

**BRIDGEPORT WEST SEWER IMPROVEMENTS
SECTION C – LIFT STATION IMPROVEMENTS
CITY OF SIOUX CITY, IOWA
Project No. 6827C-539-201
2016**

CONTRACTOR'S BID DATE: Tuesday, March 8, 2016, 1:00 p.m.

PLACE FOR CONTRACTORS
TO SUBMIT BIDS:

City of Sioux City
City Clerk
Customer Service Center, 1st Floor
405 Sixth Street
P.O. Box 7402
Sioux City, IA 51102

ADDENDUM NO. 1

February 22, 2016

TO ALL PLANHOLDERS:

The following changes, additions, and/or deletions are hereby made a part of the contract documents for the above-referenced project, as fully and completely as if the same were fully set forth therein:

SPECIFICATIONS

1. Refer to Special Provisions, page SP-1:

Replace the Special Provisions with the revised sheet. The following items have been modified:

Change first sentence to read "A pre-bid meeting will be held for this project on **Tuesday**, February 23, 2016 at 1:00 pm at York Lift Station, 3901 Southgate Drive."

2. Refer to Section 01 5136, Temporary Wastewater Bypass System:

Replace this Section with the revised sheets. The following was added to 1.07:

"E. Dakota Pump, Inc."

3. Refer to Section 26 3213, Packaged Engine Generators:

Replace this Section with the revised sheets. The Sub-paragraph 2.06.J.2a.3d was revised as follows:

"d) Sub-base fuel tank shall meet all state or local codes as required by the State of Iowa."

PLANS

1. Refer to Sheet U.16:

Replace Plan Sheet U.16 with revised Sheet. The following items have been modified.

Revised Detail #1.

2. Refer to Sheet D.20:

Replace Plan Sheet D.20 with revised Sheet. Note 5 should be replaced as follows:

"Remove existing in-ground pull box and replace with an above grade NEMA 4X, 304 stainless steel box, size as required. Re-work conduits as required to stub into new above grade box. Inside box shall be terminals to be used to splice pump cables to wiring from control panels. Support bottom of box 16 inches off of ground using a 6" x 6" treated wood post."

3. Refer to Sheet E.20:

Replace Plan Sheet E.20. The following items have been modified:

- a. In the Electric Unit Heater Schedule, change EUH-1 and EUH-2 to 35KW heaters with amps of 44.
- b. In the Power One-Line Diagram, change the breakers feeding EUH-1 and EUH-2 to 50 amp 3 pole breakers.

All bidders shall acknowledge receipt and acceptance of ADDENDUM NO. 1 by signing the space provided on the Bid Form.

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.
	<i>Dawn R. Horner</i> _____ DAWN R. HORNER, P.E.
	Date: <i>4/22/16</i>
	License No. 16306
	My renewal date is December 31, 2017
Pages or sheets covered by this seal: <u>Entire Document.</u>	

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VIEW ONLY - NOT FOR BIDDING

Addendum #1
(Revised 2-22-16)

SPECIAL PROVISIONS
BRIDGEPORT WEST SEWER IMPROVEMENTS
SECTION C – LIFT STATION IMPROVEMENTS

The specifications to be used on this project are the 2016 Iowa Statewide Urban Design and Specifications (SUDAS) in conjunction with the 2015 Sioux City Supplement to SUDAS. The following project special provisions take precedence over and revise the SUDAS and Sioux City Supplement to SUDAS.

1. Pre-Bid Meeting:

A pre-bid meeting will be held for this project on Tuesday, February 23, 2016 at 1:00 p.m. at York Lift Station, 3901 Southgate Drive. IT IS STRONGLY RECOMMENDED THAT THE CONTRACTOR ATTEND THE PRE-BID MEETING AND/OR VISIT THE SITE PRIOR TO BIDDING. IF THE CONTRACTOR IS NOT ABLE TO ATTEND THE PRE-BID MEETING, THEY SHALL CONTACT LINCOLN RYAN AT 712-279-6448 TO SET UP A SITE VISIT TO BOTH LIFT STATIONS.

2. Pre-construction Conference

A pre-construction conference will be held at City Hall in the 4th Floor Clocktower Conference Room at a time to be determined by the City Project Manager. The contractor will receive the Notice to Proceed at the conclusion of the pre-construction meeting.

3. Notification to Property Owners

The Owner will provide an informational paper that is to be given to the property owners on the streets this project affects. The Contractor shall provide liaison between his activities and all businesses/residences and distribute this paper seven (7) days prior to the time when works begins and/or when their street will be closed for construction, in order to allow the affected businesses and residences to compensate for disruptions caused by the project. Property owners will be notified seventy-two (72) hours prior to any scheduled utility outage including water outages.

4. Section 1070 – Legal Relations and Responsibility to the Public
(the following is hereby added)

2.06 Traffic Control

C. The Contractor shall furnish, install, and maintain throughout the course of the construction all necessary construction signs, traffic control signs, barricades and other warning devices to inform the traveling public (including vehicular and pedestrians) of the construction within the project area. This shall include the removal or covering of existing traffic control signs, which are in conflict with the temporary construction signing. Existing traffic control signs which are removed shall be delivered to the City of Sioux City for storage during the duration of the construction. At the completion of the work, the Contractor shall remove all temporary signs and construction barricades and restore all permanent traffic control signs along the roadways (which were covered during the construction) as directed by the Engineer and the City of Sioux City.

D. Prior to the start of construction, the Contractor shall submit all phase revisions to the Engineer and a traffic control plan to implement. The City of Sioux City reserves the right to modify the proposed construction signing and barricade plan as necessary throughout the course of the work to assure the safety of the traveling public. The

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Contractor shall coordinate and schedule all street closures with the City of Sioux City. Please contact the Engineering Division 712-279-6324 to issue a press release: start date, duration, extent & location of closure, detour route, reason for closure.

E. Payment for furnishing, installation, maintenance, and removal of all traffic control devices including temporary pavement marking, construction signs and barricades for each phase of the project shall be paid for lump sum at the contract unit price bid for "Traffic Control." This work shall also include submittal of all construction phase revisions, removal of existing and all temporary pavement markings, and all necessary removal, reinstallation or covering of existing traffic control signs which may conflict with the proposed construction signing and traffic control plan.

F. The Contractor must provide a 24-hour phone number to the City and the 911 Operator in the event of defective, missing or non-operational signing.

G. All open trenches and other excavations shall be protected with suitable barriers, signs and lights to the extent that adequate protection is provided to the public against accident by reason of such open construction. Obstructions such as material piles and equipment shall be provided with similar warning signs and lights.

H. All traffic control devices, procedures and layouts shall be as per part VI of the current addition of the MUTCD as adopted by the Iowa Department of Transportation. All sign shall utilize retroreflective sheeting material which meets the requirements of Article 4186.03 of the English Standard Specifications of Highway and Bridge Construction 2012 series as published by the Iowa Department of Transportation or shall be illuminated by means of acceptable warning lights from sunset to sunrise. Material stored upon or alongside public streets, roads and highways shall be so placed that the work at all times shall be so conducted as to cause minimum obstruction and inconvenience to the traveling public.

I. Where Type III barricades are shown as part of a full closure, the installation shall include an adequate number of Type III barricades to reach from edge of pavement to edge of pavement, as well as orange safety fence placed from right-of-way line to right-of-way line or as necessary to prevent vehicles from going around the barricades and entering the work area.

J. The Traffic Control bid item shall include all costs associated with furnishing, placing, maintaining, and removing all traffic control devices including the cost of flaggers.

K. The basis of payment shall be 50 percent of Lump Sum price paid on the first Certificate for Payment and 100 percent of Lump Sum price paid when 95 percent of the value of the work is completed.

