a padlockable handle connected to a latching mechanism. Latch shall engage door casing or maximum security against vandalism. All mounting hardware for door casing and door must be concealed or of such type as to prevent vandalism with ordinary tools.
2. Removable panels shall be supplied on two sides of the enclosure for additional access to equipment. Location and size shall permit access for routine maintenance functions such as pump and motor inspection, drive belt adjustment, and pump clean-out. Non-hinged panels shall be secured with stainless steel tamper-proof hardware

E. Receptacle:

1. A duplex ground fault indicating utility receptacle providing 115 volts, single phase, 60 hertz shall be mounted inside the pump station. Receptacle shall be NEMA 5-15r configuration, heavy duty, specification grade and fitted with a weatherproof cover.

2. The receptacle shall be protected by normal duty circuit breaker.

F. Exhaust Fan:
1. A shuttered exhaust fan with a minimum capacity of 500 CFM to change the air in the enclosure once every minute, shall be mounted in the end wall approximately opposite the hinged door opening. An air intake vent shall be mounted in the hinged door assembly. Both intake and exhaust opening shall be equipped with a screen and cowl suitably designed to prevent the entrance of rain, snow, rocks, and other foreign material.
2. Fan circuit shall be protected by a normal duty circuit breaker.

G. Interior Lights:
1. Two vapor-tight LED light fixtures shall be provided. The fixtures shall be NEMA 4, suitable for wet location. The fixtures shall be located to provide adequate light to all parts of the station and shall not constitute a physical hazard to inspection or service personnel.
2. Light circuit shall be protected by a normal duty circuit breaker and shall be provided with a toggle switch located inside the enclosure near the entrance door.

H. Exterior Light:
1. An LED security light fixture shall be provided. The fixture shall be suitable for outdoor locations, and located near the entrance door. The light shall operate via a photocell.
2. The exterior light shall be protected by a normal duty circuit breaker.

I. Station Heater:
1. A 4 KW three-phase wall mounted forced air heater shall be provided for protection of the pump station equipment. The heater shall maintain an inside/outside temperature differential of 60 degrees F while operating on the primary electrical power available to the station.
2. The heater shall be controlled by a thermostat and contactor and protected by a heavy duty circuit breaker.

J. Low Station Enclosure Temperature:
1. The enclosure shall be provided with a thermostat to serve as a low temperature alarm.

K Alarm Light (External):
1. Station manufacturer will supply one 115 VAC NEMA 4X alarm light fixture with red globe, conduit box, and mounting base. The design must prevent rain water from collecting in the gasketed area of the fixture, between the base and globe. The alarm light will be shipped loose for installation by the contractor.

2.02 PUMPS

A. Pump Description:
1. Pumps shall be Gorman-Rupp Model T3A71S-B horizontal, self-priming, centrifugal pumps, specifically designed for pumping raw, unscreened, domestic sanitary sewage.
2. All openings, internal passages, and internal recirculation ports shall be large enough to permit the passage of the specified spherical solids passing capacity, and any trash or

stringy material which may pass through the average house collection system. Screens or any internal devices that create a maintenance nuisance or interfere with priming and performance of the pump shall not be permitted.

3. The pumps shall have the following characteristics:

a.	Suction connection, flanged, in	3
b.	Discharge connection, flanged, in	3
c.	Minimum shutoff head, each pump, ft	32
d.	Pump speed, rpm	1050
e.	Maximum NPSH required at design point, ft	5.0
f.	Minimum reprime lift capability, ft	13
g.	Spherical solids passing capability, in. diameter	2.5
h.	Motor horsepower	5
i.	Motor speed, rpm	1750
j.	Impeller diameter, in	8-3/4

B. Pump Performance:

1. Each pump must have the necessary characteristics and be properly selected to perform under these operating conditions:

a.	Capacity, gpm	190
b.	Total dynamic head, ft	22
c.	Total dynamic suction lift, ft	15.6
d.	Maximum static suction lift, ft	10.9
e.	Discharge static head, ft	3.0

2. Consideration shall be given to the sanitary sewage service anticipated, in which occasionally debris will lodge between the pump suction check valve and seat, resulting not only in loss of the suction leg, but also in the siphoning of liquid from the pump casing to the approximate center line of the impeller. Such occurrence shall be considered normal with proper installation of air release line to atmosphere.
3. In consideration of such occurrence and of the unattended operation anticipated, each pump shall be so designed as to retain adequate liquid in the pump casing to insure unattended automatic repriming while operating at its rated speed in a completely open system without suction check valves and with a dry suction leg.

C. Reprime Performance:

1. Each pump must be capable of the specified reprime lift while operating at the selected speed and impeller diameter. Reprime lift is defined as the static height of pump suction centerline above liquid that the pump will prime; and delivery within five minutes on liquid remaining in the pump casing after a delivering pump is shut down with the suction check valve removed. Systems requiring ancillary vacuum generating devices shall not be acceptable. Additional standards under which reprime tests shall be run are:
   a. Piping shall incorporate a discharge check valve down stream from the pump. Check valve size shall be equal (or greater than) the pump discharge diameter.
   b. A ten-foot length of one-inch pipe shall be installed between pump and discharge check valve. This line shall be open to atmosphere at all times to duplicate the air displacement rate of a typical pump system fitted with an air release valve.

c. No restrictions shall be present in pump or suction piping that could serve to restrict the rate of siphon drop of the suction leg. Suction pipe configuration for reprime test shall incorporate a minimum horizontal run of 2 feet and one 90-degree elbow.
d. The pipe size used for the reprime performance test shall be the same size as the pump suction diameter.
e. Impeller shall be set at the clearances recommended by the manufacturer in the pump service manual.
f. Reprime lift repeatability shall be demonstrated by five sequential reprime cycles.
g. Liquid to be used for reprime test shall be water.

D. Serviceability:

1. The pump manufacturer shall demonstrate to the engineer's satisfaction that due consideration has been given to reducing maintenance costs by incorporating the following features:
   a. No special tools shall be required for replacement of any components within the pump. Threaded fasteners shall be of the Unified National Standard type.
   b. The mechanical seal shall be a one-piece cartridge type to allow for easy replacement. Mechanical seals requiring assembly of individual components shall not be acceptable.
   c. The pump must be equipped with a removable cover plate, allowing access for service and repair without removing suction or discharge piping.
   d. The pump shall be fitted with a replaceable wear plate. Replacement of the wear plate, impeller, seal, and suction check valve shall be accomplished through the removable cover plate without removing suction or discharge piping.
   e. The entire rotating assembly, which includes bearings, shaft, seal, and impeller, shall be removable as a unit without removing the pump volute or piping.
   f. Each pump shall incorporate a suction flap valve that can be removed or installed through the removable cover plate opening, without disturbing the suction piping. Sole function of the suction flap valve shall be to eliminate re-priming with each cycle. Pumps requiring suction flap valves to prime or reprime will not be acceptable.
   g. Atmospheric isolation: The shaft bearings shall be isolated from the seal cavity with an air gap to provide positive protection of the bearings in the event of a seal leak and to provide for external monitoring of the seal integrity.
   h. Adjustment of the impeller face clearance (distance between impeller and wear plate) shall be accomplished by external means. The adjusting mechanism shall provide a means to make discrete calibrated movements in increments of 0.005 inches. No special tools, measuring devices, feeler gauges, or other tools shall be required to make these impeller-to-wear plate clearance adjustments.
   i. Clearances between the impeller and wear plate shall be maintained by a 4 point external shimless coverplate adjustment system with four collar and adjusting screws. Provide 4-point incremental clearance adjustment. Each of the 4 points shall be lockable to prevent inadvertent clearance increases or decreases due to equipment vibration. The 4 point system shall provide equal clearance gaps at all points between the impeller and wear plate. Systems that require realignment of belts, couplings, sheaves, etc., each time a clearance adjustment is performed shall not be acceptable. Coverplate shall be capable of being removed and reinstalled without

disturbing the clearance settings. Clearance adjustment systems that utilize less than 4 point system will not be considered.

j. There shall be provisions for additional clearance adjustment in the event that adjustment tolerances have been depleted from the coverplate side of the pump. The removal of stainless steel shims from the rotating assembly side of the pump shall allow for further adjustment as described above.

k. Clearance adjustment which requires movement of the shaft only, thereby adversely affecting seal working length or impeller back clearance, shall not be acceptable.

E. Construction:

1. The pump, excluding the base frame and motor, shall be manufactured of iron that is melted and cast in the United States.
2. Pump design: Pumps shall be the original design of the pump manufacturer. Products violating intellectual property regulations shall not be allowed, as they may violate domestic or international law and expose the user or engineer to unintended liabilities. Reverse-engineered products fabricated to imitate the design of original products shall not be allowed as they may contain substantial differences in tolerances and material applications that may contribute to product failure.
3. Hardware: All hardware, nuts and bolts, shall be Unified Thread Standard (UNC) per ASME/ANSI standards.
4. Pump casing: Made of Gray Iron 30, shall be foot supported, and shall have a horizontal centerline suction and vertical discharge.
   a. The casing shall have a top mounted 3-1/2 inch priming fill port with a safety lock bar cover. In consideration for safety, hand nut threads must provide slow release of pressure, and the clamp bar shall be retained by detent lugs. A Teflon gasket shall prevent adhesion of the fill port cover to the casing.
   b. Casing shall have no openings of smaller diameter than the specified sphere size.
   c. Casing shall be designed to retain sufficient liquid to ensure automatic repriming and unattended operation.
   d. A minimum 1-1/4 inch diameter drain hole shall be provided for attachment of the pump drain kit and to ensure complete and rapid draining.
   e. Bolts and other threaded fasteners shall have Unified National Standard threads.
   f. Suction flap valve: Molded neoprene with integral steel and nylon reinforcement. A blow-out center shall protect the pump casing from hydraulic shock or excessive pressure. Removal or installation of the check valve must be accomplished through the cover plate opening without disturbing the suction piping. Sole function of the suction flap valve shall be to save energy by eliminating need to reprime after each pumping cycle. Pumps requiring a suction check valve to assist reprime will not be acceptable.
   g. Pump shall be provided with a separate capped threaded port for use of an optional casing heater.
5. Cover plate: Cover plate shall be Gray Iron 30.
   a. Retained by four (4) hand nuts for complete access to pump interior. Cover plate removal must provide ample clearance for removal of stoppages, and the allow removal or service to the impeller, seal, wear plate or suction flap valve.
   b. Replaceable wear plate (Hardened): Secured to the cover plate by four (4) welded studs and nuts. The wear plate shall be cast in hardened steel with a minimum Brinell Hardness of 400. The wear plate shall be of sufficient width to maintain the manufacturer's recommended clearance between the entire edge of each impeller vane

and the wear plate. Wear plate attachment hardware shall have Unified National Standard threads and shall be located out of the direct flow path of the liquid into the impeller.

c. O-ring Seals: Two (2) Buna-N o-rings shall seal cover plate to the pump casing. The inner cover plate o-rings shall provide a seal between the suction chamber and the discharge chamber of the pump casing to eliminate the possibility of recirculation at the wear plate.
d. In consideration for safety, a pressure relief valve shall be supplied in the cover plate. Relief valve shall open at 75 PSI.
e. Pusher bolt capability to assist in removal of coverplate. Threaded pusher boltholes shall be sized to accept same retaining capscrews as used in rotating assembly.
f. Easy-grip handle shall be mounted to face of coverplate.

