JEAN Water & Wastewater Standards Manual

VOLUME VIA: Water Reclamation Facility Details

2023 - Edition

“Foundation for the Future - Water & Wastewater Standards”
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RELCAIMED WATER TREATMENT PLANT DETAILS

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VIA.1 PROCESS FLOW DIAGRAM
### Piping Schedule Legend

<table>
<thead>
<tr>
<th>Service</th>
<th>Color</th>
<th>Size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALUM</td>
<td>Black</td>
<td>1/2&quot;</td>
<td>Schedule 40</td>
</tr>
<tr>
<td>STEEL</td>
<td>Dark Brown</td>
<td>1&quot;</td>
<td>Schedule 40</td>
</tr>
<tr>
<td>COPPER</td>
<td>Yellow</td>
<td>1.5&quot;</td>
<td>Schedule 40</td>
</tr>
<tr>
<td>COPPER</td>
<td>Blue</td>
<td>2&quot;</td>
<td>Schedule 40</td>
</tr>
<tr>
<td>COPPER</td>
<td>Green</td>
<td>3&quot;</td>
<td>Schedule 40</td>
</tr>
<tr>
<td>COPPER</td>
<td>Red</td>
<td>4&quot;</td>
<td>Schedule 40</td>
</tr>
</tbody>
</table>

### General Notes
- This piping schedule is an example from Greenland WRF. Piping schedules are site-specific and shall be customized based on project requirements.

### Piping Schedule

<table>
<thead>
<tr>
<th>Sheet</th>
<th>Service</th>
<th>Line Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alum</td>
<td>1/2&quot;</td>
<td>Dark Brown</td>
</tr>
<tr>
<td>2</td>
<td>Steel</td>
<td>1&quot;</td>
<td>Dark Brown</td>
</tr>
<tr>
<td>3</td>
<td>Copper</td>
<td>1.5&quot;</td>
<td>Yellow</td>
</tr>
<tr>
<td>4</td>
<td>Copper</td>
<td>2&quot;</td>
<td>Blue</td>
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<tr>
<td>5</td>
<td>Copper</td>
<td>3&quot;</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>Copper</td>
<td>4&quot;</td>
<td>Red</td>
</tr>
</tbody>
</table>

### Material Specifications
- **Alum:** Schedule 40
- **Steel:** Schedule 40
- **Copper:** Schedule 40

### VIA.3 Piping Schedule

<table>
<thead>
<tr>
<th>Sheet</th>
<th>Service</th>
<th>Line Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
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<td>Dark Brown</td>
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<tr>
<td>8</td>
<td>Steel</td>
<td>1&quot;</td>
<td>Dark Brown</td>
</tr>
<tr>
<td>9</td>
<td>Copper</td>
<td>1.5&quot;</td>
<td>Yellow</td>
</tr>
<tr>
<td>10</td>
<td>Copper</td>
<td>2&quot;</td>
<td>Blue</td>
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<td>11</td>
<td>Copper</td>
<td>3&quot;</td>
<td>Green</td>
</tr>
<tr>
<td>12</td>
<td>Copper</td>
<td>4&quot;</td>
<td>Red</td>
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</table>

### VIA.3 Piping Schedule

<table>
<thead>
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<th>Service</th>
<th>Line Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
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<td>Alum</td>
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<td>Dark Brown</td>
</tr>
<tr>
<td>14</td>
<td>Steel</td>
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<td>Dark Brown</td>
</tr>
<tr>
<td>15</td>
<td>Copper</td>
<td>1.5&quot;</td>
<td>Yellow</td>
</tr>
<tr>
<td>16</td>
<td>Copper</td>
<td>2&quot;</td>
<td>Blue</td>
</tr>
<tr>
<td>17</td>
<td>Copper</td>
<td>3&quot;</td>
<td>Green</td>
</tr>
<tr>
<td>18</td>
<td>Copper</td>
<td>4&quot;</td>
<td>Red</td>
</tr>
</tbody>
</table>

### Coating System Numbers
- These numbers are specified in section 30.03.04.10 Painting and Coatings, and are specified in Article 2 of the Metal Corrosion Protection.
### VIA.4 VALVE SCHEDULE, ELECTRIC ACTUATED

<table>
<thead>
<tr>
<th>TAG NUMBER</th>
<th>VALVE TYPE</th>
<th>ACTUATION POWER SUPPLY</th>
<th>VALVE DIAMETER</th>
<th>PROCEDURE</th>
<th>MAXIMUM OPERATING FLOW RATE</th>
<th>MAXIMUM OPERATING FLOW RATE</th>
<th>OPERATION</th>
<th>TRAVEL TIME (SECONDS)</th>
<th>CONTROL FEATURE MODIFICATIONS/ SUPPLEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

### VIA.5 VALVE SCHEDULE, SOLENOID

<table>
<thead>
<tr>
<th>TAG NUMBER</th>
<th>VALVE TYPE</th>
<th>VALVE BODY MATERIAL</th>
<th>PROCESS SERVICE</th>
<th>VALVE DIAMETER</th>
<th>MAXIMUM OPERATING FLOW RATE</th>
<th>MAXIMUM OPERATING FLOW RATE</th>
<th>OPERATION</th>
<th>TRAVEL TIME (SECONDS)</th>
<th>ACTUATOR CONTROL FEATURES, MODIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
SELF-REGULATED VALVE SCHEDULE

<table>
<thead>
<tr>
<th>DAY NUMBER</th>
<th>VALVE TYPE</th>
<th>VALVE SIZE (INCHES)</th>
<th>VALVE PRESSURE</th>
<th>MAXIMUM PRESSURE (PSI)</th>
<th>FLOW (GPM)</th>
<th>PROCESS SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. A = ACTUAL PRESSURE = INITIAL SET PRESSURE FOR PRESSURE RELIEF VALVES OR INITIAL DRAINAGE SET PRESSURE FOR PRESSURE RELIEF VALVES. NPS equals 1/2 of O.E. x O.E. (inch) x square inch. This equipment shall be responsible for making adjustments to valve setting during start-up to meet the systems requirements of the design or operation.

FLOW CONTROL VALVE SCHEDULE

<table>
<thead>
<tr>
<th>DAY NUMBER</th>
<th>VALVE TYPE</th>
<th>PROCESS SOURCE</th>
<th>Cv</th>
<th>MIN</th>
<th>MAX</th>
<th>MIN Cv</th>
<th>MAX Cv</th>
<th>CONTROL FEATURE</th>
<th>ACTUATOR</th>
<th>POWER SUPPLY</th>
<th>TRAVEL TIME (SEC)</th>
<th>PNEU.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>V20</td>
<td>4</td>
<td>225</td>
<td>350</td>
<td>50</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>100</td>
<td>500</td>
</tr>
</tbody>
</table>

