pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

REQUEST FOR A WAIVER FROM THE AMERICAN IRON AND STEEL REQUIREMENT

This request for a waiver from the American Iron and Steel requirement is completed by a PENNVEST funding recipient when there is a need to use a foreign-made iron/steel component and the component is not expected to be placed on the De Minimus list.

PENNVEST Funding Recipient	Independence-Cross Creek Joint Sewer Authority
PENNVEST Project:	Independence Village and Cross Creek Village Sanitary Sewer System
ME Number:	75308
Recipient/Engineer Contact Name:	Kevin L. Szakelyhidi, PE
Telephone:	(412) 767-5100
Email:	kevins@banksonengineers.com

Waiver requested on the basis of:

☒ **Public Interest (complete sections A and B below)**

☒ **Availability (complete sections A and C below)**

☐ **Cost (complete sections A and D below)**

Waivers may be requested using more than one basis.

NOTE: Some of the referenced attachments with project diagrams, schedules, and supplier correspondence may be in formats that do not meet the Federal accessibility requirements for publication on the Agency's website and if so, may have been omitted from this waiver publication. They are available upon request by emailing SRF_AIS@epa.gov

PLEASE SUBMIT WAIVER REQUEST TO:

Completed requests can be either mailed or emailed to:
Veronica Kasi
Division of Technical and Financial Assistance
P. O. Box 8774
Harrisburg, PA 17105-8774

Email: vbkasi@pa.gov
Phone: 717.772.4053

A. General

Describe the unit process which contains the proposed foreign-made iron/steel component:

The project includes 119 progressive cavity grinder pumps, normally one pump installed to serve each customer. With each grider pump, the grinder pump manufacturer is to furnish a lateral kit consisting of a curb stop/redundant check valve assembly, a curb box and valve stem extension. The lateral kit is to be installed on each customer's service line close to the service line connection to the public pressure sewer. The curb stop is required if the entire public pressure sewer system is to remain operational while either the individual grinder pump or the individual service line is being repaired or replaced. The redundant check valve serves two functions. Primarily, it provides protection against a sewage spill at the grinder pump which could result from diversion of sewage from the public pressure sewer system to the individual service line should the grinder

pump's integral check valve fail. Secondarily, the redundant check valve prevents a sewage spill should the service line become broken. Drawings showing the lateral kit are attached.

Additional materials attached. (☒)

Describe the foreign-made iron/steel component:

The curb stop/redundant check valve and the associated valve stem extension to operate the curb stop are all made of stainless steel. While the lateral kit was designed in the United States by Environment One Corporation, and while Evnironment One Corporation produced the pattern and cores as well as the tools required to finish the curb stop/redundant check valve in the United States, the stainless steel curb stop/redundant check valve is not manufactured in the United States, and neither is a purpose-built stailess steel valve stem extension for the lateral kit assembly.

Additional materials attached. (☐)

Proposed foreign-made manufacturer:

Name: Environment One Corporation

Address: 2773 Balltown Road, Niskayuna, New York, 12309

B. Public Interest (N/A ☐)

Why is the use of the product in the public interest? For example, is the use of a foreign-made iron/steel component necessary because of compatibility with existing components in the water or wastewater system, or other reason?

The only alternative to the foreign made lateral kits is (1) to use a less reliable domestically produced plastic curb stop/check valve assembly and (2) to use a more expensive domestically produced, stainless steel valve stem extension which, because of the lack of ready availability, may delay construction.

Unfortunately, the stainless steel curb stop/redundant check valve is not made in the United States. The curb stop/redundant check valve was available previously made with PVC materials. It may be available still. However, once the stailess steel alternative became available, it quickly became the the more desirable material to use given its durability and significant improvement in reliability. It is possible that one could obtain a domestically produced stailess steel valve stem extension for the curb stop. However, given that the stainless steel valve stem extensions provided with the lateral kit are being mass produced and are normally furnished with the lateral kit, to entice a manufacturer to produce only 119 stainless steel valve stem extensions for just this project would most probably be cost prohibitive. More important, domestically produced valve stem extensions would probably be dfficult to obtain quickly enough to avoid disruption of the project schedule, possibly delaying the removal of sewage discharges to the environment.