6. Rotating assembly:
   a. Impeller (ADI): Two-vaned, semi-open, non-clog, cast in Austempered Ductile Iron with a minimum Brinell Hardness of 400 with integral pump out vanes on the back shroud. Impeller shall thread onto the pump shaft and be secured with a lockscrew.
   b. Shaft: Shaft shall be constructed of Alloy Steel 4150 and shall employ an Alloy Steel 4130 shaft sleeve.
   c. Mechanical seal: A mechanical cartridge seal shall seal the pump shaft against leakage. The stationary sealing member and the mated rotating face shall be tungsten titanium carbide. Each of the mated surfaces shall be lapped to a flatness of three light bands (35 millionths of an inch), as measured by an optical flat under monochromatic light. The stationary seal seat shall be double floating so that faces will not lose alignment during periods of shock loads that will cause deflection, vibration, and axial movement of the pump shaft. The seal shall be warranted for five (5) years from date of shipment.
   d. Lubrication: Separate oil filled cavities, vented to atmosphere, shall be provided for shaft seal and bearings. Oil cavities must be cooled by the liquid pumped. Three lip seals will prevent leakage of oil.
      1. The bearing cavity shall have an oil level sight gauge and fill plug with check valve. The clear sight gauge shall provide easy monitoring of the bearing cavity oil level and condition of oil without removal of the fill plug. The check valve shall vent the cavity but prevent introduction of moist air to the bearings.
      2. The seal cavity shall have an oil level sight gauge and fill plug with vent. The clear sight gauge shall provide easy monitoring of the seal cavity oil level and condition of oil without removal of the vented fill plug.
      3. Double lip seal shall provide an atmospheric path providing positive protection of bearings, with capability for external drainage monitoring.
   e. Atmospheric isolation: The shaft bearings shall be isolated from the seal cavity with an air gap to provide positive protection of the bearings in the event of a seal leak and to provide for external monitoring of the seal integrity.
   f. Seal plate (ADI): Replaceable seal plate shall be constructed of Austempered Ductile Iron with a minimum Brinell Hardness of 400, and shall be bolted to the bearing housing.
   g. Shaft bearings: Shall be anti-friction ball or tapered roller bearings, of ample size and proper design to withstand all radial and thrust loads which can reasonably be expected during normal operation. Pump designs in which the same oil lubricates both the shaft bearings and the shaft seal shall not be acceptable.

h. Pusher bolt capability to assist in removal of rotating assembly. Pusher bolt threaded holes shall be sized to accept same capscrews as used for retaining rotating assembly.

7. Suction and discharge spools: Each pump shall be equipped with one-piece, cast iron spools, flanged on each end. Each spool shall have one 1 1/4-inch NPT and one 1/4-inch NPT tapped hole with pipe plugs for mounting of gauges or other instrumentation.

2.03 PUMP ACCESSORIES

A. Spare Parts: Furnish the following spare parts:

1. Two (2) Spare Parts Kits, each including one (1) mechanical cartridge seal, one (1) set of rotating assembly adjustment shims, one (1) cover plate O-ring, one (1) rotating assembly O-ring
2. One (1) complete rotating assembly (with austempered ductile iron impeller and seal plate)
3. Four (4) suction flap valve assemblies
4. One (1) belt tensioning gauge – spring loaded
5. Two (2) quarts of seal lubricant
6. Two (2) air pump repair kits for bubbler level control system
7. Two (2) air release valve diaphragms
8. Two (2) air release valve springs

B. Gauge Kit With Vibration Isolation Frame:

1. Each pump shall be equipped with a glycerin-filled compound gauge to monitor suction pressures, and a glycerin-filled pressure gauge to monitor discharge pressures. Gauges shall be a minimum of 4-inches in diameter, and shall be graduated in feet water column. Rated accuracy shall be 1 percent of full-scale reading. Compound gauges shall be graduated -34 feet to +34 feet water column minimum. Pressure gauges shall be graduated 0 to 70 feet water column minimum.
2. Gauges shall be mounted on a vibration isolation frame assembly with resilient panel, frame, and adjustable brackets which shall be firmly secured to pumps or piping. Gauge installations shall be complete with all hoses and fittings, and shall include a shutoff valve installed in each gauge inlet at the point of connection to suction and discharge pipes.
3. Gauge kit shall be supplied with stainless steel fittings.

C. Pump Drain Kit:

1. A pump drain kit shall be provided, including the following:
   a. One set of drain fittings for each pump. Each set of drain fittings includes a pipe nipple, bushing, bronze ball valve and aluminum quick connect male Kamlock fitting.
   b. One drain hose for common use among all pumps. Drain hose shall consist of a 10’ length of plastic hose with an aluminum quick connect female Kamlock fitting on one end.
2. All fittings shall be supplied as stainless steel, unless specified otherwise above.

2.04 VALVES AND PIPING

A. Check Valves, 4-inch:

1. Each pump shall be equipped with a full flow type check valve, each capable of passing a 3" spherical solid, with flanged ends and be fitted with an external lever and spring. The valve seat shall be constructed of stainless steel and shall be replaceable. The valve body shall be cast iron. The valve shall be equipped with a removable cover plate to permit entry for complete removal and replacement of internal components without removing the valve from the line. Valve clapper shall have a molded neoprene seating surface incorporating low pressure sealing rings. Valve hinge pin and internal hinge arm shall be stainless steel supported on each end in brass bushings, sealing bushing shall have double o-rings. O-rings shall be easily replaceable without requiring access to interior of valve body. Valve shall be rated at 175-PSI water working pressure, 350-PSI hydrostatic test pressure. Valves other than full flow type or valves mounted in such a manner that prevents the passage of a 3" spherical solid shall not be acceptable.

2. Each check valve shall be provided with a ¼-inch treaded tap with plug on the downstream side of the valve for installation of a pressure gauge.

B. Plug Valves, 4-inch:

1. Each pump shall be equipped with a full flow type plug valve, capable of passing a 3" spherical solid, with flanged ends and be fitted with a lever operator to permit the pump to be isolated from the common discharge header. The plug valve shall be non-lubricated, tapered type. Valve body shall be semi-steel with flanged end connections drilled to 125 pound standard. The drip-tight shutoff plug shall be mounted in stainless steel bearings and shall have a resilient facing bonded to the sealing surface. Valve shall be operated with a single lever actuator providing lift, turn, and reseat action. The lever shall have a locking device to hold the plug in the desired position.

C. Air Release Valves (Diaphragm Type):

1. Each pump shall be equipped with one pressure actuated automatic air release valve, designed to permit the escape of air to the atmosphere during initial priming or unattended repriming cycles. Upon completion of the priming or repriming cycle, the valve shall close to prevent recirculation. Valves shall provide visible indication of valve closure, and shall operate solely on discharge pressure. Level/float actuated air release valves shall not be acceptable.
2. All valve parts exposed to sewage shall be constructed of cast iron, stainless steel, or similar corrosion resistant materials. Diaphragms shall be fabric-reinforced neoprene or similar inert material.
3. A cleanout port, 3 inches or larger in diameter, shall be provided for ease of inspection, cleanout, and service.
4. Valves shall be field adjustable for varying discharge heads.
5. Air release valves shall be connected to pump station piping using stainless steel pipe fittings.
6. Each air release valve shall be provided with an isolation ball valve.
7. Air release valve piping must discharge directly into wet well. ARV piping shall not discharge to a sump.
8. Each air release valve shall have a separate air release discharge pipe back to the wet well for each air release valve. Discharge pipe shall be minimum 1-½-inch diameter.

D. Header Piping:

1. Flanged header pipe shall be centrifugally cast, ductile iron, complying with ANSI/AWWA A21.51/C115 and Class 53 thickness. Flanges shall be cast iron Class 125 and comply with ANSI B16.1. All piping pipe and flanges shall be threaded and suitable thread sealant applied before assembling flange to pipe.
2. Boltholes shall be in angular alignment within ½-degree between flanges. Flanges shall be faced and a gasket finish applied that shall have concentric grooves a minimum of 0.01 inch deep by approximately 0.03 inch wide, with a minimum of three grooves on any given surface spaced a maximum of ¼ inch apart.

E. Supports and Thrust Blocks:
1. Contractor must insure all pipes connected to the pumping system are supported to prevent piping loads from being transmitted to pumps or system piping.
2. Pump station discharge force main piping shall be anchored with thrust blocks by the contractor where shown on the contract drawings.

F. Gauge Connection Assembly:
1. The header piping shall be equipped with a gauge connection assembly located between the discharge check valve and force main isolation plug valve allowing the operator to easily attach a discharge gauge on any pump for troubleshooting.
2. The gauge assembly shall consist of a 1/4" brass pipe nipple, 1/4" brass full port ball valve and a quick connect fitting.
3. The gauge connection assembly shall be installed in the discharge header piping such that the static and dynamic pressure in the force main can be read at all times unless the force main isolation plug valve is closed for that particular pump.

G. Portable Pump Discharge Bypass Connection:
1. The station header pipe shall incorporate a 2-way plug valve to permit emergency access to the pump station force main after isolation of the pumps. Valve body shall be cast iron with flanged end connections drilled to 125-pound standard. The plug valve shall be non-lubricated type, furnished with a drip-tight shutoff plug mounted in stainless steel or Teflon over phenolic bearings, and shall have a resilient facing bonded to the sealing surface.
2. The bypass connection shall terminate with a male OPW type quick connect fitting.

H. Air Release/Vacuum Valve
1. The station header pipe shall incorporate an air release/vacuum valve at the highest point. Valve shall be 316 Stainless Steel, with 2” FNPT inlet.
2. Valve shall be Model 990, as manufactured by H-Tec.

2.05 DRIVE UNIT

A. Motors:
1. Provide motors as specified herein. Any additional motor requirements specified in another Specification Section, but not specified herein, shall not apply to the motors for this equipment.
2. The pump motors shall be horizontal, totally enclosed fan cooled, induction type, with normal starting torque and low starting current characteristics.

3. The motors shall not be overloaded at the design condition or at any head in the operating range as specified.
4. Motors shall be tested in accordance with provisions of ANSI/IEEE Std. 112.
5. Each motor shall be in current NEMA design B cast iron frame with copper windings.
6. Motors shall be NEMA Premium Efficient, per NEMA MG-1, Table 12-12.

B. Drive Transmission:

1. Power shall be transmitted from motors to pumps by means of v-belt drive assemblies. The drive assemblies must be selected to establish proper pump speed to meet the specified operating conditions.
2. Each drive assembly shall have a minimum of two v-belts. In no case will a single belt drive be acceptable. Each v-belt drive assembly shall be selected on the basis that adequate power will be transmitted from driver to pump. Drive systems with a safety factor of less than 1.5 shall not be considered sufficient for the service intended. Computation of safety factors shall be based on performance data published by the drive manufacturer.
3. V-belts shall be the banded type.

C. Belt Guards:

1. Pump drive transmissions shall be enclosed on all sides in a guard constructed of any one or combination of materials consisting of expanded, perforated, or solid sheet metal, except that maximum perforated or expanded openings shall not exceed ½ inch.
2. Guards shall be manufactured to permit complete removal from the pump unit without interference with any unit component, and shall be securely fastened to the unit base.
3. All metal shall be free of burrs and sharp edges. Structural joints shall be continuously welded. Panels may be riveted to frames with not more than five-inch spacing. Tack welds shall not exceed four-inch spacing.
4. The guard shall be finished with one coat of gray W.R. non-lift primer and one coat of orange acrylic alkyd W.R. enamel in accordance with section 3, Color Definitions of ANSI 253.1; Safety Color Code for Marking Physical Hazards.

2.06 FINISH

A. Surface Preparation and Painting:

1. Pumps, piping, and exposed steel framework shall be cleaned prior to coating, using an approved solvent wipe or phosphatizing cleaner. The part must thoroughly dry before pain application. Open joints shall be caulked with an approved polyurethane sealant.
2. Exposed surfaces to be coated with one coat of Tnemec Series 69 Polymide Epoxy primer and one finish coat of Series 73 Aliphatic Acrylic Polyurethane for a total dry film thickness of 4-6 mils. Finish coat shall be semi-gloss white for optimum illumination and enhancement.
3. The finish coat shall be corrosion, moisture, oil, and solvent resistant when completely dry.
4. The factory finish shall allow for over-coating and touch up for 6 months after coating. Thereafter, sanding may be required to accept a topcoat or touch-up coating.