CONTROL FEATURE MODIFICATIONS/CONSIDERATIONS:
A = ACTUATOR SHALL OPERATE VALVE ON OPEN LOSS OF SIGNAL.
B = ACTUATOR SHALL CLOSE VALVE UPON LOSS OF SIGNAL.
C = ACTUATOR SHALL REMAIN IN LAST POSITION UPON LOSS OF SIGNAL.
D = LOCAL OPERATING SWITCH IN CASE OF LOCAL OPERATING MONITORING OR VALVETRACKS THAT MUST BE CONTINUOUSLY BE PRESENT TO MAINTAIN MAN DEVICES IN A COMPLETELY OPEN SETTING, THE SWITCH SHALL BE CLOSED.
E = VALVE IS OPERATED FROM A REMOTE PILOT OR TURNTABLE, THE VALVE SHALL BE OPERATED FROM THE DESIGNER'S CONTROL SYSTEM.
F = VALVE IS OPERATED FROM A REMOTE PILOT OR TURNTABLE, THE VALVE SHALL BE OPERATED FROM THE DESIGNER'S CONTROL SYSTEM.
G = MOTOR AND CONTROL ENCLOSURE, SIZE TYPE 3 X 4 WITH INTERNAL INSTRUMENTATION, OVERHEAD MONITOR AND MANUAL CONTROL.
H = MOTOR AND CONTROL ENCLOSURE, SIZE TYPE 3 X 4 WITH GLOBULAR SPACE RELIEF DEVICES.
I = MOTOR AND CONTROL ENCLOSURE, SIZE TYPE 3 X 4 WITH EXTERNAL MONITORING DEVICES.
J = VALVE POSITION OUTPUT: DEVICES THAT GENERATE DEVICES THAT GENERATE CURRENT TO VALUE OF 4-20 MA. DEVICES THAT GENERATE CURRENT TO VALUE OF 4-20 MA. DEVICES THAT GENERATE CURRENT TO VALUE OF 4-20 MA.
### Sludge Gate Schedule

<table>
<thead>
<tr>
<th>Gate Identification No. and Location</th>
<th>Assembly Style</th>
<th>Wall Opening (width / height)</th>
<th>Gate Height (inches)</th>
<th>Flow Stream</th>
<th>Design Operating Head (ft.)</th>
<th>Seating / Unseating Condition</th>
<th>Operator Type / Control Style</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example: 10GTH300</td>
<td>Style A.2</td>
<td>36 / 96</td>
<td>96</td>
<td>RS</td>
<td>3 Seating</td>
<td>Type 2</td>
<td>Odor Control Seal</td>
<td></td>
</tr>
</tbody>
</table>

Note: See the Drawings for configuration and invert elevations.
**CRANE DATA SHEET (Facility No. - Facility Name)**

- **Project:**
- **Owner:**
- **Service:**
- **Equi. Tag No.:**

### GENERAL REQUIREMENTS

- **Equipment Capacity:**
- **Factory Furnished:**
- **Pump Supply:**
- **Method of Control:**
- **Location of Control:**
- **Equipment Location:**
- **Performance:**

### BRIDGE TROLLEY HOIST

<table>
<thead>
<tr>
<th>Type</th>
<th>Type</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>Single Girder</td>
<td>Top Running</td>
<td>Electric, Wire Rope</td>
</tr>
<tr>
<td>Double Girder</td>
<td>Underslung</td>
<td>Power Operated Chain</td>
</tr>
</tbody>
</table>

### SPECIAL REQUIREMENTS

- **Product Controls:**
- **Special Electrical Requirements:**
- **Auxiliary Controls:**
- **Sheave:**
- **Electrical Operation:**
- **Service Platforms:**
- **Central Lubrication Systems:**
- **Emergency Power Source:**
- **Bridge Drive System (EMAX):**
- **Bridge Drive System (M):**
- **Low Voltage:**
- **High Voltage:**
- **Bridge Accessory:**

**FILE NAME:**

**Plot Date:**

**Plot Time:**

---

**CRANE DIMENSION SHEET (Facility No. – Facility Name)**

**Building Clearances for Top-Running Cranes**

- **Project:**
- **Owner:**
- **Eqip. Tag No.:**

### LOW POINT OF ROOF TRUSS, LIGHTS, ETC.

- **A:**
- **B:**
- **C:**
- **D:**
- **E:**
- **F:**
- **G:**
- **H:**
- **J:**

**Notes:**

1. Runway Length: 
2. Bridge Wheelbase, Centered on Bridge, Maximum:
3. Notes:
### GENERAL REQUIREMENTS

<table>
<thead>
<tr>
<th>Equipment Capacity</th>
<th>Factory Testing</th>
<th>Power Supply</th>
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<table>
<thead>
<tr>
<th>Method of Control</th>
<th>Required</th>
<th>Not Required</th>
<th>Voltage</th>
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<table>
<thead>
<tr>
<th>Location of Control</th>
<th>Field Testing</th>
<th>Not required</th>
<th>Phase</th>
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<table>
<thead>
<tr>
<th>Equipment Location</th>
<th>Required, functional and performance</th>
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<tbody>
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### HOIST

<table>
<thead>
<tr>
<th>Type:</th>
<th>Electric, Wire Rope, Hand Operated, Chain</th>
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<tbody>
<tr>
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<td>Top Running, Trolley</td>
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</table>

<table>
<thead>
<tr>
<th>Service Class (ANSI):</th>
<th>D (light)</th>
<th>C (medium)</th>
<th>B (heavy)</th>
</tr>
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<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Speed (ft/min):</th>
<th>ﺲ to</th>
<th>Speed (ft/min):</th>
<th>Ś to</th>
<th>Speed (ft/min):</th>
<th>Ś to</th>
</tr>
</thead>
<tbody>
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<table>
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<th>Motor hp:</th>
<th>Motor Type</th>
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<table>
<thead>
<tr>
<th>Hook:</th>
<th>See Hoist/Monorail Dimension Sheet</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Hook Manufacturer:</th>
<th>Filing Bar</th>
<th>Filing:</th>
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<table>
<thead>
<tr>
<th>Trolley:</th>
<th>Electric, Wire Rope, Hand Operated, Chain</th>
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<tbody>
<tr>
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<td>Top Running, Trolley</td>
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### SPECIAL REQUIREMENTS

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<thead>
<tr>
<th>Accessories:</th>
<th>Remote Controls</th>
<th>Special Electrical Requirements:</th>
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<tr>
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<thead>
<tr>
<th>Central Lubrication System</th>
<th>Infrared, Line-of-Sight</th>
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<table>
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<tr>
<th>DDA, SPLA operating and safety devices</th>
<th>Frequency Modulated (FM)</th>
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</thead>
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<table>
<thead>
<tr>
<th>Manufacturer:</th>
<th>Extended Fume Fittings</th>
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<tbody>
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</table>

See Hoist/Monorail Dimension Sheet for clearances, EN Dimensions, and details.

---

### HOIST/MONORAIL DIMENSION SHEET: (Facility No. – Facility Name)

**Building Clearances for Monorail Cranes**

<table>
<thead>
<tr>
<th>Project:</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner:</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Equipment Tag Number(s):</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. Monorail Track Length: ____
PUMP DATA SHEET

Tag Numbers: ________________________________

Pump Name: ________________________________

Manufacturer and Model Number: (1) ________________________________

(2) ________________________________

(3) ________________________________

SERVICE CONDITIONS

Liquid Pumped (Material and Percent): ________________________________

Pumping Temperature (Fahrenheit): Normal: Max ___________ Min ___________

Specific Gravity at 60 Degrees F: _______ Viscosity Range: _______

Vapor Pressure at 60 Degrees F: _______ pH: _______

Abrasive (Y/N) _______ Possible Scale Buildup (Y/N): _______

Total suspended solids (mg/L): ________________________________

Largest diameter solid pump can pass (inches): ________________________________

Min. NPSH Available (Fs Absolute): ________________________________

Suction Pressure (Ps): Max ____________________ Rated ____________________

Altitude (Feet above Mean Sea Level): ________________________________

Area Classification: ________________________________

Ambient Temperature (degrees F): ________________________________

Location: Indoor (Y/N) _______ Outdoor (Y/N): ________________________________

PERFORMANCE REQUIREMENTS

Capacity (US gpm): Rated: Secondary: ________________________________

Total Dynamic Head (Ft): Rated: Secondary: ________________________________

BHP at Rated Point: Secondary: ________________________________

Maximum Shutoff Pressure (Ps): ________________________________

Min. Pump Hydraulic Efficiency at Rated Capacity (%): ________________________________

