Scope
This electrical design guide shall only be used under the direction of the Homeless Facilities and Special Projects Division, for temporary homeless shelters. This document can be modified by BOE, for use with permanent homeless facilities. Please contact the Homeless Facilities and Special Projects Division Electrical Engineer (HFD-EE) for clarification.

Purpose
The purpose of this document is to optimize the electrical design, construction, and delivery of all temporary homeless shelter projects.

General Specifications
1. MEP Coordination and Construction Forces
   a. BOE MEP, MEP Consultant, and Construction Forces shall meet in the pre-design phase to discuss the overall method of approach, lowest cost construction method, and fastest material procurement times. BOE MEP shall provide overall guidance. A 50% CD and 90% CD shall be reviewed and approved by the BOE-MEP Engineers.

2. LADWP Electric Services
   a. A new LADWP Electric Service Planning Information (SPI) Form shall be completed if installing a new electric service or upgrading an existing electric service. This shall be completed immediately, since it has the potential of being the longest lead item. The lead time is difficult to control, since LADWP will need to assess/upgrade their infrastructure.

   b. Typically, a complete SPI package is sent directly to LADWP. For all temporary homeless shelter projects, BOE will be facilitating the application process, to expedite and track the overall progress of LADWP, and the MEP Consultant. The MEP Consultant shall provide to BOE, in one complete electronic package via email, the following items:
      i. Completed and signed, LADWP Service Planning Information Form.
         1. To complete the form, use Navigate LA and Zimas, to research all information. All incomplete forms will not be accepted.
      ii. AutoCAD file of
         1. The site plan
         2. Existing and new meters, transformers, etc…
         3. Building elevations
         4. Single line diagram
         5. Panel schedule(s)
      iii. A PDF of the site electrical distribution system, single line diagram, riser diagrams, and elevations of switchgear.
      iv. All LADWP requirements can be found in the LADWP Commercial Service Construction Standards, and the LADWP Electrical Service Requirements. The MEP Consultant shall coordinate all required clearances with the Architect for design and overall site layout. All clearances, and dimensions, shall be clearly indicated on the electrical plans.
1. All LADWP requirements are posted on their website under “Codes and Specifications”.

2. Reference: LADWP 0A006-01, LADWP C702-50, LADWP C721-01, LADWP H-242, LADWP UB721-(03) and (07) and (09), and (12) and (16) and (17) and (29) and (32), LADWP UB730-01

c. Once a complete package has been submitted to BOE. BOE will coordinate the application process with the LADWP Electrical Design Engineer. BOE will have LADWP post the maximum short circuit fault current at the meter on WMIS before an official LADWP Service Commitment Letter is issued for the project.

d. The MEP Consultant shall finalize the site electric power distribution system and obtain and electrical ready to issue set, with all variances from LADBS. The site electric power distribution system shall be used by the Contractor to procure all materials and begin the site underground electrical distribution system construction.

e. The final electrical design set shall not exceed the capacity of the underground site electrical distribution system that was proposed in the electrical ready to issue set.

3. **Electrical Power Distribution System**
   a. Avoid the use of battery inverter systems, or a centralized emergency power distribution system, unless it is a more cost effective solution. Cost effectiveness shall be analyzed by the Electrical Consultant, in the form of a report, indicating material and labor costs based on local rates. This report shall be submitted to BOE for review and approval.

   b. A 3-phase, 4-wire, 480V distribution system shall be provided to the site for all temporary homeless shelters. A different voltage distribution system is permitted if it will reduce cost by using an overhead electric feed, pending LADWP pre-approval. Please consult with the HFD-EE during the design phase.

   c. A service rated electrical panel or a service rated disconnect, shall be provided to each building, in accordance with the LAEC/CEC/NEC.

   d. Coordination of site utilities shall be done during the design phase (i.e. sewer, water, fire). All required clearances of electrical equipment shall be indicated using dimensions on the electrical plans. Specific attention shall be given to utility transformers, transformer staging areas, transformers in relation to egress routes and building openings, HVAC clearances, and electrical panel clearances in the vicinity of walkways.

   e. Provide tamper proof receptacles.

   f. Provide AFCI receptacles in all sleeping spaces, and as required by the LAEC/CEC/NEC.

   g. Provide GFCI receptacles as required by the LAEC/CEC/NEC.

   h. MC Cables shall be permitted for use, when protected inside of walls or located above ceilings.

