

**Exhibit GW2a: Mountlake Terrace Guideway and Wayside
Facilities Code Compliance Summary 100% Submittal**

**Lynnwood Link Extension | Northgate Station to
Lynnwood Transit Center
Contract No. RTA/AE 0010-15**

**Contract L300M
Code Compliance Summary
City of Mountlake Terrace
Guideways and Wayside Facilities
100% Submittal**

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Prepared for:



Prepared by:



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1.0 INTRODUCTION

The following summary describes key code requirements which the design must address to meet various local, state and national code requirements for Contract L300 non-station facilities within the City of Mountlake Terrace. This includes guideways, signal and traction power facilities. Code summations for stations are provided separately.

The summary will cover the following issues:

1. Code references which will be used for the project.
2. NFPA 130 requirements including fire protection, egress and access.
3. Land Use requirements

This Code summary reviews key municipal codes and regulations and does not include requirements found within Sound Transit's Design Criteria Manual. Refer to the Design Criteria Conformance Checklist for this summary.

1.1 Summary Assumptions

The report is based on the current 100% Design and informed by previous code reviews.

The analysis is the compilation of input from Sound Transit, the City of Mountlake Terrace Development Services and Snohomish Fire District #1 regarding incident response access and fire protection.

Wayside facilities are un-occupied prefabricated equipment buildings and are inspected and certified by the Washington State Labor & Industries. Electrical and foundation inspections of these facilities may however be done by the City of Mountlake Terrace. Fire protection systems are not required.

1.2 Code References and Standards

Light rail guideways and wayside facilities pass through the City of Mountlake Terrace. Development is governed under the City of Mountlake Terrace Municipal Code. The Municipal Code, enacted by Council Ordinance, adopts and amends certain model building codes as adopted by the State of Washington. Within the City of Mountlake Terrace Municipal Code, relevant Titles include, but are not limited to:

- *Title 15 Building and Construction* including International Building, Mechanical, Performance, Green, Fuel Gas, National Electrical, Energy Conservation, Uniform Plumbing and Fire Codes among others.
- *Title 16 Environment* including SEPA procedures, Shoreline Management, Critical Areas and Stormwater Runoff.
- *Title 18 Land Use Planning and Development Code* including Comprehensive Plan, Sustainability and Essential Public Facilities among others.

- *Title 19 Zoning including Land Use Regulation, Development Standards and Special Land Use D, Landscape Development among others.*

The following code references are currently utilized for the design of Link Guideways and Wayside Facilities within the City of Mountlake Terrace.

Discipline	Code References as Applicable
Building	<ul style="list-style-type: none"> • International Building Code, 2015 Edition with Washington State and City of Mountlake Terrace amendments. Chapters 51-50 WAC. Chapter 15.05 MTMC • NFPA 130, 2017 Edition Standard for Fixed Guideway Transit and Passenger Rail Systems
Mechanical	<ul style="list-style-type: none"> • International Mechanical Code, 2015 Edition with Washington State and City of Mountlake Terrace amendments. Chapters 51-52 WAC. Chapter 15.05 MTMC.
Electrical	<ul style="list-style-type: none"> • National Electrical Code (NFPA 70), 2014 Edition with Washington State amendments, and the Washington Cities Electrical Code, 2014 Edition. WAC 296-46B. Chapter 15.05 MTMC. • Washington State Electrical Regulations • NFPA 70E, Electrical Safety in the Workplace, 2015 Edition • NFPA 72, National Fire Alarm Code, 2016 Edition • NFPA 130, 2017 Edition Standard for Fixed Guideway Transit and Passenger Rail Systems
Fire	<ul style="list-style-type: none"> • International Fire Code, 2015 Edition with City of Mountlake Terrace and Washington State amendments. Title 15.10 MTMC. WAC Chapters 51-54 including the following documents as amended: <ul style="list-style-type: none"> ○ 2016 NFPA 14 Standard for the Installation of Standpipes Private Hydrant and Hose Systems ○ 2016 NFPA 110 Standard for Emergency and Standby Power Systems ○ 2017 NFPA 130, Standard for Fixed Guideway Transit and Passenger Rail Systems
Land Use & Landscape	<ul style="list-style-type: none"> • Mountlake Terrace Land Use Planning and Development Title 18 MTMC. • City of Mountlake Terrace Comprehensive Plan. Chapter 18.10 MTMC. • Mountlake Terrace Zoning. Title 19 MTMC. • WSDOT Roadside Manual: Chapter 800 – Vegetation, 810 – Vegetation Restoration; 820 – Irrigation • WSDOT Design Manual: Chapter 900 Roadside Development
Geotechnical	<ul style="list-style-type: none"> • WSDOT’s Geotechnical Design Manual M46-03 (GDM) (May 2015) • AASHTO’s Load and Resistance Factor Design (LRFD) Bridge Design Specifications, Customary U.S. Units, 7th Edition (with 2015 and 2016 interim revisions) • AASHTO Guide Specifications for LRFD Seismic Bridge Design w/ WSDOT amendments (2011)
Structural	<ul style="list-style-type: none"> • 2015 International Building Code, Chapter 16 • 2013 ASCE/SEI 7-10 Minimum Design Loads for Buildings and other Structures • AASHTO’s LRFD Bridge Design Specifications, 7th Edition (2016) • WSDOT’s Bridge Design Manual LRFD M23-50 (June 2016) • WSDOT Geotechnical Design Manual M46-03 (May 2015) • FHWA’s Seismic Retrofitting Manual for Highway Bridges, Part 1 (Jan 2006 and Dec 2009) • FHWA’s Seismic Retrofitting Manual for Structures, Part 2 (Aug 2004 and Dec 2009)

