**ELECTRICAL SITE LAYOUT PLAN**

**CONFIGURATION-1**

**GENERAL NOTES:**
1. REFER TO ONE LINE DIAGRAM ON SHEET E400 FOR ADDITIONAL DETAILS ON THE ELECTRICAL SYSTEM.
2. FOR ELECTRICAL SCHEDULES, SEE DRAWINGS ON SHEETS E401 AND E402.

**PLAN NOTES:**
---
1. OUTDOOR CONDENSING UNIT (TYPICAL OF 3).
2. LS/HS VACA STAND BY GENERATOR.
3. UTILITIES TRANSFORMER.
4. REQUIRED CLEARANCE (TYPICAL).
5. REFER TO DRAWING E400 FOR ADDITIONAL DETAILS.
6. CONCRETE (PAD TYPICAL).
7. A BUILT IN DISCONNECT SHALL BE INCLUDED WITH EACH CONDENSING UNIT (TYPICAL OF 3).
8. GENERATOR SHALL INCLUDE A BUILT IN CIRCUIT BREAKER. SEE ONE LINE DRAWING E400 FOR DETAILS.

---

**NOT FOR CONSTRUCTION**

**REF: 400W DATA CENTER REFERENCE DESIGN**
**PREFAB CONFIGURATION-1**

**E101**

**DATE:**

**DRAWN BY:**

**CHECKED BY:**

**REV. DATE**

**NO. OF IT RACKS**

**NO. OF CONDENSING UNITS**

**UPS SYSTEM MODEL**

**ATS MODEL**

**NO. OF IN-RACK CONDENSING UNITS**

**ENERGY CURRENCY UNIT (MCU) MODEL**

**MAX IT LOAD (KVA)**

**MAX IT LOAD (KVA)**

**DATE:**

**DRAWING NUMBER:**

**SHEET TITLE:**

**PROJECT NUMBER:**

**DRAWING SCALE:**

**IT MISSION CRITICAL SERVICES, INC.**

**MISSION CRITICAL SERVICES, INC.**

**Schneider Electric IT**

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**400W DATA CENTER REFERENCE DESIGN**

**PREFAB CONFIGURATION-1**
ELECTRICAL PREFAB MODULE DETAILS

GENERAL NOTES:
1. REFER TO THE ONE LINE DIAGRAM ON SHEET E102 FOR ADDITIONAL DETAILS ON THE ELECTRICAL SYSTEM.
2. FOR ELECTRICAL SCHEDULES, SEE DRAWINGS ELECTRICAL SYSTEM E400 FOR ADDITIONAL DETAILS ON THE PLAN NOTES:
- IT RACK:
  - ACSO-300 IN-ROW COOLING UNIT.
- HOT AISLE:
  - ACSO-300 IN-ROW COOLING UNIT.
- FIRE ALARM CONTROL PANEL:
  - Fire Alarm System Installation shall be as per NFPA 72 requirements.

ELECTRICAL PREFAB MODULE DETAILS CONFIGURATION-1

PROVIDE FOUR (4) 3" CONDUITS FOR DATA/FIBER OPTIC COUPLERS. COUPLERS SHALL BE CONNECTED PERPENDICULARLY TO MODULE WALL AT 11'-6" ABOVE FINISHED SLAB AT LOCATION SHOWN. TURN VERTICALLY WITH A 36" RADIUS DOWN TO SLAB FOR UNDERGROUND RUN. PROVIDE PIPES FOR HUMIDIFICATION AND DEHUMIDIFICATION. CONDUITS AND PIPES SHALL BE CONNECTED PERPENDICULARLY TO MODULE WALL AT 11'-6" ABOVE FINISHED SLAB AT LOCATION SHOWN. PROVIDE ONE (1) 2-1/2" CONCRETE ENCASED UNDERGROUND PVC SCH-80 CONDUITS FOR POWER AND CONTROLS CONNECTIONS. PROVIDE ONE (1) 2-1/2" CONCRETE ENCASED UNDERGROUND PVC SCH-80 CONDUIT FOR POWER FROM UTILITY. PROVIDE ONE (1) 2-1/2" AND TWO (2) 3/4" CONCRETE ENCASED UNDERGROUND PVC SCH-80 CONDUITS FOR POWER AND CONTROLS FROM GENERATOR. TRANSFER SWITCH WITH TRANSFORMER (TRF-2). 480V MAIN (I-LINE/NF). ASCO-300 MODEL (480V) SERVICE TRANSITION (ATS-MDP-100). 208/120V DISTRIBUTION PANEL (DMP-XXXXXX). POWER FROM UTILITY. PROVIDE ONE (1) 2-1/2" CONCRETE ENCASED UNDERGROUND PVC SCH-80 CONDUIT FOR POWER FROM UTILITY. PROVIDE ONE (1) 2-1/2" AND TWO (2) 3/4" CONCRETE ENCASED UNDERGROUND PVC SCH-80 CONDUITS FOR POWER AND CONTROLS FROM GENERATOR. TRANSFER SWITCH WITH TRANSFORMER (TRF-2). 480V MAIN (I-LINE/NF). ASCO-300 MODEL (480V) SERVICE TRANSITION (ATS-MDP-100). 208/120V DISTRIBUTION PANEL (DMP-XXXXXX).
GENERAL NOTES:

