Chapter 210 Design Matrix Procedures

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210.01 General

Chapter 200 provides guidance for the scoping of capital terminal preservation and improvement projects. The design matrices in this chapter are used to identify the project type and the associated design elements to be addressed. Design variances can be allowed. This chapter addresses matrices for Preservation as well as common types of improvement projects. Atypical Improvement projects, less frequently funded, will be evaluated on a project-by-project basis in consultation with the Assistant State Design Engineer (ASDE). Coordinate with the Design Engineering Manager, the WSF ADA Coordinator and the ASDE on the scope of these projects particularly regarding ADA analysis and inclusion.

The Preservation design matrices are broken into three tables to coincide with the location and/or the type of facility found in the *Life Cycle Cost Model* (LCCM) Inventory Identification Scheme; in or over water, on land, and buildings. The Improvement matrix was developed to address the most common improvement matrix projects.

A design matrix is used to determine which design elements need to be considered in a project. See Chapter 220 for documentation requirements.

When a project requires work beyond the limits of the terminal area, such as Preservation or Improvement work along an existing state route, consult the WSDOT *Design Manual* M 22-01 (DM) for applicable design guidance and criteria.

210.02 Selecting a Design Matrix

For Preservation projects, selection of a design matrix is based on the location of the facility:

- Waterside
- Upland
- Buildings

For Improvement projects, design matrix use is subject to ASDE discretion, and may not apply to all projects.

210.03 Using a Design Matrix

The design matrices are shown in Exhibits 210-1 through 210-4. The definitions presented in this chapter are meant to provide clarification of terminology used in the WSF *Terminal Design Manual*. There is no assurance that these terms are used consistently in references outside the WSF *Terminal Design Manual*.

(1) Project Type

For project types not listed in the design matrices (such as unstable slopes, traffic signals, or work outside the terminals), consult the Headquarters (HQ) Design Office for guidance.

In the design matrices, row selection is based on Project Type. The Project Summary Form (see Section 200.05) defines the purpose and needs for the project and describes the project.

Note: Some projects may fall under two or more project types. For example, pavement replacement (Matrix 2) may be combined with utility work (Matrix 4). If the main purpose of a project is preservation, but some requirements are covered under the improvement matrix, the project is still classified as a preservation project.

Preservation Project Types are:

(a) Waterside: Terminal facilities located in or over the water.

Transfer Span/Tower Mechanical/Electrical – Work on transfer span/tower/headframe mechanical and/or electrical systems that have reached the end of their useable service life identified in the LCCM prevent failure of the lifting systems. May include utility work. Does not include structural work but may be combined with a Transfer Span/Tower Rehabilitation project.

Transfer Span/Tower Rehabilitation – Work on a transfer span/tower that has reached the end of the useable service life identified in the LCCM to repair elements to prevent further corrosion, wearing, and/or preserve the structural integrity. May include utility work. Does not include electromechanical work but may be combined with a Transfer Span/Tower Mechanical/Electrical project.

Transfer Span/Tower Replacement – Work on a transfer span/tower to replace elements that have reached the end of the useable service life identified in the LCCM. May include utility work. May include mechanical, electrical and structural work.

Bridge Seat Rehabilitation – Work on a bridge seat that has reached the end of the useable service life identified in the LCCM to preserve or restore operational or structural capacity. May include utility work. ***Note:*** use *Matrix 4: Improvement Projects* when seismic retrofit is only design element.

Bridge Seat Replacement – Work on a bridge seat to replace elements that have reached the end of the useable service life identified in the LCCM. May include utility work.

Overhead Loading Electrical/Mechanical – Work on the overhead loading systems that have reached the end of its useable service life identified in the LCCM to preserve elements to prevent electromechanical failure of the lifting systems. May include utility work. Does not include structural work but may be combined with an Overhead Loading Rehabilitation project.

Overhead Loading Rehabilitation – Work on overhead loading fixed and moveable structures that have reached the useable service life identified in the LCCM to preserve or restore operational or structural capacity. Does not include electromechanical work but may be combined with an Overhead Loading Electrical/Mechanical project.

Overhead Loading Replacement – Work on overhead loading fixed and moveable structures to replace elements that have reached the end of the useable service life identified in the LCCM. Includes structural, electrical and mechanical work.

Landing Aids Wingwalls – Work on wingwalls that have reached the end of the useable service life identified in the LCCM to repair or preserve the structural integrity of the wingwalls.

Landing Aids Dolphins – Work on dolphins that have reached the end of the useable service life identified in the LCCM to repair or preserve the structural integrity of the dolphin. May include dredging.

