PROJECT DEVELOPMENT PROCEDURES

WASHINGTON UNION STATION

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WASHINGTON, DC 20002

U.S. Department of Transportation
Federal Railroad Administration

EYP Architecture & Engineering

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WASHINGTON UNION STATION (WUS) PROJECT DEVELOPMENT PROCEDURES

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1 OVERVIEW

1.1 INTRODUCTION

This document contains pertinent information to plan and execute construction and maintenance projects at the Washington Union Station Complex (WUS) also referred to as Union Station. The document includes, but is not limited to, information regarding:

Users:

- Stakeholders
- Authority Having Jurisdiction (AHJ)

Information and Procedures:

- Existing facility information and code data
- Adopted codes and standards
- Project initiation requirements
- Project development procedures
- Building Permit, inspection, and Certificate of Occupancy processes
- Document safeguarding and handling requirements
- General construction requirements: Division 1 Specifications
- Union Station specific requirements
- Discipline specific design requirements
- WUS Construction accident prevention plan

1.2 FACILITY SUMMARY

The Union Station Complex is comprised of multiple structures and parcels of land that include two freestanding buildings (main building and parking garage), surrounding grounds to the east, south, and west that contain sidewalks and driveways, (Lot 171). In addition, the complex includes the North Hanger extension, the parking garage, and rail yard area immediately north of the main building of Union station located on Lot 172 just south of the H Street Bridge. There is a perpetual easement over Lot 173 for the access ramps serving the parking garage.

FRA has jurisdiction over the land and the real property and owns the real property improvements. Amtrak retains the right to conduct its railroad operations in Lots 171 and 172 which are dedicated solely to Amtrak's railroad operations. (Platforms, catenary, track infrastructure and Amtrak's direct support activities.)

The original station building was designed by renowned architect Daniel Burnham, with construction completed in 1908. The facility has undergone two major projects since then which have drastically changed the character of the property.

The original (Burnham) station building consists of the Headhouse (Main Hall, West Hall, East Hall, and Presidential Suite) and the former train concourse (present-day Retail Concourse) form the original station building, which has been designated by the District of Columbia as a historic landmark and listed in the National Register of Historic Places.

The first major alteration occurred with the addition of the Claytor Concourse in the 1970s, which added a third bay onto the northern side of the original station building. Passenger railway functions for ticketing and customer service are still located in the historic train station, the gates, waiting areas, and queueing area were moved out of the historic portion of station into the Claytor Concourse.

The second major renovation was undertaken in the 1980s, converting some of the historic portions of the main building into a retail center while at the same time generally restoring the Headhouse to its original condition, and repurposing the train concourse to a retail mall. The Union Station Parking Garage (USPG) was completed during this time. The USPG and The Claytor Concourse are modern structures and not considered historic as well as the structures north of the station on Lot 172.

In addition to the station building itself the entire Washington Union Station Historic Site, extending north to include the railyards, south to include Columbus Plaza, and the First Street Tunnel, have been evaluated and determined eligible for inclusion on the District of Columbia's Inventory of Historic Sites. Contributing resources within the WUS Historic Site include the Station Building, the surviving historic umbrella sheds on the platforms, the First Street NE retaining wall, and the First Street tunnel (long haul tunnel). The full list of contributing resources is illustrated in Figure 2 of the DC SHPO Determination of Eligibility Form for Washington Union Station. Refer to 4.7 in the Appendices.

1.3 UNION STATION STAKEHOLDERS

The Station complex is occupied by multiple entities that share responsibility for different areas of the station.

1.3.1 Internal Stakeholders

1.3.1.1 FRA

Federal Railroad Administration (**FRA**) and specifically the Office of Railroad Policy and Development (**FRA-RPD**), owns the Washington Union Station (**WUS**) Complex (buildings and land) as a whole. For the purposes of this document, the **FRA-RPD** is shortened to **FRA** and is referred to as the **Owner**.