Discipline	Code References as Applicable
<p>Civil Work, Drainage, Storm Water, Sewer, Water and Utilities</p>	<ul style="list-style-type: none"> • City of Mountlake Terrace Engineering Standards, 2016 • Standards and publications adopted in MTMC 19.95.010 • American Water Works Association’s Cross-Connection Manual • American Water Works Association Standards, current version • Washington State Department of Ecology Criteria for Sewage Works Design • Washington State Department of Ecology Storm Water Management Manual for Western Washington as adopted in Chapter 16.20 MTMC. • WSDOT Design Manual M22-01.09, July 2014 • WSDOT Highway Runoff Manual, M31-16.04 February 2016 • WSDOT/APWA Standard Specifications for Road, Bridge and Municipal Construction M41-10, August 2016 • WSDOT Standard Plans Manual, M21-01, August 2016 • WSDOT Construction Manual, M41-01, July 2016 • WSDOT Hydraulics Manual, M23-03, January 2015 • Department of Ecology Storm Water Management Manual for Western Washington, August 2014 as identified in Chapter 16.20 MTMC • Snohomish County Drainage Manual, 2016 • Low Impact Development Technical Guidance Manual for Puget Sound, December 2012 • WDFW Water Crossing Design Guidelines, 2013 • AASHTO A Policy on Geometric Design of Highways and Streets, 6th edition 2011 • FHWA Manual of Uniform Traffic Control Devices, 2009 and May 2012 • FHWA, The Urban Drainage Design Manual Third Edition (HEC-22), 2009. • FHWA, Design of Bridge Deck Drainage (HEC-21), 1993. • PSE Electric Service Handbook, June 2016 • PSE Gas Service Handbook, March 2016
<p>Safety</p>	<ul style="list-style-type: none"> • City of Mountlake Terrace, local codes and amendments • International Building Code • International Fire Code • Sound Transit standards for facilities and design

2.0 GUIDEWAYS

Guideways includes development of the trainway alignment within the established Right of Way. They must meet local land use regulations and the requirements of NFPA 130 Standard for Fixed Guideway Transit and Passenger Rail Systems. The following narrative follows the structure of the 2017 Edition of NFPA 130 Chapter 6 Trainways.

