



Agence spatiale Canadienne Canadian Space Agency

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Addendum No. 1

Project: Water Main System Upgrade project No. CSA17-M1

Date Issued: March 6, 2020

THE PURPOSE OF THIS ADDENDUM IS TO ISSUE THE FOLLOWING:

1. **Delete** Section 21 30 00 – Fire Pumps in the Specifications in the project specification and **Replace** with the attached Fire Pump Scope of Work documentation.
2. **Delete** all comments intended to describe “fire pump package supplied by department representative and installed by others” in the project drawings and specifications and **Replace** with “fire pump package must be supplied and installed by contractor”
3. **Add** the following notes to the Section 01 00 10 – General Instructions in the project specification:

Project Milestones form interim targets for Project Schedule:

- Phase I Pre-assemble pipe header and provide rough-in (mechanical and electrical) for the fire pump package installation prior to de-energize fire protection system
- Phase II De-energize the fire protection system and install fire pump package and associated piping. Complete start-up, testing and commissioning of the fire pump package. This phase must be completed no longer than one (1) week timeframe to minimize system downtime.
- Phase III Install pre-action system and associated piping connection. Complete start-up, testing and commissioning of the pre-action system.

END OF ADDENDUM

Part 1 General Instructions

1.1 DELIVERABLES

- .1 This requirement is for the purchase of one (1) new listed Fire Pump Packaged System (Armstrong Vertical-in-line Fire Pump – VIL FirePak), in accordance with these Documents.
- .2 Products
 - .1 Fire Pump
 - .1 Model VIL-8x8x13-50hp, packaged, ULC, CSA listed and labelled vertical in line fire pump.
 - .2 Cast iron casing, bronze impeller, carbon steel shaft, bronze sleeve & mechanical seal.
 - .3 Furnish not less than 150% of rated capacity at not less than 65% of rated head. The shut-off total head of the pump must not exceed 120% of the total rated head.
 - .4 Motor: standard efficiency vertical close coupled open drip proof (ODP) motor with 1.15 service factor.
 - .5 Materials and construction: to NFPA 20.
 - .6 Capacity: 1000 usgpm @ 50 psi
 - .7 Accessories to NFPA 20 requirements and in addition:
 - .1 1xCasing relief valve 3/4" n.p.t.
 - .2 2x88mm pressure relief gauges
 - .2 Pressure Maintenance (Jockey) Pump with Controller
 - .1 Pump Model Series 4700-VMS-01:06B-0.75hp
 - .2 Controller Model Tornatech-JP3-600/0.75/3/60, power rating of 575V/3/60
 - .3 Horizontal regenerative turbine type, with cast iron casing and bronze impeller and mechanical seals.
 - .4 Jockey pump motor must be standard open drip-proof (ODP) horizontal motor with a 1.15 service factor, mounted on a steel base with flexible coupling and guard.
 - .5 Jockey pump must be controlled by an automatic jockey pump controller with full voltage starter.
 - .6 The jockey pump must start on a pressure drop in the system. The jockey pump will boost the system pressure back to the normal setting on the pressure switch and stop immediately.
 - .7 The fire pump must automatically start on a further pressure drop or on a jockey pump failure
 - .8 Capacity: 10 usgpm @ 60 psi
 - .9 Accessories: To NFPA 20.
 - .3 Fire Pump Controller
 - .1 Model: Tornatech-GPR-GPU-600/50/3/60, power rating of 575V/3/60
 - .2 Starting method: Full voltage across the line.
 - .3 Typical voltage applied at start: 100%.