2.07 PUMP CONTROL SYSTEM

A. General:
1. This specification covers a pump control system for the duplex pumping system including motor circuit breakers, starters, thermal overload relays, door mounted operator controls, and liquid level controls.
2. The primary liquid level control will include an air bubbler level control system, electronic pressure switch, pump sequence control, alarms and pump safety shutdowns.
3. The backup level control will include an independent smart relay and two (2) float switches.

B. UL Listing:
1. The pump controls shall be manufactured by the pump manufacturer who shall be a UL panel builder and each assembly shall bear a serialized UL label listed for "Enclosed Industrial Control Panels."
2. The enclosure and all components mounted on the sub-panel or control cover shall conform to UL descriptions and procedures. Listing for open style industrial control panels or an assembly of listed or recognized components shall not be acceptable.

C. Panel Enclosure:
1. Enclosure shall be constructed in conformance with applicable section of national electrical manufacturers' association (NEMA) standards for Type 1 electrical enclosures. Enclosure shall be fabricated of stainless steel having a minimum thickness of not less than 0.075 inch (14 gauge).
2. Door shall be hinged and sealed with a neoprene gasket and shall be held closed with clamps that are quick and easy to operate. The door shall accommodate the mounting of switches and indicators.
3. Enclosure shall be furnished with a removable back panel, fabricated of steel having a thickness of not less than 0.106 inch (12 gauge), which shall be secured to the enclosure with collar studs. Such panel shall be of adequate size to accommodate all basic components.
4. All control components shall be securely fastened to a removable back panel with screws and lock washers. Switches, indicators and instruments shall be mounted through the control panel door. Self-tapping screws shall not be used to mount any components.
5. Each control assembly shall be furnished with main terminals and ground lug for field connection of the electrical supply. The connections shall be designed to accept copper conductors of sufficient size to serve the loads. The main terminals shall be mounted to allow incoming wire bending space in accordance with article 373 of the National Electric Code (NEC). A separate terminal strip shall be provided for 115 volt, single-phase control power and shall be segregated from the main terminals. Ten percent of the control terminals shall be furnished as spares.

D. Motor Branch Components:
1. All motor branch components shall be of the highest industrial quality. Operating coils of all AC control devices shall be rated for 120 volts, and shall be suitable for use in a voltage range of 108 to 132 volts, 60 hertz. The short circuit rating of all power circuit devices shall be a tested combination or evaluated per the National Electric Code Article 409. The lowest rated power circuit component shall be the overall control panel short circuit rating and shall not be less than the fault current available. The minimum control panel rating shall not be less than 10 kA, rms symmetrical. Control assemblies operating

at 120 volts nominal or less may be provided with transformers which limit that fault current and may be rated less than the minimum required short circuit rating.

2. Circuit Breakers and Operating Mechanisms:
   a. A properly sized heavy duty air circuit breaker shall be furnished for each pump motor. All circuit breakers shall be sealed by the manufacturer after calibration to prevent tampering.
   b. A padlocking operating mechanism shall be installed on each motor circuit breaker. Operator handles for the mechanisms shall be located on the exterior of the control compartment door, with interlocks which permit the door to be opened only when circuit breakers are in the "off" position.
3. Motor Starters:
   a. An open frame, across-the-line, NEMA rated magnetic motor starter shall be furnished for each pump motor. Starters of NEMA size 1 and above shall be designed for addition of at least two auxiliary contacts. Starters rated "0", "00", or fractional sizes shall not be acceptable. Power contacts shall be double-break and made of cadmium oxide silver. All motor starters shall be equipped to provide undervoltage release and overload protection on all three phases.
   b. Motor starter contacts shall be easily replaceable without removing the motor starter from its mounted position.
4. Overload Relays:
   a. Overload relays shall be of the thermal block-type and shall have visual trip indication with trip-free operation. Pressing of the overload reset lever shall not actuate the control contact until such time as the overload thermal element is reset. Resetting of the overload reset lever will cause a snap-action control contact to reset, thus reestablishing a control circuit.
   b. Overload reset pushbuttons shall be mounted through the door of the control panel in such a manner as to permit resetting the overload relays without opening the control panel door.

E. Indicators:
1. Physical indicating light operators shall be made of an industrial grade thermoplastic and chemical-resistant for harsh environments. Lights shall have a protection rating of IP 65/66 (type 3/3R/4/4X/12/13). Lights shall include an easily replaceable, integrated LED power module for long lamp life. Indicating lights shall be push-to-test.
2. Indicating lights will be furnished for the following functions:
   a. General alarm - Red
   b. Pump No. 1 run - Green
   c. Pump No. 2 run - Green
   d. Pump Fault, No. 1 - Red
   e. Pump Fault, No. 2 - Red
   f. High Water Alarm - Red

F. Switch Controls:
1. A normal duty thermal-magnetic circuit breaker shall protect all control circuits by interrupting control power.
2. Pump mode selector switches shall be connected to permit manual start and manual stop of each pump individually or permit automatic operation under control of the liquid level control system. Manual operation shall override shutdown systems except motor

overload and phase failure relays. Selector switches shall be oil-tight design with contacts rated NEMA A-300.

3. Override switches shall be connected to bypass the level control system and all shutdown systems supplied with it, to provide manual start and manual stop of each pump individually in the event of level control system malfunction.
4. A selector switch shall provide manual alternation of the air pumps in the bubbler system. The switch shall be connected in such a manner that either pump may be selected to operate continuously.
5. A pushbutton switch shall be provided to silence the 115-volt AC alarm circuits while corrective actions are underway. Depressing the alarm silence pushbutton shall also cause the high water alarm circuit to reset when the liquid level has been lowered.

G. High Pump Temperature Shutdown:

1. The control panel shall be equipped with circuitry to override the level control system and shut down the pump motor(s) when required to protect the pump from damage caused by excessive temperature.
2. A thermostat shall be mounted on each pump to detect its temperature. If the pump temperature should rise to a level that could cause pump damage, the thermostat shall cause the pump motor to shut down. A visual mechanical indicator shall indicate that the pump motor has been stopped because of a high temperature condition.
3. The pump shall remain locked out until the pump has cooled and the circuit has been manually reset. Automatic reset of such a circuit shall not be acceptable.

H. Elapsed Time Meters:

1. Six-digit elapsed time meters (non-reset type) shall be connected to each motor starter to indicate the total running time of each pump in “hours” and “tenths of hours”.

I. Pump Start Delay:

1. The lag pump will be equipped with a time delay to prevent simultaneous motor starts.

J. Alarm Contacts:

1. Provide separate alarm contacts for the following alarm conditions:
   a. High water
   b. Low water
   c. Phase failure
   d. Pump fault, #1
   e. Pump fault, #2
   f. Station low temperature
   g. Backup level control system enabled
   h. Pump run, #1 – normally open
   i. Pump run, #2 – normally open

K. Three Phase Voltage Monitor:

1. The control panel shall be equipped to monitor the incoming power and shut down the pump when required to protect the motor(s) from damage caused by phase-reversal, phase loss and voltage. The motor(s) shall automatically restart when power conditions return to normal.

L. Secondary Surge Arrestor:

1. All Control Panels shall have Surge Protective Devices installed immediately after the main overcurrent device or immediately after the supply conductors to the panel have been terminated. The Surge Protective Device(s) shall follow IEEE C62.41 recommendation for cascading to protect all voltage levels to and including 24 volts AC/DC and shall be as follows:
2. Be UL 1449 3rd Edition Recognized for UL Type 2 applications except at 48 volts AC/DC and below may be UL 1449 3rd Edition for Type 3 applications.
3. Provide suppression for both normal mode (L-N [Wye]) and common mode (L+N-G [Wye] or L-G [Delta]).
4. Have a Surge Current Capacity (Imax) of at least 40kA.
5. Have a Nominal Surge Current Rating (In) of 20kA.
6. Have SCCRs of 200kA, except that 347Y/600V, 240/480V High leg Delta and 347V single-phase SPDs shall have a minimum SCCR of 125kA.
7. Use MOV technology with thermal disconnect.
8. Be RoHS compliant.
9. SPD status monitoring shall be provided by local visual indication and, if needed, by remote contact signaling using an optional Form C contact relay.
10. Hardwired Listed Type 1 or Type 2 Surge Protective Devices Shall:
    a. All Type 1 or Type 2 surge protective devices shall be manufactured by a single ISO-9001 registered company normally engaged in the design, development and manufacture of such devices for electrical distribution system/ equipment protection. Surge protective devices shall be UL Listed with a Short-Circuit Current Rating of 200kA, Nominal Discharge Current (In) of 20kA, and Surge Current Capacity (Imax) of120kA, 200kA, 300kA or 400kA. These SPDs shall be installed in accordance with the NEC® and/or local code requirements. The said manufacturer shall offer a minimum five (5) year warranty for its Type 1 and Type 2 surge protective devices.
    b. The hardwired surge protective device shall have specifications as shown below:
    c. The Maximum Continuous Operating Voltage (MCOV) shall not exceed 25% on Wye and 40% on Delta systems of the nominal voltage (system voltage) in the configuration being used
    d. Prewired NEMA 1 or NEMA 4X factory sealed enclosure suitable for the intended installation location
    e. Shall have a two color LED status indicator per phase
    f. Have an operating temperature range of at least -40˚C to +50˚C
    g. Only use thermally protected MOV technology, such as Bussmann SurgePOD™.
    h. Surge Protective Device Agency Information: SPDs shall be "Listed" by Underwriters Laboratories, Inc. to UL 1449 3rd Edition as a Type 1 or Type 2 device and shall exhibit the UL Listing mark for the UL category VZCA for USA and/or VZCA2 for Canada; and must have CSA certification.
    i. Manufacturers must provide verification of performance data for UL and CSA standards.
    j. All SPDs must be RoHS compliant.
    k. Surge protective devices shall be installed and located in accordance with the all applicable gency, NEC® and local code requirements. The SPDs must be suitable for the particular installation, be it on the upstream side (Type 1) or downstream side (Type 1 or Type 2) of service entrance Overcurrent Protective Device (OCPD).

l. All SPDs shall match voltage and system specific requirements as provided by the manufacturer.
m. All SPDs shall provide surge protection for both normal mode (L-N [Wye], L-L [Delta]) and common mode (L+N-G [Wye] or L-G [Delta]).
n. Surge protective device shall be clearly marked with specifications as required by UL 1449 3rd Edition along with UL holographic label on the SPD.
o. Each surge protective device should be serial numbered along with barcode for easy identification and traceability.

M. Receptacle:
1. A duplex ground fault interrupter utility receptacle providing 115 VAC, 60 hertz, single-phase current shall be provided. Receptacle circuit shall be protected by a 15-ampere thermal-magnetic circuit breaker.

N. Auxiliary Power Transformer:
1. A 5 KVA step-down transformer shall be provided to supply 115 volt, AC, single phase for the control and auxiliary circuits. The primary side of the transformer shall be protected by a thermal-magnetic air circuit breaker, specifically sized to meet the power requirements of the transformer. A mechanical operating mechanism shall be installed on the circuit breaker to provide a means of disconnecting power to the transformer.
2. A padlockable operator handle for the operating mechanism shall be located on the exterior of the control panel with interlocks which prevent opening the door until primary circuit breaker is in the "OFF" position.