Additional materials attached. (☐)

C. Availability (N/A ☐)

Describe requirements in the project plans, specifications or permits which describe the required quantity and quality of the product:

A letter from Environment One Corporation, the grinder pump manufacturer and the supplier of the lateral kits, is attached. It discusses both the advantages of the stainless steel curb stop/redundant check valve component as well as its unavaiablity from domestic manufacturers. Please also refer to Item P. "Lateral Kit" in the attached Subsection 26. "SEMI-POSITIVE DISPLACEMENT GRINDER PUMP SYSTEMS" CONTAINED IN Section D "Detailed Specifications for the project.

Excerpts from plans, specifications and/or permits must be attached.

When is the product needed for installation: Month: July Year: 2017

Describe the efforts to use domestic suppliers: Environment One Corporation has attempted to have domestic manufactures make the stainless steel components in its lateeral kit.

Additional materials attached. (☐)

Provide information from potential domestic suppliers:			
Name Of Domestic Supplier Contacted	Supplier Contact Person/Email	Availability	Delivery Date (Month/Year)
Ashland Foundry & Machine Works, Inc.	Sheila Rooney ashlandfoundrymachine,com 570-857-6100	None	NA
Spectron Manufacturing	sales@spectronmanufacturing.com 720-951-5458	None	NA
Additional materials attached. (☐)			

D. Cost (N/A ☒)

Cost of project with domestic components: $_____

Cost of project with foreign-made components: $_____

Will the use of domestic components increase the project cost by more than 25%?

☐ Yes ☐ No

If no, cost is not a valid basis.
If yes, attach a detailed cost comparison of the domestic and foreign-made options.

26. SEMI-POSITIVE DISPLACEMENT GRINDER PUMP SYSTEMS

A. General

The work under this item shall include the furnishing and complete installation to working condition outdoor residential grinder pump systems complete with wet well and controls, and shall be Model DH071 Simplex Grinder Pump manufactured by Environment One Corporation. Each grinder pump system shall be factory-built and tested.

The manufacturer shall furnish complete factory-built and tested Grinder Pump Station(s), each consisting of grinder pump(s) suitably mounted in a basin constructed of high density polyethylene (HDPE), electrical quick disconnect (NEMA 6P), pump removal system, shut-off valve, anti-siphon valve, and check valve assembled within the basin, NEMA 4X electrical alarm/disconnect panel, and all necessary internal wiring and controls. For ease of serviceability, all pump, motor/grinder units shall be of like type and horsepower throughout the system. All basin and other components ancillary to the pump/motor which are to be located below the ground shall be of non-corroding materials and shall be of either HDPE, PVC, nylon, fiberglass or stainless steel. The entire pump/motor assembly unit shall be completely removable and reinstallable, including discharge piping disconnect/reconnect from the ground surface and without entry into the basin.

In addition, the Contractor shall furnish with each pump, except for spare pump units, a control panel and a complete lateral assembly. Each lateral assembly shall consist of a redundant check valve, a curb stop, a curb box and a curb stop valve stem extension. The curb stop and check valve shall be suitable for installation of a 1½-inch-diameter pressure sewer service line.

After receipt of notice to proceed, the manufacturer shall furnish a minimum of six (6) sets of shop drawings detailing the equipment to be furnished including dimensional data and materials of construction.

