ATTACHMENT R: SOUND TRANSIT DCM – CHAPTERS 6.4, 9, 21, 30, AND 31

6. CIVIL WORK

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6.3.9 Traffic Maintenance and Protection

The design drawings shall be in accordance with the Manual of Uniform Traffic Control Devices (MUTCD) or the requirements of the applicable jurisdiction and shall include traffic staging and detour plans submitted to and approved by local agencies. The maintenance and protection of vehicular, bicycle, bus zone, and pedestrian traffic including ADA Standards for Transportation Facilities (DOT) access, must be addressed as well as construction work crews, and emergency and enforcement personnel. Traffic control and staging plans shall include:

A. The number of lanes that must remain open.

B. Hours of allowable closure by day of week.

C. General impacts such as driveway access and the need for night time work.

D. Consideration of special events such as Seafair and emergency services.

E. Needs for public information.

6.4 STORM DRAINAGE

6.4.1 General

A. Sound Transit stormwater management solutions shall comply with the requirements of the agencies having jurisdiction, and Sound Transit's supplemental criteria as specified herein. The project design strives to be accountable to taxpayers to provide innovative, compliant, and cost-effective stormwater management facilities.

6.4.2 The Applicable Stormwater Manual(s) and Stormwater Report(s)

A. A stormwater report shall comply with the applicable agencies holding jurisdiction. In some cases, multiple stormwater reports may be necessary to accommodate the multiple municipalities involved in the project.

B. Unless otherwise specified, all stormwater analyses, reports, and final design efforts shall be in accordance with the applicable stormwater manual, or manuals, herein collectively referred to as the "applicable manual" or "stormwater manual".

C. Sound Transit intends to comply with local agency stormwater manuals that meet or exceed the Department of Ecology's 2012 Stormwater Management Manual for Western Washington (SWMMWW). Special attention is needed where project elements occur in cities that have not yet ratified Ecology's 2012 Ecology Manual.

1. If and when local agencies adopt a newer manual, the project design shall comply with that ratified manual.

D. Vesting of Applicable Criteria – In many cases, a local jurisdiction may anticipate adopting a new stormwater manual in the future. Such an action may introduce new criteria to a project after the start of design development. Such a situation is to be addressed using the following approaches, as a minimum:

1. Secure Vesting – The local agency (ies) may agree to provide a letter of concurrence to Sound Transit, establishing a given criteria applicable to Sound Transit's multi-year project. Such an action provides a static design criteria upon which design development may be based.

2. Incorporate Future Criteria into the Project Design – Sound Transit may elect to implement a stormwater design according to anticipated requirements of a future stormwater manual. For example, if a local municipality plans to ratify the 2012 Ecology Manual within the foreseeable future, then it should be utilized even though the local jurisdiction having authority has yet to ratify it.

E. Coordination of Criteria from Multiple Agencies

1. Where the project encompasses multiple municipalities, including WSDOT Rights of Way, coordination shall be implemented concerning applicable manuals to determine if a single applicable manual may govern the project design.

2. In some cases, the above approach may be inconsistent with each municipality's NPDES reporting obligations to Ecology and/or with specific municipality requirements aligned to a specific applicable manual.

3. The above topics shall be represented in the stormwater report for review and approval by Sound Transit and applicable third parties. Refer to Engineering Design Procedures for detailed deliverable information.

6.4.3 Floodplain Management Criteria

A. Design of facilities to be constructed within the 100-year flood plain shall conform to the agencies having jurisdiction including the Corps of Engineers, the Federal Emergency Management Agency, the Department of Ecology, and the local jurisdiction. The primary jurisdiction having authority is typically the local flood control district, such as the King County Flood Control District, for instance.

B. The top of rail elevation shall be a minimum of 1 foot above the 100-year flood elevation.

C. The design shall also comply with Executive Order 13690 which requires federal agencies to expand management from the base flood (100-year floodplain) elevation to a higher vertical flood elevation and corresponding horizontal floodplain to address long-term project resiliency to flooding. To establish the higher flood elevation, the design shall implement FTA Guidance as related to Executive Order 11988, as amended by Executive Order 13690. In the absence of FTA guidance, the design shall use FEMA's October 8, 2015 "Guidelines for Implementing Executive Order 11988, Floodplain Management, and Executive Order 13690, Establishing a Federal Flood Risk Management Standard," including any revisions thereto. Should project and/or case specific questions arise, the designer shall inform Sound Transit to obtain a final determination.

6.4.4 Low Impact Development (LID) and Sustainable Design

A. Sound Transit has minimum requirements concerning LID that may surpass the criteria of the applicable manuals of certain authorities having jurisdiction. LID project design shall meet requirements of applicable manuals that meet or exceed Ecology's 2012 SWMMWW.

B. Representative LID BMPs – Unless stated otherwise in a specific applicable manual, the following LID Best Management Practices (BMPs) are required, unless determined to be infeasible.

1. Natural or Engineered Dispersion
2. Infiltration Facilities
3. Permeable Pavement
4. Bioretention Facilities
5. Rain Gardens (small projects only)

6. Downspout Dispersion

7. Sheet Flow

8. Perforated stub-out connections

C. LID Feasibility – Some sites may lack the characteristics to support dispersion and/or infiltration BMPs. In other cases, the cost to provide and maintain certain LID BMPs may not be cost-effective. Provide a review of LID feasibility, as required by the applicable manual. For example, Chapter 4 of WSDOT's Highway Runoff Manual provides for a review of site feasibility, cost-effectiveness, and prioritization of potentially applicable LID BMPs.

D. Sustainability – Refer to Sound Transit's sustainability chapter for design considerations related to storm drainage.

E. Terminology – The terms Green Stormwater Infrastructure (GSI) and Integrated Management Practices (IMPs) are also used to describe LID methodologies.

6.4.5 Operations and Maintenance (O&M), Ownership, and Access

A. General – The preliminary and final design activities shall include analysis of ownership, operation, maintenance and access of storm drainage facilities.

B. Maintenance – The project design shall represent maintenance of stormwater facilities, including attention to the following:

1. owner's maintenance procedures and preferences;

2. frequency of maintenance for specific facilities; and

3. geometric design for maintenance vehicles and equipment.

C. For each stormwater facility, maintenance shall be addressed in the design in accordance with BMP procedures for the specific stormwater facilities in the applicable manual.

D. Ponds Under Structures – Where stormwater facilities are located under elevated structures, including guideways, the design shall provide for reasonable access and maintenance of said stormwater facilities. This includes adequate vertical clearance for access by maintenance vehicles, such as a vacuum truck or a backhoe.

E. Maintenance Frequency – The design shall be appropriate for the anticipated maintenance frequency. The design of facilities requiring higher frequency maintenance shall provide maintenance and access elements of reasonable nature. Conversely, it may not be reasonable to provide certain maintenance and access capabilities for facilities that have low maintenance needs.

F. Access Roads and Corridors – In general, drivable access to stormwater facilities that require maintenance shall be provided. Where such provisions are cost prohibitive, inconsistent with the nature of the anticipated maintenance activities, or otherwise exorbitant in nature, the design circumstances shall be brought to the attention of Sound Transit for review and approval. The following design elements are desired by Sound Transit:

1. Where stormwater ponds are located adjacent to trackways, maintain a 10 foot horizontal corridor waterward of trackway retaining walls in order to allow for maintenance vehicle access that avoids the requirement for a trackway right-of-way access permit for each maintenance activity.

2. Where stormwater facilities exist in proximity to WSDOT Rights of Way, review the compatibility of maintenance access with WSDOT limited access requirements.

G. O&M Narrative in Stormwater Reports – Stormwater Reports shall address ownership, maintenance, operations, and access, including specific recommendations as appropriate. These topics shall be represented in a well written format facilitating review and response by Sound Transit and third parties, as applicable.

6.4.6 Stormwater Report Format and Organization

A. The stormwater report narrative shall address report format and organization, the relevant applicable manuals upon which it is based, and any attempts to satisfy multiple manuals via a common stormwater report.

B. Stormwater reports shall be clearly written and organized per the requirements of applicable manuals and Sound Transit requirements. Special format and organizational aspects of stormwater reports may be desired by Sound Transit and/or by agencies holding jurisdiction. Deviations from applicable manual requirements should be coordinated with Sound Transit and acknowledged in the stormwater report narrative. For example, in some cases a common stormwater report encompassing

multiple jurisdictions—and multiple applicable manuals—may benefit all parties.

C. Provide stormwater technical memoranda and related documents, as directed by Sound Transit per the consultant's scope of work.

6.4.7 Design

A. Guideway Drainage Facilities – Guideway drainage pipe length sections without a clean-out shall be a maximum of 500 LF to ensure that maintenance personnel can maintain the system.

B. Hydraulic Design – The hydraulic capacity, and pipe flow velocities, of open channels, swales, gutters, storm sewer pipe systems, and culverts shall comply with the applicable manual. In the event of absent criteria, the WSDOT Hydraulic Manual shall apply.

Conveyance calculations for culverts and other closed storm drainage systems shall comply with the applicable manual. Representative design criteria for several types of storm drainage systems are itemized in Table 6-1.

Table 6-2: Facilities and Design Storm Frequency

Facility	Design Storm Frequency
Culverts and drainage facilities crossing rail corridors where the potential for flood damage to the rail corridor is present	100-year
Track roadbed (to top of subballast)	25-year
Closed storm water storm systems, such as in parking lots, roadways, and track roadbeds	25-year

C. Pump Stations – Drainage shall be by gravity flow. Where sections are below discharge points or in a tunnel where gravity outfalls cannot be provided, pump stations shall be installed. Special coordination is required for this situation in order to evaluate options, ascertain operation and maintenance, and coordinate with third parties.

D. Discharge of Sanitary Sewage – Sanitary sewer discharge shall not be permitted to enter drainage systems.

E. All construction, relocation, and restoration of storm sewers and drainage facilities and maintenance of existing facilities during construction shall conform to the design standards of those agencies.

F. Local Agency Standards – The design shall comply with local jurisdiction criteria, including local agency Standard Drawings. Provide special detailing where standard plans alone do not adequately clarify the Work.

G. Pipe Materials – Storm drainage pipe materials shall comply with the requirements of the authority having jurisdiction. Storm Drainage facilities that are outside the jurisdiction of the local authority having jurisdiction shall meet the minimum requirements of the latest version of the WSDOT Hydraulic Manual unless otherwise directed by Sound Transit. Pipe material for underdrains for Sound Transit facilities may be PVC, HDPE, or non-reinforced concrete pipe.

H. Drainage Structures and Related Elements

1. Drainage structures located within facilities—such as maintenance base sites and parking lots—shall comply with design criteria and standard plans of the jurisdiction having authority.

1. Structures shall be designed to accommodate applicable surface loading, including attention to unique loads incurred by maintenance vehicles, outriggers of fire response vehicles, etc.

2. In track sections, placement of drainage structures shall be in consideration of hydraulic requirements, economy, low points, and precede crosswalks and intersections.

3. Drainage structures shall be provided at changes in pipe slope, alignment and size, and at multiple-pipe intersections.

4. In general, placement of drainage structures shall be every 300 feet to 400 feet for at-grade track sections and every 400 feet to 750 feet for aerial guideway. Special installation of drainage structures shall be evaluated by the final designer on a case-by-case basis.

5. All storm drain piping crossing beneath the track shall have a minimum of 4 feet clearance from the top of rail to the top of piping, unless otherwise approved by Sound Transit.

6. Underdrain cleanouts shall be provided at maximum 500-foot centers along all Link drainage lines.

7. In general, drainage facilities shall be located to prevent sheet flow across at-grade track.

I. Parking Lots – Parking lots shall be designed so that stormwater is removed by overland flow, to a gutter or curb and gutter, then to an inlet

where the water will enter either a closed drainage system or an open ditch. The maximum permissible spread for gutter flow shall be 6 feet.

6.4.8 Betterments

A. Design of drainage facilities belonging to another entity which are not directly a part of a Sound Transit project and are relocated or modified due to construction shall be treated as “replacement-in-kind” or “equal construction”. Requests to further modify the design including changes in type, size or material shall be considered a betterment. Refer to Engineering Procedure 07 (EP-07), or other Sound Transit policies and standards, for the complete Sound Transit policy on betterments, if applicable.

6.4.9 Erosion Control

A. All areas disturbed by construction shall have erosion control plans. Temporary Erosion and Sedimentation Control Plans shall be prepared and reviewed during design for use during construction. Erosion control methods shall include the Best Management Practices as established by the applicable manual.

6.5 SURVEYING AND MAPPING

6.5.1 Survey Control System

A. Horizontal Control

1. All horizontal controls shall comply with the Sound Transit Design Technology Manual.

2. The precision of all Secondary horizontal ground control surveys shall be, as a minimum, 1:50,000, Second Order, Class I as defined by the Federal Geodetic Control Committee and published under the title, “Standards and Specifications for Geodetic Control Networks,” authored by the Federal Geodetic Control Committee in September 1984.

3. All subsequent horizontal surveys shall, as a minimum, have a precision of 1:20,000, Second Order, Class II as defined by the Federal Geodetic Control Committee and published under the title “Standards and Specifications for Geodetic Control Networks,” authored by the Federal Geodetic Control Committee in September 1984.

B. Vertical Control

9. STATIONS AND FACILITIES

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9. STATIONS AND FACILITIES

9.1 INTRODUCTION

This chapter establishes specific guidelines and standards for the design of stations and facilities such as maintenance facilities, office buildings and ancillary buildings. Elements discussed in this chapter include the design of platforms, platform access, amenities, vertical circulation, general guidelines for use in the design of bus access, pick-up and drop-off areas, bicycle parking and access, and park-and-ride facilities; and requirements and guidelines for the selection of materials for all ST facilities.

Successful station and building design is the result of the integration of multiple criteria included in the Sound Transit Link Light Rail Design Criteria Manual. This effort incorporates the work of multiple design disciplines. The designer is required to review and incorporate all criteria into station and building design as relevant.

Station design shall provide a permanent civic architecture that contributes to and enhances its context. Each station's design should not only be a cohesive part of the overall transit system, but also an integrated element of the neighborhoods and community of which it is a part. Within this framework, the use of a standardized family of materials for stations as outlined in this chapter will provide consistency for the system and accommodate the individual character of each neighborhood or community.

Building design shall provide an appropriate solution for the program needs, site conditions and location. All facilities shall fit within the neighborhoods and communities where they reside.

Furthermore, the Sound Transit Board has adopted resolutions with respect to the functioning and appearance of the Link light rail facilities, several of which apply to the design of stations. Specific reference should be made to existing and future motions.

Table 9-1: Board Motions Related to Stations

MOTION	SUBJECT
R98-1	Automated Teller Machines, Bicycles, Passenger Amenities, and Signage
M98-58	Architectural Expression, Vertical/Horizontal Circulation, Guideway Architecture, Overhead Catenary System, and Streetscape
M98-64	Security
M98-65	Advertising

MOTION	SUBJECT
M98-66	Concessions
M98-67	Public Restrooms and Drinking Fountains
M2010-87	Bicycle Policy
R2012-02	Facility and Link System Naming Policy

9.2 DEFINITIONS

Passenger Stations are defined as those facilities and their appurtenances used to load and unload passengers that are located on exclusive, semi-exclusive, or open right-of-way, often with passenger access restricted by fences or other barriers.

This chapter is applicable to elevated, at-grade, retained cut, and underground passenger stations.

9.3 CODES AND STANDARDS

The linear nature of light rail causes its alignment to travel through numerous districts, cities, and counties. Each of these legally defined areas has different land use and development regulations and legislative procedures directly affecting station site planning and design. Each individual jurisdiction may have special amendments or supplements to codes and standards that apply on a statewide and national basis. In addition, transit companies (private and public) have Design Criteria and Standards for their facilities. Therefore, station designers shall:

A. Identify the governing jurisdiction for each site at every governmental level

B. Locate and indicate jurisdictional boundaries

C. Review applicable adopted master plans, municipal codes, and standards

D. Use the latest edition of the following:

1. International Building Code (IBC), as adopted and amended by the State of Washington and/or local jurisdiction.

2. National Fire Protection Association (NFPA) – Multiple codes including:

NFPA 101 – Life Safety Code

NFPA 130 – Standard for Fixed Guideway Transit and Passenger Rail Systems

3. International Fire Code (IFC)

4. ADA Standards for Transportation Facilities (DOT, 2006) (ADA Standards)Washington State Accessibility Standards

5. International Code Council/American National Standards Institute (ICC/ANSI) A117.1-03

6. Federal Transit Administration Regulation 49 CFR Part 37

Where variances in codes occur, the most stringent requirement shall govern. Where no provisions are made in the codes for particular features of the design, the best practice shall be followed.

E. Use the latest edition of the Sound Transit Standards

1. Sound Transit Customer Signage Design Manual and Production Drawings

2. Link Light Rail Facility Lighting Standards

3. Link Equipment and Facilities Numbering Standards

4. Sound Transit Low Impact Development Stormwater Management

5. Sound Transit Access Control Lock and Key Policy

6. Sound Transit Accessibility Design Guidelines

9.4 GENERAL DESIGN PARAMETERS

A. Stations must be able to handle patrons efficiently, economically, conveniently, and comfortably. Stations shall be designed to facilitate movement of patrons in an efficient, safe and secure manner. This movement shall be in conformance with all applicable codes and the design criteria. Stations and related facilities shall aesthetically support the use of proven modern technology while providing for the traditional requirements of public transit systems such as identity as a location for public transit, shelter from severe weather, and cover and screening from average weather conditions.

B. Integration of station design: Care shall be taken in coordinating and developing the station design with the neighborhood and community, adjacent property owners, and other public agencies and community groups that may have interest the station.

C. Stations shall be designed to enhance both the actual and perceived security of the patron and staff and to minimize property loss from damage or vandalism. Reference 9.10.5 and 9.10.6 and Chapter 29, Security, for requirements.

D. In designing stations and related facilities, the anticipated growth and long-term life of the system shall be considered for functional elements, materials, and visual quality. The quality of the designs shall have timeless, lasting character and shall utilize high quality, durable materials.

E. All station public areas shall have the highest quality of design and construction. Public areas include all areas used by, and visible to, the public including exterior plazas, general public areas of stations, trackways at stations, and emergency exit paths. Non-public (back of house) areas are not required to have as high a level of quality as public spaces. Non-public spaces include areas only accessible by ST or authorized personnel.

F. The design of stations shall provide proper orientation for the patron. To a large extent, this orientation can be accomplished by simplifying how patrons use the system, which in turn can be measured in terms of the ease of patron access to and dispersal from stations/trains. The ease of patron access is best achieved by utilizing a common arrangement or organization of the functional spaces in stations. This level of commonality will make each station familiar to patrons and minimize the need to learn the system on a station-by-station basis.

G. The following general principles shall be employed for the basic organization of a station's public spaces:

1. Public access to the station should be restricted to designated public entrances only.

2. Public entrances shall be open and direct patrons to the fare collection areas and circulation to the platform.

3. Locate fare collection areas prior to accessing the platform. Fare vending locations and designation of Fare Paid Zones shall be positioned in a similar manner in all stations to the greatest extent possible.

4. The area of the Fare Paid Zone must be clear and obvious and designated by signage and proximity of Smart Card Readers (SCRs).

5. The connection of major spatial elements shall minimize the number of decisions a patron must make at any one point and should be organized

in a clear, logical, and sequential manner that reinforces and assists the smooth flow of patrons.

6. Vertical circulation elements shall be located so as to be readily visible and identifiable as a means of access to the levels they are designated to interconnect.

7. Stairs and escalators shall be located so as to reinforce the direct travel path from entry to platform.

8. Stairs and escalators shall be oriented in the same direction (be parallel) so that patron movement is simplified and logical.

9. Access to elevators serving the platform shall be located in Fare Paid areas to the greatest extent possible.

10. Elevator landings shall be located so that users waiting for elevators do not impede general circulation, have adequate space for queuing, and are open and visible to the greatest extent possible.

H. Material selection

1. Sound Transit approved standard elements including "furniture" (benches, trash receptacles, etc.), customer signing systems, paving materials, glazing type and sizes, and light fixture types and lamps shall be utilized to reduce inventory, maintenance efforts, and replacement costs. Reference Section 9.10.

2. Materials selected by the designer shall have the maintenance and performance characteristics to be durable and meet the vandal resistance and maintenance requirements of the station. Materials shall be selected considering life cycle costs and total cost of ownership. Reference Section 9.10.8.

I. Non-public spaces shall be arranged and sized such that equipment is sensibly located, coordinated, easily operable, accessible for maintenance and a clear path is available for replacement. Large equipment spaces such as traction power sub-stations (TPSS) shall be located at or near grade for ease of ventilation and equipment maintenance and replacement.

9.4.1 Art Program

Sound Transit has established an art program, titled “STart”, to incorporate works of art in and adjacent to the light rail facilities. The STart program takes into consideration that stations will be designed first and foremost, as

functional facilities organized on established principles of pedestrian movement. Reference Chapter 27, STart Sound Transit Art Program for the guiding principles and goals for the program. Basic requirements related to incorporating art in the stations are included herein:

A. Architectural Integration

Given the potential variety of character and size, art shall be compatible with the volumes of the interior or exterior spaces in which they are located and shall be compatible with the architectural expression of individual stations.

B. Locational Criteria

1. The placement of art shall recognize the primary importance of the functional clarity of stations.

2. The location of art shall not impede patron circulation, restrict clear sightlines, nor pose a safety hazard.

3. Art may support, but not compete with, essential system signing and information and security features such as CCTV.

C. Maintenance and Performance Criteria

1. All materials used in the fabrication of artworks shall support the concept developed for the station while recognizing the vital role of durability, vandal-resistance, and maintenance needs.

2. Artwork intended to be permanent shall incorporate materials, fabrication methods, and installation methods which are appropriate for its expected life.

3. Art, art supports and adjacent structure shall be designed to meet structural requirements.

4. Maintenance and security needs of artwork shall be consistent with the maintenance and security needs of the facility.

5. Artwork shall not invite climbing or skateboarding unless specifically built for that purpose. There shall be no sharp edges or potential trip or fall hazards in the touch zone.

6. Artwork shall work with the existing ambient lighting of the stations. Special lighting requirements shall be identified on a station-specific

basis and shall be accommodated within the station planning and design as early as possible.

7. Other special needs shall be assessed on a station-specific basis and shall be identified within station planning as early as possible.

D. The station designer shall work with the art program to incorporate into the station design those elements necessary to be provided by the station contractor to accommodate the artwork and shall indicate in the contract documents the coordination required of the station contractor to accommodate the art program.

9.4.2 Pedestrian Circulation

A. The criteria listed below are minimum requirements relevant to pedestrian circulation and should not supplant the logic of a better functional solution should it develop. Certain circulation elements can handle a finite number of people conveniently in a given period of time.

B. There are three distinct groups that must be considered in the design of pedestrian circulation: regular commuters, infrequent users, and individuals with disabilities. The three groups move through the system in different ways, i.e. commuters move quickly with a minimum of guidance, infrequent users move easily with great reliance on signs for guidance, and individuals with disabilities move slowly with guidance required depending on the frequency of use and the degree of the disability.

C. The following general principles shall be employed to accommodate these varying demands:

1. Right-hand flows are the norm and therefore desirable.

2. Pedestrian flow will take the path-of-least-resistance. Stations shall be designed to directly and safely accommodate anticipated pedestrian movement.

3. Grade changes are to be minimized, see Section 9.6 Platform Geometrics. Grades shall conform to slope criteria for individuals with disabilities.

4. Circulation elements shall provide a clear and easily understood path of travel for the patron.

5. Circulation shall be designed to accommodate hesitation or slow passage so that the individual with a disability, the infrequent user, or

the waiting patron can pause adjacent to, but out of, the main pedestrian flow.

6. Surge and queuing spaces shall be provided ahead of every barrier, change in circulation direction or mode, and in front of ticket vending machines.

7. No obstructions shall be within the main pedestrian flow.

8. Enclosed shelter areas and circulation elements shall have sufficient transparency to permit adequate visual surveillance of these spaces and to discourage vandalism.

9. Pedestrian access from bus stops, pick-up and drop-off areas, park-and-ride lots, and neighborhood sidewalks shall be direct and easily understood.

10. Circulation elements and station structures shall be designed using "Transit Security Design Considerations, FTA-TRI-MA-26-7085-05, November 2004", as noted in Appendix C and Crime Prevention through Environmental Design (CPTED).

9.4.3 Tactile Wayfinding Provisions

A. Tactile wayfinding provisions shall be provided to assist people with disabilities, who are blind, or have vision impairments.

B. A platform edge detectable warning surface is required to meet ADA Standards. Provide 24 inch wide truncated dome pavers along the edge of the platform for the full length of the public use area.

C. A tactile path shall be provided to guide the user through the station. The requirements of the tactile path are as follows:

1. The tactile path shall begin at the entry to the station with a perpendicular paver. See Guidance Drawings A-01-352, A-01-353 and A-01-353. From the perpendicular start paver, the path shall extend through the fare vending/information areas and TVM, and onto the platform or to the threshold of vertical circulation elements.

2. At the platform level, the tactile path shall extend from the station entries or threshold of vertical circulation elements to the tactile train waiting/information areas. See Guidance Drawings A-01-204 and, A-01-205, and A-01-350.

3. The tactile path shall be located 4 feet back from the platform edge detectable warning surface. Where platforms wider than 30 feet are used, the path can be moved up to 6 feet back from the platform edge if there is room for a minimum of four feet of circulation on both sides of the tactile path.

4. The tactile path shall consist of an 8 inch wide tile with a raised three striped pattern. See Guidance Drawing A-01-350

5. Materials employed for the tactile path shall be of a contrasting color to field paving. Sound Transit standard is a white granite paver with Link standard striped pattern etched or sandblasted into the paver. See Section 9.10.8.2 for material and Guidance Drawing A-01-350 for typical running pattern. Adjacent pavers or tiles shall be the dark gray version of the relevant materials for at least 80% of the tactile path.

D. Tactile Train Waiting Area

1. Tactile train waiting areas shall identify the location of the two center-most sets of doors of a two-car train based on a center platform vehicle stopping location.

2. The tactile train waiting areas shall be 6 feet wide and extend the full depth of platforms, except where the platform edge detectable warning tile and the tactile wayfinding path are located. See Guidance Drawings A-01-204 and A-01-205.

3. Pavers with raised ribs oriented parallel to the platform edge shall be used. See Section 9.10.8.2 for material.

4. Pavers of the same materials and color as adjacent platform paving may be used.

5. Operational Train Stopping Marker shall be required to allow vehicle operators to align vehicle doors with tactile train waiting areas. See 9.8.10.C.

E. Bus Loading Areas

At stations with off-street bus loading areas, provide truncated dome detectable pavers at bus boarding edges immediately behind the 6 inch concrete curb. The truncated dome surface shall extend the full length of public boarding areas and shall be 12 inches wide.

At stations with off street bus loading areas, provide a tactile boarding pad adjacent to each bus stop pole, or leading edge of the bus zone, directly behind the truncated dome pavers. Tactile pad to be 6 feet by 6 feet. Pavers with raised ribs oriented parallel to the platform edge shall be used. See Section 9.10.8.2 for material.

9.5 SITE REQUIREMENTS

9.5.1 Travel Modes

A. Patrons will arrive at or depart from stations by the modes of travel listed below. The modes are listed in order of priority for providing convenience and directness of routing.

1. Pedestrian
2. Para-transit - Individual with disability / non-driver
3. Bicycle
4. Bus Service
5. Individual with disability - self-driver (at park-and-ride facilities)
6. Pick-up and Drop-off and Taxi Areas (including non-driver individual with disability)
7. Park-and-ride lots includes carpools, van-pools, low emissions-fuel efficient (LEFE) vehicles, motorcycles and single occupant vehicles
8. Service and Transit/Security Police vehicle parking.

B. The design of the site shall, to the greatest degree reasonable, provide access consistent with all criteria. Refer to Chapter 28, System Safety for any additional requirements.

9.5.2 Pedestrian Access

A. Pedestrian circulation routes shall provide direct, safe, and convenient access to station entrances from off the site, park-and-ride lots and bus loading zones. Routes shall minimize the distance pedestrians have to travel and shall minimize conflict with other forms of travel, such as bicycles, vehicles, buses or rail. Major pedestrian movements shall be separated from bicycle and vehicle circulation to the greatest extent possible. Protect or close any unintended pedestrian routes into the station and/or platform.

B. Driving aisles in park-and-ride lots shall be oriented to consider pedestrian needs and safety, as well as lot capacity. Pedestrian movements within park-and-ride lots will normally occur within the driving aisles. Pedestrian walkways may be necessary to minimize vehicular interference, to reduce the number of points where pedestrians cross aisles, or to shorten irregular routes through successive aisles. Designate crosswalks within the parking areas for major pedestrian circulation routes.

C. The following additional design guidelines shall be adhered to:

1. Steps or abrupt changes in level in walkways shall be avoided. Layout of walkways shall provide maximum visibility of and by oncoming rail and vehicular traffic.

2. Vertical changes of less than 3 steps (18 inches) shall use ramps or sloping walks in lieu of steps. Diminishing steps are not allowed. All steps shall end in a full tread and riser.

3. The width of pedestrian walkways shall be as follows:

Table 9-2: Walkway Guidelines

Walkways	Preferred	Minimum
Walkways approaching station entries	12 to15 feet	8 feet
Crosswalks over at-grade tracks	15 feet	10 feet
Waiting areas at edge of tracks	8 to 10 feet (depth) by crosswalk width	5 foot - 6 inches (depth) by crosswalk width
Walkways through bus stop areas	12 feet	7 feet – 2 inches
Walkways adjacent to Long term parallel parking	8 feet	6 feet
Walkways adjacent to short term parallel parking	10 feet	7 feet – 2 inches
Crosswalks	12 feet	10 feet

4. Provide safe pedestrian pathways to crosswalks in the most direct path possible. Crosswalks shall be marked and be clearly visible to motorists. Warning signs or signals shall be provided at crossings of light rail tracks and railroad tracks, as well as adjacent roadways in accordance with Chapter 11, Traffic Control.

5. Crosswalk materials shall be noticeably different color or texture to clearly indicate where crossing should occur.

6. Pedestrian walkways shall be adequately lighted for safety. See Chapter 21, Lighting.

D. Track Crosswalks at At-grade Stations

1. Track crosswalks shall be provided at areas where pedestrians will be crossing tracks. They shall be located on tangent track, if possible, and away from special trackwork areas.

2. Track crosswalks shall be level with the top of rail except for a maximum 2.5-inch gap on the inner edge of each rail to permit passage of wheel flanges.

3. Track crosswalks shall be made of materials sufficiently durable for pedestrian traffic and, if located directly adjacent to a street crossing, for vehicular traffic. Special care shall be taken, to ensure a safe, slip resistant walking surface.

4. Track crosswalks shall comply with the requirements of ADA Standards.

9.5.3 Paratransit Facilities

A. Provide one paratransit stop with off-street loading area at stations as determined by Sound Transit. The location shall provide off-street short term parking to allow vans to load and unload out of traffic. This location may be shared with a bus zone if short term parking can be accommodated.

B. Locate paratransit stop at station entry or station plaza to allow direct access to the station.

C. Private or public shuttle services may serve specific stations. The variety of physical requirements for these shuttles, typically large vans or small buses, shall be accommodated.

D. Paratransit services shall load onto the sidewalk area. Provide space for the lift to operate and land in the sidewalk area with room for a wheelchair to load and unload. Curb ramps are not required.

E. A shelter or windscreen and overhead weather protection shall be provided adjacent to the paratransit stop to shelter patrons waiting for

paratransit service. Include a bench with armrests in a portion of the covered area. Allow space for two wheelchair users.

F. Provide space for one three foot bench and space for a wheelchair within the shelter for protection from weather.

G. See Sound Transit Accessibility Design Guidelines for further requirements.

9.5.4 Bicycle Facilities

A. Bicyclists shall be directed to bicycle parking and platforms via signage and other wayfinding cues. Bicycle parking shall be provided within easy access from bicycle paths. Where bicycle users share space with pedestrian paths, provide ample space to ensure safety and comfort of pedestrians and bicyclists.

B. Bicycle storage shall be provided at all facility locations to the extent determined by Sound Transit. Designers should reference Sound Transit Board Motion M2010-87 for overriding policies.

C. Sound Transit classifies types of bicycle parking as either “Class One” or “Class Two”:

1. Class One bicycle parking is the most secure and weather-protected type of bicycle storage. It is typically associated with long-term (all day or overnight) bicycle parking.

2. Class Two bicycle parking provides a lower-level of bicycle security than Class One and is typically associated with short-term parking.

D. Bicycle parking shall be a combination of Class One and Class Two parking. Sound Transit will determine proportions during preliminary engineering. See Section 9.9 Bicycle Facility Requirements for specific requirements.

E. The number of bicycle parking spaces to be accommodated (including future expansion) will be provided by Sound Transit. The quantity will be determined by means of a bicycle ridership projection methodology for each facility.

F. Bicycle facilities shall conform to the following minimum requirements and designers shall notify Sound Transit if these conflict with any municipal codes:

1. Bicycle parking shall not be located on the platform or in conflict with circulation to the platform, fare vending areas, or signage.

2. Bicycle parking facilities shall be located for easy access to station entrances, streets, and bicycle routes.

3. Current and planned jurisdictional bicycle routes shall be taken into consideration when station bicycle parking is designed to eliminate conflicts between bicyclists and other patron movement.

4. Avoid conflicts with station entries, emergency exits, pedestrian routes, fare collection and transit vehicle loading areas.

5. Bicycle parking facilities shall be given preference over motor vehicle parking facilities as to location.

6. Placement of bicycle parking shall avoid areas that require bicycles to travel over stairs. Where stairs cannot be avoided, designers will make every attempt to incorporate runnels into the edge of the stairs.

7. Where determined by Sound Transit, Bicycle Stations may be developed as a joint development project in lieu of specific Class One and Class Two bicycle parking. Bicycle Stations would be staffed and provide bicycle storage, an area for repairs, and possibly showers and lockers for bicycle riders.

9.5.5 Bus Service

A. Some stations will include bus service access. The layout of bus facilities shall be coordinated with the transit companies (private and public) that will service these stations and shall utilize Sound Transit criteria. Where other agency(ies) criteria conflicts with Sound Transit criteria, Sound Transit shall seek concurrence with the other agency(ies) for any modifications to the design criteria. This concurrence may result in cost sharing agreements. The design of station sites shall address the potential for relocating bus zones, rerouting bus lines, and establishing new bus lines, and layover and turnback facilities.

B. Bus stops shall be placed to minimize patron travel time (bus and walk time). Typically, street curb service is preferred over on-site access, especially for "through" buses. Walk distance shall be minimized between the train entry/platform and buses. Where buses will circulate within the site, curb radii, and other turning movement geometry shall conform to the bus operators design criteria.