2.08 WIRING

A. General:
1. The pump control as furnished by the manufacturer shall be completely wired except for the power feeder lines to the branch circuit breakers and final connections to remote alarm devices and between control assemblies.
2. All wiring, workmanship, and schematic wiring diagrams shall be in compliance with applicable standards and specifications set forth by the National Electric Code (NEC).
3. All user serviceable wiring shall be type MTW or THW, 600 volts, and shall be color-coded as follows:

a. Line and load circuits, AC or DC power	Black
b. AC control circuit less than line voltage	Red
c. DC control circuit	Blue
d. Interlock control circuit, from external source	Yellow
e. Equipment grounding conductor	Green
f. Current carrying ground	White
g. Hot with circuit breaker open	Orange

B. Wire Identification and Sizing:
1. Control circuit wiring inside the panel, with the exception of internal wiring of individual components, shall be 16-gauge minimum, type MTW or THW, 600 volts. Motor branch wiring shall be 10-gauge minimum.
2. Motor branch conductors and other power conductors shall not be loaded above 60-degree C temperature rating, on circuits of 100 amperes or less, nor above 75-degree

C on circuits over 100 amperes. Wires shall be clearly numbered at each end in conformance with applicable standards. All wire connectors in the control panel shall be of the ring tongue type with nylon insulated shanks. All wires on the subplate shall be bundled and tied or installed in duct. All wires extending from components mounted on door shall be terminated on a terminal block mounted on the back panel. All wiring outside the panel shall be installed in conduit.

C. Wire Bundles:

1. Control conductors connecting components mounted on the enclosure door shall be bundled and tied in accordance with good commercial practice. Bundles shall be made flexible at the hinged side of the enclosure. Adequate length and flex shall be allowed so that the door can swing to its full open position without undue mechanical stress or abrasion on the conductors or insulation. Bundles shall be clamped and held in place with mechanical fastening devices on each side of the hinge.

D. Conduit:

1. All conduit and fittings shall be UL listed.
2. Liquid tight flexible metal conduit shall be constructed of a smooth, flexible, galvanized steel core with a smooth abrasion resistant, liquid tight, polyvinyl chloride cover.
3. Conduit shall be supported in accordance with Articles 346, 347, and 350 of the National Electric Code.
4. Conduit shall be sized according to the National Electric Code.

E. Grounding:

1. The pump control manufacturer shall ground all electrical equipment to the enclosure back panel. The mounting surface of all ground connections shall have any paint removed before making final connections.
2. The contractor shall provide an earth driven ground connection to the control panel at the main ground lug in accordance with the National Electric Code (NEC).

2.09 PRIMARY LEVEL CONTROL SYSTEM

A. Liquid Level Control:

1. The level control system shall be a Gorman-Rupp Integrinex Standard Electronic Pressure Switch controller.
2. The manufacturer of the liquid level control system must be ISO 9001:2000 revision certified, with scope of registration including design control and service after sales activities.
3. The level control system shall start and stop the pump motors in response to changes in wet well level, as set forth herein.
4. The level control system shall be furnished as an air bubbler type level control system; however, it must be capable of being operated as a submersible transducer type system or ultrasonic transmitter type system.
5. The level control system shall incorporate automatic alternation to select first one pump, then the second pump, then subsequent pumps (if required) to run as lead pump for a pumping cycle. Alternation shall occur at the end of a pumping cycle, or in the event of excessive run time.

6. The level control system shall utilize an electronic pressure switch, which shall continuously monitor the wet well level, permitting the operator to read wet well level at any time. Upon operator selection of automatic operation, the electronic pressure switch shall start the motor for one pump when the liquid level in the wet well rises to the "lead pump start level". When the liquid is lowered to the "lead pump stop level", the electronic pressure switch shall stop this pump. These actions shall constitute one pumping cycle. Should the wet well level continue to rise, the electronic pressure switch shall start the second and/or subsequent pumps when the liquid reaches the "lag pump start level", or subsequent pump start levels, so that all pumps are operating. These levels shall be adjustable as described below.
    a. The electronic pressure switch shall include integral components to perform all pressure sensing, signal conditioning, EMI and RFI suppression, DC power supply and 120 volt outputs. Comparators shall be solid state, and shall be integrated with other components to perform as described below.
    b. The electronic pressure switch shall be capable of operating on a supply voltage of 12-24VDC in an ambient temperature range of -10 degrees C (14 degrees F) through 55 degrees C (131 degrees F). Ingress Protection of IP56 for indoor use with closed cell neoprene blend gasket material. Evaluated by Underwriters Laboratories for Pollution Degree 2 device for U.L. and cU.L. Control range shall be 0 to 33.3 feet of water with an overall repeat accuracy of (plus/minus) 0.1 feet of water. Memory shall be retained using a non-volatile lithium battery back-up.
    c. Eleven optically isolated, user defined digital inpurs for pump and alarm status. Rated at 10mA at 24VDC. Eight digital output relays (mechanical contacts), configurable for pump start/stop or alarms. Three relays rated at 12A at 28VDC and 120 VAC, five relays rated at 3A at 30VDC and 120VAC. The electronic pressure switch shall consist of the following integral components: pressure sensor, display, electronic comparators, digital inputs and digital output relays.
        1. The internal pressure sensor shall be a strain gauge transducer and shall receive an input pressure from the air bubbler system. The transducer shall convert the input to a proportional electrical signal for distribution to the display and electronic comparators. The transducer output shall be filtered to prevent control response to level pulsations or surges. The transducer range shall be 0-14.5 PSI, temperature compensated from -40 degrees C (-40 degrees F) through 85 degrees C (185 degrees F), with a repeat accuracy of (plus/minus) 0.25% full scale about a fixed temperature. Transducer overpressure rating shall be 3 times full scale.
        2. The electronic pressure switch shall incorporate a digital back lighted LCD panel display which, upon operator selection, shall indicate liquid level in the wet well, and pump status indication for up to 3 pumps. The display shall include a 128 x 64 bit resolution LCD to read out directly in feet of water, accurate to within one-tenth foot (0.1 foot), with a full-scale indication of not less than 12 feet. The display shall be easily convertible to indicate English or metric units.
        3. Level adjustments shall be electronic comparator set points to control the levels at which the lead, lag, and standby pumps start and stop. Each of the level settings shall be easily adjustable with the use of membrane type switches, and accessible to the operator without opening any cover panel on the electronic pressure switch. Controls shall be provided to permit the operator to read the selected levels on the display. Such adjustments shall not require hard wiring, the

use of electronic test equipment, artificial level simulation or introduction of pressure to the electronic pressure switch.

4. Each digital input can be programmed as pump run, pump HOA, pump high temp, pump moisture/thermal, starter failure (FVNR, RVSS, VFD), and phase failure. Inputs are used for status and alarm indication.
5. Each output relay in the electronic pressure switch shall be hard contact mechanical style. Each relay input shall be optically isolated from its output and shall incorporate zero crossover switching to provide high immunity to electrical noise. Each output relay shall have an inductive load rating equivalent to one NEMA size 3 contactor. A pilot relay shall be incorporated for loads greater than a size 3 contactor

d. The electronic pressure switch shall be equipped with alarm banners with time and date history for displaying alarm input notification. Alarm history will retain 16 of the most recent alarm events.
e. The electronic pressure switch shall be capable of jumping to next available pump if current pump is out of service due to pump failure or manual selection. Circuit design in which application of power to the lag pump motor starter is contingent upon completion of the lead pump circuit shall not be acceptable.
f. The electronic pressure switch shall be equipped with a simulator system capable of performing system cycle testing functions.
g. The electronic pressure switch shall be capable of controlling liquid levels in either a pump up or pump down application.
h. The electronic pressure switch shall be equipped with pump start/stop and alarm input delay(s) that have an adjustable delay set points.
i. The electronic pressure switch shall be capable of calculating and displaying pump elapsed run time. The elapsed run time is resettable and adjustable.
j. An Antiseptic function with a built in timer shall be incorporated in the electronic pressure switch to prevent the well from becoming septic.
k. The electronic pressure switch shall have internal capability of providing automatic simplex, duplex, and triplex automation, manual selection of pump sequence operation, and alternation in the event of 1-24 hours of excessive run time.
l. The electronic pressure switch shall be equipped with a security access code to prevent accidental set-up changes and provide liquid level set-point lock-out. The supervisor access code is adjustable.
m. The electronic pressure switch shall be equipped with one (1) 0-33 ft. W.C. input, one (1) scalable analog input of either 0-5VDC or 4-20mA, and one (1) scalable analog output of either 0-5VDC, 0-10VDC, or 4-20mA. Output is powered by 10-24VDC supply. Load resistance for 4-20mA output shall be 100-1000 ohms.
n. The electronic pressure switch shall include a DC power supply to convert 120 VAC control power to 12 or 24VDC power. The power supply shall be 500-mA (6W) minimum and be UL listed Class II power limited power supply.
o. The electronic pressure switch shall be equipped with an electronic comparator and mechanical output relay to alert maintenance personnel to a high liquid level in the wet well. An alarm banner, visible on the front of the controller, shall indicate that a high wet well level exists. The alarm signal shall be maintained until the wet well level has been lowered and the circuit has been manually reset. High water alarm shall be furnished with a dry contact wired to terminal blocks.

7. An alarm silence pushbutton and relay shall be provided to permit maintenance personnel to de-energize the audible alarm device while corrective actions are under way. After silencing the alarm device, manual reset of the alarm condition shall clear the alarm silence relay automatically. The pushbutton shall be a membrane style button integral to the Integrinex Standard level controller.

B. Air Bubbler System:

1. The level control system shall be the air bubbler type, containing air bubbler piping, which extends into the wet well. A pressure sensor contained within the electronic pressure switch shall sense the air pressure in this piping to provide wet well level signals for the remainder of the level control system.
2. Two vibrating reeds, industrial rated, air pumps shall be furnished to deliver free air at a rate of approximately 5 cubic feet per hour and a pressure not to exceed 7 psi. Liquid level control systems utilizing air compressors delivering greater quantities of air at higher pressures, requiring pressure-reducing valves, air storage reservoirs, and other maintenance nuisance items will not be acceptable. A selector switch shall be furnished to provide manual alternation of the air pumps. The switch shall be connected in such a manner that either pump may be selected to operate continuously. The selector switch shall be oil-tight design with contacts rated NEMA A300 minimum.
3. An air bell constructed of PVC 3 inches in diameter shall be provided for installation at the outlet of the air bubbler line in the wet well. The air bell shall have a 3/8" NPT tapped fitting for connection to the bubbler line.
4. An air flow indicator gauge shall be provided and connected to the air bubbler piping to provide a visual indication of rate of flow in standard cubic feet per hour.

2.10 BACKUP LEVEL CONTROL SYSTEM (INTRINSICALLY SAFE)

A. An independent redundant 2-float control system shall be mounted in the wet well and wired in to the pump control panel to serve as a backup level control system.

1. Float switches shall be mercury free, and shall serve the following functions:
   a. High Water / Pump ON
   b. Low Water / Pump OFF
2. NEMA 4X stainless steel wet well junction box
3. Float system shall include an anchor and stainless steel chain
4. Intrinsically safe barriers
5. The system shall utilize a smart relay, independent of the primary level control. The low level float (pump off) shall be placed below all primary pump off set-points. The high level float (pump start) shall be placed above all primary on set-points. If either float condition is achieved, a “Float Control Timer” shall begin. When the timer expires, the float control shall be latched in, the float control shall become active, and a “Backup Level Control Active” indicating light shall illuminate on the front of the control panel. If the high level float is achieved, a pump shall start. When the wet well level reaches the low level float, both pumps shall shut off. The float control shall include automatic alternation. The float control system shall remain latched until manually reset.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Contractor shall off-load equipment at installation site using equipment of sufficient size and design to prevent injury or damage. Pumping equipment manufacturer shall provide written instructions for proper handling. Immediately after off-loading, contractor shall inspect pumping equipment and appurtenances for shipping damage or missing parts.

