<table>
<thead>
<tr>
<th>SHEET TITLE</th>
<th>SHEET NO.</th>
<th>REV NO.</th>
<th>PROJECT NO.</th>
<th>PROJECT DESCRIPTION</th>
<th>SCALE</th>
<th>OWNERS REVIEW</th>
<th>OUT FOR BID</th>
</tr>
</thead>
<tbody>
<tr>
<td>090-ENGINEERING BUILDING</td>
<td>5050 ANTHONY WAYNE DRIVE</td>
<td>ELECTRICAL RELIABILITY UPGRADES</td>
<td>WAYNE STATE UNIVERSITY FACILITIES PLANNING &amp; MANAGEMENT</td>
<td>5454 CASS AVENUE DETROIT MICHIGAN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JAS</td>
<td>CJM</td>
<td>RSD</td>
<td>SRB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SITE DEMOLITION KEY NOTES:

1. NITROGEN TANK & ASSOCIATED PIPING TO BE REMOVED BY OTHERS
2. REMOVE EXISTING PAVEMENT, CONCRETE PADS, FENCING & MISCELLANEOUS SITE ELEMENTS
3. REMOVE GUARD POST AS INDICATED ON PLAN
4. REMOVE EXISTING ASPHALT PAVING
5. PROTECT EXISTING GENERATOR & MAINTAIN IN CONTINUOUS OPERATIONAL CONDITION
6. REFER TO STRUCTURAL & ELECTRICAL DRAWINGS FOR BUILDING INTERFACE REQUIREMENTS
7. REMOVE APPROXIMATELY 12'-0" OF EXISTING STORM LINE FOR NEW MANHOLE & OIL STOP VALVE
8. FOR SITE DEMOLITION RECONSTRUCTION/MANUFACTURER'S PASSABLE LANE AND ACCESS TO PARKING AT ALL TIMES
9. EXISTING CONCRETE PAVEMENT TO REMAIN
10. EXISTING ASPHALT PAVING TO REMAIN
11. REMOVE PORTION OF EXISTING CURB
12. SAWCUT & REMOVE 6'-0" WIDE STRIP OF EXIST. CONCRETE SLAB. DO NOT DISTURB EXIST. ELECT. EQUIPMENT
13. EXISTING SHED STRUCTURE, WALL & SILANE STORAGE TO REMAIN.

PLAN NOTES:

1. SITE SURVEY PROVIDED AS REFERENCE BY NOWAK & FRAUS DATED 6-25-2014 IS USED AS A BASIS FOR SITE DEMOLITION, DESIGN & RESTORATION

SITE DEMOLITION PLAN

NORTH

SCALE 1/100

KEY PLAN

NORTH

SCALE N/A
PLANNED ACTIVITIES:
1. ENGINEERING BUILDING DEMOLITION
2. NEW ELECTRICAL PANEL INSTALLATION
3. NEW CONCRETE PAVERS INSTALLATION
4. NEW DUCT BANKS INSTALLATION

SITE SURVEY
- Provided by Nowak & Frous
- Dated 6-25-2014

BENCHMARK
- Existing storm catch basin rim to be modified = REF EL. 100'-0".

UNCHARTED UTILITIES
- May exist.
- Locations shown on the survey may vary from locations shown on the plans.
- Elevation data is unavailable for inverts & utility depths.
- Hand dig as necessary to avoid damage to existing utilities.

SITE RESTORATION PLAN
- Scale: 1/4" = 1'-0"
- Existing electrical gear to be removed.
- New electrical gear to be installed.
- New concrete paving to be installed.
- New duct banks to be installed.

