Chapter 440 Maintenance Buildings, Enclosures, and Support Areas

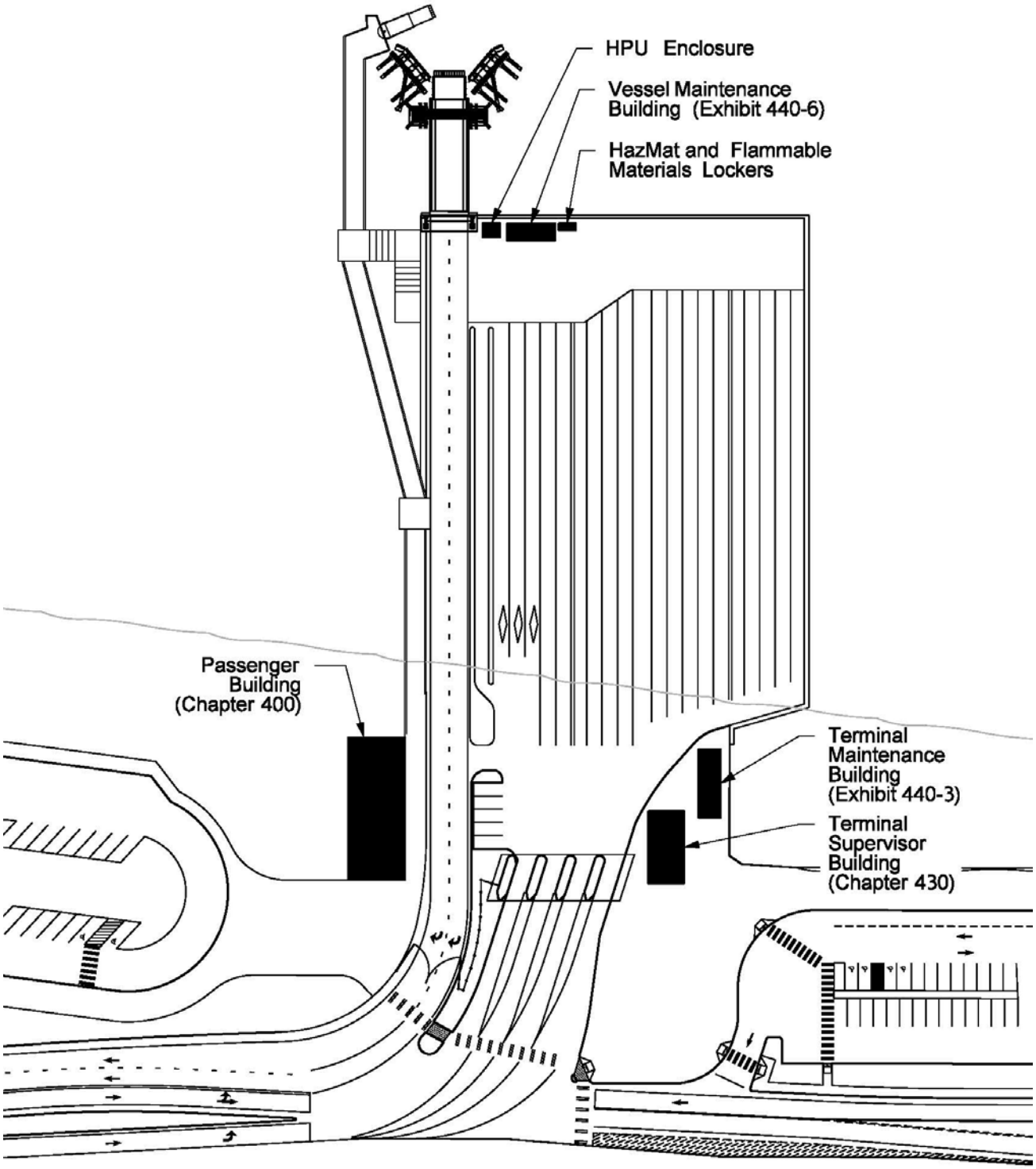
440.01 General

This chapter provides design guidelines for the terminal and vessel maintenance buildings, enclosures, and support areas, including storage areas and utility enclosures. Exhibit 440-2 provides a key to a sample layout for the terminal outbuildings, enclosures, and support areas. Some of the maintenance functions described in this chapter may be incorporated into the passenger building (refer to Chapter 400) and/or the terminal supervisor building (refer to Chapter 430).