B. Any damage or discrepancy shall be noted in written claim with shipper prior to accepting delivery. Validate all serial numbers and parts lists with shipping documentation. Notify manufacturer's representative of any unacceptable conditions noted with shipper.

3.02 INSTALLATION

A. Install, level, and align pump station as indicated on project drawings. Installation must be in accordance with written instructions supplied by the manufacturer at time of delivery.

B. Suction pipe connections must be vacuum tight. Fasteners at all pipe connections must be tight. Install pipe with supports and thrust blocks to prevent strain and vibration on pump system piping. Install and secure all service lines (level control, air release valve or pump drain lines) as required in wet well.

C. Provide adequate clearance for removal of pump rotating assembly and cover plate.

D. Each air release valve shall have a separate air release discharge pipe back to the wet well for each air release valve. Discharge pipe shall be minimum 1-½-inch diameter, and constantly downward slope towards the wet well.

E. Check motor and control data plates for compatibility to site voltage. Install and test the electrical ground prior to connecting line voltage to pump control panel.

F. Prior to applying electrical power to motors or control equipment, check all wiring for tight connection. Verify that fuses and circuit breakers conform to project design documents. Manually operate circuit breakers and switches to ensure operation without binding. Open all circuit breakers and disconnects before connecting utility power. Verify line voltage, phase sequence and ground before actual start-up.

G. After all anchor bolts, piping connections are installed, seal all openings between wet well and pump enclosure.

H. If determined by the engineer and/or manufacturer at startup, that grouting the pump/motor base is needed, the contractor shall be responsible to install grout to the pump/motor base. If grout is installed, the contractor shall ensure that the grout does not interfere with the pump/motor/belt guard adjustment or mounting hardware.

3.03 PROTECTION

A. The pumping equipment should be placed into service soon after delivery of the equipment. If installation is delayed, **the pumping equipment and motor control center shall be stored indoors, free of excessive dust, in a low humidity, heated environment.**

B. During installation and after the pumping equipment is placed into operation the motor control center shall operate in an environment free of excessive dust, in a low humidity, heated environment.

3.04 FIELD QUALITY CONTROL

A. Prior to acceptance by the owner, an operational test of all pumps drives, and control systems shall be conducted to determine if the installed equipment meets the purpose and intent of the specifications. Tests shall demonstrate that all equipment is electrically, mechanically, structurally, and otherwise acceptable; it is safe and in optimum working condition; and conforms to the specified operating characteristics.

B. Prior to start-up, clean wet well by removing construction debris and foreign material.

3.05 MANUFACTURER'S PRE-STARTUP INSPECTION

A. Coordinate system pre-startup with manufacturer's factory-trained service technician. The factory-trained service technician will inspect the installation and answer any installation questions by the Contractor, Engineer, or Owner.

B. Manufacturer's representative shall provide pre-startup checklist to be completed by the contractor prior to pre-startup inspection.

C. Verify that operations and maintenance manual is on site and installation instructions contained in the manual have been followed.

D. Verify that all pumping equipment, piping, level control system, alarms and ancillary equipment has been properly installed and all wiring is complete.

E. Verify that all spare parts for the pumping equipment are on site.

F. Pre-startup inspection shall be a separate trip and shall not be less than two weeks prior to the startup of the equipment.

3.06 MANUFACTURER'S STARTUP AND FIELD PERFORMANCE TESTING

A. Coordinate system start-up with manufacturer's factory-trained service technician. The factory-trained service technician will inspect the completed installation, calibrate and adjust instrumentation, and correct or supervise correction of defects or malfunctions. Startup shall be performed in the presence of the Engineer and Owner.

B. Equipment startup shall be tested under both utility power and emergency power.

C. Contractor shall supply clear water of adequate volume to operate the system including the force main through several pumping cycles.

D. Contractor shall have an electrician present at startup to resolve any wiring issues.

E. Observe and record operation of pumps, suction and discharge gage readings, voltage readings, ampere draw, pump controls, and liquid level controls. Check calibration of all instrumentation equipment. Test manual and automatic control systems. Test all alarms. Report any undue noise, vibration or other operational problems.

F. Startup shall be a separate trip.

3.07 MANUFACTURER'S OPERATION AND MAINTENANCE TRAINING

A. The manufacturer shall furnish the services of a qualified, factory-trained operations and maintenance serviceman to instruct and train Owner's personnel in the proper care, operation and maintenance of the equipment. The training shall include, but not be limited to, the following:
1. Theory of operation
2. Actual operation
3. Mechanical maintenance
4. Hydraulic troubleshooting
5. Electrical maintenance
6. Instrumentation and level controls
7. Optimization of the system
8. Alarm circuits
9. Safe operating and working practices and operation of safety devices.

B. One (1) training session is required. Training shall be completed after startup services have been performed. Training shall be a separate trip and shall not be less than two weeks after the startup of the equipment. Time, location, and duration of all training sessions shall be coordinated with Owner's personnel.

C. Hands-on training and demonstrations shall use the installed equipment.

D. Supplier shall provide all materials for training and shall provide training manuals to all personnel being trained.

3.08 MANUFACTURER'S EQUIPMENT RE-CERTIFICATION

A. The Contractor shall require, and cover the cost in his bid, for the manufacturer's factory-trained service technician to return to the site six (6) month's after initial startup of the equipment to perform a final re-certification of the equipment.

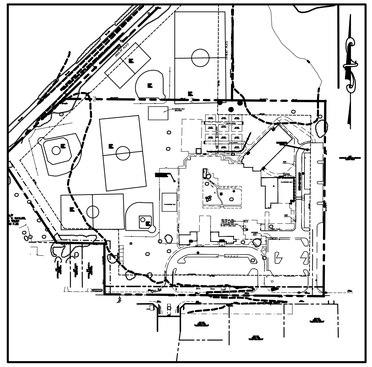
B. The re-certification shall consist of demonstrating and certifying that the equipment is meeting the performance requirements of the specifications. Equipment service technician shall perform field-testing of the equipment in the presence of the Owner. Results of all field-testing shall be submitted to the Engineer and the Owner.

3.09 CLEANING AND HOUSEKEEPING

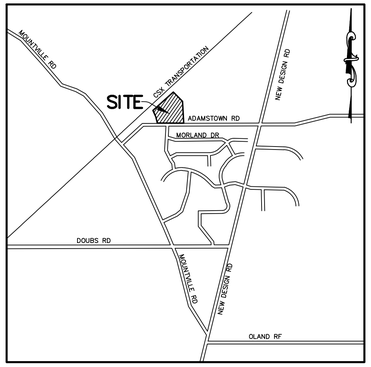
A. Prior to acceptance, inspect interior and exterior of pump station for dirt, splashed material or damaged paint. Clean or repair accordingly. Use touch-up paint provided under spare parts to repair any painted surfaces damaged during installation or startup. Remove from the job site all tools, surplus materials, scrap and debris.

END OF SECTION

CARROLL MANOR ELEMENTARY SCHOOL
SEWER LINE REDESIGN
FREDERICK COUNTY PUBLIC SCHOOLS



VICINITY MAP
SCALE: 1" = 250'±



LOCATION MAP
SCALE: 1" = 2,000'±

SHEET NO.	SHEET TITLE
C-0	COVER SHEET
C-1	SITE PLAN
C-2	SEWER PROFILE
C-3	SITE DETAILS

PROJECT SUMMARY

THE PROJECT CONSIST OF INSTALLING NEW PUMP STATION AND REMOVING TWO SEWER PUMP STATION. ONE LOCATED AT THE REAR OF THE BUILDING AND ONE LOCATED IN THE COURT YARD. NEW GRAVITY LINES WILL BE INSTALLED UNDER EXISTING BUILD BY BORE AND JACKING.

ABBREVIATION LIST

ABDN	ABANDONED
AC	ACRE
AGG	AGGREGATE
APPX	APPROXIMATE
ARCH	ARCHITECTURAL
B&B	BALL & BURLAP
BC	BOTTOM OF CURB (FLOW)
BRL	BUILDING RESTRICTION LINE
BIT	BITUMINOUS
BM	BENCH MARK
C&G	CURB AND GUTTER
C&P	CHESAPEAKE AND POTOMAC TELEPHONE
CA	CONCRETE ANCHOR
CAP	CAPACITY
CATV	CABLE TELEVISION
CFS	CUBIC FEET PER SECOND
CL	CENTER LINE/CLASS
CLF	CHAIN LINK FENCE
CLR	CLEAR, CLEARANCE
CO	CLEAN OUT
CONC	CONCRETE
CT	CURB TRANSITION
D	DIESEL
DA	DRAINAGE AREA
DEC	DECIDUOUS
DIP	DUCTILE IRON PIPE
DOM	DOMESTIC
DRN	DRAIN
DS	DOWN SPOUT
E	EAST
ELEC	ELECTRIC
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
ESMT	EASEMENT
EW	ENDWALL
EX	EXISTING
EXP	EXPOSED
F/	FROM
FC	FIELD CONNECTION
FDC	FIRE DEPARTMENT CONNECTON
FDI	FOUNDATION DRAIN INVERT
FND	FOUNDATION
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FIN	FINISHED
FO	FIBER OPTIC
FPS	FEET PER SECOND
FS	FIRE SERVICE
FT	FOOT/FEET
G	GAS (NATURAL)
GAL	GALLON
GM	GAS METER
GPM	GALLONS PER MINUTE
HB	HORIZONTAL BEND
HC	HANDICAP
HDPE	HIGH DENSITY POLYETHYENE
IMP	IMPERVIOUS
INV	INVERT
IPF	IRON PIPE FOUND
L	LENGTH
LAT	LATERAL
LOC	LOCATION
LP	LOW POINT/LIGHT POLE
LS	LOADING SPACE
MAX	MAXIMUM
MECH	MECHANICAL
MEG	MATCH EXISTING GRADE
MH	MANHOLE
MIN	MINIMUM
MON	MONUMENT
N	NORTH
OC	ON CENTER
OHE	OVERHEAD ELECTRIC
OHT	OVERHEAD TELEPHONE
OHW	OVERHEAD WIRE
OJPB	OPEN JOINT PAVEMENT BLOCK
OW	OBSERVATION WELL
PER	PERVIOUS
PP	PERMEABLE PAVEMENT
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
R =	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
REV	REVISION
RL	REMOVAL LIMITS
ROW	RIGHT OF WAY
S	SOUTH
S OR SAN	SANITARY
SC	SIAMESE CONNECTION
SEW	SEWER
SF	SQUARE FOOT/FEET
SHT	SHEET
SPEC	SPECIFICATION
SPK	SPRINKLER
STA	STATION
STD	STANDARD
STM	STORM
S/W	SIDEWALK
T OR TELE	TELEPHONE
T/	TO
TBR	TO BE REMOVED
TC	TOP OF CURB
TW	TOP OF WALL
TYP	TYPICAL
UGE	UNDERGROUND ELECTRIC
UGT	UNDERGROUND TELECOMMUNICATIONS
VC	VERTICAL CURVE
VENT	VENT PIPE
W	WATER/WEST
W/	WITH
WL	WATER LINE
WM	WATER MAIN
W/M	WATER METER
X-ING	CROSSING

ENGINEER:
ADTEK ENGINEERS, INC.
150 SOUTH EAST STREET, SUITE 201
FREDERICK, MARYLAND 21701
ATTN: SHAWN BENJAMINSON, P.E.
PHONE: 301-662-4408

OWNER/APPLICANT
FREDERICK COUNTY PUBLIC SCHOOLS
191 SOUTH EAST STREET
FREDERICK, MARYLAND 21701
ATTN: TONY RAY
TEL: 301-644-5167 FAX: 301-644-5027

