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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | September 22,2009 | Insertion of the pre-approved suppliers/manufacturers names and review/update of document cross-references |
| 3 | April 9, 2013 | Final Draft – Consolidated Comments Spec Update Project |
| 4 | June 17, 2013 | Finalized for Legal Review. Incorporation of new Commissioning and Computerized Maintenance Management System Data Requirements Specification cross references. |
| 5 | June 3, 2014 | Incorporation of Legal Comments (AV) |
| 6 | July 15, 2014 | Amended to reflect changes related to commissioning specification and name change (AV) |
| 7 | September 24, 2014 | Updated, Finalized Specification – Reference eDOCS #1029442-v5 (AV) |
| 8 | February 11, 2015 | Updated standards (AV) |
| 9 | March 2, 2015 | Updated, Finalized Specification – Legal Reference eDOCS #5043365 v12 (AV) |
| 10 | November 11, 2016 | Updated NEMA MG-1 reference to 2016 new version (AV) |
| 11 | January 30, 2017 | Updated Acceptable Manufacturers to be consistent with other specifications (CDP PMO) |
| 12 | December 7, 2017 | Updated references to Design Guidelines Section 30 (AAM) |

NOTE:

This is a CONTROLLED Document. Any documents appearing in paper form are not controlled and should be checked against the on-line file version prior to use.

**Notice:** This Document hardcopy must be used for reference purpose only.

**The on-line copy is the current version of the document.**

# GEneral

## Related Sections

[Under "Related Sections", identify other Sections that are related to, and/or dependent on, the work results or information specified elsewhere. The list should be limited to Sections with specific information that the reader might expect to find in this Section, but is specified elsewhere. For example, if hardware for aluminum entrances is specified in the aluminum entrance Section, a cross-reference would be appropriate in the finish hardware Section. The purpose of this cross-referencing is for information only, to aid in finding those other requirements—not to define the scope of the Section.

Cross-referencing here may also be used to coordinate assemblies or systems whose components may span multiple Sections and which must meet certain performance requirements as an assembly or system.

This Section is to be completed/updated during the design development by the Consultant. If it is not applicable to the section for the specific project it may be deleted.

List Sections specifying installation of products supplied but not installed under this Section and indicate specific items.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Execution requirements for ...[item]... specified under this Section.

### [List Sections specifying products installed but not supplied under this Section and indicate specific items.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Product requirements for ...[item]... for installation under this Section.

### [List Sections specifying related requirements.]

### Section 11010 – Equipment General Requirements.

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: [Optional short phrase indicating relationship].

### Section 01250 – Substitutions

### Section 01425 – Computerized Maintenance Management System Data Requirements

### Section 01640 – Manufacturer’s Services

### Section 01810 – Equipment Testing and Facility Commissioning

### Section 01820 – Demonstration and Training

### Section 05500 – Metal Fabrications General

### Section 09900 – Painting and Protective Coatings

### Section 11010 – Equipment General Requirements

### Section 16220 – AC Induction Motors

### Section 16260 – Low Voltage Adjustable Frequency Drive Systems

### Division 13 SCADA and Instrumentation – [applicable specifications]

### Design Guideline Section 30 – Operation Manual Guideline [Include as an appendix to the Contract Documents]

### Product requirements for [item]... for installation under this Section.

## Standards

### Comply with the latest edition of the following codes and standards, and all amendments thereto:

#### Institute of Electrical and Electronics Engineers (IEEE):

##### IEEE 112-2004, Standard Test Procedure for Polyphase Induction Motors and Generators.

##### IEEE 519-2014, IEEE Recommended Practice and Requirements for Harmonic Control in Electric Power Systems

#### Hydraulic Institute (HI) Standards.

##### ANSI-HI Pump Standards version 3.1

#### National Electrical Manufacturer's Association (NEMA):

##### NEMA MG 1-2016, Motors and Generators.

#### American Petroleum Institute (API)

##### API STD 675, Positive Displacement Pumps – Controlled Volume for Petroleum, Chemical, and Gas Industry Services, 3rd Edition, Includes Errata (June 2014).

#### *[Additional standards as defined by the Consultant].*

#### *[Additional standards as proposed by the Contractor and approved by the Consultant].*

## Definitions

### Terminology pertaining to pumping unit performance and construction shall conform to the ratings and nomenclature of the Hydraulic Institute Standards.