5. Section 1080 – Prosecution and Progress
(the following is hereby added)

1.17 Contact Personnel

Contractor shall provide the City and 911 operator with the name and phone number of their representative to be contacted during working and non-working hours as necessary.

--END OF SPECIAL PROVISIONS--

SECTION 01 5136
TEMPORARY WASTEWATER BYPASS SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Furnishing, installing, maintaining, and removing the temporary bypass system to bypass wastewater around the wet well.
- B. Temporary bypass of wastewater for the various construction sites.

1.02 SUBMITTALS

- A. Upon Notice to Proceed, provide the following items related to the temporary wastewater bypass system:
 - 1. Emergency Spill Response Plan.
 - 2. Diversion Plan Check List.
 - 3. Monitoring Plan. Shall include details on devices used, how maintained, how monitored, and response time in the event of a problem.
 - 4. Pumping Schedule.
 - 5. Equipment and piping schematic.
- B. Submit a detailed proposed method for temporary diversion of sewage that follows the general plan shown on the drawings and defined in this spec.
 - 1. The proposed method shall include:
 - a. Suction pipe and valves for multiple wastewater pumps.
 - b. Manufacturer, type, capacity, hp, full load amperage, mounting details, and location of wastewater pumps including pump curves.
 - c. Size and material of discharge pipe and valves from wastewater pumps.
 - d. Electrical power input connections to wastewater pumps.
 - 1) Include information on physical characteristics and electrical capacity of the connections.
 - e. Controls for wastewater pumps.
 - f. Schedule for flow transfers and/or facility shutdowns.
- C. For each bypass set-up, submit a detailed proposed method for temporary bypass of sewage. The proposed method shall include the method of bulkheading the existing pipe(s), connection to the existing pipe(s), size and material of the bypass pipe, and related operations and equipment. Submittals shall show the required redundancy and capacities of all equipment, etc. Submittals shall show all wastewater services and laterals into the system and how each is being accounted for and diverted. Submittals shall show pipe support into temporary pipe discharge location.
 - 1. Submittal shall show wastewater operating levels in lift station wet well.

1.03 SYSTEM DESCRIPTION

- A. Maintain continuous flow of wastewater at all times unless otherwise indicated. Provide all necessary equipment, temporary installations, and personnel to set up, test, maintain, and operate the bypass of wastewater around construction areas for the time necessary to accomplish the work.
 - 1. All wastewater shall be conveyed to acceptable downstream facilities.
 - 2. Flow shall not be allowed to back up or be restricted in any way.
 - 3. Do not spill wastewater.
 - 4. Temporary bypass systems shall be designed to convey flows specified herein.
- B. The Contractor shall be responsible for temporary power to operate bypass pumping equipment. Suitable valves shall be provided at the upstream and downstream end of each line

for isolation purposes in the event of a rupture, leak or some other problem. Under normal conditions, these valves shall remain open.

- C. The Contractor shall be responsible for damages (including settled materials removal) caused by wastewater backup due to the Contractor's operations.
- D. Pumps: Provide multiple pumps to meet the range of flows specified herein. All pumps shall be in place, connected, and ready to operate.
 - 1. The pumping capacity shall be equal to the listed peak flow with largest pump out of service.
- E. The Contractor may utilize redundant vector trucks for small temporary bypassing.

1.04 PROJECT CONDITIONS

- A. See contract drawings for site layout.
- B. Pump Performance:
 - 1. Pump Requirements:
 - a. Provide portable pumps.
 - b. Provide diesel or temporary electricity to run pumps.
- C. Suction Location: Manhole SA_10-138_3605.
- D. Discharge Location: 16" Forcemain Cleanout.
- E. Electrical Requirements.
 - 1. The Contractor shall provide a control panel for each electrically driven pump. Each control panel enclosure shall be rated to protect internal components from weather and contamination. Each shall contain/be provided with:
 - a. A single connection point for the required power supply.
 - b. A main disconnect and main overcurrent device for overall protection of the control panel.
 - c. Control power source to supply power for all internal and external control devices/functions to perform the required pumping control.
 - d. Operator interface devices on the front of the control panel to allow operation of the pumping equipment.
 - e. A collective alarm contact closure output, rated 10A at 120VAC, to indicate any alarm/fail conditions occurring within the pump control panel. This will be wired to the plant SCADA system by the Owner.
 - 2. Provide level sensor and transmitter instrumentation to control operation of the pumps.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform setup of the bypass system.
- B. Provide bi-weekly trips by a qualified service representative to perform a system check on the installation and to check on the equipment.

1.06 QUALITY ASSURANCE

- A. Contractor must have a minimum of five (5) years experience with temporary bypass of wastewater at treatment plants.
 - 1. Submit three (3) references upon request.
- B. Interested Contractors must visit the site prior to bidding to discuss the project and observe the site layout.
- C. Contractor shall provide mechanical maintenance of the pumps as required during the equipment rental period.

1.07 MANUFACTURERS

- A. Northern Dewatering Inc.
- B. Griffin Dewatering.
- C. Rain for Rent
- D. Engineer approved equivalent.
- E. Dakota Pump, Inc.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL

- A. Develop an Emergency Spill Response Plan subject to the approval of the Engineer and Owner. The Plan shall have the minimum requirements:
 - 1. One set of repair clamps/coupling for each temporary forcemain pipe size and type shall be stocked on-site prior to starting any pumping of wastewater to perform the work. Any use of these spare materials will require immediate replacement within one calendar day.
 - 2. Prior to bypassing wastewater, the Contractor shall successfully hydrotest the temporary piping system. Contractor is responsible for supplying water needed to hydrotest temporary piping system.
 - 3. At minimum, Contractor will evaluate the condition of the bypass piping system at the beginning and end of each work day. Contractor shall continually monitor the bypass system during construction activities. A monitoring device shall be included in the bypass system to immediately notify responsible parties of possible system failure when the Contractor is not on site.
 - 4. A monitoring device shall be included in the bypass system to immediately notify responsible parties of possible system failure.
 - 5. If a break or spill occurs, or if vandalism occurs that results in a spill, then the Contractor shall contact City staff. If the incident is due to vandalism, then the Contractor shall also notify the local police and obtain a police report.
 - 6. Contractor will have their emergency repair and cleanup respondents on site within one hour to assess the situation and initiate the appropriate action. The first response will be to stop the spill immediately. Depending upon the nature of the incident, the Contractor's responders may need to call in additional equipment and personnel.
 - 7. Contractor's respondents will review the cause of the problem and will implement the appropriate corrective action. This corrective action may involve, but not necessarily be limited to, pumping wastewater into tanker trucks and hauling sewage to a downstream location until such time that repairs can be completed.
 - 8. Depending on the nature of the situation, a spill may result in standing wastewater in places. Contractor shall utilize appropriate equipment to pump or suction up the wastewater and dispose of it either by tanker truck or via the repaired system. This action will take place in a timely manner as logistics permit, but within 12 hours of the incident or a shorter time period if required by local or state authorities. Clean up shall be to the satisfaction of the Owner, Engineer, and local or state authorities.
 - 9. If in an appropriate area to do so, lime or gypsum should be sprinkled on those areas of spilled wastewater to buffer any excess nitrogen that may have been absorbed.
 - 10. The Contractor shall issue a report to the Owner and Engineer on the date and time of the incident, the estimated amount of spillage, the cause of the incident, and the action taken including both the corrective action and the clean up activities. Attach any police reports, if applicable.