1.3.1.2 USRC

Under a long-term lease from FRA, the Union Station Redevelopment Corporation (USRC) leased property including the parking garage, historic station, retail and Claytor Concourses. USRC operates the parking garage through a parking garage contractor, and oversees its lessee, Union Station Investco's (USI) operation of the Station complex. Operation and care of these portions of the Station complex have been delegated to USRC which is responsible for preserving and restoring the Station's historic and architectural significance through capital improvements, maintaining the Station's long-term function as a multimodal transportation center, and enhancing the Station's retail and other amenities. USRC's board of directors consists of representatives from DOT, FRA, D.C., Amtrak, and the Federal City Council.

1.3.1.3 Union Station Investco, LLC (USI):

Under a long-term sublease from USRC, USI operates all portions of the Station complex, except the parking garage. USI is responsible for the day-to-day operations and maintenance including building systems as well as the retail, office, and Amtrak leasing management.

1.3.1.4 Jones Lang LaSalle Americas, Inc. (JLL): USI Subcontractor

Building Management; JLL performs all operation and maintenance activities at the station.

1.3.1.5 Union Station Parking Group, LLC: USRC Contractor/Operator

Contractor to USRC and operates the USPG.

1.3.1.6 Federal Railroad Administration, Office of Railroad Safety (FRA-RRS): Authority Having Jurisdiction (FRA AHJ)

By statute, FRA is the Authority having Jurisdiction (AHJ) for the WUS buildings, the USPG, and any other structures on the grounds it owns.

1.3.1.7 National Railroad Passenger Corporation (AMTRAK): Tenant

Subleases from USI (and USRC) the concourse and a ticket counter and operations of Amtrak at the lower level. Outside of the lease structure, Amtrak operates a passenger railroad at the station. Amtrak retains the right to conduct its railroad operations north of the USRC footprint which are dedicated solely to Amtrak's railroad operations although the land, real property, and real property improvements are owned by FRA.

1.3.1.8 Washington Metropolitan Area Transit Authority (WMATA)

WMATA has an easement through subterranean and ground portions of the west side of the property that includes the occupation of the southwest corner of the basement and easements that penetrate WUS surface area in multiple locations.

1.3.1.9 Other Easements

- Foot Bridge to the east owned by and connects to Station Place to the east.
- Utility Bridge over First St NE owned by and connects to US Postal Service to the west.
- Bicycle shed owned by District of Columbia on the west.
- AOC piping easements

In addition to the easements identified, there are various other easements which require research as to use and will require permission prior to work being performed in the areas.

1.3.2 External Stakeholders

1.3.2.1 District of Columbia Historic Preservation Office (DCHPO)

1.3.2.2 District of Columbia Department of Consumer and Regulatory Affairs (DCRA)

1.3.2.3 District of Columbia Department of Health / Food Safety and Hygiene Inspection Services Division (FSHISD)

1.3.3.4 District of Columbia Fire Marshal (DCFM)

1.3.3 Definitions

1.3.3.1 Owner: Federal Railroad Administration, Office of Railroad Policy and Development (FRA-RPD)

- Lots 171 and 172. Northernmost lots or property, between Washington Union Station building and H Street, currently utilized for railroad operations. Included is a perpetual easement over Lot 173 for access ramps serving the parking garage.

1.3.3.2 Project Sponsor (PS): Any entity that endeavors to modify Washington Union Station (WUS) and Union Station Parking Garage (USPG) which may include:

- Owner (FRA-RPD)
- Tenant (USRC and or Amtrak north of the USRC footprint exclusive of the parking garage.)
- Building Manager for maintenance, day to day operations and leasing. (USI)

1.3.3.3 NOT USED.

1.3.3.4 Owner's Agent: Entity formally designated by the Owner to act on the behalf of the Owner.

1.3.3.5 Building Manager**:** Entity responsible for day-to-day operations of the facility.

1.3.3.6 NOT USED.

1.3.3.7 NOT USED.

1.3.3.8 Construction Observation: Observations by Owner, Owner's Agent, and or Lessor, intended to verify the construction project is being executed in general conformity with the AHJ approved construction documents.

