Des Moines Metropolitan Wastewater Reclamation Authority
Des Moines, Iowa

Wastewater Reclamation Facility
Digester Heat Exchanger Improvements

WRA Activity ID: 04-2021-014
Plan File No. 626-054/067

March, 2020

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THE 2020 EDITION OF THE IOWA STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDES) AS MODIFIED BY THE WRA SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISION TECHNICAL SPECIFICATIONS SHALL APPLY TO THIS PROJECT.
### Table 1: Temperature Instrument Schedule

<table>
<thead>
<tr>
<th>SERVICE</th>
<th>TAG</th>
<th>INSTRUMENT</th>
<th>RANGE (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 1</td>
<td>BS-DG-H52-01</td>
<td>HOT WATER INLET</td>
<td>80-DG-TF-110 80-250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HOT WATER OUTLET</td>
<td>80-DG-TT-111 0-250</td>
</tr>
<tr>
<td>No. 3</td>
<td>BS-DG-H52-03</td>
<td>HOT WATER INLET</td>
<td>80-DG-TF-112 0-250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HOT WATER OUTLET</td>
<td>80-DG-TT-112 0-250</td>
</tr>
<tr>
<td>No. 4</td>
<td>BS-DG-H52-04</td>
<td>HOT WATER INLET</td>
<td>80-DG-TF-120 0-250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HOT WATER OUTLET</td>
<td>80-DG-TT-121 0-250</td>
</tr>
<tr>
<td>No. 6</td>
<td>BS-DG-H52-06</td>
<td>HOT WATER INLET</td>
<td>80-DG-TF-122 0-250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HOT WATER OUTLET</td>
<td>80-DG-TT-122 0-250</td>
</tr>
</tbody>
</table>

### Table 2: Hot Water Supply Flow Meter Schedule

<table>
<thead>
<tr>
<th>SERVICE</th>
<th>TAG</th>
<th>INSTRUMENT</th>
<th>RANGE (GPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 1</td>
<td>BS-DG-H52-01</td>
<td>HOT WATER SUPPLY FLOWMETER</td>
<td>BS-DGQ-FIT-108 0-400</td>
</tr>
<tr>
<td>No. 2</td>
<td>BS-DG-H52-02</td>
<td>HOT WATER SUPPLY FLOWMETER</td>
<td>BS-DGQ-FIT-109 0-400</td>
</tr>
<tr>
<td>No. 3</td>
<td>BS-DG-H52-03</td>
<td>HOT WATER SUPPLY FLOWMETER</td>
<td>BS-DGQ-FIT-208 0-400</td>
</tr>
<tr>
<td>No. 4</td>
<td>BS-DG-H52-04</td>
<td>HOT WATER SUPPLY FLOWMETER</td>
<td>BS-DGQ-FIT-207 0-400</td>
</tr>
<tr>
<td>No. 5</td>
<td>BS-DG-H52-05</td>
<td>HOT WATER SUPPLY FLOWMETER</td>
<td>BS-DGQ-FIT-308 0-400</td>
</tr>
<tr>
<td>No. 6</td>
<td>BS-DG-H52-06</td>
<td>HOT WATER SUPPLY FLOWMETER</td>
<td>BS-DGQ-FIT-307 0-400</td>
</tr>
</tbody>
</table>

### Table 4: Meanings of Instrument Identification Letters

This table only applies to the functional identification of instruments.

### Instrument Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE</td>
<td>Piping with flow direction</td>
</tr>
<tr>
<td>CM</td>
<td>Communications signal, with direction indicating input or output to/from PLC</td>
</tr>
</tbody>
</table>

### Equipment Abbreviations

- **HKS**: Heat Exchanger
- **BSL**: Bleded Sludge
- **DG**: Digestor Gas
- **DS**: Digested Sludge
- **HWR**: Heating Water Return
- **HWS**: Heating Water Supply
- **NG**: Natural Gas
- **OV**: Overflow
- **PSL**: Primary Sludge
- **RCSL**: Recirculated Sludge
- **SV**: Seal Water
- **W1**: Potable Water
- **W2**: Non-Potable Water
- **W3**: Non-Potable Plant Effluent Water
- **WBL**: Waste Activated Sludge

### Miscellaneous Symbols

- **P**: Photo Location
- **K**: Keynote
GENERAL NOTES:
1. DRAWING IS BASED ON AVAILABLE RECORD DRAWINGS. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, INFORMATION AND EXISTING CONDITIONS PRIOR TO START OF CONSTRUCTION.
2. DRAWINGS SHOWS HEAT EXCHANGERS P&D FOR BUILDINGS 80-2, BUILDINGS 80-1 AND 80-3 CONTROLS SIMILAR. EXISTING HEAT EXCHANGERS THAT ARE TO REMAIN AND THOSE TO BE REPLACED WITH NEW SHOWN ON PLAN SHEETS.
3. CONTRACTOR SHALL PROVIDE CONDUIT SEAL-OFFS BETWEEN CLASSIFIED AND UNCLASSIFIED AREAS.
4. SEE SHEET 00Y000 FOR PROJECT NOTES.
5. HEAT EXCHANGERS THAT ARE TO REMAIN AND THOSE TO BE REPLACED WITH NEW SHOWN ON PLAN SHEETS.

