Introduction

The Facilities Services Design Guide is for the use by design professionals to facilitate design and construction of University facilities. The manual was written in response to problems that have occurred during design, construction and operation of University facilities in an attempt to avoid historical problems, to allow flexibility for future alterations and ease of operations and maintenance.

Other University departments, such as the Capital Planning & Development, Classroom Support Services, Environmental Health & Safety and UW Information Technology, independently develop and maintain their respective design guides.

It is recognized that all design guides contained herein are not universally applicable to every project. With the wide variety of facilities, varying life expectancies and program requirements, the Facilities Services Design Guide has to be correctly applied to each project. Further, the design guide does not replace professional design analyses. Consultants shall conduct independent evaluations. Applications of proven technologies and systems to provide cost effective alternate design concepts are encouraged. Deviations from the Facilities Services Design Guide may be acceptable and shall be discussed with and approved by Facilities Services prior to implementation. Exceptions to the Facilities Services Design Guide shall be defined by the consultants and approved by the University during the technical programming phase. Consultants shall document the exceptions in the technical program.

It is further intended that these design guides represent a sustainable and life cycle cost-effective application of proven systems that provide functional facilities that satisfy the University’s program requirements and are efficient to operate and maintain. Suggestions for improving this guide should be addressed to the Manager, Engineering Services. Revisions will be issued on a periodic as-needed basis.

Facilities Services Design Guide Organization and Use

The Facilities Services Design Guide provides architects and engineers with the information for each phase of the project from technical programming through construction documents and commissioning. Each design guide section contains a Design Information component. Guide Specification and Reference Drawing components supplement the Design Information as needed. Guide specifications are included when a specific system and/or product is restricted because of spare parts inventories, prior experiences of the University, staff training on sophisticated equipment and/or to match existing systems. The Reference Drawings are intended to be used as shown or with slight modifications. The Reference Drawings are available from Engineering Services in CAD format and are referenced by the SD number on the Drawing.

Each section includes a table of contents and a page verification sheet to verify all pages are the current version. The page verification sheet functions as a check that all participants are using the identical design guide to avoid conflicts. The page numbering system uses the old CSI divisions as chapter numbers for a logical framework of design guide section organization.

Facilities Services Design Guide Disclaimer

This manual is not intended to replace codes, other design standards or the services of a professional design team. This document is copyrighted by the University of Washington. Use of this document for University of Washington official business is permitted. Contact University of Washington Engineering Services to request approval for any other purposes. Do not reproduce any part of this document that contains the University name or logo.

END OF INTRODUCTION SECTION
TABLE OF CONTENTS

TITLE PAGE

INTRODUCTION

TABLE OF CONTENTS – FACILITIES SERVICES DESIGN GUIDE

CIVIL

Table of Contents
Page Verification Sheet

2G General Requirements
2H Topographical Surveys
 Drawing – Monument Installation
 Drawing – Monument Plug Marker
2J Earthwork
 Guide Specification - Earthwork
2K Irrigation
 Drawing - Interior Irrigation Controller Wall Mounted
 Drawing - Exterior Pedestal Mounted Controller
 Drawing - Exterior Irrigation Controller Wall Mounted
 Drawing - Irrigation Point of Connection Assembly
 Drawing - Quick Coupler Anchor Assembly and Installation
 Drawing - Exterior Single Zone Valve Assembly
 Drawing - Pop-Up Sprinkler Assembly and Installation
 Drawing - Pop-Up Head Set-Back and Location
 Drawing - Exterior Dedicated Drip Filter & PRV Assembly
 Drawing - ½” Air/Vacuum Relief Valve for Dripline
 Drawing - Automatic Flush Valve For Dripline
 Drawing - Dripline Trench
 Drawing - Typical Drip Manifold Connections
 Drawing - Dripline Check Valve
 Drawing - Dripline Operation Indicator
 Drawing - Tree Bubbler Detail
2L Curbs
 Drawing – Typical Type A-1 Curb & Gutter
 Drawing – Concrete Curb & Gutter Cast In Place
 Drawing – Extruded Curb Concrete
2M Parking Lots
 Drawing – Parking Area Right Angle Parking
 Drawing – Typical Parking Area Spacing
 Drawing – Precast Parking Block
2N Roadways
 Drawing - Roadway & Utility Corridor Arrangement
 Drawing – Road Superelevation Typical
 Drawing – Removable Bollard
UNIVERSITY OF WASHINGTON
Facilities Services
Design Guide