KEY PLAN
- Scale: N/A
- Site work location for project

NOTE:
- Field verify depth of all existing underground utilities.
NEW 12" CMU WALL
NEW CONCRETE PAVEMENT
NEW CONCRETE PAVING 10'-0"
MANHOLE
NEW 8" STORM LEAD TO EXISTING MANHOLE
REPLACE CATCH BASIN GRATE WITH SOLID LID W/ GASKET BOLTED
1(17+0$1+2") GRATE & OIL STOP VALVE
SLOPE PAVING TO NEW CATCH BASIN/LOCAL LOW POINT (TYP.)
LOADING APPARATUS
NEW FENCE & GATE TO EXISTING BUILDING GROUNDING GRID
EXISTING DUCT BANK
NOTES:
1. TIE NEW GEN, ATS 4& 5, DUCT BANKS TO NEW DRIVEN GROUND ROD AND TO EXISTING FLD & BLDG. GROUNDING SYSTEM

NEW ELECTRICAL DUCT BANK

NEW 5000KVA 480V-4800V ATTS

NEW 1200A MV DRIVEN GROUND ROD
PENETRATE SIDE OF XFMR & ATS-5 & PROVIDE FOR TIGHT SEAL.

TO 600A MAIN DBC.
NOTES:
1. SHADED ROOMS / AREAS INDICATE NEW UPS CIRCUIT LOCATIONS TO SERVE EQUIPMENT LOADS.
2. REFER TO E102 THRU E103 FOR CIRCUIT AND PANEL SCHEDULES.
3. NEW CIRCUITS EXTEND FROM UPS PANELS (URP-1 AND URP-2) TO DESIGNATED LOADS THROUGHOUT THE ENGINEERING BUILDING.
4. EXPOSED SURFACE MTD RACEWAY SHALL BE SOLID WIRE DUCT WITH SNAP ON COVER.
5. COORDINATE WITH OWNERS-REP FOR DEVICE REQ'D TO MAKE CONNECTION TO USER EQUIPMENT.
6. COORDINATE WITH OWNERS-REP FOR EXACT LOCATION OF DEVICE TO BE INSTALLED.
7. CONDUITS ARE SHOWN DIAGRAMMATIC, EXACT ROUTING AND PENETRATION THROUGH CEILINGS AND WALLS SHALL BE COORDINATED WITH THE OWNERS REPRESENTATIVE.
8. VERIFY ALL ELECTRICAL LOADS FOR VOLTAGE AND AMPERAGE PRIOR TO MAKING CONNECTIONS. ORIGIN OWNERS REPRESENTATIVE.
9. FOR BID PURPOSES CONTRACTOR SHALL ASSUME 20' CABLE EXTENSION INTO EACH ROOM.
10. INSTALL 3.5 TON HVAC UNIT ON INSIDE WALL OF UPS ENCLOSURE.

ENLARGED PLAN DETAIL
SCALE: NTS

DETAIL "A"
SCALE: NTS

NOTES:
1. SHADED ROOMS / AREAS INDICATE NEW UPS CIRCUIT LOCATIONS TO SERVE EQUIPMENT LOADS.
2. REFER TO E102 THRU E103 FOR CIRCUIT AND PANEL SCHEDULES.
3. NEW CIRCUITS EXTEND FROM UPS PANELS (URP-1 AND URP-2) TO DESIGNATED LOADS THROUGHOUT THE ENGINEERING BUILDING.
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2. REFER TO E102 THRU E103 FOR CIRCUIT AND PANEL SCHEDULES.
3. NEW CIRCUITS EXTENDING FROM UPS PANELS (URP-1 AND URP-2) TO DESIGNATED LOADS THROUGHOUT THE ENGINEERING BUILDING.
4. COORDINATE WITH OWNERS REP FOR DEVICE REQ'D TO MAKE CONNECTION TO USER EQUIPMENT.
5. COORDINATE WITH OWNERS REP FOR EXACT LOCATION OF DEVICE TO BE INSTALLED.
6. CONDUITS ARE SHOWN DIAGRAMMATIC. EXACT ROUTING AND PENETRATION THRU FLOORS, CEILING AND WALLS ARE TO BE COORDINATED WITH THE OWNERS REPRESENTATIVE.
7. VERIFY ALL ELECTRICAL LOADS FOR VOLTAGE AND AMPERAGE PRIOR TO MAKING FINAL CONNECTION. NOTIFY OWNERS REPRESENTATIVE FOR ANY LOAD THAT DOES NOT COMPLY.
8. CORE DRILLING SHALL BE COORDINATED WITH OWNERS REPRESENTATIVE AND ACCOMPLISHED PER SPECIFICATIONS.
SEE DRAWING 103.1 FOR CONDUIT CABLE DETAILS

