At the March 20, 2019, Building Codes Committee meeting, the committee reviewed and discussed draft model plans developed by the Salt River Project for installation of electric vehicle chargers at residential units.

At the April 17, 2019, meeting, the committee voted to recommend approval of the final version of the plans and make them available to any member agency that wants to use and distribute them as needed.
FAULT CURRENT CALCULATIONS

ONE-LINE GENERAL NOTES

1. This electrical system shall be a U.L. listed wiring circuit.
2. Published available fault current from service utility = 21,188 amperes.
3. Motor fill factor does not exceed 85% of the interrupt rating of down stream A.C. system-rated device.
   Worst case down stream A.C. rating = 10,000 amperes.
   Worst case total motor full load amps < 50 amperes.
4. No design changes may be made to this system without approval of the authority having jurisdiction. This system shall be installed exactly as indicated on these plans.
5. Provide labels for each series/paddle wired panelboards as indicated below in accordance with NEC #810.22
6. Panels, switches, contractors, terminations and all internal components of all panelboards, panelboards and load centers shall be fully braced for the available fault current available at the terminals of the equipment. Refer to ratings specified, for these documents, apply equally to the equipment panels installed therein unless noted otherwise.

Permissible substitution of a currently rated circuit breaker system is allowable provided the panelboards and circuit breakers are rated in available fault current as indicated on this sheet and labeled as a "fully-rated system".

This proposed addition/alteration will not cause the existing system to become unsafe or create an unhealthy or overloaded condition.

SERVICE EQUIPMENT RATING INFORMATION

CAUTION

SINCE RATED SYSTEM

21,188 AMPS AVAILABLE

INCREASED REPAIR

COMPONENTS REQUIRED

PANEL RET

PROPERY ADDRESS

BCAS #18

CALCULATIONS

DO NOT USE - FOR REGULATORY APPROVAL ONLY
**RESIDENTIAL LOAD CALCULATION**

**USING THE OPTIONAL METHOD PER NEC 220.82**

**LIGHTING CALCULATION (LOAD 1):**

**LIVEABLE SQUARE FOOTAGE OF THE HOME:**

**HOME SQUARE FOOTAGE MULTIPLIED BY 3 VA PER SQUARE FOOT:**

**FIXED LIGHTING LOADS:**

(1) BATHROOMS
(1) KITCHEN
(1) EXTERIOR
(1) RECESSED LTG
(1) GARAGE
(1) CEILINGS FANS (60 WATTS EACH)
(1) CEILINGS FANS WITH LIGHT (240 WATTS EACH)
(1) OTHER

**TOTAL LIGHTING LOAD:**

**NOTE (a) APPLIANCE OR CIRCUIT**

<table>
<thead>
<tr>
<th>Appliance or Circuit</th>
<th>Number of Units (T)</th>
<th>VA (EA)</th>
<th>TOTAL VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMALL APPLIANCE CIRCUITS</td>
<td>1,500</td>
<td>1,500</td>
<td></td>
</tr>
<tr>
<td>DISHWASHER</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISPOSAL</td>
<td>760</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MICROWAVE</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OVEN RANGE</td>
<td>8,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAUNDRY CIRCUIT</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLOTHES DRYER</td>
<td>5,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATER HEATER</td>
<td>4,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COOKTOP</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WASHER/DRAWER</td>
<td>5,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPA TUB</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEDICATED REFRIGERATOR CIRCUIT</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEDICATED FREEZER CIRCUIT</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POOL MOTOR</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POOL HEATER</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POOL LIGHT</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL OF ALL LOADS FROM ABOVE:**