KEY NOTES:
1. INSTALL NEW SENSOR, INDICATORS, TRANSMITTERS, ACCESSORIES AND ASSOCIATED WIRE AND CONDUIT FROM HEAT EXCHANGER AND CONNECT TO PLC IN ELECTRICAL ROOM. CONTRACTOR SHALL PROVIDE NEW RIGID ALUMINUM CONDUIT AS REQUIRED AND SHALL PROVIDE NEW FLEX CONDUITS AT ALL INSTRUMENT CONNECTIONS.
2. INSTALL NEW PRESSURE GAUGE ASSEMBLY. SEE DETAIL 1, SHEET MUN01.
3. RE-INSTALL SALVAGED FLOW METERS.

PLC IN BLG 80-2 ELECTRICAL ROOM
(TYPICAL OF ELECTRICAL ROOMS IN BLG 80-1 AND 80-3)
GENERAL NOTES:
1. SEE SHEET AGG#3 FOR PROJECT NOTES.
2. SYMBOL FOR PHOTO, SEE SHEETS 80X01.

KEY NOTES:
1. EXISTING ROLL-UP DOOR
2. EXISTING FLOOR ORDINANCE TO LOWER LEVEL WITH METAL GRATING.
3. EXISTING HOT WATER PUMPS AND PIPING. PROTECT FROM DAMAGE.
4. REMOVE 4" HOT WATER SUPPLY AND RETURN PIPING (ONE SUPPLY
   AND ONE RETURN PIPE PER HEAT EXCHANGER), VALVES, PIPE
   SUPPORTS AND INSTRUMENTS FROM EXTENT OF DEMO TO HEAT
   EXCHANGER FLANGE. SEE PHOTO.
5. REMOVE PRESSURE GAUGES, TEMPERATURE SENSORS, INDICATORS,
   TRANSMITTERS WIRE AND ACCESSORIES FROM HEAT EXCHANGER
   TO PLC IN ELECTRICAL ROOM. REMOVE ALL ASSOCIATED FLEX
   CONDUIT. ASSOCIATED ROID CONDUIT MAY REMAIN IF SUITABLE
   FOR RE-USE. OTHERWISE REMOVE.
6. REMOVE EXISTING 8" SLUDGE PIPING AND FITTINGS AS NEEDED TO
   REMOVE INSTALL NEW SENSORS AND GAUGES, SALVAGE ANY
   REMOVED SLUDGE PIPING IN BUILDING 80-1 FOR RE-INSTALLATION.
   PROTECT EXISTING STRAP ON FLOW METER FROM DAMAGE.
7. EXISTING HEAT EXCHANGERS IN BUILDING 80-1 TO REMAIN. PROTECT
   FROM DAMAGE.
8. LOCATION OF PLC.
9. BUILDING COLUMN.

DIGESTER 86-3

DIGESTER 85-1

ELECTRICAL ROOM

10'-0"
GENERAL NOTES:
1. SEE SHEET NS8H1 FOR PROJECT NOTES.
2. SYMBOL FOR PHOTO, SEE SHEETS NSX5/62.

KEY NOTES:
1. EXISTING ROLL-UP DOOR.
2. EXISTING FLOOR OPENING TO LOWER LEVEL WITH METAL GRATING.
3. EXISTING HOT WATER PUMPS AND PIPING. PROTECT FROM DAMAGE.
4. REMOVE 4' HOT WATER SUPPLY AND RETURN PIPING (ONE SUPPLY AND ONE RETURN PIPE PER HEAT EXCHANGER). VALVES, PIPE SUPPORTS AND INSTRUMENTS FROM EXTENT OF DEMO TO HEAT EXCHANGER FLANGE. SEE PHOTOS.
5. REMOVE PRESSURE GAUGES, TEMPERATURE SENSORS, INDICATORS, TRANSMITTERS, WIRE AND ACCESSORIES FROM HEAT EXCHANGER TO PLC IN ELECTRICAL ROOM. REMOVE ALL ASSOCIATED FLEX CONDUIT. ASSOCIATED RIGID CONDUIT MAY REMAIN IF SUITABLE FOR RE-USE.
6. REMOVE EXISTING 6' SLUDGE PIPING, VALVES AND INSTRUMENTS FROM NEAREST PIPE JOINT BELOW FLOOR TO HEAT EXCHANGER. REMOVE LINK SEAL AT FLOOR PENETRATION.
7. REMOVE HEAT EXCHANGER. PROTECT CONCRETE EQUIPMENT PAD FROM DAMAGE.
8. LOCATION OF PLC.
9. REMOVE EXISTING SLUDGE PIPING STRAP-ON FLOW METERS AND ACCESSORIES AND SALVAGE FOR RE-INSTALLATION ON NEW PIPES.
10. BUILDING COLUMN.
GENERAL NOTES:
1. SEE SHEET 000001 FOR PROJECT NOTES.