PSC #10.069.19 SR

ADTEK
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150 South East Street, Suite 201
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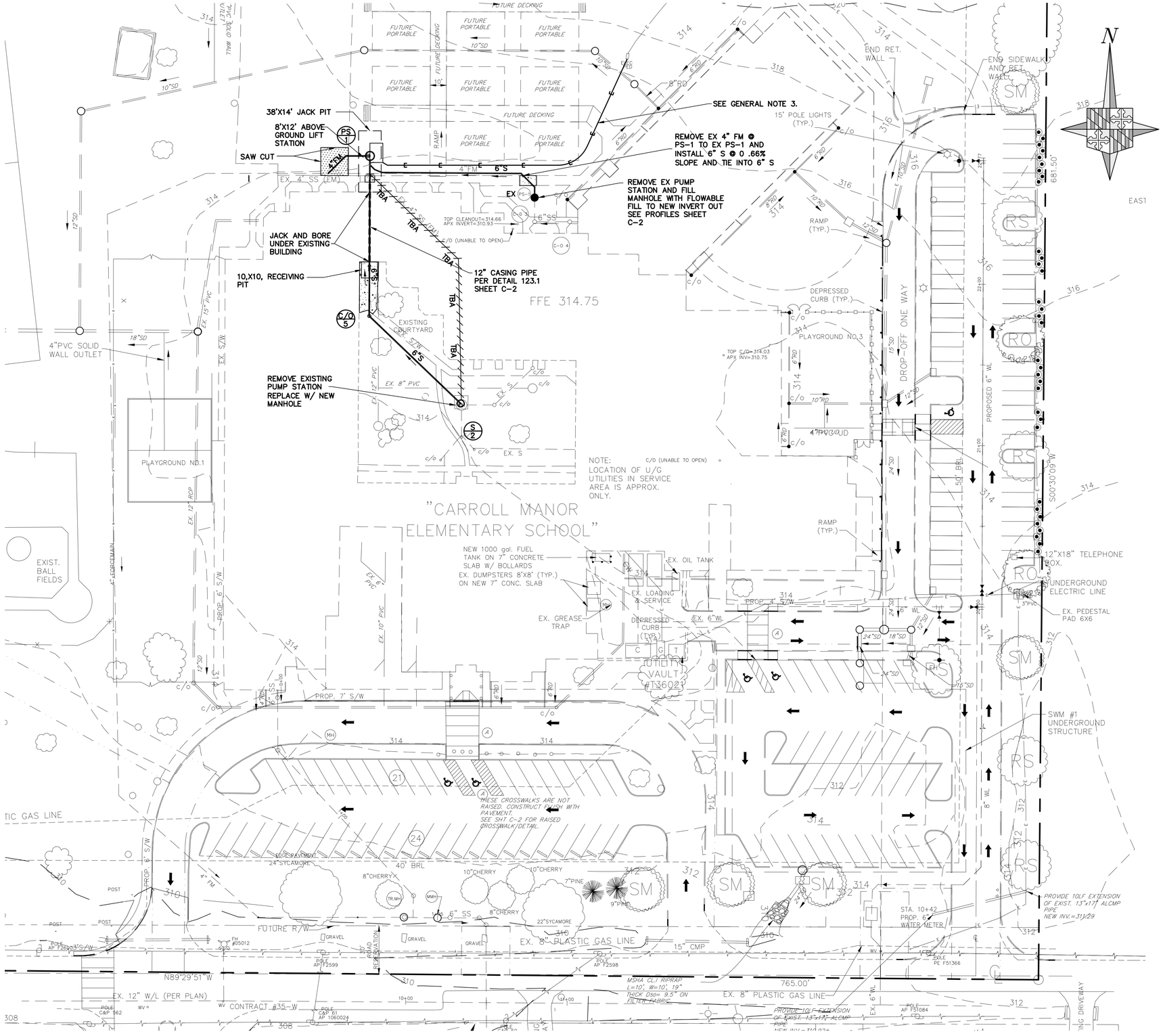
www.adtekengineers.com

NO.	DESCRIPTION	DATE
	ISSUE	

CARROLL MANOR ES SEWER REDESIGN
5624 ADAMSTOWN ROAD, ADAMSTOWN MD
FREDERICK COUNTY, MARYLAND
TAX MAP 103 P21 TAX ID 01-002368
COVER SHEET

SCALE:
DRAWN BY: JEB
DESIGN BY: JEB
DATE: 03/03/2020
CHECKED BY: JRB
PROJECT NUMBER: 172202
DRAWING NUMBER: C-0



LEGEND

- EXISTING TREE LINE
- EXISTING TREE LINE
- EXISTING MANHOLE
- EXISTING SANITARY SEWER — X"S
- EXISTING STORM DRAIN
- UTILITY POLE
- EXISTING WATER LINE — X"W
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING CONTOUR — 96
- PROPERTY LINE
- EXISTING UTILITY (TBA) (TO BE ABANDONED) W/ FLOWABLE FILL
- CONCRETE SIDEWALK SEE DETAIL 1 SHEET C-3
- LIGHT DUTY ASPHALT SEE DETAIL 2 SHEET C-3C

GENERAL DEMOLITION NOTES

1. ALL WORK SHALL BE PERFORMED IN STRICT CONFORMANCE WITH THE MOST CURRENT APPLICABLE EPA AND OSHA REGULATIONS AND MUST COMPLY WITH THE MOST CURRENT FEDERAL, STATE AND/OR LOCAL REGULATIONS AND CODES APPLICABLE TO SAID WORK.
2. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WORK WITH REPRESENTATIVE UTILITY COMPANIES AND IMPLEMENTING REQUIRED UTILITY-RELATED WORK ACCORDINGLY.
3. THE CONTRACTOR SHALL NOTIFY THE OWNER AND/OR OWNERS REPRESENTATIVE IMMEDIATELY UPON ENCOUNTERING ANY HAZARDOUS OR CONTAMINATED MATERIALS. THE CONTRACTOR SHALL DOCUMENT SAME TO THE OWNER TO OBTAIN DIRECTION AS TO THE APPROPRIATE ACTION(S) TO BE TAKEN.
4. WHERE NEW WORK IS TO BE DONE, CARE SHALL BE TAKEN TO PROTECT ALL EXISTING ADJACENT SURFACES AND AREAS FROM DAMAGE. ANY AREAS DAMAGED DURING CONSTRUCTION SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
5. CONTRACTOR SHALL BACKFILL EXCAVATED AREAS WITH ACCEPTABLE MATERIAL, AS SPECIFIED IN THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL SHEET/SHORE AND BRACE ANY AND ALL STRUCTURES EXPOSED BY EXCAVATION/CONSTRUCTION.
7. IN THE EVENT THAT, DURING DEMOLITION OR CONSTRUCTION ACTIVITIES THE CONTRACTOR ENCOUNTERS ANY EXISTING UTILITIES/STRUCTURES NOT SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL NOTIFY THE OWNER FOR DIRECTION PRIOR TO PROCEEDING WITH ANY WORK.
8. ALL SAWCUTS ARE TO BE STRAIGHT AND EVEN, JAGGED EDGES WILL NOT BE ACCEPTED.
9. THERE MAY BE ADDITIONAL EXISTING UTILITIES WITHIN THE LIMITS OF CONSTRUCTION THAT ARE NOT IDENTIFIED ON THESE PLANS. CONTRACTOR SHALL EXERCISE CAUTION DURING EXCAVATION AND IMMEDIATELY NOTIFY THE OWNER OF ANY ENCOUNTERED UTILITIES NOT PLANNED FOR. CONTRACTOR SHALL AS-BUILT ANY FOUND UTILITIES WITHIN THE LIMITS OF DISTURBANCE.
10. ALL UNDERGROUND UTILITIES ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION SHALL BE ASSUMED TO BE LIVE UNTIL DETERMINED OTHERWISE.

GENERAL NOTES:

1. CONTRACTOR IS RESPONSIBLE TO REPLACE ANY CONCRETE SIDEWALK DAMAGE DURING CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE TO RESTORING ANY DISTURBED AREA DAMAGED DURING CONSTRUCTION.
3. FCPS REQUEST THE BIDDER INCLUDE THE COST TO PROVIDE AND INSTALL A 125 AMP 208 VOLT DISCONNECT NEAR THE EXISTING ELECTRICAL PULL BOX BEHIND THE SCHOOL. THE 125 AMP DISCONNECT IS TO BE CONNECTED TO THE ELECTRICAL WIRING IN THE EXISTING PULL BOX. THE ELECTRICAL SERVICES IS TO CONTINUE TO THE PROPOSED PUMP ENCLOSURE. THE CONTINUATION OF THE ELECTRICAL SERVICES MUST BE INSTALLED NOT LESS THAN 40" BELOW GRADE BETWEEN THE NEW 125 AMP BREAKER AND THE PROPOSED PUMP ENCLOSURE. THE REQUESTED 125 AMP SERVICES SHALL BE TERMINATED IN THE PUMP ENCLOSURES. ADDITIONALLY PROVIDE AND INSTALL A 1 ¼" PVC CONDUIT FROM THE PUMP ENCLOSURE BACK INTO THE MAIN SCHOOL BUILDING, THIS SHALL BE INSTALLED TO THE CLOSEST POINT IN THE MAIN SCHOOL POSSIBLE.

MISS UTILITY

CALL "MISS UTILITY AT 1-800-257-7777, 48 HOURS PRIOR TO THE START OF WORK. THE EXCAVATOR MUST NOTIFY ALL PUBLIC UTILITY COMPANIES WITH UNDERGROUND FACILITIES IN THE AREA OF PROPOSED EXCAVATION AND HAVE THOSE FACILITIES LOCATED BY THE UTILITY COMPANIES PRIOR TO COMMENCING EXCAVATION. BEFORE EXCAVATION THE CONTRACTOR IS RESPONSIBLE FOR CALLING TICKET CHECK AT 1-866-821-4226 TO VERIFY THAT ALL UTILITIES HAVE BEEN MARKED, 48 HOURS AFTER CALLING MISS UTILITY.