Trestle Rehabilitation – Work on a trestle that has reached the end of the useable service life identified in the LCCM to preserve or restore the trestle's operational or structural capacity. May include substructure and/or superstructure work. May include utility work. Does not include pavement rehabilitation, but may be combined with that type of project. For trestle projects requiring environmental mitigation, see *Matrix 4: Improvement Projects*. May include seismic retrofit. ***Note:*** use *Matrix 4: Improvement Projects* when seismic retrofit is only design element.

Trestle Replacement – Work on a timber trestle to replace elements that have reached the end of the useable service life identified in the LCCM. This work may also impact or require the replacement of components, such as pavement, electromechanical systems, utilities and buildings that have not reached the end of their useable service life but cannot be removed and re-installed on a new trestle. For trestle projects requiring environmental mitigation, see *Matrix 4: Improvement Projects*.

Trestle Pavement Rehabilitation – Work to preserve or restore the existing pavement surface by removing and replacing pavement that has reached the end of the useable service life identified in the LCCM to protect the underlying structure. This work serves to protect the underlying trestle deck from damage.

Bulkhead Rehabilitation – Work on bulkhead elements that have reached the end of the useable service life identified in the LCCM to preserve or restore the structural capacity. May include work directly on the bulkhead and/or rip rap placement if feasible.

Bulkhead Replacement – Work on a bulkhead to replace elements that have reached the end of the useable service life identified in the LCCM. May include replacing the bulkhead in-kind or with rip rap if feasible.

Tie-up Slip – Work on a tie-up slip to preserve or restore the structural integrity of the slip, or replace elements, such as electromechanical systems, gangways, tie-up slip dolphins and/or wingwalls that have reached the end of the useable service life identified in the LCCM. May include dredging.

(b) Upland: Terminal facilities located on the land side

Pavement Rehabilitation – Work that preserves the existing pavement surface that has reached the end of its useable service life identified in the LCCM by overlaying or milling-and-filling at regular intervals to protect the public investment. Does not include trestle pavement rehabilitation.

Pavement Replacement – Work that replaces deteriorated pavement that has reached the end of its useable service life identified in the LCCM with a full depth Hot Mix Asphalt (HMA), Portland Cement Concrete Pavement (PCCP), pervious cement concrete pavement, or other pavement surface as described in Chapter 340 to protect the public investment and enhance the ridership experience.

Chip Seal – Work that resurfaces the existing HMA pavement surface that has reached the end of its useable service life identified in the LCCM with a chip seal to protect the public investment.

Gravel Regrading – Work that regrades the existing gravel surface that has reached the end of its useable service life identified in the LCCM at regular intervals to protect the public investment.

Security – Work on security features to repair, upgrade, or replace elements that have reached the end of its useable service life identified in the LCCM.

Toll Plaza Rehabilitation – Work that rehabilitates existing toll plaza elements that have reached the end of its useable service life identified in the LCCM to protect the public investment. Does not include, but may be combined with pavement preservation projects. See Chapter 510 for more information.

Toll Plaza Replacement – Work on toll plazas to replace elements that have reached the end of its useable service life identified in the LCCM. Does not include, but may be combined with pavement preservation projects.

(c) Buildings: Terminal facility buildings Preservation

Rehabilitation/Remodel

Terminal Building – Work that rehabilitates or remodels existing building elements that have reached the end of its useable service life identified in the LCCM to protect the public investment. This work can include repairs to foundations (not including seismic work), building utilities, building code upgrades such as accessibility, restroom capacity, structural, energy compliance, wiring, grounding, breaker/fuse boxes, HVAC, elevators, and other electrical systems.

Toll Booth – Work that rehabilitates toll booth elements that have reached the end of its useable service life identified in the LCCM to protect the public investment.

Auxiliary Facilities – Work that rehabilitates or remodels existing public auxiliary facilities, such as restroom buildings, that have reached the end of its useable service life identified in the LCCM. This work can include repairs to foundations (not including seismic work), building utilities, building code upgrades such as accessibility, restroom capacity, structural, energy compliance, wiring, grounding, breaker/fuse boxes, HVAC, elevators, and other electrical systems.

Superstructure-Seismic – Work that upgrades the existing building superstructure that has reached the end of its useable service life identified in the LCCM to current seismic code to protect the public investment and safety in the event of a seismic event. If the structure has not reached the end of its usable service life, the work is classified as an improvement project and *Matrix 4: Improvement Projects* is to be used.

Staff Facilities – Work that remodels or rehabilitates staff facilities that have reached the end of its useable service life identified in the LCCM. This work can include repairs to foundations (not including seismic work), building utilities, building code upgrades such as accessibility, restroom capacity, structural, energy compliance, wiring, grounding, breaker/fuse boxes, HVAC, elevators, and other electrical systems.

Roofing – Work involving the replacement or major repair of building roofs that have reached the end of its useable service life identified in the LCCM.