The equipment specified shall be a product of a company experienced in the design and manufacture of grinder pumps for specific use in low-pressure sewage systems. The company shall submit detailed installation and user instructions for its product; submit evidence of an established service program including complete parts and service manuals, and be responsible for maintaining a continuing inventory of grinder pump replacement parts. All manufacturers proposing equipment for this project shall have at least five years of experience in the design and manufacture of units of identical size and mechanically similar to the specified units which have been in successful operation at no less than five hundred low pressure sewer system installations. An installation is defined as multiple progressive cavity pumps discharging into a common force main forming a low pressure sewer system. Each manufacturer shall submit, for evaluation by the Owner and Engineer, a minimum of 5 detailed reports of existing low pressure sewer systems utilizing the progressive cavity grinder pump system they propose for this project which have been in service a minimum of 5 years including project name, name and phone number of operating personnel.

B. Pump

The pump shall be a custom designed, integral, vertical rotor, motor driven, solids handling pump of the progressing cavity type with a single mechanical seal. The rotor shall be through-hardened, highly polished, precipitation hardened stainless steel. The stator shall be of a specifically compounded ethylene propylene synthetic elastomer. The material shall be suited for domestic wastewater service. Its physical properties shall include high tear and abrasion resistance, grease resistance, water and detergent resistance, temperature stability, good aging properties, and outstanding wear resistance.

The pump shall be capable of delivering 15 GPM against a rated total dynamic head of 0 feet (0 PSIG) and 7.8 GPM against a rated total dynamic head of 185 feet (80 PSIG) and 5.9 GPM against a rated total dynamic head of 231 feet (100 PSIG). The pump(s) must also be capable of operating at negative total dynamic head without overloading the motor(s). Under no conditions shall in-line piping or valving be allowed to create a false apparent head. Centrifugal type pumps will not be allowed.

C. Grinder

The grinder shall be placed immediately below the pumping elements and shall be direct-driven by a single, one-piece stainless steel motor shaft. The grinder impeller assembly shall be securely fastened to the pump motor shaft. The grinder will be of the rotating type with a stationary hardened and ground stainless steel shredding ring spaced in accurate close annular alignment with the driven impeller assembly, which shall carry two hardened type 400 series stainless steel cutter bars. This assembly shall be dynamically balanced and operate without objectionable noise or vibration over the entire range of recommended operating pressures. The grinder shall be constructed so as to eliminate clogging and jamming under all normal operating conditions including starting. Sufficient vortex action shall be created to scour tank free of deposits or sludge banks which would impair the operation of the pump. These requirements shall be accomplished by the following, in conjunction with the pump:

1) The grinder shall be positioned in such a way that solids are fed in an up-flow direction.
2) In order to control inlet velocity to the grinder, the grinder pump inlet shroud shall have a diameter of no less than five inches.
3) At maximum flowrate, the cutting mechanism shall not exceed 4 feet per second.
4) The grinder rotational speed shall not exceed 1800 RPM.

The grinder shall be capable of reducing all components in normal domestic sewage, including a reasonable amount of “foreign objects”, such as paper, wood, plastic, glass, rubber and the like, to finely-divided particles which will pass freely through the passages of the pump and the 1¼” diameter stainless steel discharge piping.

D. Electric Motor

As a maximum, the motor shall be a 1 HP, 1725 RPM, 240 Volt 60 Hertz, 1 Phase, capacitor start, ball bearing, squirrel cage induction type with a low starting current not to exceed 30 amperes and high starting torque of 8.4 foot pounds. Inherent protection against running

overloads or locked rotor conditions for the pump motor shall be provided by the use of an automatic-reset, integral thermal overload protector incorporated into the motor. This motor protector combination shall have been specifically investigated and listed by Underwriters Laboratories, Inc., for the application.

E. Mechanical Seal

The core shall be provided with a mechanical shaft seal to prevent leakage between the motor and pump. The seal shall have a stationary ceramic seat and carbon rotating surface with faces precision lapped and held in position by a stainless steel spring.