Max. NPSH Required at Rated Capacity (Fs Absolute): ________________________________

Max. Pump Speed at Rated Capacity (rpm): ________________________________

Constant (Y/N): ________________________________

Adjustable (Y/N): ________________________________

Reverse rotation: Pump shall be capable of operating at runaway speed in reverse rotation without damage.

wk2 inertia of total rotating assembly (pump + motor components) lb-ft2, minimum: ________________________________

DESIGN AND MATERIALS

Pump Type: Horizontal (Y/N) _______ Frame-Mounted (Y/N): ________________________________

Vertical (Y/N) _______ Other: ________________________________

Casing Material: ________________________________

Casing Wear Rings (Y/N) _______ Casing Wear Ring Material: ________________________________

Impeller: Type: ____________________ Material: ____________________

Impeller Wear Rings (Y/N) _______ Impeller Wear Ring Material: ________________________________

Shaft Material: ____________________ Shaft Sleeve Material: ____________________

Shaft Seal: Packing (Y/N) _______ Mechanical (Y/N) _______ Type: ____________________

Seal Lubrication: ____________________

ABMA B-10 Bearing Life (hrs): _______ Lubrication: ____________________

Bearings: Outboard End Type: _______ Inboard End Type: ____________________

Coupling: Falk (Y/N) _______ Fast: (Y/N) _______ Spring-Grid (Y/N): ____________________

Gear Type (Y/N) _______ Spacer (Y/N): ____________________

Manufacturer Standard (Y/N): ____________________

Baseplate Material: ____________________

Drive Type: Direct-Coupled _______ Belt _______ Adjustable Speed _______ Other: ____________________
PERISTALTIC HOSE PUMP DATA SHEET

Tag Numbers: __________________________

Pump Name: __________________________

Manufacturer and Model Number: (1) __________________________
                                             (2) __________________________

SERVICE CONDITIONS

Liquid Pumped (Material and Percent): __________________________

Pumping Temperature (Fahrenheit): Normal: _______ Max: _______ Min: _______

Specific Gravity @ 60 Degrees F.: _______ Viscosity Range: _______

pH: __________________________

Abrasive (Y/N): _______ Possible Scale Buildup (Y/N): _______

Inlet Pressure at Pump (psig): _______

Min. Net Positive Inlet Pressure Available (psia): _______

Area Classification: __________________________

PERFORMANCE REQUIREMENTS

Rated Capacity (gpm): _______ Rated Differential Pressure (psig): _______

Maximum Pump Speed at Rated Condition (rpm): _______

Constant Speed (Y/N): _______ Adjustable Speed (Y/N): _______

Speed Range: _______% to _______% of Rated Speed: _______

DESIGN AND MATERIALS

Pump Type: Heavy-duty, horizontal, peristaltic hose pump

Pump Configuration: Direct or close-coupled

Pump Housing Material: Cast, ASTM A48/A48M, Class 25

Cover Material: Carbon steel or cast iron, with inspection window

Cover Scal Material: EPDM or Buna N (NBR)

Rotor Material: Cast iron
Rotor Shoes: Material selected to be suitable for intended flow stream and hose material.

No. of Rotor Shoes (Minimum): 2

Rotor Shoe Shim Material: Type 316 stainless steel

Hose Size, Millimeters:

Maximum Number of Hose Occlusions per 100 Gallons Pumped:

Hose Material: Material selected to be suitable for intended flow stream.

Hose Pressure Rating (psig):

Hose Inserts Material:

Hose Lubricant: Manufacturer’s standard

Flange Rating and Material: ANSI Class 125/150 Material selected to be suitable for intended flow stream.

Bearing Housing Material: Cast iron

Bearing Type: Ball bearings, permanently lubricated

Bearing Life (ABMA L-10) (hrs): 100,000

Gear Drive: Planetary type, AGMA Class II

Baseplate: Material selected to be suitable for intended flow stream/service area.

High Level Leak Detector (Y/N):

Pump Speed Sensor (Y/N):

Revolution Sensor (Y/N):

Suction Pulsation Dampener (Y/N):

Discharge Pulsation Dampener (Y/N):

**DRIVE MOTOR** (see IV.3.9, Low-Voltage AC Induction Motors)

Homepower: ______ Voltage: ______ Phase: ______ Synchronous Speed (rpm):

Service Factor: ______ Inverter Duty (Y/N):

Enclosure: D, I, EXP, ODP, T, TEFC, C, CTD, T, TEF, C

TeN, W, WPI, WPI, WPI, SUBM

Adjustable Speed Drive Range: ______ min to ______ max, see Section IV.3.15,

Low-Voltage Adjustable Frequency Drive Systems
VIA.15 VERTICAL TURBINE PUMP DATA SHEET

Tag Numbers: ____________________________

Pump Name: ____________________________

Manufacturers and Product: (1) __________________ (2) __________________ (3) ____________

SERVICE CONDITIONS

Liquid Pumped: ____________________________

Pumping Temperature (Fahrenheit): Normal Max Min ____________________________

Specific Gravity at 60 Degrees F: Viscosity Range: ____________________________

Possible Scale Buildup (Y/N): Creosote (Y/N): ____________________________

Largest Diameter Solid Pump Can Pass (inches): ____________________________

Min. NPSH Available (ft. Absolute): ____________________________

Location: Outdoor (Y/N): ____________________________

PERFORMANCE REQUIREMENTS

Primary Duty Point: ____________________________

Secondary Duty Point: ____________________________

Maximum Shut-off Pressure at Primary Duty Point (psig): ____________________________

Max. NPSH Required (ft. Absolute): ____________________________

Adjustable Speed (Y/N): ____________________________

DESIGN AND MATERIALS

Pump Type: ____________________________

Bowl: ____________________________

Bowl Bearings: ____________________________

Bowl Wear Rings (Y/N): Bowl Wear Ring Material: ____________________________

Column: ____________________________

Line Shafting: ____________________________

Line Shaft Bearings: ____________________________

Discharge Head: ____________________________

Type: ____________________________

Material: ____________________________

Discharge Nozzle Size (inches): Flange Standard/Class: ____________________________

Impeller Material: ____________________________

Impeller Wear Rings (Y/N): Impeller Wear Ring Material: ____________________________

Head Shaft Material: Shaft Sleeve Material: ____________________________

Shaft Sealing: Packing (Y/N): Mechanical (Y/N): ____________________________

Type: ____________________________

Seal Lubrication: ____________________________


Gear Type (Y/N): Spacer (Y/N): ____________________________

Manufacturer Standard (Y/N): ____________________________

Sole Plate (Y/N): Material: ____________________________

Motor Base Material: ____________________________

DRIVE MOTOR (See Specification Low-Voltage AC Induction Motors or Medium-Voltage AC Induction Motors)

Horsepower: Voltage: Phase: ____________________________

Synchronous Speed (rpm): ____________________________

Service Factor: ____________________________

Motor nameplate horsepower shall not be exceeded at any head-capacity point on pump curve.