URP2-1,3
URP2-2,4
URP2-6,8
URP2-10,12

SEE CONDUIT RISER DIAGRAM ON DWG. E-106 FOR DIAGRAMATIC VIEW OF CONDUITS ENTERING THIS ROOM.

NEW FUSED DISCONNECT SWITCH
NEW TRANSFORMER
NEW PANEL URP-1

SEE DRAWING E-103 FOR CONDUIT AND CABLE DETAILS

URP2-2
URP2-1
URP2-4
URP2-5
URP2-7
URP2-6
URP2-8
URP2-9
URP2-10
URP2-11
URP2-12
URP2-13
URP2-14
URP2-15
URP2-16
URP2-17
URP2-18
URP2-19
URP2-20
URP2-21

CEILING CAVITY
MOUNTING BOX FOR CONNECTING DEVICE AS DIRECTED BY OWNER REPRESENTATIVE

V.I.F.

NOTES:
1. SHADED ROOMS / AREAS INDICATE NEW UPS CIRCUIT LOCATIONS TO SERVE EQUIPMENT LOADS.
2. REFER TO E102 THRU E103 FOR CIRCUIT AND PANEL SCHEDULES.
3. NEW CIRCUITS EXTEND FROM UPS PANELS (URP-1 AND URP-2) TO DESIGNATED LOADS THROUGHOUT THE ENGINEERING BUILDING.
4. VERIFY ALL ELECTRICAL LOADS FOR VOLTAGE AND AMPERAGE PRIOR TO MAKING FINAL CONNECTION. NOTIFY OWNERS REPRESENTATIVE FOR ANY LOAD THAT DOES NOT COMPLY.
5. CONDUITS ARE SHOWN DIAGRAMATIC. EXACT ROUTING AND PENETRATIONS THROUGH FLOORS AND CEILINGS ARE TO BE COORDINATED WITH THE OWNERS REPRESENTATIVE.
NEW PANEL URP-2
URP2-22/24
URP2-19/21
URP2-26/28
URP2-23/25
URP2-14,16
URP2-11/13
URP2-18/20
URP2-15/17
URP2-7,9
NEW TRANSFORMER
NEW FUSED DISCONNECT SWITCH
SEE CONDUIT RISER DIAGRAM ON DWG. E-106 FOR DIAGRAMATIC VIEW OF CONDUITS ENTERING THIS ROOM.
FOR CONDUIT AND CABLE DETAILS SEE DWG 103.1

NOTES:
1. SHAD ED ROOMS / AREAS INDICATE NEW UPS CIRCUIT LOCATIONS TO SERVE EQUIPMENT LOADS.
2. REFER TO E102 THRU E103.1 FOR CIRCUIT AND PANEL SCHEDULES.
3. CONDUITS ARE SHOWN DIAGRAMATIC. EXACT ROUTING AND PENETRATIONS THRU CEILINGS AND WALLS ARE TO BE COORDINATED WITH THE OWNERS REPRESENTATIVE.
### Major Equipment Panel Schedule & Cable/Conduit Schedule

#### Panel Schedule:

**URP-2**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Panel</th>
<th>Location</th>
<th>Model/Type</th>
<th>Manufacturer</th>
<th>Quantity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Phase 1</td>
<td>URP-2</td>
<td>Panel 1</td>
<td>URP-2</td>
<td>Siemens</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Phase 2</td>
<td>URP-2</td>
<td>Panel 2</td>
<td>URP-2</td>
<td>Siemens</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

#### Cable/Conduit Schedule:

**URP-2**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cable Type</th>
<th>Diameter</th>
<th>Length (ft)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel 1</td>
<td>3/8&quot; Conduit</td>
<td>1&quot;</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Panel 2</td>
<td>3/8&quot; Conduit</td>
<td>1&quot;</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

**NOTE A:** All equipment listed is assumed to be 80% of the load provided by the Regional Load-Order Chart. Contractor should verify all loads for design.

