

Utility Metering Requirements (Building and Sub-level)

Purpose

1. This document consolidates, modifies, and supersedes any conflicting metering requirements and guidance in multiple LANL Standards locations.¹
2. It supersedes the technical material in VAR-10538.

Requirements

1. Install building-level energy and water meters in new facilities, additions, and existing buildings undergoing a modernization or major renovation.
 - a. Install electric, steam, and natural gas meters unless any of the following exceptions apply:
 - i. the existing building is planned to be razed within 5 years; or
 - ii. the building does not have an energy-consuming heating or cooling system, or house or serve significant energy-consuming equipment or processes, including food service areas greater than 1,000 square ft; or
 - iii. the building does not house or serve significant energy-consuming equipment or processes, including food service areas greater than 1,000 square feet, and is either:
 - a) a warehouse less than 25,000 square feet, or
 - b) a building housing any other function less than 5,000 square feet, or
 - c) a building with combined functions where neither function exceeds the thresholds in a) and b).
 - b. Install potable water meters unless any of the following exceptions apply:
 - i. the existing building is planned to be razed within 5 years, or
 - ii. the building does not house or serve high water-consuming equipment or processes and is either:
 - a) expected to consume less than 1,000 gallons per day, or
 - b) less than 5,000 square feet.
2. Sub-meters (not building-level meters) are required for:
 - a. renewable energy systems, such as a photovoltaic or solar thermal water heating, installed on-site or roof-mounted. These systems must be metered

¹ Including but not limited to:

ESM Chapter 3 Civil, Section G30 Site Civil/Mechanical Utilities, rev. 3
ESM Chapter 6 Mechanical, Section D10-30GEN General Mechanical Requirements, rev. 5
ESM Chapter 7 Electrical, Section D5010 Electrical Service & Distribution, rev. 5
Tailored Standards Manual, STD-342-600, rev. 0
LANL Master Specification Section 26 2713, Electricity Metering, rev. 5

- independently to allow for reporting energy generation separately from building usage.
- b. potable make-up water for cooling towers, or other high potable water-using process.
 - c. potable water for irrigation when the irrigated landscape is 25,000 square feet or greater and not a temporary irrigation system.
3. Shared meters: Where an existing building is metered with shared infrastructure (i.e., two or more buildings with one meter), a separate or sub-meter may not be required depending on the size, function, and complexity of the building(s). Email umetering@lanl.gov with questions about such situations. The Form 2137 CoE Variance or Alternative Method process may be required to document the decision.
4. Communications Requirements
- a. Building-level meters shall be connected to the LANL UI owned and managed Metering Program Power Monitoring Expert (PME) system via an active yellow network connection.
 - i. Electric meters may be connected directly.
 - ii. Water, gas, and steam meters require a gateway device for cyber security and device firmware management purposes; email umetering@lanl.gov to request current approved model selection, required communication gateway device information, and additional direction. Provide a separate enclosure with a DIN rail to house these components and run both a yellow-net connection and 120-volt individual branch circuit to the enclosure. The power supply, isolation device, and a terminal block are on the DIN rail. Design documents shall reflect these requirements.
Guidance: At time of writing, the complete unit Schneider P/N SQD FAEM2DCPSUPLANLN12 EGX150 from Summit Electric was accepted, had up to a 30+ week lead time (gateways being LANL-OCIO accepted).
 - b. Where sub-meters (not building-level meters) are installed, they may or may not be in conjunction with a building-level utility meter; however, all sub-meters shall be connected to one or more of the following Utilities and Infrastructure-owned monitoring systems, where available (email umetering@lanl.gov for direction):
 - PME System
 - Supervisory Control and Data Acquisition (SCADA) System
 - Equipment Surveillance Systems (ESS)
 - Building Automation systems (BAS)
5. Building-level meter specifics. Meter make/model shall be determined by LANL UI, and due to rapid changes in available products, may change frequently. To request current make/model for all utility meters, email umetering@lanl.gov. Prior to acceptance, UI must review and commission meter installations.
- a. Electricity

- i. Refer to Specification Section 26 2713, *Electricity Metering*, for additional material installation details and yellow network connection requirements.
 - ii. Refer to LANL Standard Drawings ST-D5010-3, *Meter Connection Diagram*, ST-D5010-4, *Meter Installation Detail*, and ST-D5010-5, *Meter Connection Diagram*, for meter installation details and connection requirements.
- b. Natural Gas
- i. The meter shall incorporate pressure and temperature compensation.
 - ii. The meter may be installed upstream or downstream of the regulator station. Location approval required by umetering@lanl.gov.
- c. Steam
- i. Email umetering@lanl.gov for requirements since steam metering will only apply to existing buildings and will vary based on existing conditions.
- d. Water
- i. Refer to Mechanical Drawing(s) ST-D2020-1, *Site/Building Water Component Diagram*, for building water meter location.

Basis: At LANL, building-level utility meter location, design specifications, installation, and commissioning requirements are determined by UI-DO and -ES based on the latest Federal requirements: EAct 2005 § 103 (42 U.S.C § 8253(e), EISA 2007 § 434 (42 U.S.C. § 8253(e)(1)), and Federal Building Metering Guidance. Utility meters are owned, maintained, and monitored by UI-DO (FOD-8) who is responsible for reporting site-wide and facility specific energy consumption data on an annual basis to the DOE.

There are contractual requirements and LANL preferences for metering cost-effectively. As examples, Ch 6 footnote reads, in part: Based on DOE O 430.2B CRD 6.D "To the maximum extent practicable, the contractor must install metering for devices that measure consumption of potable water, electricity, steam, and natural gas in each building and other facilities and grounds." Ch 7 footnote reads, in part: Refer to DOE O 436.1 Departmental Sustainability, DOE/EE-0312 Guidance for Electric Metering in Federal Buildings, and EAct 2005. EAct 2005 directs that all Federal buildings be metered "...for the purposes of efficient energy use and reduction in the cost of electricity used in such buildings..." by October 1, 2012.