- B. Develop a Bypass Plan Checklist subject to approval by the Owner and Engineer. The Plan shall have the following minimum requirements:
1. Bypass Start Up Check List. Include notifications to the Owner and Engineer just prior to start up and provide a copy of completed check list showing that all conditions are met.
 - a. All equipment and materials necessary for the installation of the new facility are on site.
 - b. The bypass pipe was successfully hydrotested.
 - c. All required redundant back-up systems are in place and ready to function.
 - d. The Emergency Spill Response Plan has been approved and attendant has proper training and phone numbers.
 - e. Back-up repair couplings and/or clamps for each size and type used are on site.
 - f. The bypass set-up plan detailing the proposed method for temporary bypass of wastewater has been approved.
 2. Bypass Shutdown Check List. Include notifications to the OWNER and Engineer just prior to shutdown and provide a copy of completed check list.
- C. Notify the Owner in writing a minimum of 5 working days in advance of a planned connection or shut down. Notify the Owner verbally 48 hours in advance of the planned connection or shutdown.
- D. Prior to bypassing wastewater, hydrotest the bypass pipe to 150 psi or two (2) times the operating pressure, and hold for two hours. The test fails if leakage is observed or if the pressure drop exceeds 5 percent of the test pressure over the two-hour test period. This hydrotest shall be repeated for each subsequent downstream lining where the pipe is disassembled and later reassembled.
- E. Do not begin the bypass of wastewater without the Owner's approval and evidence of a completed startup checklist. Do not terminate pumping/bypass of wastewater without the Owner's approval and evidence of a completed shutdown checklist. Coordinate with Owner for scheduling.
- F. Contractor shall have a Monitoring Plan with the following required:
1. At all times when any Contractor equipment, bulkheads or other devices are in the Owner's sewer, Contractor shall provide a system with the means to detect or determine that flow is not backing up abnormally and is hence moving properly through the sewer and/or temporary bypass piping. System shall be such that should a problem start, the Contractor is alerted by the system and the Contractor can respond within 60 minutes to the site. Any device(s) that the Contractor uses shall be tested or checked daily and a log of such shall be maintained.
 - a. Contractor shall maintain the system and shall have access to spare parts as necessary to keep it functioning properly. Maintenance on the system shall be recorded in the log.
- G. Reschedule as needed due to wet weather conditions at no additional cost to the Owner.
- H. Upon completion of the work and flow transfer, the temporary bypass system shall be removed and all affected surface improvements shall be restored to a condition equal to or better than the condition existing prior to construction.

END OF SECTION

SECTION 26 3213
PACKAGED ENGINE GENERATORS

PART 1 GENERAL

1.01 SCOPE

- A. All equipment provided under this Specification Section shall be by a single supplier and manufacturer.
- B. Provide engine generator sets as listed in this specification to be installed by others adjacent to existing sewage lift stations.
- C. General Requirements:
 - 1. Delivery and start up of the one (1) generator and transfer switch (see Specification Section 26 3600) to the York Lift Station site. Delivery to the site shall be coordinated with the installing Contractor. If the generator is available before the Contractor is ready to receive it, the generator supplier shall be required to securely store it at their facility until delivered to the lift station site.

1.02 SECTION INCLUDES

- A. Delivery to job site of generator and transfer switch.
- B. Packaged diesel engine generator set.
- C. Exhaust silencer and fittings.
- D. Fuel tank.
- E. Engine/Generator Monitoring and Control Panel.
- F. Battery and battery charger.
- G. Weatherproof outdoor sound attenuating enclosure.
- H. On-site training.
- I. Start-Up and testing and fuel tank filling.

1.03 REFERENCES

- A. NECA/EGSA 404 - Recommended Practice for Installing Generator Sets; National Electrical Contractors Association; 2000.
- B. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2006.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2003.
- D. NFPA 30 - Flammable and Combustible Liquids Code; National Fire Protection Association; 2003.
- E. NFPA 37 - Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
- F. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.
- G. NFPA 110 - Standard for Emergency and Standby Power Systems; National Fire Protection Association; 2005. The generator set shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit, component level type tests will not substitute for this requirement.
- H. UL142 - Sub-base Tanks
- I. UL1236 - Battery Chargers
- J. ANSI S1.13-1971 - Measurement Of Sound Pressure Levels In Air

- K. IEEE446 - Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- L. UL 2200 - The generator set shall be listed to UL2200 or submit to an independent third party certification process to verify compliance as installed.
- M. IEC8528 part 4. Control Systems for Generator Sets
- N. The generator set manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.

1.04 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Shop Drawings: Indicate electrical characteristics and connection requirements. Show plan and elevation views with overall and interconnection point dimensions, fuel consumption rate curves at various loads, ventilation and combustion air requirements, electrical diagrams including schematic and interconnection diagrams.
- C. Product Data: Provide data showing dimensions, weights, ratings, interconnection points, and internal wiring diagrams for engine, generator, control panel, battery, battery rack, battery charger, exhaust silencer, vibration isolators, day tank, and weather enclosure.
- D. Test Reports: Indicate results of performance testing.
- E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Field Reports: Indicate procedures and findings.
- H. Operation Data: Include instructions for normal operation.
- I. Maintenance Data: Include instructions for routine maintenance requirements, service manuals for engine and fuel tank, oil sampling and analysis for engine wear, and emergency maintenance procedures.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70 and NFPA 110.
 - 1. Maintain one copy of each document on site.
- B. UL 2200 listed.
- C. Products: Furnish products listed and classified by Underwriters Laboratories as suitable for purpose specified and indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Units shall be delivered to the job site for unloading and installation by others. Supplier shall coordinate with Installing Contractor the delivery to site the time of the delivery and the size and weight of item(s) to be unloaded.
- B. Protect equipment from dirt and moisture by securely wrapping in heavy plastic.

1.07 MAINTENANCE MATERIALS

- A. Furnish one set of any special tools required for preventative maintenance of the engine generator system. Package tools in adequately sized metal tool box.

1.08 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after final acceptance by the Owner, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Caterpillar.
- B. Cummins.
- C. MTU.
- D. Kohler.
- E. Generac.

2.02 PACKAGED ENGINE GENERATOR SYSTEM

- A. Description: NFPA 110, engine generator system to provide source of power for Level 1 applications conforming to NFPA 99.
- B. Generators shall be able to produce full ratings at 1000 feet above sea level using engine-mounted radiator.

2.03 LOADING SEQUENCE

- A. Upon failure of normal utility power, the generator shall be required to pick up 80% of the rated generator KW load in one step with a voltage dip of 15% or less.

2.04 ENGINE

- A. Type: Water-cooled inline or V-type, four stroke cycle, compression ignition Diesel internal combustion engine.
- B. Rating: Sufficient to operate at rated full load output in an ambient of 122 degrees F at elevation of 1000 feet.
- C. Fuel System: No. 2 winter blend diesel fuel.
- D. Engine speed: 1800 rpm.
- E. Governor: Electronic isochronous type to maintain engine speed within 0.5 percent, steady state, and 5 percent, no load to full load, with recovery to steady state within 2 seconds following sudden load changes.
- F. Safety Devices: Engine shutdown on high water temperature, low oil pressure, over speed, and engine over crank. Limits as selected by manufacturer.
- G. Engine Starting: DC starting system with positive engagement, number and voltage of starter motors in accordance with manufacturer's instructions. Include remote starting control circuit, with MANUAL-OFF-REMOTE selector switch on engine-generator control panel.
- H. Engine Jacket Heater: The coolant heater shall be installed on the engine with SAEJ20 compliant materials. Steel tubing shall be used for connections into the engine coolant system wherever the length of pipe run exceeds 12 inches. The coolant heater installation shall be specifically designed to provide proper venting of the system. The coolant heaters shall be installed using isolation valves to isolate the heater for replacement of the heater element. The design shall allow the heater element to be replaced without draining the engine cooling system or significant coolant loss. The coolant heater(s) shall be sized as recommended by the engine manufacturer to warm the engine to a minimum of 40C in a 15C ambient, in compliance with NFPA110 requirements, as a minimum, or the temperature required for starting and load pickup requirements of this specification. Jacket heaters shall be designed to operate on 208 volts (single or 3 phase), or 120 Volt single phase.

