ABBREVIATIONS

EWC: Egress Way Connection
ESP: Electric Service Panel
EL: Exit Location
EA: Entry Area
DV: Duct Volume
DPV: Duct Pressure Volume
DH: Duct Hanger
DDCV: Duct Dampener Control Valve

BV: Backflow Preventer
BTUH: British Thermal Unit Per Hour
CWS: Condensing Water Supply
CWR: Condensing Water Return
CW: Condenser Water
CU: Condenser, Cubic
CTF: Condenser Tank Filler

P: Pressure
PO: Power Outlet
PV: Power Volts
PM: Pressure Monitor
P/D: Pump/Discharge
P/ST: Pump/Station

CAB: Cabinet Heater, Chiller
CAM: Cabinet Assembly, Mechanical
CAP: Computer-Aided Projecting
CE: Construction Expense
CFD: Computational Fluid Dynamics
CM: Central Monitoring

CHP: Combined Heat and Power
CPR: Control Panel, Remote
CR: Control Room
CT: Control, Temperature

DDB: Double Down Battery
DB: Down Base
DDB: Double Depth of Keyhole
DLS: Downlight
DLP: Downlight, Low Profile
DLR: Downlight, Low Profile Recessed
DPP: Downlight, Wide Angle
DPM: Downlight, Pearl Metal

DTP: Designated Turndown Point
DVC: Designated Voltage Change
DWC: Designated Water Change

DYM: Designated Year Modified
E: Energy
EB: Equipment Bank
EC: Equipment Center
EDP: Equipment Designation Panel
EI: Equipment Inlet

EFC: Effective Floor Area
EFC: Effective Floor Area
EF: Event File
EL: Exit Location
ED: Exit Device

EOF: Electrical Operating Facility
EO: Electrical Outlet
EOB: Electrical Overload Breaker

ENG: Engineering
EP: Equipment Panel
ET: Escutcheon Tag

F: Fuel
FF: Fire Fighting
FG: Fire Guard
FH: Fire Hydrant
FHV: Fire Hydrant Valve

FMS: Flow Measurement Station
FT: Floor Sign
FU: Fire Unit

G: Gas
GB: Garbage Bin
GST: Gas Storage Tank

HC: Heat Recovery Unit
HGT: Heat Grid Toddler
HER: Heat Recovery Unit
HEZ: Heat Eradication Zone
HST: Heat Storage Tank
HUM: Humidity

THER: Temperature

e: Electronic
nt: Natural
B: Building

CRR: Certified Refractory Respirator
PR: Pressure Relief
PDR: Pressure Drop

GDL: General Design Letter
GDL: General Design Letter
GRT: General Rule

GFR: General Factory Requirements
GEL: General Engineering Letter

SDF: Solar Design Factor
WSD: Wind Speed

EQUIPMENT NAMING AND NUMBERING CONVENTIONS:

- All equipment shall be named and numbered.
- Equipment shall be named with the last name of the manufacturer followed by a number.

MECHANICAL EQUIPMENT INSTALLATION NOTES:

1. Coordination with the general contractor is required prior to installation.
2. Installation of all work.
3. Equipment should be marked with the manufacturer's name and model number.
4. Equipment should be properly supported and hinged.
5. Equipment should be properly insulated.

MECHANICAL SYSTEMS:

1. Cooling systems shall be coordinated with the electrical systems.
2. Heating systems shall be coordinated with the electrical systems.
3. Ventilation systems shall be coordinated with the electrical systems.
4. Plumbing systems shall be coordinated with the electrical systems.

ENERGY CODE NOTES:

1. Motors: Comply with the latest edition of the National Electrical Code.
2. Pumps: Comply with the latest edition of the National Electrical Code.

GENERAL NOTES - MECHANICAL:

1. The contractor is responsible for providing all mechanical equipment.
2. The contractor is responsible for providing all mechanical piping.
3. The contractor is responsible for providing all mechanical insulation.
4. The contractor is responsible for providing all mechanical electrical work.