Retail Accommodations – Work that remodels or rehabilitates retail accommodations, including vending, that have reached the end of its useable service life identified in the LCCM.

Exterior Siding – Work that replaces exterior building siding. If the structure has not reached the end of its usable service life, the work is classified as an improvement project.

Interior Remodel – Work that includes the remodel of existing facilities. If the structure has not reached the end of its usable service life, the work is classified as an improvement project.

Replacement

Terminal Building – Work that replaces existing terminal buildings that have reached the useable service life identified in the LCCM where rehabilitation is not cost-effective.

Toll Booth – Work that replaces existing toll booths that have reached the useable service life identified in the LCCM where rehabilitation is not cost-effective.

Auxiliary Facilities – Work that replaces existing auxiliary building facilities that have reached the useable service life identified in the LCCM where rehabilitation is not cost-effective.

Security Facilities – Work on security facilities to repair, upgrade, or replace elements that have reached the useable service life identified in the LCCM.

Staff Facilities – Work that replaces existing staff facilities that have reached the useable service life identified in the LCCM where rehabilitation is not cost-effective.

(d) Improvement Project Types

Improvement projects apply to non-LCCM items or work, or work on LCCM elements which have not reached the end of their usable service life and that are not incidental to preservation projects (such as replacing pavement or utilities that are demolished during a trestle replacement project). Consult Terminal Engineering Management regarding final determination between classification of Improvement and Preservation during scoping.

ADA Compliance (Site) – Work that improves accessibility within the terminal site by bringing the facility in compliance with current Americans with Disabilities Act (ADA) based upon accessibility criteria from the US Access Board's "Revised Draft Guidelines for Accessible Public Rights of Way" (PROWAG) standards. (See Chapter 300 for more information.)

ADA Compliance (Building) – Work that improves accessibility at or within the terminal building(s) based upon accessibility criteria from the Department of Justice's "2010 ADA Standards for Accessibility Design." (See Chapter 300 for more information.)

ADA Compliance (Passenger Vessel Loading) – Work that improves accessibility at the vessel loading based upon accessibility criteria from the Access Board's "Proposed Passenger Vessels Accessibility Guidelines". (See Chapter 300 for more information.)

Additional Slip – Work which adds an additional operating or tie-up slip at the terminal.

Develop New Terminal Facility – Work to develop a new terminal facility.

Environmental Mitigation/Retrofit – Work mandated by environmental permit conditions, generally associated with a larger preservation or improvement project. Also includes hazardous materials or waste abatement where applicable.

Hazardous Abatement – Work to remove or mitigate hazardous materials, such as asbestos or mold, where applicable.

Illumination System Replacement and Upgrades – Work that replaces structurally deficient luminaires, when needed, and upgrades conventional lighting systems to energy-efficient LED systems.

Intelligent Transportation Systems (ITS) – Improvements of Intelligent Transportation Systems, including those supporting reservations systems.

Security Improvements – Work that upgrades facility, passenger and/or employee security based on current security requirements.

Seismic Retrofit – Work that brings non-building structure(s) to current seismic code.

Systems and Utilities Improvements – Standalone project. Work that brings systems, such as illumination, signal, and/or utilities to current code, upgrades existing systems and/or utilities, or adds systems and/or utilities to the terminal facility. Work could pertain to a specific utility or system.

(2) Design Elements

The column headings on a design matrix are Design Elements. Not all potential design elements have been included in the matrices.

The design elements that are included are based on the LCCM, knowledge gained from past projects, and typical project design elements encountered on the WSF Terminal designs.

If using a design element that is not covered in this manual, use an approved manual or guidance on the subject and document the decision and the basis for the decision.

The following elements are shown on the design matrices.

(a) Matrix 1 – Waterside Preservation

ADA – Address ADA issues such as pedestrian handrails, landing requirements, cross or running slope on pedestrian walkways, and publically accessed gangways, including overhead loading systems. Ensure ADA parking stalls are laid out as per the *Standard Plans* and other WSDOT ADA references. Project shall be in compliance with The Americans with Disabilities Act. (See Chapter 300 for compliance requirements.)

Basic Safety – Safety Elements protect the public and WSF employees from injury or loss of life by upgrades and/or repairs including, but not limited to the following:

- Signing Improvements
- Illumination Improvement
- Pavement Marking Delineations/Channelization Improvements
- Vehicle/Pedestrian Guardrail Upgrades
- Eliminating Trip Hazards
- Installing bicycle friendly road features
- Signalization
- Electrical grounding repairs
- Replacing worn wire ropes on mechanical transfer span systems
- Addressing Ergonomic Issues
- Spot Safety Improvements

(See Chapter 200 for more information.)

Does not include rescue ladders and life rings.

