

General Information

Welcome

The Facilities Design Standard (FDS) is a collaboration between UW Facilities and various campus Process Partners, and it is intended for use by design, construction, and maintenance professionals to facilitate the design, construction, and maintenance of University facilities and assets. These standards represent proven systems that are based on life cycle cost analysis, and provide functional facilities and systems that satisfy the University's Best Practice requirements for efficient operation and maintenance.

These design standards and standard specifications are to be adhered to and incorporated into all project and maintenance contracts, for all types of contract delivery methods. Any deviations to these standards shall be vetted through a documented resolution process, prior to the completion of project design documents or maintenance contracts.

FDS Organization and Use

Each FDS section contains Design and Standard Drawing concepts; standard specifications are included when a specific system and/or product is preferred because of spare parts inventories, prior experiences of the University, staff training on sophisticated equipment and/or to match existing systems, just to name a few. Standard Detail Drawings are intended to be used as shown or with slight modifications, modifications should be reviewed with the University Representative or Engineering Services prior to implementing. Implementation of the FDS is a collaborative process where flexibility, openness, and forward thinking are encouraged.

The FDS, Drawings and Specifications are complementary and what is called for by one shall be as binding as if called for by any others. Should the FDS, drawings, specifications and/or other instructions be contradictory in any manner, or should there be apparent errors in any, or should there be doubt as to the meaning of any, the Contractor shall refer the matter to the Owner whose decision thereon shall be conclusive and at no additional cost.

FDS Disclaimer

The FDS is not intended to replace codes, manufacturer's installation directions, or professional architectural and engineering design analyses. Reference to codes, guides, or standard specifications of any Institute, Society or other organization or to any manufacturer's installation directions, shall be the latest edition thereof, unless laws, ordinances, rules or regulations require compliance with a specific edition, in which case the reference shall be to such edition.

Consultants and/or contractors shall conduct their own independent evaluations and are liable for the final design. Any errors and omissions by the consultants and/or contractors for not following the FDS is at the responsibility of the associated party.

This document is copyrighted by the University of Washington. Use of this document for University of Washington official business is permitted - contact Engineering Services to request approval for any other purposes. Do not reproduce any part of this document that contains the University name or logo.

UW Medical Center Projects

Refer to UWMC specs for all UWMC projects. The UW Medical Center Project Specifications should be approved by UWMC prior to use.

Sustainability

The University of Washington is a leader in sustainability and committed to implementing best practices through environmentally responsible construction for every new building and major capital renovation, projects greater than \$5M. The UW Green Building Standard was established and the following performance requirements were developed for the facilities.

- LEED Gold certified is the minimum target using the most current LEED standard.
- Design to reduce energy use with a minimum threshold of 15% more efficient than local city code.
- Using current code as a baseline, design to achieve at least 50% reduction for indoor and outdoor potable water use.
- Additional energy performance criteria can be found under the Energy Conservation and other discipline sections of the Design Standard.
- All appliances (clothes washers, dishwashers, ice makers, refrigerators, etc.) should be energy star rated.

The University is committed to sustainability at a leadership and policy level as stated in the following -

- [Climate Action Plan](#), 2009
- [Executive Order No.13](#), 2012
- [Campus Master Plan](#), 2019
- [Sustainability Action Plan](#), 2020
- [STARS Reporting](#) Ongoing (*developed by the national Association for the Advancement of Sustainability in Higher Education*)

The State of Washington established greenhouse gas (GHG) emission reduction goals for state agencies, and requires GHG reduction by 15% from 2005 levels by 2020; and reduction by 45% from 2005 levels by 2030. The University also participates in, or is a member of a variety of organizations. Please refer to the following website for more information:

<https://green.uw.edu/dashboard/awards>, which design should take into consideration. For more

information about what organizations' designs should be in alignment, please contact UW Sustainability (sustainability@uw.edu), or a University Representative.

Roof and Building Envelope Safe Access

Fall safety systems for new buildings, major renovations, and roof replacement projects shall implement "passive fall protection" (i.e. parapets, railings, guardrails) of 42" or higher. Any deviation from this standard (i.e. life lines and roof anchors) shall be vetted and will need approval from UW Facilities senior leadership. In some cases, even with "passive fall protection" systems, roof anchors for over-the-side work may still be needed for window washers, glaziers, and building envelope repair and maintenance. Roof anchors may be avoided if there is unobstructed access for a lift all around the perimeter of the building. Lifts should be able to reach the top of exterior walls. All proposals for roof anchors or lift access around the perimeter of the building shall be vetted and approved by a representative from UW facilities senior leadership.