KEY NOTES:
1. EXISTING HOT WATER PUMPS AND PIPING. PROTECT FROM DAMAGE.
2. REMOVE 4" HOT WATER SUPPLY AND RETURN PIPING (ONE SUPPLY AND ONE RETURN PIPE PER HEAT EXCHANGER). VALVES, SUPPORTS AND INSTRUMENTS FROM EXTENT OF DEMO TO HEAT EXCHANGER FLANGE. EXTENT OF DEMO SHALL BE TO FIRST HORIZONTAL OVERHEAD PIPE JOINT BETWEEN EXCHANGERS AND HOT WATER PUMPS, OR TO HOT WATER FLOW METER, WHICHEVER DISTANCE IS GREATER.
3. REMOVE PRESSURE GAUGES, TEMPERATURE SENSORS, INDICATORS, TRANSMITTERS AND ASSOCIATED WIRE FROM HEAT EXCHANGER TO I/C IN ELECTRICAL ROOM. REMOVE ALL ASSOCIATED FLEX CONDUITS. ASSOCIATED RIGID CONDUIT IN SUITABLE CONDITION MAY BE REUSED IF SUITABLE. OTHERWISE REMOVE.
4. REMOVE EXISTING SD SLUDGE PIPING AND FITTINGS AS NEEDED TO REMOVE INSTALL NEW SENSORS AND GAUGES. SALVAGE ANY REMOVED SD SLUDGE PIPING IN BUILDING 80-1 FOR REINSTALLATION. PROTECT EXISTING STRAP ON FLOW METER FROM DAMAGE.
5. EXISTING HEAT EXCHANGERS IN BUILDING 80-1 TO REMAIN. PROTECT FROM DAMAGE.
DIGESTER 85-1

GENERAL NOTES:
1. SEE SHEET 10401 FOR PROJECT NOTES.
2. CONTRACTOR SHALL MOUNT NEW INSTRUMENTATION IN SAME LOCATION AS REPLACED INSTRUMENTATION OR AS COORDINATED WITH WRA.
3. THE DRAWINGS ARE DIAGRAMATIC, INTENDED TO CONVEY THE SCOPE OF THE WORK AND TO INDICATE THE GENERAL ARRANGEMENT AND APPROPRIATE ROUTING. CERTAIN BASIC ITEMS SUCH AS OFFSETS, FITTINGS, ACCESS PANELS, HANGERS AND SLEEVES MAY NOT BE SHOWN WHERE ITEMS ARE REQUIRED FOR PROPER INSTALLATION OF THE WORK, SUCH ITEMS SHALL BE INCLUDED. CONTRACTOR TO VERIFY CONNECTIONS, CLEARANCES AND SERVICE PRIOR TO WORK.
4. INSTALL ALL NEW PIPE SUPPORTS PER SPECIFICATION SECTION 1059.

KEY NOTES:
1. EXISTING ROLL-UP DOOR.
2. EXISTING FLOOR OPENING TO LOWER LEVEL WITH METAL GRATING.
3. EXISTING HOT WATER PUMPS AND PIPING, PROTECT FROM DAMAGE.
4. INSTALL NEW HOT WATER SUPPLY AND RETURN PIPING, SUPPORTS, VALVES AND INSTRUMENTS FROM EXTENT OF DEMOLITION TO HEAT EXCHANGERS. SEE PHOTOS. INSTALL NEW PUMPS AND PIPING TO AVOID CONFLICTS AND MAXIMIZE ACCESS. CONFIRM LOCATION WITH WRA.
5. INSTALL NEW FLOW METERS AND TEMPERATURE SENSORS, INDICATORS, TRANSMITTERS, ACCESSORIES AND ASSOCIATED WIRE AND CONDUIT FROM heat exchanger and CONNECT TO PLC IN ELECTRICAL ROOM. CONTRACTOR MAY USE EXISTING RIGID CONDUIT IF SUITABLE, BUT SHALL PROVIDE ALL NEW FLEX CONDUCTS AT INSTRUMENT CONNECTIONS. CONTRACTOR SHALL PROVIDE NEW RIGID CONDUIT AS REQUIRED.
6. INSTALL NEW FLEX FITTINGS AND ADAPTERS FOR NEW INSTRUMENTATION. EXISTING SLUDGE PUMP IS 6" DIA.
7. CONNECT NEW SENSOR AND FLOW METER WIRES WITHIN EXISTING FLOCONSOL CABINET.
8. INSTALL AIR VENT ASSEMBLY AT HIGH POINT ON HOT WATER PIPING, ONE PER EACH HEAT EXCHANGER. CONFIRM LOCATION WITH WRA, SEE DETAIL 4830-09.