- I. Radiator: Engine-mounted unit using glycol coolant, with blower type fan, sized to maintain safe engine temperature in ambient temperature of 104 degrees F (40 degrees C). Radiator air flow restriction 0.5 inches of water maximum.
- J. Engine Accessories: Fuel filter(s), lube oil filter(s), intake air filter(s), lube oil cooler, fuel transfer pump, fuel priming pump, gear-driven water pump. Include fuel pressure gage, water temperature gage, and lube oil pressure gage on engine/generator control panel.
- K. Mounting: Generators shall be mounted to integral sub-base fuel tank.
- L. The engine(s) shall be certified for the EPA emissions requirements that are in effect at the time of installation at the project site(s).

2.05 GENERATOR

- A. Generator: NEMA MG 1, three phase, four pole, reconnectable brushless synchronous generator with brushless exciter.
- B. Rating: 400 KW/500 KVA, standby rated, 480/277V, 60 Hz at 1800 rpm.
- C. Insulation Class: As required for specified temperature rise.
- D. Temperature Rise: 130 degrees C Standby.
- E. Enclosure: NEMA MG 1, open drip proof.
- F. Excitation: Excitation power shall be provided from a permanent magnet generator (PMG) source mounted to the motor shaft of the generator.
- G. Voltage Regulation: Include generator-mounted volts per hertz exciter-regulator to match engine and generator characteristics, with voltage regulation plus or minus 1 percent from no load to full load for any constant load between no load and rated load. Include manual controls to adjust voltage droop, voltage level (plus or minus 5 percent) and voltage gain.
- H. Frequency Regulation: Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with any steady load from no load to full load shall not exceed plus or minus 0.25%.
- I. The Alternator shall produce a clean AC voltage waveform, with not more than 5% total harmonic distortion at full linear load, when measured from line to neutral, and with not more than 3% in any single harmonic, and no 3rd order harmonics or their multiples. Telephone influence factor shall be less than 40. Provide an anti-condensation heater for the alternator
- J. The generator set load connections shall be composed of silver or tin plated copper bus bars, drilled to accept mechanical or compression terminations of the number and type as shown on the drawings. Sufficient lug space shall be provided for use with cables of the number and size as shown on the drawings.
- K. Electric starter capable of three complete cranking cycles without overheating.

2.06 ACCESSORIES

- A. Exhaust Silencer: Residential type silencer, with muffler companion flanges and flexible stainless steel exhaust fitting, sized in accordance with engine manufacturer's instructions.
- B. Batteries: Heavy duty, diesel starting type lead-acid storage batteries. Match battery amp-hr requirements and voltage to starting system. Include necessary cables and clamps.
- C. Battery Tray: Treated for electrolyte resistance, constructed to contain spillage.
- D. Battery Charger:
 - 1. Provide a fully regulated, constant voltage, current limited, multi-rate battery charger for each generator set. The chargers shall be designed for heavy-duty industrial service, primarily to quickly recharge and maintain batteries that start internal combustion engines. Charger shall be rated a minimum of 12 amps, and be capable of operating in parallel with

- another like charger for reliability and added charging capacity. The charger shall be mounted inside the generator enclosure.
2. Charger shall provide 4 distinct charge states: dead battery, bulk charge, absorption, and float. Charge rate shall be temperature compensated to provide charging in ambient conditions from -20 to +55C.
 3. Provide LED indication of general charge condition, including charging, fault, and equalize. Provide a 2 line LCD display to indicate charge rate, battery voltage, faults, and provide charger set up. Charger shall provide relay contacts for fault conditions as required by NFPA 110.
 4. The charger shall operate properly during fault conditions, including battery disconnection while charging, reversed battery polarity connections, and shorted battery.
 5. The charger shall be compliant to the same RFI/EMI and voltage surge performance as are specified for the genset control.
- E. Line Circuit Breaker: NEMA AB 1, electronic circuit breaker (with LISG Trips) on generator output with integral thermal and instantaneous magnetic trip in each pole. Include battery-voltage operated shunt trip, connected to open circuit breaker on engine failure. Unit mount in enclosure to meet NEMA 250, Type 1 requirements. The generator set over current protection shall be UL listed as a utility grade protective device.
- F. Engine-Generator Control Panel: NEMA 250, Type 1 generator mounted control panel enclosure with engine and generator controls and indicators. Include the following equipment and features:
1. Frequency Meter: 45-65 Hz. range.
 2. Generator Set AC Output Metering. The generator set shall be provided with a metering set including the following features and functions:
 - a. Analog or digital voltmeter and ammeter. Voltmeter and ammeter shall display all three phases.
 3. Output voltage adjustment.
 4. Lamp-test pushbutton.
 5. Engine Manual/Off/Remote selector switch.
 6. Engine Start/Run/Stop switch.
 7. Engine running time meter.
 8. Oil pressure gage.
 9. Water temperature gage.
 10. Engine running pilot light.
 11. Auxiliary Relay: 3PDT, operates when engine runs, with contact terminals prewired to terminal strip.
 12. Local Alarms: Monitor and indicate the following alarm conditions via a pilot light on control panel.
 - a. Low oil pressure.
 - b. High engine temperature.
 - c. Overspeed.
 - d. Overcrank.
 - e. High engine temperature pre-alarm.
 - f. Low oil pressure pre-alarm.
 - g. Control switch not in Auto.
 - h. Low battery voltage.
 - i. Low fuel level.
 - j. Fuel tank leak.
- G. Provide a common general generator alarm on the generator control panel to communicate the generator alarm into the Lift Station SCADA system for display on SCADA screens.

- H. Provide an OSHA approved Lockout Tagout generator starter switch to prevent starting of generator when locked out.
- I. Provide a NEMA 4X emergency stop pushbutton mounted on the outside of generator enclosure. The pushbutton shall be a maintained contact type with red mushroom style operator. Provide an extra contact on the emergency stop button. Provide flip open cover over pushbutton.
- J. Outdoor Weather-Protective Sound Attenuating Enclosure
1. The generator shall be provided with a weather-protective outdoor enclosure that houses the generator. Muffler shall be internal to the enclosure.
 2. General
 - a. The enclosure shall be sized to adequately house the generator and all specified accessories.
 - 1) Doors
 - (a) Adequate doors shall be installed for sufficient access to the generator set and all accessories. All door shall be lockable.
 - 2) Exhaust/Silencer
 - (a) The engine generator set shall be provided with critical grade silencer housed internally to the enclosure.
 - 3) Base/Fuel Tank
 - (a) A secondary containment, UL listed, skid-base fuel tank shall form the base of the enclosure and shall support the engine generator. Provide lugs on bottom of fuel tank for fastening of the assembly to a concrete slab foundation. Provide tank with necessary conduit stub-up area.
 - (b) The fuel capacity of the tank shall be sized to run the generator at 3/4 load for 24 hours.
 - (c) Provide the fuel tank with a 2" fill with lockable cap, tank vent, rupture basin vent, emergency relief vent, mechanical gauge, drain for fuel tank and rupture basin, low level alarm dry contact, leak detection dry contact, and ports for fuel supply, return, & one spare connection. The dry contacts to be rated minimum 5A at 120 VAC.
 - (d) Sub-base fuel tank shall meet all state or local codes as required by the State of Iowa.
 - (e) Provide a fuel tank level sensor/transmitter that transmits a 4-20mA signal proportional to fuel level.
 - 4) Painting
 - (a) One quart of factory matching touch-up paint shall be provided to touch up any scratches in the future. Contractor shall be responsible for touching up any dings or scratches occurred during construction using factory matching paint before final acceptance by the Owner.
 - 5) Sound Attenuation
 - (a) Sound level emissions from the sound attenuating enclosures shall not exceed the following dBA, as measured at a distance of 7 meters (23 ft.) around the housing in a free field environment.
 - (1) 76 dBA at full load.