**NOTE B:** Conduit sizes and numbers shown are for planning purposes only and should be verified by contractor.

**NOTE C:** Conduit sizes are based on the Regional Load-Order Chart. Conduit sizes should be verified by contractor.

**NOTE D:** All cable types and sizes shown are for planning purposes only and should be verified by contractor.
<table>
<thead>
<tr>
<th>Circuit No.</th>
<th>Equipment (Volts)</th>
<th>Panel*</th>
<th>Load No.</th>
<th>Equipment Brand</th>
<th>Length (ft)</th>
<th>Voltage (Vac)</th>
<th>Load (kVA)</th>
<th>BMI (kVA)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>URP-1-03</td>
<td>Phase Cables</td>
<td>URP-1</td>
<td>3458</td>
<td>Network</td>
<td>80</td>
<td>120</td>
<td>1600</td>
<td>4-3/4</td>
<td></td>
</tr>
<tr>
<td>URP-1-04</td>
<td>Phase Cables</td>
<td>URP-1</td>
<td>3456</td>
<td>Network</td>
<td>80</td>
<td>120</td>
<td>1600</td>
<td>4-3/4</td>
<td></td>
</tr>
<tr>
<td>URP-1-05</td>
<td>Phase Cables</td>
<td>URP-1</td>
<td>3454</td>
<td>Network</td>
<td>80</td>
<td>120</td>
<td>1600</td>
<td>4-3/4</td>
<td></td>
</tr>
<tr>
<td>URP-1-06</td>
<td>Phase Cables</td>
<td>URP-1</td>
<td>3453</td>
<td>Network</td>
<td>80</td>
<td>120</td>
<td>1600</td>
<td>4-3/4</td>
<td></td>
</tr>
<tr>
<td>URP-1-07</td>
<td>Phase Cables</td>
<td>URP-1</td>
<td>3452</td>
<td>Network</td>
<td>80</td>
<td>120</td>
<td>1600</td>
<td>4-3/4</td>
<td></td>
</tr>
<tr>
<td>URP-1-08</td>
<td>Phase Cables</td>
<td>URP-1</td>
<td>3451</td>
<td>Network</td>
<td>80</td>
<td>120</td>
<td>1600</td>
<td>4-3/4</td>
<td></td>
</tr>
<tr>
<td>URP-1-09</td>
<td>Phase Cables</td>
<td>URP-1</td>
<td>3450</td>
<td>Network</td>
<td>80</td>
<td>120</td>
<td>1600</td>
<td>4-3/4</td>
<td></td>
</tr>
<tr>
<td>URP-1-10</td>
<td>Phase Cables</td>
<td>URP-1</td>
<td>3449</td>
<td>Network</td>
<td>80</td>
<td>120</td>
<td>1600</td>
<td>4-3/4</td>
<td></td>
</tr>
</tbody>
</table>

*Uninterruptible Receptacle Schedules

CABLE / CONDUIT SCHEDULE FOR PANEL URP-1

**Note:** Circuits are listed in order of their importance. The essential circuits are marked with an asterisk (*) and are shown in the table. The circuits are not connected in parallel, and they are grouped accordingly. The total load is calculated as the sum of all the loads. The BMI (kVA) is determined by dividing the total load by the voltage. The notes indicate any special considerations or requirements for each circuit.
### Cable / Conduit Schedule for Panel URP-2