C. Weather protection in the form of canopies and windscreens shall be provided at bus stops adjacent to or within Link station facilities. Canopy coverage shall be a minimum of 3 feet back from the edge of the street curb. Type and size of weather protection shall be determined in conjunction with the bus service provider and maintenance agreements. Where other agencies are maintaining the facility their standards shall be met. Where ST is maintaining the facility, ST standards for materials shall be met.

D. Schedule and route information shall be prominently displayed. Bus information at bus stops shall be in accordance with Sound Transit Customer Signage Design Manual.

9.5.6 Passenger Pick-up and Drop-Off and Taxi Area

A. Provide passenger loading zones or taxi drop-off in close proximity to the station.

B. Size of loading area and quantity of short term parking shall be determined by Sound Transit during station site development. Where determined by Sound Transit in conjunction with the AHJ, on-street passenger loading zones or taxi drop-off shall be provided.

C. Preferred location for pick-up and drop-off areas is within view of the platform(s) or entry plazas to the station.

D. Where off street short term parking is provided, provide convenient recirculation of pick-up and drop-off vehicles in the event that short-term parking spaces become filled where possible.

E. See Chapter 31 Parking Facilities for specific layout requirements.

9.5.7 Park-and-Ride Lots – See Chapter 31 Parking Facilities

9.5.8 Vehicular Access to Station Sites

A. The design of entrances for motor vehicles at station sites with bus interface, parking and pick-up and drop-off facilities shall take into consideration adjacent land uses and avoid large unplanted and paved areas that are out of scale with those uses. Driveway access shall be minimized, while fulfilling the following requirements:

1. Direct access for service shall be from streets designated as arterials and from minor commercial streets.

2. Direct access from quiet residential streets shall be minimized.

3. Entrance roadways to station sites shall be designed to contain sufficient traffic storage capacity to meet expected transit patronage at peak times and to prevent traffic backing up into public streets.

4. Conflicts shall be avoided between entrance roadways, bicycle access, and pedestrian access points.

5. Access by motor vehicles into a station site with more than 1,000 parking spaces shall be from more than one street. For such large station sites, more than one station site exit to the local street system should be considered to reduce traffic delays.

B. Access Roadways - Roadways intended to provide access to parking stalls, bus zones, park-and-ride, and pick-up and drop-off facilities, shall be designed in accordance with "AASHTO Policy on Geometric Design of Highways and Streets" as supplemented and modified in these criteria. Roadway design shall accommodate the loading and turning radii requirements for transit fleet vehicles.

C. One-way traffic operation on such roadways is preferred. Provisions for passing a stalled vehicle shall be provided. Separate site access for car and buses shall be provided if possible.

9.5.9 Service and Transit Security Vehicle Parking

A. Provide service vehicle and transit security parking at stations.

B. Provide space for 2 service vehicles at multi-level stations such as elevated tunnel or retained cut stations. Designated street parking may be used to meet this requirement. Provide at least one of the service vehicle parking spaces within 100 feet of station whenever possible.

C. Provide space for 2 security vehicles at multi-level stations if no passenger drop off areas are provided. Where stations have passenger drop off areas for at least 2 vehicles, or short term parking, no additional security vehicle parking is needed, except at terminus stations. Designated street parking may be used to meet this requirement.

D. Where multi-level stations do not provide parking or passenger drop off areas, service and security parking can use pedestrian areas for temporary parking if the area does not inhibit pedestrian and bicycle circulation flow. These parking areas can be located on pedestrian plazas out of the way of general pedestrian flow and shared with

emergency vehicle response locations. Coordinate with drainage for areas of pollution generating pavement.

E. At terminus stations provide space for 3 security vehicles and 3 service vehicles.

F. Determine parking requirements for special service vehicles based on equipment location and operational needs. TPSS, Signals and communications equipment will require adjacent parking access. When these elements are located at the stations, coordinate vehicle access and parking requirements.

9.5.10 Lighting

The design of the site lighting shall facilitate patron movement and assist in providing site security. Illuminance levels, including that for emergency lighting, shall comply with the design criteria and local codes. Reference Chapter 21, Lighting, for additional requirements.

9.5.11 Emergency Access

See Chapter 18, Fire/Life Safety, for access requirements for emergency response by Fire Department and paramedic equipment and personnel.

9.6 PLATFORM GEOMETRICS

9.6.1 Configuration and Access

A. Station platforms may be of center or side platform type depending on station functional requirements, site constraints and traffic conditions.

B. The design approach to the functional configuration of stations shall be "operational" in bias in that there will be a need to consider patronage forecasts and system characteristics to achieve maximum system efficiency. As the capacity of the system increases, so does the importance of the interrelationship between stations. The objective is to achieve balanced vehicle loading by balancing platform access points within the whole system. Balanced vehicle loading also benefits patron comfort.

C. No columns or walls are permitted within 8 feet of a platform edge. Freestanding columns that are within 10 feet of a platform edge shall be located so as not to coincide with the locations of vehicle doors during station stops to minimize congestion. Columns beyond 10 feet have no restrictions in their placement.

D. Elevator, escalator, and stair surge zones shall be free of all obstructions. The elevator surge zone is defined as a 10 feet by 10 feet area in front of the elevator door. Stair and escalator surge zones shall be 15 feet long (measured from end of handrail) and, where conditions permit, 5 feet wider in each direction than the width of the stair or escalator. Surge zones of elevators shall not overlap surge zones for stairs/escalators.

E. Obstructions of passenger and CCTV camera sight lines shall be minimized.

9.6.2 Size of Platform

A. The dimensional requirements for station platforms are established by the vehicle length, exiting requirements identified in Chapter 18, wayfinding provisions, and the day-to-day patron requirements as established in this section. Where calculations under the methods lead to different numbers, the more stringent shall control.

B. The platform length available for boarding and alighting shall be 380 feet to accommodate a four-car consist.

C. The platform shall be sized to comfortably accommodate the expected patrons on the platform under normal headways and operating conditions. Missed or delayed headways need not be considered. The minimum platform area (excluding elevator, escalator, stair, surge zones, and the 24-inch platform edge detectable warning surface) shall accommodate typical train loads based on the peak 15-minute entraining load and detraining load at 15 square feet per person or under more constrained site conditions, the peak 15-minute entraining load at 15 square feet per person and detraining load at 7 square feet per person.

D. Platform Width

1. Platform widths will vary based on patronage, wayfinding provisions, the configuration of vertical circulation elements (for below-grade, retained cut, and elevated stations) and station site considerations. For initial planning purposes, the minimum platform widths outlined below shall be used until patronage numbers are established to confirm or adjust required width of platforms.

2. For center platforms at-grade, the minimum platform width shall be 20 feet.

3. For side platforms at-grade, the minimum platform width shall be 12 feet from edge of platform to the face of station wall, structural element, parapet, or railing.

4. For elevated, retained cut, and underground stations, the minimum platform width will be based on required clearances between the vertical circulation elements and the edge of platform. See 9.6.1.C and 9.6.2.D.5.

5. Encroachment into the platform width by vertical circulation or other platform elements shall not reduce the platform width at any given point to less than 8 feet between the edge of platform and the face of a wall, column, balustrade, railing, seating, or any other station furnishing. This dimension is based on the 24-inch platform edge detectable warning surface plus 4 feet (the minimum dimension to the tactile path/striped pattern), plus the 8 inch wide tactile path/striped pattern, plus one travel lane (measured to the center line of the tactile path/striped pattern). See Guidance Drawings A-01-204 and A-01-205.

9.6.3 Platform Interface with Light Rail Vehicle

The vertical distance between top of rail and finished platform floor and the horizontal distance between the rail and platform edge are critical dimensions governed by the vehicle specifications. The allowed gap between the vehicle and the edge condition of the platform shall meet ADA Standards. Refer to Chapter 4, Track Alignment and Vehicle Clearance and Chapter 12 Light Rail Vehicle.

9.6.4 Platform Slope, Adjacent Trackway and Platform Edge Condition

A. The platform shall have a cross slope of 1.0 percent to drain the platform towards the trackway.

B. The platform shall be parallel to the vertical grade of the adjacent track alignment and maintain the prescribed distance from the edge of the platform to the top of rail for the full length of the platform. See Chapter 4 Track Alignment and Vertical Clearances for maximum longitudinal slope of platform.

C. Trackway adjacent to station platforms shall be fixed or embedded rail whenever possible. Where tie and ballast tracks are located at stations, tracks shall include fillers between the platform and tie to eliminate issues with track moving or needing adjustment and creating situations

where the platform edge condition is out of tolerance. See Chapter 4 Track Alignment and Vertical Clearances.

D. Platform edge condition shall be as shown in Guidance Drawing A-01-400. Tolerances to track shall be per Directive Drawing AD245. Reference Section 9.10.8 for standard truncated dome materials.

E. Platform edge condition shall be designed and constructed to meet requirements of the ADA Standards for vehicle interface.

F. The platform edge angle shall allow adjustability of up to 0.25" in both the horizontal and vertical direction to allow for adjustment during construction. This does not eliminate the need to meet the platform edge tolerances identified in Guidance Drawing A-01-400; it merely allows adjustability during construction to meet those tolerances more easily.

9.6.5 Travel Lanes/Exit Provisions

A. The minimum exit provisions shall be as required by IBC, NFPA 130, or NFPA 101, as modified by local jurisdictions. See Chapter 18, Fire/Life Safety for calculating exiting requirements.

B. Travel lanes shall not occupy surge zone areas in front of elevator doors, ticket vending machines, patron assistance telephones, pay phones, SCR's, dynamic signs, and customer information / maps.

9.6.6 Vertical Clearances

A. Station elements that could be targeted for theft or vandalism such as light fixtures, speakers, cameras, signs, etc. shall be located to provide a minimum of 9 feet clear above floor surface. The potential to use benches, trash receptacles, etc., to access these elements should also be considered in locating these elements. In addition, horizontal elements such as canopy framework, sign units, etc., that could be climbed upon shall also be located above 9 feet. Vertical elements shall be designed to minimize the ability to climb them.

B. Elements along walls, such as suspended signs, can be located a minimum of 8 feet above the platform if needed to achieve visibility.

C. Locate equipment and light fixtures between 9 feet and 16 feet above the floor to permit reach by maintenance crews using a 12 foot ladder. Design of elements above this reach zone shall be approved by Sound Transit based on station type and configuration. Where equipment,

lighting or other elements are above 16 feet high, such as tunnel stations, roofs, canopies and window walls, fall protection shall be provided for maintenance crews to safely access these areas. See 9.8.20.

9.7 ELEMENTS OF VERTICAL CIRCULATION

The following criteria shall be used to determine the primary vertical circulation elements:

A. Provide elevators when ramps or sloping walks cannot provide accessibility to each entry.

B. Where the vertical rise between public levels is 12 feet or less, utilize stairs and ramps.

C. Where the vertical rise between public levels is greater than 12 feet and does not exceed 30 feet, utilize escalators for upward movement and utilize stairs for downward movement.

D. Where the vertical rise between the public levels is greater than 30 feet and does not exceed 120 feet, utilize escalators for both upward and downward movement.

E. Where the vertical rise between public levels is less than 40 feet use hydraulic elevators (when the cylinder can be accommodated) or electric traction elevators. Costs shall be considered in determining the best type of elevator to use.

F. Where the vertical rise between public levels is between 40 feet and 100 feet or use electric traction elevators.

G. Where the vertical distance from the station entry to the platform level exceeds 100 feet, provide high speed traction elevators.

H. Where stations are anticipated to have over 5,000 patrons a day, regardless of the rise between public levels, provide escalators for both upward and downward movement.

I. Provide stairs as required to meet exiting requirements.

J. Provide public stairs in conjunction with escalators, where possible, to provide additional access for peak periods and during maintenance of escalators.

K. Exceptions to the above criteria must be reviewed and approved by Sound Transit prior to including in design.

1. Ramps and Sloping Walks

a. Ramps shall meet the requirements of applicable codes.

b. Sloping walks are preferred over ramps, and shall be used whenever possible.

c. When designing sloping walks in lieu of ramps, design valuations should be less than 4.75 percent to account for construction tolerances. This will provide a sloping walk of less than the maximum 5 percent.

d. Vertical changes of less than 18 inches shall use ramps or sloping walks. Do not use less than three stairs. See 9.5.2 Pedestrian Access.

2. Stairs

a. Stairs shall meet the requirements of applicable codes.

b. Stairs that are primary circulation elements in stations shall include the following:

- Stairs adjacent to an escalator shall be parallel to the angle of inclination of the escalator (30 degrees). Stairs with treads of approximately 11.50 inches and risers with approximately 6.64 inches risers will comply.
- Minimum headroom clearance of 9 feet measured vertically from stair tread nosing. 12 feet height preferred.
- Maximum riser height - 7 inches.
- Minimum tread depth – 11.50 inches.
- Riser and read dimensions shall be consistent for each step in a given stairway.
- A cleaning trough three inches wide flanking the stairs on both sides that adjoins the back of the tread height on each side, or open railings to allow ease of cleaning. See 9.10.8.3 Standardized Stair Elements and Guidance Drawing A-01-100.

c. Main public access stairs shall be 72 inches wide minimum. While the building codes limit allowable exit width to within 30 inches of handrails, main public stairs shall be at least 72 inches wide for ease of use by patrons in both directions.

d. The width of emergency exit stairs shall be 66 inches minimum. The minimum length of landing for straight-line stairs shall be per code. Larger dimensions shall be provided where high patronage may require more space. Exit stairs shall meet required code widths.

e. Height between landings shall not exceed 12 feet. Where a stair is adjacent to escalator(s), landings shall be distributed to mirror the slope of the escalator.

f. Tactile warning cues for the visually impaired shall be provided with a distinct visual contrast between tread edges and treads. Where this is not possible a visual contrast between treads and risers shall be provided.

g. Treads shall have non-slip finish.

h. Stairs and landings shall be sloped to allow for drainage. Where stairs are covered, this slope shall be minimal in order to not allow water from cleaning to collect on treads or landings. Exit stairs that are not covered shall have a drainage path that does not allow water from upper stairs and landings to drip onto lower landings. See 9.8.1 Station entries and Weather Protection.

i. Bike runnels shall be provided on at least one public stair accessing mezzanines, landings, and/or platforms where stairs are less than 30 feet in height and the clear width of stairs is a minimum of 72 inches, or as determined by Sound Transit. Runnels shall be provided on both sides of a stair when they are provided. See Guidance Drawing A-01-101. Where bike runnels are provided, adjacent stair guardrail must not be glass or painted steel below the height of the handrail. Solid wall or stainless steel mesh infill panels are acceptable. No runnels are to be provided on public stairs with center handrails within 48 inches of the outside handrail/guardrail assembly or at emergency egress stairs

j. Open stair risers are not permitted.

k. For material requirements of stairs see Section 9.10.

9.7.1 Escalators

The necessity, direction and capacity (width) of escalators shall be determined by a combination of factors including, rise, expected patronage, and available budget. In general, the greater the patronage and rise, the more "weight" is given to including escalators. Each entrance shall be considered separately. All escalators shall have a nominal tread width of 40 inches. The designers shall recommend, and Sound Transit will determine, if "future" or "optional" escalators are to be initially included, given available budget. See Chapter 25 Elevators and Escalators.

9.7.2 Elevators

A. Each multilevel station shall be provided with an elevator(s) connecting entry level to platforms or to intermediate public levels. Elevator car equipment shall be designed for use by individuals with disabilities and comply with ADA Standards. Elevator machine rooms shall be located as near as possible to hoistways but clear of public walking and landing areas. See Chapter 25 Elevators and Escalators.

B. Elevators intended for use in moving equipment to and from equipment rooms shall be sized and rated to accommodate the intended equipment.

9.8 GENERAL STATION REQUIREMENTS

9.8.1 Station Entries and Weather Protection

A. Station Entries

1. Station entries shall be as open as possible to allow clear surveillance and the ability for patrons to see all areas quickly and be seen. Entries shall direct the patron through the entry sequence of Fare Paid Zone and circulation to the platform in a seamless manner.

2. Weather protection shall be provided over the entry of the station through the fare vending area.

3. All stations, other than at-grade stations adjacent to or open to public streets, shall have the ability to be secured during non-revenue hours. Security closures shall be overhead coiling doors / grilles or gates that are connected to the LCC for off-site operation. Avoid use of man doors as the main entry to stations due to their limiting width and interference with ease of pedestrian flow. All overhead doors/grilles shall provide an emergency egress button on the

interior of the entry for emergency egress after hours and keyed locks to operate the door on both sides of the grille. The button shall be located beyond the reach of the exterior of the door/grille, or a man door exit with egress hardware shall be provided in the area that is being secured. It is preferable to have the security closure in line with the fare paid zone.

4. Station entry signs, Hours of Operation signs, and PAVMS shall be visible to the public when the security closure is down.

B. Weather Protection

1. Though the Puget Sound climate allows for open stations, patron protection from the sun and rain warrant special consideration. Weather protection from the rain shall be provided for the following:

   a. All public access points to the station

   b. Public stairs and adjacent surge zones

   c. Escalators and elevators and adjacent surge zones

   d. Fare vending equipment and adjacent surge zones

   e. System map viewing areas and other patron facilities such as dynamic signs and emergency telephones, etc.

   f. Platform areas in accordance with Section 9.8.1.B.

2. In general, canopy and wind screen design shall assume that rain is falling at a 15-degree angle from vertical. However, the orientation of a station platform will impact the effectiveness of canopies in providing shade and rain protection. Station orientation shall be considered in developing canopy and wind screen concepts on a station-specific basis. Drip lines or gutters shall not be over travel pathways or platform edges.

C. Platform Canopy

1. A minimum of thirty percent of the platform area shall be provided with canopy protection. This may be increased on a station-by-station basis as determined by Sound Transit. Increases above the minimum canopy coverage shall be determined based on 15 minute peak period patronage at 10 square feet per person for boarding and alighting patrons combined. Include the truncated dome area in this

calculation as the canopy edge overlaps the truncated domes for maximum protection from weather to the train. Coverage of vertical circulation and surge spaces are in addition to the calculated canopy coverage for patrons.

2. Location of canopies shall provide coverage at the two-car vehicle stopping areas.

3. A basic design module of 4 feet 0 inches o.c. shall be employed in the design of canopies and related structures to permit the consistent accommodation of signage, standardized glazing and station furnishings.

4. Canopy designs shall accommodate clearances required for Light Rail Vehicle (LRV) and the overhead contact wire system.

5. Platform canopies shall be supported by columns centered on the platform for center platform stations or supported at the platform edge opposite the trackway for side platform stations.

6. Canopy structures shall be designed to allow for future expansion.

7. Canopies shall be composed of materials that are durable and economical to repair or replace. Reference Section 9.10 Required Materials and Families of Materials.

8. The minimum vertical clearance under the canopy, or any equipment attached to same, shall be 9 feet. See Section 9.6.6.

9. Canopy coverage shall extend over the platform area and as close to the platform edge as permitted by the vehicle and overhead catenary clearance envelope.

10. Canopies shall slope away from the platform edge with drainage collection near the center of a center platform station or near the back of a side platform station to allow for gutter cleaning without affecting train service. Minimum slope of canopies is 1.5%

11. Canopies and their structures shall provide clear floor space conforming to ADA Standards.

D. Windscreens

1. To protect patrons from wind and wind-blown rain, transparent windscreens shall be provided on the platform for a minimum of

approximately half of the length of the platform canopy. At side platform stations each platform shall be provided with this length of windscreen. Where side platform stations are directly adjacent to streets, provide windscreen for at least 80% of the length of the canopy. Full width of canopy preferred. Windscreens adjacent to streets, parking or landscape areas shall have no gap at the platform in order to prevent splash from vehicle traffic or planting areas. At stand-alone windscreens, provide a four to six inch gap at the bottom of framing for ease of cleaning and visibility. Windscreens shall include side panels wherever possible to allow protection from weather in multiple directions.

2. A basic planning module of 4 feet 0 inches o.c. shall be utilized. Glazing and other infill material sizes shall be standardized to allow ease of replacement. Reference Section 9.10.8 Required Materials and Families of Materials.

3. Windscreens shall be transparent to allow clear surveillance of station areas for patron security and to discourage vandalism. Lower portions of windscreens may be solid or semi-transparent to minimize damage to lower glazing due to kicking and to protect patrons from environments outside the platform, such as spray from vehicular traffic.

4. Windscreens located at the edge of canopies shall extend as close to the underside of the canopy as possible and the canopy edges shall extend past the windscreens to maximize protection from inclement weather. Gaps between the windscreen and canopy are permitted where necessary to meet the definition of open station.

9.8.2 Station Furniture and Patron Conveniences

A. The minimum seating provided at platform level shall be 30 seats for each center platform station and 20 seats for each side platform. Each "seat" shall be defined as a seat width of 21 to 24 inches. The seating shall be distributed to three or more locations along platform areas. At least 60% of the seating shall be protected within areas covered by canopy. Additional seating shall be located near each public entry point (fare vending areas) to the station and arranged so that they do not interfere with patron circulation or emergency exiting.

B. Seating shall be of a design that will prevent individuals from lying down or sleeping. Seating shall be selected from Sound Transit approved family of furnishings.

C. Seating shall conform to ADA Standards. At least 25 percent of the platform seating shall be designed with backs and full-length armrests to facilitate use by individuals with disabilities. Seating areas shall be placed to allow space for a wheelchair user to be located next to a bench.

D. Seating shall not be provided adjacent to railings, stairways or other openings which may present a fall hazard where the grade difference is more than four feet at the location of the seating.

E. On-site bus stops shall be provided with a minimum of 3 lineal feet of seating per bus stall. Seating and shelter for bus stops on public streets will typically be provided by the local transit company(s).

9.8.3 Ancillary Spaces

A. Ancillary spaces such as electrical rooms, elevator machine rooms, train control and communications rooms, and janitor closets, as well as traction power rooms or buildings may be required at stations. Specific requirements will be determined on a station-by-station basis in the Station Program during initial station layout. In addition to Systems requirements, the following rooms shall be provided:

1. All At-grade stations do not require rooms other than for Systems requirements.

2. All stations with more than one level and containing vertical circulation shall include:

   a. One 100 square foot Janitor's room with janitors mop sink, emergency eye wash, and wall shelving. Access door to be 40 inch wide minimum or a pair of 3 foot wide doors.

   b. One 100 square feet Storage room with a minimum 15 lineal feet of shelving for storage of materials and an open floor area to store cleaning equipment. Access door to be 40 inch wide minimum or a pair of 3 foot wide doors. Locate at grade whenever possible. Storage room to be separate from Janitor's room.

   c. One Emergency Responder Equipment Room 12 foot x 12 foot. See 9.8.17.

   d. One unisex staff restroom with visual "Occupied" lock separated from the keyed lock.

e. One trash enclosure for two 4 cubic yard dumpsters. Locate adjacent to truck access from local garbage hauler. Screen dumpsters from view or locate within a room. Provide a pair of 3 foot wide doors or gates. Lock separately from other trash enclosures on site.

3. All terminus stations shall include:

a. One 100 square foot Janitor's room with janitors mop sink, emergency eye wash, and wall shelving. Access door to be 40" minimum or a pair of 3 foot doors.

b. One 100 square feet Storage room with shelving for storage of materials and an open floor area to store cleaning equipment. Access door to be 40 inch wide minimum or a pair of 3 foot wide doors. Locate at grade whenever possible.

c. Two Unisex staff restrooms with visual "Occupied" locks. Locate within a reasonable distance to the platform and adjacent to Crew Room. One restroom shall be for exclusive use of Link Operators and shall be signed as such. The other restroom will be shared by staff.

d. One trash enclosure for two 4 cubic yard dumpsters. Locate adjacent to truck access from local garbage hauler. Screen dumpsters from view or locate within a room with a pair of 3 foot doors. Lock separately from other trash enclosures on site.

e. One Supervisor's office 100 square feet with daylighting where possible; one workstation, network connection, phone and HVAC.

f. One Crew room with microwave, under counter refrigerator, sink with chilled and filtered water, paper towel holder, 4 foot minimum counter area, table and chairs for 4. Provide phone jack. Compost / waste area. Power receptacles and space for 2 vending machines. Provide daylighting where possible.

g. One Security room 80 square feet minimum with desk surface for two computers / laptops, two network connections, and phone connections. No clear glazing to the exterior. If daylighting is provided it shall be above eye level or translucent glazing. Room layout shall provide 5'-0" ADA accessible turnaround.

B. Provide adequate access for equipment maintenance envelopes and replacement paths. Rooms containing large equipment such as the Traction Power Substation transformers are to be located at or near grade whenever possible and shall have an equipment replacement path defined. Special considerations shall also be made for removal and replacement of tunnel and smoke emergency ventilation equipment including providing removal paths.

C. Where Systems equipment would be visible to the public from public rights-of-way, private property or stations, provide screen walls of a height to conceal equipment. Gates and access points shall be coordinated with screening to provide a secure area for the Systems equipment. Do not rely on landscape screening to screen equipment. See Chapter 10 Landscaping for requirements of off-site landscape areas and landscape screens.

D. Provide reasonable (less than 300 feet travel distance) access from ancillary rooms to a service vehicle parking stall when feasible.

E. Design of ancillary spaces shall be compatible with station architectural scheme.

F. Where systems buildings are not enclosed within a station or facility and are visible to the public, provide an architecturally interesting, secure screen compatible with the neighborhood to enclose systems buildings.

G. All non-public rooms shall provide an accessible door, maneuvering clearances at the door, and latch clearances required per the ADA Standards (Reference Section 404). No permanent elements or equipment shall be placed to block these clearances. Exceptions permitted for spaces with ladder access only, narrow access, or required change in elevation. Confirm all exceptions with Sound Transit.

H. See Chapter 20 Heating, Ventilation and Air Conditioning and Chapter 24 Plumbing and Fire Protection Systems for space needs associated with mechanical and fire protection requirements of ancillary spaces.

9.8.4 Restrooms

A. All restrooms shall comply with ADA Standards and local accessibility requirements.

B. Staff restrooms shall be provided at locations as determined by Sound Transit.

C. Staff restrooms shall have tampon dispensers that will not require coins to operate.

D. All restrooms shall have electric hand dryers. No paper towel dispensers shall be used.

E. Public restrooms shall be provided at locations as determined by Sound Transit. Where required by code, Sound Transit will investigate if jurisdictions will consider waiving this code requirement in order to meet Sound Transit Restroom Policy M98-67.

F. For security reasons, public restrooms shall include partitioned stalls even if only one toilet is provided. The exterior man door shall not be able to be locked by the public. The locking device shall be keyed on both sides.

G. Public restrooms shall not include tampon dispensing units or diaper changing stations unless required by jurisdiction having authority.

9.8.5 Advertising

A. General Criteria

1. Sound Transit shall determine whether advertising will be accommodated in stations depending on location and patronage. When advertising is to be accommodated, identify appropriate locations for advertising.

2. Advertising shall conform to local jurisdictional restrictions.

3. Advertising shall not compromise the function, wayfinding, architectural, and artistic expression of the station.

4. Do not locate advertising where points of decisions are being made, customer information is provided, or where confusion may result due to its presence. See Sound Transit Customer Signage Design Manual.

5. Advertising shall not conflict, by placement or treatment with, or take priority over, operations, wayfinding, system signing, and information or art.

6. Entry / Ticket Concourse and Mezzanine: These areas are not suitable for advertising due to the amount of customer information and patron movement occurring at these locations. Advertising shall

not be located in any areas that blocks or interferes with Fare Paid Zone signs.

7. A minimum 2 foot clear buffer zone without advertising shall be maintained around all TVM's, SCR's, ETELS, PET's, customer information and signage, Fare Paid Zone signs require a 5 foot minimum buffer.

8. Advertising shall be carefully located so as not to obstruct, cause distraction, or impede patron movement. The materials used and the location of advertising shall not create a safety hazard.

9. Advertising shall be located so as not to conflict with visual legibility of emergency exits or equipment, particularly at platform level.

10. The placement of advertising in vertical circulation spaces will constitute a distraction for the patron. Advertising shall not be located at the top and bottom landings or along walls of escalators and stairs. Advertising shall not be placed near elevator control buttons, on elevator doors, or inside the elevator car.

11. Advertising shall be carefully controlled on all electronic message units that are used for system signing and information.

12. The format and size of advertising shall be compatible with the volumes of the interior or exterior spaces in which they are located and shall in all cases be compatible with the architectural expression of the stations.

13. Advertising shall work with the existing ambient lighting of the stations. No special lighting will be provided specifically for advertising.

14. Advertising shall meet all codes regarding flame spread and level of combustibility for the type of structure where it is installed.

15. Platform Level: Advertising may be appropriate in across-track locations. It shall not conflict with regulatory signs, system signing and information.

B. Maintenance and Performance Criteria

1. All materials used in the fabrication of advertising panels shall be of a durable and vandal-resistant nature. Installation of advertising shall not damage permanent surfaces. Advertising shall not be

placed on any painted surfaces in order to minimize damage to those areas.

2. Advertising panels shall exhibit low maintenance characteristics and withstand periodic pressure washing without damage.

3. Advertising shall be in conformance with all applicable codes.

9.8.6 Trash and Recycle Receptacles and Ash Urns

A. No trash or recycle receptacles shall be located on platforms at tunnel or elevated stations unless directed by Sound Transit. Trash and recycle receptacles at At-grade stations shall be placed in clear areas away from canopies and windscreens. Trash and recycle receptacles shall be provided near fare vending areas and at plazas and bus/shuttle areas. A minimum of one trash and one recycle receptacle per fare vending area shall be provided. Receptacles for the general site, park and ride, or short term parking and drop-off areas shall be determined on a site-specific basis. Wherever receptacles are located, trash and recycle receptacles shall be placed together as a pair. No single trash or recycle receptacles shall be located individually.

B. Link light rail standard trash and recycle receptacles shall be used. Trash receptacles shall include spaces for recycling and garbage. Trash receptacles shall have holes in the perimeter housing large enough to see through and shall have restricted holes of a size that restrict access into trash and recycling areas. Reference Section 9.10.8.

C. Trash and recycle receptacles shall be secured to the floor or ground to avoid removal by unauthorized persons and shall be vandal resistant.

9.8.7 Plumbing Requirements

A. Staff restrooms shall have porcelain fixtures. Toilet shall be provided with a toilet seat.

B. Provide hose bibs at spacing to permit cleaning of fare vending areas, mezzanines, and platforms with a 75 foot hose.

C. Provide hose bibs to permit cleaning of associated plazas. Hose bib water source shall be available all year. See Chapter 24 Plumbing for specific requirements of hose bibs.

D. Drains meeting ADA Standards shall be provided in public spaces where needed. Floor drains in non-public spaces shall be provided to meet applicable codes.

E. Fire protection lines shall be run in an organized manner and incorporated in raceways and chases whenever possible to reduce visual clutter and deter bird roosting. Where fire protection lines must be exposed to view in public areas, lines, hangers and related appurtenances shall be located in an organized manner, tight to adjacent surfaces, and painted to match those surfaces. Where fire lines are exposed in public or non-public areas outside of closed rooms, provide bird deterrent devices.

9.8.8 Electrical Conduit and Receptacles

A. At stations, electrical conduits, junction boxes and appurtenances required to support the electrical system shall be hidden from public view by locating them in an organized manner within raceways, cable trays or chases. All raceways and chases shall provide reasonable access and accommodate future conduit. Raceways and chases shall be designed to deter bird roosting. No conduit shall be installed exposed to view in public areas of the stations. Where conduits must be exposed to public view to connect to equipment or fixtures, the conduit and any junction boxes shall be located in an organized manner, tight to adjacent surfaces and painted to match those surfaces. Where conduits are exposed in public or non-public areas outside of closed rooms, provide bird deterrent devices.

B. Provide 110V, 20 amp single-phase NEMA 5-20R duplex receptacles to allow full coverage of all areas of the station and vertical circulation elements with a 75-foot electrical cord.

C. All receptacles in public areas shall be provided with a lockable cover plates, locks, and keys.

D. Provide one 1 inch conduit for power and one 1 inch conduit for data connected to the Communications equipment at each fare vending area for future Dynamic Rider Information Sign (previously Trip Planner). Provide termination of conduit in a locking handhole for future use at the TVM area.

E. Provide electrical receptacles on a separate circuit for concessions or vending machine at station plazas and mezzanine areas as determined by Sound Transit.

F. Provide power and data connections to the Bike Cage and On-Demand bike lockers for connection to the fare processing system. Provide an additional 110V, 20 amp single-phase NEMA 5-20R duplex receptacles with lockable cover in each Bike Cage.

G. Mechanical and electrical rooms shall have receptacles distributed in accordance with code requirements and manufacturers' and designers' recommendations. Lockable cover plates are not required in non-public spaces.

H. All grounding wires shall be located to minimize length and hide the grounding connections to station elements.

I. See Chapter 23 Electrical Systems for electrical requirements.

9.8.9 Fare Vending Area

A. These areas shall include, at a minimum, the following:

1. Customer information panels:
    a. How to Ride panel
    b. Line map, including fare chart
    c. Area Map, including transit connections/Rider alerts panel
    d. Rider conduct panel
2. Two ticket vending machines (TVM).
3. Two Smart Card Readers (SCR's)
4. Bench
5. Location and conduits for future Dynamic Rider Information Sign (previously Trip Planner).
6. Passenger Emergency Telephone (PET)

B. Fare vending areas shall be located prior to entering the fare paid zone and platform. See Guidance Drawings A-01-200 – A-01-203 for general layout. Allow 30 inch by 48 inch surge zone in front of each ticket vending machine.

C. All elements located within the fare vending areas shall be weather protected.

D. Ticket vending machines (TVM) shall be protected from rain above and on all sides. Assume rain at a 15 degree angle from vertical. See Section 9.8.1 Weather Protection.

E. Protect TVM screens from sun and glare. Canopies shall be large enough to prohibit sun from reaching the TVM screens in all seasons. Where this is not practical, orient TVM's to reduce glare and sun exposure, or provide screening or landscape to shade TVM's.

F. Where TVM orientation is limited and glare or sun exposure is likely, consult with Sound Transit to determine if special TVM screens may be warranted.

G. Locate SCR adjacent to patron circulation after the TVM's but before the platform area. Align with "Fare Paid Zone" customer signs. See Sound Transit Customer Signage Design Manual.

H. Provide location for overhead signing the limit of the proof of payment zone prior to entering platform. Align with SCR's.

I. Fare vending equipment, information displays, and adequate queue space shall be located so as to not obstruct required travel lanes.

J. Include space for one future Dynamic Passenger Information Sign (previously Trip Planner) at each TVM area. Provide a 30 inch deep by 36 inch wide surge space at the dynamic sign location outside required circulation space. See 9.8.8 Electrical.

K. See Chapter 16 Fare Collection for information on quantity, spacing, location, and other data on ticket vending machines, SCR's and related facilities.

9.8.10 Station Signage

A. System-wide customer signage has been developed by Sound Transit. Reference the Sound Transit Customer Signage Design Manual and Sign Production drawings for additional information. Sign layouts shall be based on this manual. The following design requirements are to be met to incorporate customer signs into the project.

1. Insofar as possible, architectural elements, landscaping, and other design features shall identify entrances, exits, traffic routes, etc. without the need for signage to identify the function.