- .4 Inrush current: 6 x normal load current
- .5 Starting torque: 100%
- .6 No. of contactors: 1 at 100% of horsepower
- .7 Minimum ampacity of motor conductors: 3 at 125% x 100% of full load current.
- .8 Standards, listings, approvals & certifications: Built to NFPA 20, UL218 – Fire Pump Controllers, UL 1008 – Automatic Power Transfer Switches for Fire Pump Controllers, CSA C22.2 No. 14 Industrial Control Equipment.
- .9 NEMA 12 enclosure.
- .10 Limitations: Across the line starting only, horsepower rating of maximum 30hp, can only be installed where acceptable by the authority having jurisdiction.
- .11 Surge Suppression: Surge arrestor rated to suppress surges above line voltage.
- .12 Disconnecting Means: Circuit breaker (inverse time non-adjustable) rated between 150% and 250% of motor full load current.
- .13 Emergency Start Handle: Push and slide to lock, Across the line start (direct on line).
- .14 Electrical Readings: Voltage phase to phase (normal power), amperage of each phase when motor is running.
- .15 Pressure Readings: Continuous system pressure display, cut-in and Cut-out pressure settings.
- .16 Pressure & Event Recorder: Pressure readings with date stamp, event recording with date stamp, under regular maintained operation, events can be stored in memory for up to 5 years, data viewable on operator interface display screen, downloadable by USB port to external memory device.
- .17 Pressure Sensing: Pressure transducer for fresh water application, pressure sensing connection 1/2" Female NPT, rated for 0-500PSI working pressure (standard display at 0-300PSI), internally mounted.
- .18 Visual indications: Power available, motor run, periodic test, manual start, deluge valve start, remote automatic start, remote manual start, emergency start, pump on demand/automatic start, low discharge pressure, pump room temperature, lockout.
- .19 Visual Alarms: Pump room alarm, pump on demand, motor trouble, power loss, fail to start, low water level, low suction pressure, phase reversal, phase unbalance, phase loss L1, phase loss L2, phase loss L3, low pump room temperature, control voltage not healthy, overcurrent, undercurrent, undervoltage, overvoltage, invalid cut-in, service required.
- .20 Remote Alarm Contacts: Power available, phase reversal, motor run, common pump room alarm (overvoltage, undervoltage, phase unbalance, low pump room temperature, high pump room temperature) common motor trouble (overcurrent, undercurrent, fail to start).
- .21 Operator Interface: Embedded microcomputer with software PLC logic, 7.0" colour touch screen, upgradable software, multi-language.

- .22 Building Automation System Interface:
 - .1 Contact for general alarm
- .23 Operation:
 - .1 Automatic start:
 - .1 Start on pressure drop
 - .2 Remote start signal from automatic device
 - .2 Manual start:
 - .1 Start push button
 - .2 Run test push button
 - .3 Deluge valve start
 - .4 Remote start from manual device
 - .3 Stopping:
 - .1 Manual with stop pushbutton
 - .2 Automatic after expiration of minimum run timer
 - .4 Timers (field adjustable):
 - .1 Minimum run timer (off delay)
 - .2 Sequential start timer (on delay)
 - .3 Periodic test timer
 - .5 Actuation (visual indication):
 - .1 Pressure
 - .2 Non-pressure
 - .6 Mode (visual indication):
 - .1 Automatic
 - .2 Non-Automatic
- .4 Automatic Power Transfer Switch
 - .1 Surge Suppression: Surge arrestor rated to suppress surges above line voltage.
 - .2 Disconnecting means: Circuit breaker (inverse time non-adjustable) rated between 150% and 250% of motor full load current.
 - .3 Visual Indications: Alternate (emergency) isolating switch in the OFF position, Alternate (emergency) voltage phase to phase, Transfer switch in normal position, Transition timers.
 - .4 Visual Alarms: Transfer switch trouble, Alternate power phase reversal, Alternate isolating switch open/tripped, Alternate circuit breaker open/tripped.
 - .5 Transfer switch test pushbutton.
 - .6 Bypass for re-transfer and generator shutdown.
 - .7 Electrically operated and mechanically held in the normal or alternate position.
 - .8 Provision for manual operation.
 - .9 Remote Alarm Contacts: Isolating switch in the OFF position, Transfer switch in normal position, Transfer switch in alternate (emergency) position.