2.1 NFPA 130

2.1.1 Construction Type, Section 6.2

Required/Provided: Construction materials shall be not less than Type II noncombustible material as defined in NFPA 220 for surface structures. 6.2.2.6

Required/Provided: All structures necessary for elevated trainway support and all structures and enclosures on or under trainways shall be of not less than Type I or Type II or combinations of Type I or Type II noncombustible construction. 6.2.2.7

2.1.2 Egress and Emergency Access, Section 6.3

Required/Provided: System shall incorporate a walk surface for passengers to evacuate a train and proceed to the nearest station or other point of safety. 6.3.1.1

Required/Provided: Means of egress within the trainway shall have a clear unobstructed width of 24" at walk surface, 30" at 62" above the walk surface and 17" at 80" above the walk surface. 6.3.2.1

Required/Provided: Doors in egress routes serving trainways shall have a minimum clear width of 32". 6.3.2.4

Required/Provided: Guards provided along walkways to prevent falls over the open side greater than 30" of drop. 6.3.3.5

Required/Provided: Walkways more than 30" above the floor or grade below shall have a continuous handrail opposite the trainway. 6.3.3.8

Required/Provided: Exit stairs and doors shall comply with Chapter 7 of NFPA 101 Life Safety Code. 6.3.3.10

Required/Provided: System egress points shall be illuminated. 6.3.5.2

Required/Provided: Exit lights, essential signs and emergency lights shall be included in the emergency lighting system in accordance with NFPA 70. 6.3.5.13

2.1.3 Fire Protection and Life Safety Systems, Section 6.4

Required/Provided: Security fences to be provided with gates at approved locations. Minimum 44 inches in width. 6.4.1.2, 6.4.1.3

Required/Provided: Access to the elevated trainway shall be from stations or by mobile ladder equipment from adjacent roadways. Access shall be at intervals no greater than 2,500 feet. 6.4.1.6, 6.4.1.7

Required/Provided: Where the configuration of an open-cut trainway prevents or impedes access, provisions shall be made to permit access to that section of trainway at intervals not exceeding 2,500 feet. 6.4.1.8

Primary Emergency Access points includes standardized FD Access signage, access openings such as doors, gates or sliding acoustic panels and an Emergency Telephone (ETEL) for communication. Intrusion detection and fire department key boxes (KnoxBox) are provided where noted. The spacing of Primary Access points meet the requirements of NFPA 130, Sections 6.4.1.6 through 6.4.1.8 and are provided at the following locations:

L200 / 300 Primary Emergency Access Locations and Intervals											
03/27/2018											
STATIONING	INTERVAL	CITY	FD SIGN	ETEL	FDC	ID	KNOXBOX	APPX LOCATION	APPX HEIGHT	ACCESS	
1691 + 00	1691.00	Shoreline	X	X	X	X	X	I-5 SHOULDER	+5	GATE IN SECURITY FENCING	
1712 + 20	1712.20	Mountlake Terrace	X	X	X			NE 205TH OVERPASS	+55	SLIDING ACOUSTIC PANEL	
1723 + 80	1723.80	Mountlake Terrace	X	X				I-5 OFF-RAMP	+40V / +25H	CHAINS IN CABLE RAIL	
1738 + 50	1738.50	Mountlake Terrace	X	X		X		SOUTHMLT STATION	0 / -21	SOUTH EGRESS STAIR	
		Mountlake Terrace Station			X		X				
1741 + 50	1741.50	Mountlake Terrace	X	X		X		NORTHMLT STATION	0	NORTH EGRESS STAIR	
1755 + 50	1755.50	Mountlake Terrace	X	X				I-5 NORTHBOUND OVERPASS	+40	CHAINS IN CABLE RAIL	
1760 + 90	1760.90	Mountlake Terrace	X	X				I-5 SOUTHBOUND OVERPASS	+30	CHAINS IN CABLE RAIL	
1784 + 40	1784.40	Mountlake Terrace	X	X		X	X	62 AVE W HI-RAIL	0	NOISE WALL W/20' SLIDING GATE	
1793 + 80	1793.80	Mountlake Terrace	X	X	X			220TH ST W OVERPASS	+28	SLIDING ACOUSTIC PANEL	
1804 + 50	1804.50	Mountlake Terrace	X	X				60TH AVE W	+38	SLIDING ACOUSTIC PANEL	
1828 + 50	1828.50	Lynnwood	X	X	X			212TH ST SW OVERPASS	+35	SLIDING ACOUSTIC PANEL	
FD SIGN: Fire Dept Access Sign			FDC: Fire Department Connection			Primary access includes dedicated openings to trainway, FD access signage and ETELS.					
ETEL: ST Emergency Telephone			ID: Intrusion Detection								
KNOXBOX: FD Key Storage for entry											

Secondary access points supplement the above primary locations but do not include any special provisions for access. They are listed to provide a database for emergency responders for alternative access locations. Secondary access points may require ground set ladders or openings cut in security fencing for access.