Table of Contents

Drawing – Fixed Bollard
2P Sidewalks
   Drawing – Roadway & Sidewalk Cross Section
   Drawing – Sidewalk Wheelchair Ramp
2Q Water Distribution
2R Sanitary Sewer
   Drawing – Acid Waste Manhole
2S Storm Drainage
   Drawing – Area Way Drain at Buildings, Ramp, Balconies & Landings
   Drawing – 54” or Larger Drop Manhole Interior
2T Gas Distribution
2U Utility Tunnels and Trenches
   Drawing – Utility Tunnel Section
   Drawing – Utility Trench Section
   Drawing – Utility Tunnel Manhole Plan
   Drawing – Utility Tunnel Electrical Tray Bracket Detail
   Drawing – Utility Tunnel Mechanical Pipe Supports Detail 1
   Drawing – Utility Tunnel Mechanical Pipe Supports Detail 2

STRUCTURAL

Table of Contents
Page Verification Sheet

3A General Requirements
3B Seismic Analysis & Upgrades
3C Modifications to Existing Structures
3D Shoring
3E Foundations and Piles
3F Slab on Grade
3G Sub-Grade Walls
3H Structured Floors
3I Roofs
3J Concrete
3K Reinforced Masonry
3L Structural Steel – Steel Joists and Decking
3M Timber
3N Cold Formed Metal Framing
3P Nonstructural Component Seismic Design
ARCHITECTURAL

Architectural & Accessibility Guidelines
11F Building Maintenance
13A Access Control System – CAAMS
   Guide Specification - Access Control System
   Drawing – Example of Typical CAAMS Backboard
14A Conveying Systems
   Guide Specification – Elevators

MECHANICAL

Table of Contents
Page Verification Sheet

15A General Requirements
15B Plumbing
   15B1 Potable and Nonpotable Water
      Drawing – Water Filter Header
      Drawing – Typical Building Water Header
   15B2 Waste and Drains
   15B3 Acid and Laboratory Wastes
   15B4 Compressed Air, Vacuum, Natural Gas & Nitrogen
   15B5 RO/DI
   15B6 Plumbing Pressure Testing
15C Heating, Ventilation and Air Conditioning
   15C1 Process and Environmental Chilled Water
   15C2 Central Cooling Water
      Drawing – Central Cooling Water Building Header & Coil Connection
   15C3 Steam and Condensate
      Drawing – Steam Trap Assembly
   15C4 Hydronic Heating
   15C5 Refrigeration
   15C6 Air Handlers and Ventilation Fans
   15C7 Filters
      Guide Specification – Filters Used in HVAC Systems
   15C8 Coils
   15C9 Ductwork and Duct Accessories
   15C10 HVAC and HVAC Piping Pressure Testing
15D Piping, Valves & Accessories
15E Hangers and Supports
15F Pumps
15G Motors and VFDs
   Guide Specification – Electric Motor in HVAC Applications
   Guide Specification – Variable Frequency Drives
15H Metering and Gauges
   Purchase Specification – 23 05 19.11 Steam Condensate or Hot Water Meter
   Purchase Specification – 23 05 19.21 Central Cooling Water Meter
   Purchase Specification – 23 05 19.31 Sewer Submeter
   Purchase Specification – 23 05 19.41 Building Water Meter
   Purchase Specification – 23 050 19.51 Gas Meter
   Purchase Specification – 23 08 00.11 Mechanical Meter Integration and Commissioning
### UNIVERSITY OF WASHINGTON
Facilities Services
Design Guide

<table>
<thead>
<tr>
<th>15J</th>
<th>Nonstructural Component Seismic Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>15K</td>
<td>Identification</td>
</tr>
<tr>
<td>15L</td>
<td>Insulation</td>
</tr>
<tr>
<td>15M</td>
<td>Water Treatment and Flushing</td>
</tr>
<tr>
<td>15N</td>
<td>Noise and Vibration Control</td>
</tr>
<tr>
<td>15P</td>
<td>Cold/Environmental Rooms</td>
</tr>
<tr>
<td>15Q</td>
<td>Computer Server Rooms</td>
</tr>
<tr>
<td>15R</td>
<td>Environmental Control Systems</td>
</tr>
<tr>
<td></td>
<td>Guide Specification – Environmental (HVAC) Control System</td>
</tr>
<tr>
<td>15T</td>
<td>Testing, Adjusting and Balancing</td>
</tr>
<tr>
<td></td>
<td>Guide Specification – Small Project (MACC less than $3 Million)</td>
</tr>
<tr>
<td></td>
<td>Guide Specification – Large Project (MACC more than $3 Million)</td>
</tr>
<tr>
<td>15U</td>
<td>Commissioning</td>
</tr>
<tr>
<td></td>
<td>Guide Specification – Commissioning: General Requirements</td>
</tr>
<tr>
<td></td>
<td>Guide Specification – Commissioning: Facility Start-Up</td>
</tr>
</tbody>
</table>