CAUTION: IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED (ORIGINAL SIZE = 24"x 36")

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

PSC #10.069.19 SR

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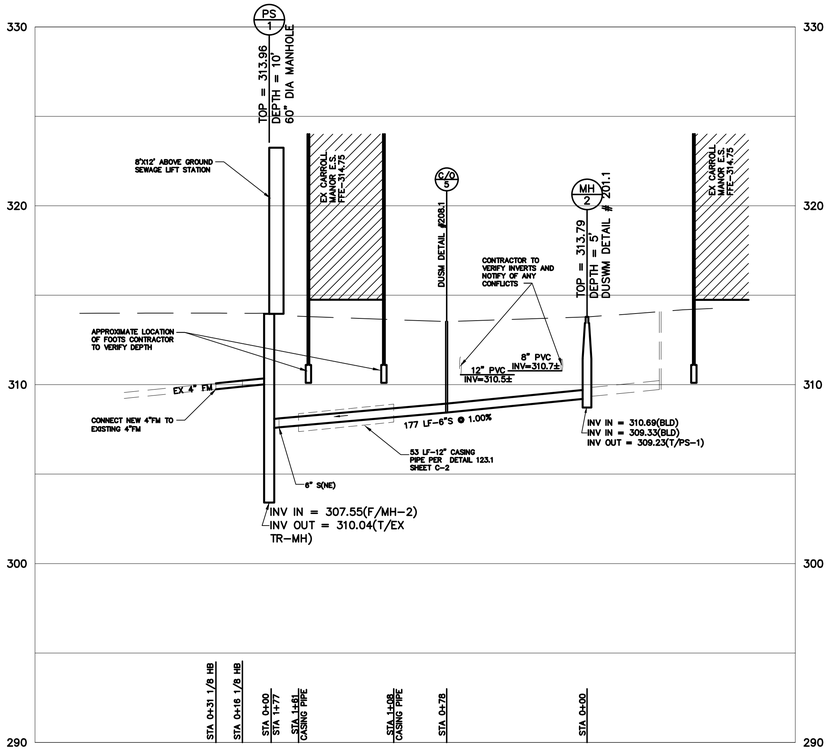
NO.	DATE	DESCRIPTION
		ISSUE

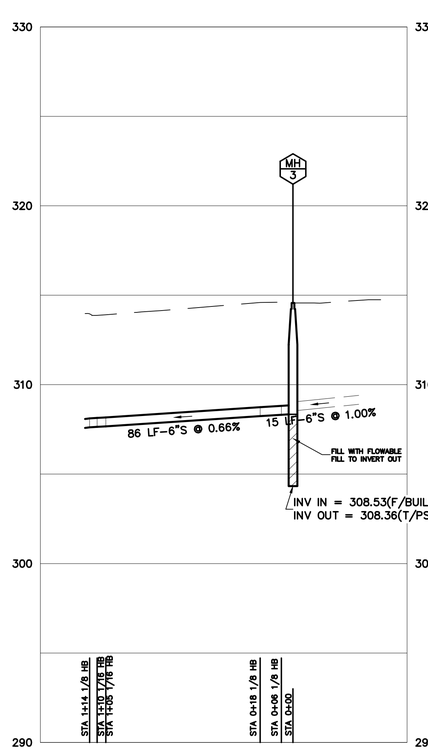
CARROLL MANOR ES SEWER REDESIGN
5624 ADAMSTOWN ROAD, ADAMSTOWN MD
FREDERICK COUNTY, MARYLAND
TAX MAP 103 P21 TAX ID 01-002368
SEWER LINE REALIGNMENT PLAN

SCALE:		PROJECT NUMBER:	172202
DRAWN BY:	JEB	DESIGN BY:	JEB
DATE:	03/03/2020	CHECKED BY:	JRB
		DRAWING NUMBER:	C-1

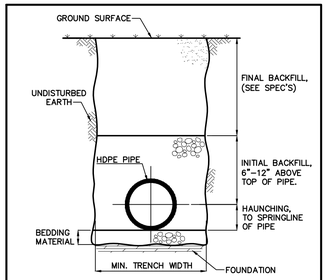
I:\Proj\172202 - Carroll Manor ES\Drawings 172202\DWG\C-1 SITE PLAN.dwg PLOTTED Apr 22, 2020



MAIN SEWER RUN
SCALE: 1" = 30'(HORIZ) 1" = 3'(VERT)



SEWER LINE B
SCALE: 1" = 30'(HORIZ) 1" = 3'(VERT)



TYPICAL TRENCH CROSS SECTION
NOT TO SCALE

REFERENCE SECTION X-2, "RECOMMENDATIONS FOR INCORPORATION INTO CONTRACT DOCUMENTS" OF ASTM SPECIFICATION D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS".

NOTES:

1. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH A FOUNDATION OF CLASS I OR II MATERIAL AS DEFINED IN ASTM D2321, "STANDARD PRACTICE FOR INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS," LATEST EDITION; AS AN ALTERNATIVE AND AT THE DISCRETION OF THE ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A WOVEN GEOTEXTILE FABRIC.
2. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

   UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" FOR FOR 4"-24" AND 42"-48" CORRUGATED POLYETHYLENE PIPE (CPEP); 6" FOR 30"-36" CPEP.
3. HAUNCHING AND INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III AND INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
4. UNLESS OTHERWISE SPECIFIED BY THE ENGINEER, MINIMUM TRENCH WIDTHS SHALL BE AS FOLLOWS:

NOMINAL ø in	MIN. RECOMMENDED TRENCH WIDTH, in
4	21
6	23
8	25
10	28
12	31
15	34
18	39
24	48
30	66
36	78
42	83
48	89
60	102

5. MINIMUM COVER: MINIMUM RECOMMENDED DEPTHS OF COVER FOR VARIOUS LIVE LOADING CONDITIONS ARE SUMMARIZED IN THE FOLLOWING TABLE. UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TAKEN FROM THE TOP OF PIPE TO THE GROUND SURFACE.

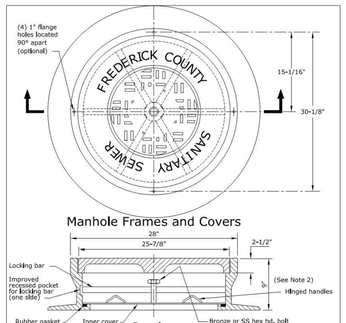
SURFACE LIVE LOADING CONDITION	MINIMUM RECOMMENDED COVER, in
H25 (FLEXIBLE PAVEMENT)	12*
H25 (RIGID PAVEMENT)	12

*TOP OF PIPE TO BOTTOM OF BITUMINOUS PAVEMENT SECTION

ON-SITE TRENCH INSTALLATION DETAIL
NOT TO SCALE

WATER AND SEWER GENERAL NOTES:

1. ALL WATER AND SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FREDERICK COUNTY "GENERAL CONDITIONS AND STANDARD SPECIFICATIONS AND DETAILS FOR WATER MAINS, SANITARY SEWER AND RELATED STRUCTURES", INCLUDED ASSOCIATED DETAILS REGULATIONS, OR POLICIES. DATED 1/1/2015
2. THE CONTRACTOR SHALL NOT TAP OR PENETRATE EXISTING WATER AND/OR SEWER MAINS WITHOUT APPROVAL FROM FREDERICK COUNTY DUSWM.
3. THE CONTRACTOR SHALL NOT OPERATE VALVES ON EXISTING COUNTY-OWNED WATER MAINS.
4. THE CONTRACTOR IS RESPONSIBLE TO AVOID THE SPILLAGE OF RAW SEWAGE. THE CONTRACTOR SHALL FURNISH NECESSARY EQUIPMENT (SEWER PLUGGING, PUMPING, CONTAINMENT, ETC.) TO PREVENT SAID SPILLAGE.
5. EXCAVATION WITHIN A COUNTY ROAD RIGHT-OF WAY FOR THE PURPOSE OF THE INSTALLATION OF UTILITIES, STORM DRAINS, ETC. SHALL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS IN THE PERMIT ISSUED BY THE FREDERICK COUNTY DIVISION OF HIGHWAY OPERATIONS.
6. EXISTING UTILITIES ARE SHOWN FROM BEST AVAILABLE RECORDS. THE CONTRACTOR SHALL TEST PIT IN THE AREA OF KNOWN UTILITIES TO VERIFY SIZE, ELEVATION, LOCATION AND TYPE PRIOR TO PERFORMING ANY WORK. ANY UTILITY, WHETHER SHOWN OR NOT, THAT IS DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED IMMEDIATELY AT NO EXPENSE TO THE OWNER. SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE OWNER IS TO BE NOTIFIED IMMEDIATELY. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT THE AUTHORIZATION OF THE OWNER, THEN THE CONTRACTOR ASSUMES THE RESPONSIBILITY FOR SAID CORRECTIONS OR ADJUSTMENTS.
7. ANY NECESSARY ADJUSTMENTS TO EXISTING MANHOLES, VALVE BOXES, ETC., ARE TO BE DONE SO BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING ANY EXISTING FENCES, DRIVEWAYS, SIGNS, DRAINAGE PIPES, MAILBOXES, SHRUBS, TREES, ETC. DAMAGED OR REMOVED DURING CONSTRUCTION. ALL DISTURBED AREAS SHALL BE RETURNED TO THEIR ORIGINAL CONDITION OR BETTER.
8. THE CONTRACTOR SHALL NOTIFY MISS UTILITY (1-800-257-7777) 72 HOURS PRIOR TO START OF CONSTRUCTION.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING SILT AND DEBRIS OUT OF THE STORM DRAINAGE SYSTEM FOR THE DURATION OF THE CONTRACT.
10. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTY OWNERS AT ALL TIMES. THE CONTRACTOR, WITH OWNER APPROVAL, WILL COORDINATE WITH PROPERTY OWNERS IF ACCESS MUST BE INTERRUPTED FOR SHORT TIME PERIODS.
11. MANHOLE LIDS FOR PRIVATELY MAINTAINED SANITARY SEWER SHALL REMOVE "FREDERICK COUNTY" FROM COUNTY STD DTL #5.1. LID TO READ "SANITARY SEWER".



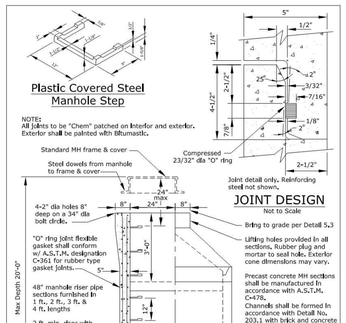
Manhole Frames and Covers

Section

Frame & outer cover - cast iron ASTM A-48, class 30 and designed for H-20 loading.
Inner cover, hinges & locking bar - steel ASTM A-36.
Neoprene "O" ring endless gasket, glued in place.
Inner cover lift handles are hinged type to prevent breakage.
Recessed pocket permits installation and removal of inner cover.
Locking bolt to have a 3/4" dia. shank.
Weight - approximately 480 lbs. (frame & cover).

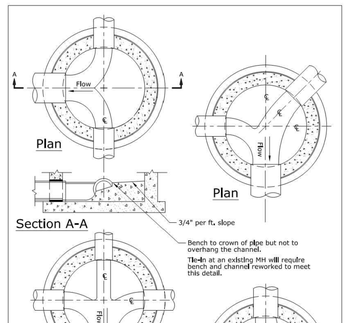
Notes:
1. When frame and cover are used for water structures, replace "Sanitary Sewer" with "Water".
2. Standard frame and cover does not include inner cover or rubber gasket. Watertight frame and cover includes the inner cover and rubber gasket as shown. Use of a 4" frame may NOT be used with watertight installations. A 4-inch frame may be used, if approved by the County prior to installation, which is attributed to unforeseen field conditions or design changes beyond the control of the contractor.
3. Detail 5.1 acceptable except when specific contract documents dictate otherwise.

Frederick County Division of Utilities & Solid Waste Management	Revisions Date	Revisions Note	Manhole Frame and Cover for Water & Sewer	Detail No. 5.1
Department of Engineering & Planning				Date: 10-04-2013

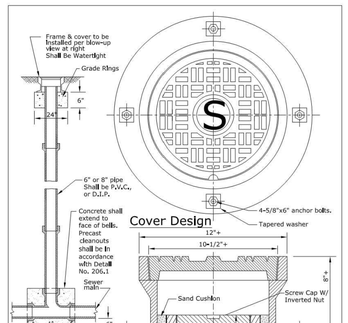


Manhole Section/Elevation

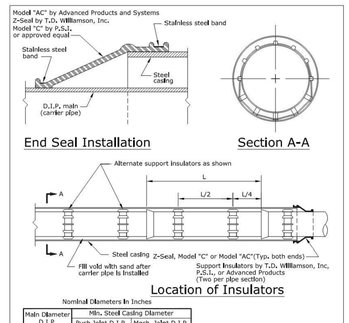
Frederick County Division of Utilities & Solid Waste Management	Revisions Date	Revisions Note	Precast Concrete Manhole Detail 48" Diameter	Detail No. 201.1
Department of Engineering & Planning				Date: 10-04-2013



Frederick County Division of Utilities & Solid Waste Management	Revisions Date	Revisions Note	Channel Layout for Sewer Manhole Bases	Detail No. 203.1
Department of Engineering & Planning				Date: 10-04-2013



Frederick County Division of Utilities & Solid Waste Management	Revisions Date	Revisions Note	Main Line Cleanout (Lamphole)	Detail No. 208.1
Department of Engineering & Planning				Date: 10-04-2013



Location of Insulators

Nominal Diameters in Inches

Main Diameter D.I.P.	Min. Steel Casing Diameter: Push Joint D.I.P.	Min. Steel Casing Diameter: Mech. Joint D.I.P.
3	10	12
4	10	12
6	12	16
8	16	18
10	18	20
12	20	24
14	24	24
16	30	30
18	30	30
20	30	36
24	36	36

Casing shall conform to AWWA C200. Min. Wall thickness shall be 3/8".
Ductile iron carrier pipe shall be coated in accordance with AWWA C-104.
All carrier pipe joints shall be restrained within casing.