**FINAL LIGHTING LOAD CALCULATION**

FIRST 10,000 VA OF THE ABOVE LIGHTING LOAD AT 100%: 10,000

REMAINDER OF THE ABOVE LIGHTING LOAD AT 40%: 4,000

**TOTAL LIGHTING LOAD (LOAD 3):**

**HEATING/AIR CONDITIONING (LOAD 2):**

**NOTE (a) APPLIANCE OR CIRCUIT**

<table>
<thead>
<tr>
<th>Appliance or Circuit</th>
<th>Number of Units (T)</th>
<th>VA (EA)</th>
<th>TOTAL VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROOF TOP UNIT 1 (PACKAGED UNIT)</td>
<td>1,500</td>
<td>1,500</td>
<td></td>
</tr>
<tr>
<td>ROOF TOP UNIT 2 (PACKAGED UNIT)</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONDENSING UNIT 1</td>
<td>760</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONDENSING UNIT 1</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIR HANDLER 1</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXHAUST FAN</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL OF HEATING/AIR CONDITIONING LOAD (LOAD 2):</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OTHER LOADS (LOAD 3):**

**NOTE (a) OTHER LOADS NOT SHOWN ABOVE AT 18%**

**NOTE (a) OTHER LIST:**

<table>
<thead>
<tr>
<th>Other Load</th>
<th>Number of Units (T)</th>
<th>VA (EA)</th>
<th>TOTAL VA</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTHER LIST</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL OF OTHER LOADS (LOAD 4):**

**TOTAL LIGHTING LOAD (LOAD 2 FROM ABOVE):**

**TOTAL HEATING/AIR CONDITIONING LOAD (LOAD 2 FROM ABOVE):**

**TOTAL OTHER LOADS (LOAD 3 FROM ABOVE):**

**TOTAL PROJECT LOAD IN VOLT AMPERES (VA):**

CONVERT VOLT AMPERES TO AMPERES

VOLT AMPERES DIVIDED BY 208 VOLTS = AMPERES @ 208 VOLTS

**TOTAL AMPERES - THIS SERVICE:**

**FOOTNOTES (a):**

1. USE THE SUM OF ALL VOLT AMPERES AT 100% OF THE LIGHTING LOAD.
2. EACH HOUSE SHALL HAVE A MINIMUM OF TWO SMALL APPLIANCE CIRCUITS BUT MAY HAVE MORE THAN TWO.
3. USE ACTUAL APPLIANCE VA (WATTS OR VOLTS/RMS) WHERE POSSIBLE.
4. IF A GAS APPLIANCE, PLEASE MARK AS "NG" IN CALCULATION TO ASSIST IN THE PERMIT PROCESS.
5. MAY NOT APPLY. PLEASE MARK AS "NO" TO ASSIST IN THE PLAN REVIEW PROCESS.
6. THESE APPLIANCES MAY BE SUPPLIED BY THE SMALL APPLIANCE BRANCH CIRCUIT. WHERE THIS OCCURS, PLEASE SHOW THE LOAD AS "NL" TO ASSIST IN THE PLAN REVIEW PROCESS.
7. WHERE MORE THAN ONE APPLIANCE OR PIECE OF EQUIPMENT IS PRESENT, MULTIPLY BY THE APPROPRIATE NUMBER OF UNITS.
8. USE THE MINIMUM CIRCUIT AMPLI TICITY (MCA) OF UNIT FOR THE CALCULATIONS UNLESS A TOTAL AMPER LOAD IS LISTED.
Submittal Package Instructions

The MAG Model Plan may be used to assist your Customer or Electrical Contractor in obtaining proper permits for a legal and safe installation of a Level 2 Electrical Charger in a single family home.

PROVIDE THE FOLLOWING:

1. MAG Model Plan – Utilize the Model plan to evaluate your existing electrical service and to perform the load calculation required by the building department of the jurisdiction where the single family home is located.

2. EV Charger Installation Documents – Provide the installation documents from the charger you intend to install.

3. Provide the correct square footage of the existing home per the Maricopa County Assessors website: Maricopa County Assessor’s Office

4. Provide a plot plan showing the property with a simple floor plan. Use this to show:
   a. Location of Service Entrance Section (SES)
   b. Route of conduit from SES to location of EV Charger.
   c. Note conduit length from SES to location of EV Charger.
   d. Note conductor size selection.
   e. Note height of charger between 15” min. and 48” max. above the finish floor.

5. Provide contractor license info and home owner information.