Basic Safety work must fall within the scope of a project to be considered for inclusion to a project.

Seismic – Address Seismic deficiencies by bringing structure(s) to current code. (See Division 6 – Waterside Development for more information.)

Code upgrade (Electrical/Mechanical) – Work to upgrade transfer spans, OHL to current codes. Does not include operational enhancements. (See Chapters 610 and 620 for more information.)

Dolphin Configuration – (See Chapters 200, 640 and 650 for more information.)

Utilities – Terminal Waterside Facilities Only: Natural Gas Lines, Water Lines, Sewer Lines, Communications systems. (See Chapters 600, 610, and 620 for more information.) Does not include fire protection, electrical, lighting, storm sewer or drainage features. See Section 200.05 for list of known or suspected in-water utilities at various terminals.

Railings/Barrier – Upgrading rails and barriers to latest standards, including AASHTO and ADA. (See Chapters 600 and 610 for more information.)

Maintenance Issues – Coordinate with maintenance for project scope.

Programmable Logic Controller – Element controls for the electromechanical system of vehicle transfer span and passenger overhead loading systems. May require HQ Design approval if specifying a proprietary item (See Chapters 610 and 620 for more information.)

Replace Mechanical Components – Replacement of worn or deficient mechanical system components to protect life and safety of operators and the traveling public. (See Chapters 610 and 620 for more information.)

Replace Electrical System Components – Replacement of worn or deficient electrical system components to protect life and safety of operators and the traveling public. (See Chapters 610 and 620 for more information.)

Vessel Sewer/Water – Only supplied to boats at certain terminals (See Chapter 200 under Project Impacts Form for more information.)

Fire Protection – Install or upgrade trestle fire protection system. (See Chapter 560 for more information.)

Power Upgrade – Power to Boats and Terminal facilities (See Chapters 360 and 560 for more information.)

Lighting – Provide exterior lighting per established criteria for vehicles, pedestrians and operations requirements. Does not include interior lighting. (See Chapters 360 and 560 for more information.)

Corrosion Protection – Includes cathodic protection for steel piles; corrosion resistance coatings. (See Chapter 600 for more information.)

Control Systems – Gate control (see Chapter 500), fire protection (see Chapter 560), relays (See Chapter 360), and signal/vehicle controls (See Chapter 360 and Division 5). Does not apply to Programmable Logic Controllers.

Operational Enhancements – (See Chapter 200 for more information.)

Stormwater – Per requirements of the most recent edition of the WSDOT *Highway Runoff Manual* (HRM) (See Chapters 340 and 600 for more information.)

Signing/Striping/Channelization – Addresses traffic flow or pavement marking issues. See Chapter 340 and the WSDOT *Design Manual* for more information.)

Rip Rap – A foundation or sustaining wall of stones placed together used for armoring of beaches and scour protection when needed. Consider replacing bulkheads with rip rap. (See Chapter 600 for more information.)

Maintenance Access – Elements associated with access to maintenance appurtenances and functionality.

Rescue Ladder and Life Rings – Safety elements per Requirements of RCWs. (See Chapter 200 for more information). Not included as a basic safety element.

Dredging – Involves dredging of operating and tie-up slips to accommodate larger vessels and/or preserve the use of the slip for the current vessel class operating at the terminal. The need for this work is only evaluated on dolphin and tie-up slip preservation projects.

Lane Width – Holding Lanes, Traffic Lanes, Turning Radius, Bicycle Lanes and pedestrian use areas. (See Chapter 340 for more information on lane width requirements.)

(b) Matrix 2: Upland Preservation

ADA – Address ADA issues such as cross or running slope on pedestrian walkways. Ensure ADA parking stalls are laid out per the *Standard Plans* and other WSDOT ADA References. (See Chapter 300 for further information.)

Basic Safety – Safety Elements protect the public and WSF employees from injury or loss of life by upgrades and/or repairs including, but not limited to the following:

- Signing Improvements
- Illumination Improvement
- Pavement Marking Delineations/Channelization Improvements
- Vehicle/Pedestrian Guardrail Upgrades
- Eliminating Trip Hazards
- Installing bicycle friendly road features
- Signalization
- Electrical grounding repairs
- Addressing Ergonomic Issues
- Spot Safety Improvements

(See Chapter 200 for more information.)

Basic Safety work must fall within the scope of a project to be considered for inclusion.

Lane Width – Holding Lanes, Ferry Highway Shoulder Holding Lanes, Traffic Lanes, Turning Radius, Bicycle Lanes and pedestrian use areas. (See Chapter 340 for more information on lane width requirements.)

Traffic Calming – Speed bumps, raised pavement markers, signing, traffic islands/circles, curbing, bulb outs. See Chapter 340 and WSDOT *Design Manual* Chapter 1510 for more information.