### Terminology pertaining to measured parameters shall be in SI units (primary) or both SI units and Imperial units (secondary).

## Submittals

### Shop Drawings:

#### Make, model, weight, kW and horsepower of each equipment assembly and all other required information as detailed in the Equipment Information Template and electronically up-loadable to the CMMS (Maximo). Refer to Section 01425 - Computerized Maintenance Management System Data Requirements.

#### Complete catalog information, descriptive literature, specifications, and identification of materials of construction.

#### Performance data on pumps, including curves showing the flow rate verses pump stroke setting (in percent) at maximum speed in strokes per minute and at minimum pump speed as specified in the Contract Documents.

#### Pump data sheet confirming pump capacity in litres per hour and imperial gallons per hour and pressure in kPa and psig, required NPSH, required backpressure valve setting, pumped chemical characteristics, pipe connection sizes, stroke rate, materials, testing requirements, intermediate fluid type, and appurtenances to be provided with pumps.

#### Detailed dimensional drawings for pump and driver including mounting requirements and piping connection sizes and locations.

#### Power and control wiring diagrams, including terminals and numbers.

#### Complete motor nameplate data, as defined by NEMA, motor manufacturer, and including any motor modifications.

#### Manufacturer’s materials compatibility information, confirming compatibility of wetted parts with specified pumped chemicals.

#### Factory finish system.

#### Detailed information on associated chemical feed pump flow meter and such meter’s ability to accurately monitor the feed pump flow under the actual operating conditions and characteristics of the feed pump system.

### Quality Control Submittals:

#### [Factory Functional and Performance] Test Reports [and Log].]

#### [Manufacturer's Certification of Compliance stating that the factory finish system is identical to requirements specified in this Section.]

#### Factory Acceptance Test (FAT) Report.

#### Site Acceptance Test (SAT) Report.

#### Special shipping, storage, protection and handling instructions.

#### Manufacturer's printed installation instructions.

#### Manufacturer's Certificate of Proper Installation.

#### Suggested spare parts list to maintain the equipment in service for a minimum period of [ 1 year] [ and] [ 5 years]. Include a list of special tools required for checking, testing, parts replacement, and maintenance with current price information including an electronic version that can be up-loaded to the Region’s CMMS (Maximo).

#### List special tools, materials, and supplies furnished with equipment for use prior to and during startup and for future maintenance.

#### Chemical compatibility report.

#### Operation and Maintenance Manual, including an electronic version of the manual that can be uploaded to the Region’s CMMS (Maximo). Refer to Design Guideline Section 30 – Operation Manual Guideline.

#### Extra Materials List (as required).

### Furnish for [each pump:] [this set of pumps:]

#### [One complete pump, drive motor, and gear box.]

#### [One variable speed drive controller.]

#### [One diaphragm back pressure control valve.]

#### [One printed circuit board of each type.]

#### Any other component essential for optimum operation of the chemical pump (mechanical and/or electrical).

#### [One complete set of any special tools required to dismantle pump.]

## Measurement and Payment

*[Choose one of the following payment language provisions that best suits the individual project.*

*If this Section is not specifically referenced by an item in the Bid Form, please use the following language:*

.1 The work of this Section will not be measured separately for payment. All costs associated with the work of this Section shall be included in the Contract Price.

*OR If this Section is specifically referenced in the Bid Form, use the following language and identify the relevant item in the Bid Form:*

.1 All costs associated with the work of this Section shall be included in the price(s) for Item No(s). \_\_\_ in the Bid Form.

*If the work of this Section is to be measured and paid for by several different methods, please amend the standard wording given above to reflect the different methods of measurement and payment.*]

# PRODUCTS

## General

### [No “or-equal” or substitute products will be considered.]

### Coordinate pump requirements with the drive manufacturer and ensure that all pump and drive requirements specified in the Contract Documents are met.

### The Contractor shall provide information regarding the procurement of spare and/or replacement parts for chemical metering pumps and associated equipment.