1. REFER TO ELECTRICAL GROUNDING DIAGRAM ON SHEET E401 FOR ADDITIONAL INSTRUCTIONS.
2. SEE DRAWING E500 FOR DETAILS ON MAIN GROUNDING ELECTRODE SYSTEM AND GROUND BUS.
3. ALL GROUNDING CONNECTIONS AND BONDINGS SHALL BE IN ACCORDANCE WITH ARTICLE 250 OF NFPA 70.
4. ALL LIGHTNING PROTECTION WIRE SHALL BE #2 AWG BARE COPPER, STRANDED.
5. ALL LIGHTNING PROTECTION WIRES SHALL BE #2 AWG BARE COPPER, STRANDED.
6. ALL LIGHTNING PROTECTION COMPONENTS SHALL BE PROPERLY SUPPORTED TO THE STRUCTURE.
7. ALL LIGHTNING PROTECTION CONNECTIONS AND BONDINGS SHALL BE PER NFPA 70E.

PLAN NOTES:

1. MAIN GROUNDING ELECTRODE SYSTEM

2. MAIN GROUNDING ELECTRODE CONDUCTOR.

3. GENERATOR NEUTRAL AND UTILITY TRANSFORMER NEUTRAL SHALL BE DISCONNECTED AT THE NEUTRAL BUS OF SERVICE ENTRANCE AT THE SERVICE NEUTRAL BUS CONNECTION. REFER TO ELECTRICAL GROUNDING DIAGRAM ON SHEET E401 FOR DETAILS.

4. CONNECT STRUCTURAL STEEL TO MAIN GROUNDING ELECTRODE SYSTEM TO ENSURE THAT ALL STRUCTURAL STEEL COMPONENTS ARE PROPERLY BONDED WITH EACH OTHER.

5. CONNECT EQUIPMENT ENCLOSURE TO MAIN GROUNDING BUS.

6. LIGHTNING PROTECTION AIR TERMINAL (TYPICAL OF 6).

7. LIGHTNING PROTECTION ROOF WIRE.

8. LIGHTNING PROTECTION DOWN WIRE (TYPICAL OF 2).

9. LIGHTNING PROTECTION DOWN WIRE (TYPICAL OF 2).

10. LIGHTNING PROTECTION SHIELD WIRE.

11. LIGHTNING PROTECTION DOWN WIRE.

LEGEND:

G = GROUND WIRE
LP = LIGHTNING PROTECTION WIRE
GB = GROUND BAR
MB = MAIN GROUNDING BUS
RAMP UP →

**LIGHTING FIXTURE SCHEDULE**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MANUFACTURER</th>
<th>VOLTAGE</th>
<th>WATTAGE</th>
<th>LAMP</th>
<th>NUMBER OF FIXTURES</th>
<th>MOUNTING</th>
<th>REMARKS</th>
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<tbody>
<tr>
<td>A</td>
<td>LITHONIA LIGHTING</td>
<td>120V</td>
<td>38W</td>
<td>LED</td>
<td>4</td>
<td>SURFACE</td>
<td>4 LED VAPOR TIGHT FIXTURE</td>
</tr>
<tr>
<td>B</td>
<td>LITHONIA LIGHTING</td>
<td>120V</td>
<td>28.4W</td>
<td>LED</td>
<td>2</td>
<td>SURFACE</td>
<td>2 LED VAPOR TIGHT FIXTURE</td>
</tr>
<tr>
<td>DM</td>
<td>LITHONIA LIGHTING</td>
<td>120V</td>
<td>4.3W</td>
<td>LED</td>
<td>1</td>
<td>SURFACE</td>
<td>THERMOPLASTIC WHITE</td>
</tr>
</tbody>
</table>

**GENERAL NOTES:**

1. REFER TO ONE LINE DIAGRAM ON SHEET E400 FOR ADDITIONAL DETAILS ON THE ELECTRICAL SYSTEM.
2. FOR ELECTRICAL SCHEDULES, SEE DRAWINGS ON SHEETS E600 AND E601.