2.07 SPARE PARTS

- A. Provide a listing of the factory recommended spare parts for maintenance purposes.
- B. Provide a listing of factory recommended coolants and engine oils to be used for maintenance of generator.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Installation on site will be by the Projects General Contractor. Delivery to the site will be by the generator supplier. Start up on site will be by the Supplier/Manufacturer. Supplier/Manufacturer shall verify that the generator is installed per manufacturers requirements.

3.02 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with Section 01 4000.
- B. Provide full load test utilizing portable test bank for four hours minimum.
 - 1. Record the following at 20 minute intervals during four hour test:
 - a. Kilowatts.
 - b. Amperes.
 - c. Voltage.
 - d. Coolant temperature.
 - e. Frequency.
 - f. Oil pressure.
 - g. Outdoor air temperature.
- C. Simulate power failure including operation of transfer switch, automatic starting cycle, and automatic shutdown and return to normal.
- D. Test alarm and shutdown circuits by simulating conditions.
- E. Provide manufacturer's information verifying the sound level measurements to verify compliance to the specification.
- F. The generator supplier or the General Contractor shall provide the fuel (#2 diesel winter blend) for the load test and shall fill the fuel tank after testing is complete.

3.03 MANUFACTURER'S FIELD SERVICES

- A. Provide the services of manufacturer's representative to prepare and start the generator system.

3.04 ADJUSTING

- A. Adjust generator output voltage and engine speed.

3.05 CLEANING

- A. Clean engine and generator surfaces. Replace oil and fuel filters.

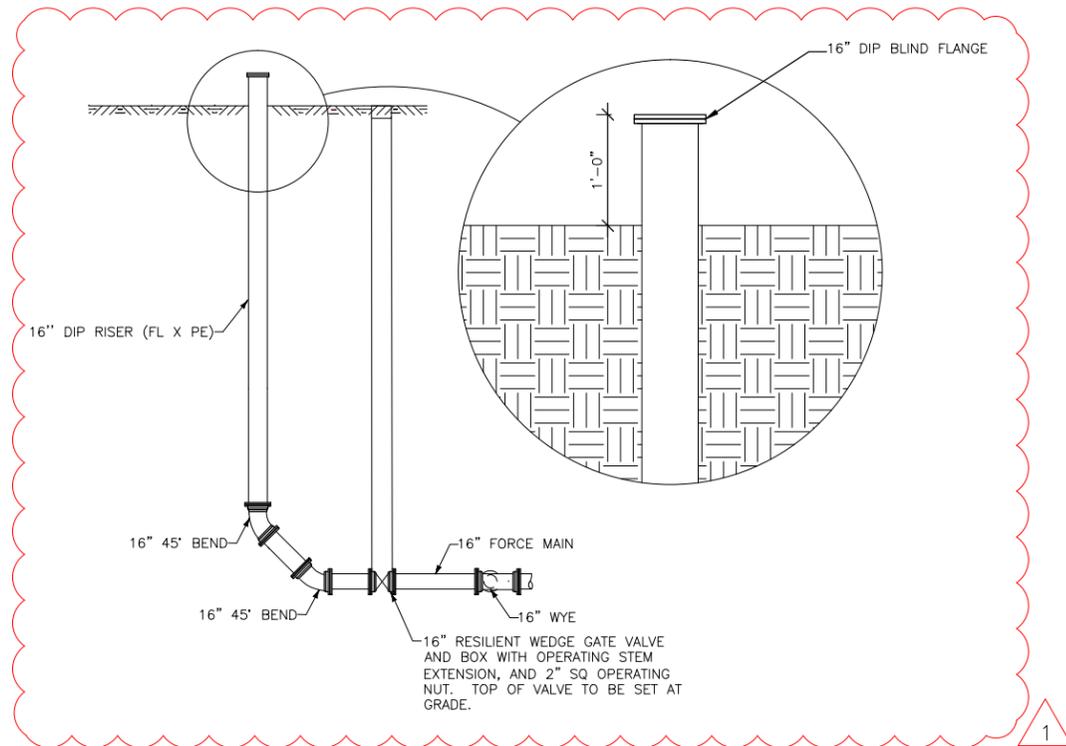
3.06 DEMONSTRATION

- A. Simulate power outage by interrupting normal source, and demonstrate that system operates to provide standby power including automatic starting cycle, operation of transfer switch to load generator, return to normal power, and automatic shutdown.

3.07 TRAINING

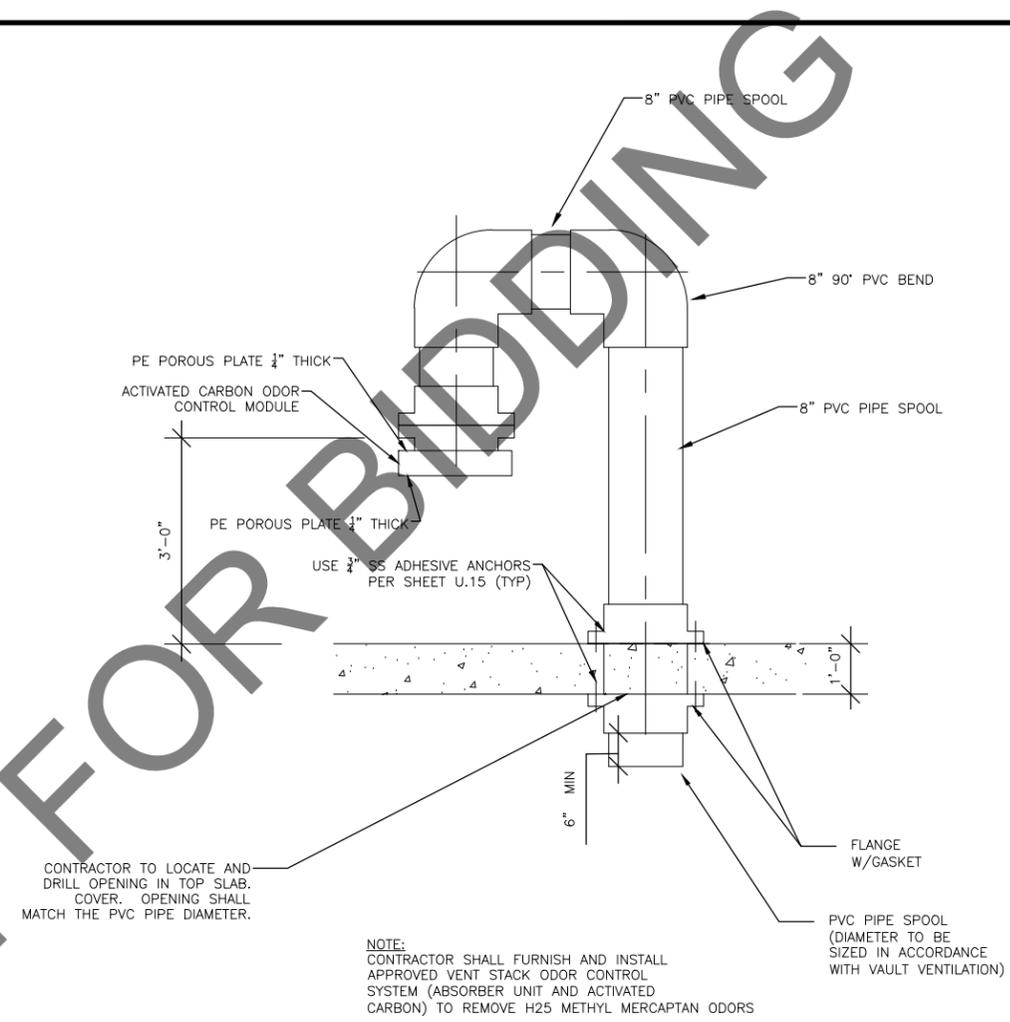
- A. The Contractor shall provide a minimum of two hours of typical Generator and transfer switch operation and maintenance requirements training of the Owner's personnel at the generator site. The training shall include but not be limited to startup, operation, shutdown, system indicators, maintenance, and trouble shooting.