Enclosure: DIP: EXP ODP TEC CSD-TEFC ____________________________

TEWAC: WPI WPF: ____________________________

Mounting Type: Vertical Hollow Shaft: Nonreversal Ratchet (Y/N): ____________________________

Vertical Solid Shaft: ____________________________

ABMA 9 and ABMA 11, B-10 Motor Bearing Life (hrs): ____________________________

REMARKS: ____________________________

______________________________

______________________________
### Service Conditions
- Liquid Pumped (Material and Percent):
- Pumping Temperature (Fahrenheit): Normal: Max: Min:
- Liquid pH:
- Abrasive (Y/N): Possible Scale Buildup (Y/N):
- Suction Pressure (psig): Minimum:
- Altitude (ft): Area Classification: Location (indoor/outdoor):

### Performance Requirements
- Capacity (US gpm): Maximum: Minimum:
- Maximum Discharge Pressure (psig):
- Internal Bypass Valve Setting (psig):
- Relief Valve Setting (psig/as recommended):
- Back Pressure Valve Setting (psig/as recommended):

### Design and Materials
- Pump Type: Single Diaphragm (Y/N)
- Tubular (double) Diaphragm (Y/N): Other
- Wet End Material: Tubular Diaphragm Housing Material:
- Check Valve Material: Configuration (Single/Double):
- Diaphragm Material: Primary: Tubular:
- Calibration Cylinder: Quantity: Material: Units: Capacity:
- Diaphragm Actuation Type: Mechanical: Hydraulic:
- Stroke Position Adjustment: Manual: Automatic:
- Pump Speed Control: Constant: Variable:

### Chemical Metering Pump Data Sheet - VIA.16
Tag Numbers:

**Drive Motor** (See Specification Section, Low-Voltage AC Induction Motors)
- Horsepower: Volts: Phase: Synchronous Speed (rpm):
- Service Factor: 
- Motor nameplate horsepower shall not be exceeded at any head-capacity point on pump curve.
- Enclosure: DIP EXP ODP TEFC CISD-TEFC TENV WPI WPII SUBM
- Variable Speed Drive, See Specification Section, Low-Voltage Variable Frequency Drive System.

**Testing**

**Remarks**
<table>
<thead>
<tr>
<th>DATENO.</th>
<th>DSGN DR</th>
<th>REVISION</th>
<th>CHK</th>
<th>APVDBY</th>
<th>APVD</th>
</tr>
</thead>
</table>

### Screw Conveyor Schedule

<table>
<thead>
<tr>
<th>Conveyor Name</th>
<th>Number</th>
<th>Conveyor Type</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, lbs/ft³</td>
<td>maximum</td>
<td>Capacity, cubic feet per hour</td>
<td></td>
</tr>
<tr>
<td>Screw Speed, rpm</td>
<td>maximum</td>
<td>Trough Fill, maximum percent</td>
<td></td>
</tr>
<tr>
<td>Screw Diameter, inches</td>
<td>maximum</td>
<td>Conveyor Length, end plate to end plate, feet</td>
<td></td>
</tr>
<tr>
<td>Incline, degrees</td>
<td></td>
<td>Drive Location</td>
<td></td>
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<tr>
<td>Feed Points, each</td>
<td></td>
<td>Feed From</td>
<td></td>
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<tr>
<td>Discharge Points, each</td>
<td></td>
<td>Actuated Gates, each</td>
<td></td>
</tr>
<tr>
<td>Discharge To</td>
<td></td>
<td>Hours of Operation, hours per day</td>
<td></td>
</tr>
</tbody>
</table>
GENERAL SHEET NOTES

1. THIS TANK DATA SHEET IS AN EXAMPLE FROM BLACKS FORD WRF. TANK DATA SHEETS ARE SITE-SPECIFIC AND SHALL BE CUSTOMIZED BASED ON PROJECT REQUIREMENTS.

VIA.18 TANK DATA SHEET

DATA NO.

DSGN DR

REVISION CHK

APVDBY APVD

SHEET 1

00-G-015 GENERAL TANK DATA SHEET AND SCHEDULE

VIA.19 FRP TANK SCHEDULE

Name of Tank

Equipment Numbers

Material (strong and corrosion-resistant)

Maximum Capacity Measured to High Solution Level (galvans)

Installation (Vertical/Horizontal)

Diameter (feet)

Height (feet)

Support (saddles, flat pad, legs)

Type of Bottom Head

Type of Top Head

Ladder Required (Yes/No)

Tank Location (submersible)

Ambient Temperature Range (degrees F)

Exterior Loading (pounds)

Personnel Roof Loads

Platforms

Masts

Pipe Supports

Operating Conditions:

Temperature (degrees F, not to exceed 160)

Chemical Composition

Specific Gravity

Concentration

(pH Range)

Visual Test Type (1 or 2)

Visual Test Tube Length

Visual/Visual Testing (Yes/No)

*Specify feed into tank as such.

VIA.18 TANK DATA SHEET

VIA.19 FRP TANK SCHEDULE
NTT

VIA. 20 SUBMERSIBLE MIXER DATA SHEET

NTT

VIA. 20 SUBMERSIBLE MIXER DATA SHEET CONTINUED

NTT

Line Shaft Bearings: ____________________________
Discharge Head: ______________________________
Type: ______________________________
Material: ______________________________
Discharge Nozzle Size (inches): __________ Flange Standard/Class: __________
Impeller Material: ______________________________
Impeller Wear Rings (Y/N) __________ Impeller Wear Ring Material: ______________________________
Head Shaft Material: ____________________________ Shaft Sleeve Material: ______________________________
Shaft Sealing: Packing (Y/N) __________ Mechanical (Y/N) __________
Type: ______________________________
Seal Lubrication: ______________________________
Coupling: Falk (Y/N) __________ Fast (Y/N) __________ Spring-Grid (Y/N) __________
Gear Type (Y/N) __________ Spacer (Y/N) __________
Manufacturer Standard (Y/N) __________
Sole Plate (Y/N) __________ Material: ______________________________
Motor Base Material: ______________________________

DRIVE MOTOR (See Specification Low-Voltage AC Induction Motors or Medium-Voltage AC Induction Motors)

Horsepower: __________ Voltage: __________ Phase: __________
Synchronous Speed (rpm): ______________________________
Service Factor: ______________________________
Motor nameplate horsepower shall not be exceeded at any head-capacity point on pump curve.
Enclosure: DIP: __________ EXP: __________ ODP: __________ TEFC: __________ CSED-TEFC: __________
TEWAC: __________ WPR: __________ WPR: __________
Mounting Type: Vertical Hollow Shaft: __________ Nonreversible Ratchet (Y/N): __________
Vertical Solid Shaft: ______________________________

SUBMERSIBLE MIXER DATA SHEET
Tag Numbers: ______________________________
Mixer Name: ______________________________

Elastomers: ______________________________
Fasteners: ______________________________
Impeller: Material: ______________________________
Shaft Material: ______________________________
Double Mechanical Seal: __________ Bearing Life (Hrs): ______________________________

DRIVE MOTOR (See Specification Low-Voltage AC Induction Motors)

Horsepower: __________ Voltage: __________ Phase: __________ Synchronous Speed (rpm): ______________________________
Enclosure: ______________________________
Other Features: Moisture Detection Switches (Y/N): ______________________________
Thermal Protection Embedded in Windings (Y/N): ______________________________

REMARKS: ______________________________

______________________________
______________________________
INDUCTION MOTOR DATA SHEET

Project: 
Owner: 
Equipment Name: 
Equipment Tag Number: 

Type: Squirrel-cage induction motor meeting requirements of NEMA MG 1
Manufacture: 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 674 and have an approved UL listing mark.