L200 / 300 Secondary Access Locations											
03/27/2018											
STATIONING		CITY	FD SIGN	ETEL	FDC	ID	KNOXBOX	APPX LOCATION	APPX HEIGHT	ACCESS CONDITION	
1702 + 80		Shoreline						I-5 OFF-RAMP OVERPASS	+30	CABLE RAIL	
		Mountlake Terrace Station									
1767 + 50		Mountlake Terrace						227TH ST SW	0	EAST DOOR IN WSDOT NOISE WALL	
1813 + 00	to 1824 + 00	Mountlake Terrace						CONTINUOUS I-5	<10	SECURITY FENCING	
1831 + 00	to 1836 + 00	Mountlake Terrace						CONTINUOUS I-5	<10	SECURITY FENCING	
1841 + 00		Lynnwood						52ND AVE W	+28	ACOUSTICAL PANEL	
FD SIGN: Fire Dept Access Sign			FDC: Fire Department Connection			Secondary access locations do not make special provisions for access unless noted otherwise.					
ETEL: ST Emergency Telephone			ID: Intrusion Detection								
KNOXBOX: FD Key Storage for entry											

Egress points from guideways are via adjoining stations, to public rights of way at street running alignments and along the elevated guideways to a point of safety at least 50 feet from the incident. Egress structures specific to guideways are not provided.

Required/Provided: Blue light stations are to be provided at ends of station platforms, emergency access points and traction power substations. Systems with overhead traction power may utilize alternate means to disconnect traction power. Sound Transit utilizes Emergency Telephones (ETELs) for communication and to disconnect overhead power. 6.4.2.1, 6.4.2.4

- Required/Provided: Heat and smoke detectors shall be installed at traction power substations and signal bungalows and connected to the operations control center. Provided by Systems. 6.4.4.1
- Required/Provided: Approved fire standpipe system provided in trainways where physical factors prevent or impede access to the water supply or fire apparatus if required by the AHJ. 6.4.5.1
- Required/Provided: Standpipe system not required to be enclosed in fire resistive construction if it has a looped configuration or fed from two locations. Standpipes are fed from two locations through fire department connections and nearby hydrants. 6.4.5.3
- Required/Provided: Standpipe system permitted to be a dry system when water is delivered to all hose connections within 10 minutes and air relief-vacuum valves installed with authority approval. 6.4.5.4
- Required/Provided: Standpipe system supplied from an approved water supply capable of supplying the system demand for a minimum of 1 hour. Standpipes are fed from hydrants connected to the municipal water supply system via fire department pumper. 6.4.5.5
- Required/Provided: Fire department access road to extend within 50 feet of the fire department connection. 6.4.5.10, MTFD & Snh FD #1 Stds
- Required/Provided: 4" Storz inlets shall be provided at all fire department connections. MTFD & Snh FD #1 Stds
- Required/Provided: Fire department connections shall be within 50 feet of a hydrant. MTFD & Snh FD #1 Stds
- Required/Provided: Standpipes sized to provide 1,000 gpm based upon 500 gpm at 150 psi at the hydraulically most remote hose connection with a simultaneous flow of 500 gpm at the next hydraulically remote hose connection. Maximum calculated pressure shall not exceed 350 psi. Per MLT FD direction

2.2 Landscape, Trees, and Buffers

- Required/Provided: Proposals on parcels that are zoned F/T are required to provide a Type V landscape buffer that is a minimum of 20 feet wide along all interior lot lines that abut parcels zoned RS (or with residential land uses) and a Type IV landscape buffer that is a minimum of 15-foot wide along all interior lot lines that abut parcels that are zoned RMM. 19.130, MTMC 2016

3.0 WAYSIDE FACILITIES

Wayside facilities include signal bungalows, traction power substations, gate controllers and the like. These structures are prefabricated, non-occupied equipment enclosures that are brought onto a field constructed foundation and secured. Prefabricated structures are built to the Washington State Building Code and are approved, inspected and certified by the Washington State Department of Labor and Industries. Prefabricated wayside facilities are however subject to Codes regulating foundation design and Land Use Codes.