4. **Methane Zones and Methane Buffer Zones**
   a. Methane mitigation shall be implemented for the electrical system in Methane Zones and Methane Buffer Zones. LADWP methane mitigation shall also be implemented, as required by LADWP.
5. **Lighting**
   a. All lighting shall be designed in accordance with the current IES recommended illumination levels.
   b. Although Title 24 plan check and compliance is exempt for Temporary Homeless Shelters. The following guidelines shall be used:
      i. Use Title 24, as a basis for indoor lighting design, with respect to wattage per square foot allowances.
      ii. All interior lighting shall be LED and be dimmable. All enclosed spaces shall be controlled via a on/off/dimmable switch with integrated occupancy sensor. All open spaces inside of the buildings shall utilize on/off/dimmable switches.
      iii. Use Title 24, as a basis for exterior lighting design with respect to wattage allowances; and controlled via an astronomical time clock, or a time clock with a photocell.
   c. Color Temperatures:
      i. Select one color temperature, for the entire site, for all interior lighting.
      ii. Select one color temperature, for the entire site, for all exterior lighting.
   d. Photometrics
      i. Provide normal lighting photometrics on the electrical plans.
      ii. Provide emergency lighting photometrics on the electrical plans for interior and exterior emergency egress lights.
   e. Exterior Lighting:
      i. When possible, mount all exterior lighting to the exterior of the buildings, instead of utilizing site pole lights. If site pole lights are used, the Electrical Consultant shall provide proof to BOE, of a quantifiable cost savings amount.
      ii. All exterior lighting shall comply with BUG ratings.
   f. Alternate light fixtures shall be approved by the HFD-EE prior to use. For approval, the Electrical Consultant shall submit the lighting specification sheet, budget pricing, and lead time to the HFD-EE for review. Allow a minimum of three working days for review.
      i. A priority shall be given to minimize material and installation cost.
   g. Exit Signs
      i. Interior/exterior exit signs shall be designed along the egress path, in accordance with state and local codes.
   h. Obtain budget pricing during the design phase, and submit a total lighting and/or lighting system quote to BOE for review. This shall occur a minimum of three weeks before an electrical RTI set is to be submitted to BOE. Set target cost of less than $5 per square foot of indoor space, for all lighting in the project.

6. **Modular Furniture**
   a. All circuits will be AFCI protected at the electrical panel using a single phase AFCI protected breaker (Square D Catalogue #QOB120CAF1, $76.50/Each, 7-10 day lead time or equivalent). Sharing of neutral wires between two different circuits is not permitted.
   b. Provide tamper proof receptacles, when 120V receptacles are specified.
   c. USB only receptacles shall be provided for use in the modular furniture.
d. The 120V general use receptacles, in the sleeping areas, shall be capable of being turned off via a switch. The switch shall be located at an area only accessible to operations staff or shall be key switch operated. The breaker at the panel cannot be used as the switch.

e. A minimum of one floor mounted junction box shall be provided to each group of modular beds (maximum of 16 beds). If a wall is provided at the end of the furniture run, then a wall mounted junction box is permitted. The junction box shall be concealed beneath the modular bed. The floor mounted junction box shall be located one foot away from all nearby walls, to allow for a sufficient bending radius for the modular furniture interface cable.

f. The modular furniture has an integrated electrical distribution system utilizing the Byrne 4-Trac system. The Byrne 4-Trac system has two hots and one neutral. The two hots shall be supplied from the same circuit, for each island of beds.

g. The electrical demand for each modular bed, as of date, is as follows:
   i. SpotMod Tile LED: 4 Watts
   ii. Byrne Retrofit USB (BEM03844-C-72): 20 Watts

7. Sprung Structure
   a. A building automation system (BAS) shall not be specified for the project.
   b. Dimmable high bay LED lights shall be used for general area lighting in the open spaces. The high bay lights shall be cord connected, and powered from a twist lock receptacle or hard wired to a junction box. The dimmable high bay LED light shall be mounted using a hook/loop method to the Sprung structure main frames, from a standard Sprung structure hanging bracket. The Sprung structure’s frames are located every fifteen feet.

8. Greenheck Exhaust Fans and Intake Louver System (Sprung Structure)
   a. Each Sprung Structure shall have a PLC based motor controller by Multi W Systems. “Triplex(or Quadruplex) Motor Starter with 6(or 8) Louvers”.
      i. Each Sprung Structure shall have a maximum of 4 exhaust fans, and a maximum of 8 intake louvers. A minimum of 1 exhaust fan, and a minimum of four intake louvers shall be provided for each Sprung Structure.
      ii. A minimum intake louver free flow area of 7.56 square feet shall be provided for each operating 5,000 cfm exhaust fan.
      iii. The intake louvers are electrically actuated, by Belimo, Catalogue #FSLF120 US.
      iv. Only one exhaust fan is permitted to be operating at a time. This will help with reducing the transformer size.
      v. The remote start/stop switches shall be located in a staff office, or a staff administration room.
      vi. The motor controller shall be located in a room that does not contain a mop sink or water heater. The motor controller is permitted to be installed outdoors.
b. The Greenheck Exhaust Fan(s) shall be electrically interlocked with the HVAC System, Fire and Smoke Detection System, and any other system, as required for a LAFD/LADBS Certificate of Occupancy.

c. Greenheck Exhaust Fans is by Baldor Reliance, Catalogue #L3516T. Operating voltage of 120V or 240V.