Motor Horsepower: 
Voltage: 
Phase: 
Frequency: 

Synchronous Speed: 
D] Thermal Protection: 
D] Space Heater: 

Guaranteed Minimum Efficiency at Full Load: ______ percent
Guaranteed Minimum Power Factor at Full Load: ______ percent
Service Factor (if rated max amb. temp.): [ ] 1.0 [ ] 1.15

Enclosure Type: 
Wiring: [ ] One [ ] Two

Mounting Type: [ ] Horizontal [ ] Vertical
Vertical Shaft: [ ] Solid [ ] Hollow
Vertical Thrust Capacity (lb): [ ] Up [ ] Down

Operating Speed Range: ______ to ______ % of Rated Speed
[ ] Variable Torque
[ ] Constant Torque

Additional Motor Requirements: [ ] See Specification Low-Voltage AC Induction Motors.

Special Features: 

Seals and drain for moisture removal.

VIA. 21 INDUCTION MOTOR DATA SHEET

VIA. 22 CONTROL PANEL SCHEDULE
### Paint System Data Sheet

Complete this PSDS for each coating system. Include all components of the system (surface preparation, primer, intermediate coats, and finish coats). Include all components of a given coating system on one PSDS.

- **Paint System Number (from Spec.):**
- **Paint System Title (from Spec.):**
- **Coating Supplier:**
- **Representative:**

**Surface Preparation:**

<table>
<thead>
<tr>
<th>Paint Material (Generic)</th>
<th>Product Name/Number (Proprietary)</th>
<th>Min. Coats, Coverage</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

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### Paint Product Data Sheet

Complete and attach manufacturer’s Technical Data Sheet to this PSDS for each product submitted. Provide manufacturer’s recommendations for the following parameters at temperature (°F) and relative humidity:

<table>
<thead>
<tr>
<th>Temperature/RH</th>
<th>50/90</th>
<th>75/90</th>
<th>90/95</th>
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<tbody>
<tr>
<td>Induction Time</td>
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<tr>
<td>Pot Life</td>
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<td>Shelf Life</td>
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<td>Drying Time</td>
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<td>Curing Time</td>
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<tr>
<td>Min. Recoat Time</td>
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<tr>
<td>Max. Recoat Time</td>
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</tbody>
</table>

Provide manufacturer’s recommendations for the following:

- **Mixing Ratio:**
- **Maximum Permissible Thinning:**

<table>
<thead>
<tr>
<th>Ambient Temperature Limitations:</th>
<th>min:</th>
<th>max:</th>
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<tbody>
<tr>
<td>Surface Temperature Limitations:</td>
<td>min:</td>
<td>max:</td>
</tr>
<tr>
<td>Surface Profile Requirements:</td>
<td>min:</td>
<td>max:</td>
</tr>
</tbody>
</table>
APPLICATION SCHEDULE

(Note: Submittals will be rejected unless this form is completely filled out for each proposed CRC system)

Attach additional information, as specified (technical data sheets, chemical resistance, application specifications, special configuration details).

<table>
<thead>
<tr>
<th>CRC System No. (From Spec):</th>
<th>Coating Supplier:</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Representative (Name and Telephone):</th>
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<tr>
<th>Reinforcing Material:</th>
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<tr>
<th>Recommended Joint Material:</th>
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<tr>
<th>Substrate Surface Preparation:</th>
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</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Product Name/Number</th>
<th>Application Method</th>
<th>Min. Coats/Cover</th>
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</thead>
<tbody>
<tr>
<td>Primer</td>
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<tr>
<td>Base Coat</td>
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<td>Intermediate Coat(s)</td>
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<td>Topcoat</td>
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<td>(Sealer)</td>
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VIA. 25 CHEMICAL RESISTANT COATING APPLICATION SCHEDULE

FILE NAME: PLOT DATE: PLOT TIME: 
NOTES:
1. SECTION APPLIES TO PIPE W/DIAMETERS 12' AND SMALLER. FOR 20' DIAMETER PIPES SEE PIPE ENCASEMENT DETAIL 2.
2. WHEN PIPE ENCASEMENT IS CLOSER THAN 4" TO SLAB ABOVE, TIE SLAB & ENCASEMENT TOGETHER. SEE PIPE ENCASEMENT DETAIL 3.
3. EXTEND PIPE ENCASEMENT 0'-6" BEYOND EDGE OF BASE SLAB.

VIA.26 PIPE ENCASEMENT DETAIL 1

VIA.30 PIPE ENCASEMENT DETAIL 5

VIA.27 PIPE ENCASEMENT DETAIL 2

VIA.28 PIPE ENCASEMENT DETAIL 3

VIA.29 PIPE ENCASEMENT DETAIL 4

VIA.31 PIPE ENCASEMENT DETAIL 6
NOTES:
1. FLOOR STAND IS REPRESENTATIVE ONLY.
2. SURFACE-MOUNTED SST SLIDE GATE SHOWN. COPOLYMER GATE SIMILAR.

VIA.32 FABRICATED SLIDE GATES

VIA.33 FLOOR STAND INSTALLATION TYPE 1

VIA.34 FLOOR STAND INSTALLATION TYPE 2

VIA.35 STEM GUIDE INSTALLATION
1. Lateral bracing required only for fixed pipe supports. Lateral bracing not required for sliding supports.
2. For materials of construction, see Piping Support Systems Specifications.
3. Sizes of members, bolts, and anchors are preliminary. Final design shall be provided in accordance with Piping Support Systems Specifications.

**NOTES:**
- 1. Bolt to structure using 5/8" bolts, 4 minimum for saddle, 3 minimum for strap.
- 2. For other than fixed supports provide Teflon pad on non-saddle surface.
- 3. At fixed supports eliminate Teflon pad and tighten strap around duct.
- 4. For materials of construction, see Piping Support Systems Specifications.

**VIA.47 PIPE SUPPORT**
- **FIXED OR SLIDING**

**VIA.48 PIPE/DUCT SUPPORT**
- **FIXED OR SLIDING**

**VIA.49 PIPE SUPPORT**
- **FLOOR MOUNTED**

**VIA.50 PIPE SUPPORT**
- **BASE BEND**

**DIMENSIONS IN INCHES**

**Nominal Pipe Size**

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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</table>

**NOTES:**
- 1. Confirm supporting beam/finale with meets or exceeds modes width "E".
- 2. Use A325 bolts and anchor bolts.

**LIST OF MATERIALS**

- Pipe Flange: HP-600, 316 SSTL threaded to 1/2" hex nut and flat washer, size = 4, thickness = 1 1/2".
- Base Elbow, 4" commercial fit, 24" or less, 100° bend, 1 1/2" embedment, one layer of expansion joint filler, wrap around pipe, 16"-dia. as required.
- Replace with Teflon pads.

**SECTION**

- Hollow structural section (HSS) 5x5x5/16.
- Min 4 1/2" rebar, size = 4, thickness = 1 1/2" embedment, one layer of expansion joint filler, wrap around pipe, 16"-dia. as required.
- Replacement with sliding support, one layer of Teflon pads.

**NOTES:**
- 1. Only for floor mounted pipes.
- 2. Submit final design and calculations for support and anchorage as specified.
- 3. For materials of construction, see Piping Support Systems Specifications.