### Where adjustable speed drives are required, furnish a coordinated operating system complete with pump, drive, chemical flow metering and speed controller that allows for real-time dosage monitoring and SCADA control of speed and stroke to achieve dosage required operator adjusted set-points. The coordinated operating system shall be in accordance with the operational requirements set out in Division 13 - SCADA and Instrumentation and the Process Narrative/Process Control Narratives that are included as part of the Contract Documents in the SCADA Appendices. [*Please ensure that the Process Narrative/Process Control Narratives are attached as appendix documents to the Contract.]*

## Pump

### Positive displacement self-compensating hydraulically activated diaphragm type consisting of [simplex] [duplex] pumping heads, with internal automatic pressure relief valve, external manually adjustable stroke positioner from 0 to 100 percent, and with maximum stroke rate as specified in the Pump Data Sheet (attached as a supplement to this Section) and be in accordance with the operational requirements set out in Division 13 SCADA and Instrumentation and the Process Narrative/Process Control Narratives which are included as part of the Contract Documents in the SCADA Appendices.

### Pump shall be capable of chemical delivery through the design dosage range under design suction conditions from associated chemical storage tanks. Liquid chemical pumping shall be primarily measured by the associated magnetic (or other type) of flow meter and adjustable by speed and/or stroke changes from the SCADA system and locally.

### [Alternatively, the pump shall be a simplex, motor driven metering pump with a hydraulically actuated diaphragm. The drive case and the hydraulic unit shall be filled with a liquid that functions as a hydraulic coupling. A plunger shall connect the drive case with the hydraulic unit and the dosing diaphragm shall separate the hydraulic part of the pump from the dosing unit. The motor driver metering pump shall incorporate a hydraulically balanced Teflon diaphragm. The drive case shall be cast iron, incorporating a worm gear set driving a rotating eccentric. The locking stroke adjuster shall vary the flow from 100% to 0% in 1% increments. The pump shall be built in accordance with API STD 675 standards. The hydraulic system shall transfer the rotating eccentric motion to diaphragm movement by way of a reciprocating plunger. The plunger and diaphragm shall be hydraulically coupled (no mechanical connection). Coupling compliance shall be precisely controlled by a mechanically actuated replenishment valve, which senses diaphragm position in order to admit coupling fluid as required. The coupling fluid shall be automatically degassed to maintain accuracy and drive case is protected from overload by a simple acting relief valve. The hydraulic system shall be separated from the fluid end by a Teflon diaphragm, completely isolating the pumped fluid from the surroundings. The Consultant will define the type of chemical feed system.]

### Bearings, tapered roller or needle type. Gearing, polished steel or bronze worm type. Mount bearings and internal working parts in weather-resistant gear box with moving parts oil flooded.

### [Lubricant, non-toxic food grade quality.]

### Pump leakage shall be prevented through hydraulically actuated balanced diaphragm design. [Alternatively, for mechanically actuated diaphragm, liquid end shall be physically separated from drive unit by back plate with weep hole creating an air gap. Elastomer shaft wiper seal shall be provided to prevent migration of leakage to drive unit along shaft.] [Alternatively, for a mechanically actuated diaphragm, liquid end shall include secondary diaphragm separated from primary diaphragm by spacer plate, with diaphragm protected pressure switch to provide external indication and alarm of leak of primary diaphragm.]

### Pump shall include adjustable, spring loaded internal pressure relief valve to protect pump against excessive hydraulic pressure.

### Acceptable Manufacturers:

#### ProMinent Fluid Controls Ltd.

#### GRUNDFOS Canada Inc. (Alldos).

#### Approved Equivalent.

## Pulsation Dampeners

### [Single] [Double] diaphragm type mounted on [suction] [discharge] [suction and discharge] piping as shown for pneumatic-hydraulic pulsation dampening. Size for pump stroke volume. Body material shall be [ ] and diaphragm material shall be [ ].

### Pulsation dampers shall be a chemically resistant bladder type or an approved equivalent.

### Air charging valve and pressure gauge (if applicable).

## Valves

### Adjustable diaphragm backpressure sustaining type shall be installed on the pump discharge as shown on the Contract Drawings and set [at kPa. gauge] [as recommended by the pump manufacturer.]

### Adjustable pressure relief type shall be installed on the pump discharge as shown on the Contract Drawings and set [at kPa. gauge] [as recommended by the pump manufacturer.]