2. The designer shall become familiar with the customer sign types and their intended use and shall locate the signage in the facility.

3. The customer signage may be installed through a Sound Transit contract separate from the construction contract that will construct the facility. The designer shall accommodate into the station design those elements necessary to be provided by the station contractor to accommodate the installation of the customer signage, including backing, steel plates, or concrete foundations for attachment of the signage.

4. Signage shall be designed and positioned in such a manner to provide effective passenger guidance. The number of signs shall be kept close to the minimum necessary for passenger guidance and to avoid creating a distraction.

5. Signs shall be located for maximum visibility at or before all decision points within facilities. Landscaping, architectural elements, and lighting shall not obstruct clear sightlines to signage.

6. Signs shall be placed at frequent enough intervals so that the infrequent or new user can readily find his or her way without assistance.

7. The pattern of signs shall be predictable and therefore consistent from station to station.

8. Map space shall be provided immediately adjacent to fare collection equipment and at other decision points such as platform areas.

9. Walls at ends of passageways, opposite major entrances, or leading to exits, shall be kept free of miscellaneous doors and advertisements so that they may be used for customer signage information graphics.

10. Station identification signs shall be located so they may be easily seen by both sitting and standing passengers in transit vehicles.

11. Relate passengers to the surrounding community with appropriate signage.

12. Lighting shall be provided to illuminate signs to meet code requirements.

13. Coordinate signs with other elements of the station to provide clear legibility.

B. Regulatory and Room Signs

1. Provide signs as required by code.

2. Provide signs for all rooms and spaces based on the Light Rail Equipment and Facilities Numbering Standards.

3. Regulatory and room signs to meet sign standards in Figure 9-1.

4. Sign specifications to meet the following:

a. Sign material to be 1/8” matte acrylic with black background and white raised copy. Where red signs are required, text shall be white (J2.0). Where yellow signs are required, text shall be black (J5.0 and J6.0).

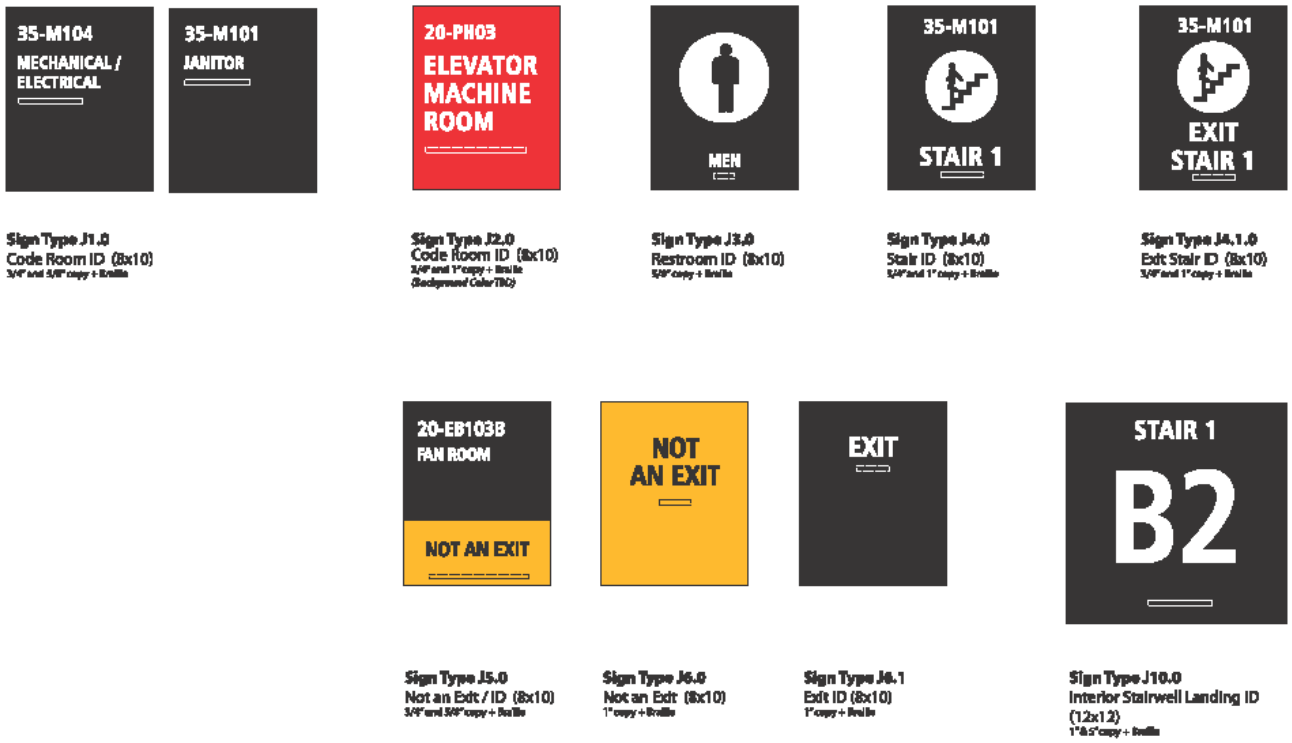
b. Typeface: Humanist 777 Bold condensed

c. Letter spacing: Tracking = 25

d. Braille to be Grade 2 (Contracted) with inset round glass beads

e. All signs to be fabricated to meet ADA requirements

Figure 9-1: Standard Room Signs



C. Operational Train Stopping Marker

1. Identify location and provide footing for two Train Stopping Marker on each platform to be placed at the leading edge of a two car consist, a four car consist, and a 4 car reverse running consist to align vehicle doors with Tactile Train Waiting Areas. See 9.4.3 Tactile Wayfinding Provisions.

2. Train Stopping Markers are pole mounted signs to be mounted beyond the truncated domes on the platform side within 6-inches of the back edge of the truncated dome pavers.

3. Train Stopping Marker location to be coordinated with ST Operations during installation.

D. Signage at terminus stations

1. At terminus stations, provide locations for a “Next Train” sign to be installed on an interim basis to indicate which train will leave the station first. Where the signs are mounted, provide a finish that can

be easily repaired or supports that can be removed when the sign is removed.

2. For center platform, stations signs shall be located near the ends of the platform and near the midpoint of the station where they can be viewed from general circulation patterns.

3. For side platform stations, locate the signs in the best location for patrons to easily recognize which platform they should use.

4. Provide structural support, power and data connections to these locations. Locate a key switch on the platform for staff to override the system when necessary.

5. Sound Transit may use the PAVMS for “Next Train” signs.

E. Public Audio and Visual Message System (PAVMS)

1. Public audio and visual message signs shall be located at station entries and at least three points along the station platform. Signs shall be located at a vertical angle of articulation for optimum passenger visibility entering and exiting the vehicle. Additional locations may be determined by ST at terminus stations to accommodate “Next Train” messaging.

2. Two types of visual message signs may be used. Flat panel screen signs are typically larger and used where ceiling or canopy height is not restricted such as entries below elevated stations. Initially allow for flat panel sign size of 36 inches high by 60 inches wide. Variable message LED signs shall be used when canopy height is restricted to maximize weather protection for the patrons, such as at-grade or elevated stations. Initially plan for variable LED sign size of 18 inches high by 78 inches wide. Confirm current projected sizes based on input from ST Systems.

3. Provide structural support, power and data connections to these locations.

4. Canopies shall cover the PAVMS to prevent direct weather and glare on the face of the sign.

5. See ST Customer Sign Design Manual and Communications and Central Control, Chapter 15 for additional requirements.

F. Dynamic Passenger Information Signs

1. Dynamic Passenger Information signs are changeable electronic signs providing passenger information in the touch zone. A 4 foot wide cavity wall at the sign location is required for conduit stub ups and structural mounting of the sign.

2. Dynamic Passenger Information signs shall be provided in each fare vending area.

3. Sound Transit will determine if additional Dynamic Passenger signs are warranted at off site bus facilities in conjunction with light rail stations, in structured parking facilities, and along the path from parking facilities to the station.

4. Provide structural support, power, and data connections to these locations.

5. Canopies shall cover the signs to prevent direct weather and glare on the face of the sign.

9.8.11 Light Rail Equipment and Facilities Numbering Standard

Room and equipment numbering shall be based on the document, Light Rail Equipment and Facilities Numbering Standards.

9.8.12 Public Telephone

A. Provisions for a minimum of one coin-operated telephone shall be provided at each station entry and at least one shall conform to ADA Standards.

B. Public telephone locations shall be inside weather protected areas.

C. Public telephone locations shall be near fare-vending areas.

D. See Sound Transit Customer Signage Design Manual for relevant customer signage.

9.8.13 Passenger Emergency Telephone (PET)

A. Passenger emergency telephones are required at stations. The station designer shall accommodate these devices and incorporate them into the station design. Each fare vending area shall include one PET minimum. PET's shall be located as identified in relevant chapters of the DCM. For other requirements and locations along the platform,

reference Chapter 15 Communication and Central Control for requirements.

B. See Sound Transit Customer Signage Design Manual for relevant customer signage.

9.8.14 Emergency Telephone System (ETEL)

Emergency telephones (ETEL) are required at stations. The station designer shall accommodate these devices and incorporate them into the station design. Emergency telephone system shall be back up communications for the Fire Department and other emergency personnel. Reference Chapter 15 Communication and Central Control for requirements.

9.8.15 Closed Circuit Television Cameras (CCTVs)

Closed Circuit Television Cameras (CCTVs) are required at stations, plazas, bicycle cages and other public spaces related to the station facilities. The station designer shall accommodate these devices and incorporate them into the station design. Reference Chapter 15 Communication and Central Control and Chapter 29, Security, for requirements.

9.8.16 Fire Command Center (FCC) and Fire Control Room (FCR)

A. The Fire Command Center or Fire Control Room shall be adequately sized based on input from electrical, mechanical and systems designers, local jurisdictions and the Fire/Life Safety committee. See Chapter 18 Fire/Life Safety and reference Sound Transit guidance drawings.

B. For elevated stations, a Fire Control Room shall include the fire alarm panel. The location of the FCR will be determined in conjunction with the Authority Having Jurisdiction.

C. For tunnel stations, the location of the Fire Command Center shall include a work surface for multiple computer work stations with power and data. The work surface shall include a flat plan shelf 4 inches below the work table. The Fire Command Center shall include various equipment panels required for the operation of the FCC. Reference Sound Transit guidance drawings.

9.8.17 Emergency Responder Equipment Room

A. At elevated and underground stations, provide a 12-foot by 12-foot room, or similar, to store four carts storing emergency responder equipment. The carts are approximately 30-inches wide by 48-inches long and 77-

inches tall. Carts should be stored in separate lanes to allow removal of one cart without moving the others. Four power outlets shall be provided near the door to allow portable lights to be charged. The light units (approximate footprint 2 feet by 2 feet) shall not require the removal of carts to access them. The door into the room shall not be less than 3-feet wide. For underground stations, the room should be located on platform level.

B. For elevated stations, this room can contain the Fire Control Room equipment. The minimum 12'x12' room requirement must be reevaluated based on the required equipment and clear access shall be provided to the equipment. The room layout shall be determined acceptable by the local fire department.

C. Access from the Emergency Responder Equipment Room to the station platform shall be flat to allow carts to move easily. Where rooms are located on a different level than the platform, provide clear, easy access to the elevator. Confirm pathways are wide enough for the carts to turn and that the size of the elevator will accommodate one cart and two attendees.

9.8.18 Defibrillators

If determined by Sound Transit, provide defibrillators in alarmed cabinets on platforms. Locate near center of platforms.

9.8.19 Bird Control and Deterrent Devices

A. Stations shall be designed to minimize open ledges, conduits and mechanical/electrical piping, pendant light fixtures, and exposed structural members that birds can perch on. Where horizontal surfaces, piping and conduits, and pendant lights cannot be avoided, bird deterrent shall be included as part of the project. Deterrent devices may include spikes, mesh, spiders, and piano wire. Piano wire is preferred over bird spikes as the spikes collect dirt and debris that is unsightly and difficult to clean. Provide bird deterrent solutions that are visually unobtrusive.

B. Consider audible bird deterrent or other temporary deterrents during construction and between completion of civil construction and opening day to eliminate birds taking ownership of station areas before the station is operational.

9.8.20 Window Washing and Fall Protection

A. Station designs shall include structural features to allow general maintenance to occur.

B. All roof areas shall have access by moveable ladder, fixed ladder and/or roof hatch. Access points shall be directly accessible to connect to the roof fall protection system.

C. Fall protection shall be provided for all roof areas and other locations where needed to access the roof. Fall protection shall include both fall restraint for maintenance and fall arrest where required. All fall protection shall meet WAC, Washington State Department of Safety and Health (DOSH), and OSHA standards. Attachment systems shall be coordinated to accept standard Sound Transit maintenance equipment.

D. Window washing attachment systems shall be provided as needed to provide access to clean all glazing. Window washing attachment systems shall be provided for all roof areas and other locations to access windows where ladder access and tie-offs are not a reasonable or safe option. Alternatively, access by a scissor lift may be permitted if the lift is located at the facility.

E. Ladder tie offs meeting Washington State Department of Safety and Health (DOSH) and OSHA standards shall be provided where access by ladder is required for frequent maintenance such as lamp replacement.

F. Areas of glass shall be unobstructed so as to provide reasonable and safe access for cleaning.

9.8.21 Lighting

A. The design of the lighting shall facilitate patron movement and assist in providing site security. Reference Chapter 21 Lighting for illumination requirements and appropriate lighting standards and codes.

B. Illuminance levels, including that for emergency lighting, shall comply with the design criteria and local codes.

C. To minimize maintenance costs, standardized lamps and fixtures are required. Reference Link Light Rail Facility Lighting Standards.

D. Lighting for stairs and escalators shall be easily accessible for maintenance by ladder or from above, such as from platform level. Any

lighting located above stairs shall be accessible from a flat surface that provides space for an "A" frame ladder or small scissor lift.

E. When possible, light fixtures that are not required to light the platform edge shall be located beyond the 10 foot OCS clearance zone to allow maintenance without shutting down power for trains. If required foot-candles cannot be met with this restriction, seek guidance from Sound Transit.

9.8.22 Vending Machines and Concessions

A. Vending Machines

1. At Sound Transit direction, provide locations and power for vending machines which may include beverage or snack vending, video rental, automated teller machines (ATM's) or other types of patron conveniences.

2. Vending machines shall not be located on the platform.

3. Vending equipment and adjacent surge space shall not obstruct required site and station circulation.

4. Vending machines shall have weather protection.

B. Concession Pushcarts

1. At all stations, provide locations for freestanding mobile concession pushcarts providing retail or food items to patrons. These areas shall be visible and open to patrons.

2. Each location shall have separate power and water connections that shall be tenant metered separately from the station as determined by Sound Transit.

3. Concession pushcarts, related signage, advertising and adjacent surge space shall not obstruct required site and station circulation.

4. Where directed by Sound Transit, provide weather protection for concession pushcarts and storage rooms for pushcarts.

C. Food Service Vending Trucks

1. At Sound Transit direction, designate parking areas for food vending trucks. Where feasible, these areas shall be visible and open to patrons in lieu of locations within parking garages.

2. Food service truck locations shall have access to separate power and water connections. Provide services required by code for food service.

3. Food service trucks, related signage, advertising and adjacent surge space shall not obstruct required site and station circulation.

D. Permanent Concession Kiosk Locations

1. At Sound Transit direction, provide one or more areas within the station facilities for future permanent concession kiosks up to 144 square feet each to be installed. These areas shall be visible and open to patrons.

2. Each location shall have separate power and water connections as determined by Sound Transit. Determine other services required by code for retail and/or food service. Sound Transit to direct what facilities to be built initially.

3. Kiosks, related signage, advertising and adjacent surge space shall not obstruct required site and station circulation.

4. Where directed by Sound Transit, provide weather protection for concession kiosks and non-public storage rooms.

5. At Sound Transit direction, provide space for bike rental/sharing type kiosks.

E. Built-in Concessions / Retail Spaces

1. At Sound Transit direction, provide built-in concessions and/or retail spaces within the station facility. Sound Transit will determine, based on market analysis, whether conditions allow for positive net revenue and rents sufficient to recover capital costs and annual maintenance for required mechanical, electrical, restroom facilities and other facilities required to support these spaces.

2. Requirements of built in facilities will be determined based upon the market analysis conditions.

3. Determine services required by code for retail and/or food service. Sound Transit to direct what facilities to be built initially.

9.9 BICYCLE FACILITY REQUIREMENTS

9.9.1 Classification of Bicycle Parking

A. Any non-standard facilities, products or installation must be reviewed by Sound Transit's Bicycle Program prior to submitting a deviation request.

B. Sound Transit defines types of bicycle parking as "Class One" and "Class Two":

1. Class One bicycle parking is the most secure and weather-protected type of bicycle storage. It is typically associated with long-term (all day or overnight) bicycle parking.

   Class One bicycle parking shall be either:

   a. Individual bicycle lockers, key type or On-Demand.

   b. At Bicycle Cage that can only be accessed by smart card (preferred) or keypad code lock (Trilogy DL3500 or approved) provide 100% canopy coverage and protection from windblown rain on all sides. Walls, screens or fences shall be used to secure the area to allow visibility into the cage. Access doors shall be a minimum of 36" wide. Doors shall allow visibility by the use of glazing or screening that does not allow access to the interior door latch from the exterior by hand or use of a tool. Bike Cages shall have two doors, CCTV, passenger emergency telephone (PET), one floor mounted bike pump, and one 6 foot bench. Provide one floor-mounted bike pump inside the cage. In addition, the walls should be made of materials that cannot be cut or broken with common hand tools. The enclosure shall have no gaps large enough to allow unauthorized people to gain access.

   c. Pre-manufactured secure and weather-protected bicycle storage areas may be permitted on a case by case basis. Review these conditions with the Sound Transit's Bicycle Program before seeking a deviation request.

2. Class Two bicycle parking provides a lower-level of bicycle security than Class One and is typically associated with short-term parking.

   a. Class Two bicycle parking shall be Bicycle Racks

b. Class Two bicycle parking shall provide a minimum of 50% bicycle parking spaces with canopy coverage.

9.9.2 Bicycle Parking Requirements

A. Bicycle storage facilities shall be constructed on hard surfaces.

B. Facility designs shall direct roof and site drainage away from the bicycle parking.

C. Bicycle storage areas shall be lighted: See design standards for guidance on lighting.

D. Facility designs shall provide sufficient space between parking areas so that access is possible by a bicyclist walking a bicycle. See Table 9-3.

E. Where CCTV is provided at new facilities, provide CCTV surveillance for bicycle parking areas and entry gates to bicycle parking.

F. Designation of the location of the bicycle storage area and routes for entering and exiting the facility shall be provided as signage and/or pavement markings.

G. All bicycle parking areas shall be provided with bicycle route information in signage/maps as per the Sound Transit Customer Signage Design Manual (C type panels).

H. Placement of bicycle parking elements shall conform to ADA Standards.

I. Bicycle parking expansion space shall be clearly indicated in all new facility design documents.

J. Bicycle parking elements and their installation shall comply with Sound Transit's Environmental and Sustainability Management System (ESMS).

K. At Bicycle Cage entrances, designs shall include electrical and data infrastructure for power and communications connections for ORCA card readers at each door.

L. Where Bicycle Lockers are installed, each On-Demand (pay per use) locker shall include electrical and data infrastructure for power and communications connections (smart card readers). Sound Transit will provide the quantity of lockers to be "On-Demand".

M. ST acceptable bicycle racks and lockers are defined in Section 9.10.

9.10 MATERIALS AND FINISHES GUIDELINES AND REQUIREMENTS

The following basic requirements and criteria have been established for finish materials used in public and non-public areas within the system. While convenience, comfort, and attractiveness shall be considered in the selection and application of finishes, safety, durability, and economy are essential attributes that must be satisfied.

Sound Transit seeks to maximize the use of recycled products and sustainable materials; and minimize, or eliminate, the use of hazardous chemicals in the products used on these projects. See Ch. 30 Sustainability for additional requirements and considerations in the selection of materials.

9.10.1 General Criteria

Finish materials shall meet the following general criteria:

A. Finish materials shall aid in the creation of a visually pleasing transit system.

B. Finish materials shall be easily maintainable and repairable.

C. Finish materials shall facilitate passenger guidance, information, safety, and security in an aesthetically pleasing manner.

D. Structures and materials shall be designed and detailed to minimize bird roosting areas and other environments that may attract pest species.

E. Finish materials for floors, walls, and ceilings shall be considered with respect to the total acoustic environment, so as to minimize reverberation while meeting other design and performance criteria.

F. Finish materials shall be supportive of an efficient lighting system.

G. The quality of the materials and the workmanship of their application shall be of high standard.

H. Initial materials costs shall be weighed against long-term maintenance costs.

I. Finish materials by virtue of texture, composition, or application shall not pose safety hazards to patrons using the system.

J. All finish materials shall accommodate the specific needs of persons with mobility disabilities and the requirements of the ADA Standards.

K. Floor finish patterns shall not create an environment that is visually "too busy" or disorienting to patron movement.

L. Floors in heavy wear areas shall have a wear surface separate from the structural slab to facilitate replacement.

M. The zone from floor level to 8 feet on vertical surfaces, called a "touch zone", is subject to abuse and willful damage; therefore, finish materials in this area shall be especially resistant to damage and vandalism and capable of being quickly repaired in a cost-effective manner.

N. Where appropriate, wall and ceiling finishes shall be chosen with reference to the potential need for access to equipment behind the finish.

O. Wall finish materials shall not pose safety hazards to patrons; for example, materials adjacent to escalators shall not have perforations capable of catching fingers.

P. Structure, walls, ceiling and canopy finishes/systems shall allow access for future retrofitting of subsystems such as conduit for data and power for additional CCTV and public address systems.

Q. Consideration shall be given to the use of ceiling materials designed for the attenuation of sound. Ceiling finishes/systems offer an effective means of controlling noise levels within below-grade stations. Materials shall withstand infrequent cleaning by pressure washing.

R. Material units shall be large enough to reduce the number of joints yet small enough to facilitate replacement if damaged. Monolithic materials may be used if they can be easily repaired without the repair being noticeable.

S. Materials shall be detailed and specified to be installed in accordance with industry standards and manufacturer's printed directions for long life, low maintenance, and compliance with manufacturer's warranty requirements.

9.10.2 Non-Proprietary Materials and Buy America Requirements

Non-proprietary items shall be used in the system in order to obtain competitive bids and comply with federal regulations. Proprietary items shall be used only where established systemwide products and materials have been identified by Sound Transit.

All materials shall be manufactured and/or supplied from the USA to meet Buy America Requirements. No materials shall be used that do not meet Buy America provisions without prior approval of Sound Transit.

9.10.3 Safety

A. Flame spread and smoke generation hazard from fire shall be reduced by using finish materials with minimum burning rates, smoke generation and toxicity characteristics consistent with all applicable codes.

B. Proper fasteners and adequate bond strength shall be used to minimize hazards from dislodgment due to temperature change, vibration, water, wind, and vehicle movement through stations, seismic forces, aging, or other causes.

C. Floor materials with slip resistant qualities shall be utilized to increase pedestrian safety and accommodate the needs of individuals with disabilities. Stairways, platform edge strips and areas around equipment shall have high slip resistant properties.

D. As a minimum, provide materials that meet static coefficient of friction as defined in the ADA Standards and Dynamic Coefficient of Friction (DCOF) AcuTest (ANSI A137.1 Section 9.6)

9.10.4 Ease of Maintenance

A. Cleaning: Facilitate ease cleaning and reduce cleaning costs by the use of materials that do not soil or stain easily, that have surfaces that are easy to clean in a single operation using standard equipment and cleaning agents, and on which minor soiling is not apparent. Materials shall be cleanable with commonly used equipment and biodegradable cleaning agents. Materials and connections shall permit cleaning by pressure washing of all surfaces. Platform walking and horizontal surfaces shall utilize materials that are not damaged by pressure washing.

B. Minimize shelves, ledges and any elements that may accumulate dirt or be used for depositing trash. Because trash cans are not allowed on elevated and tunnel platforms, garbage accumulation will be an issue.

C. Repair or Replacement: To reduce inventory and maintenance costs, materials shall be used that are readily available and can be easily repaired or replaced without undue cost or interference with the operation of the Link system. For example, hose bibs, electrical outlets, lighting fixtures and lamps, glass or plastic lights, etc., shall be

standardized on commonly available sizes and finishes to ease inventory stocking or direct purchase. Spare quantities shall be provided for tile and other applied unit materials in an amount equal to approximately 0.5 percent of the total material used.

D. Access to equipment: Provide the ability to access equipment for service. Provide maintenance stairs, ladders, working platforms, and so forth to equipment areas requiring service. Provide access protocol to define the method anticipated for on-going maintenance.

9.10.5 Resistance to Vandalism

A. Provide materials and details that discourage vandalism and that are difficult to deface, damage, or remove.

B. All surfaces exposed to the public shall be finished in such a manner that the results of casual vandalism can be readily removed with common maintenance techniques.

C. Exposed Concrete and Concrete Masonry Units in the touch zone shall be sealed with graffiti resistant coatings that do not affect appearance and allow easy cleaning of graffiti. Stop sealer at a logical breakpoint above the touch zone.

D. Concrete walls, piers, and guideway elements shall have WSDOT approved pigmented sealer in “WSDOT Gray” to allow easy coverage over graffiti.

E. Skateboard Deterrent: Minimize design solutions that may be susceptible to skateboarders, such as raised planter walls. If potential skateboard areas are unavoidable, provide significant breaks in surfaces (preferred) or durable skateboard deterrents on surface edges at no more than 30-inch centers.

9.10.6 Security

A. Hardware: Doors accessible to the public shall have stainless steel kick plates on both sides. Door closers shall have parallel closer arms. Marine hardware to be used when hardware is exposed to the environment (brass interior parts).

B. Facilities shall use Sound Transit standard locking hardware. Bi-Lock is the proprietary keying system for all Link facilities. All hardware shall be compatible with the Bi-Lock locking system or current approved ST hardware system.

C. Keying system structure shall be based on Sound Transit standard keying schedule. Location of rooms shall be reviewed with Sound Transit early in the design process to assure key system will allow appropriate level of access into areas.

D. Keying for all elevator machine room doors to allow L & I access. Any intervening doors shall be keyed to match the elevator machine room doors, or access card readers shall be provided.

E. Overhead rolling grilles or gates shall be provided with locking hardware that can be rekeyed to the ST Standard Bi-Lock system. Provide key operation on both sides of rolling grilles.

F. Access card readers are an integral part of facility security. Location of access card readers throughout the station shall be determined in conjunction with Sound Transit and requirements identified in Chapter 15 Communications. Where access card readers are located on interior rated exit stair doors, the mechanism must Fail-Safe and allow the door to remain latched. Therefore, electric latches and hinges shall be used in those conditions in lieu of electronic strikes. Access card readers located on exterior entrance doors shall Fail-Secure.

G. Requirements for Door Intrusion Detectors and their connection to the communications system are identified in Chapter 15 Communications and Central Control.

H. Knox boxes shall be provided to allow first responders to have access to the facilities. Coordinate number, type and location with local fire department.

I. Elevator lock boxes shall be provided to allow access to elevator machine rooms. Specify “Knox – Elevator Key Box”. It is preferred to have elevator machine rooms directly accessible to the exterior or accessible through one main door to avoid allowing unintended access to other areas of the station.

9.10.7 Color

Material colors shall be consistent with system-wide identity colors, compatible with the surrounding area and of sufficient contrast and accent to provide visual interest, warmth, and concealment of minor soiling.

9.10.8 Required Standard Materials and Families of Materials

The list of required materials that follows applies to all areas of the station. Public use and contact areas shall use the most durable materials. Exceptions to the list must be reviewed and approved by Sound Transit prior to use in design.

9.10.8.1 Standardized Structural Grid

Use of a basic grid of 4 feet will accommodate standardized glazing. Spacing of 16'-0" will accommodate the standard platform edge light for at-grade and aerial stations.

9.10.8.2 Standard Family of Pavers

A. For at grade stations use 24-inch by 24-inch nominal concrete pavers. Wausau Tile "Terra-Pavers" Type 3 Cotillio FDX or Mutual Materials Architectural Pavers. Maximum of three colors to be used selected from the following approved colors:

   1. FDX 2008 Wausau Light Gray (UniFace UF-30)
   2. FDX 3008 Wausau Dark Gray (UniFace UF-60)
   3. FDX 4008 Wausau Dark Red (UniFace UF-50)
   4. FDX 5008 Wausau Dark Tan (UniFace UF-40)

B. For elevated and tunnel stations use 12-inch by 12-inch nominal unglazed porcelain ceramic tiles. Crossville Cross-slate.

   1. Crossville A 850 Graphite (Dark Gray)
   2. Crossville A900 Mica (Light Gray)
   3. Crossville A 790 Burgundy (Dark Red) with cross sheen finish
   4. Crossville A876 Truffle (Tan)

C. At 2'-0" wide Detectable Warning Platform Edge Condition: Use Link standard truncated dome edge pavers at all station platform edge conditions. 12-inch by 12-inch nominal porcelain tile. Domes shall be spaced in an orthogonal pattern. Standard color to be muted yellow to match all stations. Grout to match standard tile. Custom brand grout "Sahara Tan" in this area.

D. Tactile Wayfinding "striped" paver to be Mount Airy white granite or equal, 8-inch x 16-inch nominal paver with sandblasted "striped" pattern. See Guidance Drawings A-01-350 – A-01-353. Alcohol based sealer shall be used to minimize staining of granite (DeGussa Protectosil Chemtrete 40 VOC or equal). Mock-ups shall be required by contractor before approving use of any sealer products.

E. Tactile train waiting pavers shall be precast concrete ribbed 12-inch by 12-inch nominal paver, dark gray (Wassau -FDX 3008 Wausau Dark Gray). See Guidance Drawings A-01-204 and A-01-205.

F. Tiles and pavers installation details shall meet the Tile Council of North America (TCNA) recommendations, at a minimum. Expansion joints shall be clearly dimensioned and detailed.

G. All tile/pavers shall be separated from structures by a decoupling membrane with under-bed drainage. Weep holes shall be provided in the edge angle. See Guidance Drawings A-01-400 and A-01-401.

9.10.8.3 Standardized Stair Elements

A. At public stairs, use pre-cast concrete treads and landings with medium sandblast or acid etch finish on tread for non-slip surface. Nosing of treads to have horizontal recesses to provide gripping surface at edge of tread.

B. Pre-cast concrete treads to be detailed to allow mechanical attachment for ease of installation and replacement when necessary. No epoxy connections will be permitted.

C. Emergency exit and non-public stairs may be cast- in-place or precast tread / riser unit and precast landings. Avoid using metal pan concrete filled stairs unless weather protection of stairs is provided. Slope all surfaces to drain. Do not allow drainage to drip onto lower stairs and landings. Stair nosing shall be replaceable inset aluminum tread nosing with grit insets. Where metal pan stairs are used, canopies or other materials must protect steel from rust. No cleaning trough is required at emergency exit stairs. See 9.10.8.5 Steel Materials and Color Palette.

D. Handrails and top guardrails shall be stainless steel 316 with random orbital finish. Intermediate infill of railings may be stainless steel (preferred) or painted steel with highest durability paint system. Where welded wire mesh is used, use stainless steel or steel mesh

with each joint welded prior to painting otherwise the joints will not be coated with paint and they will rust.

9.10.8.4 Standardized Glazing Type and Sizes

A. Windscreen Glazing shall be 1/4-inch clear tempered Float Glass (heat soak tested). Sizes shall be limited to the following:

1. 2'-9" by 3'-11" actual glass size to fit in 2'-10" by 4'-0" grid.
2. 2'-9" by 2'-9" actual glass size to fit in 2'-10" by 2'-10" grid.
3. 3'-11" by 3'-11" actual glass size to fit in a 4'-0" by 4'-0" grid.

B. All windscreen glazing and windows in the touch zone shall have anti-graffiti film on all sides accessible by the public to facilitate repair of graffiti.

C. Where windscreen glazing is located above traffic lanes or trackway, laminated-tempered glass may be used. Seek approval from Sound Transit prior to using this type of glazing for windscreens.

D. Overhead canopy glazing shall be laminated glass with a 65 percent light transmittance translucent white interlayer between two layers of 1/4-inch clear glass. This glazing shall also be used at clerestories when located above 12 feet from floor or grade. Clerestory glazing may be laminated or heat strengthened. Sizes shall be limited to the following options:

1. 1'-11 ½" by 3'-11 ½" actual glass size to fit in 2'-0" by 4'-0" grid.
2. 2'-5 ½" by 3'-11 ½" actual glass size to fit in 2'-6" by 4'-0" grid.
3. 3'-11 ½" by 3'-11 ½" actual glass size to fit in a 4'-0" by 4'-0" grid.
4. 3'-11 ½" by 5'-11 ½" actual glass size to fit in 4'-0" by 6'-0" grid.

E. Elevator shaft glazing and glazing in elevator cars that is required to be laminated shall conform to the standard sizes whenever possible. Atypical glazing sizes may be used at these locations to meet the dimensional requirements of the elevators specified.

F. Framing for glazing shall be detailed to maintain conformance to required glazing sizes and accommodate allowable tolerances for any supporting structure, such as steel. Where steel supporting members are provided in the same plane as the glazing and its

framing, the designer shall detail the condition to maintain conformance to the glazing size requirements.

9.10.8.5 Steel Finishes, Metal Finishes, and Color Palette

A. Exposed steel structures, windscreens, railings, and so forth shall be designed, detailed and specified recognizing their visibility to the public. No overall Architecturally Exposed Structural Steel (AESS) requirements shall be used. In lieu of blanket AESS requirements, areas within 16 feet of the ground in public areas shall have all welds ground smooth, exposed edges ground, piece marks hidden and erection aides removed and so forth due to their visibility. Mockups shall include these requirements. Structural elements above 16 feet in public areas, or visible only from the train, or in non-public spaces do not require ground welds or other special steel fabrication requirements. Provide weep holes at low spots of all tube or pipe steel for drainage of condensation.

B. The tolerances specified for the structural steel shall be accommodated in the design of the facility. This includes maintaining any required clear area as well as providing for adjacent materials with different tolerance requirements. The connections between steel and other materials shall provide for the permitted steel variance and provide for the more limited tolerance of the finish material by means of space and attachment such that plumb and true finishes can be provided.

C. Designers shall investigate the availability of proposed steel member shapes and sizes and shall select members that are readily available in the size and shape detailed that meet Buy America requirements.

D. Finishing of steel shall be completed with Semi-Gloss Finish (semi-gloss), High Performance Coatings. Finishing of steel in the field shall be minimized by designing structures that can be shop fabricated in sections, primed and finished in the shop, and bolted together on site. Minimize on-site welding and touch up painting whenever possible. All finishing shall be compatible, whether shop primed and painted or primed in shop and field painted.