DIGESTER 85-3

ENGINEER/DRWNR: PATRICK BROWN
ENGINEER: MELISSA SCHLOEBEINZ

DES MOINES WASTEWATER RECLAMATION FACILITY

BUILDING 80-1 NEW CONSTRUCTION PLAN
DIGESTER HEAT EXCHANGER IMPROVEMENTS

ISSUED FOR BID: 6-21-2021
ACTIVITY ID: 9A-2021-011
PROJECT FILE NUMBER: 925-004

SCALE: 1/4" = 1'-0"  SHEET 80U101
GENERAL NOTES:
1. SEE SHEET RS019 FOR PROJECT NOTES.
2. CONTRACTOR SHALL MOUNT NEW INSTRUMENTATION IN SAME LOCATION AS REPLACED INSTRUMENTATION OR AS COORDINATED WITH VRA.
3. THE DRAWINGS ARE DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF THE WORK AND TO INDICATE THE GENERAL ARRANGEMENT AND APPROXIMATE ROUTING. CERTAIN BASIC ITEMS SUCH AS OFFSETS, FITTINGS, ACCESS PANELS, HANGERS AND SLEEVES MAY NOT BE SHOWN WHERE ITEMS ARE REQUIRED FOR PROPER INSTALLATION OF THE WORK. SUCH ITEMS SHALL BE INCLUDED. CONTRACTOR TO VERIFY CONNECTIONS, CLEARANCES AND SERVICE PRIOR TO WORK.
4. INSTALL ALL NEW PIPE SUPPORTS PER SPECIFICATION SECTION 15080.

KEY NOTES:
1. EXISTING ROLL-UP DOOR.
2. EXISTING FLOOR OPENING TO LOWER LEVEL WITH METAL GRATING.
3. EXISTING HOT WATER PUMPS AND PIPING. PROTECT FROM DAMAGE.
4. INSTALL NEW 4" HOT WATER SUPPLY AND RETURN PIPING, SUPPORTS, VALVES AND INSTRUMENTS FROM EXTENT OF DEMOLITION TO HEAT EXCHANGERS. SEE PHOTOS. INSTALL NEW VALVES AND PIPING TO AVOID CONFLICTS AND MAXIMIZE ACCESS. CONFIRM LOCATION WITH VRA.
5. INSTALL NEW FLOW METERS AND TEMPERATURE SENSORS, INDICATORS, TRANSMITTERS, ACCESSORIES AND ASSOCIATED WIRE AND CONDUIT FROM HEAT EXCHANGER TO PLG IN ELECTRICAL ROOM. CONTRACTOR MAY RE-USE EXISTING RIGID CONDUIT IF SATISFAC CT, BUT SHALL PROVIDE ALL NEW FLEX CONDUITS AT INSTRUMENT CONNECTIONS. CONTRACTOR SHALL PROVIDE NEW RIGID CONDUIT AS REQUIRED.
6. INSTALL NEW 4" RECIRCULATED SLUDGE PIPING, VALVES AND INSTRUMENTS FROM EXTENT OF DEMOLITION TO HEAT EXCHANGER. NEW PIPE AND VALVES TO MATCH EXISTING CONFIGURATION WITH ADJUSTMENTS AS NEEDED FOR NEW HEAT EXCHANGER. INSTALL NEW SEAL AT FLOOR Penetration WITH Mastic Topping and Flex Joint at Connection to Heat Exchangers.
7. INSTALL NEW HEAT EXCHANGER ON EXISTING CONCRETE EQUIPMENT PAD. CONNECT TO PIPING WITH EXPANSION CONNECTORS AS NEEDED. SEE SPECIFICATION 12330.
8. CONNECT NEW SENSOR AND FLOW METER WIRING WITHIN EXISTING PLC/CONTROL CABINET.
9. REINSTALL SALVAGED FLOW METER ON SLUDGE PIPE TO HEAT EXCHANGER.
10. INSTALL AIR VENT ASSEMBLY AT HIGH POINT ON HOT WATER PIPING, ONE PER EACH HEAT EXCHANGER, CONFIRM LOCATION WITH VRA. SEE DETAIL-408001.