### All piping, valves and related gauges and appurtenances shall be fully compatible and chemically resistant with the chemicals specified in the Contract Documents.

## Pump Output Control

### Manual Stroke Adjustment: Provide manual stroke length adjustment through an adjustment knob on the unit that provides adjustment accuracy of 1 percent (both locally and via the SCADA system). Adjustment shall be self-locking and shall be operable whether or not the pump is running.

### Automatic Stroke Adjustment: Provide automatic stroke position adjustment using either motorized drive or energy from pump. Stroke adjustment system shall be capable of receiving an external [4 - 20 mA dc] [ ] control signal to provide linear adjustment of stroke setting from zero to 100 percent. Provide a manual override using either integral hand-wheel or knob, or separate manual adjustment as specified in subsection 2.5.1 above. Provide selection of AUTO or MANUAL position adjustment.

### Adjustable Speed (Stroke Frequency) Adjustment: Provide adjustable speed operation of pump using [DC SCR drive] [or] [AC inverter]. Coordinate the pump motor type with the drive unit provided. [DC SCR drive shall not cause more than 1 percent harmonic distortion into power supply voltage waveform, as defined by IEEE Standard 519-2014. Furnish isolation transformers or filtering devices as necessary to meet this requirement.] [AC inverter shall be in accordance with Section 16262 – Variable Frequency Drives 300-500 HP (Section 2.2.2.1).] Drive unit shall include an integral or separate control panel with speed indication in percent, HAND/OFF/AUTO selector switch, and manual adjustable potentiometer for adjustment of pump speed when in HAND position. Drive shall be capable of accepting external [4 - 20 mA DC] [ ] control signal to provide linear adjustment of pump speed from zero to 100 percent when in AUTO position. Provide DRIVE FAIL and ON/OFF discrete output signals. Provide 4 - 20 mA analog output signal for drive speed.

### All defined input/output signals to be conveyed to the SCADA system shall be in accordance with the operational requirements set out in Division 13 - SCADA and Instrumentation and the Process Narrative/Process Control Narratives that are included as part of the Contract Documents in the SCADA Appendices.

## Accessories

### Equipment Identification Plate: 1.5 mm stainless steel with 6 mm die stamped equipment tag number securely mounted in a readily visible location.

### Lifting Lugs: Equipment weighing over 45 kg.

### Anchor Bolts: [Galvanized,] [Type 316 stainless steel,] [sized by equipment manufacturer,] [13 mm minimum diameter,] and as specified in Section 05500 - Metal Fabrications General. [Coat in accordance with Section 09900 - Painting and Protective Coatings.]

### Gauge Connections: Tapped and plugged suction and discharge gauge connections on piping headers adjacent to pumps. Workmanship and materials must be of high quality with no chemical leaks evident during the warranty period.

### Screens or Guards: Mesh size of less than 13 mm, exposed rotating shafts, rotors, couplings, pulley, wheel, bolts, chains, or similar components. Where guards/screens are located over grease fittings, couplings, or other items requiring maintenance, provide a means for ready access.

### Calibrated Cylinder: Graduated in [50 ml] [ ] increments, constructed of clear polypropylene and PVC with ball type shutoff valve. Calibrated cylinder shall be of high quality and manufactured for the purpose of accurate volume measurement.

### The Contractor shall coordinate all components from various manufacturers such that the chemical feed system performs as designed at the accuracy defined by the Specifications and compatible with the chemicals specified in the Contract Documents.

## Factory Finishing

### [Prepare, [and] prime, [and finish] coat in accordance with Section 09900 - Painting and Protective Coatings.]

### [Manufacturer's standard [B: baked] enamel finish.]

## Source Quality Control

### [Factory Inspections:] Inspect [control panels] [ ] for required construction, electrical connection, and intended function.

### [Factory Tests and Adjustments:] Test [one] [ ] [all] [equipment] [ ] [and] [control panels [actually] [identical to that]] furnished.

### Factory Test Report: Include [test data sheets.] [ .]

### Functional Test: Perform [manufacturer's standard,] [ ] [motor] test on [equipment.] [ .]

# EXECUTION

## Installation

### Install in accordance with the manufacturer's printed instructions or as modified to field conditions and certified by the manufacturer’s representative.