F. Wetwell Tank and Integral Accessway

The tank shall have a nominal capacity of 70 gallons and be made of high density polyethylene, with a melt index of 2.0 grams/10 minutes or lower to assure high environmental stress cracking resistance. Corrugated sections are to be made of a double wall construction with the internal wall being generally smooth to promote scouring. Corrugations of outside wall are to be of minimum amplitude of 1½" to provide necessary transverse stiffness. Any incidental sections of a single wall construction are to be a minimum ¼" thick. All seams created during tank construction are to be thermally welded and factory tested for leak tightness. Tank wall and bottom must withstand the pressure exerted by saturated soil loading at maximum burial depth. All station components must function normally when exposed to maximum external soil and hydrostatic pressure.

The tank shall be furnished with one EPDM grommet fitting to accept a 4" Schedule 40 PVC pipe.

The accessway shall be an integral extension of the wet well assembly and include a tamper-proof cover assembly providing low profile mounting and watertight capability. Accessway design and construction shall enable field adjustment of station height in increments of 4" or less. The station shall have all necessary penetrations molded in and factory sealed. No field penetrations shall be acceptable.

All discharge piping shall be constructed of 304 Series Stainless Steel and terminate outside the accessway bulkhead with a stainless steel, 1¼" female NPT fitting. The discharge piping shall include a stainless steel ball valve rated for 235 psi. The bulkhead penetration shall be factory installed and warranted by the manufacturer to be watertight.

The accessway shall include a single NEMA 6P electrical quick disconnect for all power and control functions, factory installed with accessway penetrations warranted by the manufacturer to be watertight. The accessway shall also include a 2" PVC vent to prevent sewage gases from accumulating in the tank.

G. Check Valve

The pump discharge shall be equipped with a factory installed, gravity operated, flapper-type integral check valve built into the stainless steel discharge piping. The check valve will provide a full-ported passageway when open, and shall introduce a friction loss of less than 6 inches of water at maximum rated flow. Working parts will be made of a 300 series stainless steel and fabric reinforced synthetic elastomer flapper to ensure corrosion resistance, dimensional stability, and fatigue strength. A non-metallic hinge shall be an integral part of the flapper assembly providing a maximum degree of freedom to assure seating even at a very low back pressure. The valve body shall be an injection molded part made of glass filled PVC.

Each grinder pump station shall also include one separate check valve for installation in the 1½" service lateral between the grinder pump station and the sewer main, next to the curb stop.

H. Anti-Siphon Valve

The pump discharge shall be equipped with a factory-installed, gravity-operated, flapper-type integral anti-siphon valve built into the stainless steel discharge piping. Moving parts will be made of 300 Series stainless steel and fabric-reinforced synthetic elastomer flapper to ensure corrosion resistance, dimensional stability, and fatigue strength. A nonmetallic hinge shall be an integral part of the flapper assembly, providing a maximum degree of freedom to ensure proper operation even at a very low pressure. The valve body shall be injection-molded from an engineered thermoplastic resin. Holes or ports in the discharge piping are not acceptable anti-siphon devices due to their tendency to clog from the solids in the slurry being pumped. The anti-siphon port diameter shall be no less than 60% of the inside diameter of the pump discharge piping.

I. Core Unit

The Grinder Pump Station shall have cartridge type, easily removable core assembly containing pump, motor, grinder, all motor controls, check valve, anti-siphon valve, electrical quick disconnect and wiring. The watertight integrity of each core unit shall be established by 100% factory test at a minimum of 5 PSIG.

J. Controls

All necessary controls shall be located in the top housing of the core unit. The top housing will be attached with stainless steel fasteners.

Non-fouling wastewater level detection for controlling pump operation shall be accomplished by monitoring the pressure changes in an integral air-bell level sensor connected to a pressure switch. The level detection device shall have no moving parts in direct contact with the wastewater. High-level sensing will be accomplished in the manner detailed above by a separate air-bell sensor and pressure switch of the same type.

To assure reliable operation of the pressure sensitive switches, each core shall be equipped with a breather assembly, complete with a suitable means to prevent accidental entry of water into the motor compartment. The grinder pump will be furnished with a length of 6 conductor 14 gauge, type SJOW cable, pre-wired and watertight to meet UL requirements.