Kingston Ferry Terminal Outbuildings
Exhibit 440-1

For additional information, see the following chapters:

Chapter	Subject
300	Accessibility
310	Security
320	Environmental Considerations
350	Buildings
400	Passenger Buildings
430	Terminal Supervisor Buildings
450	Architecture
510	Toll Plaza
560	Site Utilities
620	Passenger Overhead Loading



Example Layout for Maintenance Buildings and Enclosures
Exhibit 440-2

440.02 References

Unless otherwise noted, any code, standard, or other publication referenced herein refers to the latest edition of said document.

(1) Federal/State Laws and Codes

29 CFR Part 1910 Occupational Safety and Health Standards, Subpart H – Hazardous Materials International Building Code (IBC), International Code Council

(2) Design Guidance Enterprise Services Sizing Criteria Enterprise Services Standard Plans WSDOT Facilities Office Standard Plans

(3) Supporting Information

Mukilteo Multimodal Terminal Master Plan Design Report (2004), Ferries Division, Washington State Department of Transportation, Seattle, WA.

440.03 Design Considerations

(1) Accessibility

Wherever pedestrian facilities are intended to be a part of a transportation facility, 28 CFR Part 35 requires that those pedestrian facilities meet ADA guidelines. Federal regulations require that all new construction, reconstruction, or alteration of existing transportation facilities be designed and constructed to be accessible and useable by those with disabilities and that existing facilities be retrofitted to be accessible. Design pedestrian facilities to accommodate all types of pedestrians, including children, adults, the elderly, and persons with mobility, sensory, or cognitive disabilities. Refer to Chapter 300 for accessibility requirements. Section 300.06 addresses accessibility requirements relating to staff facilities at terminals.

(2) Security

Chapter 310 includes a general discussion of the United States Coast Guard (USCG) three-tiered system of Maritime Security (MARSEC) levels, vessels security requirements, and additional information pertaining to building design. Below are links to relevant sections by topic.

Coordinate with the WSF Company Security Officer (CSO) regarding design issues pertaining to security. In addition, coordinate with the USCG and Maritime Security for all terminals, the United States Customs and Border Protection (USCBP) for international terminals, and the Transportation Security Administration (TSA) for TWIC and SSI.

- MARSEC Levels: 310.04
- Access Control / Restricted Areas / TWIC: 310.10
- Signage: 310.13

(3) Environmental Considerations

Refer to Chapter 320 for general environmental requirements and design guidance. Refer to the project NEPA/SEPA documentation for project-specific environmental impacts and mitigation. For projects that involve remodeling and renovation of existing buildings, consider the need for assessment of lead paints, asbestos and other hazardous materials.

(4) Building Structures and Utilities

Refer to Chapter 350 for general building design criteria pertaining to maintenance buildings, enclosures and support areas. Below are links to relevant sections by topic.

- Building Structures: 350.04
- Building Foundations: 350.05
- Building Utilities: 350.06

(5) Circulation, Structure, and Envelope Multipliers

The building areas provided in Appendix S do not account for space requirements associated with building circulation corridors, structural columns, and the building envelope (walls). Estimate these space requirements using a 7 percent building multiplier.

(6) Building Architecture

Refer to Chapter 450 for general architectural design criteria pertaining to the maintenance buildings and enclosures. Below are links to relevant sections by topic.