### Anchor Bolts: Accurately place the anchor bolts using equipment templates and as specified in Section 05500 - Metal Fabrications General.

## Field Finishing

### [Equipment as specified in Section 09900 - Painting and Protective Coatings.]

## Field Quality Control

### Conduct tests on each pump.

### Functional Test:

#### Alignment: Test complete assemblies for [correct rotation,] proper alignment and connection, and quiet operation.

#### Submit the test report to the Consultant and Region for approval in an electronic format capable for upload to the Region’s CMMS (Maximo). Refer to Section 01425 – Computerized Maintenance Management System Data Requirements.

#### Associated chemical pump flow meter shall be the primary indicator of pump liquid chemical delivery.

### Performance Test:

#### Perform under actual or approved simulated operating conditions.

#### Test for a continuous [3 hour] [ ] period without malfunction and deliver liquid chemical through the entire design performance range.

#### Submit the test report to the Consultant and Region for approval and sign-off in an electronic format capable for upload to the Region’s CMMS (Maximo). Refer to Section 01425 - Computerized Maintenance Management System Data Requirements for additional requirements.

#### Associated chemical pump flow meter shall be the primary indicator of pump liquid chemical delivery.

## Manufacturer’s Services

### Manufacturer's Representative: Present the manufacturer’s representative at the Site or classroom designated by the [Region,] [ ,] for the minimum number of Person-days listed below, travel time excluded:

#### [ ] Person-days for [installation assistance] [and] [inspection.]

#### [ ] Person-days for [functional] [and] [performance] testing and completion of the Manufacturer's Certificate of Proper Installation.

#### [ ] Person-days for pre-startup classroom or Site training.

#### [ ] Person-days for facility startup.

#### [ ] Person-days for post-startup training [of the Region's personnel.] [Training shall not commence until an accepted detailed lesson plan for each training activity has been reviewed by the [Region] [Consultant] [ ].]

#### The Contractor shall ensure that the training will be performed by a technically competent person who may be videotaped by Region staff during the training session. Taped training sessions shall be used for refresher training or for staff missing the original training.