K. Alarm/Disconnect Panel

Each grinder pump station shall include a NEMA 4X, UL listed ALARM/DISCONNECT PANEL suitable for wall or pole mounting. The NEMA 4X enclosure shall be manufactured of thermoplastic to assure corrosion resistance. The enclosure shall include a hinged, padlockable cover, secured dead front and component knockouts. The enclosure shall not exceed 10.5"W x 14"H x 7"D. Each panel shall have a ground fault interrupt.

For each core, the panel shall contain one (1) 15 amp, double pole circuit breaker for the power circuit and one (1) 15 amp single pole circuit breaker for the alarm circuit. The panel shall contain terminal blocks, integral power bus, push to run feature and a complete alarm circuit.

The Alarm/Disconnect Panel shall include the following features: audio and visual alarm, push to run switch, and high level (redundant) pump starting control. The alarm sequence is to be as follows:

1) When liquid level in the sewage wet well rises above the alarm level, visual and audio alarms will be activated. The contacts on the alarm pressure switch will close. The redundant pump starting system will be energized.
2) The audio alarm may be silenced by means of the externally mounted, push-to-silence button. At maximum flowrate, the cutting mechanism shall not exceed 4 feet per second.
3) Visual alarm remains illuminated until the sewage level in the wet well drops below the "off" setting of the alarm pressure switch.

The visual alarm lamp shall be inside a red oblong lens at least 3.75"L x 2.38"W x 1.5"H. Visual alarm shall be mounted to the top of the enclosure in such a manner as to maintain NEMA 4X rating. For duplex units, in addition to the above, two high level indicator lights shall be mounted behind the access cover.

During a high level alarm condition the appropriate light will illuminate to indicate which pump core requires servicing. The audible alarm shall be externally mounted on the bottom of the enclosure, capable of 93dB@ 2 feet. The audible alarm shall be capable of being deactivated by depressing a push-type switch which is encapsulated in a weatherproof silicone boot and mounted on the bottom of the enclosure.

The entire Alarm/Disconnect Panel as manufactured, shall be listed by Underwriters Laboratories, Inc. and shall be furnished by the pump manufacturer.

L. Remote Sentry Indoor Alarm Module

A separate, remote indoor alarm module shall be provided to indicate a high level alarm with or without AC power to the grinder pump station. The Remote Sentry indoor alarm module shall have an internal power source enabling its continued operation without AC power. The Remote Sentry shall have an audible alarm and a visual alarm, both of which shall automatically reset if the high level alarm condition is eliminated. The Remote Sentry indoor alarm module shall include a Silence button for the audible alarm and a Test button.

M. E/One Sentry Advisor

The E/One Sentry Advisor shall use a cellular transmitter to communicate trouble conditions and high level alarm. Each panel shall be equipped with hardware that is connected to dry contacts for high level alarm and pump running events. This information shall then be transmitted to a host system that utilizes an interactive website interface for end users to access the information.

A secure user ID and password shall be used to provide access to the website. The website shall quickly identify sites that may be experiencing trouble, and shall be able to generate reports including: running tallies of usage, flow rates, potential infiltration, predictive maintenance indicators and asset mapping/management. The website shall also provide a means to configure alerts corresponding to the various trouble conditions that can be sent to users via secure e-mail, SMS text, phone or an existing telemetry system. These alerts can be sent to any number of recipients.

Accessible data shall include:

- Pump Runtime
- Pump Cycles
- Min, Max, Avg. and Last Runtime
- Trouble Events
    - High Level Alarm
    - Excessive Runtime
- Average GPM based Flow Rate Data

The E/One Sentry Advisor shall be equipped with a battery that will allow one message to be sent out in the event of a power loss.

The communication package shall be a factory prewired unit within the panel enclosure including the compact cellular transmitter, power supply and antenna. Panels with this option must be within range of the associated cellular network.

The entire alarm panel, as manufactured and including any of the following options shall be listed by Underwriters Laboratories, Inc.