NON-STRUCRTURAL COMPONENT NOTES:

1. The contractor is responsible for providing all non-structural components.
2. The contractor is responsible for providing all non-structural electrical work.

AUTHORITY HAVING JURISDICTION:

1. The authority having jurisdiction shall be notified prior to installation.
2. The authority having jurisdiction shall be notified prior to testing.
3. The authority having jurisdiction shall be notified prior to operation.
4. The authority having jurisdiction shall be notified prior to commissioning.

MECHANICAL SYSTEMS:

1. The contractor shall be responsible for providing all mechanical systems.
2. The contractor shall be responsible for providing all mechanical piping.
3. The contractor shall be responsible for providing all mechanical insulation.
4. The contractor shall be responsible for providing all mechanical electrical work.

M.E. JOINER AND ASSOCIATES

WASHINGTON, D.C.

500 FIFTH STREET, N.W.

1100 FIFTH STREET, N.W.

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HYDRONIC WATER PIPE SIZING SCHEDULE

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<th>PIPE SIZE</th>
<th>GPM RANGE</th>
<th>NOTES</th>
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<td>1 1/2</td>
<td>5.8 - 10.1</td>
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CHILLER SCHEDULE - AIR COOLED

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<tr>
<th>SHEET NUMBER</th>
<th>LOCATION</th>
<th>TAPE MARK</th>
<th>CHILLER MAKE</th>
<th>TRANE MAKES/MODEL NO.</th>
<th>UNIT NAMEPLATE FLA.</th>
<th>CAPACITY</th>
<th>LOAD EFF.</th>
<th>TBP</th>
<th>MAX. AMPS</th>
<th>NPSH</th>
<th>CAPACITY (TONS)</th>
<th>MCA</th>
<th>TBP</th>
<th>MOCP</th>
<th>LWT</th>
<th>TOTAL WPD</th>
<th>WEAPON</th>
<th>MAX HEAD</th>
<th>MIN HEAD</th>
<th>MAX CAP. NO.</th>
<th>NOTES</th>
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<tr>
<td>CH-01</td>
<td>1/F</td>
<td>1/2</td>
<td>SP-01</td>
<td>Trane TPACVMV0300D-MM</td>
<td>00165/0165</td>
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<tr>
<td>P-13</td>
<td>5TH FLR</td>
<td>Mech RM</td>
<td>B502</td>
<td>SPIROTHERM / VDN600</td>
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AIR SEPARATOR SCHEDULE

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PIPING SYSTEMS INSULATION SCHEDULE

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<th>TYPE OF PIPE</th>
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<th>INSULATION THICK. (IN.)</th>
<th>TOTAL WPD</th>
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<tbody>
<tr>
<td>COLD HVAC PIPING</td>
<td>INSIDE BUILDING ENVELOPE</td>
<td>FIBERGLASS</td>
<td>1-1/2 INCH AND SMALLER</td>
<td>7 INCH \n</td>
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</table>
CRANE LOCATION ON 15TH AVE NE. CONTRACTOR SHALL BE RESPONSIBLE FOR PERMITTING, SAFETY AND TRAFFIC CONTROL.

1. SEE DWG. M0.2 FOR GENERAL NOTES.
2. DRAWINGS ARE BASED ON AS-BUILT DRAWINGS. NOT ALL EXISTING BUILDING ELEMENTS ARE SHOWN ON THE DRAWINGS. PRIOR TO START OF CONSTRUCTION, FIELD VERIFY EXISTING CONDITIONS AND INCORPORATE INTO PLANS AS REQUIRED.
3. CONSTRUCTION OF SHEEHAN MECHANICAL AND RELATED ROOF WORK REQUIRED. MEANS AND METHODS TO BE DETERMINED BY THE GENERAL CONTRACTOR AND APPROVED BY THE OWNER.

APPROX. LOCATION OF ROOFTOP AREA WELL.
1. SEE DWG. M0.2 FOR GENERAL NOTES.