END OF SECTION



1 FORCE MAIN CLEANOUT

SCALE: NTS



2 STILLING STRUCTURE VENT PIPE

SCALE: NTS

VIEW ONLY - NOT FOR BIDDING

ADDENDUM #1

DRAWN BY: JV JOB DATE: 2015
 APPROVED: DRH JOB NUMBER: 50150006
 PLOT DATE: 2/22/2016 12:05 PM
 CAD FILE: \\HRGSFDC\Drawings\50150006.01\CAD\Section C\Drawings\U.16.dwg

BAR IS ONE HALF INCH ON OFFICIAL DRAWINGS.
 IF NOT ONE HALF INCH, ADJUST SCALE ACCORDINGLY.

NO.	DATE	BY	REVISION DESCRIPTION
1	2/22/16	JV	REVISE CLEANOUT DETAIL



BRIDGEPORT WEST SEWER IMPROVEMENTS - SECTION C
 CITY OF SIOUX CITY, IOWA



DETAILS
 DETAILS

SHEET NO.
U.16

SITE PLAN KEY NOTES: (#)

- 1 CONTRACTOR SHALL REMOVE EXISTING UTILITY METERING AND PROVIDE NEW UTILITY DISCONNECT, NEW METER, AND SUPPORT STRUCTURE AS REQUIRED. MOVE METER RACK CLOSER TO FENCE AND COORDINATE WITH LOCAL UTILITY THE EXTENSION OF THE SERVICE DROP AS REQUIRED.
- 2 CONTRACTOR SHALL REMOVE THE EXISTING CONTROL PANEL AND REPLACE WITH NEW CONTROL PANEL, REUSING THE EXISTING CONDUITS THAT ARE CAST INTO THE CONCRETE BELOW THE PANEL. PANEL SHALL BE PROVIDED UNDER SPECIFICATION SECTIONS 250000 AND INSTALLED BY THE ELECTRICIAN.
- 3 CONTRACTOR SHALL INSTALL A NEW 3 INCH 20 FOOT GALVANIZED STEEL CONDUIT ANTENNA POLE ONTO THE SIDE OF THE NEW CONTROL PANEL. INSTALL A WEATHERHEAD AT TOP OF POLE. INSTALL EXISTING SCADA ANTENNA AND NEW SCADA AT THE TOP AND INSTALL NEW ANTENNA CABLES.
- 4 CONTRACTOR SHALL REUSE THE EXISTING SERVICE ENTRANCE RATED AUTOMATIC TRANSFER SWITCH.
- 5 REMOVE EXISTING IN-GROUND PULL BOX AND REPLACE WITH AN ABOVE GRADE NEMA 4X, 304 STAINLESS STEEL BOX, SIZE AS REQUIRED. RE-WORK CONDUITS AS REQUIRED TO STUB INTO NEW ABOVE GRADE BOX. INSIDE BOX SHALL BE TERMINALS TO BE USED TO SPLICE PUMP CABLES TO WIRING FROM CONTROL PANELS. SUPPORT BOTTOM OF BOX 16 INCHES OFF OF GROUND USING A 6" X 6" TREATED WOOD POST.
- 6 EXISTING INGROUND PUMP CABLE SPLICE BOX SHALL BE REUSED.
- 7 CONNECT EXISTING LIGHT TO NEW CONTROL PANEL USING EXISTING CONDUITS. REWIRE AS REQUIRED. REMOVE EXISTING FIXTURE AND REPLACE WITH NEW APPLETON TYPE JAMLED-6-7 LED FIXTURE. PROVIDE MOUNTING BRACKETS AS REQUIRED TO INSTALL ON EXISTING CONDUIT POLE.
- 8 CONTRACTOR SHALL WIRE NEW PUMP (POWER AND CONTROL) TO NEW CONTROL PANEL. USING EXISTING CONDUIT SYSTEM. CONTRACTOR SHALL PROVIDE NEW PUMP CABLES FROM CONTROL PANEL TO INGROUND SPLICE BOX.
- 9 CONTRACTOR SHALL RE-USE EXISTING ULTRASONIC LEVEL SENSOR AND HYDRORANGER 200 IN EXISTING CONTROL PANEL. HYDRORANGER 200 SHALL BE REMOVED FROM EXISTING CONTROL PANEL AND INSTALLED IN NEW CONTROL PANEL.
- 10 CONTRACTOR SHALL RE-USE EXISTING CONDUIT/OUTLET BOX FOR ELECTRIC HOIST. CONTRACTOR SHALL PROVIDE NEW OUTLET WITHIN THE BOX.
- 11 CONTRACTOR SHALL INSTALL FIVE (5) FLOATS IN THE EXISTING WET WELL (STOP, START LEAD, START LAG 1, START LAG 2, HIGH LEVEL ALARM). SUPPORT FLOATS FROM A 316 STAINLESS STEEL ROPE ATTACHED TO THE CEILING AND WEIGHTED TO THE FLOOR. INSTALL NEAR WET WELL HATCH FOR ACCESS.
- 12 CORE DRILL AND LINK SEAL A NEW 3 INCH SCHEDULE 80 PVC CONDUIT INTO SIDE OF WET WELL FOR NEW FLOATS. RUN PVC CONDUIT TO NEW NEMA 4X STAINLESS STEEL SPLICE BOX INSTALLED NEXT TO FENCE.
- 13 INSTALL A METER VAULT LIGHT SWITCH AND RECEPTACLE 18 INCHES ABOVE GRADE NEXT TO METER VAULTS.
- 14 CEILING MOUNT TWO APPLETON LIGHT FIXTURES WITHIN THE METER VAULT, TYPE CMLED70, AND WIRE TO LIGHT SWITCH LOCATED OUTSIDE OF THE VAULT. FIXTURES SHALL BE RATED CLASS 1, DIVISION 2, GROUP D HAZARDOUS.
- 15 INSTALL A NEW LIGHT FIXTURE IN N.E. CORNER OF FENCED AREA. FIXTURE SHALL BE AN APPLETON TYPE JAMLED-6-7 MOUNTED ON A 20 FOOT 2 INCH GALVANIZED STEEL CONDUIT POLE.
- 16 INSTALL A 10"x15" PT STYLE QUAZITE INGROUND PULL BOX FOR FUTURE FIBER OPTIC LINE.