E. Designer shall select from the following colors for all field painted steel finishes. All deviations from these colors shall be reviewed and approved by Sound Transit prior to use. Link Standard Paint colors are:

1. ST Dark Blue - FED 25042 (DeVoe ICI color # 368-07)

2. Charcoal Gray – FED 27038 (Rodda #FS00D3197)

3. Custom Mix Old Monterey + TW 32, by DeVoe, ICI color # TAC 363-09

4. Light Gray – Rodda #FS00B2659 (For interior walls in non-public spaces)

5. Ferrari Red – Rodda #FS03A482 (accent color)

6. Pencil Yellow – ICI MP#10YY 37/654 (accent color)

F. Materials with integral colors or factory finishes, such as tile, metal wall panels and metal roofing panels, may use colors other than the standard steel colors identified above. Factory finishes shall be of the most durable type available for the product: Kynar 500 (70% solids) or similar. No metallic paints are permitted as they are difficult to repair.

G. Stainless steel to be Type 316, or Type 316L for welding conditions, with chemical passivation treatment required. Stainless steel finish shall have a random orbital finish. Sound Transit may approve Type 304 stainless steel in isolated cases. Do not use Type 304 SS below 18" above finished floor as this will be exposed to de-icing materials. Designer to seek Sound Transit written approval prior to use of 304. Stainless steel shall be separated from ferrous metal. Do not weld stainless steel to ferrous metal.

H. All gutters and downspouts at stations shall be Type 316 stainless steel.

I. Anodized aluminum framing systems are preferred in the touch zone for glazing or metal panels. Where painting of aluminum framing is acceptable to Sound Transit, fluoropolymer finish systems shall be used. No metallic paints are permitted as they are difficult to repair.

J. Other than stainless steel, all metals and aluminum shall be isolated and separated from concrete and other dissimilar metals to prevent corrosion. Type of isolation shall be based on best practices suited for the specific materials; asphalt emulsion, galvanizing or high performance coating system (all 3 coats).

K. All handrails and top guardrails shall be stainless steel 316 with random orbital finish. Welds and connections shall meet item 9.10.8.5.A. Intermediate infill of railings may be stainless steel (preferred) or painted steel with highest durability paint system.

Where welded wire mesh is used, use stainless steel or steel mesh with each joint welded prior to painting otherwise the joints will not be coated with paint and they will rust.

9.10.8.6 Furnishings

A. Designer shall choose from the following approved benches:

1. Landscape Forms "35 Series" Stay Bench: Cast aluminum, three seat and two seat bench. Backed and backless benches with arms and intermediate seat dividers, with Pangard II finishing process, including rust inhibitor and thermosetting polyester powder coat top coat finish. Color: manufacturer's standard black.

2. RS Public Seating by Forms and Surfaces – Aluminum modular bench system with intermediate arm rests, with and without backs. Provide isolation between bench and concrete. Color: manufacturer's standard black.

3. All bench supports shall be isolated from the concrete structure and flooring materials with a minimum 1/4" inch thick HDPE or Mylar shims to prevent degradation due to de-icers and stray current corrosion.

4. Custom benches supported from the station / canopy structure may be considered at some locations. Seek a deviation prior to considering custom, side supported benches.

B. Trash and Recycle Receptacles

1. Trash Can: Provide large perforation trash can unit with lockable hinged lid, and wire liner. Lock mechanism to be located on the side or front of the lid, not at hinge location. Metal etched, raised letter sign with black background. Dimensions: 20 inches in diameter by 42 inches high. Finish: Pangard II finishing process, including rust inhibitor and thermosetting polyester powder coat top coat finish or approved equal system. Color: black. See Figure 9-3.

2. Recycle Can: Provide large perforation recycle can unit with lockable hinged lid, and wire liner. Lock mechanism to be located on the side or front of the lid, not at hinge location. Metal etched, raised letter sign with blue background. Dimensions: 20 inches in diameter by 42 inches high. Finish: Pangard II finishing

process, including rust inhibitor and thermosetting polyester powder coat top coat finish or approved equal system. Color: black. See Figure 9-4.

3. All trash and recycle cans shall be isolated from the concrete structure and flooring materials with HDPE or Mylar shims to prevent degradation due to de-icers and stray current corrosion.

Figure 9-2 Standard Trash Can

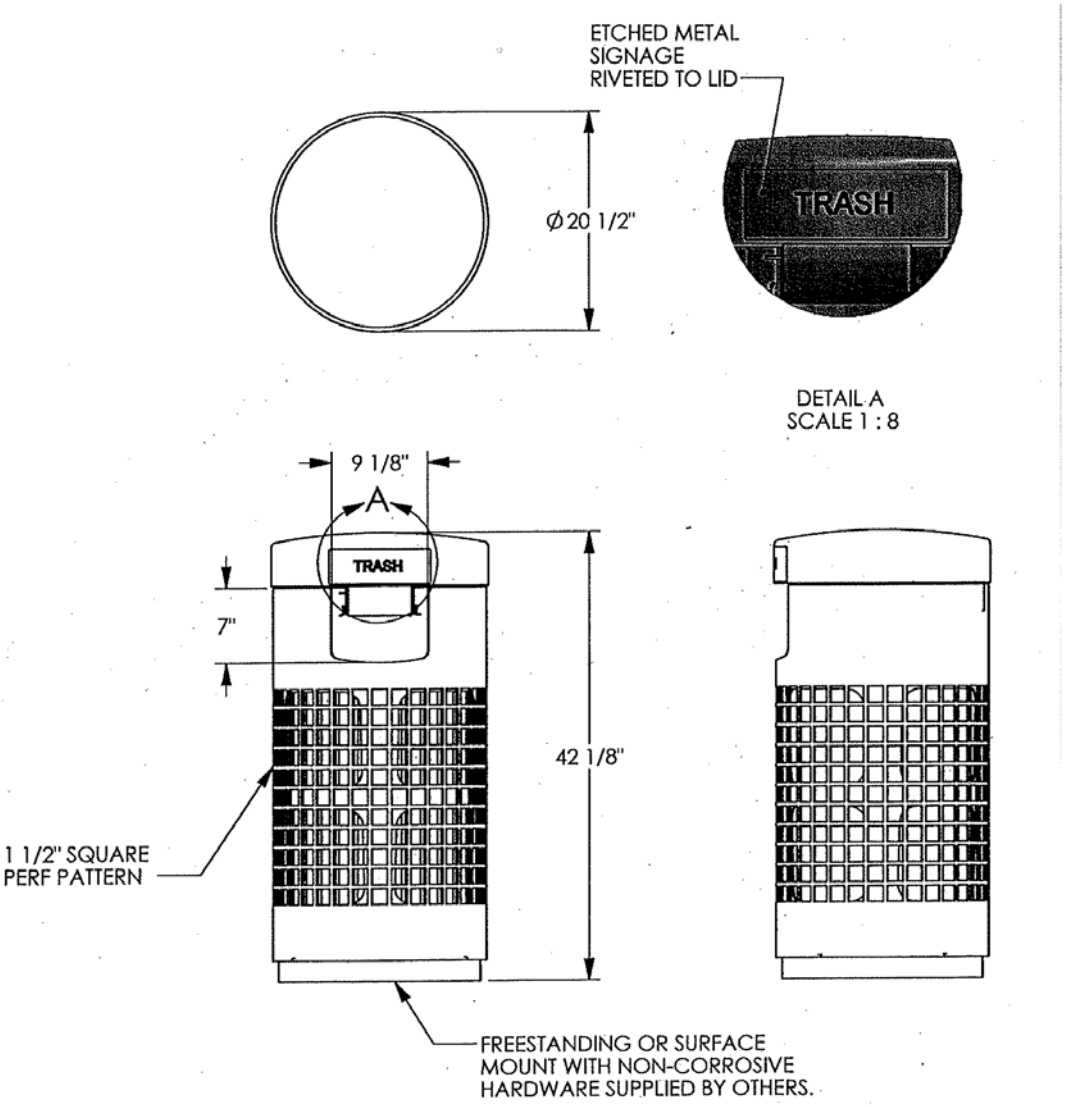
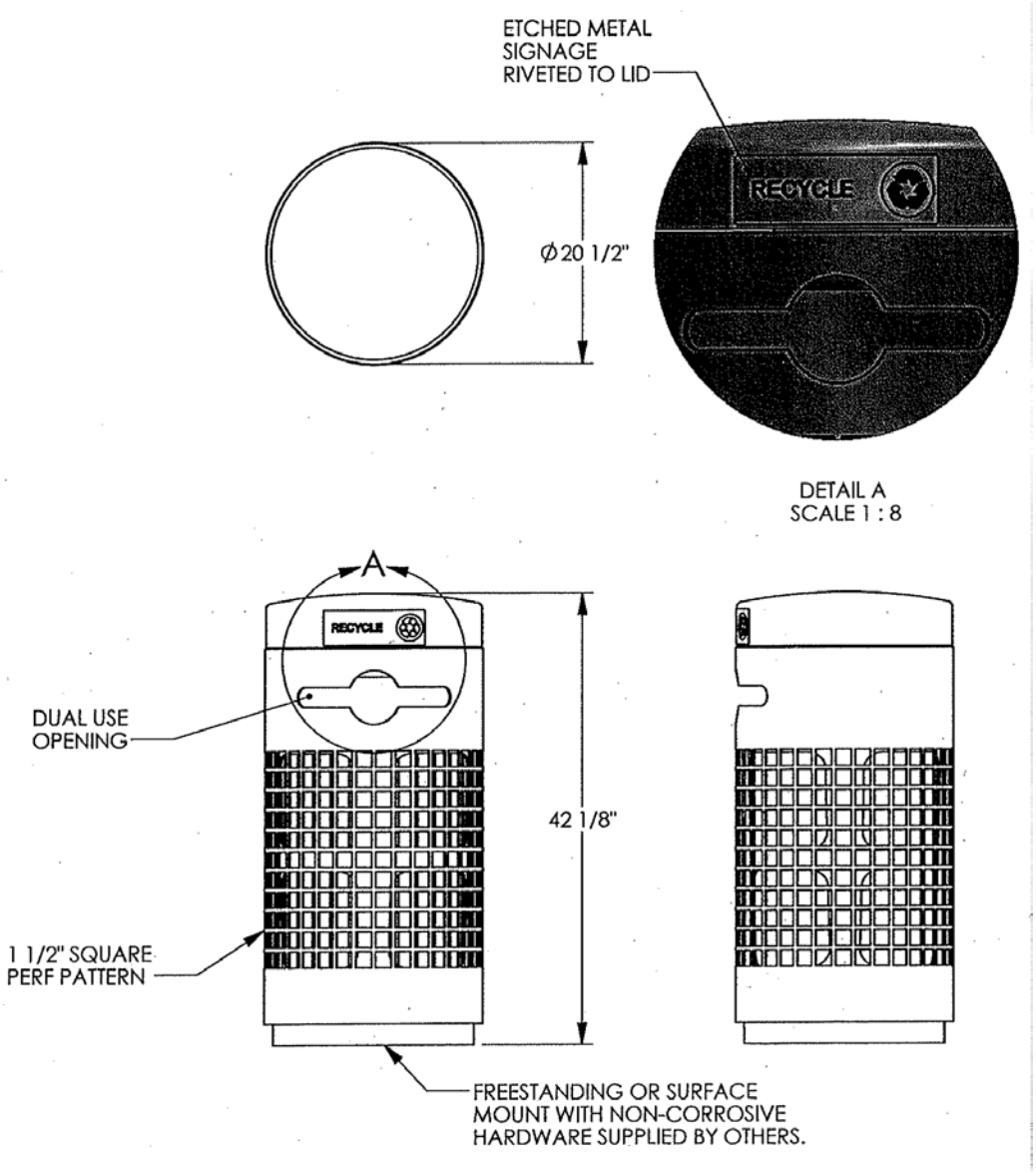


Figure 9-3: Standard Recycle Can



C. Bicycle Racks

1. Bicycle Racks shall provide support at a minimum of two parts of the bicycle to rest against the rack, including the frame.

2. Bicycle Racks shall be able to lock at least one wheel and the frame, using either a cable lock or a U-lock.

3. Bicycle Racks shall be resistant to breaking and withstand general vandalism, including kicking, without failure of the structure of the stand. Bicycle racks and lockers shall be made

with durable materials. Stainless steel and baked-on powder coat finish are acceptable. Hardware to be non-corrosive. Do not use galvanized steel.

4. Bicycle Racks shall be fabricated from material that resists being cut or detached using common hand tools, especially those that can be concealed in a backpack, such as bolt cutters, pipe cutters, wrenches, and pry bars.

5. Bicycle Racks shall be installed and anchored so that they cannot be stolen with the bicycles attached—use vandal resistant fasteners and secure anchorage into concrete footings.

6. The surface of the Bicycle Rack shall not damage the bicycle's finish.

7. Bicycle Racks shall not have gaps that are between 4" and 9" in width (to prevent children from trapping their heads). Sharp edges are prohibited.

8. Bicycle Racks shall be located in conjunction with other facility elements, as per manufacturers recommended clearances, and as identified in Table 9-3:

Table 9-3: Bicycle Rack Clearances

FIXED OBJECT	MIN DISTANCE TO BIKE RACK (X)
STREET ENCROACHMENTS	24"
LIGHT POLE	30"
SIDEWALK OBSTRUCTIONS	36"
TRANSIT BOARDING AREAS, LOADING ZONES, DISABLED PARKING, CURB RAMPS, CROSSWALKS, AND STORM DRAIN INLETS	48"
FIRE HYDRANTS	60"

9. Acceptable bicycle racks are:

   a. Dero "Bike Hitch", Creative Metalworks "Welded Bike Circle" or approved. Standard size to accommodate two bicycles.

   b. Dero Model "Cycle Stall" or approved. Standard size to accommodate 14 bicycles. Thermo-plastic steel or powder-

coated steel. (only to be used when vehicle parking spaces are converted to bicycle parking)

c. Hoop racks: Urban Racks "Urban Staple" or "Urban Corral", Dero "Heavy Duty Hoop Rack" or "Cycle Stall Basic", Tofino "Westport" or approved. Standard size to accommodate two bicycles or series of hoops for multiple bikes. Preference to locate a series of hoop racks in lieu of "Urban Corral" type to minimize potential trip hazards of bottom rail. "Urban Corral" type preferred in areas away from main pedestrian paths.

d. Dero Model "Dero Decker" or approved. Wall or floor mounted. Modular units to accommodate up to 24 bicycles. Does not meet ADA Standards, therefore it shall only be used in Bike Cages or other enclosed areas.

e. Dero Model "Ultra Space Saver" or approved. Wall or floor mounted. Modular units to accommodate up to 60 bicycles in a 20' x 20' space. Available in Powder coated steel. Does not meet ADA Standards and it shall only be used in Bike Cages or other enclosed areas.

D. Bicycle Lockers

1. Bicycle Lockers shall be located to provide adequate clearance of at least six feet on each end containing a door to the locker.

2. Bicycle Lockers shall be made of at least 18 gauge stainless steel or powder-coated steel to ensure longevity and ease of maintenance. Center dividing panels within lockers shall also be steel.

3. Bicycle Lockers shall have walls and roof made of strong and durable materials that resist theft, vandalism and fire.

4. Bicycle Lockers shall have roofs that drain.

5. Bicycle Lockers shall have a tamper-resistant door that recesses into the jamb.

6. Bicycle Lockers shall have multi-point latching, such as a long bar that moves with the lock.

7. Bicycle Lockers shall be secured to the surface with tamper proof fasteners.

8. Bicycle Lockers shall be installed with standard T-locks without cores, and shall be able to operate with Multi-Lock interchangeable cores. ST to provide final locks and keys.

9. Bicycle Lockers shall provide enough interior space to accommodate a single standard two-wheel bicycle and typical accessories.

10. Bicycle Lockers shall be waterproof and not leak.

11. Bicycle Lockers shall have a view screen close to the top of the locker and a "sniffing area" for bomb-sniffing dogs.

12. Bicycle Lockers for On-demand lockers shall be located to avoid direct sunlight on control panels, where possible, and shall be capable of incorporating using smart card technology as part of the locking system.

13. Acceptable Bicycle Lockers

    a. DURA Model "DLP" (Pie Shaped Locker) or approved. Standard sizes to accommodate one bicycle per locker.

    b. DURA Model DL2 or approved. Standard size to accommodate two bicycles.

    c. eLocker Models Rectangular, Quad or Wedge or approved similar. Modular units. Standard sizes to accommodate one or two bicycles.

14. Bicycle Lockers that are Not Acceptable

    a. Lockers or racks made out of any materials other than stainless steel or powder-coated steel.

    b. Bicycle Cage walls made out of chain link fencing or other materials that are easy to vandalize, damage, or break into.

9.10.8.7 Systemwide Customer Signage

See Sound Transit Customer Signage Design Manual.

9.10.8.8 Link Facility Lighting Standards

See Sound Transit Link Light Rail Facility Lighting Standards and Chapter 21 Lighting for requirements.

9.10.8.9 Acceptable Station Finish Materials in Public Spaces

In addition to the Required Standard Materials identified in 9.10.8, the list of acceptable materials that follows is general in nature and applies to all areas of public view, use and contact. Exceptions to the list must be reviewed and approved by Sound Transit prior to use in design. The use of items listed as "acceptable" is subject to location and environmental considerations.

9.10.8.10 Materials in Public Spaces

Materials in Public Spaces refer to materials used to finish surfaces of a transit station that are exposed to the public and to the environment including sun, wind, and rain. Materials should be selected that are highly resistant to vandalism, and retain their original appearance with a minimum amount of maintenance and repair.

9.10.8.11 Paving and Flooring Materials

Paving and flooring materials refers to the finish of areas used as walking surfaces other than at passenger platforms. See Section 9.10.8.2 for required paving materials at platforms.

A. Acceptable Plaza Paving Materials

1. Standard concrete pavers (preferred)
2. Granite: thermal finish (minimum)
3. Cast-In-Place Concrete: integral color or textured / sandblasted and sealed.
4. Brick pavers
5. Permeable pavement or paver systems shall be considered. Proposed systems shall be presented to Sound Transit for review and approval. Reference Chapter 6 Civil Work and Chapter 30 Sustainability.

B. Acceptable Mezzanine Floor Materials

1. Standard Porcelain tile (preferred)
2. Terrazzo

3. Cast-In-Place Concrete: integral color or textured / sandblasted and sealed.

4. Granite: thermal finish (minimum)

C. Not Acceptable

1. Tile: mosaic and small format

2. Polished concrete

3. Polished stone

4. Synthetic resin or epoxy toppings

5. Wood

6. Marble

7. Glazed tile

8. Bituminous toppings

9. Carpet

10. Vinyl

11. Rubber flooring

D. Acceptable Elevator Flooring

Resin Epoxy flooring: seamless, flexible, resilient flooring system with high solids with colored rubber chips in a troweled mortar system. ¼-inch thickness. “SofTop” Decorative Flooring by General Polymers or approved equal, with “Shark-Grip” Slip Resistant additive to meet coefficient of friction.

9.10.8.12 Walls, Doors, and Ceiling Materials

Wall and ceiling materials refer to the finish of vertical wall surfaces and ceilings that provide enclosure to areas of a station at platform, entry, and mezzanine levels.

A. Acceptable Solid Wall Materials

1. Architectural Precast Concrete

2. Aluminum framed glazing system –(See 9.10.8.4 for standard units)
3. Concrete – integral color and/or sandblasted or stained, and sealed
4. Porcelain Enamel Metal wall panels (with or without acoustical treatment)
5. Metal wall panels (with or without acoustical treatment)
6. Stone tile
7. Stone veneer system
8. Brick - sealed
9. Concrete masonry units textured, ground face, or glazed; sealed
10. Glass block
11. Porcelain tile
12. Glazed ceramic tile on cement backer board (outside touch zone preferred)

B. Acceptable Open Wall Elements

Open wall elements refer to the finish of vertical wall surfaces that provide enclosure while permitting ventilation and/or views into and out of station areas.

1. Expanded metal – Aluminum or stainless steel
2. Perforated metal– Aluminum or stainless steel
3. Stainless steel railing system
4. Cables and turnbuckles as intermediates
5. Crimp metal: To be all stainless steel, or steel welded at each connection and painted to prevent rust accumulation where paint cannot reach.
6. Metal louver

7. Aluminum grating
8. Concrete Masonry Units textured, ground face or glazed; sealed
9. Brick
10. Vegetated green screens (only to be used with prior written acceptance from Sound Transit)

C. Acceptable Doors and Frames

1. Hollow metal doors and frames with zinc rich primer and acceptable high performance coating. All door frames shall be 14 gauge. No frames shall be grout filled.
2. Stainless steel doors
3. Overhead coiling doors with stainless steel or aluminum grilles or slats.
4. Overhead coiling doors with aluminum grilles or slats.

D. Not Acceptable Doors and Frames

1. Grout filled hollow metal frames
2. Wood doors and frames
3. Overhead coiling doors with painted grilles or slats.

E. Acceptable Ceiling Materials

1. Stainless steel
2. Porcelain enamel steel panels (with or without acoustical treatment)
3. Factory finished baked enamel metal panels (with or without acoustical treatment)
4. Expanded metal – painted or stainless steel (with or without acoustical treatment)
5. Perforated metal – painted or stainless steel (with or without acoustical treatment)

6. Cement Plaster smooth finish (not on GWB backer)

7. Metal ceiling system with rigid attachment (with or without acoustical treatment)

F. Not Acceptable Wall and Ceiling Materials

1. Gypsum Wall Board

2. Plastics

3. Wood

4. Galvanized painted steel

5. Galvanized railing

6. EIFS - Exterior Insulation and Finish Systems

7. Single wythe masonry walls for conditioned spaces or as primary barrier for water intrusion.

9.10.8.13 Canopy Structural Elements

A. Acceptable

1. Structural steel (See 9.10.8.5 Steel Finishes and Color Palette)

2. Steel: tubesteel or round preferred for horizontal members when possible. Minimize number of structural members. Minimize use of steel that will create ledges that will hold dirt and provide bird perch areas.

3. Concrete

4. Concrete Masonry Units

B. Not Acceptable

1. AESS steel requirements (See 9.10.8.5)

2. Wood

3. Galvanized steel: Painted or unpainted

9.10.8.14 Canopy Materials

A. Acceptable

1. Standard laminated translucent glass (See 9.10.8.4 for standard units).
2. Factory finished baked enamel metal deck (Kynar or better)
3. Single ply roofing
4. Ballasted roof in limited areas (ST to approve prior to use)
5. Resin or polycarbonate panels – UV resistant. Locate outside touch zone. (Obtain ST approval prior to use)
6. Photovoltaic panels

B. Not Acceptable

1. Wood
2. Tile roofing
3. Built-up roofing
4. Composition roofing
5. Painting over galvanized steel
6. Fabric Roof

9.10.8.15 Miscellaneous Metallic Surfaces and Fixtures

Wall panels, guardrails, handrails, railings, posts, columns, conduits and junction boxes, fences, and miscellaneous metal.

A. Acceptable

1. Stainless steel (preferred)
2. Porcelain enamel over steel
3. Factory applied baked on enamel
4. Fluoropolymer coatings

5. Factory applied powder coating
6. High Performance Coating
7. Polyurethane (3-coat system)

B. Not Acceptable

1. Painted galvanized materials
2. PVC downspouts
3. Site-painted metal panels
4. Galvanized steel
5. Glass guardrails or railings
6. Metallic paints

9.10.8.16 Public Restrooms

A. Acceptable

1. Stainless steel fixtures
2. Stainless steel toilet accessories (vandal resistant)
3. Porcelain tile with cement backer board
4. Glazed ceramic wall tile with cement backer board
5. Solid polymer toilet partitions, floor and ceiling anchored
6. Stainless steel toilet partitions, floor and ceiling anchored
7. Portland cement plaster walls (above touch zone) and ceilings

B. Not Acceptable

1. Vitreous china or porcelain fixtures
2. Plastic or fiberglass toilet accessories
3. FRP or fiberglass wall panels
4. Mosaic tile

5. Plastic laminate, phenolic core or baked enamel toilet partitions
6. Floor anchored with horizontal overhead braced toilet partitions
7. Ceiling hung toilet partitions
8. Gypsum wallboard

9.10.9 Acceptable Materials in Non-Public Spaces

Materials in Non-Public Spaces refer to materials used to finish surfaces of a transit station that are not directly exposed to public view or use and the exterior environment. Where non-public spaces are exposed to weather, use the Acceptable Station Finishes.

9.10.9.1 Floor Materials

A. Acceptable

1. Porcelain tile
2. Resilient flooring with heat treated seams
3. Vinyl composition tile
4. Concrete: sealed
5. Terrazzo
6. Synthetic epoxy toppings for Systems rooms only

B. Not Acceptable

1. Wood
2. Rubber flooring
3. Glazed tile
4. Synthetic epoxy toppings (except where required in Systems rooms.)

9.10.9.2 Wall and Ceiling Materials

A. Acceptable Wall and Ceiling Materials

1. Porcelain enamel steel panels

2. Baked/coated steel panels
3. Ceramic wall tile with cement backer board
4. Metal wall panels
5. FRP or fiberglass wall panels (not acceptable at janitor sink backsplashes)
6. Concrete; sealed
7. Concrete masonry units-sealed (not painted)
8. Portland cement plaster
9. Gypsum wall board with moisture resistant core, anti-mold and anti-fungal characteristics with fiberglass mat facing (conditioned spaces only). DensArmor Plus for interior rooms above grade; DensGlass Sheating or DensShield Tile Backer for below grade rooms, or approved.
10. Expanded metal – painted or stainless steel (with or without acoustical treatment)
11. Perforated metal – painted or stainless steel (with or without acoustical treatment)
12. Stainless steel railing
13. Non-public or exit stairs - Galvanized railing (protected from rainwater and run-off)
14. Metal ceiling system with rigid attachment (w/acoustical treatment)
15. Acoustical ceiling tiles (conditioned spaces only)

B. Not Acceptable

1. Gypsum backed plaster synthetic stucco system
2. Reinforced glass fiber panels
3. Wood
4. Plastic

5. Single wythe masonry walls for conditioned spaces or as primary barrier for water intrusion.

END CHAPTER 9

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION MRB DISPOSITION FORM
LYNNWOOD LINK LIGHT RAIL

Contract No.: L200/L300	Project/Contract Name: Lynnwood Link Extension	Deviation No.: LLE-014
Description: Amend the requirement for vertical circulation within the Stations, including maximum vertical rise, escalators for both upward and downward movement where the number of station patrons exceeds 5,000, and platform width adjacent to access stairs.		

MRB Member Disposition:

	Not Required	Approve	Reject	
Kerry Pihlstrom Director, Civil and Structural Design	☒	☐	☐	Date: 10/5/2017
Julie Montgomery (thru DECM RFD Form) Director, Architecture & Art	☐	☒	☐	Date: 10/5/2017
Peter Brown Director, Systems Engineering & Integration	☒	☐	☐	Date: 10/5/2017
Paul Denison Link Light Rail Operations Director	☐	☒	☐	Date: 10/26/2017
Matthew Preedy Director, Construction Management	☒	☐	☐	Date: 10/5/2017
Mohammad Saleem Quality System Manager (MRB Chairperson)	☐	☒	☐	Date: 10/27/2017

For Information Only:
Rod Kempkes, Executive Project Director

Comments:

SOUND TRANSIT DESIGN CRITERIA DEVIATION REQUEST – LYNNWOOD LINK EXTENSION

Deviation No: LLE-014 **Title:** Elements of Vertical Circulation

Description: Amend the requirement for vertical circulation within the Stations, including maximum vertical rise, escalators for both upward and downward movement where the number of station patrons exceeds 5,000, and platform width adjacent to access stairs.

HNTB|Jacobs Project or Engineering Manager:
JIM SCHETTLER
Print Name
Signature indicates Approval — Date
9-25-17

ST DCM Chapter Owner, DECM: Hyperlink
DOUG POWELL
Print Name
Signature indicates Approval — Date
10/4/17

ST Corridor Design Manager, DECM:
Joel Theodore
Print Name
Signature indicates Approval — Date
9/26/2017

ARCHITECTURE & ART
ST Director ~~Civil and Structural Engineering~~, DECM:
~~Kerry Pihlstrom~~ JULIE MONTGOMERY
Print Name
Signature indicates Approval — Date
10.4.17

Return Documents to
Consultant
Deputy Contract Package Manager
Bryan Williams

Transmit to ST Quality Manager
(CC: ST Contract Package Manager, H|J Engineering Manager, ST Design Criteria Chapter Owner, ST Corridor Design Manager)

Return Documents to
ST Corridor Design Manager

Required Revision or Rejection
If at any stage in the approval process, the deviation documents requires revision or rejection, please indicate as such on the applicable signature line and return documents to Joel Theodore, ST Corridor Design Manager, or Consultant Deputy Contract Package Manager, Bryan Williams.

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-014

5. Date of Request:	6. Criticality: ☐ Minor* ☒ Major ☐ Critical
August 31, 2017	*Minor does not require MRB Action

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-014

7. Existing DCM Requirement:	8. Proposed DCM Deviation:	9. DCM Chapter, Drawing or Spec. No.:
9.7.D States: Where the vertical rise between the public levels is greater than 30 feet and does not exceed 120 feet, utilize escalators for both upward and downward movement. 9.7.H States: Where stations are anticipated to have over 5000 patrons a day, regardless of the rise between public levels, provide escalators for both upward and downward movement. 9.6.2 D.5 States: Encroachment into the platform width by vertical circulation or other platform elements shall not reduce the platform width at any given point to less than 8 feet between the edge of platform and the face of a wall, column, balustrade, railing, seating, or any other station furnishing. This dimension is based on the 24-inch platform edge detectable warning surface plus 4 feet (the minimum dimension to the tactile path/striped pattern), plus the 8 inch wide tactile path/striped pattern, plus one travel lane (measured to the center line of the tactile path/striped pattern). See Guidance Drawings A-01-600 204 and A-01-205.	9.7.D: Where the vertical rise between the public levels is greater than ~~30~~ 40 feet and does not exceed 120 feet, utilize escalators for both upward and downward movement. 9.7.H: Where stations are anticipated to have over ~~5000~~ 8,000 patrons a day, regardless of the rise between public levels, provide escalators for both upward and downward movement. <u>For stations with greater than 8,000 patrons a day, exceptions for down escalator requirements may be considered when multiple egress alternatives are provided and pedestrian load flow study supports peak level of service demand.</u> 9.6.2 D.5: Encroachment into the platform width by vertical circulation or other platform elements shall not reduce the platform width at any given point to less than 8'-0" feet between the edge of platform and the face of a wall, column, balustrade, railing, seating, or any other station furnishing. <u>8'-0" clearance may be reduced to 7'-6" when providing required 72" wide stair; or as determined by ST Architect. The width dimensions are</u> based on the 24-inch platform edge	Sound Transit Design Criteria Manual (DCM) Rev 4, March 2016 Chapter 9, Section 9.7 Elements of Vertical Circulation, Paragraphs (9.7.D, 9.7.H & 9.6.2 D.5)

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-014

	detectable warning surface plus 4 feet (the minimum dimension to the tactile path/striped pattern), plus the 8 inch wide tactile path/striped pattern, plus one travel lane (measured to the center line of the tactile path/striped pattern). See Guidance Drawings A-01-600 204 and A-01-205.	

10. Requested By (Designer or RE):	11. Reference Documentation (attach):
Terrence Bulfin, HNTB|Jacobs Station Architect	NA

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-014

12. Explanation for Deviation:

Deviation from DCM 9.7.D

Deviation would facilitate reducing the escalators requirement for both upward and downward movements when the vertical rise is less than 40 feet.

Deviation from DCM 9.7.H

Deviation would facilitate replacement of all down escalators with public stairs for stations with a patronage up to 8,000. The current design has two pairs of vertical transportation at each station. 145th, MLT and LTC currently utilize one pair with up and down escalators and one pair with an up escalator and a stair. The stairs at 145th and MLT are 66" wide. The stair at LTC is 72" wide due to the wider 31' platform at that station. The proposal would replace all down escalators with 72" public stairs. Additionally, the City of Lynnwood is requiring at least one (and likely two) public stair(s) in addition to the end of platform emergency egress stairs for egress purposes. The stations on Lynnwood Link have the following projected 2035 patronage.

Station	*Patronage*	*#Escalators (Up)*	*# Stairs (Public)*	*Notes*
145th	*6,200*	*2*	*2*	
185th	*7,000*	*2*	*2*	
MLT	*4,600*	*2*	*2*	
LTC	*17,500*	*2*	*2*	*Ped Flow/Analysis Anticipated*

Adding a stair in place of an escalator provides operational flexibility if the escalator is out of service. By replacing an escalator with the stair the station construction cost and future maintenance cost will be reduced. Public stairs also include a bike runnel, providing more access for bicyclists to the platform, since bike are not allowed on escalators.

Deviation from DCM 9.6.2 D.5

Deviation would reduce the platform width clearance by the canopy posts adjacent to the public stair/escalator from 8'-0" to 7'-6". The reduced platform width clearance would allow a 72" wide

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-014

public stair to replace the existing escalator without significant redesign of the platform around the escalator / stair opening. 7'-6" platform width clearance exceeds other transit agencies requirements for platform width clearance.

13. Consultant Approval of Deviation:

Terrence R Bulfin

Acceptable ☒ Not Acceptable ☐

Architect/Engineer of Record Signature

9/15/17

Date

Terrence Bulfin, HNTB|Jacobs Station Architect

(Printed Name and Title)

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-014

INSTRUCTIONS FOR

REQUEST FOR DEVIATION FORM

The Resident Engineer or the Design Engineer is responsible for the preparation of the Request for Deviation form. It is to be filled out as follows:

1. Department (i.e. U-Link, E-Link, Sounder, etc.)
2. Contract Number (i.e. RTA/LR 90-12)
3. Project/Contract Name (i.e. U240 – Capitol Hill Station)
4. Deviation Number – from RFD log (obtained from SQA)
5. Date of Deviation Request
6. Criticality; either Minor, Major, or Critical (copy from Link Design Quality Plan, Rev 0)

   1. Critical – The deviation will have a direct and significant impact on fit, function, reliability, maintainability, operability, quality, constructability, interfaces with other contracts, and/or systems safety aspects of the work product.

   2. Major – The deviation will have either a direct or indirect, but not a significant impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product.

   3. Minor – The deviation will have no direct or indirect impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product. This classification is sometimes for cosmetic issues, equivalent substitutions not specifically allowed by specification or non-technical issues.

   - Deviations classified as "Critical" or "Major" require MRB approval prior to incorporation into the work.
   - Deviations classified as "Minor" require only the Architect/Engineer of Record (A/EOR) and MRB Chairperson's approvals prior to incorporation into the work.