2. DRAWINGS ARE BASED ON AS-BUILT DRAWINGS. NOT ALL EXISTING BUILDING ELEMENTS ARE SHOWN ON THE DRAWINGS. PRIOR TO START OF CONSTRUCTION, FIELD VERIFY EXISTING CONDITIONS AND INCORPORATE INTO PLANS AS REQUIRED.

3. REMOVAL OF THE EXISTING CHILLER WILL REQUIRE A CRANE. SEE DWG. MS1.0 FOR LOCATION.

4. REMOVE CHILLED WATER PUMPS AND ASSOCIATED PIPING FROM PUMP TO CHILLER AND FROM PUMP TO THE PENTHOUSE WALL PENETRATION TO FACILITATE INSTALLATION OF NEW PUMPS INSIDE PENTHOUSE.
1. SEE DWG. M0.2 FOR GENERAL NOTES.

2. DRAWINGS ARE BASED ON AS-BUILT DRAWINGS. NOT ALL EXISTING BUILDING ELEMENTS ARE SHOWN ON THE DRAWINGS. PRIOR TO START OF CONSTRUCTION, FIELD VERIFY EXISTING CONDITIONS AND ELEMENTS AND INCORPORATE INTO PLAN AS REQUIRED.

NOTIFY ENGINEER OF DISCREPANCIES PRIOR TO COMMENCING WORK.

CONNECT NEW CHILLED WATER PUMPS TO EXISTING CONTROL SYSTEM TO MAINTAIN EXISTING SEQUENCE OF OPERATIONS AND CONTROL/MONITORING POINTS. ENSURE CHILLED WATER PUMP OPERATES PER EXISTING CONTROL SEQUENCE OF OPERATIONS. SEE DETAIL 1/M9.1.
ENLARGED 5TH FLOOR PIPING PLAN

Sheet Notes:
1. See OVs. Bldg. for General Notes.
2. Drawings are based on AS-BUILT drawings. Not all existing building elements are shown on the drawings. Prior to commencement of work, verify all existing equipment and incorporate into plan as required. Notify Engineer of deficiencies prior to commencing work.

Legend:
- Provide heat trace for piping exterior to the building (within the area well). Provide misc. steel supports connected to the existing new misc. support steel as necessary. Structural beams (ref. structural dwgs.) to suit.
- Provide heat trace controller. Mount to existing unistrut framework. Provide additional support cross members as necessary. Ref. electrical dwgs. for power requirements.
- Air-cooled chiller disconnects, mounted to existing unistrut framework. See elec. dwgs.
- Chiller shall run off packaged controls by manufacturer to maintain chilled water temperature set point. See OVs. Bldg. M6.15 for additional requirements.

Enlarged Plan & Sections

1. See DWG. M0.2 for General Notes.
2. Drawings are based on AS-BUILT drawings. Not all existing building elements are shown on the drawings. Prior to commencement of work, field verify existing conditions and incorporate into plans as required. Notify Engineer of discrepancies prior to commencing work.
3. Installation of the new chillers requires a crane. See DWG. MS1.0 for location.
**DETAIL - BASE MOUNTED PUMP**

**Not to Scale**

**DETAIL - AIR-COOLED CHILLER SUPPORT**

**Not to Scale**

**DETAIL - INSULATED PIPE HANGER**

**Scale: None**

**DIAGRAM - AIR-COOLED CHILLER PIPING**

**Scale: None**

**NOTES**

1. Maintain 3' clearance all around each chiller for proper airflow and maintenance clearances.
2. CONTROLLING CONTRACTOR TO PROVIDE SENSORS AND DEVICES AS NECESSARY TO IMPLEMENT THE EXISTING SEQUENCES OF OPERATION AND PROVIDE THE PROPRIETARY CHILLER CONTROLLER NECESSARY INPUTS.
The modular air-cooled chillers shall operate via a proprietary on-board master controller to maintain the chilled water supply set point temperature (42°F, Adj.) and stage the modules operation to equalize run time. If the master controller fails, each module shall operate independently via a 'slave controller' to maintain the chilled water supply set point.