**FILE SHEET**

- 2 of 10

**SUBMIT**

- Final design drawings and calculations of supports, only anchorages as specified.
- Tension component and connection size shown. Furnish larger sizes as required by calculations.
- For materials of construction, see Piping Support Systems Specifications.
NOTES:
1. TAPPING OF FITTINGS ALLOWED AT BOSS ONLY.

GENERAL NOTES:
A. NON-FREEZE POST HYDRANT CONSISTS OF OPERATING HANDLE, HOSE CONNECTION, CASING, CASING/GRAVEL GUARD, INTERNAL ROD AND VALVE HOUSING.
B. POST HYDRANT AVAILABLE WITH HOSE CONNECTIONS 3/4", 1", 1 1/4", 1 1/2" & 2".
C. DEPTH OF BURY IS TYPICALLY 3-FOOT, BUT OCCASIONALLY MAY BE DEEPER. HYDRANTS ARE AVAILABLE WITH DEPTH OF BURY RANGING FROM 2 TO 10 FEET (MODEL DEPENDENT).

NOTES:
A. DIMENSION BASED ON: (1) HOSE CONNECTION 30" ABOVE GRADE AND (2) DEPTH OF BURY REQUIRED TO CONNECT WATER SUPPLY LINE.
B. CRUSHING CASING OR GRAVEL GUARD IF SUCH OPTION IS AVAILABLE.
C. U-BOLT AND FASTENERS SHALL BE STAINLESS STEEL.
D. PROVIDE SIGN AS PER SPECIFICATIONS, WITH TEXT "DANGER - NON-POTABLE WATER NOT FOR DRINKING".

VIA.67 NON-FREEZE POST HYDRANT, NON-POTABLE
VIA.58 FLUSHING CONNECTION TYPE 1
VIA.59 FLUSHING CONNECTION TYPE 2
VIA.60 LINE DRAIN VALVE INSTALLATION
VIA.61 SAMPLING VALVE INSTALLATION
VIA.62 MUD VALVE INSTALLATION
NOTES:
1. Omit pipe sleeve for installation in existing structure.
2. For existing CMU wall penetration, core drill through wall, clean cored hole, fill cores with grout and grout in sleeve.
3. For existing concrete wall penetration, core drill through wall, 1" greater than pipe OD, clean cored hole and coat with bituminous damp proofing. Voids in concrete shall be grouted prior to damp proofing.
4. For interior pipes exposed to view in finished spaces, fill with non-shrink grout after modular mechanical seal assembly is installed. Between passages of different classifications or ratings, fill annular space with fire stopping or non-shrink grout. Link seal is not allowed.
5. For penetration through exterior wall exposed to view, provide 3/4 SST escutcheon plate on exterior.
6. Coat floor sleeve with specified paint system prior to concrete placement.
7. Cleanout via. 63 process line cleanout.
1. UNLESS OTHERWISE NOTED, PROVIDE SST SERVICE SADDLE FOR DUCTILE CAST IRON, BURIED VALVES AND BOX - SIDE MOUNT.

2. MPT INLET CONNECTION ORIENT BEVEL SO IT FACES FLOW DIRECTION. SEE VENDOR'S RECOMMENDATIONS.

3. INTEGRAL SPRING LOADED BALL CHECK VALVE.

4. USE CORPORATION STOP FOR 1" AND LARGER USE GATE VALVE WITH VALVE BOX FOR BURIED INSTALLATIONS.

VIA.68 BURIED VALVE AND BOX - VERTICAL MOUNT

VIA.69 BURIED VALVE AND BOX - SIDE MOUNT

VIA.70 SERVICE TAP

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1. FOR HYDROXIDE ISOLATION VALVE, FURNISH 1/2" SST BALL VALVE, SST FLANGES, AND SST FLANGES. FLANGE CONNECT TO MATING PIPE USING SST FASTENERS.

2. FOR HYPOCHLORITE ISOLATION VALVE, PROVIDE PRESSURE RELIEF HOLE DRILLED ON LOW PRESSURE SIDE OF BALL VALVE.

SCHEDULE 1 - CHEMICAL INJECTION DEFAULT COMPONENTS

SCHEDULE 2 - COMPONENTS BY CHEMICAL

GENERAL NOTES:

1. PROVIDE SUITABLE SUPPORT SYSTEM AS PER PIPING SUPPORT SYSTEMS SPECIFICATIONS.

2. PROVIDE PRESSURE RELIEF HOLE DRILLED FOR SYSTEMS AS PER VENDOR'S RECOMMENDATIONS.

SPECIFIC NOTES:

1. UNLESS OTHERWISE NOTED, PROVIDE SET SERVICE SADDLE FOR DUCTILE CAST IRON, BURIED VALVES AND BOX - SIDE MOUNT. USE CORPORATION STOP FOR 2" AND LARGER USE GATE VALVE WITH VALVE BOX FOR BURIED INSTALLATIONS.

2. USE CORPORATION STOP FOR 1" AND LARGER USE GATE VALVE WITH VALVE BOX FOR BURIED INSTALLATIONS.

NOTES TO SHEET:

1. COMPONENTS SUITABLE FOR CONCENTRATIONS LISTED UP TO 160PPM.

2. MATERIALS NICE OF SHORT SCHEDULES ARE ALLOY 20; HASTELLOY C-276 SPRING.
NOTES:

1. ANCHORING FLANGE PAIR ON PROCESS PIPE REQUIRED.

2. ADJACENT MECHANICAL DRAWINGS AND DRAWINGS OF FLOW METERS, STATIC MIXERS, PUMPS, ETC. PROHIBITED.

3. CONTRACTOR SHALL USE DATA FOR ONLY THOSE PIPE SIZES AND TEST PRESSURES SPECIFIED IN THIS CONTRACT.

4. PIPE SCHEDULES SHOWN ON THIS DRAWING ARE APPROXIMATE.

5. CONTRACTOR SHALL VERIFY THAT CROSS-SECTIONS MATCH THE MATERIAL OF THE ADJOINING PIPELINE.

TIE ROD SCHEDULE

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DATE: PLOT TIME: $PLOTDATE $PLOTTIME
VIA.81 ULTRASONIC LEVEL ELEMENT INSTALLATION

1. Stainless steel bolts, nuts & lockwashers
2. Paint aluminum in contact with concrete according to specifications for painting

VIA.82 SUBMERSIBLE LEVEL TRANSMITTER INSTALLATION

1. Stainless steel bolts, nuts & lockwashers
2. Paint aluminum in contact with concrete according to specifications for painting

VIA.83 SAMPLE PREPARATION SYSTEM INSTALLATION

1. Components designated by an asterisk (*) are supplied by instrument manufacturer
2. Paint aluminum in contact with concrete according to specifications for painting

VIA.84 PRESSURE AND PRESSURE DIFFERENTIAL TRANSMITTER INSTALLATION - STANCHION MOUNT

1. Paint aluminum in contact with concrete according to specifications for painting
2. Components designated by (*) are supplied by instrument manufacturer

VIA.85 PRESSURE AND PRESSURE DIFFERENTIAL TRANSMITTER INSTALLATION - WALL MOUNT

1. Paint aluminum in contact with concrete according to specifications for painting
2. All mounting brackets are to be installed approximately 4'-6" above floor or as required by process connection

VIA.86 PRESSURE SWITCH AND INDICATOR WITH ANNULAR SEAL INSTALLATION

1. Indicator and switch installation shown for single instrument installations. Mount device directly to seal
1. Locate transmitter less than 50 feet from pipe sleeve.