<table>
<thead>
<tr>
<th>Cat</th>
<th>Phase/Conduit</th>
<th>Description</th>
<th>&quot;Power&quot;</th>
<th>&quot;TN&quot;</th>
<th>Load (kW)</th>
<th>Equipment Brand</th>
<th>Length (ft)</th>
<th>Voltage (V)</th>
<th>Load (kW)</th>
<th>RPM (RPM)</th>
<th>Conduct Wire/Conduit Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>URP-2-1</td>
<td>2-Phase Conduit</td>
<td>1-gross</td>
<td>URP-2-2</td>
<td>3000</td>
<td>400</td>
<td>Siemens</td>
<td>280</td>
<td>480</td>
<td>206</td>
<td>480</td>
<td>2&quot; EMT - Circuits to be combined</td>
</tr>
<tr>
<td>URP-2-3</td>
<td>2-Phase Conduit</td>
<td>1-gross</td>
<td>URP-2-2</td>
<td>3000</td>
<td>400</td>
<td>Siemens</td>
<td>280</td>
<td>480</td>
<td>206</td>
<td>480</td>
<td>2&quot; EMT - Circuits to be combined</td>
</tr>
<tr>
<td>URP-2-5</td>
<td>2-Phase Conduit</td>
<td>1-gross</td>
<td>URP-2-2</td>
<td>3000</td>
<td>400</td>
<td>Siemens</td>
<td>280</td>
<td>480</td>
<td>206</td>
<td>480</td>
<td>2&quot; EMT - Circuits to be combined</td>
</tr>
<tr>
<td>URP-2-24</td>
<td>2-Phase Conduit</td>
<td>1-gross</td>
<td>URP-2-2</td>
<td>3000</td>
<td>400</td>
<td>Siemens</td>
<td>280</td>
<td>480</td>
<td>206</td>
<td>480</td>
<td>2&quot; EMT - Circuits to be combined</td>
</tr>
<tr>
<td>URP-2-308</td>
<td>2-Phase Conduit</td>
<td>1-gross</td>
<td>URP-2-2</td>
<td>3000</td>
<td>400</td>
<td>Siemens</td>
<td>280</td>
<td>480</td>
<td>206</td>
<td>480</td>
<td>2&quot; EMT - Circuits to be combined</td>
</tr>
<tr>
<td>URP-2-19</td>
<td>2-Phase Conduit</td>
<td>1-gross</td>
<td>URP-2-2</td>
<td>3000</td>
<td>400</td>
<td>Siemens</td>
<td>280</td>
<td>480</td>
<td>206</td>
<td>480</td>
<td>2&quot; EMT - Circuits to be combined</td>
</tr>
<tr>
<td>URP-2-1901</td>
<td>2-Phase Conduit</td>
<td>1-gross</td>
<td>URP-2-2</td>
<td>3000</td>
<td>400</td>
<td>Siemens</td>
<td>280</td>
<td>480</td>
<td>206</td>
<td>480</td>
<td>2&quot; EMT - Circuits to be combined</td>
</tr>
<tr>
<td>URP-2-2201</td>
<td>2-Phase Conduit</td>
<td>1-gross</td>
<td>URP-2-2</td>
<td>3000</td>
<td>400</td>
<td>Siemens</td>
<td>280</td>
<td>480</td>
<td>206</td>
<td>480</td>
<td>2&quot; EMT - Circuits to be combined</td>
</tr>
<tr>
<td>URP-2-2301</td>
<td>2-Phase Conduit</td>
<td>1-gross</td>
<td>URP-2-2</td>
<td>3000</td>
<td>400</td>
<td>Siemens</td>
<td>280</td>
<td>480</td>
<td>206</td>
<td>480</td>
<td>2&quot; EMT - Circuits to be combined</td>
</tr>
</tbody>
</table>