- Building Code Requirements: 450.04
- Building Permits: 450.05
- WSF Architectural Guidelines: 450.06

(7) Location

When feasible, locate equipment and storage areas in close proximity to their required use. Take under consideration equipment and storage related issues such as access, noise, vibrations, emissions, odor, safety and environmental concerns. Depending on their function, these areas may be located either on land or over-water and may be within a multi-purpose building or standalone enclosure. Storage areas may be combined if they have compatible storage requirements.

(8) Storage of Dangerous and Hazardous Materials

Design storage areas for dangerous and hazardous materials in compliance with all applicable codes and regulations. Applicable materials include, but are not limited to, used oil rags, oil drums, batteries, gasoline, and compressed oxygen. Refer to 29 CFR Part 1910 Subpart H for OSHA hazardous materials requirements.

(9) Heating and Cooling of Maintenance Spaces and Support Areas

Enclosed maintenance spaces, support areas and storage areas do not require cooling. Provide heating of these spaces, as needed, for the reasons noted below. Provide adjustable heat sources, controlled by a thermostat, which can be turned off if not required in the summer time.

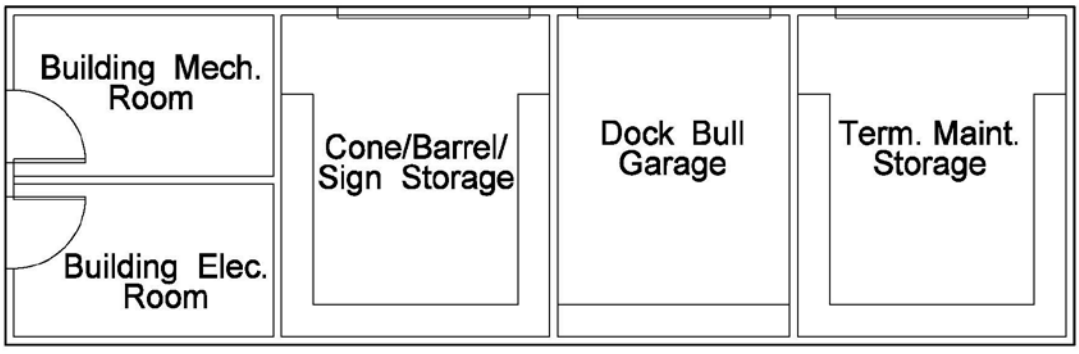
- For comfort in manned support spaces (e.g. OHL operator control station, vehicle/ traffic attendant booth, and traffic attendant office)
- To prevent freeze ups of the utilities or equipment.
- To ensure condensation does not occur on equipment or stored product (heat spaces above the dew point).

440.04 Terminal Maintenance Building

The terminal maintenance building is typically located near the vehicle holding area. The building spaces associated with the terminal maintenance building are:

- Terminal Maintenance Storage
- Cone/Barrel and Sign Storage
- Building Electrical/Mechanical Room
- Dock Bull Garage

These spaces are described in more detail in the paragraphs that follow. Information on sizing requirements for these spaces is provided in Appendix S . Exhibit 440-3 gives an example layout for a terminal maintenance building. Actual maintenance facility layouts will vary. Coordinate maintenance facility layout based on specific site features and terminal needs. Certain terminal maintenance functions such as terminal maintenance storage, cone/barrel and sign storage, and building electrical/mechanical may be incorporated into the passenger building or provided as standalone structures.



Example Layout for Terminal Maintenance Building
Exhibit 440-3

Clinton Terminal Maintenance Building
Exhibit 440-4

(1) Terminal Maintenance Storage

Provide a storage space for maintenance equipment and supplies such as leaf blowers, lawn mowers, pressure washers, garden hoses, shovels, salt, sand, deicer, etc. This storage area may also be used to store overflow items such as garbage bags, cleaning supplies, brooms, mop handles, etc. Provide the space with shelves. As much of this equipment is gasoline powered, this building/storage area may require special consideration or separation from other buildings.