7. Description of the **existing** Design Criteria Manual (DCM) requirement in 10 words or less. (Provide DCM chapter reference in item #9 herein)
8. Description of the **proposed** Design Criteria Manual (DCM) deviation in 10 words or less
9. Design Criteria, Drawing or Spec Number where requirement is noted
10. Name of Designer, or RE requesting deviation
11. Reference Documentation attached
12. Reason for the Deviation
13. Approval Signature of the Architect/Engineer of Record (A/EoR) and Date (an attached letter of approval from the A/EoR must be provided)

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION MRB DISPOSITION FORM
LYNNWOOD LINK LIGHT RAIL

Contract No.: L200/L300	Project/Contract Name: Lynnwood Link Extension	Deviation No.: LLE-019
Description: Revise Public Stair Construction from Steel Stringers and precast Treads to either pre-cast or cast-in-place concrete.		

MRB Member Disposition:

	Not Required	Approve	Reject	
Kerry Pihlstrom Director, Civil and Structural Design	☒	☐	☐	Date: 8/28/2017
Julie Montgomery Director, Architecture & Art	☒	☐	☐	Date: 8/28/2017
Peter Brown Director, Systems Engineering & Integration	☒	☐	☐	Date: 8/28/2017
Paul Denison Link Light Rail Operations Director	☐	☒	☐	Date: 8/29/2017
Matthew Preedy Director, Construction Management	☒	☐	☐	Date: 8/28/2017
Mohammad Saleem Quality System Manager (MRB Chairperson)	☐	☒	☐	Date: 8/31/2017

For Information Only:

Don Davis, Executive Project Director

Comments:

SOUND TRANSIT DESIGN CRITERIA DEVIATION REQUEST – LYNNWOOD LINK EXTENSION

Deviation No: LLE-019 **Title: Use Cast-In-Place or Precast Concrete Stairs for Public Stairs**

Description: Revise Public Stair Construction from Steel Stringers and Precast Treads to either pre-cast or cast-in-place concrete.

HNTB|Jacobs Project or Engineering Manager:
Kevin R. Collins, P.E.
8/11/17

ST DCM Chapter Owner, DECM: Hyperlink
Doug Powell
8/24/17

ST Corridor Design Manager, DECM:
Joel Theodore
8/24/2017

ARCHITECTURE & ART
ST Director ~~Civil and Structural Engineering~~, DECM:
~~Kerry Pihlstrom~~ Julie Montgomery
8.24.17

Return Documents to
ST Corridor Design Manager

Transmit to ST Quality Manager
(CC: ST Contract Package Manager, H|J Engineering Manager, ST Design Criteria Chapter Owner, ST Corridor Design Manager)

Return Documents to
Consultant
Deputy Contract Package Manager
Bryan Williams

Required Revision or Rejection
If at any stage in the approval process, the deviation documents requires revision or rejection, please indicate as such on the applicable signature line and return documents to Joel Theodore, ST Corridor Design Manager, or Consultant Deputy Contract Package Manager, Bryan Williams

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L200/L300	Lynnwood Link Extension	LLE-019

5. Date of Request:	6. Criticality: ☐ Minor* ☒ Major ☐ Critical *Minor does not require MRB Action
July 26,2017	

7. Existing DCM Requirement:	8. Proposed DCM Deviation:	9. DCM Chapter, Drawing or Spec. No.:
9.10.8.3-A States: "At public stairs, use pre-cast concrete treads and landings with medium sandblast or acid etch finish on tread for non-slip surface."	"Public stairs may be cast-in-place or precast unit construction."	Section 9-Stations, 9.10.8.3-A

10. Requested By (Designer or RE):	11. Reference Documentation (attach):
Kamran Marashi, HNTB|Jacobs Station Structural Lead	NA

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L200/L300	Lynnwood Link Extension	LLE-019

12. Explanation for Deviation:

Precast treads and landings production and installation are time consuming. Although they were intended for future ease of replacement and/or repair, replacing large landings and long treads may prove challenging when the stair way is enclosed in glazed curtainwall. Landings are very heavy due to their large sections requiring mechanical lifts or cranes to remove, which in turn require disassembly of curtainwalls for access and reconstruction of curtainwall once stair parts/sections are replaced. Touch up or repairs of cast-in-place stairs may prove more feasible.

Disassembly of curtainwalls or operation of crane/lift in the vicinity of stair to remove parts may equally shut down any public access to stair during repair.

With concrete stairs, many of the architectural features, such as troughs can be built into the stair monolithically and avoid possibilities of corrosion from moisture entrapment behind gutter sidewall attached to stringers.

A concrete stair is less susceptible to vibration from foot traffic.

A monolithic stair is less susceptible to chips from abutting pieces and joints.

Precast treads require ST to store and keep stocks of precast treads and landings of various shapes and sizes to match every station with differing design.

Precast treads at the bottom of stairs are access challenged to replace from underside of stair.

Infrequent repairs could easily be made to concrete stairs, using high early strength cementitious materials overnight to avoid shutting down access to public during operating hours.

SOUTHTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L200/L300	Lynnwood Link Extension	LLE-019

13. Consultant Approval of Deviation:

Acceptable ☒ Not Acceptable ☐

K. Marashi

Architect/Engineer of Record Signature

8-11-17

Date

Kamran Marashi, HNTB/Jacobs Station Structural Lead

(Printed Name and Title)

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L200/L300	Lynnwood Link Extension	LLE-019

INSTRUCTIONS FOR

REQUEST FOR DEVIATION FORM

The Resident Engineer or the Design Engineer is responsible for the preparation of the Request for Deviation form. It is to be filled out as follows:

1. Department (i.e. U-Link, E-Link, Sounder, etc.)
2. Contract Number (i.e. RTA/LR 90-12)
3. Project/Contract Name (i.e. U240 – Capitol Hill Station)
4. Deviation Number – from RFD log (obtained from SQA)
5. Date of Deviation Request
6. Criticality; either Minor, Major, or Critical (copy from Link Design Quality Plan, Rev 0)

   1 Critical – The deviation will have a direct and significant impact on fit, function, reliability, maintainability, operability, quality, constructability, interfaces with other contracts, and/or systems safety aspects of the work product

   2 Major – The deviation will have either a direct or indirect, but not a significant impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product

   3 Minor – The deviation will have no direct or indirect impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product. This classification is sometimes for cosmetic issues, equivalent substitutions not specifically allowed by specification or non technical issues

   - Deviations classified as "Critical" or "Major" require MRB approval prior to incorporation into the work
   - Deviations classified as "Minor" require only the Architect/Engineer of Record (A/EOR) and MRB Chairperson's approvals prior to incorporation into the work

7. Description of the existing Design Criteria Manual (DCM) requirement in 10 words or less. (Provide DCM chapter reference in item #9 herein)
8. Description of the proposed Design Criteria Manual (DCM) deviation in 10 words or less
9. Design Criteria, Drawing or Spec Number where requirement is noted
10. Name of Designer, or RE requesting deviation
11. Reference Documentation attached
12. Reason for the Deviation
13. Approval Signature of the Architect/Engineer of Record (A/EoR) and Date (an attached letter of approval from the A/EoR must be provided)

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION MRB DISPOSITION FORM
LYNNWOOD LINK LIGHT RAIL

Contract No.: L200/L300	Project/Contract Name: Lynnwood Link Extension	Deviation No.: LLE-020
Description: Use concrete finish at platforms rather than tiles.		

MRB Member Disposition:

	Not Required	Approve	Reject	
Kerry Pihlstrom Director, Civil and Structural Design	☒	☐	☐	Date: 9/26/2017
Julie Montgomery Director, Architecture & Art *(Approved by Moises Gutierrez, Deputy Executive Director, DECM)*	☐	☒	☐	Date: 9/26/2017
Peter Brown Director, Systems Engineering & Integration	☒	☐	☐	Date: 9/26/2017
Paul Denison Link Light Rail Operations Director	☐	☒	☐	Date: 10/26/2017
Matthew Preedy Director, Construction Management	☒	☐	☐	Date: 9/26/2017
Mohammad Saleem Deputy Director, SQA (MRB Chairperson)	☐	☒	☐	Date: 10/27/2017

For Information Only:

Rod Kempkes, Executive Project Director

Comments:

As discussed with Matt Preedy and Jonathan Gabelein, station platforms represent a highly-visible element of our transit facilities. As such, it is critical to ensure a safe, high-quality finish/product. I expect that the LLE team will draw on recommendations from other projects and incorporate specific technical and construction provisions in the contract documents to address such intent (M. Gutierrez; September 28, 2017).

10/26/17 PD: Operations is very interested in a better method of platform construction. Platform tiles have caused many service impacts, additional costs and this method seems to have merit. Please check-in with operations prior to the first pour so that a close look at the process can be witnessed.

SOUND TRANSIT DESIGN CRITERIA DEVIATION REQUEST – LYNNWOOD LINK EXTENSION

Deviation No: LLE-020 **Title:** Use concrete finish at platforms rather than tiles

Description: This deviation seeks to use cast-in-place concrete at platform on all the Lynnwood Link stations by having topping slab on the structural slab. All the detectable warning paver, way finding paver, and tactile train waiting paver would installed as required.

HNTB|Jacobs Project or Engineering Manager:
Jim Schettler
Print Name
9-1-17
Signature Indicates Approval Date

ST DCM Chapter Owner, DECM: Hyperlink
Print Name
Signature Indicates Approval Date

ST Corridor Design Manager, DECM:
Joel Theodore
Print Name
7/14/2017
Signature Indicates Approval Date

DEPUTY EXEC. DIRECTOR, DESIGN & ENGINEERING
~~ST Director Civil and Structural Engineering~~, DECM:
~~Kerry Pihlstrom~~ MOISES GUTIERREZ
Print Name
Signature Indicates Approval Date

Return Documents to
Consultant
Deputy Contract Package Manager
Bryan Williams

Transmit to ST Quality Manager
(CC: ST Contract Package Manager, H|J
Engineering Manager, ST Design Criteria Chapter
Owner, ST Corridor Design Manager)

Return Documents to
ST Corridor Design Manager

Required Revision or Rejection
If at any stage in the approval process, the deviation documents requires revision or rejection, please indicate as such on the applicable signature line and return documents to Joel Theodore, ST Corridor Design Manager, or Consultant Deputy Contract Package Manager, Bryan Williams.

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-020

5. Date of Request:	6. Criticality: ☐ Minor* ☒ Major ☐ Critical *Minor does not require MRB Action
August 10, 2017	

7. Existing DCM Requirement:	8. Proposed DCM Deviation:	9. DCM Chapter, Drawing of Spec. No.:
9.10.8.2 States: A. For at grade station use 24-inch by 24-inch nominal concrete pavers. B. For elevated and tunnel stations use 12-inch by 12-inch nominal unglazed porcelain ceramic tiles.	The platforms on all of the stations shall use a cast-in-place concrete topping slab on a structural slab. Concrete topping slab shall include an improved finish that addresses the aesthetic quality of station(s), including concrete color, scoring, and finish. Concrete staining, excessive cracking, and defective finishes shall not be allowed.	Sound Transit Design Criteria Manual (DCM), Rev 4, March 2016 Chapter 9 Stations and Facilities, Pages 9-54, Section 9.10.8.2

10. Requested By (Designer or RE):	11. Reference Documentation (attach):
Terrence Bulfin, HNTB|Jacobs Station Architect	NA

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-020

12. Explanation for Deviation:

The enclosed submission requests deviation from criteria per Sound Transit DCM, Revision 4, dated March 2016 for Lynnwood Link Extension "Project" to use concrete at platform on all the Lynnwood Link stations by having a concrete topping slab on a structural slab.

List the DCM design criteria and chapter reference:

Within the DCM, Chapter 9 Stations and Facilities, Pages 9-54, Section 9.10.8.2 states:

9.10.8.2 Standard Family of Pavers

A. For at grade stations use 24-inch by 24-inch nominal concrete pavers. Wausau Tile "Terra-Pavers" Type 3 Cotillio FDX or Mutual Materials Architectural Pavers. Maximum of three colors to be used selected from the following approved colors:

1. FDX 2008 Wausau Light Gray (UniFace UF-30)
2. FDX 3008 Wausau Dark Gray (UniFace UF-60)
3. FDX 4008 Wausau Dark Red (UniFace UF-50)
4. FDX 5008 Wausau Dark Tan (UniFace UF-40)

B. For elevated and tunnel stations use 12-inch by 12-inch nominal unglazed porcelain ceramic tiles. Crossville Cross-slate.

1. Crossville A 850 Graphite (Dark Gray)
2. Crossville A900 Mica (Light Gray)
3. Crossville A 790 Burgundy (Dark Red) with cross sheen finish
4. Crossville A876 Truffle (Tan)

Explain why the requirement is not being met and provide explanation:

Deviation request seeks to utilize cast-in-place concrete topping slab (or pour) instead of pavers at the platform level. The paving will be sawcut into a maximum of an 8 ft x 8 ft grid to control cracking and provide visual relief.

See attached exhibit for the proposed location.

The proposed paving is different from current DCM requirement material. The concrete paving is equivalent in performance and durability to the concrete pavers. It meets the requirements of the

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-020

building code and public safety. The concrete paving will have a lower capital cost than the pavers.

Conditions:

1. The consultant shall incorporate lessons-learned into the respective project requirements (specifications) to avoid issues such as excessive concrete cracks, defective finishes, etc. This should consider improved joint detailing and rebar configuration, fiber-fiber mesh additives, etc.
2. The consultant shall design an improved finish that addresses the aesthetic quality of the stations(s). This shall include added color to/in the concrete mix, as well as appropriate 'scoring' patterns to meet functional and aesthetic reuqirements.
3. No concrete staining shall be permitted.

13. Consultant Approval of Deviation:

Acceptable ☒ Not Acceptable ☐

Terrence R Bulfin

Architect/Engineer of Record Signature

9/8/17

Date

Terrence Bulfin, HNTB|Jacobs Station Architect

(Printed Name and Title)

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-020

INSTRUCTIONS FOR REQUEST FOR DEVIATION FORM

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1. Department (i.e. U-Link, E-Link, Sounder, etc.)
2. Contract Number (i.e. RTA/LR 90-12)
3. Project/Contract Name (i.e. U240 – Capitol Hill Station)
4. Deviation Number – from RFD log (obtained from SQA)
5. Date of Deviation Request
6. Criticality; either Minor, Major, or Critical (copy from Link Design Quality Plan, Rev 0)

   1 Critical – The deviation will have a direct and significant impact on fit, function, reliability, maintainability, operability, quality, constructability, interfaces with other contracts, and/or systems safety aspects of the work product

   2 Major – The deviation will have either a direct or indirect, but not a significant impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product

   3 Minor – The deviation will have no direct or indirect impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product. This classification is sometimes for cosmetic issues, equivalent substitutions not specifically allowed by specification or non-technical issues

   - Deviations classified as "Critical" or "Major" require MRB approval prior to incorporation into the work
   - Deviations classified as "Minor" require only the Architect/Engineer of Record (A/EOR) and MRB Chairperson's approvals prior to incorporation into the work

7. Description of the **existing** Design Criteria Manual (DCM) requirement in 10 words or less. (Provide DCM chapter reference in item #9 herein)
8. Description of the **proposed** Design Criteria Manual (DCM) deviation in 10 words or less
9. Design Criteria, Drawing or Spec Number where requirement is noted
10. Name of Designer, or RE requesting deviation
11. Reference Documentation attached
12. Reason for the Deviation
13. Approval Signature of the Architect/Engineer of Record (A/EoR) and Date

(an attached letter of approval from the A/EoR must be provided)

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION MRB DISPOSITION FORM
LYNNWOOD LINK LIGHT RAIL

Contract No.: L200/L300	Project/Contract Name: Lynnwood Link Extension	Deviation No.: LLE-026
Description: Allows for the elevation changes at the NE 185th Station to be by elevators and stairs only.		

MRB Member Disposition:

	Not Required	Approve	Reject	
Kerry Pihlstrom Director, Civil and Structural Design	☒	☐	☐	Date: 9/26/2017
Julie Montgomery Director, Architecture & Art	☒	☐	☐	Date: 9/26/2017
Peter Brown Director, Systems Engineering & Integration	☒	☐	☐	Date: 9/26/2017
Paul Denison Link Light Rail Operations Director	☐	☒	☐	Date: 10/5/2017
Matthew Preedy Director, Construction Management	☒	☐	☐	Date: 9/26/2017
Mohammad Saleem Deputy Director, SQA (MRB Chairperson)	☐	☒	☐	Date: 10/6/2017

For Information Only:

Rod Kempkes, Executive Project Director

Comments:

SOUND TRANSIT DESIGN CRITERIA DEVIATION REQUEST – LYNNWOOD LINK EXTENSION

Deviation No: LLE-026 **Title:** NE 185th Removal of Escalators

Description: Allows for the elevation changes at NE 185th Station to be by elevators and stairs only.

HNTB|Jacobs Project or Engineering Manager:
Jim Schettler
Print Name
Signature Indicates Approval 9-14-17 Date

ST DCM Chapter Owner, DECM: Hyperlink
Doug Powell
Print Name
Signature Indicates Approval 9/15/17 Date

ST Corridor Design Manager, DECM:
Joel Theodore
Print Name
Signature Indicates Approval 9/15/2017 Date

ST Director ~~Civil and Structural Engineering~~, DECM:
~~Kerry Pihlstrom~~ ARCHITECTURE JULIE MONTGOMERY
Print Name
Signature Indicates Approval 9.15.17 Date

Transmit to ST Quality Manager
(CC: ST Contract Package Manager, H|J Engineering Manager, ST Design Criteria Chapter Owner, ST Corridor Design Manager)

Return Documents to
Consultant
Deputy Contract Package Manager
Bryan Williams

Return Documents to
ST Corridor Design Manager

Required Revision or Rejection
If at any stage in the approval process, the deviation documents requires revision or rejection, please indicate as such on the applicable signature line and return documents to Joel Theodore, ST Corridor Design Manager, or Consultant Deputy Contract Package Manager, Bryan Williams.

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L200	Lynnwood Link Extension	LLE-026

5. Date of Request:	6. Criticality: ☐ Minor* ☒ Major ☐ Critical *Minor does not require MRB Action
August 24, 2017	

7. Existing DCM Requirement:	8. Proposed DCM Deviation:	9. DCM Chapter, Drawing or Spec. No.:
9.7.C States: Where the vertical rise between public levels is greater than 12 feet and does not exceed 30 feet, utilize escalators for upward movement and utilize stairs for downward movement.	9.7.C: Where the vertical rise between public levels is greater than 12 feet and does not exceed 30 feet, utilize escalators for upward movement and utilize stairs for downward movement. An exception shall be allowed for at grade stations where the station's vertical rise between public levels is less than 20 feet, stairs may be used for upward movement.	Sound Transit Design Criteria Manual (DCM) Rev 4, March 2016 Chapter 9, Section 9.7 Elements of Vertical Circulation, Paragraph 9.7.C

10. Requested By (Designer or RE):	11. Reference Documentation (attach):
Christine Scharrer	

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L200	Lynnwood Link Extension	LLE-026

12. Explanation for Deviation:

For the proposed design of NE 185th Station as an at-grade station, reducing the entry lobbies and ancillary back of house structures, a pair of escalators and an elevator will not fit on the platform at the south end of the Station. To accommodate the pedestrian access from the south end, which is approximately 18' higher in elevation than the station, stairs and an elevator only will be used to access the south end of the platform.

With the topography of the site, the north end of the platform is at-grade and will require vertical transportation for access so as not to use an at-grade track crossing. To accommodate the pedestrian access from the north end, which is approximately 18' higher in elevation than the station, stairs and an elevator only will be used to access the north end of the platform. This deviation seeks approval to not provide escalators on either the north or south ends of this station. With the proposed side platform station, stairs would provide both up and down access to the platforms and will fit within the platform width with the elevator.

Additionally, deviation reduces station total cost of ownership.

See link below for the proposed layout.

Link to LLE VE Item 304 Exhibit 1

https://sharepoint.soundtransit.org/sites/NCHCT/ContractIntegration/VE/LLE%20VE%20Item%20304%20Exhibit%201.pdf

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L200	Lynnwood Link Extension	LLE-026

13. Consultant Approval of Deviation:

Acceptable ☒ Not Acceptable ☐

Architect/Engineer of Record Signature — Date: 9.28.2017

CHRISTINE SCHARRER NE 135th ARCHITECT
(Printed Name and Title)

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L200	Lynnwood Link Extension	LLE-026

INSTRUCTIONS FOR

REQUEST FOR DEVIATION FORM

The Resident Engineer or the Design Engineer is responsible for the preparation of the Request for Deviation form. It is to be filled out as follows:

1. Department (i.e. U-Link, E-Link, Sounder, etc.)
2. Contract Number (i.e. RTA/LR 90-12)
3. Project/Contract Name (i.e. U240 – Capitol Hill Station)
4. Deviation Number – from RFD log (obtained from SQA)
5. Date of Deviation Request
6. Criticality; either Minor, Major, or Critical (copy from Link Design Quality Plan, Rev 0)

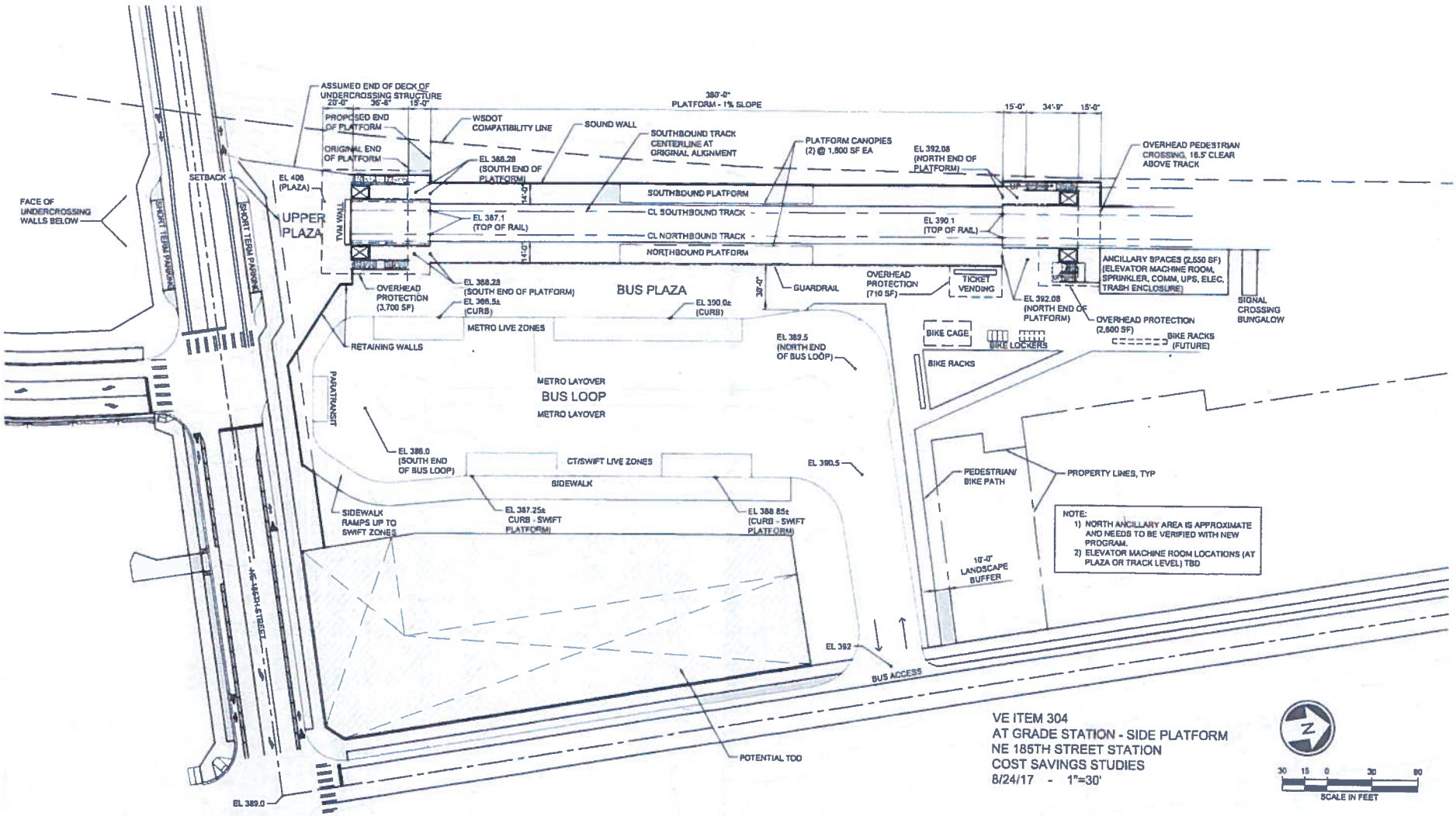
   1 Critical – The deviation will have a direct and significant impact on fit, function, reliability, maintainability, operability, quality, constructability, interfaces with other contracts, and/or systems safety aspects of the work product

   2 Major – The deviation will have either a direct or indirect, but not a significant impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product

   3 Minor – The deviation will have no direct or indirect impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product. This classification is sometimes for cosmetic issues, equivalent substitutions not specifically allowed by specification or non-technical issues

   - Deviations classified as "Critical" or "Major" require MRB approval prior to incorporation into the work
   - Deviations classified as "Minor" require only the Architect/Engineer of Record (A/EOR) and MRB Chairperson's approvals prior to incorporation into the work

7. Description of the **existing** Design Criteria Manual (DCM) requirement in 10 words or less. (Provide DCM chapter reference in item #9 herein)
8. Description of the **proposed** Design Criteria Manual (DCM) deviation in 10 words or less
9. Design Criteria, Drawing or Spec Number where requirement is noted
10. Name of Designer, or RE requesting deviation
11. Reference Documentation attached
12. Reason for the Deviation
13. Approval Signature of the Architect/Engineer of Record (A/EoR) and Date (an attached letter of approval from the A/EoR must be provided)



VE ITEM 304
AT GRADE STATION - SIDE PLATFORM
NE 185TH STREET STATION
COST SAVINGS STUDIES
8/24/17 - 1"=30'

rolluda architects

SCHARRER

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION MRB DISPOSITION FORM
LYNNWOOD LINK LIGHT RAIL

Contract No.: L200/L300	Project/Contract Name: Lynnwood Link Extension	Deviation No.: LLE-035
Description: L300-N23 – Lynnwood City Center Station: Elevator 01 and Escalator 01 Surge Zone Overlap at South Entrance.		

MRB Member Disposition:

	Not Required	Approve	Reject	
Kerry Pihlstrom Director, Civil and Structural Design	☒	☐	☐	Date: 3/28/2018
Julie Montgomery Director, Architecture & Art	☒	☐	☐	Date: 3/28/2018
Peter Brown Director, Systems Engineering & Integration	☒	☐	☐	Date: 3/28/2018
Paul Denison Link Light Rail Operations Director	☐	☒	☐	Date: 4/10/2018
Matthew Preedy Director, Construction Management	☒	☐	☐	Date: 3/28/2018
Robert Taaffe Director, Construction and System Safety	☐	☒	☐	Date: 4/2/2018
Dale Lewis Director, Transit System Safety	☐	☒	☐	Date: 4/3/2018
Jeff Chou Acting Quality Director (MRB Chairperson)	☐	☒	☐	Date: 4/13/2018

For Information Only:
Rod Kempkes, Executive Project Director

Comments:

SOUND TRANSIT DESIGN CRITERIA DEVIATION REQUEST – LYNNWOOD LINK EXTENSION

Deviation No: LLE-035 Title: Overlapping Surge Zones at Lynnwood City Center Station

Description: L300-N23 – Lynnwood City Center Station: Elevator 01 and Escalator 01 Surge Zone Overlap at South Entrance

HNTB|Jacobs Project or Engineering Manager:
Kevin R. Collins
Print Name
Signature Indicates Approval
3/5/18
Date

Sound Transit Corridor Design Manager:
Joel Theodore
Print Name
Signature Indicates Approval
3/20/2018
Date

Sound Transit DCM Chapter Owner: Owners
Doug Powell
Print Name
Signature Indicates Approval
3/20/18
Date

Sound Transit DCM Chapter Approver: Approvers
Julie Montgomery
Print Name
Signature Indicates Approval
3.20.18
Date

Return Documents to
Sound Transit Corridor Design Manager

Transmit to Sound Transit Quality Manager
(cc: Sound Transit Contract Package Manager, HNTB|Jacobs Engineering Manager, and Sound Transit Design Criteria Chapter Owner)

Return Documents to
HNTB|Jacobs Engineering or Design Integration Manager

Required Revision or Rejection

If at any stage in the approval process, the deviation documents require revision or rejection, please indicate as such on the applicable signature line, and return documents to Joel Theodore, Sound Transit Corridor Design Manager, or HNTB|Jacobs Deputy Contract Package Manager

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L300	Lynnwood Link Extension	LLE-035

5. Date of Request:	6. Criticality: ☐ Minor* ☒ Major ☐ Critical *Minor does not require MRB Action
01.31.2018	

7. Existing DCM Requirement:	8. Proposed DCM Deviation:	9. DCM Chapter, Drawing or Spec. No.:
9.6 D Elevator, escalator and stair surge zones shall be free of all obstructions. The elevator surge zone is defined as a 10 feet by 10 feet area in front of the elevator door. Stair and escalator surge zones shall be 15 feet long (measured from the end of handrail) and, where conditions permit, 5 feet wider in each direction than the width of the stair or escalator. Surge zones of elevators shall not overlap with surge zones of stairs/escalators.	*9.6 D Elevator, escalator and stair surge zones shall be free of all obstructions. The elevator surge zone is defined as a 10 feet by 10 feet area in front of the elevator door. Stair and escalator surge zones shall be 15 feet long (measured from the end of handrail) and, where conditions permit, 5 feet wider in each direction than the width of the stair or escalator. Surge zones of elevators shall not overlap with surge zones of stairs/escalators* **unless otherwise approved by Sound Transit.**	Sound Transit Design Criteria (DCM Rev 4), March 2016 – Chapter 9.6.1(D) (Stations and Facilities)

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L300	Lynnwood Link Extension	LLE-035

10. Requested By (Designer or RE):	11. Reference Documentation (attach):
Juan Pedro Alvarez (JP), LMN Architects	L300-N23-APP201 L300-N23-ASP100 L300-N23-LCC ENLARGED PLAN AT OVERLAPPING SURGE ZONES L300-N23-LCC-View 1

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L300	Lynnwood Link Extension	LLE-035

12. Explanation for Deviation:

This deviation request addresses the overlap of surge zones as designed for the

L300 N23 Lynnwood City Center Station.

The design team requests the approval of a deviation for an overlap of the Elevator 01 and Escalator 01 surge zones at the south entrance of the station at Plaza Level. This deviation request applies only to a portion of the zones as shown in the attached Enlarged Plan at Overalpping Surge Zones:

1. The area of overlap is relatively small (8 – 23/32").
2. Additional area adjacent to the surge zones is available to serve the function of the surge area.

Elevator 01 and Escalator 01 locations are based on platform design, minimum height clerances over 46th Avenue, and Egress Stair 01 location which is dependent on existing site grades along the southern surface parking areas. The program rooms in between the Egress Stair 01 and Elevator 01 are at the minimum size requirments (Elevator Machine Room N23S01 and Communications Closet N23S02). Also, the structural guideway cap beam locations restrict the location of Elevator 01 hoistway and Escalator 01. This creates a "land-locked" situation where neither Vertical Transporation element can be relocated.

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L300	Lynnwood Link Extension	LLE-035

13. Consultant Approval of Deviation:

Acceptable ☒ Not Acceptable ☐

Architect/Engineer of Record Signature

3/19/2018
Date

Juan Pedro Alvarez (JP) - Station Lead LMN Architects
(Printed Name and Title)

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	L300	Lynnwood Link Extension	LLE-035

INSTRUCTIONS FOR

REQUEST FOR DEVIATION FORM

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1. Department (i.e. U-Link, E-Link, Sounder, etc.)
2. Contract Number (i.e. RTA/LR 90-12)
3. Project/Contract Name (i.e. U240 – Capitol Hill Station)
4. Deviation Number – from RFD log (obtained from SQA)
5. Date of Deviation Request
6. Criticality; either Minor, Major, or Critical (copy from Link Design Quality Plan, Rev 0)

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   2 Major – The deviation will have either a direct or indirect, but not a significant impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product.