Sidewalk – Replacement of ADA non-compliant sidewalk. Installation of new sidewalks to provide an ADA compliant path to the toll booths from the terminal building at those facilities where the terminal building ticket booth is not manned year round so ADA/senior discounted fares may be purchased.

Also may include installation of curb ramps so disabled patrons may access sidewalks. (See Chapter 300 for ADA Compliance and the WSDOT *Standard Plans* for current design guidance.) Does not include elevated walkways or overhead loading.

Security or Intelligent Transportation Systems – Systems supporting the function of the design feature.

Utilities (power supply) – Includes illumination systems. (See Chapter 560 for more information.)

Utilities (sanitary sewer) – (See Chapter 560 for more information.)

Utilities (other) – Water, Gas, Communications, including phone and data work. Does not include electrical or sanitary sewer work. (See Chapter 560 for more information.)

Fencing – Security, Fare Evasion and Fall Protection Fencing. (See Chapter 500 and the WSDOT *Standard Plans* for more information.)

Stormwater – Per requirements of the most recent edition of the WSDOT *Highway Runoff Manual* (HRM) (See Chapters 340 and 560 for more information.)

Guardrail/Handrail – Replacing deficient or upgrading obsolete vehicular or pedestrian handrail (fall protection). May also include the placement of additional guardrail, subject to analysis. See the WSDOT *Design Manual* for roadway guardrail requirements, and Chapter 300 for pedestrian guardrail requirements.

Barrier – Replacing or installing protective concrete barrier at toll booth or other upland roadway locations. (See Chapters 500 and 510 for more information.)

Bicycle – Includes replacing bicycle hazardous roadway features, and may include installing bicycle lanes and storage facilities (See Chapter 500 for more information.

Pedestrian – Installation of crosswalks, overhead walkways and/or other pedestrian facilities. (See Chapter 340 and Division 5 for more information.) May include addressing safety, circulation or wayfinding issues outside of a building. Does not include safety, circulation or wayfinding issues, or sidewalk project elements or pedestrian accommodations within buildings.

Alignment – See WSDOT *Design Manual* (See Chapter 340 for more information.)

Signing/Striping/Channelization – Address Pavement Marking and/or Channelization Issues. See *Standard Plans*, *Design Manual*, and MUTCD. Does not include barrier or guardrail work. (See Chapters 340 and 570 for more information.)

Operational Enhancements – (See Chapter 200 for more information.)

Maintenance Issues – Coordinate with maintenance for project scope.

Toll Booth Approach Pads – Replace asphalt toll booth approach pads with Portland cement concrete pavement. Does not apply to toll booth building foundations. (See Chapters 340 and 510 for more information.)

(c) Matrix 3: Terminal Facility Buildings

ADA – Address ADA issues such as ramp slopes, access, visual paging, signing, safety, circulation or wayfinding issues, and other pedestrian accommodation requirements (See Chapters 300, 350 and Division 4 for more information.)

Enclosure/Energy Upgrade – Installation of energy-saving features for new construction or code upgrades for building rehabilitation such as lighting, HVAC, windows, doors and insulation.

Exterior Siding – Replace, paint or repair exterior building siding. (See Chapter 350 and Division 4 for more information.)

Roofing – Replace or repair building roofs. (See Chapter 350 and Division 4 for more information.)

Superstructure-Seismic – Address seismic deficiencies by bringing structure(s) to current code. (See Chapters 350 and 450 for more information.)

Interior Remodel – Flooring, tiling, drywall, and ceiling work. (See Chapter 350 and Division 4 for more information.)

Retail Accommodations – Replace, rehabilitate or repair public retail accommodations, including vending. (See Chapter 400 for more information.)

Operational Enhancements – See Chapter 200 for explanation concerning these project elements.

Maintenance Issues – Consult and work with terminal maintenance team to reduce ongoing or high maintenance expenditures and other issues.

Hazardous Abatement – Abate building hazards such as, but not limited to, lead paint, asbestos and mold.

(d) Matrix 4: Improvement Projects

ADA – Address ADA issues such as ramp slopes, access, visual paging, signing, safety or circulation or wayfinding issues, and other pedestrian accommodation requirements. (See Chapters 300, 350 and Division 4 for more information.)

Basic Safety – Safety Elements protect the public and WSF employees from injury or loss of life by upgrades and/or repairs including, but not limited to the following:

- Signing Improvements
- Illumination Improvement
- Pavement Marking Delineations/Channelization Improvements
- Vehicle/Pedestrian Guardrail Upgrades
- Eliminating surface discontinuities
- Installing bicycle friendly road features
- Signalization
- Electrical grounding repairs
- Addressing Ergonomic Issues
- Spot Safety Improvements

(See Chapter 200 for more information.)