PHOTO 1

SCALE: NTS



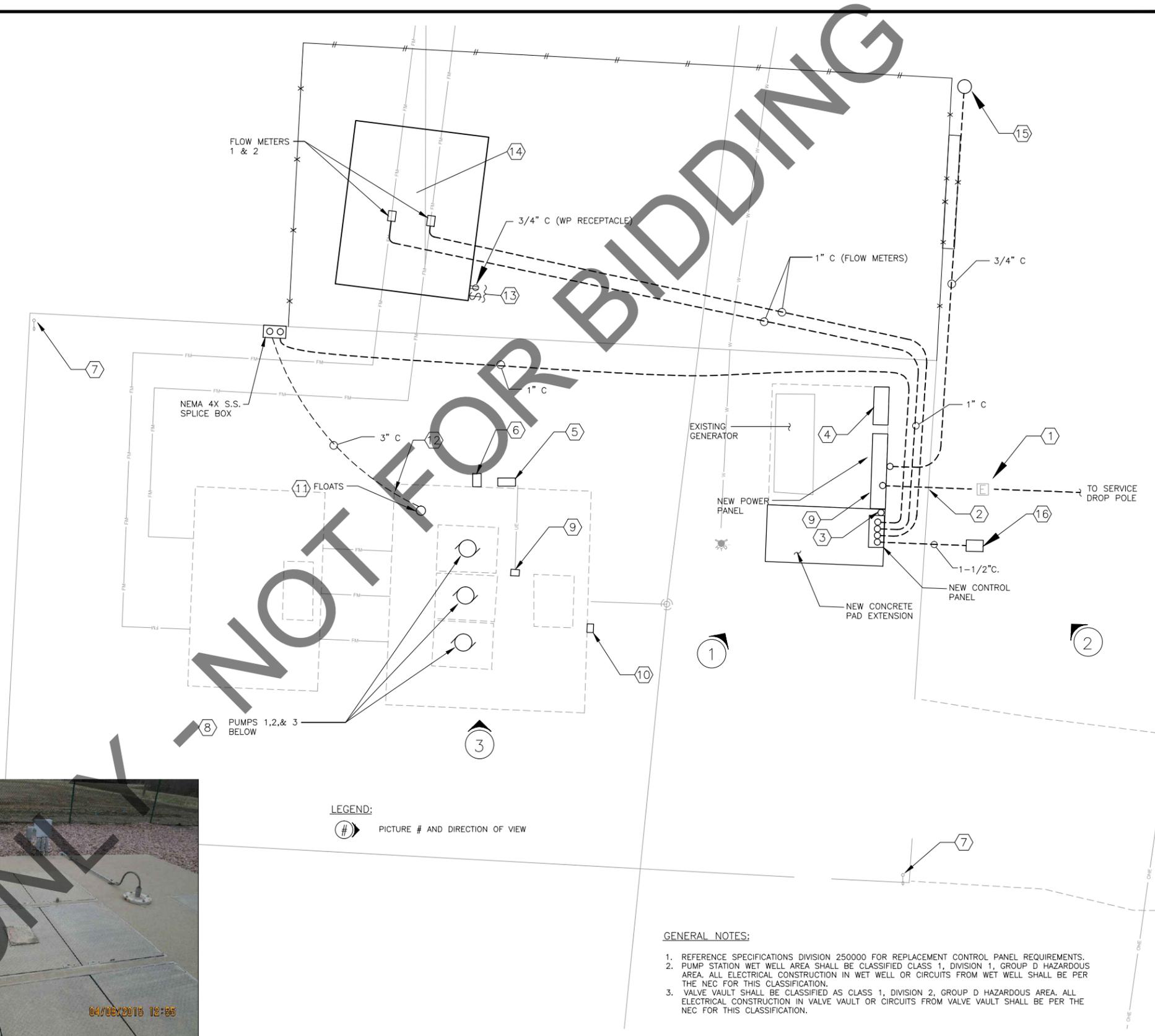
PHOTO 2

SCALE: NTS



PHOTO 3

SCALE: NTS



GENERAL NOTES:

1. REFERENCE SPECIFICATIONS DIVISION 250000 FOR REPLACEMENT CONTROL PANEL REQUIREMENTS.
2. PUMP STATION WET WELL AREA SHALL BE CLASSIFIED CLASS 1, DIVISION 1, GROUP D HAZARDOUS AREA. ALL ELECTRICAL CONSTRUCTION IN WET WELL OR CIRCUITS FROM WET WELL SHALL BE PER THE NEC FOR THIS CLASSIFICATION.
3. VALVE VAULT SHALL BE CLASSIFIED AS CLASS 1, DIVISION 2, GROUP D HAZARDOUS AREA. ALL ELECTRICAL CONSTRUCTION IN VALVE VAULT OR CIRCUITS FROM VALVE VAULT SHALL BE PER THE NEC FOR THIS CLASSIFICATION.

LEGEND:

- (#) PICTURE # AND DIRECTION OF VIEW

1 SITE PLAN

SCALE: 1" = 10'



ADDENDUM #1

DRAWN BY: JV	JOB DATE: 2015	BAR IS ONE HALF INCH ON OFFICIAL DRAWINGS.
APPROVED: DRH	JOB NUMBER: 50150006	IF NOT ONE HALF INCH, ADJUST SCALE ACCORDINGLY.
PLOT DATE: 2/24/2016 9:13 AM		
CAD FILE: \\HRGSFDC\Data\50150006.01\CAD\Section C\DWG\LD.20 BRIDGEPORT LIFT STATION SITE PLAN.dwg		