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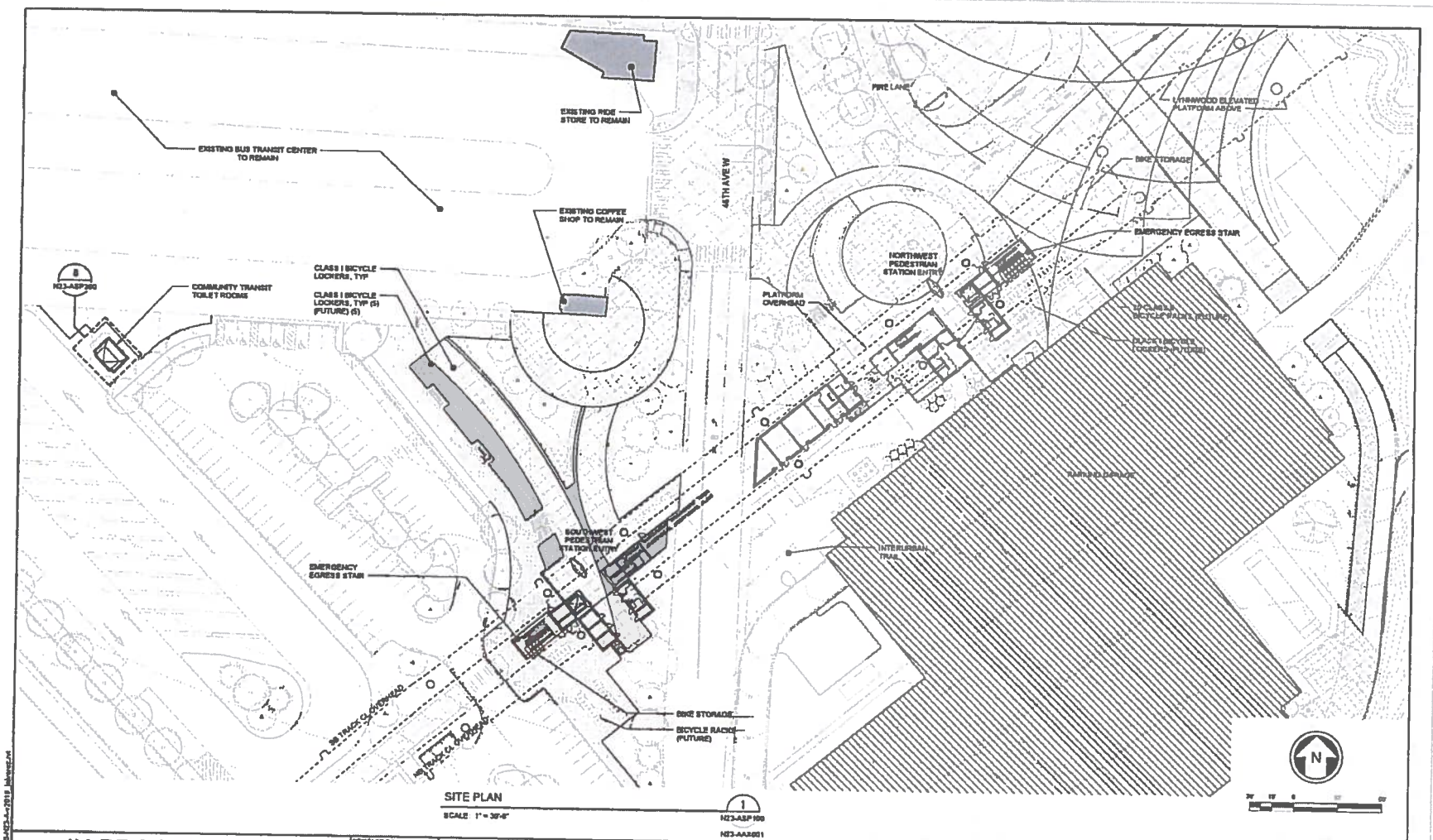
9. Design Criteria, Drawing or Spec Number where requirement is noted
10. Name of Designer, or RE requesting deviation
11. Reference Documentation attached
12. Reason for the Deviation
13. Approval Signature of the Architect/Engineer of Record (A/EoR) and Date (an attached letter of approval from the A/EoR must be provided)



IN-PROGRESS 90%

NO.	DATE	DSN	CHK	APP	REVISION

DESIGNED BY H. FITZPATRICK
DRAWN BY T. ERDMANCZYK
LICENSED BY
CHECKER
APPROVED BY
APPROVER

REGISTERED ARCHITECT

LMN

HNTB Jacobs

SOUND TRANSIT

K. COLLINS

J. THEODORE

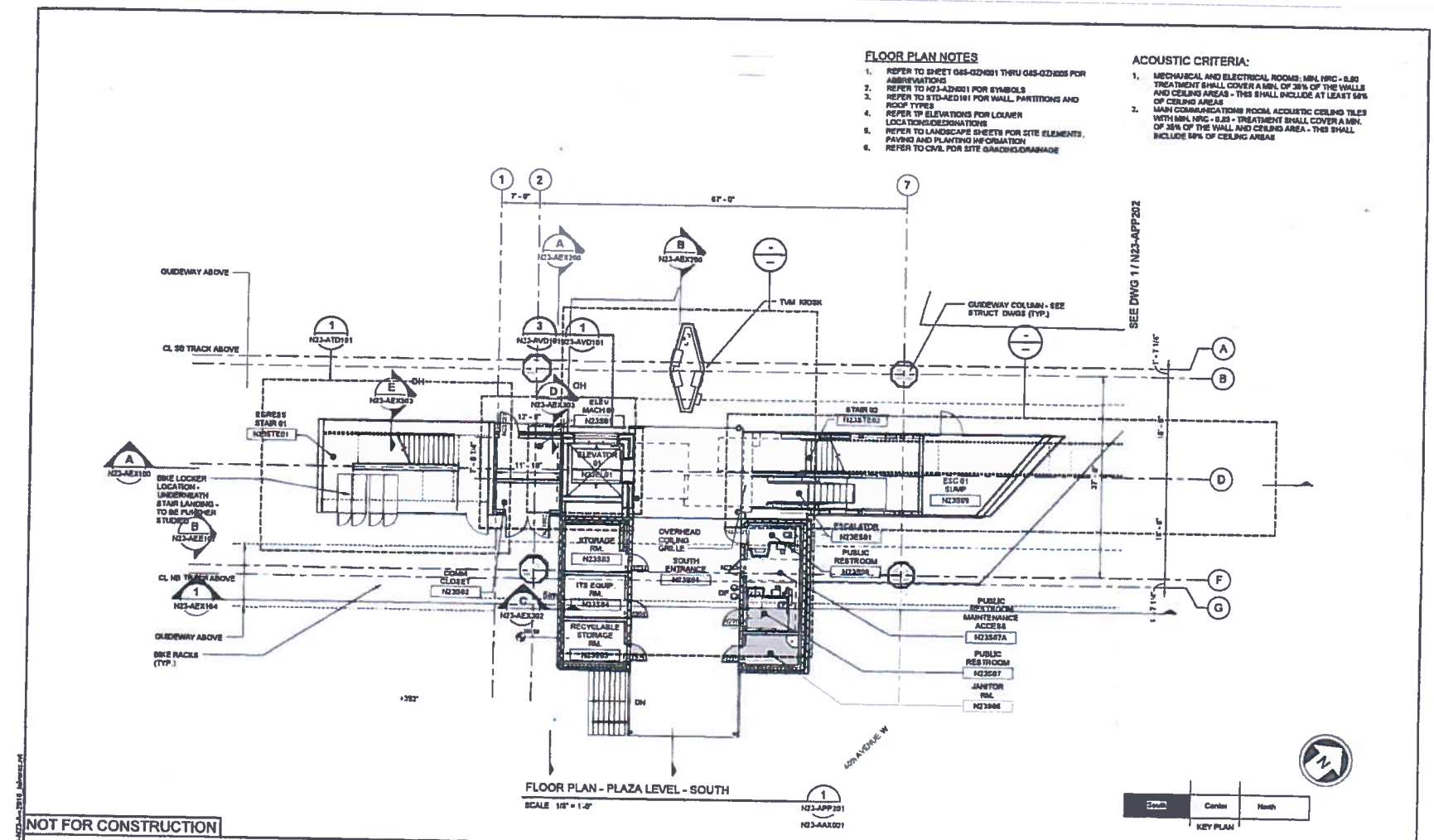
SCALE: 1" = 30'
FILENAME: L300-N23-A
CONTRACT NO.: RTA / CN 0019-16
ISSUE DATE: 11/28/2017

LYNNWOOD LINK EXTENSION
CONTRACT L300
NE 200TH STREET TO LYNNWOOD CITY CENTER

LCC STATION - ARCHITECTURE
ARCHITECTURAL SITE PLAN

DRAWING NO.: N23-ASP100

L300-N23-Elevator 01 and Escalator 01 Surge Zone Overlap at South Entrance
01.31.2018



NOT FOR CONSTRUCTION

IN-PROGRESS 90%

NO.	DATE	DSN	CHK	APP	REVISION

DESIGNED BY: M. FITZPATRICK
DRAWN BY: T. ERDMANCZYK
CHECKER
APPROVED BY
APPROVER

REGISTERED ARCHITECT
JOHN F. NICHOLS

LMN
DESIGN MANAGER: K. COLLINS

HNTB Jacobs
PROJECT MANAGER: J. THEODORE

SOUNDTRANSIT

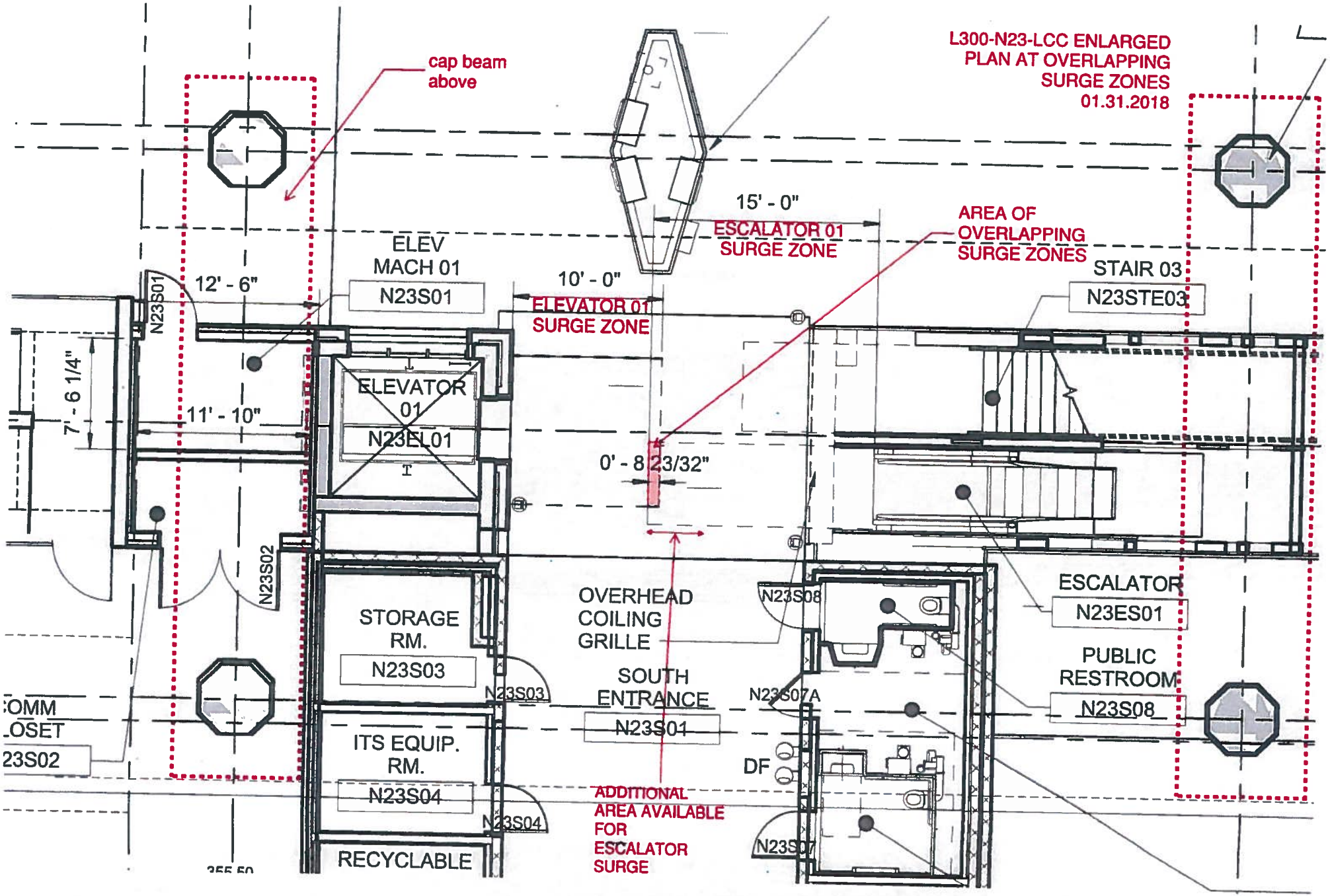
SCALE: 1/8" = 1'-0"
FILE NAME: L300-N23-A
CONTRACT No.: RTA / CN 0910-16
SUBMITTAL DATE: 11/29/2017

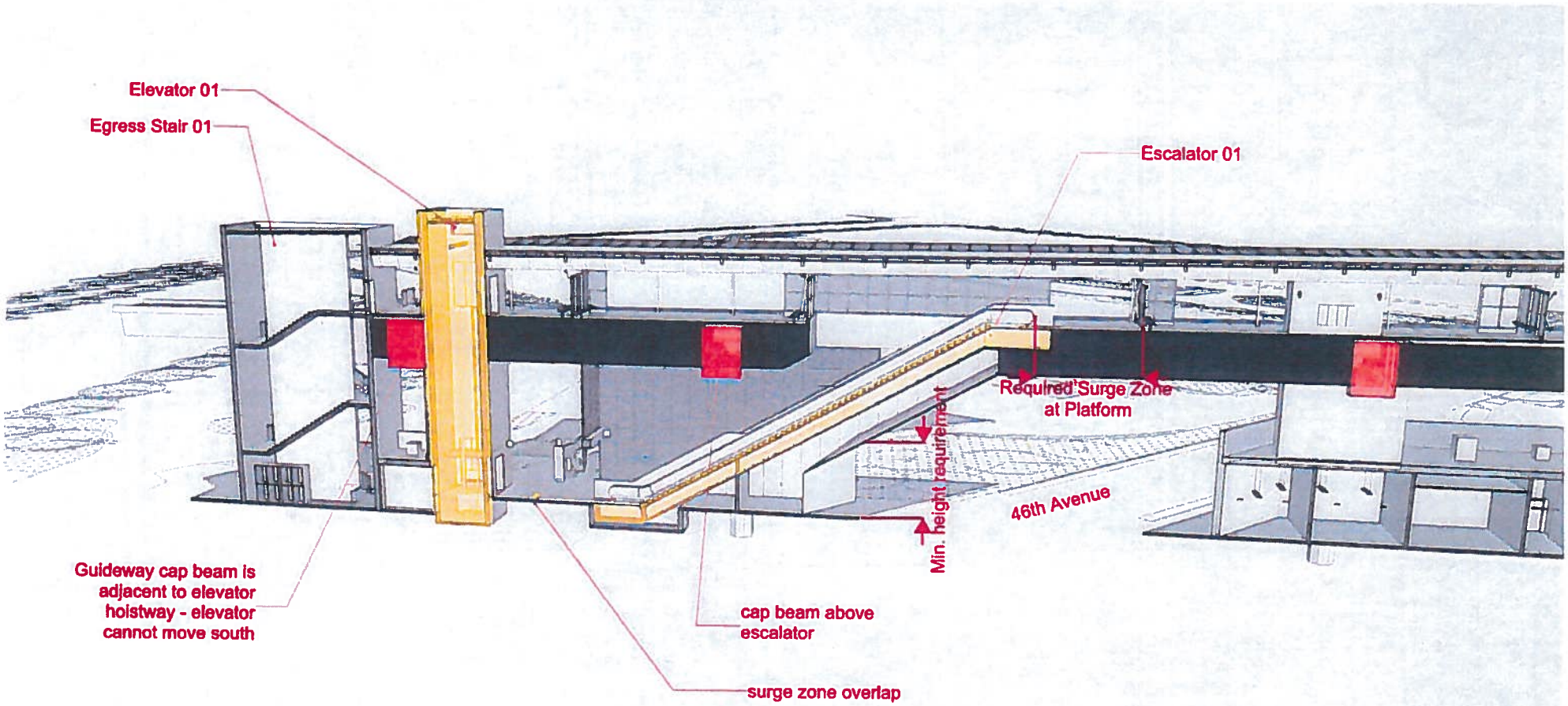
LYNNWOOD LINK EXTENSION
CONTRACT L300
NE 200TH STREET TO LYNNWOOD CITY CENTER

LCC STATION - ARCHITECTURE
FLOOR PLAN
PLAZA LEVEL - SOUTH

DRAWING NO.: N23-APP201
N23
REV: 0

L300-N23-Elevator 01 and Escalator 01 Surge Zone Overlap at South Entrance
01.31.2018


L300-N23-LCC ENLARGED PLAN AT OVERLAPPING SURGE ZONES 01.31.2018
cap beam above
15' - 0"
ESCALATOR 01 SURGE ZONE
AREA OF OVERLAPPING SURGE ZONES
ELEV MACH 01
N23S01
12' - 6"
10' - 0"
ELEVATOR 01 SURGE ZONE
STAIR 03
N23STE03
N23S01
7' - 6 1/4"
11' - 10"
ELEVATOR 01
N23EL01
0' - 8 23/32"
N23S02
STORAGE RM.
N23S03
OVERHEAD COILING GRILLE
N23S08
ESCALATOR
N23ES01
PUBLIC RESTROOM
N23S08
SOUTH ENTRANCE
N23S01
N23S07A
ITS EQUIP. RM.
N23S04
DF
ADDITIONAL AREA AVAILABLE FOR ESCALATOR SURGE
RECYCLABLE
N23S07



L300-N23-LCC -View 1
01.31.2018

30. SUSTAINABILITY

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TABLE OF CONTENTS

TABLES

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30. SUSTAINABILITY

30.1 INTRODUCTION

A. Overview of Sustainability at Sound Transit

Sustainability is an agency commitment. In 2007, the Board adopted a comprehensive Sustainability Initiative (Resolution No. R2007-12) with initial areas of focus on energy, water, land use, and procurement issues. Executive Order No. 1 was issued to reinforce that sustainable business practices would be integrated "throughout the Sound Transit organization, including planning, designing, constructing, and operating existing and new transit systems and facilities."

Sound Transit adopted a Sustainability Plan in July 2011 to formally establish the agency's long-term priorities and performance targets. The Sustainability Plan was updated in 2015 to define the Agency's metrics. The Agency's framework for sustainability is organized around the principles of People, Planet and Prosperity (see Section 30.6).

B. Sustainability in the Design Criteria Manual

This chapter establishes guidelines and requirements for designing sustainable projects. The purpose of integrating sustainability into our designs is to:

1. Implement environmental stewardship and sustainable development;
2. Reduce environmental risks and liabilities;
3. Ensure regulatory compliance;
4. Improve environmental performance with a focus on reducing the impacts of our natural resource use;
5. Identify cost-effective solutions; and
6. Enhance our public education and outreach around sustainability with regulators, other agencies and stakeholders.

C. To help guide designers to focus on sustainability measures for projects that are not eligible for LEED certification, a Sustainability Checklist is included at the end of this chapter. The checklist also serves as a tool for Sound Transit

to document how sustainability guidelines and requirements are being implemented at the project level.

D. All sustainability measures shall be in conformance with all federal, state and local codes and must not interfere with compliance to the Americans with Disabilities Act.

E. Sound Transit conducts environmental mitigation efforts in addition to the actions referred to in this chapter. To see the environmental actions being undertaken by Sound Transit, please refer to the applicable project's Environmental Commitments Matrix.

30.2 ENVIRONMENTAL AND SUSTAINABILITY MANAGEMENT SYSTEM

A. Sound Transit's Environmental and Sustainability Management System (ESMS), developed in 2004 in conjunction with a pilot program established by the FTA and certified in 2007 to meet the requirements of the internationally recognized ISO 14001:2004 standard, serves as a framework for evaluating and implementing environmental and sustainable recommendations. The ESMS establishes objectives and targets that lead to improved environmental and sustainability performance.

B. All project elements are guided by ESMS Procedures. These procedures outline project implementation using standard Sound Transit policies and procedures. A major component of the ESMS involves bi-annual environmental compliance and sustainability audits during construction and operations. Design and construction elements must be implemented according to the processes detailed in the ESMS Procedures.

Procedures are located on the Sound Transit intranet site and consultants must get Sound Transit permissions for access (Intranet > ST Business > Environment & Sustainability > ESMS Documents).

30.3 SUSTAINABLE BUILDING CONSTRUCTION (LEED ELIGIBLE PROJECTS)

All Sound Transit funded buildings eligible to meet United States Green Building Council (USGBC), Leadership in Energy and Environmental Design (LEED) standards shall, at a minimum, meet LEED Version 4 Silver certification. Higher levels of sustainability are encouraged and should be considered and evaluated through the design process. Sound Transit does not require submission for certification to the LEED program through the USGBC. Where application to United States Green Building Council (USGBC) is not made for LEED certification, designer shall provide documentation of metrics aligned with LEED points achieved in their determination for Sound Transit review and approval.

Sound Transit defines “buildings” as permanent enclosed structures housing full time employees such as operations and maintenance facilities and administrative offices. Any reference to building refers solely to Sound Transit owned properties. Buildings do not mean partial, temporary or unenclosed operations and maintenance structures, stations or parking garages.

For further information on the USGBC and the LEED Rating System, see http://www.usgbc.org/.

30.4 SUSTAINABILITY CHECKLIST FOR NON-LEED PROJECTS

A. For projects that are not eligible for LEED certification, such as stations, Sound Transit has developed a Sustainability Checklist to assist in integrating sustainability into projects and tracking the sustainability measures that are integrated into a project. The checklist is meant to be the basis for identifying and evaluating sustainable features to be considered for and integrated into the projects.

   The checklist provides sustainability categories and ideas to design teams on potential sustainability design elements.

B. The Sustainability Checklist is patterned after the United States Green Building Council, Leadership in Energy and Environmental Design (LEED) rating system. It has been modified to be applicable to Sound Transit’s facilities. Refer to the current version of the LEED Reference Guide for Green Building Design and Construction for specific definition on sustainability measures in the checklist. The checklist is organized to address the priorities of Sound Transit’s sustainability framework of People, Planet, and Prosperity. Eight main categories are identified in the checklist and further defined below.

   1. Site Design
   2. Station Access
   3. Energy
   4. Water Quality and Stormwater
   5. Water Efficiency and Landscaping
   6. Materials and Purchasing
   7. Air Quality / Emissions
   8. Construction Practices

C. Process to use the checklist.

1. The Checklist contains a number of sustainability items that Sound Transit requires to be incorporated into the design and construction of Sound Transit facilities. Sound Transit has determined that these sustainability items are achievable, the best value for the measure, and/or proven technology. Required measures shall be integrated into the project without any further evaluation. The design team shall provide design services necessary to incorporate these elements. Where required items are not relevant to a particular project, those elements shall be marked "Not Applicable" (such as carpool parking for a project that does not include parking).

2. The checklist contains measures that are not identified as "Required." During the Scope of Work negotiations, the designer shall propose what measures, beyond the required items, might be feasible for the project. During this scope negotiation, feasibility will be determined based on the physical attributes of the project and the probability to implement the items. Sound Transit will meet with the designer to determine the extent of the measures to be evaluated further during the design and include that effort in the Scope of Work.

3. Based on the Scope of Work negotiations, the designers shall proceed with evaluating agreed upon measures. Items under consideration shall be marked "Pending" under the "Maybe" column on the checklist until the evaluation is complete and a determination by Sound Transit is made. The design team shall evaluate these potential measures based on maintenance requirements, the longevity of an installation or material, and the potential cost impacts (initial and total cost of ownership. Total Cost of Ownership is defined as a cost benefit analysis incorporating capital, operating, maintenance, and replacement costs. The evaluation shall also consider whether the measure is a proven or new technology. Sound Transit will review the results of the evaluation and direct the designer to integrate appropriate measures into the design.

4. When Sound Transit has directed the team to incorporate a measure, a "Yes" shall be marked in the "Yes" column on the checklist. If a measure is not to be incorporated, a "No" shall be marked in the "No" column. No further work is required on elements once they are identified as "No".

5. All columns in the checklist must be completed by the design team for measures that are evaluated by the team. If an evaluated measure is not incorporated, the design team must identify how the decision was reached. For example, if cost guided the decision not to include a measure, a cost estimate is to be provided. If future maintenance

requirements affected the decision, these requirements shall be identified.

6. Designers are encouraged to notify Sound Transit when more efficient sustainability alternatives other than those included in the checklist are available. Sound Transit will determine if such measures shall be evaluated. Any additional measures evaluated shall be added to the checklist for documentation.

D. Checklists are to be used to report progress on implementing sustainability measures at the agreed upon submittal milestones; e.g. checklists to be submitted at the 30%, 60%, 90% and 100% design milestones. For larger projects having multiple design segments and submittals, the checklist submittal schedule shall be determined as part of the design Scope of Work. Checklists must be completed as outlined in Section 30.4.C. Required items in the checklist shall continue to indicate "Required" in the "Yes" column and comments shall be added to specifically identify where an item is used, such as a particular segment or station. During construction, tracking of sustainable measures shall be performed by the construction management team.

30.5 SUSTAINABILITY PRACTICES PLAN

A. The Contractor shall be required to prepare and implement a Sustainable Practices Plan (SPP) during construction. The plan shall be updated quarterly on the achievement of items identified as requiring tracking in the Sound Transit Sustainability Checklist or any alternative certification method agreed by Sound Transit to be applicable. Where specific rates or percentages are required, the Contractor shall maintain a current log and track those items. Contractor shall maintain the back-up information supporting the tracked items.

B. The Sustainable Practices Plan shall include, at a minimum:

1. Identify roles and responsibilities of key personnel in regard to sustainable practices

2. Document Contractor procedures for sustainable practices

3. Establish, track and report performance metrics for sustainable practices

4. Establish communications and monitoring procedures for documenting plan adherence

5. Include tracking of all sustainable items.

C. The Contractor shall provide a Project Sustainability Plan Summary at project substantial completion. The Summary shall compile the final results of construction. The Checklist shall be finalized by indicating strategies achieved, final rates of recycling, salvage, recycled content, etc. and addressing the final status of each required strategy. The Summary shall also include a section on 'Lessons Learned' from the process of tracking and reporting sustainability performance during construction. Sound Transit will review and comment on the summary. Any comments or edits shall be picked up by the Contractor and resubmitted as part of Project Close-out documentation.

30.6 SOUND TRANSIT SUSTAINABILITY FRAMEWORK

Table 30-1: Sustainability Framework

Action Areas	Priorities	Long-Term Targets
PEOPLE **Ridership** *Increase the availability and use of regional transit*	**Ride** Provide safe, secure and reliable transportation choices.	• Transit services, ridership and market share are expanded.
	Live Support healthy, diverse, transit-oriented communities.	• Pedestrian, bicycle, rideshare and connecting transit access is improved at all Sound Transit stations and facilities. • Customer experience and amenities are improved at all stations. • Transit-oriented development projects are established at all applicable Link properties owned by Sound Transit.
	Advocate Increase community support for transit investments and services.	• A strong majority of regional leaders and residents recognize the benefits of transit system expansion.
PLANET **Conservation** *Promote environmental stewardship by conserving natural resources*	**Save Energy** Reduce energy use, greenhouse gas emissions and air pollution.	• All fleets deploy the most fuel-efficient, clean and cost-effective vehicles that optimize the use of proven technology. • 40 percent of greenhouse gas emissions are reduced (per vehicle revenue mile). • Electricity use is carbon neutral.
	Protect Ecosystems Protect natural habitats and conserve water resources.	• One percent of indoor and outdoor water use is reduced (per vehicle revenue mile) on average per year. • Total ecosystem functions are improved. • Low impact development (LID) treats 100 percent of stormwater in new facilities.
	Use Less, Buy Green Reduce materials consumption and increase recycling and environmentally preferable procurements.	• 100 percent of the waste stream is diverted from landfills. • 100 percent of purchases are assessed for environmentally preferable products. • Sound Transit is a 'paperless office.'
PROSPERITY **Operating Efficiency** *Integrate sustainability into decision-making processes*	**Connect** Provide the mobility necessary for strong economic growth by connecting regional urban centers.	• The ST2 Plan for regional transit is completed, and the system is operated and maintained at maximum efficiency.
	Streamline Incorporate Sustainability into agency decision-making processes.	• Operational efficiency and financial savings are maximized by fully evaluating economic, environmental and social costs.
	Engage Enhance staff participation in sustainability initiatives.	• Sound Transit maintains a highly-skilled workforce that actively contributes to sustainability solutions.

30.7 SOUND TRANSIT SUSTAINABILITY DESIGN CHECKLIST

For all eligible building projects, LEED Silver standards apply. In all other cases, the Design Criteria Manual's Sustainability Chapter (Chapter 30) and its checklist (below) are Sound Transit's sustainable design standards.

Table 30-2: Sustainability Checklist

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
EP	**EARLY PLANNING > PEPD RESPONSIBILITY.** *FINAL DESIGN TEAMS WILL NOT FILL OUT THIS SECTION.*									
S	**SITE DESIGN AND MANAGEMENT**									
S-1	For facilities with patron parking, provide designated parking stalls for carpools. (5% target)	Required								
S-2	Provide bicycle parking at stations. See DCM Ch. 9.	Required								
S-3	Incorporate public art and/or reference to the local culture and history of the place - Coordinate with STart Program. See DCM Ch. 27.	Required								
S-4	Provide parking stalls with access to receptacles to recharge LEFE vehicles. (3% target). Electric vehicle charging stations shall include power and data conduit. No wireless systems shall be used.									
S-5	Provide parking stalls for shared car services. (ST to determine number of stalls; awaiting Board policy)	**(ST action)**								
S-6	Maintain existing native vegetation and soil to the maximum extent feasible.									
S-7	Balance earthwork materials on the site.									
S-8	Reduce export/import of materials such as saving topsoil to reuse on site or reusing crushed materials on site as base. Target 50% reuse of suitable excavated material to be used on site.									
S-9	Evaluate feasible pedestrian and bike access to local schools, hospitals, job centers, and public facilities in vicinity of the project.	Required **(ST action)**								
S-10	When designing occupied external spaces, consider orientation and design of outdoor waiting areas in relation to local wind patterns to shelter / temper the weather.	Required								

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
S-11	Consider third party green certifications for the project such as Envision, Sustainable Sites, or Greenroads.									
SA	**SITE ACCESS**									
SA-1	Install curb bulbs / extensions to make pedestrian crossings shorter.									
SA-2	Include educational demonstration and signage in the project to promote public awareness of innovative sustainable design solutions									
SA-3	Incorporate elements that give transit priority at signals over cars, pedestrians and bicycles. (At-grade only)									
E	**ENERGY**									
E-1	Design projects to reduce energy use. Use current Seattle Energy Code as the basis of design. See DCM Ch. 20.	Required								
E-2	At 100% design, provide energy use calculations using an energy modeling tool for projected monthly and annual usage of both gas and electricity. If facility is sub-metered, calculations to align with sub-metered equipment.	Required								
E-3	Perform independent commissioning of all facilities to assure all vertical circulation, envelope, mechanical, electrical and plumbing systems are operational, fully integrated with all systems and appropriate training has occurred. See DCM Ch. 32	Required								
E-4	Establish and conduct post-occupancy evaluation of systems and design elements to guide future design standards.	Required **(ST action)**								
	HEATING AND COOLING									
E-5	Only heat and cool rooms that require conditioned spaces. See DCM Ch. 20.	Required								
E-6	Adjust automatic temperature control set points to correspond with primary activities and hours of occupation of conditioned spaces. See DCM Ch. 20.	Required								
E-7	Use natural ventilation in lieu of mechanical systems to cool facilities.									

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
	LIGHTING									
E-8	Provide photocell controls for separate areas of the facility that have different lighting needs to permit lights to come on in darker areas before coming on in areas with more daylight - e.g., mezzanine zoned separate from platform.	Required								
E-9	Maximize daylight to reduce lighting use.	Required								
E-10	Use full cut-off and glare screening on fixtures.	Required								
E-11	Position lights to avoid shining outside of property boundaries.	Required								
E-12	Eliminate lights pointing up to the sky - No up lights to be used to accent structures or other elements of the facility.	Required								
E-13	Reduce lighting power density of light fixtures to less than the Washington State Energy Code for non-public spaces.									
E-14	Use LED lights in areas that require 24 hour lighting, such as tunnels.	Required								
	CONTROLS									
E-15	Use controls to minimize energy use of lights, escalators, elevators, signs, and other equipment wherever feasible, including: Occupancy sensors, photo controls, regenerative and/or variable frequency drives, etc.	Required								
E-16	Provide sub-meters for lighting, HVAC, vertical circulation (elevators/escalators), Tunnel/Trackway (any equipment on track powered by station), parking garages (if fed from station), and miscellaneous (station loads not covered by the above categories, including but not limited to BMS, emergency fans, fire equipment, miscellaneous plug loads, leased areas, etc.). Provide infrastructure to accommodate sub-meters. If provided or anticipated, include sub-meters for on-site energy production. Connect meters to the communication room to track energy and water use via the Sound Transit network. Track utility meter numbers and corresponding function.	Required								

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
E-17	Provide separate electrical meters for traction power substations from any other facility meters. Track utility meter numbers and corresponding function.	Required								
	OTHER									
E-18	Provide SRI of 78 for roofs under 2:12 slope. Provide SRI of 29 for roofs steeper than 2:12.	Required								
E-19	Use instantaneous hot water heaters. See DCM Ch. 24.	Required								
E-20	Ensure that utility capacity of the site has been considered based on projected growth and future development for the site such as TOD. Study and review TOD opportunities as related to utility and infrastructure requirements. Document potential utility and infrastructure needs for TOD. Document if the infrastructure and utilities will be installed as part of the ST facility or deferred to the TOD developer.	**(ST action)**								
E-21	For non-roof areas, use combination of the following strategies to reduce heat island effect: Provide shade for at least 50% of pedestrian hardscape area within 5 years of project completion. Provide paving materials with an SRI of 29 or higher. (Consider glare when designing high SRI paving and restrict to areas not exposed to direct southern exposure from sun.)									
E-22	Provide building envelope commissioning for site constructed buildings. Identify best approach: e.g. blower or air leakage.	Required								
E-23	Evaluate renewable energy options including solar, geothermal or other feasible means to the greatest extent possible. Do not use solar panels with a surface containing Perfluorinated Compounds (PFC's).									
E-24	Use and upgrade minor electrical elements for use of solar power (e.g., CCTV, emergency phones, illumination, and garbage compactors). Panels could be located with the equipment or locally on bus shelters, light poles, etc.									
E-25	Use thermal conditioning capacity in tunnels									

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
WS	**WATER QUALITY AND STORMWATER**									
WS-1	Use low-impact development (LID) methods for handling storm water per DCM Ch. 6.4. [Chapter covers Washington State Department of Ecology guidelines, WSDOT Drainage Requirements, City of Seattle Drainage requirements and other local agency requirements where applicable.]	Required								
WS-2	Ensure that LID techniques are properly installed and commissioned by a qualified contractor with oversight by a qualified designer or inspector.	Required								
WS-3	FLOW CONTROL: Reduce storm water run-off by volume by implementing a Management Plan that reduces impervious cover, promotes infiltration, captures and provides flow control for 100% of the design rainfall storm event for non-pollution generating impervious surface using acceptable best management practices (BMPs) and AHJ requirements. See DCM Ch. 6.	Required								
WS-4	TREATMENT CONTROL: Reduce storm water run-off by implementing a Management Plan that reduces impervious cover, promotes infiltration and captures and treats 100% of the of the design rainfall storm event for pollution generating impervious surface using acceptable best management practices (BMPs) and AHJ requirements. See DCM Ch. 6.	Required								
WS-5	Reuse water flows generated on the site to the maximum extent feasible.									
WS-6	Evaluate constructing structured parking in lieu of planned surface parking to reduce impervious surface. If determined beneficial to ST, construct parking garage in lieu of planned surface parking.									
WS-7	Install ballasted trackways for at-grade facilities to reduce impervious areas.									
WS-8	Use gabions, geotextiles, vegetative treatments and reinforced earth in place of hard structures such as cast in place concrete retaining walls.									
WL	**WATER EFFICIENCY AND LANDSCAPING**									
WL-1	At 100% design, provide water use calculations for projected monthly and annual usage. Separate irrigation water from other water uses in calculations.	Required								

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
WL-2	Provide separate irrigation or deduct meters for irrigation. Connect meters to the building management system to track water use. Track utility meter numbers and corresponding function. See DCM Ch. 10.	Required								
WL-3	Specify efficient water use fixtures. (Target 20% reduction)	Required								
WL-4	Provide low flow toilets (≤1.1 gpf) and dual flush valves.	Required								
WL-5	Provide automatic shut off for lavatory faucets	Required								
WL-6	Reduce or eliminate potable water usage for landscape irrigation. (Target 50% reduction in potable water usage for irrigation.)	Required								
WL-7	Provide water efficient landscape irrigation with drip systems, rain sensors, automatic shut off if leak detected. See DCM Ch. 10.	Required								
WL-8	Contract documents shall include requirements to verify irrigation systems are installed properly by a qualified contractor with oversight by a qualified landscape designer or inspector.	Required								
WL-9	Construction documents shall clearly identify soil amendments and amended soil depths.	Required								
WL-10	Landscape Designers and construction management shall monitor the installation of soil including on-site testing to assure good plant root development.	Required								
WL-11	Use an Integrated Pest Management System (IPM), including fertilization program to promote healthy plants that will require less water over the long term. See DCM Ch. 10.	Required								
WL-12	Use native and adaptive plantings (salvaged from the site when possible) to promote habitat and minimize or eliminate use of potable water during construction, landscape establishment and operation. See DCM Ch. 10.	Required								
WL-13	Evaluate reuse of storm water to irrigate landscape, fill toilets, and any other acceptable uses. (Related to Item WL-4 above.) If evaluation is acceptable to ST, include reuse of storm water in project. This can be a rainwater harvesting system and/or diversion of storm water into landscape areas.									