N. Serviceability

The grinder pump core unit shall have two lifting hooks complete with nylon lift-out harness connected to its top housing to facilitate easy core removal when necessary. All mechanical and electrical connections must provide easy disconnect accessibility for core unit removal and installation. A push-to-run feature will be provided for field trouble shooting. All motor control components shall be mounted on a readily replaceable bracket for ease of field service.

All maintenance tasks for the grinder pump station must be possible without entry into the grinder pump station (as per OSHA 1910.146 Permit-required confined spaces). "Entry means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space."

O. Factory Test

Each grinder pump shall be submerged and operated for 5 minutes (minimum). Included in this procedure will be the testing of all ancillary components such as, the anti-siphon valve, check valve, discharge line, level sensors and each unit's dedicated controls. All factory tests shall incorporate each of the above listed items. Actual appurtenances and controls which will be installed in the field, shall be particular to the tested pump only. A common set of appurtenances and controls for all pumps will not be acceptable. Certified test results shall be available upon request showing the operation of each grinder pump at two (2) different points on its curve, with the maximum pressure no less than 80 psi. The ENGINEER reserves the right to inspect such testing procedures with representatives of the OWNER, at the GRINDER PUMP MANUFACTURER'S facility.

All completed stations shall be factory leak tested to assure the integrity of all joints, seams and penetrations. All necessary penetrations such as inlets, discharge fittings and cable connectors shall be included in this test along with their respective sealing means (grommets, gaskets etc.).

P. Lateral Kit

Each grinder pump unit shall be delivered complete with a 1½" lateral kit which shall include 42"-66" arch stile curb box, a curb box stem extension, a 1½" plastic arch compression curb stop, and a 1½" check valve. Both curb stop and check valve shall be designed to operate at a continuous pressure of no less than 150 psi. The lateral kit shall be furnished by the grinder pump manufacturer.

Q. Connection Kit

Each grinder pump unit shall be delivered complete with one set of flexible pipe and compression fittings. The connection kit shall include a 1¼" x 4' long SDR 9 (or heavier) HDPE pipe and a 1¼" x 1½" compression reducer coupling. The connection kit shall be furnished by the grinder pump manufacturer.

R. Delivery and Installation

All Grinder Pump units will be delivered to the job site, 100% completely assembled, including testing, ready for installation. Grinder pump units will be individually mounted on wooden pallets.

Installation of the grinder pump units shall be in accordance with the manufacturer's instructions.

A concrete anti-floatation collar, as detailed on the drawings, and sized according to the manufacturer's instructions, shall be required and shall be pre-cast to the grinder pump enclosure or poured in place. Each grinder pump station with a precast anti-floatation collar shall have a minimum of three lifting eyes for loading and unloading purposes.

The Contract Work includes the mounting of the alarm/disconnect panel either on the side of the house or on a pressure treated lumber post furnished by the contractor, as decided by the owner of the property being served. The Contract work also includes all conduit and wiring required between the grinder pumping unit and the alarm/disconnect panel.

Where desired by the owner of the property being served, the Contractor shall furnish and install a pressure treated wooden post having nominal dimensions of 4" x 4" x 8'. The contractor shall install the post with the bottom 4 feet buried and socketed into the ground with concrete.

The Contract Work includes the installation of a new 240 Volt, 30 Amperes circuit breaker to the homeowner's electrical panel, the installation of 240 V, single phase wiring, including conduit where required, between the control panel and the homeowner's electrical panel and all required connections. All wire shall be copper. Aluminum will not be accepted. The size of wire shall be no less than 10 gauge and shall be larger if required by code.

The Contract Work includes the complete installation, including all wiring and connections, of all Remote Sentry Indoor Alarm Modules for each customer.

The Contractor shall furnish and install a Stainless Steel, Type 304 or Type 316, cotter pin to secure the curb stop extension to the curb stop.