- .10 Time Delays: Momentary normal power outage override (factory set at 3 sec – field adjustable 1 to 3 sec), Alternate (emergency) power available delay (factory set at 3 sec - field adjustable 1 to 3 sec), Transfer trouble delay (factory set at 20 sec - field adjustable 1 to 60 sec), Retransfer to normal (factory set at 5 min - field adjustable 1 to 20 min), Generator cool down (factory set at 5 min - field adjustable 1 to 20 min).
 - .11 Voltage Sensing: Transfer to alternate (normal power dropout) 85% of nominal – field adjustable 0 to 100%, Phase reversal transfer to alternate, Retransfer to normal (normal power pickup) 90% of nominal - field adjustable 0 to 100%.
 - .12 Generator Start Connection: SPDT-8A-250V.AC.
 - .5 Pump packaged complete with pump, booster pump, check valve, butterfly valves, discharge tee, OS&Y valves, sensing lines, controllers and additional parts and accessories that conform with the VIL Armstrong Packaged Fire Pump.
 - .6 Pump package components and all fittings described herein are to be skid mounted (common base) from the factory, assembled & wired, and ready for customer system inlet, outlet and single point power connection.
- .3 Delivery
- .1 To the David Florida Laboratory, 3701 Carling Avenue, Ottawa, Ontario
 - .2 Delivery date to be coordinated a minimum of ten (10) working days prior to delivery.
 - .3 The fire Pump must be off loaded by Manufacturer at site to an area designated by the Departmental Representative.
 - .4 Manufacturer must provide post delivery review with Department Representative of units both prior to unit off loading and once off loaded and submit both reports to Department Representative confirming unit is in good condition with no damage or issues from manufacturing, shipment or off loading.
 - .5 Fire Pump and all accessories are to be delivered in one shipment. Multiple shipments are not acceptable.
 - .6 Access to building will be through CRC campus Main Gate.
- .4 Storage, Handling and Protection
- .1 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Used touch-up materials to match original. Do not paint over name plates.
- .5 Shop Drawings
- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Manufacturer to illustrate details & performance of equipment to Department Representative.
 - .1 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 General arrangement drawings, showing component parts, dimensions, including identified field dimensions, and operating and maintenance clearance ie. access door swing spaces.
 - .3 Setting or erection details.

- .4 Mounting details and dimensions.
 - .5 Capacities.
 - .6 Complete certified performance data for the specified application, with particular reference to rate of flow, operating pressure and temperatures, entering and leaving conditions of air or fluid, operating limitation, electrical characteristics and BHP requirements.
 - .7 Standards.
 - .8 Operating weight.
 - .9 Electrical wiring diagrams, control panel boards, motor test data, motor starters and controls for electrically-operated equipment furnished by mechanical trades.
 - .10 Single line and schematic diagrams.
 - .11 Finish.
 - .12 Gauge of materials.
 - .13 Vibration isolators stating locations and weight distribution.
 - .14 Controls (if required).
 - .15 Equipment operation and maintenance manuals.
 - .16 Equipment storage procedures and checklists.
- .2 Manufacturer must allow one (1) week for review of shop drawings by Departmental Representative.
 - .3 The review is for the sole purpose of ascertaining conformance with the general design concept and does not mean approval of the design details inherent in the shop drawings, responsibility for which must remain with the Manufacturer. Such review will not relieve the Manufacturer of responsibility for errors or omissions in the shop drawings or of his/her responsibility for meeting all requirements of the Contract Documents.
 - .4 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested & provide explanation for changes.
 - .5 Do not proceed with unit manufacture until submittal review is complete.
 - .6 Present shop drawings and product data in SI Metric units.
 - .7 Where items or information is not produced in SI Metric units converted values are acceptable.
 - .8 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents & stating reasons for deviations.
 - .9 Manufacturer's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
 - .10 Manufacturer's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .6 Quality Assurance
 - .1 Test Reports:

- .1 Submit certified test reports for packaged fire pumps from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - .2 Test each pump/driver package at factory to provide detailed performance data and to demonstrate compliance with NFPA and specification. Submit certified test curves for approval of Departmental Representative.
 - .3 Test hydrostatically to meet requirements of fire protection system to which it will be connected.
 - .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .5 Instructions: submit manufacturer's installation instructions.
- .7 Start-Up, Testing and Verification
- .1 Provide Fire Pump start-up, testing and verification (controls and full operation) by qualified/certified Manufacturer representative during commissioning. Each unit will be started and commissioned at different times.
 - .2 Pre-Start-up to include but not limited to:
 - .1 Visually inspect all wiring, tubing, condensate drain, piping connections etc.
 - .2 Proper lubrication, balancing, levelling etc.
 - .3 Pump properly aligned tight on shaft and freely moving,
 - .4 Verify proper installation of all components not assembled in factory (i.e. pump, jockey pump, controllers, etc.)
 - .5 Verify installation of unit with proper clearances.
 - .6 Verify there are no leaks in the system.
 - .7 Verify all shipping bolts and other material have been removed, (fan, dampers etc.)
 - .8 Complete manufacturer's start-up report and submit to Department Representative.
 - .3 Site Tests:
 - .1 Field test each fire pump, driver and controllers in accordance with NFPA 20. Testing to include:
 - .1 Verification of proper installation, system initiation, adjustment and fine tuning.
 - .2 Verification of the sequence of operations and alarm systems.
 - .2 Testing to be witnessed by authority having jurisdiction.
 - .3 Develop, with Departmental Representative assistance, detailed instructions for O & M installation.
- .8 Demonstration and Training
- .1 The Manufacturer must provide the services of factory trained instructors who will provide instruction to designated personnel in the adjustment, operation and maintenance, including pertinent safety requirements, of the equipment and

system specified. The training must be oriented toward the system installed rather than being general “canned” training course. Instructors must be thoroughly familiar with all aspects of the subject matter they are to teach.