(2) Cone/Barrel and Sign Storage

Provide an area for the storage of traffic direction equipment such as traffic cones, barrels and directional signage which are typically kept at each terminal. Provide the space with shelves on three sides and a lockable door (preferably a roll up type door).

(3) Building Electrical Room

This room is used to house the building circuit breaker panels and their conduit pathways. Provide enough space to house between 2 and 5 commercial sized wall mounted breaker panels. Refer to Chapter 360 for additional information.

(4) Building Mechanical Room

Provide space for building backflow preventer, hot water heater, furnace, heat exchanger and blower assembly for building HVAC, as well as building sprinkler valve assemblies, pumps, fire risers and equipment. Refer to Chapter 350 for additional information.

(5) Dock Bull Garage

Provide a space for housing the terminal dock bull tractor either on or near the trestle. The garage does not need to accommodate a dock bull trailer as pictured in Exhibit 440-5. Provide a concrete pad under the structure and shelves at the back for the storage of chains, tow straps, etc. Ensure that this area is covered, enclosed and secure. This space can be combined with the man lift storage.

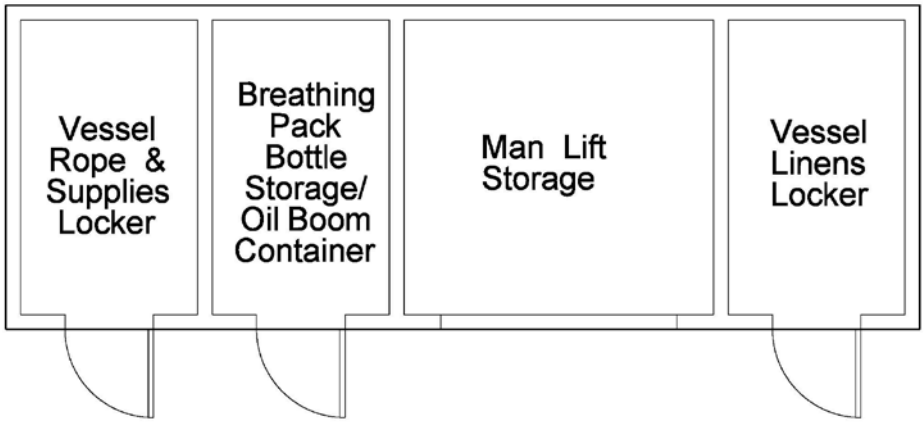
Typical Dock Bull
Exhibit 440-5

440.05 Vessel Maintenance Building

The vessel maintenance building is typically located near the slips. The building spaces typically associated with the vessel maintenance building include:

- Vessel Rope/ Supplies Locker
- Vessel Linens Locker
- Breathing Pack Bottle Storage
- Oil Boom Containers
- Man Lift Storage

These spaces are described in more detail in the paragraphs that follow. Information on sizing requirements for these spaces is provided in Appendix S. Exhibit 440-6 gives an example layout for a vessel maintenance building. Actual vessel facility layouts will vary and should be coordinated with specific site features and terminal needs. Certain vessel maintenance functions may be provided as standalone structures.



Example Layout for Vessel Maintenance Building
Exhibit 440-6

(1) Vessel Rope/Supplies Locker

Provide a locker to store replacement berthing lines and miscellaneous supplies not stored on the vessel including such items as sand, salt, garbage/recycle bags, toiletries and cleaning equipment. Locate the locker on the dock level and near the slips at terminals where vessels tie up at night.

Provide the space with shelves on three sides and a lockable door (preferably a roll up type door).

(2) Vessel Linens Locker

Provide a locker to store vessel linens (clean and dirty) for crew sleeping on the boat. Locate the locker on the dock level and near the slips at terminals where vessels tie up at night. Provide the space with shelves on three sides and a lockable door (preferably a roll up type door).