### Notes
1. All wires in the "Power" column are to be #2 AWG solid copper unless noted. The "TN" column is for single-phase systems only.
2. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
3. "Power" and "TN" columns are for single-phase systems only.
4. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
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29. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
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33. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
34. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
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42. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
43. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
44. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
45. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
46. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
47. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
48. Conduit sizes are determined by the NEC and are not required to match the conduit schedule.
TO EXISTING 2000 KVA PAD MTD TRANSFORMER
TO EXISTING 1000KVA PAD MTD XFMR
EXISTING UNDERGROUND 9'6 (59, 52, 60)
PLD UTILITY SWITCHGEAR RM.
SEE DWG. E-104
NEW 1200A ATS-5
BSMT LVL
1ST FLR
2ND FLR
3RD FLR
NEW 400A BUS PLUG-IN DISCONNECT
UPS ENCLOSURE AUX LOADS (HVAC, LIGHTING, H2 VENTING)
NEW 100A PLUG-IN DISCONNECT (E-0)
REPLACE W/ NEW CABLE FROM PLD B
TOSHIBA UPS SYSTEM (E-106) EXIST.
SWITCH
NEW 2000KW KVA XFMR. SET UP TRANSFORMER CONNECTION TO NEW ATS-5 TRANSFER SWITCH 9'+6=1'
3-1/2KV, 350KCMIL W/#2 GNDS
9'6 (59, 52, 60)
U
RM. 3354
URP2-7,9
PANEL
112 kVA TRANSFORMER
480V PRI - 208 / 120V SEC
200A, 3P DISCONNECT FUSED AT 180A
3000 KVA
480V, 3PH
UPS TO DISCONNECT SWITCH ON EXIST. BUS DUCT (E-105.1)
1-2" C-3 #3/0, #6 GND
2" C-3 #350, 1# GND
(2) 2" C-4 # 4/0, 1# GND
MOUNTING CHANNEL
NOTE 2 (TYP.)
OVERSIZED WIRE FOR VOLTAGE DROP
J-BOX WITH COVER PLATE (SIZE FOR APPLICATION)
POWER BLOCK WITH WIRE RANGE OF #2 - #14 FOR LINE AND LOAD
#10 AWG FOR 20A & 30A BREAKER & LOADS
#8 AWG FOR 50A BREAKERS & LOADS
NOTE 2 (TYP.)
FILE NAME:
C:\pw_work\pw_proj\jashinn\d0399695\E-20.dwg
PLOTTED DATE:
8/22/2014 3:51 PM
PLOTTED BY:
Joseph A. Shinn

NOTES:
1. RISER DIAGRAM IS DIAGRAMATIC REPRESENTATION ONLY. SEE PLAN DRAWINGS E-0, E-1, E-2 AND E-3 FOR GENERAL CONDUIT ROUTING. EXACT INSTALLATION TO BE DETERMINED BY CONTRACTOR AND OWNERS REPRESENTATIVE.
2. MOUNTING CHANNEL AND FITTINGS LOCATED AND SIZED AS REQUIRED FOR COMPLETE CONDUIT INSTALLATION SUPPORT FOR CONDUIT NOT TO EXCEED 10'-0" BETWEEN SUPPORTS AND NOT TO EXCEED MORE THAN 3'-0" FROM CONDUIT TERMINATION POINTS SUCH AS DEVICE BOXES, J-BOXES, ETC. (TYPICAL)
3. SEE PANEL & CABLE/CONDUIT SCHEDULE FOR CABLE & CONDUIT SIZES PER CIRCUIT.
Customer Utility Supply

Primary AC Input
480V, 3Ph/4W, 60Hz

Customer supplied wiring

Battery Cabinet with Main Breaker

360VDC Nominal

Output
480Y/277V
3Ph/4W, 60Hz, 300 kVA

NOTES:
1) This drawing is for illustration purposes only and is subject to change without notice. TIC is not responsible for any errors or omissions.
2) Interconnections between battery cabinets are provided by others at installation.
1) This drawing is for illustration purposes only and is subject to change without notice. TIC is not responsible for any errors or omissions.
2) UPS enclosure type: NEMA 1 Free-standing.
3) Approximate overall weight: 4,400 Lbs. (2,000 kg)
4) Approximate FL heat loss: 61,680 Btu/Hr (18 kW)

TOSHIBA INTERNATIONAL CORPORATION
Houston Texas, USA

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DATE 05/20/04

T80S3K-300KVA

1.0