Basic Safety work must fall within the scope of a project to be considered for inclusion to a project.

Bicycle – Includes replacing bicycle roadway features, and may include installing bicycle lanes and storage facilities (See Chapter 500 for more information.

Building Access Ramps and Stairs – Replacement of non-ADA compliant building access ramps and stairs. May include installation of elevators (if applicable).

Energy Upgrades – Installation of energy saving lighting (i.e. LED) technology or other features.

Fencing – Security, Fare Evasion and Fall Protection Fencing. (See Chapter 500 and the WSDOT *Standard Plans* for more information.)

Gangways and OHL Systems – Work to upgrade non-ADA compliant gangways and OHL systems used for passenger loading.

Guardrail – Replacing deficient or upgrading obsolete vehicular guardrail or pedestrian handrail (fall protection). May also include the placement of additional guardrail, subject to analysis. See the WSDOT *Design Manual* for roadway guardrail requirements, and Chapter 300 for pedestrian handrail requirements.

Hazardous Abatement – Abate hazards such as, but not limited to, creosoted materials, contaminated soils, lead paint, asbestos and mold.

Intelligent Transportation Systems – Systems supporting the function of the design feature.

Lighting – Upgrade facility lighting to current standards.

Maintenance Issues – Consult and work with terminal maintenance team to reduce ongoing or high maintenance expenditures and other issues.

Operational Enhancements – (See Chapter 200 for more information.)

Pedestrian – Installation of crosswalks, overhead walkways and/or other pedestrian facilities. (See Chapter 340 and Division 5 for more information.) May include addressing safety, circulation or wayfinding issues.

Does not include sidewalk project elements or pedestrian accommodations within buildings.

Permit Mitigation Condition Requirements – Address permit mitigation condition requirements. Generally applies to over water coverage, beach cleanup or eel grass restoration.

Security Systems – Systems support the function of the design feature.

Seismic – Address Seismic deficiencies by bringing structure(s) to current code. (See Division 6 for more information.)

Sidewalk – Replacement of ADA non-compliant sidewalk, or installation of new sidewalks to provide an ADA compliant path to the toll booths from the terminal building at those facilities where the terminal building ticket booth is not manned year round so ADA/senior discounted fares may be purchased.

Also may include installation of curb ramps so disabled patrons may access sidewalks. (See Chapter 300 for ADA Compliance and the WSDOT *Standard Plans* for current design guidance.) Does not include elevated walkways.

Signing – Address traffic or pedestrian signing or way finding issues. See *Standard Plans*, *Design Manual*, MUTCD. (See Chapters 340 and 570 for more information.)

Striping/Channelization – Addresses traffic flow or pavement marking issues. See Chapter 340 and the WSDOT *Design Manual* for more information.)

Stormwater – Per requirements of the most recent edition of the WSDOT *Highway Runoff Manual* (HRM) (See Chapters 340 and 560 for more information.)

Utilities (power supply) – Includes power supply for illumination systems and emergency standby generators, and installation of infrastructure supporting the installation Electric Vehicle Charging stations. (See Chapter 560 for more information.)

Utilities (sanitary sewer) – (See Chapter 560 for more information.)

Utilities (other) – Water, Gas, Communications, including phone and data work. Does not include electrical or sanitary sewer work. (See Chapter 560 for more information.

(3) Design Element inclusion within a Project Type

If an "X" is indicated in a matrix cell the box for a Design Element for a Project Type, it should be included as part of the scope of the project. If the matrix cell for a Design Element is empty for a Project Type, it is not necessary to consider for inclusion as part of the project scope.

(4) Design Variances

The two types of design variances are evaluate upgrades (EU) and deviations. (See Chapter 220 regarding the Design Variance Inventory System (DVIS).) For design elements that are not variances to a design standard see Chapter 220 on how to document design decisions.

(a) Evaluate Upgrade (EU)

An EU in a matrix cell indicates that WSF has determined the design element is an item of work that is to be justified for inclusion in the project. For an existing element that does not meet or exceed the specified design level, an evaluation is required to determine the impacts and cost-effectiveness of including the element in the project. The EU analysis must support the decision to upgrade that element. (See Chapter 220 regarding documentation.)

(b) Deviation

A deviation is required when an existing or proposed design element differs from the specified design level for the project or when considering not including a specified element as indicated by an "X" in the matrix for the type of preservation project. (See Chapter 220 regarding documentation.)