Vashon Ferry Terminal Vessel Rope/Linens Locker
Exhibit 440-7

(3) Breathing Pack Bottle Storage

Provide storage containers for replacement breathing pack bottles. Exhibit 440-8 provides an example of a typical breathing pack bottle storage container.

Vashon Ferry Terminal Breathing Pack Bottle Storage
Exhibit 440-8

(4) Oil Boom Containers

Provide a portable storage container (Connex) to house 2000 feet of floating harbor boom for emergency waterborne oil spill containment. Containers are mandated wherever fuel and oil is transferred. Place the container close to the transfer span or water for easy deployment.

(5) Man Lift Storage

Oil Boom Containers
Exhibit 440-9

Provide a space to store a scissor type man lift at terminals where vessels tie up. The man lift is used by vessel engineers and maintenance staff for replacing light bulbs and other maintenance in hard to reach areas. Provide a concrete pad under the structure. This space can be combined with the dock bull garage.

Manlift in Use at WSF Terminal
Exhibit 440-10

440.06 Miscellaneous Structures, Enclosures, and Support Areas

There are numerous miscellaneous structures, enclosures and storage areas that support WSF operations. The items discussed in this section are generally standalone structures/areas due to special locations needs (toll booths, hydraulic power unit enclosures, operator control station, etc), risk control (vessel hazmat storage locker, flammable materials locker, etc.), noise control (emergency generator) or other unusual constraints. Some of these spaces may be incorporated into a passenger building or maintenance building as space and location permits. Exhibit 440-11 identifies the miscellaneous structures, enclosures and support areas required. These spaces are described in more detail in the paragraphs that follow. Information on sizing requirements for these spaces is provided in Appendix S.

Structure, Enclosure or Support Area	Near Toll Booths	Near Slips	Vehicle Holding	Other / Variable
Operator Control Station (OHL) [1]		X		
Vehicle/Traffic Attendant Booth	X			
Traffic Attendant Office		X		
Vehicle/Passenger Staff Restroom			X	
Vessel HazMat Storage Locker		X		
Flammable Materials Locker		X		
Oil Spill Supply Barrel			X	
Oil Spill Response Kit			X	
Terminal Engineering Damage Assessment Kit		X		
Garbage and Recycling		X		
Cart Storage [2]		X		
Vendor Storage		X		
Service Transformer Area				X
Emergency Generator [3]				X
Isolation Transformers		X		
Transfer Span Electrical Enclosures		X		
Hydraulic Power Unit (HPU) Enclosures		X		
Backflow Preventer Enclosures		X		
Sewage/Stormwater Lift Station				X

[1] Locate near overhead loading

[2] Locate near garbage and recycling area

[3] Locate near main power

Miscellaneous Structures, Enclosures, and Support Areas
Exhibit 440-11

(1) Operator Control Station for Overhead Loading

Refer to Chapter 620 for requirements.

(2) Vehicle Toll Booths

Refer to Chapter 510 for requirements.

(3) Vehicle / Traffic Attendant Booth

Provide a booth or a small area for traffic attendants when their work station is in a remote location at a facility. This area provides a means for the attendant to retreat from inclement weather conditions and serves to store medical supplies, incident report forms, ferry information, and a hydration source. Provide sufficient space for one employee, a small medical kit, radio battery charger, ferry information, and some personal items.

(4) Traffic Attendant Office

Provide an office for the traffic attendants within the vehicle holding area at large terminals. This area provides a means for the attendants to retreat from inclement weather conditions and serves to store medical supplies, incident report forms, ferry information, and a hydration source.

Provide a desk and chair for each attendant and sufficient space for a small medical kit, radio battery charger, ferry information, and some personal items. Consider locating this office in the Terminal Supervisor Building where the attendant has access to a restroom and potentially other amenities such as an employee lunch room and locker room.

Anacortes Terminal Traffic Attendant Booth
Exhibit 440-12

(5) Vehicle/Passenger Staff Restroom

Consider providing restooms near the vehicle holding area for passengers and staff working in the vicinity. See Chapter 400 for more information on restroom design.