#### See Section 01820 – Demonstration and Training.

### See Section 01640 Manufacturers' Services and Section 01810 - Equipment Testing and Facility Commissioning.

## Supplements

### The supplement listed below, attached following “End of Section”, forms part of this Section

#### Data Sheet: Pump and Motor.

**END OF SECTION**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PUMP DATA SHEET CHEMICAL METERING PUMPS NO. | | | | | | | | | | | |
| Project: | | | | | | | | | | | |
| Region: | | | | | | | | | | | |
| Service: | | | | | | | | | | | |
| Pump Name: | | | | | | | | | | | |
| Equip. Tag Number(s): | | | | | | | | | | | |
| Manufacturer and Model: (1)  (2)  (3) | | | | | | | | | | | |
| No. Pumps Required: | | |  | | | | |  | | | |
| Drive Type: Constant Adjustable | | |  | | | | |  | | | |
| **LIQUID** | | | **OPERATING CONDITIONS** | | | | **SERVICE CONDITIONS** | | | | |
| Name: | | | Capacity (l/s): | | | | Temp (C): Max Min | | | | |
| Pumping Temperature (ºC): | | | Normal  Rated | | | | Rel. Hum (%): Max  Min | | | | |
| Normal Max Min | | | Min. Continuous Flow (l/s): | | | | Altitude (m): | | | | |
| Specific Gravity @ ºC: | | | Max. Discharge Pressure (kPa): | | | | Indoor Heated | | | | |
| Vapor Pressure (kPa): | | | Suction Pressure (kPa): | | | | Outdoor Unheated | | | | |
| Viscosity (CP) @  ºC: | | | Max  Rated | | | | Area Classification: | | | | |
| @ ºC: | | |  | | | | Other: | | | | |
| pH: | | |  | | | |  | | | | |
| Corrosion/Erosion/Abrasion Caused by: | | |  | | | |  | | | | |
|  | | |  | | | |  | | | | |
| Remarks: | | | Remarks: | | | | Remarks: | | | | |
|  | | |  | | | |  | | | | |
| **PERFORMANCE REQUIREMENTS (manufacturer to supply missing data)** | | | | | | | | | | | |
| Pump Speed Control: Constant: | | | Max. Head (kPa): | | | | | | Factory Testing: | | |
| Variable: | | | Max. Power (kw): | | | | | | Required Not Required | | |
| Internal Bypass Valve Setting (kPa) | | | | | | | | | | | |
| Relief Valve Setting (kPa) | | | | | | | | | | | |
| Back Pressure Valve Setting (kPa) | | | | | | | | | | | |
| Maximum Stroke Rate: | | | | | | | | | | | |
| Remarks: | | | | | | | | | | | |
| **Data shall be provided in an electronic format suitable for upload to the Region’s CMMS.** | | | | | | | | | | | |
| Equipment Tag Number(s): | | | | | | | | | | | |
| **PUMP CONSTRUCTION DETAILS (manufacturer to supply missing data)** | | | | | | | | | | | |
| **Nozzles** | | | | | |  | |  | | | |
|  | **Size** | **Rating** | | **Facing** | **Location** |  | |  | |  |  |
| Suction |  |  | |  |  |  | |  | |  |  |
| Discharge |  |  | |  |  |  | |  | |  |  |
| Pump Type: Single Diaphragm (Y/N) | | | | | | | | | | | |
| Tubular (Double) Diaphragm (Y/N) | | | | | | | | | | | |
| Other | | | | | | | | | | | |
| Check Valve Configuration: (Single/Double) | | | | | | | | | | | |
| Calibration Cylinder: Capacity Units | | | | | | |  | | | | |
| Diaphragm Actuation Type: Mechanical Hydraulic | | | | | | | | | | | |
| Stroke Position Adjustment: Mechanical Automatic | | | | | | | | | | | |
| Remarks: | | | | | | | | | | | |
|  | | | | | | | | | | | |
|  | | | | | | | | | | | |
| **MATERIALS (manufacturer to supply missing data)** | | | | | | | | | | | |
| Wet End: | | | Tubular Diaphragm Housing: | | | | Baseplate: | | | | |
| Check Valve: | | | Diaphragm: Primary | | | | Type: | | | | |
| Tubular | | | | | | | Material: | | | | |
| Calibration Cylinder: | | | | | | |  | | | | |
| Remarks: | | | | | | | | | | | |
|  | | | | | | | | | | | |
|  | | | | | | | | | | | |
| **ADDITIONAL REQUIREMENTS** | | | | | | | | | | | |
| Vent and drain connections tapped and plugged | | | | | | | | | | | |
| Suction and discharge gauge connections tapped and plugged | | | | | | | | | | | |

### **Data shall be provided in electronic format suitable for upload to the Region’s CMMS.**

|  |  |
| --- | --- |
| INDUCTION MOTOR DATA SHEET | |
| Project: | |
| Region: | |
| Equipment Name: | |
| Equipment Tag Number(s): | |
| Type: Squirrel-cage induction meeting requirements of NEMA MG 1-2016 | |
| Manufacturer: For multiple units of the same type of equipment, furnish motors and accessories of a single manufacturer | |
| Hazardous Location: Furnish motors for hazardous (classified) locations that conform to UL/ULC 674 and have an applied UL/ULC listing mark | |
| Motor Rating (kw): | Guaranteed Minimum Efficiency at Full Load:  percent |
| Voltage: | Guaranteed Minimum Power Factor at Full Load:  percent |
| Phase: | Service Factor (@ rated max. amb. temp.): 1.0 1.15 |
| Frequency: | Enclosure Type: |
| Synchronous Speed: rpm |  |
| Multispeed, Two-Speed: |  |
| / rpm |  |
| Constant Horsepower | Adjustable Speed Drive: See Section 16260, Low Voltage |
| Variable Torque | Adjustable Frequency Drive Systems. |
| Constant Torque | Operating Speed Range:  to % of Rated Speed |
| Winding: One Two | Thermal Protection: |
|  | Space Heater:  volts, single phase |
|  | Oversize main terminal (conduit) box for motors |
|  | Terminal for connection of equipment grounding wire in each  terminal box |
| Additional Motor Requirements: [Consultant to provide specification on], AC Induction Motors | |
| Special Features: | |
|  | |
|  | |

### **Data shall be provided in an electronic format suitable for upload to the Region’s CMMS.**