SECTION 16211

ELECTRICITY METERING GUIDELINES

PART 1  GENERAL

1.1 SYSTEM DESCRIPTION: Provide digital revenue meters on all new electrical services including alternate sources, emergency, and on-site generator transfer switches (See ES-12). Stanford has adopted a proprietary data acquisition system which operates only with the meters that are compatible with the ION system designed and manufactured by Schneider/Square D(www.powerlogic.com/). Different models are required for different application as described below.

Exception 1: Self contained, socket type meters may be accepted for outdoor services up to 200 amperes. Contact Project and Power Systems Manager for approval.

Exception 2: Non-standard meters may be accepted for specific indoor sub-metering applications. Contact the Project and Power Systems Manager for approval.

1.2 PHYSICAL LAYOUT:

A. Make provisions for removal of electronic meters without interrupting power to the load.

B. Provide current transformer shorting switches. Terminal blocks with shorting pins are not acceptable.

C. Provide disconnect switches or pull-out fuse holders for voltage inputs and control power.

D. Refer to drawings ES-22 and ES-23 for applicable wiring.

1.3 CURRENT TRANSFORMERS

Provide current transformers for all meters.

1.4 VOLTAGE TRANSFORMERS

Provide voltage transformers with 120 volt outputs for all service voltages above 208Y/120. See drawing ES-23.

1.5 CONSTRUCTION SITE TEMP POWER METERING

Provide socket type meter for construction power system switchboard in construction site. Installation must be approved by Stanford High Volt Shop.
PART 2  PRODUCTS

2.1  METERS

A. Meter applications are listed in the following table, Appendix A “Electrical Meter Applications”

B. Where approved, self-contained socket type meters for services up to 200 amperes for 120/240 Volt, single phase, and 208Y/120 Volt, three phases, shall be Class 200. Single-phase meters shall be four (4) terminal, Form 2S. Poly-phase meters shall be seven (7) terminal, Form 14S or Form 16S.

2.2  CURRENT TRANSFORMERS:

A. Provide three ANSI metering class current transformers with 0.3 percent accuracy. Select the ratio to produce five (5) amps at eighty percent (80%) of the ampere rating of the service. (Example 800 to 5 for a 1000 Amp service).

B. Provide current transformer shorting switches (States type MTS or approved equal) in an accessible location adjacent to meter. Shorting switches shall be mounted on the outside of the metering compartment, with removable cover.

2.3  VOLTAGE TRANSFORMERS:

A. Provide three ANSI metering accuracy (Class .6X) potential transformers with ratio 2.4 to 1 for metering on 480Y/277 Volt systems. Control power to the digital meter may be taken from the voltage transformer secondary at 120 Volt only. For meter model ION 7330 or 7550, contractor shall provide UPS or emergency power system for backup power.

B. Provide pull-out fused disconnects on the primary and secondary voltage leads. Fuse holders for PT’s shall be mounted at the front of the metering compartment for ease and safety of fuse replacement.

PART 3  EXECUTION

3.1  GENERAL

A. Mounting heights above the bottom of the enclosure: Sixty inches (60 in.) maximum; fifty-eight inches (58 in.) minimum. (It is anticipated that the meter will actually be sixty-four inches (64 in.) above the floor, accounting for approx . 4 inch of concrete pad).

B. Where more than one digital meter is installed (such as double ended switchgear), connect the communications terminals together with a shielded twisted pair and terminate on an accessible terminal block according to the meter Manufacturer’s instructions.
C. Install the meters strictly according to the meter Manufacturer’s instructions. Meters, instrument transformers, and accessories shall be furnished, installed, wired, and tested by the switchboard Manufacturer.

D. Ground the digital meter to the switchboard ground bus. Door hinges shall not be used for the ground path.

E. Mark current and voltage transformer ratios on the switchboard with permanent engraved nameplates.

F. Meter wiring shall be neatly bundled with tie wraps, supported, and properly marked with approved wire marker.

END OF SECTION
# Appendix A
## ELECTRICAL METER APPLICATIONS

<table>
<thead>
<tr>
<th>SERVICE TYPE</th>
<th>TRANSFORMER KVA</th>
<th>METER MODEL</th>
<th>ALTERNATE METER MODEL (CONTACT UTILITIES FOR APPROVAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Service Panel</td>
<td>+/- 50 kVA</td>
<td>ION 7330</td>
<td>Socket Type Meter</td>
</tr>
<tr>
<td>Up to 200 Amp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pad Mounted Outdoor</td>
<td>200 to 2500 KVA</td>
<td>ION 7330</td>
<td>None</td>
</tr>
<tr>
<td>Single Main Switch Panel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400 to 3000 Amp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Ended Substation</td>
<td>200 to 2500 KVA</td>
<td>ION 7330</td>
<td>If electrical system requires the monitoring of power</td>
</tr>
<tr>
<td>400 to 3000 Amp</td>
<td></td>
<td></td>
<td>quality then use Model: ION 7550</td>
</tr>
<tr>
<td>Double Ended Substation</td>
<td>200 to 2500 KVA</td>
<td>Left ION 7550</td>
<td>None</td>
</tr>
<tr>
<td>800 to 4000 Amp</td>
<td></td>
<td>Right ION 7550</td>
<td></td>
</tr>
<tr>
<td>Emergency Generator</td>
<td>All</td>
<td>ION 7330</td>
<td>None</td>
</tr>
<tr>
<td>Pedestals, trailers, Etc.</td>
<td>All</td>
<td>ION7300</td>
<td>None</td>
</tr>
<tr>
<td>Temporary Service</td>
<td>All</td>
<td>ION E5600 Cl 200 form 16S or Cl 20 form 9S</td>
<td>Glass meter with form S.</td>
</tr>
</tbody>
</table>