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
WL-14	Remove invasive plant species and replant with native and adaptive species where applicable. See DCM Ch. 10.									
WL-15	Landscape only areas that are maintainable. Consider other alternatives for areas that may be problematic to maintain such as under guideway or bridge structures.									
MP	**MATERIALS AND PURCHASING**									
	RECYCLING AND SALVAGE									
MP-1	Incorporate a percentage (by cost) of materials made from salvaged, renewable, recycled, and / or regional materials within the project. (Cumulative Target 25%). Track the use of these materials as percentage of cost.	Required								
MP-2	Require 80% (minimum) of demolition and construction waste to be recycled, reused or repurposed. • Contractor to provide area for cutting up materials and clearly identify recycling dumpsters or contract with an off-site recycling sorter. Recycling containers to be clearly identified for source separated or commingled recycling. Contractor to contract with appropriate recycling facilities for disposal. Where recycling facilities are available that will sort off-site, they may be used with acceptance from ST. • Track items diverted from waste stream such as salvaged, recycled, and reused material. Track by type, item and/or weight as appropriate for material being diverted from waste stream. • Provide and document education and training of staff and sub-contractors about recycling plan. Provide enhanced signage.	Required								
MP-3	Require salvage and deconstruction of buildings to be demolished.	Required **(ST action)**								
MP-4	Evaluate moving buildings off-site to be reused elsewhere in lieu of demolition.	Required **(ST action)**								
MP-5	Provide stations and facilities with permanent locations for collection of trash and recyclables. See DCM Ch. 9.	Required								
MP-6	Salvage landscape materials: Plants, rockeries, etc. prior to demolition.	Required								

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
	OTHER									
MP-7	Do not use Chlorofluorocarbon (CFC), Hydrochlorofluorocarbon (HCFC) or Halon refrigerants in HVAC and refrigeration. See DCM Ch. 20. All products, sealants and their manufacturing processes shall be CFC and HCFC free.	Required								
MP-8	Do not use Halon in fire suppression systems and extinguisher equipment. Use either Ketone (PFC) type chemical clean agents or inert gas systems. See DCM Ch. 24.	Required								
MP-9	Evaluate the use of high-quality and long-lasting products (such as stainless steel) in lieu of replacing items over time. Materials shall be selected based on durability, design life or service life, and maintenance requirements when making material choices to minimize replacement and maintenance costs.	Required								
MP-10	Do not use exterior finishes with zinc, galvanizing, lead, or copper where subject to rainwater or run-off, except where required for operational systems.	Required								
MP-11	Avoid using materials that require ongoing painting or staining.	Required								
MP-12	Maximize the use of substitute cementious materials in concrete mix.									
MP-13	Use pre-manufactured and pre-cast materials to reduce the amount of waste left on site.									
MP-14	Use bio-based products where applicable. (Target 1% offset of fossil fuel based products)									
MP-15	All insulation materials integrated into the work shall NOT contain: urea formaldehyde, asbestos, nor halogenated flame retardants. Do not use products such as extruded or expanded polystyrene, spray polyurethane foam, polyisocyanurate. Use mineral wool, perlite, cellular glass foam, cementitious foam.	Required								
MP-16	Do not use cadmium batteries.	Required								

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
MP-17	Reduce or eliminate the use of the following chemicals in the materials or in the manufacture of materials to the greatest extent possible: Halogenated Organic Compounds in roofing membranes, resilient flooring. Polyvinyl Chloride (PVC) in upholstery, low slope roofing, carpet backing, waterproofing membranes. Halogentated Flame Retardants. Use materials that do not require fire retardants or use borate based fire retardants. Phthalates in PVC, roofing, floor tiles, wall coverings, adhesives and sealants. Use PVC free options, rubber or cork flooring, copper piping.									
MP-18	The use of the following chemicals shall be minimized on the project. Evaluate alternatives. Review potential use of these materials with ST prior to specifying their use: Polyvinyl chloride (PVC) in plumbing, conduits, wire jacketing. Bisphenol A (BPA) in polycarbonate plastics, adhesives, sealants, paint, epoxies.									
MP-19	Minimize or eliminate the use of the following Persistent, Bioaccumulative and Toxic Pollutants (PBTs) or Persistent Organic Pollutants (POPs) per the 2001 Stockholm Convention to the greatest extent possible: aldrin/dieldrin benzo(a)pyrene cadmium chlordane DDT(+DDD+DDE) hexachlorobenzene lead mercury and compounds (see LEED v4 PBT Source Reduction – Mercury) mirex octachlorostyrene PBDE (polybrominated diphenyl ethers) PCBs PCDD (Dioxins) and PCDF (Furans) PVC Toxaphene .									

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
MP-20	Avoid mildewcides and antimicrobials in tile, paint, insulation, and Gypsum products. These products are not as effective as claimed.									
MP-21	Use products with improved environmental life-cycle impacts per LEED v4 Materials and Resources - Building Product Disclosure and Optimization Environmental Product Declarations (EPD's) and Environmental Ingredients. EPD's shall meet ISO standards or come from USGBC-approved programs. Use third party certifications of products such as GreenCircle, or Cradle to Cradle (C2C) Gold or better certified products. Do not use GreenScreen Benchmark 1 products.									
MP-22	Use products that are extracted and sourced in a responsible manner per LEED v4 Materials and Resources - Sourcing of Raw Materials. Raw materials shall be verified by Corporate Sustainability Reports (CSR) from third parties.									
AQ	**AIR QUALITY / GHG EMISSIONS**									
AQ-1	Reduce volatile organic compounds (VOC) by establishing a budget to reduce overall VOC's on the project. Refer to ST Chemical Management System, California Air Resouces Board (CARB) and South Coast Air Quality Management District (SCAQMD).	Required								
AQ-2	Do not use project materials that contain added urea-formaldehyde.	Required								
AQ-3	Restrict smoking to designated areas at ST Facilities during operations.	Required								
AQ-4	Provide operable windows and natural ventilation at facilities and staff areas located above ground.	Required								
AQ-5	Determine the potential presence of emissions from transit vehicles and installed equipment. Design facilities to avoid intake of fumes/emissions into occupied interior and exterior spaces.	Required								
AQ-6	Perform a building flush-out prior to occupancy. Flush-out shall be done with all furniture installed. Perform to meet LEED v4 Indoor Air Quality Assessment Option 1 - Path 1.	Required								

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
AQ-7	Design and select materials to reduce possibility for mold and mildew growth. Do not use products susceptible to water absorption or mold such as paper faced GWB. Use fiberglass faced GWB or cement board products.	Required								
C	**CONSTRUCTION**									
	CONSTRUCTION PRACTICES									
C-1	Minimize air emissions from disposal of construction spoils by reducing number of truck trips or distance traveled to disposal site.	Required								
C-2	Construction documents shall clearly define the limits of the site disturbed during construction.	Required								
C-3	Where possible, do not locate construction staging areas within 100 feet of storm water discharge areas, wetlands, streams, buffers, or other sensitive areas.	Required								
C-4	Restrict smoking to designated areas on the project site during construction.	Required								
C-5	Mitigate loss of existing alternative transportation modes during construction (e.g. bicycle facilities, sidewalks, paths, transit stops/facilities). Document temporary facilities that will be constructed during the construction phase.									
C-6	Reduce idling and institute no-idle zones at construction sites. Educate staff and sub-contractors. Provide signage and enforcement. Contractor shall self-report and track violations and successes.									
C-7	Minimize noise and vibration generated during construction and in the operation of the constructed works to maintain and improve community livability.									
C-8	NOT USED									
C-9	NOT USED									

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
C-10	Contractor to develop and implement an Indoor Air Quality Management Plan for the construction of enclosed facilities such as tunnels and tunnel stations. Meet or exceed the recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association IAQ Guidelines for Occupied Buildings Under Construction, 2nd edition 2007, ANSI/SMACNA 008-2008 (Chapter 3).									
C-11	When permanently installed mechanical systems are used during construction, filtration media with a minimum efficiency reporting value of MERV 8 shall be used at each return air grille, as determined by ASHRAE Standard 52.2-1999 (with errata but without addenda). Replace all filtration media just prior to final acceptance.									
	WATER & MATERIALS									
C-12	Use recycled or non-potable water in construction: e.g. wheel wash, dust control, etc.									
C-13	Use alternatives to impervious temporary surfaces in construction areas: Hogs fuel, quarry spall, peat, pervious pavement, etc.									
C-14	Contractor shall track water and energy usage. Contractor to provide data to Sound Transit.									
C-14A	Develop and implement a water conservation plan. Create a water conservation checklist and tracking procedures, including bill monitoring. Provide and document education and outreach to staff and sub-contractors on conservation plan implementation; provide signage.									
	OTHER									
C-15	Use temporary public art at construction sites as mitigation.	**(ST action)**								
C-16	Enhance access to business during construction and communicate this to the public. When determined by ST, include contractor's responsibility for this in contract documents.	**(ST action)**								
C-17	Inventory all **Contractor** vehicles and equipment used on site. List make, model, year, fuel type and EPA Tier, where applicable. Potential threshold: apply this to equipment used on site for more than 10 total days of use or minimum hours of use.									

			Project Incorporation			Project Impacts				
No.	**Sustainable Measures**	**Required (ST action noted)**	**Yes (include % achieved if applicable)**	**Maybe**	**No**	**Impacts capital cost? (Y/N)**	**Capital costs (include cost est.)**	**Life-cycle costs (TCO)**	**Maintenance issues**	**New or proven technology?**
C-18	Inventory all **Sub-contractor** vehicles and equipment used on site. List make, model, year, fuel type and EPA Tier, where applicable. Potential threshold: apply this to equipment used on site for more than 10 total days of use or minimum hours of use.									
C-19	Use (purchased or leased) vehicles or equipment onsite that are alternative fuel, hybrid or fuel efficient (EPA Tier 3 or 4). Track the percentage of vehicles or equipment that meet this criterion (by hours or days of operation). Potential threshold: apply this to equipment on site for more than 10 total days of use. Report shall include inventory of equipment onsite.									
C-20	Ban EPA Tier 0 vehicles and equipment from jobsite. Provide an inventory of site equipment and indicate no use of Tier 0 equipment. An exception could be granted for a certain percentage of DBE or SBE firms. Report shall include inventory of equipment onsite.									
C-21	Require electrification of most-used equipment onsite. Provide an inventory of site equipment and indicate the electrified items. Potential threshold: apply this to equipment used on site for more than 10 total days of use.									
C-22	Track fuel use for equipment and vehicles. Record monthly volume of fuel and total cost for contractor and sub-contractor.									
C-23	Provide employee incentives for reduction of vehicle use. Provide transit passes, institute a carpool/shuttle program. Track by percentage of workers who do not drive to work alone a majority of the time.									
C-24	Educate and train staff and sub-contractors on the use of certified green cleaning products. Document by percentage of total cleaning material purchases that meet the adopted target.									
C-25	Demonstrate sustainable purchasing practices for goods and/or services related to design and construction phases of the work. Purchase durable versus disposable goods, products composed of post-consumer recycled materials, post-consumer recycled content products (paper and other office supplies). Track by percentage of total purchases that meet the adopted target.									

QUALITY ASSURANCE
REQUEST FOR DEVIATION MRB DISPOSITION FORM
LYNNWOOD LINK LIGHT RAIL

Contract No.: L200/L300	Project/Contract Name: Lynnwood Link Extension	Deviation No.: LLE-042
Description: Deviation to remove the restriction on the use of galvanized material.		

MRB Member Disposition:

	Not Required	Approve	Reject	
Kerry Pihlstrom Director, Civil and Structural Design	☒	☐	☐	Date: 7/11/2018
Julie Montgomery Director, Architecture & Art	☒	☐	☐	Date: 7/11/2018
Peter Brown Director, Systems Engineering & Integration	☒	☐	☐	Date: 7/11/2018
Paul Denison Link Light Rail Operations Director	☐	☒	☐	Date: 7/11/2018
Matthew Preedy Director, Construction Management	☐	☒	☐	Date: 7/11/2018
Robert Taaffe Director, Construction and System Safety	☒	☐	☐	Date: 7/11/2018
Jeff Chou Quality Director (MRB Chairperson)	☐	☒	☐	Date: 7/12/2018

For Information Only:
Rod Kempkes, Executive Project Director

Comments:

SOUND TRANSIT DESIGN CRITERIA DEVIATION REQUEST – LYNNWOOD LINK EXTENSION

Deviation No: LLE-042 Title: Use of Galvanized Materials

Description: Deviation to remove the restriction on the use of galvanized materials

HNTB|Jacobs Project or Engineering Manager:

Jim Schettler
Print Name

Signature Indicates Approval — 7-29-18 Date

Sound Transit Corridor Design Manager:

Fouad Chihab
Print Name

Signature Indicates Approval — 6/29/2018 Date

Sound Transit DCM Chapter Owner: Owners

Doug Powell
Print Name

Signature Indicates Approval — 6/29/18 Date

Sound Transit DCM Chapter Approver: Approvers

Julie Montgomery (for Julie M.)
Print Name

Signature Indicates Approval — 6/29/18 Date

Return Documents to
Sound Transit Corridor Design Manager

Transmit to Sound Transit Quality Manager

(cc: Sound Transit Contract Package Manager, HNTB|Jacobs Engineering Manager, and Sound Transit Design Criteria Chapter Owner)

Return Documents to
HNTB|Jacobs Engineering or Design Integration Manager

Required Revision or Rejection

If at any stage in the approval process, the deviation documents require revision or rejection, please indicate as such on the applicable signature line, and return documents to Joel Theodore, Sound Transit Corridor Design Manager, or HNTB|Jacobs Deputy Contract Package Manager

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-042

5. Date of Request:	6. Criticality: Minor* X Major ☐ Critical
6/27/2018	*Minor does not require MRB Action

7. Existing DCM Requirement:	8. Proposed DCM Deviation:	9. DCM Chapter, Drawing or Spec. No.:
Do not use exterior finishes with zinc, galvanizing, lead, or copper where subject to rainwater or run-off, except where required for operational systems.	Do not use exterior finishes with zinc, galvanizing, lead, or copper where subject to rainwater or run-off, except where required for operational systems, and as follows: Galvanized steel may be used for guideway structures, such as emergency railing, drain hangers, fall protection, and miscellaneous steel where not in contact with public.	Rev 4 Chapter 30, Section 30.7, Table 30-2, Item No. MP-10

10. Requested By (Designer or RE):	11. Reference Documentation (attach):
Jerry Dorn, H|J	

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-042

12. Explanation for Deviation:

The Lynnwood Link extension team has collaborated with multiple Sound Transit stakeholders, including Operation and Maintenance, to look at ideas for improving the project quality and reducing the project cost. The LLE project proposed a deviation to allow the use of galvanized steel for the guideway guardrail, handrail, and other miscellaneous steel on the guideway as a cost savings measure. Galvanized steel reduces initial cost and will reduce the need for maintenance by eliminating painting.

Revision 5 of the Design Criteria Manual allows the use of galvanized steel for these elements. This proposed deviation meets the requirements of DCM rev 5.

This proposed deviation also does not pertain to the current (Rev 4) and proposed (Rev 5) restriction on galvanized materials in Stations (Chapter 9), specifically:

9.10.8.12 Wall and Ceiling Materials (F. Not Acceptable)

4. Galvanized painted steel

5. Galvanized railings

9.10.8.13 Canopy Structural Elements (B. Not Acceptable)

3. Galvanized steel: painted or unpainted

9.10.8.14 Canopy Materials (B. Not Acceptable)

5. Painting over galvanized steel

9.10.8.15 Miscellaneous Metallic Surfaces and Fixtures (B. Not Acceptable)

4. Galvanized steel

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-042

13. Consultant Approval of Deviation:

Acceptable [X] Not Acceptable [ ]

Gerald L Dorn 6/27/18

Architect/Engineer of Record Signature Date

JERRY DORN - STRUCTURES DISCIPLINE LEAD

(Printed Name and Title)

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-042

INSTRUCTIONS FOR

REQUEST FOR DEVIATION FORM

The Resident Engineer or the Design Engineer is responsible for the preparation of the Request for Deviation form. It is to be filled out as follows:

1. Department (i.e. U-Link, E-Link, Sounder, etc.)
2. Contract Number (i.e. RTA/LR 90-12)
3. Project/Contract Name (i.e. U240 – Capitol Hill Station)
4. Deviation Number – from RFD log (obtained from SQA)
5. Date of Deviation Request
6. Criticality; either Minor, Major, or Critical (copy from Link Design Quality Plan, Rev 0)

   1. Critical – The deviation will have a direct and significant impact on fit, function, reliability, maintainability, operability, quality, constructability, interfaces with other contracts, and/or systems safety aspects of the work product.
   2. Major – The deviation will have either a direct or indirect, but not a significant impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product.
   3. Minor – The deviation will have no direct or indirect impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product. This classification is sometimes for cosmetic issues, equivalent substitutions not specifically allowed by specification or non-technical issues.

   - Deviations classified as "Critical" or "Major" require MRB approval prior to incorporation into the work.
   - Deviations classified as "Minor" require only the Architect/Engineer of Record (A/EOR) and MRB Chairperson's approvals prior to incorporation into the work.

7. Description of the **existing** Design Criteria Manual (DCM) requirement in 10 words or less. (Provide DCM chapter reference in item #9 herein)
8. Description of the **proposed** Design Criteria Manual (DCM) deviation in 10 words or less
9. Design Criteria, Drawing or Spec Number where requirement is noted
10. Name of Designer, or RE requesting deviation
11. Reference Documentation attached
12. Reason for the Deviation
13. Approval Signature of the Architect/Engineer of Record (A/EoR) and Date (an attached letter of approval from the A/EoR must be provided)

Schwaegler, Jack

From: Powell, Doug
Sent: Wednesday, June 27, 2018 7:59 AM
To: Schwaegler, Jack
Cc: Chihab, Fouad; Dorn, Jerry; Schettler, Jim; Montgomery, Julie
Subject: RE: RFD LLE-042 Use of Galvanized Materials

No concerns. This is all consistent with changes we have made to DCM Rev. 5.
Doug

From: Schwaegler, Jack
Sent: Tuesday, June 26, 2018 4:40 PM
To: Powell, Doug <doug.powell@soundtransit.org>
Cc: Chihab, Fouad <Fouad.Chihab@soundtransit.org>; Dorn, Jerry <jerry.dorn@soundtransit.org>; Schettler, Jim <jim.schettler@soundtransit.org>
Subject: FW: RFD LLE-042 Use of Galvanized Materials

Hi Doug,

I've been working with Fouad to modify RFD LLE-042 Use of Galvanized Materials. It now is more explicit about where these materials may be used (guideway), as well as where they will not be used (stations). Could you please give it another review, and let me know if you have any concerns or questions?

Thanks, -let me know if you need any more info regarding this.
Jack

From: Powell, Doug
Sent: Thursday, June 21, 2018 9:45 AM
To: Schwaegler, Jack <Jack.Schwaegler@soundtransit.org>
Cc: Dorn, Jerry <jerry.dorn@soundtransit.org>; Schettler, Jim <jim.schettler@soundtransit.org>; Montgomery, Julie <Julie.Montgomery@soundtransit.org>
Subject: RE: RFD LLE-042 Use of Galvanized Materials

Jack-
Julie is out of the office. I no questions or concerns.
Doug

From: Schwaegler, Jack
Sent: Wednesday, June 20, 2018 10:10 AM
To: Powell, Doug <doug.powell@soundtransit.org>; Montgomery, Julie <Julie.Montgomery@soundtransit.org>
Cc: Dorn, Jerry <jerry.dorn@soundtransit.org>; Schettler, Jim <jim.schettler@soundtransit.org>
Subject: RFD LLE-042 Use of Galvanized Materials

Hello Doug, Julie,

Attached is a deviation for the use of galvanized materials, modifying Chapter 30, which would be consistent with the new Rev 5 of the DCM. Please see attached email from Jon Jordan, giving us direction to pursue this deviation, and the Deviation itself. Let me know if you have any concerns, or questions.

Thanks,
Jack

Jack Schwaegler, P.E., CCM
Design Integration Manager
Sound Transit Lynnwood Link Extension

HNTB Jacobs trusted design partners

HNTB|Jacobs Trusted Design Partners
401 South Jackson Street
M/S 705 11-001
Seattle, WA 98104

206-398-5196 (office)
206-200-8732 (mobile)
jack.schwaegler@soundtransit.org

Schwaegler, Jack

From: Weston, John
Sent: Thursday, June 28, 2018 4:48 PM
To: Schwaegler, Jack
Cc: Chihab, Fouad; Schettler, Jim; Denison, Paul
Subject: RE: RFD LLE-042 Use of Galvanized Materials

Operations has reviewed the proposal and deemed it acceptable. Please ensure this proposal is submitted to the Material Review Board (MRB) for final approval.

Thanks!

John Weston
Corridor Operations Director (North Corridor)
and
(Acting) Deputy Director
Facilities Capital, Maintenance
& NRV Programs
Operations Department
Sound Transit

t] 206-398-5476
c] 206-251-0161
e] john.weston@soundtransit.org

From: Schwaegler, Jack
Sent: Wednesday, June 27, 2018 12:29 PM
To: Weston, John <john.weston@soundtransit.org>
Cc: Chihab, Fouad <Fouad.Chihab@soundtransit.org>; Schettler, Jim <jim.schettler@soundtransit.org>
Subject: FW: RFD LLE-042 Use of Galvanized Materials

Hi John,

Here is another Request For Deviation, regarding the use of Galvanized material in specific locations. Please review, and let me know if you need any further info.

We need your concurrence on this to move it forward, so your prompt attention would be greatly appreciated.

Thanks,
Jack

From: Powell, Doug
Sent: Wednesday, June 27, 2018 7:59 AM
To: Schwaegler, Jack <Jack.Schwaegler@soundtransit.org>
Cc: Chihab, Fouad <Fouad.Chihab@soundtransit.org>; Dorn, Jerry <jerry.dorn@soundtransit.org>; Schettler, Jim <jim.schettler@soundtransit.org>; Montgomery, Julie <Julie.Montgomery@soundtransit.org>
Subject: RE: RFD LLE-042 Use of Galvanized Materials

No concerns. This is all consistent with changes we have made to DCM Rev. 5.
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Subject: FW: RFD LLE-042 Use of Galvanized Materials

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Thanks,
Jack

Jack Schwaegler, P.E., CCM
Design Integration Manager
Sound Transit Lynnwood Link Extension

31. PARKING FACILITIES

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FIGURES

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31. PARKING FACILITIES

31.1 INTRODUCTION

Public parking at some Sound Transit facilities may be necessary to provide adequate access for Sound Transit customers. In 2013, the Sound Transit Board approved motion M2013--03, establishing policies to define and regulate the uses that are permitted and those that are prohibited at Sound Transit's parking facilities. The Sound Transit Board also approved resolution R2012-24 Transit Oriented Development Policy establishing direction to consider station area development. The design, layout and ultimate use of parking facilities shall be consistent with these policies. Local codes also shall be considered to help ensure acceptance of design and layout of parking facilities.

Sound Transit structured parking facilities, when provided, become an integral part of the transit user's system experience. Access to and egress from these facilities becomes the first and last experience of the transit user's trip. Access, layouts, and design should be clear, logical and support access to and from the adjacent station. Parking should be located and designed to integrate into the surrounding community, minimize impacts on traffic patterns, and minimize impacts on the environment.

At Sound Transit's discretion, parking facilities may be provided on Sound Transit-owned property, provided by third parties in partnership with Sound Transit, or leased by Sound Transit on other properties.

Parking demand at Sound Transit parking facilities may change as the Light Rail System expands. Once the Light Rail system expands, and the terminus of a line changes, the parking demand may decrease significantly. A station's interim terminus condition may require corresponding temporary parking strategies such as combinations of structured parking and surface lots, lease of adjacent property, or jurisdictional agreements, etc. Sound Transit will determine which strategy works best for the interim condition at a particular station.

Sound Transit's primary mission is providing high capacity transit to the region. Sound Transit strives to do so in a manner that anticipates adjacent station area development and integrates with local jurisdiction urban plans. Jurisdictions may impose additional requirements on surface parking and structured parking that require integration into the design and budget of a parking facility project. These potential requirements shall not interfere with the quality of the Sound Transit transportation system.

31.2 CODES AND REFERENCE STANDARDS

Parking Facilities described in this chapter are subject to codes and reference standards as specified in Chapter 1 of the Design Criteria Manual (DCM). This includes, but is not limited to, codes and standards adopted by the Authority Having Jurisdiction (AHJ). All parking layouts shall be in compliance with all relevant codes.

The design of facilities described in this chapter shall also incorporate applicable elements of all Sound Transit DCM Chapters. In the case that a regulation by the AHJ conflicts with an element of the DCM, the AHJ has the authority of a final interpretation. If ST and the AHJ agree on a deviation from an AHJ regulation, a Letter of Concurrence (LOC) between the AHJ and ST shall be obtained.

31.3 PARKING FACILITES

Per Chapter 9 of the DCM, Sound Transit will consider meeting the parking demand with parking facilities where projected parking demand exceeds 200 vehicles, where land value is high, or where land is limited. Sound Transit has the authority to determine if the preference for a parking facility at a particular site is to provide a surface lot or a structured garage. This chapter describes ST's requirements for both structured and surface lot parking facilities.

31.3.1 Types of Parking Required

Parking facilities shall accommodate parking for the following (in order of priority):

A. Individuals with disability

1. ADA van accommodation and drop-off area shall be located in the most direct access route to the station entry or elevator. (Unless ADA parking is located elsewhere on the site outside of the structured parking facility).

2. Accessible parking shall be provided at all facilities where parking is provided, in accordance with requirements of ADA Standards, the Washington State Building Code, and requirements of the AHJ.

3. Accessible spaces shall be located along the shortest possible route to the elevators if parking is not located at the station entry level.

B. High Occupancy Vehicles (Carpools and vanpools) – Provide at ST direction (Chapter 30 – Sustainability)

C. Low emission fuel efficient vehicles (LEFE) and electric vehicle charging stations – Provide at ST direction (see Sections 23.8 and 30.6, Table 30-1)

D. Motorcycles – Provide motorcycle parking stalls at parking facilities. Locate motorcycle parking in areas created by the lot layout that would otherwise not be useable for parking cars wherever possible.

E. Shared car services (i.e. Zip Cars) – Provide at ST direction (see Chapter 30 – Sustainability)

F. Where Paratransit services are located within parking lots or garages, provide requirements to meet ADA Standards. See Chapter 9 for additional requirements for the loading area and patron waiting areas.

G. Passenger Pick-Up and Drop-Off

4. Stalls and aisles for pick-up and drop-off areas shall be larger than those for park and ride areas due to the frequent use of short-term parking.

5. Per ADA Standards, provide space for passenger loading zones to unload persons with disabilities. Location of these zones shall not interfere with others using the pick-up and drop off zone.

6. Avoid routing pick-up and drop-off vehicles through the parking lots and parking garages.

7. Parking arrangements, in order of preference, for pick-up and drop-off areas are as follows:

a. Parallel to curb

b. 45 degrees to the aisle; drive through preferred

c. 60 degrees to the aisle; drive through preferred

d. 90 degrees to the aisle; drive through preferred

1. Parking stalls parallel to the curb shall be 10 feet wide and 21 feet long except that beginning and ending stalls may be 20 feet. Parallel parking spaces shall maintain a minimum of 20 feet from pedestrian crosswalks.

2. See Chapter 9 - Stations for preferred location of pick-up and drop off at station areas.

H. At ST direction, locate a designated permit parking area. Quantity of stalls to be provided by ST.

I. If bicycle storage is required ST will provide the appropriate types and quantity of storage facilities to be provided in the parking facility. (see Chapter 9 – Stations and Facilities for bicycle storage requirements)

J. Single occupant vehicles

31.3.2 Characteristics of Parking Facilities

A. Facility design shall include features that will allow future installation of parking management systems as directed by Sound Transit. See Section 31.5.

B. Facility design shall optimize site potential for station area Transit Oriented Development, local AHJ area plans and overall urban design impacts of the facility. TOD parking shall not reduce the available required transit parking spaces.

C. The design of structured parking shall consider potential opportunities for expansion as directed by Sound Transit including identification of potential locations for a temporary surface lot while system expansion takes place.

D. The design shall consider potential adaptive reuse of portions of the facility over time in relation to local AHJ planning and TOD opportunities. This may include designating level floor plates and increased clearances in certain areas.

E. Parking Layouts

1. Parking geometrics are based upon the Carl Walker “Guidelines for Functional Parking Design” current version. Structured parking facilities shall provide a minimum User Comfort Factor (UCF) of 2 and a minimum traffic Level of Service (LOS) of C – Acceptable. One size fits all designs are preferred, consisting of 100% standard size stalls. A standard stall shall be 18 feet deep and 8.5 feet wide for standard vehicles with a minimum of a 24 foot two-way traffic drive aisle. Stalls oriented 90 degrees to drive aisles are preferred for efficiency. No compact stalls shall be utilized.

2. Dimensional adjustments: One foot of width shall be added to any space adjacent to a wall, column, pilaster, shaft or barrier. No structural elements shall impinge on required parking stall size.

3. The end bay travel turning aisle width shall be increased by an additional two feet above the driving aisle width.

4. Motorcycle stall sizes shall be 4 feet by 8 feet with maneuvering lanes of at least 10 feet in width.

5. Parking layouts shall be in accordance with local jurisdictional requirements.

6. Within parking lots, finish grade of landscape areas between parking aisles shall not slope up within three feet of the curb or wheel stop so that damage to plantings and irrigation from car overhang will be avoided.

F. Service and Transit Security Vehicle Parking – See Chapter 9.

G. Passenger Drop-off Areas

1. Refer to Chapter 9 - Stations for additional standards and materials requirements.

2. Designers should avoid routing passenger drop-off vehicles through the parking facility unless site constraints make a separate route infeasible.

3. If drop-off areas are provided in, or circulate through, a parking facility, placement should avoid conflicts with traffic entering and exiting the longer-term parking areas. Consider access of drop off vehicles in conjunction with future parking management system control.

4. Stalls and aisles for passenger drop-off areas should be larger (9'-0" x 20'-0" when pull in and 8'-0" x 22'-0" when parallel) than those in long-term parking areas due to the frequent turnover of short-term parking, provided that the required number of regular parking stalls is not reduced. ADA requirements shall be accommodated within the passenger drop off stall quantities.

H. Cable barrier railings used for vehicle barriers shall only be utilized with ST approval. When cable barriers are utilized as vehicle barriers, they shall be engineered by the engineer of record, meet all code requirements, integrate pedestrian guardrail requirements, be provided with wheel stops or curbs or railing mounted bumper / hitch barrier, and have a treatment that allows visibility to drivers. When cable barrier

railings are used as pedestrian guard rails they shall meet all code requirements.

I. The parking facility shall be appropriately illuminated. See section 31.3.10 of this chapter and Chapter 21 - Lighting.

J. The design of the parking facility shall incorporate CPTED design guidelines. Refer to Appendix C and Chapter 29 - Security.

31.3.3 Characteristics of Structured Parking Facilities

A. Parking garages shall be "open" structures, as defined by and in accordance with the requirements of the International Building Code (IBC).

B. Minimum clearance on each floor of a parking garage shall be 7 feet, 2 inches on standard levels and 8 feet, 2 inches on the levels where ADA van accessible stalls are located and along the travel path the ADA vans will use to reach these stalls. Clearance means clear of any obstruction inclusive of signage, sprinklers, lighting conduit, piping etc. Where retail spaces are to be accommodated, higher floor to floor heights shall be determined based on individual project requirements. (Note: required clearance for public transit access-program vehicles is much greater than 8 feet, 2 inches. Typically, these vehicles collect or deliver passengers at bus stops. However, if site constraints require such vehicles to enter a parking garage, refer to governing codes and contact local transit agencies to determine required clearance along their travel path.)

C. Parking garage ramp grades shall be no more than 5% where parking is placed along the ramp and no more than 15% where ramps are separate from parking (speed ramps). Any ramp steeper than 8% shall be provided with minimum ten-foot long transitions at the top and bottom of the ramp. Parking structures designed to allow parking on ramp surfaces are preferred as they are more efficient than parking structures with level parking bays and separate vertical circulation ramps. Larger parking structures should be evaluated if the use of speed ramps will increase circulation efficiency. The use of speed ramps requires prior approval by ST.

D. Where feasible, and given site constraints, parking structures shall be designed so as to minimize the use of earth-retaining structures. Where structures are below grade, waterproofing shall be provided to control water seepage into the garage.

E. Garage facilities shall have means to be secured during non-transit hours. Overhead grilles or sliding gates shall be provided at vehicle entrances. Pedestrian access doors shall have the ability to be locked and vehicle entries shall be secured with motorized roll-up grilles. These shall be remotely monitored and allow emergency egress.

F. Parking and drive aisle surfaces within garages should be designed to be easily cleanable and slip resistant. The coefficient of friction shall meet ADA Standards requirements where applicable.

G. Provide rumble strips or raised table areas at garage entries to encourage vehicles to slow down as they enter and exit structured parking facilities. Consider these measures at major pedestrian crossings as well.

H. Ground floor pedestrian access shall be limited to designated entry ways.

I. Below grade walls shall be provided with waterproofing and drainage systems.

J. Provision for two designated ST service vehicle parking spaces 9 feet wide by 20 feet long shall be made on the level providing ADA clearance proximate to the elevator machine, electrical and/or communications rooms. When provided, they shall be considered in conjunction with service vehicle parking as required by Chapter 9 – Stations.

K. Provide a secure trash enclosure area for two 4 cubic yard dumpsters; one for trash and one for recycling. This is in addition to the station trash enclosure. See Chapter 9 - Stations. Screen dumpsters from view or locate within a room that can be easily hosed down. Provide a pair of 3 foot wide doors or gates. If leased spaces are provided within or adjacent to the garage, another separate dedicated trash/recycle area shall be provided for additional dumpsters. Size the additional dumpster area based on leased space available. Lock each trash area separately from other trash enclosures on site.

L. Provide one 100 square feet Storage room with a minimum 15 lineal feet of shelving for storage of materials and an open floor area to store cleaning equipment. Access door to be 40 inch wide minimum or a pair of 3 foot wide doors. Locate near most accessible entrance to pedestrian plaza with easy access to door from a drive aisle. Storage room to be separate from Janitor's room.