Chilled Water Variable Speed Pumps

Chilled Water Pump Differential Pressure Limit:
- The controller shall measure differential pressure across the chilled water supply/return headers. The pump speed shall be limited by the differential pressure required for maximum flow setpoint (Adj), set by balancers.

Staging on lead pump P-13:
- Lead pump P-13 shall be always on.
- Modulate pump P-13 speed up to 100% (Adj) as required to satisfy chilled water differential pressure setpoint of 12 PSI (Adj set by balancers).

Lag pump P-14:
- If lead pump fail, lag pump shall be energized and operate as lead pump.
- The designated lead and lag pump shall rotate upon one of the following conditions (user selectable):
  - Daily
  - Weekly
  - Monthly
- Pumps:
  - Pump failed, commanded on, but the status is off.
  - Pump failed, commanded off, but the status is on.
  - Pump is live fault.
FUSED CUTOUTS

NON-STRUCTURAL ELECTRICAL NOTES

1. ITEMS ARE SHOWN SCHEMATICALLY. COORDINATE INSTALLATION. PROVIDE COMPONENTS REQUIRED FOLLOWING:

2. FOR COMPLETE AND OPERATIONAL SYSTEMS REQUIRED INSPECTIONS.

3. NATIONAL AND STATE CODES AS AMENDED LOCALLY PERFORM WORK IN ACCORDANCE WITH APPLICABLE STATEMENT OF RESPONSIBILITY TO THE REGULATORY SYSTEM, DESIGNATED SEISMIC SYSTEM, OR CONSTRUCTION OF A SEISMIC-FORCE-RESISTING STRUCTURE TO RESIST THE EFFECTS OF OTHERWISE DIRECTED. RETURN ITEMS TO OWNER IN THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ABOVE FOR ADDITIONAL INFORMATION, EXCEPTIONS, AND SPECIFICATIONS. COORDINATION SHALL OCCUR IN ACCORDANCE WITH THE PROJECT SCHEDULE.

4. THE STEEL AND WOOD JOIST MANUFACTURERS

5. THE AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

6. IB. IMPACTED.

IN ADDITION TO OTHER TRADES THAT MAY BE

ELECTRICAL SYSTEMS SHALL BE DESIGNED AND HANGERS AND SEISMIC BRACING FOR

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7. THE STEEL AND WOOD JOIST MANUFACTURERS

8. THE AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

9. IB. IMPACTED.

IN ADDITION TO OTHER TRADES THAT MAY BE

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1. ELECTRICAL ITEMS SHOWN ARE DIAGRAMMATIC BASED ON AVAILABLE RECORD DRAWINGS AND SITE WALKS DURING THE DESIGN PERIOD. NOT ALL SYSTEM COMPONENTS ARE SHOWN. QUANTITIES PRIOR TO COMMENCING WORK. REMOVE EXISTING ELECTRICAL CONDUIT AND WIRED AS REQUIRED.

2. REMOVE UNUSED SURFACE RACEWAY, BOXES AND WIRING. COORDINATE PATCHING AND PAINTING WITH DIVISION 09 CONTRACTOR. REMOVE UNUSED BOXES. COORDINATE PATCHING AND PAINTING WITH DIVISION 09. PROVIDE MUD RINGS AND BLANK COVERS FOR UNUSED RECESSED BOXES TO REMAIN. REFER TO SPECIFICATION SECTION 2627 FOR ADDITIONAL INFORMATION.

3. PATCHING AND PAINTING TO MATCH EXISTING CONDITIONS AND SHALL BE PROVIDED BY DIVISION 09 CONTRACTOR.

4. REMOVE EXPOSED CONDUIT AND BOXES. ABBANDON BELOW GRADE AND INACCESSIBLE RACEWAY IN PLACE AND RECORD LOCATIONS ON RECORD DRAWINGS.

5. REFER TO SHEET E4.2 FOR NEW WORK.

REUSE EXISTING CONDUIT AND WIRE. EXTEND TO NEW LOCATION SHOWN ON E4.2. REFER TO ONE-LINE DIAGRAM ON E9.1 FOR ADDITIONAL INFORMATION.
FLAG NOTES:

1. HARDWIRED CONNECTION TO NEW HEAT TRACE EQUIPMENT.

2. MAKE HARDWIRED CONNECTION TO NEW HEAT TRACE EQUIPMENT.

COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR.