9. Modular Buildings

a. Provide a minimum of two (208V, 30A, 4500 watt) receptacles, for the future kitchen equipment in the food preparation area.

b. Provide a minimum of ten (120V, 20A, 1900 watt) receptacles, for the future kitchen equipment in the food preparation area.

c. The modular buildings shall be provided with outdoor junction boxes (one hot (always on), one switched hot (ATC controlled), one neutral, one ground), that can be used with exterior egress lighting using emergency battery packs, and for battery powered emergency exit signs.
   i. The junction boxes and wiring shall be provided by the modular building manufacturer.
   ii. The lighting fixtures and exit signs shall be specified by the site Electrical Engineer.
   iii. The site egress lighting and exit signs shall be in the scope of the site Electrical Engineer.

10. Exterior Shade Structure Heater

a. Manufacturer: Infratech
   i. WD-30 Heater (Part #21-2030, Model #WD-3027 SS)
      1. Recommended mounting height: 7FT to 9FT
      2. Approximate coverage at mounting height: 7FT by 7FT
      3. Sample application 1: Heaters configured 6-6
         b. Quantity: 1 of Part #30-4056 (6 Relay Panel, 480V, 3Ph, 55A).
         c. Quantity: 1 of Part #30-4046 (2 Zone Analog Control with Digital Timer).
         d. Each WD-3027 SS Heater will have a dedicated 15A, single pole circuit breaker.
      4. Sample application 2: Heaters configured 8-8
         b. Quantity: 1 of Part #30-1100 (8 Relay Panel, 480V, 3Ph, 75A).
         c. Quantity: 1 of Part #30-4046 (2 Zone Analog Control with Digital Timer).
         d. Each WD-3027 SS Heater will have a dedicated 15A, single pole circuit breaker.
   ii. WD-40 Heater (Part #21-2130, Model #WD-4027 SS)
      1. Recommended mounting height: 8FT to 12FT
      2. Approximate coverage at mounting height: 8FT by 10FT
      3. Sample application 1: Heaters configured 6-6
a. Quantity: 12 of Part #21-2130 (WD-4027 SS Heater).
b. Quantity: 1 of Part #30-4056 (6 Relay Panel, 480V, 3Ph, 75A).
c. Quantity: 1 of Part #30-4046 (2 Zone Analog Control with Digital Timer).
d. Each WD-4027 SS Heater will have a dedicated 20A, single pole circuit breaker.

4. Sample application 2: Heaters configured 8-8
b. Quantity: 1 of Part #30-1100 (8 Relay Panel, 480V, 3Ph, 100A).
c. Quantity: 1 of Part #30-4046 (2 Zone Analog Control with Digital Timer).
d. Each WD-4027 SS Heater will have a dedicated 20A, single pole circuit breaker.

iii. Any other configuration, as recommended by the Infratech manufacturer, is permitted.

11. List of electrical equipment pre-approved for use.
   a. Switches
      i. Lutron Diva Dimmer and Switch Series
      ii. Lutron Maestro Dimmable Switch Series with integrated on/off and integrated vacancy sensor. 0-10V LED Dimmer or Electronic Low Voltage (ELV) Dimmer.
   b. Astronomical Time Clock
      i. Intermatic: ET8000 or ET9000 Series
      ii. Tork: EWZ201C Series
   c. Indoor and Outdoor Lighting

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Catalogue Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMF</td>
<td>DRDHNJO, DRD5S4R10930</td>
</tr>
<tr>
<td>DMF</td>
<td></td>
</tr>
<tr>
<td>Amerlux</td>
<td>GRUV1.5-GB-A16-PL-10-30-HW-120/277-2-IND-0-10V</td>
</tr>
<tr>
<td>Dual Lite</td>
<td></td>
</tr>
<tr>
<td>ConTech</td>
<td>LPU2121-BZ, LPAOCC-BZ</td>
</tr>
<tr>
<td>Columbia</td>
<td>LZPT22-40MLSM-LSRS-E</td>
</tr>
<tr>
<td>ConTech</td>
<td></td>
</tr>
<tr>
<td>Beacon</td>
<td>TRV-D/24L-27/3K7/3/UNV/MOB/15S/33-20F/XXX</td>
</tr>
<tr>
<td>Hubbell</td>
<td>LBX2-MO-1-35K-A2-CD1-BL-C4HLP20A-WW22</td>
</tr>
<tr>
<td>OCL</td>
<td>VA2-S1SA-08-WF-BKP-2LD15/35K-120-DMO</td>
</tr>
<tr>
<td>Dual Lite</td>
<td></td>
</tr>
<tr>
<td>Evenlite</td>
<td>RZR3-EM-R-1-BA-1B-SD</td>
</tr>
</tbody>
</table>