1.3.3.9 Substantial Completion: Refers to a stage of a construction or building project or a designated portion of the project that is sufficiently complete, in accordance with the construction contract documents, so that the Project Sponsor may request inspection by AHJ.

1.3.3.10 Final Completion: Refers to a stage of a construction or building project or a designated portion of the project that is complete and ready for handover to Project Sponsor, and contract completion. This occurs after Certificate of Occupancy is granted by AHJ.

1.3.3.11 Authority Having Jurisdiction (AHJ) or (FRA AHJ): Federal Railroad Administration, Office of Railroad Safety

- Administration providing enforcement of the Building Codes
- Administration providing enforcement of the Health and Safety Regulations

1.3.3.12 Building Permit**:** Official document indicating approval issued by the Federal Government that allows a project to proceed with construction on FRA property. Its purpose is to ensure that the project documents comply with relevant codes as noted below for use, zoning, and construction. Code enforcement is intended to ensure the safety of Owners and Occupants**.**

1.3.3.13 Delegated Design or Deferred Design: The transfer of design responsibility of certain aspects of the project from the Design Professional to the General Contractor, typically through performance-based specifications.

1.3.3.14 AHJ Inspections: : Predetermined or random visual observations by the FRA AHJ to confirm general conformance with the construction documents and with codes; separate and independent from the Project Sponsor's observation.

1.3.3.15 Certificate of Occupancy (C of O)**:** Official document issued by the FRA AHJ confirming that project is in general conformance with applicable Building Codes and other laws indicating it to be in a condition suitable for occupancy. A Limited Certificate of Occupancy may be issued at the discretion of the FRA AHJ.

1.3.4.16 Design Professional: An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

2 WORKING WITH THE AUTHORITY HAVING JURISDICTION

2.1 AUTHORITY HAVING JURISDICTION (AHJ) ROLE

2.1.1 The Authority Having Jurisdiction for the Union Station Complex is the Federal Railroad Administration (FRA), hereinafter referred to in this role as the FRA AHJ or AHJ. The U.S. Government through the Department of Transportation, of which FRA is an agency, is the Owner of Union Station as established by an act of Congress - Public Law 97-125, The Union Station Redevelopment Act of 1981.

2.1.1.1 Design and construction projects shall be reviewed and accepted, and a Building Permit issued by the FRA AHJ prior to initiation of any activities that alter the facility or its systems.

2.1.1.2 Construction work shall be inspected and accepted by the FRA AHJ. Non-code compliant work shall be corrected prior to final acceptance and the issuance of a Certificate of Occupancy.

2.1.1.3 Upon code compliant completion of construction, the FRA AHJ will issue a letter of acceptance and Certificate of Occupancy accepting the project to be used for its intended purpose.

2.1.1.4 Standard operations inspections by the Project Sponsor responsible for each system shall be made available to the FRA AHJ for review when requested.

2.2 CODES AND STANDARDS

2.2.1 Application

Codes and standards cited in the paragraphs below will be utilized by the FRA AHJ in their reviews of the project. The latest edition of these codes and standards, in effect at the time of Construction Document submittal to the AHJ for permit (or Concept, Schematic Design, and/or the Design Development phases of design if submitted for AHJ Courtesy Reviews no more than 12 months prior to Construction Document submittal for AHJ permit), must be used throughout design and construction of the project. (Refer to Code Updates.)