NO.	DATE	BY	REVISION DESCRIPTION
1	2/24/16	JV	REVISE NOTE 5

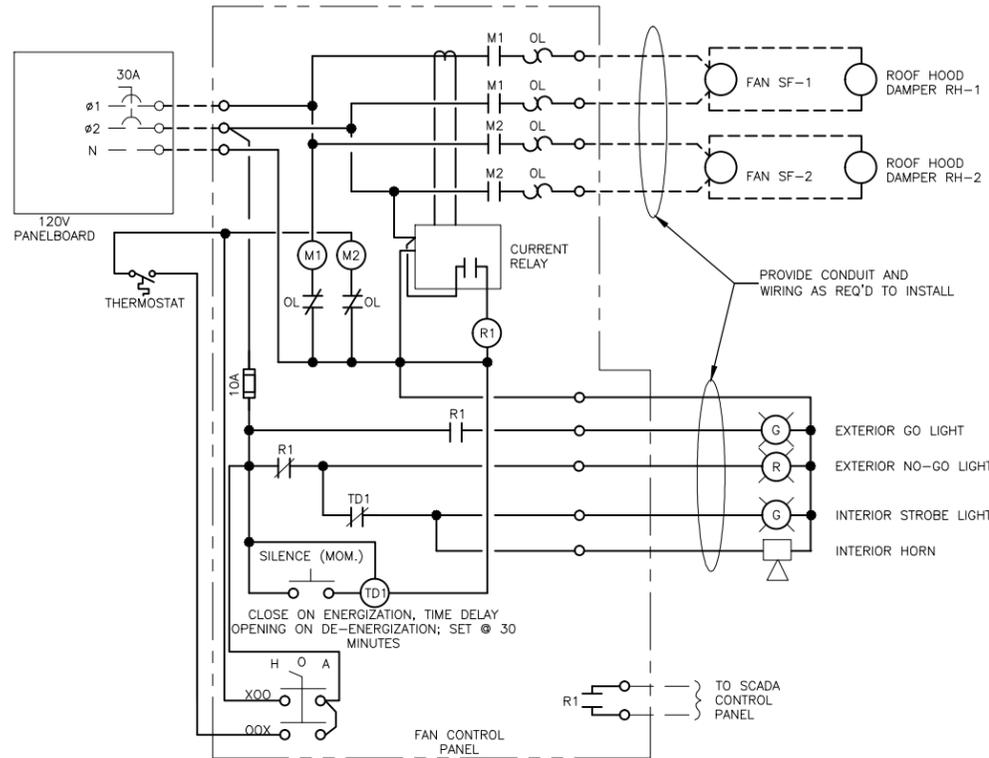


BRIDGEPORT WEST SEWER IMPROVEMENTS - SECTION C
CITY OF SIOUX CITY, IOWA



BRIDGEPORT LIFT STATION ELECTRICAL SITE PLAN

SHEET NO.
D.20



2 FAN CONTROL PANEL

SCALE: NTS

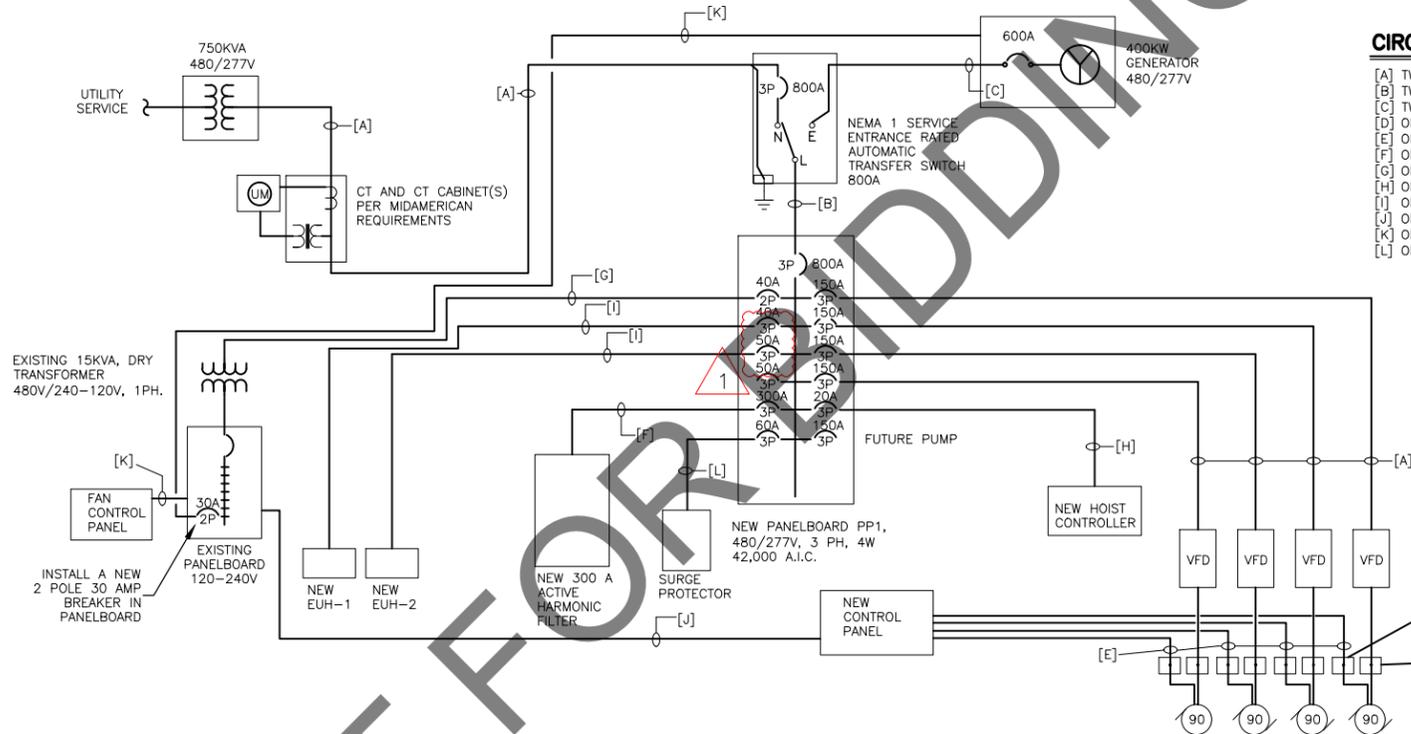
M1 & M2 = FAN MOTOR STARTERS; MATCH STARTER CAPACITIES TO ACTUAL INSTALLED FAN HP.

ELECTRIC UNIT HEATER SCHEDULE

PLAN MARK	CAPACITY kW	VOLTS	PHASE	AMPS	FAN		HP	MOUNTING	MANUFACTURER/MODEL NO.	REMARKS
					CFM	THROW				
EUH-1	35	460	3	44	2400	50	1/4	WALL	INDEECO / TRIAD	1,2,3,4,5,6
EUH-2	35	460	3	44	2400	50	1/4	WALL	INDEECO / TRIAD	1,2,3,4,5,6

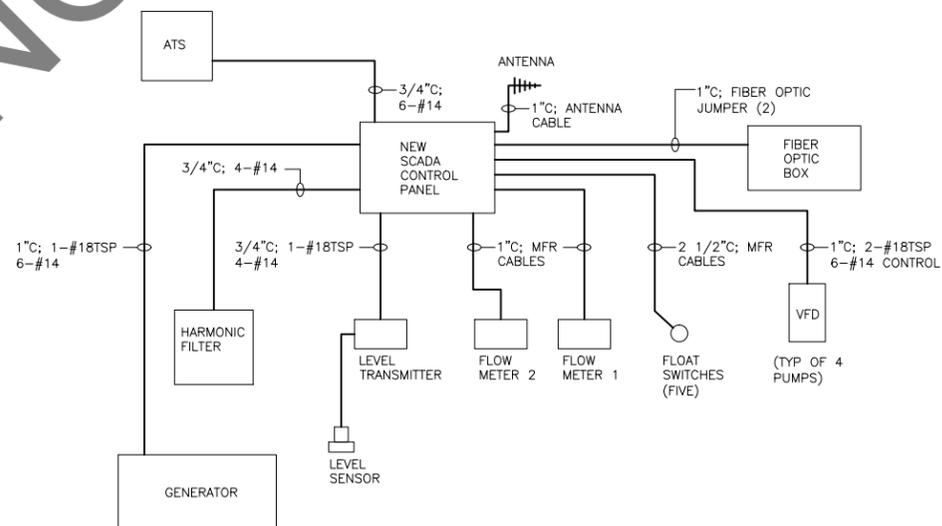
REMARKS:

- CORROSION RESISTANT STAINLESS STEEL CONSTRUCTION
- STAINLESS STEEL FINNED TUBULAR ELEMENTS
- TOTALLY ENCLOSED CORROSION RESISTANT MOTOR
- FACTORY MOUNTED DISCONNECT
- NEMA 4X WALL MOUNTED THERMOSTAT
- STAINLESS STEEL SWIVEL WALL BRACKET



1 POWER ONE-LINE DIAGRAM

SCALE: NTS



3 CONTROL ONE-LINE DIAGRAM

SCALE: NTS

CIRCUIT/CONDUIT SCHEDULE:

- [A] TWO 4" C; 4-500KCMIL EACH CONDUIT
- [B] TWO 4" C; 4-500KCMIL, 1-#2/OG EACH CONDUIT
- [C] TWO 3" C; 4-350KCMIL, 1-#2/OG EACH CONDUIT
- [D] ONE 1-1/2" C; 3-#1/0, 1-#6G
- [E] ONE 3/4" C; 4-#14
- [F] ONE 3" C; 3-350kcmil, 1-#2G
- [G] ONE 3/4" C; 2-#8, 1-#8G
- [H] ONE 3/4" C; 4-#12
- [I] ONE 3/4" C; 3-#8, 1-#12G
- [J] ONE 3/4" C; 3-#12
- [K] ONE 3/4" C; 3-#10, 1-#10G
- [L] ONE 1" C; 3-#6, 1-#6 GND