(6) Vessel Hazardous Materials Storage Locker

Provide a self-contained locker for the storage of hazardous materials including used oil rags, oil drums, light bulbs and batteries until they are picked up for disposal. Base the all metal, portable and lockable storage locker on WSF standard design. Locate the hazmat locker near the trestle such that hazardous material does not contaminate the storm drain system or scuppers. Consider locating hazmat storage locker in the garbage/recycling area.

(7) Flammable Materials Locker

Provide a self-contained flammable materials storage locker at the head of each slip to store gas cans for dock bulls and rescue boats and confiscated customers gas cans. Base on WSF standard design with shelving across the back for segregating cans by date.

(8) Oil Spill Supply Barrel

Provide a storage locker to store items needed to respond to a large spill event including:

- Oil-absorbent pads
- Oil-absorbent powder
- Oil-absorbent socks
- Disposable bags
- Disposable nitrile gloves
- Safety goggles

Provide the space with shelves on three sides and a lockable entry. Locate near the trestle.

(9) Oil Spill Response Kit

Provide an oil spill response kit to clean up minor oil spills. The spill response kit has enough materials (absorbent pads, chemicals, etc.) to respond to a small spill anywhere within the holding area.

Vashon Ferry Terminal Oil Spill Response Kit
Exhibit 440-13

(10) Terminal Engineering Damage Assessment Kit

Provide a storage locker containing equipment for Terminal Engineering Staff to perform damage assessment of the facilities. The locker is used to store the following items: lantern, claw hammer, 100’ tape, 25’ tape, plumb bob, dust masks, orange paint, hard hat, miscellaneous nails, cotton gloves (2 pairs), latex gloves (4 pairs), clipboard with paper, lumber crayon, duct tape, 7 ½” level, screwdrivers (phillips and regular), pliers (large needle nose, adjustable, linemans), crescent wrenches (8” and 12”), disposable camera, pry bar, 6’ wire, damage assessment team vest, personal floatation device (PFD), and a terminal damage assessment climbing harness.

Vashon Ferry Terminal Damage Assessment Kit
Exhibit 440-14

(11) Garbage and Recycling

Include a space to support the storage and transfer of vessel and terminal garbage and recycling. Provide adequate lighting and a fence around the garbage and recycling to secure the area. Allow for drive though access by locating lockable gates at either end of the area. Provide space for garbage dumpsters, recycle dumpsters, and a large trash compactor where applicable. The following terminals require trash compactors:

- Anacortes
- Fauntleroy
- Kingston
- Seattle

Design trash compactors so that the hydraulic systems are mounted to the compactor and do not require disconnecting of hydraulic hoses to be emptied. The intent is to prevent accidental hydraulic spills and leaks from repeated disassembly and reassembly of the hydraulic hoses that currently takes place.

Place dumpsters and trash compactors on a concrete pad in a location accessible by delivery truck. Provide a covered area for dumpsters or provide dumpsters with a hinged, watertight lid that closes automatically to prevent stormwater from collecting inside the dumpsters. Water leakage from dumpsters is considered contaminated runoff and requires treatment to meet department of ecology standards. Provide a means to contain any runoff from the garbage and recycling area and convey it to a stormwater treatment system that includes oil-water separation.

Seattle Ferry Terminal Garbage and Recycling Area
Exhibit 440-15

(12) Vendor Storage and Office Space

Vendor storage and office space is included in the Retail and Lease Space requirements discussed in Chapter 400.

(13) Service Transformer Area

Consult with the power company to ascertain their requirements for the transformers and associated access.