Frederick County Division of Utilities & Solid Waste Management	Revisions Date	Revisions Note	Casing for D.I.P. Main under Highways and Railroads	Detail No. 123.1
Department of Engineering & Planning				Date: 10-04-2013

PSC #10.069.19 SR

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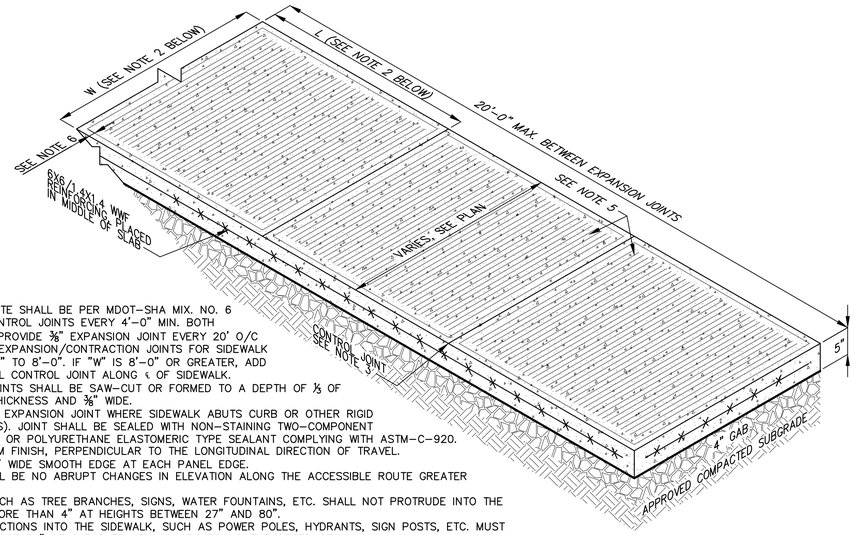
NO.	DATE	DESCRIPTION
		ISSUE

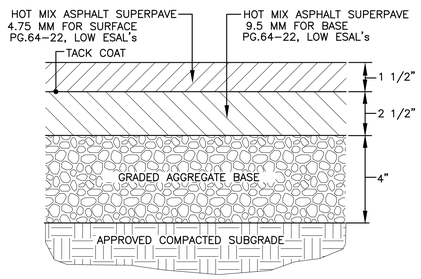
CARROLL MANOR ES SEWER REDESIGN
5624 ADAMSTOWN ROAD, ADAMSTOWN MD
FREDERICK COUNTY, MARYLAND
TAX MAP 103 P21 TAX ID 01-002368
SEWER LINE REALIGNMENT PROFILES

SCALE:	DESIGN BY: JEB	DRAWN BY: JEB	CHECKED BY: JRB
DATE: 03/03/2020			PROJECT NUMBER: 172202
			DRAWING NUMBER: C-2



NOTES:
1. ALL CONCRETE SHALL BE PER MDOT–SHA MIX. NO. 6
2. PROVIDE CONTROL JOINTS EVERY 4'–0" MIN. BOTH DIRECTIONS PROVIDE ⅜" EXPANSION JOINT EVERY 20' O/C MAX. MARK EXPANSION/CONTRACTION JOINTS FOR SIDEWALK WIDTHS 4'–0" TO 8'–0". IF "W" IS 8'–0" OR GREATER, ADD LONGITUDINAL CONTROL JOINT ALONG ℄ OF SIDEWALK.
3. CONTROL JOINTS SHALL BE SAW–CUT OR FORMED TO A DEPTH OF ⅓ OF THE SLAB THICKNESS AND ⅜" WIDE.
4. PROVIDE ⅜" EXPANSION JOINT WHERE SIDEWALK ABUTS CURB OR OTHER RIGID STRUCTURE(S). JOINT SHALL BE SEALED WITH NON–STAINING TWO–COMPONENT POLYSULFIDE OR POLYURETHANE ELASTOMERIC TYPE SEALANT COMPLYING WITH ASTM–C–920.
5. LIGHT BROOM FINISH, PERPENDICULAR TO THE LONGITUDINAL DIRECTION OF TRAVEL.
6. PROVIDE 1½" WIDE SMOOTH EDGE AT EACH PANEL EDGE.
7. THERE SHALL BE NO ABRUPT CHANGES IN ELEVATION ALONG THE ACCESSIBLE ROUTE GREATER THAN ¼".
8. OBJECTS SUCH AS TREE BRANCHES, SIGNS, WATER FOUNTAINS, ETC. SHALL NOT PROTRUDE INTO THE SIDEWALK MORE THAN 4" AT HEIGHTS BETWEEN 27" AND 80".
9. ALL OBSTRUCTIONS INTO THE SIDEWALK, SUCH AS POWER POLES, HYDRANTS, SIGN POSTS, ETC. MUST HAVE AT LEAST 36" OF CLEAR TRAVEL SPACE AROUND THE OBSTRUCTION.
10. ALL UTILITY COVERS IN SIDEWALK SHALL HAVE AN ANTI–SLIP FINISH AND MEET ADA REGULATIONS.
11. THE MAXIMUM CROSS SLOPE ON THE SIDEWALK SHALL NOT EXCEED 2%.

1 / C-3 ON-SITE CONCRETE SIDEWALK
NOT TO SCALE



2 / C-3 LIGHT DUTY ASPHALT (PLAY AREA)
NOT TO SCALE

STOCKPILE NOTES

1. NO STOCKPILING ALLOWED ON ASPHALT.
2. ALL STOCKPILES LEFT AT THE END OF THE DAY NEED TO BE STABILIZED UNTIL THE NEXT REDISTURBANCE.

FOR UTILITY WORK ONLY OR OFF–SITE UTILITY WORK

1. DISTURBANCE CANNOT EXCEED 5000 SQUARE FEET.
2. PLACE ALL EXCAVATED MATERIAL ON HIGH SIDE OF TRENCH.
3. ONLY DO AS MUCH WORK AS CAN BE DONE IN ONE DAY SO BACKFILLING, FINAL GRADING, SEEDING AND MULCHING CAN OCCUR.
4. ANY SEDIMENT CONTROL MEASURES DISTURBED BY CONSTRUCTION WILL BE REPAIRED THE SAME DAY.

SEDIMENT & EROSION CONTROL NOTES

1. ALL EROSION/SEDIMENT CONTROL MEASURES SHALL COMPLY WITH THE "MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" AS APPROVED BY THE COUNTY.
2. ALL DISTURBED AREAS NOT UNDER ANTIVE GRADING TO BE TO BE SEEDED WITHIN 7 DAYS OF INITIAL GRADING. FOR TEMPORARY SEEDING SPECIFICATIONS, SEE SECTION B1, "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" PUBLISHED JOINTLY BY WATER RESOURCES ADMINISTRATION, SOIL CONSERVATION SERVICE, AND THE STATE SOIL CONSERVATION COMMITTEE.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AT THE INITIATION OF GRADING.
4. ALL STORM DRAIN AND SANITARY SEWER LINES NOT IN PAVED AREAS AND NOT SUBJECT TO ACTIVE GRADING ARE TO BE MULCHED & SEEDED WITHIN 7 DAYS AFTER INITIAL BACKFILL..
5. ELECTRIC POWER, TELEPHONE AND GAS LINES NOT IN ACTIVE GRADING AREAS ARE TO BE COMPACTED, SEEDED AND MULCHED WITHIN 7 DAYS AFTER INITIAL BACKFILL.
6. ALL EARTH BERMS AND SEDIMENT DAMS ARE TO BE MULCHED AND SEEDED (SEE SECTION B OF ABOVE REFERENCE) WITHIN 7 DAYS AFTER GRADING. ALL SOIL STOCKPILES ARE TO BE MULCHED AND SEEDED WITHIN 7 DAYS.
7. DURING CONSTRUCTION, ALL SEDIMENT CONTROL STRUCTURES WILL BE INSPECTED AFTER EACH RAINFALL AND REPAIRED IF NECESSARY. SEDIMENT TO BE REMOVED TO A SUITABLE DISPOSAL AREA AND STABILIZED WITH PERMANENT VEGETATIVE COVER. (SEE SECTION B OF "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" PUBLISHED JOINTLY BY WATER MANAGEMENT ADMINISTRATION, SOIL CONSERVATION SERVICE AND STATE SOIL CONSERVATION COMMITTEE).
8. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL SEDIMENT EROSION CONTROL MEASURES UNTIL DISTURBED AREAS ARE STABILIZED.
9. AFTER FINE GRADING, ALL DISTURBED AREAS ARE TO BE PERMANENTLY MULCHED AND SEEDED. (SEE SECTION B)
10. NO SLOPE SHALL BE GREATER THAN 2:1.
11. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE. THIS DOES NOT APPLY TO THOSE AREAS WHICH ARE SHOWN ON THE PLAN AND ARE CURRENTLY BEING USED FOR MATERIAL STORAGE OR FOR THOSE AREAS ON WHICH ACTUAL CONSTRUCTION ACTIVITIES ARE CURRENTLY BEING PERFORMED. MAINTENANCE SHALL BE PERFORMED AS NECESSARY TO ENSURE THAT STABILIZED AREAS CONTINUOUSLY MEET THE APPROPRIATE REQUIREMENTS OF THE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL".
12. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN CONTINUOUS COMPLIANCE WITH THE LATEST VERSION OF THE MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
13. ALL UTILITIES SUCH AS STORM DRAIN, PUBLIC WATER, SANITARY SEWER, ELECTRIC POWER, TELEPHONE CABLE AND GAS LINES, THAT ARE NOT IN PAVED AREAS AND ARE NOT UNDERGOING ACTIVE GRADING SHALL BE TEMPORARILY OR PERMANENTLY STABILIZED WITHIN 3 DAYS OF INITIAL DISTURBANCE.
14. THE OWNER DEVELOPER OR THEIR DESIGNATE IS RESPONSIBLE FOR CONDUCTING ROUTINE MAINTENANCE. THE SITE AND CONTROLS SHOULD BE INSPECTED WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT**. ANY ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN A SUITABLE AREA AND SHALL BE TEMPORARILY OR PERMANENTLY STABILIZED.

** ANY PROJECT THAT HAS A STATE ISSUED N.O.I. PERMIT MUST DOCUMENT EACH INSPECTION AND MAINTAIN AN INSPECTION LOG
(PLEASE SEE NOI FOR DETAILS)

PSC #10.069.19 SR

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NO.	DATE	DESCRIPTION
		ISSUE

CARROLL MANOR ES SEWER REDESIGN
5624 ADAMSTOWN ROAD, ADAMSTOWN MD
FREDERICK COUNTY, MARYLAND
TAX MAP 103 P21 TAX ID 01–002368
SITE DETAILS

SCALE:		PROJECT NUMBER:	172202
DRAWN BY: JEB	DESIGN BY: JEB	DATE: 03/03/2020	CHECKED BY: JRB
		DRAWING NUMBER:	C–3