

Mechanical Design Deliverables and Process

General: All deliverables and processes discussed in this document are supplemental to those outlined in UNL's Owner-Consultant Agreement.

DELIVERABLES

Project Design Calculations: See *Requirements for Project Design Calculations* section within these *Design Guidelines*.

Hydronic / Steam System Documentation Using Schematic Diagrams: We require schematic diagrams of all hydronic / steam systems as part of the Design Development and Construction Document submittals. These convey much more information in one place as opposed to plan views and separate piping details. The intent is to show the overall layout of the system and omit the need for piping details (i.e., coil hookup, pump, hookup, etc.). Therefore, these diagrams should include all valving, piping accessories, instrumentation, etc.

Air System Documentation Using Schematic Diagrams: We require schematic diagrams of all major air conveyance systems as part of the Design Development and Construction Document submittals. These help in clearly defining system air flow balances as well as design intent.

Schematic Design Submittal: The schematic design submittal shall include the following elements

- Design heating / cooling / ventilation loads

Design Development Submittal: The schematic design submittal shall include the following elements:

- Design heating / cooling / ventilation loads.
- Design domestic water load
- Estimated yearly energy consumption for all energy sources (i.e., steam, chilled water, natural gas, electricity).
- Schematic diagrams for all hydronic and steam systems including flows, pressures, and equipment capacities.
- Schematic diagrams for air-side systems including supply/return/outside air/exhaust air airflows.

Construction Documents: The 95% and 100% construction document submittals shall include the following mechanical system documentation elements:

- Schematic diagrams for all hydronic and steam systems. Hydronic diagrams shall include system fill volumes and expansion tank charging requirements.
- Schematic diagrams for domestic water, process water, and any specialty systems (e.g., lab gas)
- Plumbing riser diagrams for waste and vent systems
- Schematic diagrams for air-side systems including supply/return/outside air/exhaust air airflows.
- Separate mechanical schedules for each major equipment subtype. These should only be located on plans, not in specifications.
- Sequence of Operation Narratives for all major mechanical systems. These are critical in helping UNL control system technicians understand system design intent.
- The project plans must include the coordination schedule shown in *HVAC Control, Access Control and Lighting Control Coordination Schedule* of these *Design Guidelines*.

PROCESS

Pre-Schematic Design Meeting: Before starting the schematic design phase of any project, the mechanical systems consulting engineer shall conduct a formal predesign conference. Attendees must include representatives of FMP engineering and maintenance. The purpose of this meeting

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is to discuss and identify appropriate mechanical systems for the project. Meeting minutes of this conference shall be documented by the mechanical systems consulting engineer.

Design Development Meeting: During the design development review phase of any project, the mechanical systems consulting engineer, shall conduct a formal design development review meeting. Attendees must include representatives of FMP engineering and maintenance. The purpose of this meeting is to review mechanical system design criteria, concepts, major equipment types and layouts, zoning, etc.

Bidding “Pre-approvals”: All manufacturers listed on mechanical equipment schedules shall contain the phrase: “*or owner approved equivalent.*” UNL FMP Engineering will be make the final determination on any equipment substitutions during the project bidding phase.