See the following pages for Design Matrices 1–4

⇩ Project Type / Design Elements ⇨	ADA	Basic Safety	Seismic[1]	Code upgrade (Electrical/Mechanical)	Dolphin Configuration	Utilities	Railings/Barrier	Maintenance Issues	Programmable Logic Controller	Replace Mechanical Components	Replace Electrical Components	Vessel sewer/water	Fire Protection	Power Upgrade	Lighting	Corrosion Protection	Control Systems	Operational Enhancements	Storm Water	Signing/Striping/ Channelization	Rip Rap	Maintenance Access	Rescue Ladder/Life Rings	Dredging	Lane Width
1-1 Transfer Span/Tower																									
1-1a Mechanical/Electrical		EU		X		EU		EU	X	X	X	EU		EU	EU		X					EU			
1-1b Rehabilitation	EU	X	EU	EU		EU	X	EU	EU	X	X	EU	EU			EU	EU			X		EU			
1-1c Replacement	X	X	X	X		X	X	EU	X			EU	EU	EU	EU	X	X	X		X		X			
1-2 Bridge Seat																									
1-2a Rehabilitation			EU			EU		EU								EU					EU				
1-2b Replacement			X			X		EU								X					EU				
1-3 Overhead Loading																									
1-3a Electrical/Mechanical		EU		X		EU		EU	X	X	X	EU		EU	EU		X					EU			
1-3b Rehabilitation	EU	X	EU	EU		EU	X	EU	EU	EU	EU		EU		EU	EU	EU	EU				EU			
1-3c Replacement	X	X	X	X		X		EU	X				EU	EU	X	X	X	X				X			
1-4 Landing Aids																									
1-4a Wingwalls			EU					EU							EU	EU						X	X		
1-4b Dolphins					EU			EU							EU	EU						X		EU	
1-5 Trestle																									
1-5a Rehabilitation	EU	X	EU			EU	EU	EU				EU	EU		EU	EU		EU	EU	EU	EU	EU	X		EU
1-5b Replacement	X	X	X			X	X	EU				EU	EU		X	X		X	X	X	EU	X	X		X
1-5c Pavement Rehabilitation	X	X					EU	EU										EU	EU	EU					
1-6 Bulkhead																									
1-6a Rehabilitation			EU			EU		EU				EU				EU			EU		EU				
1-5b Replacement			X			X		EU				EU				X			EU		EU				
1-7 Tie-up Slip	EU	X	X	EU	EU	EU		EU	EU	EU	EU	EU		EU		EU	EU	EU						EU	

Design Matrix Notes:

☐ A blank cell indicates that the element is not applicable.

X Design Analysis required

EU Evaluate Upgrade justification to full design level.

Notes

(1) If only element of work, and the structure has not reached its LCCM due date, see Matrix 4: Improvement Projects

Matrix 1: Waterside Preservation
Exhibit 210-1

⇩ Project Type Design Elements ⇨	ADA	Basic Safety	Lane Width	Traffic Calming	Sidewalk	Security or ITS Systems (Non-LCCM)	Utilities (power supply)	Utilities (sanitary sewer)	Utilities (other)	Fencing	Stormwater	Guardrail	Barrier	Bicycle	Pedestrian	Alignment	Signing/Striping/ Channelization	Operational Enhancements	Maintenance Issues	Concrete Toll Booth Pads
2-1 Pavement																				
2-1a Rehabilitation	X	X	EU	EU	EU						EU	X	EU				EU	EU	EU	X
2-1b Replacement	X	X	EU	EU	X					EU	X	X	X			EU	EU	EU	EU	X
2-1c Chip Seal		X																	EU	
2-2 Gravel Regrading		X																	EU	
2-3 Security		EU				X	EU		X	X								X	EU	
2-4 Toll Plaza																				
2-4a Rehabilitation	X	X	EU	EU	X	EU	X			EU		X	EU		EU		EU	EU	EU	X
2-4b Replacement	X	X	X	X	X	X	X	EU	EU	EU	X	X	X	EU	X	X	X	X	EU	X

Design Matrix Notes:

☐ A blank cell indicates that the element is not applicable.

X Design Analysis required

EU Evaluate Upgrade justification to full design level.