S. Start-Up

The Contractor shall provide the services of qualified factory-trained technician(s) who shall inspect the placement and wiring of each station, perform field tests as specified herein, and instruct the Owner's personnel in the operation and maintenance of the equipment. All equipment and materials necessary to perform testing shall be the responsibility of the Contractor. This will include, as a minimum, a portable generator (if temporary power is required) and water in each basin.

Upon completion of the installation, the authorized factory technicians will perform the following test on each station:

1) Make certain the discharge shut-off valve is fully open.
2) Turn ON the alarm power circuit.
3) Fill the wet well with water to a depth sufficient to verify the high level alarm is operating. Shut off water.
4) Turn ON pump power circuit. Initiate pump operation to verify automatic "on/off" controls are operative. Pump should immediately turn ON. Within one (1) minute alarm light will turn OFF. Within three (3) minutes the pump will turn OFF.

Upon completion of the start-up and testing, the Contractor shall submit to the Engineer the start-up authorization form from the manufacturer describing the results of the tests performed for each grinder pump station. Final acceptance of the system will not occur until authorization forms have been received for each pump station installed.

T. Maintenance Parts and Equipment

1) General

As part of Contract Number 16-1, Independence Village Sewers, the Contractor shall furnish portable emergency generators, spare grinder pump core units, alarm/disconnect panels each complete with E/One Sentry Advisors, and two (2) pump tool kits.

2) Portable Emergency Generator

The portable emergency generator shall comply with the following:

a) Voltage - 120/240
b) Power Rating - 8,000 Watts continuous with 10,000 Watts surge
c) Maximum Volt-amps - 10,000
d) Current - 120/240 66.6/33.3 Amps
e) Fuel Type - Gasoline
f) Fuel Storage Capacity - 7 Gallons
g) Efficiency - Must run no less than 9 hours at 50% of full load using no more than 7 gallons of fuel, and no less than 7 hours at full load using no more than 7 gallons of fuel.
h) Starter Type - Keyed recoil/electric
i) Remote choke
j) Engine Alternator - Power surge
k) Outlets - Four (4) household and one (1) locking, all with flip-up covers
l) Circuit-breaker protection
m) Frame mounted with two pneumatic wheels and fold-down pull handles
n) Air Cleaner Type - Paper
o) Automatic Low Oil Shut Down - No
p) Full Power Switch - No
q) Run Time Meter - Yes

r) Bearing Type - Dual ball
s) Engine Cylinder Material - Cast iron
t) E/One Alarm Panel fully wired and mounted to the frame
u) Furnished with 50 feet of power supply cable with an E/One EQD

3) Core Units

The core units shall be as per Section 26, Part I of these Detail Specifications.

4) Alarm/Disconnect Panel Complete With E/One Sentry Advisor

Each Alarm/Disconnect Panel complete with E/One Sentry Advisor shall conform to Section 26, Part K of these Detail Specifications.

5) Remote Sentry Indoor Alarm Module

Each Remote Sentry Indoor Alarm Module shall conform to Section 26, Part L of these Detail Specifications.

6) Pump Tool Kit

The pump tool kit shall be the purpose-built and assembled tool kit offered by the grinder pump manufacturer for the model of the grinder pumps being furnished under this Contract. The pump tool kit shall include one of each of the following:

Multi Meter, VOLT/AMP/OHM
Motor Air Test Fixture
Volt/Ohm Meter
5/32 Hex Drive Screwdriver, Holding Tip
Manometer Shop Test Kit
Hand Tool, Crimper
Bottoming Tap, M32x1.5
Type Connector (to test control cavity)
Press-On Tool, Pump Bearing
Press-On Tool, Upper Pump Bearing
Bearing Puller, Switch
Bearing Puller, Pump

27. NEW ELECTRIC SERVICE

The work under Contracts Numbered 16-1 and 16-2 shall include the installation of a new electric service to one or more homes or structures.

The new electric service(s) is to be furnished where the individual home electrical service entrance requires updating and expansion to accommodate the additional electrical demand of a grinder pump.