- .2 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at agreed upon times, at the equipment location.
 - .3 Instruct personnel in phases of operation and maintenance using operation and maintenance manuals as basis of instruction.
 - .4 Review contents of manual in detail to explain aspects of operation and maintenance.
 - .5 Prepare and insert additional data in operations and maintenance manuals when needed during instructions.
 - .6 Training must be provided to Department Representative within fifteen (15) days of unit start-up.
- .9 Product Data
- .1 Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
 - .2 Submit one (1) copy of product data in electronic PDF format.
 - .3 Delete information not applicable to project. Product data must be custom for this project.
 - .4 Cross-reference product data information to applicable portions of Contract Documents.
- .10 Operation and Maintenance Instruction Manuals
- .1 Operation and Maintenance Instruction Manual is to be submitted to Departmental Representative for approval, compiled in the following format:
 - .1 Binders: vinyl, hard covered, 3 ‘D’ ring, loose leaf 219 x 279 mm with spine and face pockets. Project name and number must appear on binder face and spine.
 - .2 Cover: identify each binder with type or printed title “Operation and Maintenance Instructions”.
 - .3 Title Sheet:
 - .1 Labelled “Operation and Maintenance Instructions”.
 - .2 Date of submission; names.
 - .3 Name of project.
 - .4 Addresses, and telephone numbers of Supplier/Manufacturer with name of responsible parties.
 - .5 Schedule of products and system, indexed to content of volume.
 - .4 Organize contents as instructional manual into applicable Sections of work to parallel project specifications breakdown. Mark each Section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.
 - .5 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.

- .6 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
- .7 Information in manuals is to be specific to this project. Generic information is unacceptable.
- .2 Include the following information plus data specified:
 - .1 Installation and maintenance instructions for equipment and materials.
 - .2 Description: Operation of the equipment and systems defining start-up, shut-down and emergency procedures, and any fixed or adjustable set points that affect the equipment operation. Include nameplate information such as make, size and serial number. Include appropriate wiring diagrams, schematics, elevations, mounting requirements, options included, etc. as it pertains to each system.
 - .3 Maintenance: Use clear drawings, diagrams or manufacturers' literature which specifically apply and details the following:
 - .1 Lubrication products and schedules.
 - .2 Trouble-shooting procedures.
 - .3 Adjustment techniques.
 - .4 Operational checks. Supplier names with addresses and telephone numbers of points of contact; components supplied by them must be included in this Section. Components must be identified by a description and manufacturer's part number.
 - .4 Spare Parts: List all recommended spares to be maintained on site to ensure optimum efficiency. List all special tools appropriate for unique application. All parts/tools detailed must be identified as to manufacturer, part number and supplier.
 - .5 Shop Drawings: Include final complete reviewed set of shop drawings with all mark-ups, comments, and Manufacturer's and Departmental Representative's stamps. Indicate any changes made during fabrication.
 - .6 For each product or system:
 - .1 List names, addresses and telephone numbers of suppliers, including local source of supplies and replacement parts.
 - .7 Material Safety Data Sheets (MSDS).
 - .8 Manufacturers' Pre-Start-up, Start-up, Commissioning & Testing Field Reports.
 - .9 Manufacturers' Inspection Certificates.
 - .10 Within four (4) weeks of acceptance of draft manuals by Departmental Representative submit single electronic format (pdf) and three (3) sets of hard copies of Operation and Maintenance Instruction Manuals.
 - .11 Materials and Finishings
 - .1 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
 - .2 Additional requirements: as specified in individual specifications Sections.

.11 Maintenance Materials

.1 Special Tools:

- .1 Provide a single set of special tools for unique application required to perform maintenance on Fire Pump.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Deliver to site; place and turn over to Departmental Representative.

1.2 REFERENCES

.1 Fire Safety Requirements

- .1 Comply with the National Building Code of Canada 2015 (NBC) for fire safety in construction and the National Fire Code of Canada 2015 (NFC) for fire prevention, fire fighting, and life safety in building in use.
- .2 Fire Pump must meet the requirements set out in NFPA 20, Standard for the Installation of Stationary Fire Protection.