2. Provide sampling pump with low flow switch interlock to disable 4-20 mA DC signal on falling low flow event.
TRANSMITTER

TRANSIENT SURGE PROTECTOR

PROTECTED SIDE

TWISTED, SHIELDED PAIR; TAPE BACK SHIELD AT TRANSMITTER END; DO NOT GROUND

C2: 1/2 W. O. 250 OHM 1% RESISTOR

1. IF LOAD EXCEEDS 15 AMPS PROVIDE ADDITIONAL PARALLEL CIRCUITS WITH TRANSIENT SURGE PROTECTION AS SHOWN.
2. PROVIDE APPROPRIATE LIGHTING PACKAGE FOR PANEL SIZE
3. FOR LOADS OVER 400VA, PROVIDE SIMILAR UPS SIZED FOR 125 PERCENT OF THE CONNECTED LOAD

NOTES:

LOSS OF FEED POWER

NOTES:

FIELD PANEL TO PANEL SHIELD BUS, DO NOT DAISY CHAIN

POWER DISTRIBUTION & SURGE PROTECTION

VIA 94 TYPICAL PANEL POWER DISTRIBUTION FOR PANELS WITH INTERNAL UPS

VIA 95 TYPICAL PANEL POWER DISTRIBUTION FOR PANELS WITH EXTERNAL LOCAL UPS

VIA 96 TYPICAL OUTDOOR TRANSMITTERS

VIA 97 TYPICAL OUTDOOR HAZARDOUS LOCATION 2-WIRE TRANSMITTER
All mounting hardware shall be stainless steel. Use washers and split-lock washers under all nuts.

For concrete walls, use stainless steel concrete anchors or anchor bolts with leveling nuts. (Typ of each base)

For yard locations, provide a 6 inch thick concrete pad at grade with #4 bar @ 12" OC each way, centered. The pad shall be 12 inches longer than the mounting plate by one half the height of the mounting plate above finished grade. Minimum width 24 inches.

For heights exceeding 4'-0" or weights of mounted equipment exceeding 200 lbs, size posts and connections for lateral loads. Extend posts to structure above where required by calculation. See general electrical construction notes on drawings.

Provide coating between aluminum and concrete as specified.

Provide felt spacer or bitumastic coating between aluminum and concrete as specified.

Size posts and connections for lateral loads. Extend posts to structure above where required by calculation. See general electrical construction notes on drawings.

NOTES:

1. All mounting hardware shall be stainless steel. Use washers and split-lock washers under all nuts.
2. On concrete walls use stainless steel concrete anchors or anchor bolts with leveling nuts. (Typ of each base)
3. For yard locations provide a 6 inch thick concrete pad at grade with #4 bar @ 12" OC each way, centered. The pad shall be 12 inches longer than the mounting plate by one half the height of the mounting plate above finished grade. Minimum width 24 inches.
4. For heights exceeding 4'-0" or weights of mounted equipment exceeding 200 lbs, size posts and connections for lateral loads. Extend posts to structure above where required by calculation. See general electrical construction notes on drawings.

VIA.98 DEVICE MOUNTING, WALL OR COLUMN

VIA.99 DEVICE MOUNTING, EQUIPMENT PEDESTAL

VIA.100 DEVICE MOUNTING, PEDESTAL

VIA.101 DEVICE MOUNTING, COMPUTER OUTLET BOX
VIA 102 TERMINATION OF SHIELDED INSTRUMENTATION CABLE

VIA 103 UNACCEPTABLE METHODS OF GROUNDING INSTRUMENTATION CABLE SHIELD

VIA 104 MSC CABLE TERMINATION

VIA 105 TERMINAL JUNCTION BOX (TJB)

VIA 106 GROUND TRIANGLE

VIA 107 GROUND TEST WELL
THE ENDS OF ALL CONDUITS REQUIRED TO BE GROUNDED BY THE SPECIFICATIONS SHALL BE GROUNDED IN ACCORDANCE WITH THIS DETAIL.

NOTES:
1. USES OF ALL CONDUITS REQUIRED TO BE GROUNDED BY THE SPECIFICATIONS SHALL BE GROUNDED IN ACCORDANCE WITH THIS DETAIL.

VIA.108 CONDUIT GROUNDING
VIA.109 PAD MOUNTED TRANSFORMER AND PAD MOUNTED SWITCH GROUNDING
NOTES:
1. PAD MOUNTED SWITCH GROUNDING

VIA.110 GROUNDING, GENERAL STAIRWAY
VIA.111 CONDUIT RACKING SYSTEM
VIA.112 CONDUIT RACKING SYSTEM, VERTICAL
NOTES:
1. USES OF ALL CONDUITS REQUIRED TO BE GROUNDED BY THE SPECIFICATIONS SHALL BE GROUNDED IN ACCORDANCE WITH THIS DETAIL.
2. PROVIDE GROUND CONDUCTOR FROM EACH TRANSFORMER RING TO EACH MCC GROUND BUS.

BON ENDS OR GROUND ROD TO GROUNDING SYSTEM OR GROUND CABLE TO GROUNDING SYSTEM.

NOTES:
1. PROVIDE GROUND CONDUCTOR FROM EACH TRANSFORMER RING TO EACH MCC GROUND BUS.

VIA.110 GROUNDING, GENERAL STAIRWAY
VIA.111 CONDUIT RACKING SYSTEM
NOTES:
1. PROVIDE GROUND CONDUCTOR FROM EACH TRANSFORMER RING TO EACH MCC GROUND BUS.
INSTALLATION OF CONDUIT TO A MOTOR OR OTHER DEVICE WHERE A FLEXIBLE CONNECTION IS REQUIRED AND NO JUNCTION BOXES OR CONTROL DEVICES ARE REQUIRED SHALL BE MADE IN ACCORDANCE WITH THIS DETAIL.

1. ALL HARDWARE SHALL BE STAINLESS STEEL.
2. SIZE TOP AND ANY INTERMEDIATE LATERAL SUPPORTS AS REQUIRED FOR STABILITY AND SEISMIC LOADS. SEE GENERAL ELECTRICAL CONSTRUCTION NOTES ON DRAWINGS.

NOTES:
1. CONDUITS WHICH INDIVIDUALLY PASS THROUGH EXISTING WALLS IN ACCORDANCE WITH THIS DETAIL. IF NOT OTHERWISE INDICATED.
2. INSTALL CONDUITS THROUGH EXISTING WALLS IN ACCORDANCE WITH THIS DETAIL IF NOT OTHERWISE INDICATED.
3. PROVIDE SUPPORT FOR ALL METAL CONDUITS WHICH EXTEND MORE THAN 18 INCHES OUT OF THE SLAB WITHIN 3 INCHES OF THE END OF THE CONDUIT.
4. PROVIDE SUPPORT FOR ALL PVC CONDUIT WITHIN 3 INCHES OF THE END OF THE CONDUIT.
5. THIS DETAIL SHALL BE USED FOR SUPPORT OF ALL CONDUITS WHICH ARE NOT OTHERWISE SUPPORTED IN A RIGID MANNER SUCH AS AGAINST AN EQUIPMENT BASE, WALL, COLUMN, ETC, AS REQUIRED ABOVE.
6. FOR ANY ANGLE GREATER THAN 2'-6" TALL, SIZE ANGLE SUPPORT AND ANCHORS FOR SEISMIC LOADS.