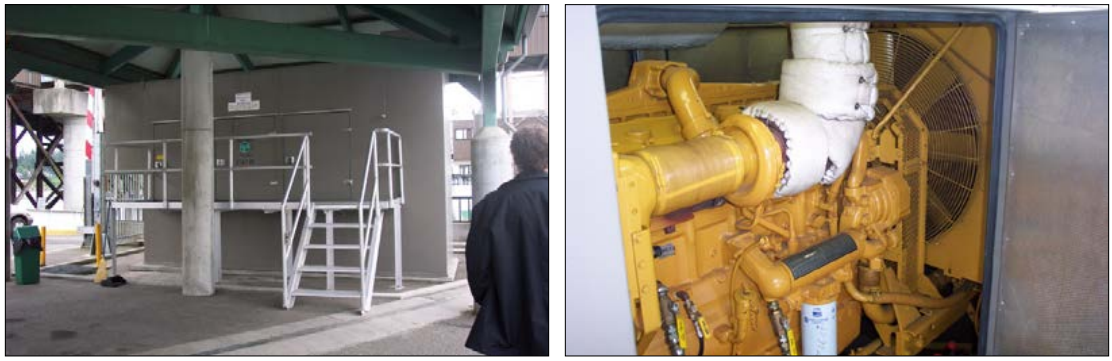
Service transformers are numbered and spaced according to the size of each terminal and function to provide electrical service from the local utility. Provide a secured or fenced area with adequate warning signage. Additionally, provide the following:

- Power company access
- Locate adjacent to the main switchboard area, where feasible.
- Clearance of 10 feet in the front and 3 feet at sides and back. If located adjacent to the main switchboard area, the clearance spaces can overlap

(14) Emergency Generator

The emergency generator supplies power to the entire terminal including vehicle transfer spans and overhead loading during a power outage. Backup power is also required in order for the Electronic Fare System to remain viable and function in real time during an outage. The generator is a standalone self-contained unit and requires a concrete pad and mounting suspension. It is often located on the perimeter of a facility and requires secure fencing or some form of enclosure. The emergency generator may be located in the terminal building if precautions are taken to address access, noise, vibrations and emissions issues. The emergency generator requires the following:

- Fuel truck access
- Maintenance access
- Space for portable load bank setup
- Location adjacent to the main switchboard area, where feasible
- Sound attenuating enclosure
- Load bank receptacles
- Size for entire facility load minus the shore power receptacles Refer to Chapter 360 for additional information.



Bainbridge Island Ferry Terminal Emergency Generator and Enclosure
Exhibit 440-16

(15) Isolation Transformers

Provide one isolation transformer per slip. These transformers are required in order to isolate the vehicle transfer spans from the rest of the electrical infrastructure of a terminal. Locate within close proximity of the vehicle transfer span. Refer to Chapter 360 for additional information.

(16) Transfer Span Electrical Enclosures

Locate the transfer span electrical enclosure near the slips. This provides electrical service to the pedestrian and vehicle transfer span(s). Refer to Chapter 360 for additional information.

(17) Hydraulic Power Unit Enclosures

Provide a separate hydraulic power unit (HPU) for each vehicle and overhead loading transfer span. Refer to Section 810.09(4) for information on HPU enclosures for vehicle transfer spans and Section 820.07(11) for information on HPU containment for overhead loading.

Bainbridge Island Ferry Terminal VTS HPU Enclosure
Exhibit 440-17

(18) Backflow Preventer Enclosures

Provide a backflow preventer and enclosure for vehicle transfer spans with water supply. Install backflow preventers where there is a safety/sanitary need to prevent liquid from reversing its course inside a flow system. Provide for one direction flow only. Locate backflow preventers near the slips. Refer to Chapter 560 for a description of the backflow preventer, enclosure, and a list of terminals with water/sewer supply at the slips.

Clinton Ferry Terminal Backflow Preventer Enclosures
Exhibit 440-18

(19) Sewage/Stormwater Lift Station

Provide a sewage/storm water lift station when gravity flow system is not adequate to move flows. Locate in isolated area with curbside access for servicing. Provide adequate access for a large crane or boom truck service vehicle. Refer to Chapter 560 for additional information regarding stormwater design at WSF Terminals.