Record Drawings

The University maintains a record drawing system, the Facilities Information Library (F.I.L.), that documents the overall utilities, as-built drawings of the individual systems, and building connection points, just to name a few. This record drawing library can be accessed online, and access to this system is granted through the UW Project Manager for the duration of individual projects. The website has many helpful how-to documents, including a document contained in Section G4 of the online help system within F.I.L. that has hyperlinks to the most common and the most up-to-date record drawings.

Engineering Services can assist with navigation of DocFinity. Contact the UW PM for access rights to the drawings needed.

Utility Locates

All projects are to include drawing and specification notes to indicate that the Contractor shall notify the Utility Notification Center (811) at least two (2) to ten (10) full working days before digging. Note that the University maintains records online for designers to research the University utility system at their leisure and generally from their office. This is intended to limit the use of the 811 system for design purposes. See the "record drawings" section for an explanation of this system and how to gain access.

Closeout Documents

At the end of a project, ensure that the documents in the Project Closeout Documents Checklist are submitted within one month of substantial completion.

Organization of the UW Design Standard

Facilities

- Engineering Services working with Central Utilities and Operations
 - Civil
 - Architectural
 - Structural
 - Mechanical
 - Electrical
 - Conveyance
 - Tunnels
 - CAD and BIM Standards
- UW Medical Center Specifications
- Building Maintenance Services
- Campus Automated Access System CAAMS
- Space Guidelines
- Sustainability
- Exterior Improvements
- Transportation
- Environmental Health & Safety

Additional University Design Standards

1. Academic Technologies Audiovisual Systems Integration
2. [Classroom Support Services design guide](#)
3. Police Department Risk Mitigation & Security Services
4. [Emergency classroom locking devices \(ECLD\)](#)
5. [UW-IT Design Guide](#)

UW Locations

1. [Bothell](#)
2. [Tacoma](#)

Major Revision History

Design Information

1. Facilities Design Information 1970
2. Facilities Design Information 2007
3. Facilities Services Design Guide 2012-2018
4. Facilities Design Standard 2020

Requirements Common to All Disciplines

A. Equity

1. **Accessibility and ADA Compliance**

Contact Engineering Services Architect

2. **IT [Accessibility](#)**

3. **Gender Neutral**

Contact Engineering Services Architect

B. Coordination

The following are some common examples of coordination needs on a project. Please note that this list is not exhaustive, and Design and Construction Professionals shall evaluate what types of coordination may be needed on a project during the design and construction phases.

1. **Architectural with All Trades:** e.g. envelope details and repair/replacement strategy; curtain walls containing electrical / mechanical equipment; provide base line for the City of Seattle (COS) [Building Tune-Up Ordinance](#).
2. **Structural with All Trades:** e.g.: penetrations of structural components by other trades; fall protection; roof hoist for buildings without elevators; equipment ramps for curbs on roofs.
3. **Civil and Mechanical:** e.g.: backwater valve required due to height of next upstream manhole; point of connection elevations for water, storm and fire protection testing.
4. **Civil and Electrical:** e.g.: exterior gravity drainage for site features that may transmit water into a building or downstream devices.
5. **Mechanical and Electrical:** e.g. short-circuit current ampacity rating of mechanical equipment; sizing of transformers serving devices commanded to start at the same time by building automation system; specialty fire protection systems; harmonic mitigation for systems with vfds; floor drainage/protection for electrical rooms that may be compromised by mechanical system leakage; permanent wiring labeling; metering system accuracy from field device to the Smart Metering cloud.
6. **Congested Spaces:** Provide "study" type building sections to illustrate how the installed work of all the disciplines fits into congested spaces. An example would be to show how the structure, fireproofing, ceiling, ductwork, cable trays, sprinkler piping, etc. fits into a lab corridor space using the available floor-to-floor height. Show how the layering of the mechanical and electrical systems are accessible for maintenance and repair, etc.

C. Internet of Things (IoT) / Operational Technology (OT) and Connected Digital Systems

Background Information:

Internet of Things (IoT), sometimes called Operational Technology (OT), systems and devices continue to be deployed on campus at an increasingly high rate. While these systems and devices have the potential to bring a lot of value to the UW-built environment, if they are not thoughtfully selected, procured, deployed, and managed, they can substantially increase the cyber risk to the University in addition to operational and performance challenges.