NOTES:
1. PROVIDE SUPPORT FOR ALL METAL CONDUITS WHICH EXTEND MORE THAN 18 INCHES OUT OF THE SLAB WITHIN 3 INCHES OF THE END OF THE CONDUIT.
2. PROVIDE SUPPORT FOR ALL PVC CONDUIT WITHIN 3 INCHES OF THE END OF THE CONDUIT.
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NOTES:
1. PROVIDE SUPPORT FOR ALL METAL CONDUITS WHICH EXTEND MORE THAN 18 INCHES OUT OF THE SLAB WITHIN 3 INCHES OF THE END OF THE CONDUIT.
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3. THIS DETAIL SHALL BE USED FOR SUPPORT OF ALL CONDUITS WHICH ARE NOT OTHERWISE SUPPORTED IN A RIGID MANNER SUCH AS AGAINST AN EQUIPMENT BASE, WALL, COLUMN, ETC, AS REQUIRED ABOVE.
4. FOR ANY ANGLE GREATER THAN 2'-6" TALL, SIZE ANGLE SUPPORT AND ANCHORS FOR SEISMIC LOADS.
NOTES:

1. Conduits which are stubbed up in a concrete slab for future extension shall be installed in accordance with this detail.

NOTES:

Conduits which pass through a roof shall be installed in accordance with the requirements of this detail.

NOTES:

Conduits through concrete floor slabs and equipment pads shall be installed in accordance with this detail.

NOTES:

Conduits installed inside of a containment area shall be installed in accordance with this detail. For type of conduit to be installed, see specification.

NOTES:

Clippings to be installed at concrete expansion joints or 10' intervals.

Conduits to be installed at concrete expansion joints or 10' intervals.
NOTES:
1. COVER LOCKING SCREWS, (TYP FOR 4)
2. CONDUIT OR CONCRETE ENCASED DUCT BANK
3. COMPACTED GRAVEL, 1/2" DEEP MIN 24" MINUS
4. 4" MIN DRAIN WITH GRATE
5. GROUT TO FULL WALL THICKNESS AROUND PIPES AT KNOCKOUTS, TYP

NOTES:
1. EXTEND REBAR A MINIMUM OF 2' BEYOND THE LIMIT OF EXCAVATION.
2. GRADING RINGS AS REQUIRED
3. CABLE RACKS OR SUPPORT BRACKET AS REQUIRED
4. #4@18" REBAR AS REQUIRED

NOTES:
1. SIZE HANDHOLE PER NEC REQUIREMENTS (MINIMUM LENGTH AND DEPTH 48 INCHES).
2. INSCRIBE "ELECTRICAL HIGH VOLTAGE" IF ANY CIRCUIT IN HANDHOLE IS ABOVE 600V.
3. INSCRIBE "ELECTRICAL LOW VOLTAGE" IF ALL CIRCUITS IN HANDHOLE ARE 600V OR LESS.
4. INSCRIBE "CONTROL" IF ALL CIRCUITS ARE DISCRETE, ANALOG, AND FIBER OPTIC.
5. INSCRIBE "SECURITY" IF ALL CIRCUITS ARE SECURITY, AND FIBER OPTIC.
LIGHTING & MISC

NOTES:
1. CONTRACTOR SHALL COORDINATE BOLTING AREA AND ANCHOR LOCATION WITH PRECAST MANUFACTURER PRIOR TO FABRICATION.
2. PROVIDE ADDITIONAL CHANNEL STRUT, SPACED AS REQUIRED TO SUPPORT CONDUIT.

VIA.135 EXTERIOR BUILDING LIGHT CONTROL

CONCRETE PLATFORM

LUMINAIRE POLE LUMINAIRE SCHEDULE

MOUNTING BRACKET FURNISHED BY POLE MANUFACTURER

SURFACE RECEPTACLE AND MINIMUM COVER WHERE REQUIRED FOR PLANS

CONCRETE PLATFORM

NOTES:
1. CONTRACTOR SHALL COORDINATE POLE LOCATIONS WITH HANDRAILS.
2. POLE SUPPLIER SHALL DESIGN POLE ANCHORAGE TO CONCRETE. SUBMIT CALCULATIONS SIGNED AND SEAL BY FL. P.E.

VIA.136 EXTERIOR LIGHT CONTROL

PATRIOTIC CAP

REMOVABLE POLE CAP

THERMITE WELD CAP, TYP

WIRE JOINT AS SPECIFIED

THERMITE WELD-WIRE CONNECTION, TYP, SEE NOTE 4, TYP

FILE OR GRIND WELD AREA TO BRIGHT METAL

NOTES:
1. COPPER SLEEVE REQUIRED FOR THERMITE WELDING OF #10 AWG AND SMALLER WIRE.
2. USE COPPER SLEEVE ON #2 AWG JOINT BONDING WIRES.
3. WELDER AND CARTRIDGE SIZE VARY ACCORDING TO WIRE SIZE AND PIPE MATERIAL. CONSULT WELDER MANUFACTURER FOR RECOMMENDED WELDER AND CARTRIDGE.
4. COAT WELD AREA AND FILL RECESS ON THERMITE WELD CAP WITH COLD APPLIED COAL TAR MASTIC AND APPLY CAP TO WELD.

VIA.137 LUMINAIRE MOUNTING

CAST OUTLET BOX WITH GASKETED BALL-TYPE FLEXIBLE FIXTURE HANGER, APPLETON JBX AND JBK, OR EQUAL, SCREW AND SPRING-NUT CONNECTION TO CHANNEL STRUT.

ALLOWABLE BOLTING AREA NOTE 1

1/4" SET-ADJ. ANCHOR K= 2 ON-CENTER NOTE 1 PRECAST CONCRETE

3/4" CONDUIT PENDANT

WIRE SIZE VARIES, TWO WIRE REQU’D FOR TEST STA INSTALLATIONS ONLY

ONE PIPE DIA MINIMUM, 2" MAXIMUM

FILE OR GRIND WELD AREA TO BRIGHT METAL

NOTES:
1. CONTRACTOR SHALL COORDINATE BOLTING AREA AND ANCHOR LOCATION WITH PRECAST MANUFACTURER PRIOR TO FABRICATION.
2. PROVIDE ADDITIONAL CHANNEL STRUT, SPACED AS REQUIRED TO SUPPORT CONDUIT.

VIA.138 LUMINAIRE POLE MOUNTING

FILE OR GRIND WELD AREA TO BRIGHT METAL

THERMITE WELD CAP, TYP

#2 AWG STRANDED COPPER WIRE WITH HMWPE INSULATION

THERMITE WELD-WIRE CONNECTION, TYP, SEE NOTE 4, TYP

VIA.139 PIPE JOINT BOND

FILE OR GRIND WELD AREA TO BRIGHT METAL

THERMITE WELD CAP, TYP

#2 AWG STRANDED COPPER WIRE WITH HMWPE INSULATION

THERMITE WELD-WIRE CONNECTION, TYP, SEE NOTE 4, TYP

VIA.140 CATHODIC PROTECTION WIRE CONNECTION

FOR STEEL AND DUCTILE IRON PIPE

FILE OR GRIND WELD AREA TO BRIGHT METAL

THERMITE WELD CAP, TYP

#2 AWG STRANDED COPPER WIRE WITH HMWPE INSULATION

THERMITE WELD-WIRE CONNECTION, TYP, SEE NOTE 4, TYP

NOTES:
1. CONTRACTOR SHALL COORDINATE BOLTING AREA AND ANCHOR LOCATION WITH PRECAST MANUFACTURER PRIOR TO FABRICATION.
2. PROVIDE ADDITIONAL CHANNEL STRUT, SPACED AS REQUIRED TO SUPPORT CONDUIT.

VIA.140C LIGHTING & MISC