### ELECTRICAL

Table of Contents
Page Verification Sheet

<table>
<thead>
<tr>
<th>16A</th>
<th>General Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>16B</td>
<td>Primary Distribution</td>
</tr>
<tr>
<td>16C</td>
<td>Emergency Power Systems</td>
</tr>
<tr>
<td>16D</td>
<td>Building Services</td>
</tr>
<tr>
<td>16E</td>
<td>Building Power Distribution</td>
</tr>
<tr>
<td></td>
<td>Drawing - Laboratory Demand Load</td>
</tr>
<tr>
<td></td>
<td>Drawing - Typical Building Power Distribution Riser</td>
</tr>
<tr>
<td></td>
<td>Drawing - Typical Floor Electrical Room</td>
</tr>
<tr>
<td>16F</td>
<td>Raceways</td>
</tr>
<tr>
<td>16G</td>
<td>Wire, Cable, and Terminations</td>
</tr>
<tr>
<td></td>
<td>Guide Specification – MV Wire, Cable and Terminations</td>
</tr>
<tr>
<td>16H</td>
<td>Medium Voltage Switchgear</td>
</tr>
<tr>
<td>16J</td>
<td>Vaults</td>
</tr>
<tr>
<td>16K</td>
<td>Load Interrupter Switches</td>
</tr>
<tr>
<td>16L</td>
<td>Transformers</td>
</tr>
<tr>
<td>16M</td>
<td>Metering and Monitoring</td>
</tr>
<tr>
<td></td>
<td>Purchase Specification – 26 08 00.11 Electrical Meter Integration and Commissioning</td>
</tr>
<tr>
<td></td>
<td>Purchase Specification – 26 09 13.11 Data Collection Controller</td>
</tr>
<tr>
<td></td>
<td>Purchase Specification – 26 27 13 Electrical Meter</td>
</tr>
<tr>
<td>16N</td>
<td>Switchboards</td>
</tr>
<tr>
<td>16P</td>
<td>Panelboards</td>
</tr>
<tr>
<td>16Q</td>
<td>Automatic Transfer Switches</td>
</tr>
<tr>
<td></td>
<td>Guide Specification - Automatic Transfer Switch</td>
</tr>
<tr>
<td>16R</td>
<td>Motor Control Centers</td>
</tr>
<tr>
<td>16S</td>
<td>Variable Frequency Drive Installations</td>
</tr>
<tr>
<td>16T</td>
<td>Wiring Devices</td>
</tr>
<tr>
<td>16U</td>
<td>Lighting</td>
</tr>
<tr>
<td>16V</td>
<td>Grounding</td>
</tr>
<tr>
<td>16W</td>
<td>Power Quality</td>
</tr>
<tr>
<td>16Y</td>
<td>Clock and Bell Systems</td>
</tr>
<tr>
<td>16Z</td>
<td>Miscellaneous Signal Systems</td>
</tr>
</tbody>
</table>
Table of Contents

16AA  Electrical Identification
      Guide Specification - Electrical Identification
      Drawing - Equipment Label Format and Location
      Drawing - Equipment “Fed From” Labels
      Drawing - Medium Voltage Equipment Label
      Drawing – Sample Arc Flash Warning Label

16BB  Power System Studies
      Guide Specification - Short Circuit and Coordination Studies

16CC  Inspection, Calibration and Testing
      Guide Specification - Inspection, Calibration and Testing

16DD  Commissioning Support
      Guide Specification - Commissioning Support

END OF TABLE OF CONTENTS – FACILITIES SERVICES DESIGN GUIDE

Other University Design Guides
(Not a part of the Facilities Services Design Guide)

- Capital Projects Office Design Guides
  o Project and Record Documents
  o Site Work - Contact the Capital Projects Office Landscape Architect

- Classroom Support Services Design Guide
  o Classrooms

- Environmental Health & Safety (EH&S) Design Review & Guides
  o Fire Safety
  o Laboratory Safety
  o Safe Access
  o Environmental Protection
  o Hazardous Materials

- Health Sciences Design Guide
  o Health Sciences Casework Specification

- Other Facilities Services Design Guides
  o Recycling & Solid Waste
Table of Contents

- University of Washington Tacoma
  - Facilities Services Design Guide Exceptions for the UW Tacoma Campus

- UW SafeCampus
  - Emergency Classroom Locking Devices (ECLD)

- UW-ITDesign Guide
  - Voice, Data and Multimedia Communications
## Preface

### Page Verification Sheet

<table>
<thead>
<tr>
<th>TITLE</th>
<th>Pages</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title Page</td>
<td>1</td>
<td>REV:05 – SEPT2017</td>
</tr>
<tr>
<td>Preface</td>
<td>1</td>
<td>REV:06 – SEPT2017</td>
</tr>
<tr>
<td>Table of Contents – FSDG</td>
<td>1-6</td>
<td>REV:09 – SEPT2017</td>
</tr>
<tr>
<td>Page Verification Sheet</td>
<td>1</td>
<td>REV:10 – SEPT2017</td>
</tr>
</tbody>
</table>