As it pertains to UW-Facilities -- there is a specific subset of IoT devices & systems that are regularly bundled into newer building system purchases (HVAC, building shades, electrical meters, lighting control, etc...). The timely and accurate configuration of these IoT/OT systems and devices is critical for the operation, monitoring, maintenance, and support of these building systems. IoT/OT systems and devices that are not thoughtfully selected, implemented, & operated creates significant operational and cyber issues for the University.

Design process and information:

Early in the design phase of capital projects, documentation to track IoT/OT and digital systems information shall be established. The document shall be updated when IoT/OT and/or internet connected digital systems for buildings systems are introduced and added, during the design, construction, and commissioning phases of the project.

The information to be provided shall include the following:

- Make, model, and description of the IoT system.
- The serial number of each device.
- MAC address of each device.
- Each device with a valid IP address within a range specified by UW.
- Firmware version information & identification of the currently most recent available firmware version.
- The location of each installed device.
- Confirmation of changed login credentials (from default) for all devices.
- Securely delivered new login credentials to the UW.
- A list of minimally required ports/services for each device.
- Confirmation that no additional ports/services are active on each device.
- Confirmation from the vendor that the IoT system does not have any software libraries with known vulnerabilities; including but not limited to those on the TCP/IP Stack Library Vulnerabilities page, maintained by the UW CISO's office <https://ciso.uw.edu/iot/iot-resources/tcp-ip-stack-library-vulnerabilities/>
- Digital photo of each device once installed in its final location.

If available, the following information shall also be provided:

- Enterprise network connectivity document, which may include but is not limited to:
 - TCP/UDP ports & protocols used by the devices
 - External server IPs that need connectivity to these devices (if applicable)
 - How devices authenticate on the network
- Data management/privacy policy document for the IoT system
- A list of third-party services used by the IoT system and their data management policy
- Lifecycle information for the IoT system.
 - General Availability / Sale (GA) date w/ OEM warranty information
 - End of Life / End of Sale (EOL / EOS) date
 - End of Development (EOD) date
 - End of Service Life / End of Support (EOSL) date
- Ownership information:
 - Name of system owner
 - Name(s) of system installer(s) / commissioners
 - Name(s) of systems admin(s)
- Ensure that the IoT device is reflected accurately in the UW-PDG low voltage cable outlet schedule and network assignment matrix (if applicable).

When designing IoT and OT systems that will be connected to UW Facilities' FACNET and BACNET networks, instance numbers for all devices shall be provided by the UWF Environmental Control Systems Manager (ECSM) (Shop 69, 206-685-8869 or 206-543-4208). The use of instance numbers that were not provided by the UWF ECSM is strictly prohibited. Prior to the activation of systems, the instance numbers shall be reviewed and approved in writing by the ECSM.

Create a spreadsheet for the information above and submit as part of the close-out documents at the completion of the project.

D. Preferred Manufacturer List

The latest technologies generate numerous options, many levels of sophistication and life cycle limitations. In order to predict service expectations for equipment and continuing education, Engineering Services has summarized a Preferred Vendors and Products list. Refer to the sections below.

- Architectural
- Electrical
- Mechanical
- Exterior Improvements
- Environmental Health & Safety

E. On Which Systems Must You Train Us?

The following are some common examples of coordination needs on a project. Please note that this list is not exhaustive, and Design and Construction Professionals shall evaluate what types of coordination may be needed on a project during the design and construction phases.

1. Worker Safety

- a. Access for equipment above fixed equipment/furniture – demonstrate with equipment used for installation.
- b. Contractor Lockout Tagout Procedures
- c. Removal of large or heavy equipment through designed pathways.
- d. Sampling of structural design elements – e.g. removal of rooftop membrane and heavy equipment mounted on the roof; fall protection pull test; fall protection means for future PV installations.

2. Equipment

- a. Demonstrate equipment location as-builts – fire dampers; room lighting controllers; critical BAS sensors
- b. Demonstrate baseline Building Tune-Up verification.
- c. Building Automation System
- d. Lighting Control System

F. What We Expect for System Redundancies

1. Research Buildings

- a. Redundant mechanical and electrical equipment
- b. Redundant sources to meet UW lockout / tagout requirements

2. Classroom / Office Buildings

- a. Ability to meet mechanical and electrical programming needs for each department.
- b. Redundant sources to meet UW lockout / tagout requirements