Matrix 2: Upland Preservation
Exhibit 210-2

⇩ Project Type Design Elements ⇨	ADA	Enclosure/Energy upgrade	Exterior Siding	Roofing	Superstructure-Seismic	Interior Remodel	Retail Accommodations	Operational Enhancements	Maintenance Issues	Hazardous Abatement
3-1 Rehabilitation/Remodel										
3-1a Terminal Building	X(1)	EU(5)	EU	EU	EU(8)	EU	EU	EU	X	EU(7)
3-1b Toll Booth	X(2)	EU	EU	EU		EU		EU	X	
3-1c Auxiliary Facilities	X(1)	EU(5)	EU	EU	EU(8)	EU	EU	EU	X	EU(7)
3-1dSuperstructure-Seismic		EU(5)	EU	EU	EU(6)	EU		EU	X	EU(7)
3-1e Staff Facilities	X(1)	EU(5)	EU	EU	EU(8)	EU			X	EU(7)
3-1f Roofing				X					X	EU
3-1g Retail Accommodations	X(1)	X(5)				EU	X	EU	X	EU(7)
3-1h Hazardous Abatement		EU	EU	EU					X	X
3-1i Exterior Siding		EU	X						X	EU(7)
3-1ij Interior Remodel	X(1)	X(5)				X(5)	EU	EU	X	EU(7)
3-2 Replacement										
3-2a Terminal Building	X(4)	X(9)	X(9)	X(9)	X(6)	X(9)	EU	X	EU	
3-2b Toll Booth	X(3)	X(9)	X(9)	X(9)	X(6)	X(9)		X	EU	
3-2c Auxiliary Facilities	X(4)	X(9)	X(9)	X(9)	X(6)	X(9)	EU(7)	X	EU	
3-2d Security Facilities	X(4)	X(9)	X(9)	X(9)	X(6)	X(9)		X	EU	
3-2e Staff Facilities	X(4)	X(9)	X(9)	X(9)	X(6)	X(9)		X	EU	

Design Matrix Notes:

☐ A blank cell indicates that the element is not applicable.

X Design Analysis required

EU Evaluate Upgrade justification to full design level.

Notes for Matrix 4: Improvement Projects

(1) Upgrade ADA to Maximum Extent Feasible (MEF)

(2) One ADA Toll Booth per Operations; Other Existing Toll Booths must be ADA Supervisor Accessible to MEF

(3) One ADA Toll Booth per Operations; Other Toll Booths must be ADA Supervisor Accessible

(4) Full ADA compliance

(5) Upgrade to IBC and/or State energy code in areas of work

(6) Design to Seismic Standards

(7) Evaluate the Necessity of this work

(8) Upgrade structure to meet current seismic standards

(9) Design to IBC and State energy code

Matrix 3: Terminal Facility Buildings Preservation

Exhibit 210-3

⇩ Project Type / Design Elements ⇨	ADA	Basic Safety	Bicycle	Building Access Ramps and Stairs	Energy Upgrades	Fencing	Gangways and OHL Systems	Guardrail	Hazardous Abatement	ITS Systems	Lighting	Maintenance Issues	Operational Enhancements	Pedestrian	Permit Mitigation Condition Requirements	Security Systems	Seismic	Sidewalk	Signing	Striping/Channelization	Stormwater	Utilities (power supply)	Utilities (sanitary sewer)	Utilities (other)
4-1 ADA Compliance (Site)	X(1)	X(7)	EU					EU(6)				EU	EU	EU				X(1)	X(8)					
4-2 ADA Compliance (Buildings)	X(1)	EU		X(1)				X(6)				EU	EU	EU					X(8)					
4-3 ADA Compliance (Passenger Vessel Loading)	X(1)	X					X(1)	X(6)				EU	EU	EU					X(8)					
4-4 Additional Slip	X(9)	X		EU	EU	EU	EU	X		X	X		X	EU(9)		X	X		X					
4-5 Develop New Terminal Site	X(1)	X	X	X	X	X	X	X	EU(5)	X	X	X	X	X	X	X	X	X	X	X	X	X(11)	X	X
4-6 Environmental Mitigation/Retrofit(10)					X(5)				X						X									
4-7 Hazardous Abatement									X															
4-8 Illumination System Replacement & Upgrades		X			X						X	X(4)			X(5)				X			X(4,11)		
4-9 Intelligent Transportation Systems	EU(2)	EU	EU		X(5)					X		X(4)	X	EU	X(5)				X	EU		X(4,11)		X(4)
4-10 Security Improvements		EU				X					EU	X(4)	X		X(5)	X						X(4,11)		X(4)
4-11 Seismic Retrofit												X(4)			X(5)		X(3)							
4-12 Systems & Utilities Improvements		EU			EU						EU	EU			X(5)						EU	X(4,11)	EU	EU

Design Matrix Notes:

A blank cell indicates that the element is not applicable.

X Design Documentation Required

EU Evaluate Upgrade justification to full design level.

Notes for Matrix 4: Improvement Projects

(1) Full ADA compliance

(2) Upgrade impacted ADA pedestrian features to Maximum Extent Feasible (MEF)

(3) Design to current Seismic Standards

(4) Evaluate the Necessity of this work

(5) If Applicable

(6) Applies to fall protection only

(7) Applies to removal of surface discontinuities

(8) Applies to accessibility signing only

(9) Applies to new slip only

(10) May apply to Trestle Replacement or Trestle Rehabilitation Projects

(11) Evaluate for support of Electrical Vehicle Charging Stations, including conduits installation.

Matrix 4: Improvement Projects
Exhibit 210-4