MOUNT ON UNISTRUT. FIELD COORDINATE EXACT LOCATION.

PROVIDE NEW 12"X12"X6" ENCLOSURE WITH HINGED COVER AND LOCK. PROVIDE STANDARD DOUBLE GANG (4" SQUARE) J-BOX WITHIN ENCLOSURE FOR TELECOMMUNICATIONS OUTLET. PROVIDE 1" CONDUIT FROM THIS J-BOX TO NEAREST DATA CLOSET FOR TIE-IN TO BUILDING NETWORK. COORDINATE LOCATION WITH UNIVERSITY OF WASHINGTON (UW).

TELECOMMUNICATIONS OUTLET AND CABLING TO BE PROVIDED BY UW IT SHOP. UW-IT INSTALLATION DETAIL AVAILABLE: DWG. NO.: CNT-CI-2 ENCLOSURE PART #: 'MILBANK 12126-LC1' WITH 'A-LKSFMKEYL' LOCK OR APPROVED EQUAL. SEE ONE-LINE DIAGRAM, SHEET E9.1 FOR METER INFORMATION.

PROVIDE NEW POWER METER FOR CONNECTION TO THE UNIVERSITY OF WASHINGTON METERING SYSTEM. PROVIDE RACEWAY FOR NETWORK CABLE FROM POWER METER TO TELECOMMUNICATIONS RACK. COORDINATE PATHWAY WITH UNIVERSITY OF WASHINGTON METERING AND POWER SYSTEM SHOPS. METER, CURRENT SENSING TRANSDUCERS, AND NETWORK CABLE PACKAGE FURNISHED AND INSTALLED BY DIVISION 26 CONTRACTOR. COORDINATE LOCATION WITH UW.

NETWORK CABLE AND ASSOCIATED NETWORK PARAMETER

REFER TO MECHANICAL EQUIPMENT SCHEDULE SHEET E9.1 FOR ADDITIONAL EQUIPMENT CHARACTERISTICS, REQUIREMENTS AND CIRCUIT INFORMATION.

FINAL LOCATION OF EQUIPMENT DISCONNECTS/CONTROLLERS SHALL BE COORDINATED WITH OTHER TRADES PRIOR TO ROUGH-IN. MAINTAIN CODE REQUIRED WORKING CLEARANCES. PROVIDE/CONSTRUCT UNISTRUT ASSEMBLY FOR MOUNTING OF DISCONNECTS/CONTROLLERS WHICH CANNOT BE LOCATED ON BUILDING STRUCTURE.
**MECHANICAL EQUIPMENT SCHEDULE**

<table>
<thead>
<tr>
<th>TAG</th>
<th>EQUIPMENT</th>
<th>VOLTAGE</th>
<th>PHASE</th>
<th>HP</th>
<th>KW</th>
<th>FLA</th>
<th>MCA</th>
<th>MOCP</th>
<th>SCCR</th>
<th>BRANCH CIRCUIT</th>
<th>DISCONNECT</th>
<th>NOTES</th>
</tr>
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<tbody>
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<td>CH-1A</td>
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<td>480</td>
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<td>63</td>
<td>90</td>
<td>&gt;7500</td>
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<td></td>
<td></td>
<td>1</td>
<td>3/4&quot;</td>
<td>3</td>
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</tbody>
</table>

**NOTES:**
1. INSTALL VFD WITH INTEGRAL DISCONNECT FURNISHED BY DIVISION 23.
2. PROVIDE FUSED DISCONNECT SWITCH.
3. MINIMUM SCCR RATING CALCULATED BASED ON AVAILABLE FAULT CURRENT FROM RECORD DRAWINGS.