M. When retail spaces are accommodated as part of the facility, provide one 80 square foot Janitor's Room with janitors mop sink, emergency eye wash, and wall shelving. Access door to be 40 inch wide minimum or a pair of 3 foot wide doors.

31.3.4 Structured Parking Architectural Elements

A. Structured Parking Facilities shall be designed to integrate with the local urban context and local AHJ area plans. Consideration shall be given to impacts and benefits for future TOD development.

B. Provide secure open screening at all levels directly adjacent to grade in order to prevent people from entering the garage except at designated entries. Screen upper floors of the garage as necessary to create a structure that fits within the neighborhood and meets AHJ requirements. When screening is provided on exterior facades, it shall maintain the open garage designation and balance impacts on interior day lighting.

C. Planted screen walls are not preferred due to maintenance and security reasons.

D. Minimize field painted finishes. All elements of the garage shall be considered an exterior exposure application for purposes of coatings or finishes. Where conditioned rooms are provided, those areas should be painted with a durable finish.

E. The underside of all concrete decks and beams shall be stained white with a pigmented stain or pigmented sealer for optimal light reflectance.

F. Utilize only durable, non-combustible, low maintenance materials. Preferences are for stainless steel, glass, aluminum, concrete, CMU, brick, etc. See Chapter 9 - Stations and Ch 30 - Sustainability for additional standards and material requirements.

G. Interior partitions exposed to the parking garage environment shall be CMU or CIP walls. With prior approval from Sound Transit, metal stud frame walls on 6 inch concrete curbs with cement board finish may be utilized in areas not subject to vehicular traffic nor in public spaces.

H. Use of light wells to provide open air garage and allow daylighting are encouraged.

I. Photovoltaic panels shall be considered for façade screening or at roof level when appropriate to the orientation and context of the facility.

31.3.5 Vertical Pedestrian Circulation within Parking Garages

A. Elevators shall be provided for passenger access to the ground from all parking floors. Refer to Chapter 25 - Elevators & Escalators. Requirements for fire department access and ambulatory evacuation shall be per the AHJ.

B. Stair towers and elevators shall be appropriately located. The stair tower providing the most direct access to the station shall be designed as a public stair and remain open during transit operating hours. The main stair shall be screened or glazed and have weather protection from above. The public stair, elevators and parking payment areas at the top deck of the garage shall be covered and have full height windscreens or walls to create a lobby area protected by windblown weather. No man-doors are required at the lobby area. Additional stair towers shall be constructed for emergency exiting to meet code and security requirements.

C. Stairs and landings exposed to the elements shall have the appropriate slopes for drainage to avoid water ponding and freezing.

D. All stairs to be secure at ground level to prevent unauthorized entry. Structure for stairs and elevators that are separate from the main garage may be of structural steel construction to increase openness. Cast-in-place or precast concrete treads/risers and landings are required. Metal pan concrete filled stair construction is prohibited. Exposed stairs with no canopy coverage shall have stainless steel guardrails and handrails secured to stainless steel embeds. No painted finishes are allowed in exposed stairs. No bike runnels are required at garage stairs unless the main stair accesses a pedestrian or bike path on a different level than grade.

E. See Chapter 9 - Stations for public and exit stair requirements and materials and finish requirements.

31.3.6 Site Design and Access to Parking Facilities

A. Parking Facilities shall be sited and access designed to anticipate, integrate and support subsequent Transit Oriented Development when feasible.

B. Vehicular access to and from any lot shall minimize interference with street traffic.

C. Station sites with more than 600 parking spaces shall contain more than one exit to the local street system. Multiple exits should be considered to reduce traffic congestion within the facility.

D. Where differing grade is present and the street system supports it, distribute access over different levels.

E. Vehicle entrances and exits shall be located away from street intersections. Obtain traffic analysis to determine the peak hour vehicle queuing requirements and accommodate the most efficient access locations.

F. Site grading for parking areas shall confirm to grading in Chapter 6.

G. Sidewalk grading shall confirm to Chapter 6

31.3.7 Stormwater and Utilities

A. Design for LID and on-site storm water capture and reuse to the greatest extent possible as specified in Chapter 6 – Civil.

B. Irrigation systems shall be provided in accordance with Chapter 10 – Landscaping, Chapter 24 – Plumbing and Fire Protection Systems, and Chapter 30 – Sustainability.

C. Where LID cannot be accommodated, drainage shall be designed so that storm water is removed by overland flow to a gutter, or curb and gutter, then to an inlet where the water will enter a closed drainage system. Overland flow shall be as specified in Chapter 6 – Civil. Provide on-site runoff treatment to the fullest extent feasible.

1. Drainage designs of on-site facilities requiring review and approval by jurisdictional agencies shall be submitted in accordance with the procedures established by the respective agencies.

2. Drainage and connections to off-site drainage systems shall be designed in accordance with the criteria of the respective AHJ.

3. All construction, relocation, and restoration of storm sewers and drainage facilities and maintenance of existing facilities during construction shall conform to the design standards of the respective governing agencies. Refer to Chapter 6 – Civil Work.

4. Eliminate or reduce the amount of metal contaminates entering storm water by eliminating galvanizing of materials subject to runoff

and eliminating or mitigating other metal finishes that create contaminates due to runoff. Refer to Chapter 30 – Sustainability.

D. Oil water separators, water quality vaults and water detention facilities shall be located on the exterior of the garage to allow for service truck access. Site utilization shall be balanced against preservation of potential Transit Oriented Development.

E. Parking structures shall be provided with all utilities services separate from the Station and the TPSS. Should leased uses, such as retail, be included as part of the facility's construction, utilities shall be separately metered. ST to direct whether this separation is achieved with sub-metering or supplemental services.

F. Any new construction and the support, maintenance, and restoration of existing utilities shall be in conformance with the latest technical specifications and practices of the governing utilities or public agencies. Refer to Chapter 7 – Utilities.

G. Utility features shall be secure and protected from public access to prevent vandalism, unless otherwise directed by the utility owner.

31.3.8 Structural Requirements for Parking Garages

A. Comply with the International Building Code (IBC), as adopted and amended by Washington State and/or the local jurisdiction, and comply with Chapters 8 – Structural and 8A – Seismic Design.

B. Columns should be located between adjacent rows of stalls, along the front bumper of cars. Columns should preferably maintain a minimum clear span of 60 feet, in the transverse direction, to accommodate two parking stall rows with a drive aisle between the rows.

C. Below grade sections of garage structural frame shall be disengaged from retaining walls.

D. The material for construction of garages is cast-in-place concrete. Steel, pre-cast concrete or hybrid structural systems are not allowed in Sound Transit parking structures.

E. Special reinforced concrete moment frames are the preferred lateral load resisting system. When using moment frames, the designer should consider using upturned moment frame beams which can be used as vehicle barriers.

F. One-way post-tensioned slabs are the preferred structural system for parking decks. Closure pours between pour breaks shall be a minimum of 3'-0" wide and shall remain open a minimum of 28 days after stressing both sides of the slab.

G. The maximum shrinkage limit for parking deck slabs shall be 0.035% at 28 days. For closure pours, the maximum shrinkage limit shall be 0.025% at 28 days. Shrinkage tests shall be performed in accordance with ASTM C157. All measurements shall be recorded and submitted with the laboratory report to the Engineer and Sound Transit for review prior to construction.

H. Special consideration shall be given to concrete mixing, curing and sealing. All curing procedures and mix designs shall be approved by Sound Transit. Immediately after placing concrete slabs, apply evaporation reducer per manufacturer's recommendations. Immediately after finishing, apply liquid membrane-forming curing compound at a rate recommended by the manufacturer.

I. A penetrating sealer with minimum 100% silane solution shall be applied to all concrete decks and concrete wall surfaces to 4'-0" above the deck. Additionally, all concrete surfaces exposed to rain shall be sealed.

J. All decks shall have a minimum slope of 1.5 percent for drainage. Roof decks shall have a slope of 2 percent and comply with ADA. Provide sloped surfaces at obstructions to provide positive drainage in all areas.

K. All concrete in parking garages shall be considered exposed to weather. Concrete top deck or other exposed/uncovered decks of parking structures shall be constructed with hydrophobic admixture concrete. (Hycrete W1000 or approved equal).

31.3.9 Mechanical, Plumbing, and Fire Protection Systems for Parking Garages

A. If required, mechanical ventilation for parking garages shall be controlled with CO sensors.

B. Back of house areas shall be conditioned in accordance with Chapter 20 – Heating, Ventilation and Air Conditioning.

C. Utility provisions: one lockable wall mounted hose bib per level at the main vertical circulation core. Locate floor drain at this location. Provide one lockable wall mounted hose bib at each exterior façade and one at the dumpster enclosure.

D. Drainage shall be provided on all levels of the garage for cleaning, and for tracked in and windblown rain.

E. Provide fire protection in accordance with local building codes and Chapter 24 – Plumbing & Fire Protection Systems.

F. ST prefers that parking structures do not incorporate fire sprinkler systems unless required by local building codes. Obtain a letter of concurrence from the AHJ as necessary.

G. Fire alarm systems shall be considered an exposed exterior installation.

H. The parking structure shall be provided with all mechanical, plumbing and fire protection services independent from the Station and the TPSS. Should leasable space, such as retail, be included as part of the facility construction, they shall be tied to separate metering and connections. ST to direct whether this separation is achieved with sub-metering or supplemental services. Fire alarm controls shall be located accessible to the leased spaces without entering ST controlled spaces and coordinated with Sound Transit Refer to Chapter 7 – Utilities for submetering.

I. Provide fire alarm system per Chapter 22 – Fire Alarm Systems except that LCC shall not be the proprietary supervising station. Provide a third party UL approved monitoring service per the code or as approved by the AHJ and ST. As a result pull stations shall be used in public places in addition to CESs. Fire Alarm Panel shall be located in non-public areas and not allow public access.

J. All mechanical installations shall be considered an exposed exterior application.

31.3.10 Electrical and Lighting Systems

A. Exposed, publically accessible panels and distribution equipment is not allowed. Within parking structures, conduits shall be concealed within the structure. Minimum concrete coverage shall not be reduced at conduit locations.

B. Lockable Electrical Receptacles to be provided in accordance with Section 23 – Electrical Systems.

C. The requirements for a light color or white ceiling within the parking garage are to increase the reflectance of light source from fixtures and shall be modelled as such in the lighting design calculations.

D. Illuminance levels, including that for emergency lighting, shall comply with DCM and AHJ requirements. The open top deck of the garage shall comply with surface parking lot light levels. See Chapter 21 – Lighting and Facility Lighting Standards and Chapter 29 – Security.

E. At parking garages, all emergency lighting shall be provided per code. The emergency lighting duration is 90 minutes. Provide a central emergency lighting inverter meeting Article 700 of the National Electrical Code.

F. All parking garage lighting shall be placed above drive aisles or areas that are accessible at all times. No lights shall be located above parked vehicles in order to allow daytime maintenance of fixtures.

G. Provide daylight control for lighting based upon parking garage level and daylight zone.

H. LED lighting is required in public areas for reduced energy use and ease of maintenance.

I. All electrical installations shall be considered an exposed exterior application.

J. The parking structure shall be provided with all electrical services separate from the Station and the TPSS. Should leasable spaces, such as retail, be included as part of the facility construction, they shall be tied to separate metering and connections. ST to direct whether this separation is achieved with sub-metering or supplemental services. Electrical panels for leasable spaces shall be accessible to those uses without entering ST only spaces. Refer to Chapter 7 – Civil for submetering

K. Provide electrical and lighting systems per Chapter 21 and Chapter 23.

31.3.11 Building Management, Communications, and Security Systems

A. Chapter 15 – Communications and Central Control provides additional information on accommodating technology at passenger facilities. The following sections identify design standards to address potential use of technology at parking facilities.

B. A closed circuit television (CCTV) system providing full coverage of all public areas, parking areas, vehicle and pedestrian entries and exits to the site and structure, and full perimeter of parking garage shall be

provided. Camera positions and types shall enable recording of vehicle license plate numbers entering and exiting the garage.

C. Customer Emergency Stations (CES) shall be installed at all parking garage facilities main pedestrian access points and on all floors of parking garages. Passenger Emergency Telephones (PET) shall be provided at all pedestrian access points at surface parking lots. Refer to Chapter 29 - Security. Provide for the installation of Cisco phones in Parking Garages in all back of house areas in accordance with Chapter 15.

D. For parking garages, provide a complete non-proprietary Building Management System (BMS). BMS shall provide control and monitoring of the following typical garage systems including but not limited to HVAC units, lighting control panel, vertical transportation and associated sumps, FACP, irrigation system, UPS systems and any additional systems as required by ST. BMS shall be integrated into the existing ST Facilities BMS headend. Typical method of integration is “Bacnet” for field device communication to field controller. If method of integration is different than Bacenet, alternative method must be approved by ST. Note, parking garage BMS systems shall not interface with ST SCADA HMI (LCC), however it shall have the capability. The parking garage BMS shall be separate from the Station BMS system. Provide one Communications room for parking garage for all communications equipment located in the garage, and the Building Management System.

E. All communications installations outside of the communications room shall be considered an exposed exterior application.

31.3.12 Pavement Markings

A. Pavement markings such as disabled person symbol, arrows, yield, and other markings, shall be per the City of Seattle Pavement Markings Standard Plan 700 series. “Thru” and “turn arrows” shall be 8’ long. “Thru/turn combination arrows” shall be 13’4” long.

B. Font for parking lot letters/numbering shall be FHWA 2000 Standard Edition font collection, Highway Gothic, D (Modified)-Series (Reference 5.12).

C. Parking Stall Numbering – Provide sequential stall numbering in order to facilitate parking enforcement and accommodate future payment systems. Stall numbering shall start at the lowest parking level, continuing sequentially to the top deck, and then continue to site parking

lots (as applicable). Each stall number shall consist of four digits and shall begin with "0001" unless otherwise directed by Sound Transit.

31.4 WAYFINDING GRAPHICS AND SIGNAGE

A. Wayfinding graphics and signage to and within the facility shall be provided. Coordinate signage mounting heights to ensure visibility over parked cars.

B. Within multi-level parking facilities, a parking wayfinding graphic system is required to identify level, aisle/row, and parking space. The system may include color coding and/or thematic imagery to identify parking zones. Colors, color contrast, icons, and fonts of parking wayfinding system shall match Sound Transit customer signage and meet ADA requirements. Quality of materials, and level of graphic design shall be no less than the standards established by the ST Customer Signage Manual. Painted concrete is not acceptable for informational or text based signage but may be considered for graphic communication with or without characters.

C. Parking facilities shall contain relevant Sound Transit standard customer signage. See Sound Transit Customer Signage Design Manual and Chapter 9 Station Signage for customer signage requirements for specific sign types mentioned below.

D. Parking facilities shall have station identification signage (A-type signs), regulatory (R-type signs) and guide signage (G-type signs). Signage shall also include, but not be limited to, pedestrian directional (D-type signs), customer information (C-type signs), bus/paratransit (E-type signs), hours of operation (F4.B), relevant ADA tactile signage (F3.A), and signage for programmed amenities (F-type signs). For vertical circulation, F3.A shall be located near elevator call buttons.

E. At each vehicular garage entry provide an A-type facility identification sign, R4 Parking Rules, and F4.B Hours of Operation, including when gates will be locked, that is visible from outside the gates. Coordinate location of future overhead electronic message sign. If an architectural facility name sign is being provided, an A-type facility identification is still required. Coordinate facility signage in perpendicular orientation to the street for maximum visibility. At pedestrian entries/exits provide F4.B Hours of Operation, R4 Parking Rules and F3.A tactile.

F. Provide directional signage within the garage for both vehicles and pedestrians to communicate pathway to station, entries/exits, specialty parking, bike storage (if provided in garage), and vertical circulation that is coordinated with the garage wayfinding system. Provide G-type signs for vehicles and D-type signs for pedestrians. Overhead sign types are

preferred. Place vehicle and pedestrian signs consistently throughout the garage. Cluster like signage together, vehicle or pedestrian, to decrease visual clutter.

G. For the top level of a structured parking facility that is open-air, location of wayfinding graphics and signage may be reduced or eliminated due to limited attachment surfaces, such as light poles and vertical circulation areas. Speed limit and regulatory signage is still required.

H. Provide four (4) C-type customer information panels at main public pedestrian access to station near vertical circulation. Provide space at each future parking payment area for one (1) C-type customer information panel.

I. Relevant regulatory R-type signage shall be used within the garage. Regulatory signs R1.C and R4 are required in all parking facilities.

J. Provide signage at each area of dedicated specialty parking such as ADA, HOV, LEFE, EV charging stalls, motorcycles, and shared car services. ADA and EV stalls require signage at each parking stall.

K. For parking stalls with access to an electric vehicle charging station, provide one sign at the head of each stall attached to the wall or post mounted and stencil the pavement as shown in Fig. 31-1 and Fig 31-2.

Figure 31-1: 12”X18” ELECTRIC VEHICLE WALL OR POST MOUNT STALL SIGN

Figure 31-2: 48" X48" ELECTRIC VEHICLE PAVEMENT STENCIL WITH 4" WIDE BORDER

L. Provide necessary code/room signage, MUTCD signage (speed limit signs, stop signs, etc.), and clearance height bars. Clearance height bars to be located at all entrances and any internal ramp leading to a level with a change in clearance height. See Ch 11 – Traffic.

31.5 PARKING MANAGEMENT

A. Provide accommodations for future parking payment machines. Provide accommodation for future patron payment machines at the main pedestrian exits of each level of the parking structure along the access route to the station. Quantity of machines per floor to be provided by Sound Transit. Include one CES at each payment machine area. Provide electrical and data conduits with pathway to electrical and communications rooms. Include one trash can and one recycle can at future parking payment areas.

B. Provide accommodation for future overhead electronic signage at the main pedestrian entry/exits and main vehicle entries. Provide electrical and data conduits with pathway to electrical and communications rooms.

C. Provide a vehicle counting system. Integrate recessed loops at all entry and exit lanes. Provide a conduit pathway to the communications room.

END CHAPTER 31

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION MRB DISPOSITION FORM
LYNNWOOD LINK LIGHT RAIL

Contract No.: L200/L300	Project/Contract Name: Lynnwood Link Extension	Deviation No.: LLE-008
Description: Allows inclusion of compact stalls in parking garages; Allows for reduced drive aisle width in parking garages; Allows limited intrusion of structural elements into parking stalls.		

MRB Member Disposition:

	Not Required	Approve	Reject	
Kerry Pihlstrom Director, Civil and Structural Design	☐	☒	☐	Date: 10/17/2017
Julie Montgomery Director, Architecture & Art *(Approved by Moises Gutierrez, Deputy Executive Director, DECM)*	☐	☒	☐	Date: 10/10/2017
Peter Brown Director, Systems Engineering & Integration	☒	☐	☐	Date: 10/9/2017
Paul Denison Link Light Rail Operations Director	☐	☒	☐	Date: 10/26/2017
Matthew Preedy Director, Construction Management	☒	☐	☐	Date: 10/9/2017
Mohammad Saleem Deputy Director, SQA (MRB Chairperson)	☐	☒	☐	Date: 10/27/2017

For Information Only:
Rod Kempkes, Executive Project Director

Comments:

SOUND TRANSIT DESIGN CRITERIA DEVIATION REQUEST – LYNNWOOD LINK EXTENSION

Deviation No: LLE-008 **Title:** Parking Garage Layout

Description: Allows inclusion of compact stalls in parking garages; Allows for reduced drive aisle width in parking garages; Allows limited intrusion of structural elements into parking stalls.

HNTB|Jacobs Project or Engineering Manager:
Print Name
10/5/2017
Signature Indicates Approval Date

ST DCM Chapter Owner, DECM: Hyperlink
Print Name
N/A – DEFERRED TO MOISES GUTIERREZ
Signature Indicates Approval Date

ST Corridor Design Manager, DECM:
Joel Theodore
Print Name
10/6/2017
Signature Indicates Approval Date

DEPUTY EXC. DIRECTOR, DESIGN ENGR
~~ST Director Civil and Structural Engineering, DECM:~~
~~Kerry Pihlstrom~~ MOISES GUITIERREZ
Print Name
N/A. SIGNATURE NOT REQUIRED
Signature Indicates Approval Date

Return Documents to
Consultant
Deputy Contract Package Manager
Bryan Williams

Transmit to ST Quality Manager
(CC: ST Contract Package Manager, H|J Engineering Manager, ST Design Criteria Chapter Owner, ST Corridor Design Manager)

Return Documents to
ST Corridor Design Manager

Required Revision or Rejection
If at any stage in the approval process, the deviation documents requires revision or rejection, please indicate as such on the applicable signature line and return documents to Joel Theodore, ST Corridor Design Manager, or Consultant Deputy Contract Package Manager, Bryan Williams.

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-008

5. Date of Request:	6. Criticality: ☐ Minor* ☒ Major ☐ Critical
August 27, 2017	*Minor does not require MRB Action

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-008

7. Existing DCM Requirement:	8. Proposed DCM Deviation:	9. DCM Chapter, Drawing or Spec. No.:
31.3.2.E.1 States: One size fits all designs are preferred, consisting of 100% standard size stalls. A standard stall shall be 18 feet deep and 8.5 feet wide for standard vehicles with a minimum of a 24 foot two-way drive aisle… No compact stalls shall be utilized. 31.3.2.E.2 States: No structural elements shall impinge on required parking stall size. 31.3.2.E.3 States: The end bay travel turning aisle width shall be increased an additional two feet above the driving aisle width.	31.3.2.E.1: One size fits all designs are preferred, consisting of ~~100% standard size stalls. A standard stall shall be 18 feet deep and 8.5 feet wide for standard vehicles with a minimum of a 24 foot two-way drive aisle… No compact stalls shall be used~~ a mix of compact and standard stalls to maximize structural bay efficiency. A standard stall shall be 18 feet deep and 8.5 feet wide for standard vehicles, and a compact stall shall be 16 feet deep and 8 feet wide. No more than 50% (Architecture preference 20%) stalls shall be compact. A minimum 23 foot two-way drive aisle width shall be utilized in the greater garage length dimension, end aisle locations and other complex tie-in aisle widths shall accommodate simultaneous cornering or turning of full-size pickup trucks with dimensions of 20'-9" x 7'-2". 31.3.2.E.2: ~~No structural elements shall impinge on required parking stall size.~~ Structural elements may impinge on a standard parking stall size	31.3.2.E.1 31.3.2.E.2 31.3.2.E.3

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-008

	up to 1ft in width and 1ft in depth at the corners of the stall away from the drive aisle. No structural elements will impinge on ADA stalls. 31.3.2.E.3 ~~The end bay travel turning aisle width shall be increased an additional two feet above the driving aisle width.~~ Drive aisle shall be sized to meet minimum sizes as required by Municipal Code of the Authorities Having Jurisdiction (AHJ), not less than 23 foot. The end aisle width shall be designed in accordance with 31.3.2.E.1.	

10. Requested By (Designer or RE):	11. Reference Documentation (attach):
John Mrozek, HNTB|Jacobs Station Architect	NA

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-008

12. Explanation for Deviation:

Using compact stalls reduces the bay sizes, which has a compounding effect of reducing beam depths, floor to floor heights, ramp lengths and building area. The garages would include a mix of compact and standard stalls. Both Shoreline and Lynnwood Municipal Codes include provisions for compact stalls measured 8'x16' when oriented at a 90 degree angle to the drive aisle.

The number of compact stalls could be adjusted to the requirements of municipalities such as Shoreline and Lynnwood. A 50% limit on compact stalls is suggested to align with the requirements of the Shoreline Municipal Code limit on compact stalls (Table 20.50.410F footnote**). Parking garages in Shoreline will have 50% compact stalls. Lynnwood requires a maximum of 20% compact stalls (LMC 21.18.700.C.1). Parking garages in Lynnwood will have 20% compact stalls.

At Lynnwood, the project would need to get a LOC for LMC 21.18.700.C.2 "Parking stalls for customers, patients, guests, deliveries and other frequent parking turnover users shall be full-size".

Using narrower aisles reduces the bay sizes, which has a compounding effect of reducing beam depths, floor to floor heights, ramp lengths and building area. Although 24 ft. is commonly listed in Municipal Codes, a flexible criterion is suggested in this deviation to accommodate compliance with local requirements. More efficient layouts would be possible when garages only need to meet the requirements of the jurisdictions such as Shoreline, which allows 23 ft. wide aisles, and minimal increase at end aisles or complex tie-in aisle to accommodate full-size pickup trucks.

Allowing structural elements to impinging into parking stalls reduces the bay sizes, which has a compounding effect of reducing beam depths, floor to floor heights, ramp lengths and building area. This type of intrusion is like the allowances written into the City of Seattle Municipal Code and others. Shoreline and Lynnwood codes have no related restrictions. Several Sound Transit garages have been built with columns impinging into parking stalls including Federal Way Transit Center, Issaquah Transit Center, and Lakewood Station.

<u>Conditions:</u>

The Architect or Engineer of Record shall run a sufficient number of AutoTURN configurations to confirm adequate end aisle or complex tie-in widths, to ensure a safe and functional layout that meets appropriate requirements. Utilize AutoTURN analysis for determining end aisle and complex tie-in widths off 23 ft. wide aisles, utilize controlling design vehicle: P Passenger Vehicle (AASHTO 2011 US) with dimensions of 19' x 7' or full-sized pickup truck with dimensions of 20'-9" x 7'-2" to accommodate simultaneous cornering or turning from 23 ft. wide aisle and end aisle or complex tie-in. The AutoTURN results shall be reviewed with ST staff prior to final parking layout.

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-008

13. Consultant Approval of Deviation:

Acceptable ☒ Not Acceptable ☐

Architect/Engineer of Record Signature — Date: 8/28/17

John Nesholm, LMN HNTB|Jacobs Architect of Record

(Printed Name and Title)

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-008

INSTRUCTIONS FOR

REQUEST FOR DEVIATION FORM

The Resident Engineer or the Design Engineer is responsible for the preparation of the Request for Deviation form. It is to be filled out as follows:

1. Department (i.e. U-Link, E-Link, Sounder, etc.)
2. Contract Number (i.e. RTA/LR 90-12)
3. Project/Contract Name (i.e. U240 – Capitol Hill Station)
4. Deviation Number – from RFD log (obtained from SQA)
5. Date of Deviation Request
6. Criticality; either Minor, Major, or Critical (copy from Link Design Quality Plan, Rev 0)

   1. Critical – The deviation will have a direct and significant impact on fit, function, reliability, maintainability, operability, quality, constructability, interfaces with other contracts, and/or systems safety aspects of the work product
   2. Major – The deviation will have either a direct or indirect, but not a significant impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product.
   3. Minor – The deviation will have no direct or indirect impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product. This classification is sometimes for cosmetic issues, equivalent substitutions not specifically allowed by specification or non technical issues

   - Deviations classified as "Critical" or "Major" require MRB approval prior to incorporation into the work
   - Deviations classified as "Minor" require only the Architect/Engineer of Record (A/EOR) and MRB Chairperson's approvals prior to incorporation into the work

7. Description of the **existing** Design Criteria Manual (DCM) requirement in 10 words or less. (Provide DCM chapter reference in item #9 herein)
8. Description of the **proposed** Design Criteria Manual (DCM) deviation in 10 words or less
9. Design Criteria, Drawing or Spec Number where requirement is noted
10. Name of Designer, or RE requesting deviation
11. Reference Documentation attached
12. Reason for the Deviation
13. Approval Signature of the Architect/Engineer of Record (A/EoR) and Date (an attached letter of approval from the A/EoR must be provided)

SOUNDTRANSIT

QUALITY ASSURANCE
REQUEST FOR DEVIATION MRB DISPOSITION FORM
LYNNWOOD LINK LIGHT RAIL

Contract No.: L200/L300	Project/Contract Name: Lynnwood Link Extension	Deviation No.: LLE-021
Description: Allow limited conduit to be exposed in parking garages at constrained and conflict locations, e.g. conduit crossings, transitions, and connections.		

MRB Member Disposition:

	Not Required	Approve	Reject	
Kerry Pihlstrom Director, Civil and Structural Design	☒	☐	☐	Date: 9/26/2017
Julie Montgomery Director, Architecture & Art	☒	☐	☐	Date: 9/26/2017
Peter Brown Director, Systems Engineering & Integration	☒	☐	☐	Date: 9/26/2017
Paul Denison Link Light Rail Operations Director	☐	☒	☐	Date: 10/5/2017
Matthew Preedy Director, Construction Management	☒	☐	☐	Date: 9/26/2017
Mohammad Saleem Deputy Director, SQA (MRB Chairperson)	☐	☒	☐	Date: 9/26/2017

For Information Only:

Rod Kempkes, Executive Project Director

Comments:

SOUND TRANSIT DESIGN CRITERIA DEVIATION REQUEST – LYNNWOOD LINK EXTENSION

Deviation No: LLE-021 Title: Allow Expose Conduit in Garages at constrained locations

Description: Allow limited conduit to be exposed in parking garages at constrained and conflict locations, e.g. conduit crossings, transitions, and connections.

HNTB|Jacobs Project or Engineering Manager:
Jim Schettler
Print Name
Signature Indicates Approval 9-14-17 Date

ST DECM DCM Chapter Owner: Hyperlink
DOUG POWELL
Print Name
Signature Indicates Approval 9/15/17 Date

ST Corridor Design Manager:
Joel Theodore
Print Name
Signature Indicates Approval 9/15/2017 Date

ST DECM ~~Civil and Structural~~ ~~ARCHITECTURE~~ Director:
~~Kerry Pihlstrom~~ JULIE MONTGOMERY
Print Name
Signature Indicates Approval 9.15.17 Date

Return Documents to
ST Corridor Design Manager

Transmit to ST Quality Manager
(CC: ST Contract Package Manager, H|J Engineering Manager, ST Design Criteria Chapter Owner, ST Corridor Design Manager)

Return Documents to
Consultant
Deputy Contract Package Manager
Bryan Williams

Required Revision or Rejection
If at any stage in the approval process, the deviation documents requires revision or rejection, please indicate as such on the applicable signature line and return documents to Joel Theodore, ST Corridor Design Manager, or Consultant Deputy Contract Package Manager, Bryan Williams.

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-021

5. Date of Request:	6. Criticality: ☐ Minor* ☒ Major ☐ Critical *Minor does not require MRB Action
August 24, 2017	

7. Existing DCM Requirement:	8. Proposed DCM Deviation:	9. DCM Chapter, Drawing or Spec. No.:
Exposed, publicly accessible panels and distribution equipment is not allowed. Within parking structures, conduits shall be concealed within the structure. Minimum concrete coverage shall not be reduced at conduit locations."	Exposed, publically accessible panels and distribution equipment is not allowed. Within parking structures, conduits shall be concealed within the structure in public stairs, elevator-waiting areas, and within 5ft. (horizontal and vertical) of pedestrian and vehicle entries; or as determined by the Sound Transit Architect. Where conduit cannot be reasonably concealed due to congested, constrained, or conflict locations (e.g. conduit crossings, transitions, and connections) the routing should be organized, run tight to surface and painted to match adjacent surfaces. Minimum concrete coverage shall not be reduced at conduit locations.	Sound Transit Design Criteria Manual, Rev 4, March 2016, Chapter 31 Parking Facilities, Page 31-13, Paragraph 31.3.10.A states:

10. Requested By (Designer or RE):	11. Reference Documentation (attach):
John Mrozek, HNTB|Jacobs Station Architect	NA

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-021

12. Explanation for Deviation:

The enclosed submission, requests deviation from criteria Sound Transit DCM, Revision 4, dated March 2016 for Lynnwood Link Extension "Project" to provide allowance to expose conduits that cannot reasonably be embedded in the parking structures due to structural limitations and where conduit cannot be reasonably concealed due to congested, constrained, or conflict locations (e.g. conduit crossings, transitions, and connections.

List the DCM design criteria and chapter reference:

Within the DCM, Chapter 31 Parking Facilities, Page 31-13, Paragraph 31.3.10.A states:

"Exposed, publically accessible panels and distribution equipment is not allowed. Within parking structures, conduits shall be concealed within the structure. Minimum concrete coverage shall not be reduced at conduit locations."

Explain why the requirement cannot be met and provide justification:

During recent project coordination meetings, there have been concerns raised by the structural engineers and architects regarding concealing conduits within the parking structures at all locations. The structural design team has indicated that if the conduits run perpendicular to each other or are in contact the conduit would be limited to 3/4" diameter each, about half the diameter of the standard 1 1/2 diameter conduit" .

Additionally, DCM Chapter 23 Electrical Systems, Page 23-15, Paragraph 23.7.2.F states: At stations and garages, all conduits shall be routed in areas not visible to the public. Where conduit cannot be hidden in structure or cavities, the routing should be organized, run tight to surface and painted to match adjacent surfaces.

13. EOR Approval of Deviation:

Acceptable ☒ Not Acceptable ☐

Architect/Engineer of Record Date 8/28/17

John Nesholm LMN, HNTB|Jacobs Architect of Record (Print name and title)

Signature

SOUNDTRANSIT

QUALITY ASSURANCE

REQUEST FOR DEVIATION FORM

1. Department:	2. Contract No.:	3. Project/Contract Name:	4. Deviation No.:
DECM	Project Wide	Lynnwood Link Extension	LLE-021

INSTRUCTIONS FOR REQUEST FOR DEVIATION FORM

The Resident Engineer or the Design Engineer is responsible for the preparation of the Request for Deviation form. It is to be filled out as follows:

1. Department (i.e. U-Link, E-Link, Sounder, etc.)
2. Contract Number (i.e. RTA/LR 90-12)
3. Project/Contract Name (i.e. U240 – Capitol Hill Station)
4. Deviation Number – from RFD log (obtained from SQA)
5. Date of Deviation Request
6. Criticality; either Minor, Major, or Critical (copy from Link Design Quality Plan, Rev 0)

   1 Critical – The deviation will have a direct and significant impact on fit, function, reliability, maintainability, operability, quality, constructability, interfaces with other contracts, and/or systems safety aspects of the work product

   2 Major – The deviation will have either a direct or indirect, but not a significant impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product

   3 Minor – The deviation will have no direct or indirect impact on fit, function, reliability, maintainability, operability, quality, constructability, and interfaces with other contracts and/or systems safety aspects of the work product. This classification is sometimes for cosmetic issues, equivalent substitutions not specifically allowed by specification or non technical issues

   - Deviations classified as "Critical" or "Major" require MRB approval prior to incorporation into the work
   - Deviations classified as "Minor" require only the Architect/Engineer of Record (A/EOR) and MRB Chairperson's approvals prior to incorporation into the work

7. Description of the **existing** Design Criteria Manual (DCM) requirement in 10 words or less. (Provide DCM chapter reference in item #9 herein)
8. Description of the **proposed** Design Criteria Manual (DCM) deviation in 10 words or less
9. Design Criteria, Drawing or Spec Number where requirement is noted
10. Name of Designer, or RE requesting deviation
11. Reference Documentation attached
12. Reason for the Deviation
13. Approval Signature of the Architect/Engineer of Record (A/EOR) and Date
    (an attached letter of approval from the A/EOR must be provided)