Part 1 General

1.1 REFERENCES - GENERAL

.1 Suppliers, Equipment, Products, and Execution must meet all requirements detailed in Section 29 05 00.

.2 Local control stations shall be supplied to house local control switches, push buttons and indictor lights associated with field devices (valves, drives etc). The control stations shall be located in close proximity to their associated devices. Where a group of devices are located within close proximity to each other, the local controls may be combined into a single common local control panel. Line of site must be maintained between all devices and the respective local controls.

Part 2 Products

2.1 GENERAL

.1 Unless otherwise specified, provide outside finishes on all enclosures in ANSI 61 Grey as specified in Division 9.

.2 The enclosures must be suitable for carrying the weight of the equipment mounted inside the panel and on the doors without any warpage.

2.2 ENCLOSURES

.1 Provide Electrical EEMAC Type 1A gasketted enclosures in main floor of building.

.2 Provide Electrical EEMAC Type 4 enclosures for below grade valve chamber.

.3 Enclosures for mounting field control indicator lamps and switches in unclassified areas to be Allen Bradley model 800T die cast enclosures.

2.3 PANEL ENCLOSURES

.1 Fabricate panel enclosures from 11 gauge steel panels complete with necessary stiffening to form a rigid free-standing lineup. The structures must be suitable for carrying the weight of the equipment mounted inside the panel and on the doors. Provide removable top and bottom cable entry plates.

.2 Provide panels with front access only. Doors shall be key lockable and fitted with 3-point heavy duty latching assemblies. Provide a continuous piano hinge and a pneumatic hold open device on each door.

.3 Finish the interior of the enclosure with white paint. Provide a switched fluorescent light fixture and 120 VAC duplex convenience receptacle inside the enclosure.

2.4 MARSHALING AND CONTROL PANELS

.1 Supply, fabricate, checkout, layout, document and deliver to Site fully equipped and functional panels**.**

.2 Supply all components contained on or within the panels fully wired under this Section of the Specification.

.3 The selection of all accessories, materials and methods for fabrication not covered by this Specification, but which are necessary to complete the fabrication of the control panels, is the responsibility of the panel fabricator.

.4 Fans and filters shall be installed to pressurize all control panels thus discouraging dust accumulation and providing air purging for temperature and corrosion control.

.5 Marshalling and control panels shall be adequately sized to facilitate a professional, uncluttered arrangement. Provide adequate internal and external space to accommodate a 20 percent increase in each type of component used.

.6 Control and marshalling panel layouts and wiring diagrams are to be provided by the Contractor as Shop Drawings.

2.5 NETWORK CABLING TERMINATION CABINETS

.1 Provide one (1) network termination cabinet and install in new valve chamber building. Cabinet to meet the following requirements:

.1 Double hinged wall mounted cabinet for 19 inch rack mounted equipment.
.2 NEMA 12 cabinet with glass door and locking wing knobs.
.3 Cabinet to house fibre patch panel, Cat 5E patch panel and Ethernet switches.
.4 Provide 120 VAC duplex receptacle and power bar with minimum six outlets.
.5 Provide horizontal wire management under each patch panel and Ethernet switch.
.6 Provide vertical wire management on one side.
.7 Provide blank panels for all empty rack units.
.8 Provide shelf 3U for mounting equipment.
.9 Cabinet sized for 8 rack units.
.10 Hoffman ProTek DH Type 12, or approved equal.

2.6 WIRING AND ACCESSORIES

.1 Provide wiring inside the panels according to the following Specifications:

.1 Control wiring to be a minimum of #16 AWG tinned stranded copper; insulation rated at 300 V.
.2 Wiring for power distribution shall be a minimum of #14 AWG tinned stranded copper; insulation rated at 600 V.
.3 Install cables in accordance with the requirements of Division 16.

.2 Tag each wire at both ends with a heat shrink sleeve that is machine printed. Allow approximately 20 mm of wire insulation between the tag and the bare wire.

.3 Wiring systems with different voltage levels or types shall be suitably segregated within the panel, according to relevant electrical codes.

.4 Run all wiring in enclosed plastic wireways such as Panduit. Size all wireways so that the total cross sectional area of the insulated wire and cable does not exceed 40 percent of the cross sectional area of the wire way.

.5 Provide a minimum clearance of 50 mm between wire ways and any point of wire termination.

.6 Terminate all wiring, incoming and outgoing, at terminal strips mounted inside the panels. Identify each terminal strip with a terminal strip number, defined as follows:

.1 Wire identification to use the connected field device tag name with the wire's corresponding end device terminal number appended to it.

.2 Identify every joint and/or terminal of the above wire run with the same identifier until the wire meets another tagged device, at which point the wire identifier will change to use the new device name and terminal number.

.3 For example, pressure transmitter S740-FIT located in the field has a 1 PR-TPSH cable connected to it. The cable runs through a junction box to a marshaling panel. The wire identifiers for the pair of wires would be S740-FIT all the way to the marshaling panel.

.4 Identify spare wires by using the cable tag, wire number and an “-SP” suffix.

.5 Arrange wiring on terminal blocks such that all internal panel wiring terminates on the inboard side of the terminal blocks and all external wiring terminates on the outboard side.

.7 Provide a 120 VAC panel power distribution system and a 24 VDC power distribution system in each panel. Provide a thermal magnetic circuit breaker on each main power circuit and a fused terminal block for each branched circuit off the main.

.8 Provide disconnect type terminal blocks Weidmuller WTR 4 series to isolate field wiring that is powered sourced from the panel. Provide a dedicated fused disconnect type terminal block to isolate each individual PLC input and output.

.9 Provide sufficient terminals so that not more than two wires are connected under the same terminal. Provide 20 percent spare terminal capacity at each terminal block assembly.

.10 Terminals shall be Weidmuller W Series color coded as follows:

Red = positive 24 VDC
Black = analog signal plus
White = analog signal common and VAC neutral
Grey = 120 VAC
Green = ground

.11 Provide nameplates for each device on or within the panels and enclosures. Nameplates shall be white lamicoid with black lettering, a minimum of 25 mm x 75 mm in size with up to three lines of 5 mm lettering. Securely fasten nameplates in and situate them in a visible location.

2.7 PANEL GROUNDING

.1 Provide a ground system for the instrumentation circuits, isolated from the main power system ground to each marshaling panel.

.2 Provide grounding lugs for each panel, suitable for termination of up to #2 AWG copper grounding conductor.

.3 Provide in each marshaling panel an isolated grounding bus bar 6 x 25 x 600 mm, equipped with necessary lugs for accepting two (2) #2 AWG grounding conductors.

.4 Firmly bond all panel-mounted devices on or within the panels to ground. Provide supplementary bonding conductors for backpanels and doors. Attach a separate bonding conductor to all devices that are not firmly fastened to the panels with screws for such devices as case mounted instruments, meters, etc.

Part 3 Execution

3.1 MOUNTING HEIGHTS

.1 Unless otherwise specified or a conflict exists, mount all panels, starters and disconnects 2000 mm to top of cover.

3.2 NETWORK CABLING TERMINATION CABINETS INSTALLATION

.1 Install network cabling termination cabinet in new valve chamber building. Terminate Fiber Optic cable.

.2 Terminate one end new Fibre Optic cabling in existing fiber termination cabinet located control panel on main floor of pumphouse building.

END OF SECTION