**PLAN NOTES:**

- OCCUPANCY SENSOR (TF) MODEL DT-305 OR CX-100-3 OR SIMILAR.

**ELECTRICAL LIGHTING PLAN CONFIGURATION-1**

**DRAWN BY:**

**CHECKED BY:**

**PROJECT NUMBER:**

**DRAWING SCALE:**

**SHEET TITLE:**

**DATE:**

**DRAWING NUMBER:**

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400W DATA CENTER REFERENCE DESIGN
PREFAB CONFIGURATION-1

**IT MISSION CRITICAL SERVICES, INC.**

**12150 MONUMENT DRIVE SUITE 150 FAIRFAX, VA. 22033**

**PH: 703-968-0300     FX: 703-654-3680**

**IT MISSION CRITICAL SERVICES, INC.**

**NOT FOR CONSTRUCTION**
GENERAL NOTES:
- See drawing E400 for abbreviations and symbols.
- See drawing E401 and E402 for electrical specifications.
- See drawing E403 and E404 for electrical schedules.

CONTROLS NOTES:
- Supply of control panels along with their integration services with the data center system shall be provided by Schneider Electric.
- Provide a separate conduit for connecting the SPD with power quality meter(s) provided for SPD failure monitoring.
- Provide a 10kA 480V/208V Panel Board for 50VDC control.
- The circuit breaker inside the generator enclosure shall be equipped with a 480V/208V panel board. Shunt trips are to be wired to this panel.
- Provide an Ethernet switch with sufficient ports for connecting the power quality meter(s) provided, UPS system components and all other components that require remote monitoring and configuration.

PLAN NOTES:
- 3W-100 (I-LINE PANELBOARD)
- 3W-50 (40KVA 208V 3PH)

ELECTRICAL ONE LINE DIAGRAM:

- [Diagram showing electrical connections and components]

GENERAL NOTES:
- See drawing E401 for abbreviations and symbols.
- See drawing E402 for electrical specifications.
- See drawing E403 for electrical schedules.

CONTROLS NOTES:
- Supply of control panels along with their integration services with the data center system shall be provided by Schneider Electric.
- Provide a separate conduit for connecting the SPD with power quality meter(s) provided for SPD failure monitoring.
- Provide a 10kA 480V/208V Panel Board for 50VDC control.
- The circuit breaker inside the generator enclosure shall be equipped with a 480V/208V panel board. Shunt trips are to be wired to this panel.
- Provide an Ethernet switch with sufficient ports for connecting the power quality meter(s) provided, UPS system components and all other components that require remote monitoring and configuration.

PLAN NOTES:
- 3W-100 (I-LINE PANELBOARD)
- 3W-50 (40KVA 208V 3PH)
**GENERAL NOTES:**
- See drawings E001 for abbreviations and symbols.
- See drawings E002 and E003 for electrical specifications.
- See drawing E004 for electrical one line diagram.
- See drawing E005 for electrical details.
- See drawing E006 and E007 for electrical schedules.
- All grounding connections and bondings shall be by Article 250 of NFPA 70.
- GEC sizing is normally determined with NEC-1999.
- Refer to electrical grounding and lightning protection drawing on Sheet E103 for additional details.

**PLAN NOTES:**
- Equipment grounding conductor normally run in raceways with circuit conductors. Size per NEC.
- Grounding electrode conductor.
- Bonding jumper, size per NEC.
- Main bonding jumper.
- System bonding jumper.
- Main grounding bar.
- Neutral bar.
- Ground bar.

**LEGEND:**
- GEC: Equipment grounding conductor.
- EGC: Grounding electrode conductor.
- BJ: Bonding jumper, size per NEC.
- MB: Main bonding jumper.
- MBJ: System bonding jumper.
- MB: Main grounding bar.
- N: Neutral bar.
- G: Ground bar.

**NOT FOR CONSTRUCTION**

**400KW DATA CENTER REFERENCE DESIGN**

**PREFAB CONFIGURATION-1**
### DISTRIBUTION PANELBOARD 'MDP-100' SCHEDULE

<table>
<thead>
<tr>
<th>LOAD (kW)</th>
<th>LOAD (%)</th>
<th>MAX INT. RMS CURRENT (A)</th>
<th>PANEL CATALOG NUMBER</th>
<th>SERVICE DROP</th>
<th>LOAD</th>
<th>PNL</th>
<th>PANEL</th>
<th>PANEL LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>50</td>
<td>500</td>
<td>4-1/0</td>
<td>1</td>
<td>30</td>
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<td>0</td>
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<tr>
<td>30</td>
<td>60</td>
<td>600</td>
<td>4-2/0</td>
<td>2</td>
<td>30</td>
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</tr>
<tr>
<td>40</td>
<td>80</td>
<td>800</td>
<td>4-3/0</td>
<td>3</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
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<td>4-4/0</td>
<td>4</td>
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### DISTRIBUTION PANELBOARD 'PDB-200' SCHEDULE