**LOAD CALCULATION**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>KW</th>
<th>FLA</th>
<th>MCA</th>
<th>MOCP</th>
<th>SCCR</th>
<th>BRANCH CIRCUIT</th>
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<tbody>
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<tr>
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</table>

<table>
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<tr>
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<th>SCCR</th>
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</thead>
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<tr>
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<tr>
<td>Added Load:</td>
<td>109.5</td>
<td>131.77</td>
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<tr>
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</tbody>
</table>

**GENERAL NOTE:**
1. EXISTING LOADS BASED OFF AS-BUILT DRAWINGS.

**ELECTRICAL PARTIAL DEMOLITION ONE-LINE DIAGRAM**

**ELECTRICAL PARTIAL ONE-LINE DIAGRAM**
GENERAL REQUIREMENTS

Project shall be built in accordance with the International Building Code and local jurisdictional codes and rules.

GOVERNMENT CODE

All design drawings shall be prepared in accordance with the IBC and local jurisdictional codes.

GUIDELINES

These guidelines shall be used in conjunction with international standards for load and resistance factor design (LRFD).

DRAWINGS

Engineers, architects, and contractors shall verify all the plans drawn by SER.

SHOP DRAWINGS AND SUBMITTALS

Shop drawings shall be submitted in accordance with the requirements of this section. The shop drawings shall be submitted to the Structural Engineer of Record (SERC) for approval. The shop drawings shall be signed and stamped by a licensed professional engineer.

CONTRACTOR RESPONSIBILITY

The contractor shall be responsible for the submittal of shop drawings and shop drawings shall be reviewed by the SER.

INSPECTIONS

All structural steel shall be inspected by the Structural Engineer of Record (SERC) and the Local Building Official (LBO). The inspections shall be documented and signed by the inspector.

STRUCTURAL STEEL COMPONENTS

All structural steel shall be inspected by the Structural Engineer of Record (SERC) and the Local Building Official (LBO). The inspections shall be documented and signed by the inspector.

STEEL FRAMING

All steel framing shall be inspected by the Structural Engineer of Record (SERC) and the Local Building Official (LBO). The inspections shall be documented and signed by the inspector.

VOLUME CALCULATIONS

All volume calculations shall be performed by the Structural Engineer of Record (SERC) and the Local Building Official (LBO). The calculations shall be documented and signed by the inspector.

QUALITY ASSURANCE

All quality assurance requirements shall be performed by the Structural Engineer of Record (SERC) and the Local Building Official (LBO). The quality assurance requirements shall be documented and signed by the inspector.

STRUCTURAL STEEL DESIGN

All structural steel design shall be performed by the Structural Engineer of Record (SERC) and the Local Building Official (LBO). The structural steel design shall be documented and signed by the inspector.

REFERENCES

All referenced standards and codes shall be the latest edition approved by the SER.

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NOTES:
1. REMOVE ALL EXISTING EQUIPMENT, HOUSEKEEPING PADS AND SUPPORTS, BAR GRATING, ETC. AS REQUIRED TO INSTALL NEW STRUCTURE AS SHOWN.
2. **INDICATES AREA OF NEW BAR GRATING WALK PLATFORM. PROVIDE GALVANIZED STEEL BAR GRATING, CONSISTING OF 1" x 3/16" BEARING BARS AT 1-3/16" O.C. ATTACH TO STRUCTURE PER 4/S2.1.
3. ALL STEEL SHALL BE HOT-DIPPED GALVANIZED PER GENERAL NOTES.
4. ALL NEW STRUCTURAL STEEL TO BE INSTALLED WITH TOP OF STEEL ELEVATION AT 155'-6".

---

**Partial Plan**

**Scale: 3/8" = 1'-0"**

**Detail**

**Scale: 3/8" = 1'-0"**

**MECHANICAL UNIT ATTACHMENT**

**Scale: 3/8" = 1'-0"**

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**Typical Guardrail Elevation**

**Scale: 3/4" = 1'-0"**

**Grate Connection**

**Scale: 3/4" = 1'-0"**

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**Notes:**

**1. GUARDRAIL NOT SHOWN FOR CLARITY**

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**Plan**

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**Section**

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**Notes:**

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**Scale:** 3/8" = 1'-0"