As Wayside Facilities are Systems designed and supplied components of the Project, only Land Use requirements will be identified.

3.1 Traction Power Substation #4 at STA 1744+25

Location: Mountlake Terrace Station

Zoning: SR 5 ROW / Public Facilities & Services

Landscape Requirements: Traction Power Substation #4 is located underneath guideway at north end of the station. Screening wall with CMU block to match material used at station.

Living screens will be used on Traction Power Substation walls to screen and soften appearance from the transit/station plaza and parking lot.

3.2 Signal Bungalow #8 at STA 1784+70

Location: 222nd Street SW

Zoning: Single-Family Residential (RS7200)

Landscape Requirements: A Type I landscape strip that is a minimum of 5-foot wide is required between the right-of-way line and any site improvements. (A rockery wall does not count towards the 5-foot width, nor does any landscaping between the back of the sidewalk and the right-of-way line.)

There are no specific landscape requirements for interior lot lines abutting RS parcels; however, along interior lot lines that abut F/T land uses, a 20-foot wide Type V landscape buffer is required.

Screening wall will be provided using CMU block to match TPSS stations. A mix of evergreen and deciduous trees and shrubs are located on the side of the screen wall, facing 62nd Avenue West to provide screening and softening of the wall.

These standards are minimum and additional landscaping may be required pursuant to MTMC 19.130.010.

3.3 Traction Power Substation #5 at STA 1826+50

Location: 212th Street SW

Zoning: Medium-Density Multi-Household Residential (RMM)

Landscape Requirements: A Type I landscape strip that is a minimum of 5 feet wide is required between the right-of-way line and any site improvements. (A rockery wall does not count towards the 5-foot width, nor does any landscaping between the back of the sidewalk and the right-of-way line.)

For interior lot lines that abut other RMM parcels, a 10-foot wide Type III landscape buffer is required. For interior lot lines that abut F/T land uses, a 20-foot wide Type V landscape buffer is required.

A screening wall will be provided using CMU block. Street trees have been incorporated in the planter strip adjacent to 212th Street SW to aid in softening and screening of the perimeter screen wall.

These standards are minimum and additional landscaping may be required pursuant to MTMC 19.130.010.

4.0 ELECTRICAL CODE SUMMARY

4.1 National Electrical Code, NFPA 70

All electrical systems will be designed to meet the requirements of the NEC as amended by the 2014 Washington Cities Electrical Code and adopted by the City of Mountlake Terrace.

Required/Provided: Electrical service compliant with NEC 70

Required/Provided: Work and dedicated space clearances compliant with NEC 70

Required/Provided: Emergency power system in accordance with NFPA 70

Required/Provided: Emergency lighting system separate from normal lighting power system in accordance with NFPA 70

4.2 NFPA 130 Wire and Cable Requirements, Chapter 12

Project shall also comply with the requirements of 2017 NFPA 130 as applicable for wiring methods as outlined in Chapter 12 including but not limited to the following:

- All exposed electrical raceways and enclosures shall be of noncombustible materials.
- Combustible raceways shall be concrete encased.
- All wiring except radio antennas, shall be enclosed in its entirety in armor sheaths, conduits or enclosed raceways, boxes, and cabinets except in ancillary areas or other nonpublic areas.

- Emergency power systems shall be located in raceways and enclosures that are separate from normal power systems.
- Wiring serving emergency power, lighting and communication circuits shall be protected from physical damage and fire via 1-hour minimum protection afforded by either suitable embedment or encasement; diversity in system routing; routing external to the interior underground portion of the system facility; or be a listed fire-resistive cable system with a minimum 1-hour rating in accordance with NFPA 130 paragraph 12.4 and 12.5. Protection by coverage with an automatic fire sprinkler system shall be allowed in addition to the methods listed above.

All wiring shall be XHHW-2, except that 2/0 AWG and larger conductors are permitted to be either type XHHW-2 or RHH/RHW-2.

All wires and cables used in enclosed trainways shall be listed as being resistant to the spread of fire and shall have reduced smoke emissions by complying with NFPA 130 Section 12.2.