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<tr>
<th>LOAD (kW)</th>
<th>LOAD (%)</th>
<th>MAX INT. RMS CURRENT (A)</th>
<th>PANEL CATALOG NUMBER</th>
<th>SERVICE DROP</th>
<th>LOAD</th>
<th>PNL</th>
<th>PANEL</th>
<th>PANEL LOCATION</th>
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</thead>
<tbody>
<tr>
<td>20</td>
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<tr>
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<td>80</td>
<td>800</td>
<td>4-3/0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
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<td>100</td>
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### 3-WIRE FEEDER SIZING SCHEDULE

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>3-PH SETS</th>
<th>CONDUCTORS (COPPER)</th>
<th>GND. CONDUCT</th>
<th>GND. CONDUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>3</td>
<td>1</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>L2</td>
<td>3</td>
<td>1</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>L3</td>
<td>3</td>
<td>1</td>
<td>12</td>
<td>24</td>
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### 4-WIRE FEEDER SIZING SCHEDULE

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<thead>
<tr>
<th>SYMBOL</th>
<th>3-PH SETS</th>
<th>CONDUCTORS (COPPER)</th>
<th>GND. CONDUCT</th>
<th>GND. CONDUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>3</td>
<td>1</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>L2</td>
<td>3</td>
<td>1</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>L3</td>
<td>3</td>
<td>1</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>L4</td>
<td>3</td>
<td>1</td>
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<td>24</td>
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### System Load Calculation

<table>
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<tr>
<th>Item</th>
<th>Load</th>
<th>Unit</th>
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<tbody>
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<td>Critical Load</td>
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<td>kWa</td>
</tr>
<tr>
<td>HVAC 101</td>
<td>2.443</td>
<td>kWa</td>
</tr>
<tr>
<td>Cond 101</td>
<td>19.250</td>
<td>kWa</td>
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<tr>
<td>HVAC 102</td>
<td>2.443</td>
<td>kWa</td>
</tr>
<tr>
<td>Cond 102</td>
<td>19.250</td>
<td>kWa</td>
</tr>
<tr>
<td>HVAC 103 (Redundant)</td>
<td>0.000</td>
<td>kWa</td>
</tr>
<tr>
<td>Cond 103SP (Redundant)</td>
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<td>kWa</td>
</tr>
<tr>
<td>EHV &amp; Chiller System</td>
<td>0.000</td>
<td>kWa</td>
</tr>
<tr>
<td>Fire Suppression</td>
<td>0.000</td>
<td>kWa</td>
</tr>
<tr>
<td>Receptacles</td>
<td>1,260</td>
<td>kWa</td>
</tr>
<tr>
<td>Hubifiers (Optional)</td>
<td>0.000</td>
<td>kWa</td>
</tr>
<tr>
<td>Dedicated Receptacle (24VDC)</td>
<td>0.750</td>
<td>kWa</td>
</tr>
<tr>
<td>Generator Power Panel</td>
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<td>Controls Power</td>
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<td>kWa</td>
</tr>
<tr>
<td>Interior Lighting</td>
<td>0.9</td>
<td>kWa</td>
</tr>
<tr>
<td>Lobby Ventilation</td>
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<td>kWa</td>
</tr>
<tr>
<td>Exterior Lighting</td>
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<td>kWa</td>
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<tr>
<td>Total kWa</td>
<td>56,710</td>
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### Distribution Panelboard 'MBP-300' Schedule

<table>
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<th>Voltage</th>
<th>PH</th>
<th>Wire</th>
<th>Circuit Breaker</th>
<th>Load Center</th>
<th>Panel Catalog Number</th>
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<tbody>
<tr>
<td>220V</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Plan Notes:

- Power shall be distributed to IT racks and control panel load through cable trays.

#### Notes:

- Calculations are made in accordance with NEC, rules, shall have line distribution.
- Optional, upgrade to line distribution shall be available on request.

### Configuration-1

- **NOT FOR CONSTRUCTION**

#### Reference Design

- **40kW Data Center**
- **Prefab Configuration-1**

---

**Schneider Electric**

**IT Mission Critical Services, Inc.**

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---

**IT Mission Critical Services, Inc.**

**40kW Data Center Reference Design Prefab Configuration-1**

**Notes:**

- **NOT FOR CONSTRUCTION**

**Electrical Schedules Configuration-1**

**Drawing Number:**

**E601**

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