2.2.2 The ICC Family of Codes

2.2.2.1 Codes

- International Building Code
- International Mechanical Code
- International Plumbing Code
- International Fire Code
  - The District of Columbia Fire Code shall be utilized for requirements related to fire service features.
- International Fuel and Gas Code
- International Energy Conservation Code
- International Existing Building Code
- International Private Sewage Disposal Code
- Wildland-Urban Interface Code
- ICC Performance Code for Buildings and Facilities
- International Property Maintenance Code
- International Swimming Pool and Spa Code

- DCMR as noted in this document

2.2.2.2 Accessibility

- The Americans with Disabilities Act ADA
- ANSI 117.1 (where referenced by other codes)

2.2.3 Other Standards

2.2.3.1 Other Standards as Required by Code

The standards below are a listing of related standards. They include but are not limited to the following:

- American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)

- American Society of Mechanical Engineers (ASME)
- American Society of Testing and Materials (ASTM)
- American National Standards Institute (ANSI)
- National Fire Protection Association

2.2.3.2 Reference Standards

- Annotated Design and Construction Details for Concrete Masonry
- Architectural Metal and Sheet Metal Roofing Manual
- Architectural Sheet Metal Manual
- Architectural Woodwork Institute (AWI)
- Brick Industry Association: Technical Notes on Brick Construction
- Indiana Limestone Institute (ILI): ILI Handbook
- Marble Institute of America: Dimension Stone Design Manual
- National Concrete Masonry Association (NCMA)
- National Roofing Contractors Association (NRCA) Roofing Manual: Membrane Roof
- Roofing and Waterproofing Manual
- Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
- TEK Manual for Concrete Masonry Design and Construction
- Steel Door Institute (SDI)

2.2.3.3 Tenant Standards

For additional standards and requirements, refer to 5.2 in the Appendices.

2.2.4 Additional Codes, Standards and Guidelines

2.2.4.1 Other Codes, Standards and Guidelines required

These are found within the various sections of this document including but not limited to 2.4 Design Criteria for the Facility which includes Structural, Sustainability, Historic Preservation and Telecom and 2.9 Union Station Specific Requirements.

2.2.5 Conflicts between Codes or Standards

In case of conflicts between or among adopted Codes and Standards, the most restrictive requirement which leads to the greatest degree of safety and protection to persons, and preservation of the building's historic resources shall be implemented.

2.2.6 Code Updates

Any project which is initiated within the most current version of these Procedures may be carried through the FRA AHJ review process if a complete good faith permit submission is

made within twelve (12) months of the date that the new code edition was adopted. This essentially provides a one-year grace period which allows the DOR to continue utilizing the previous ICC codes.

2.2.7 Modifications

Wherever there are practical difficulties involved in carrying out the provisions of this code, the AHJ has the authority to grant modifications for individual cases on application to the AHJ by the Project Sponsor. The applicant shall demonstrate that individual reason makes the strict letter of this code impractical, the modification is in compliance with the intent and purpose of this code and such modification does not lessen health, accessibility, life and fire safety or structural requirements. Supporting documentation to include the mitigations to be provided in lieu of strict conformance to the code. From the documentation provided, the FRA AHJ will make a determination. The details of action granting modification shall be recorded on the subject project drawings. Where the proposed modification is shown in the work of a registered design professional the application shall bear the seal and signature of the responsible design professional. Consideration of any request not including the seal and signature of the responsible design professional is solely at the discretion of the AHJ. Applicant shall apply for a Waiver Request using the form provided. Refer to 4.6 in the Appendices.

2.3 CODE DATA FOR EXISTING FACILITY

2.3.1 Use Group:

- Washington Union Station is classified as a Covered Mall Building per the International Building Code (IBC).

    - *COVERED MALL BUILDING. A single building enclosing a number of tenants and occupants, such as retail stores, drinking and dining establishments, entertainment and amusement facilities, passenger transportation terminals, offices, and other similar uses wherein two or more tenants have a main entrance into one or more malls. Anchor buildings shall not be considered as a part of the covered mall building.*
    - *Mall. A roofed or covered common pedestrian area within a covered mall building that serves as access for two or more tenants and not to exceed three levels that are open to each other.*

- Uses:

    - **A2 Restaurants**
    - A3: Assembly (passenger terminals, exhibition halls, etc.)
    - B: Business
    - M: Mercantile
    - **S-1**: Storage, Moderate Hazard

2.3.1.1 NOT USED.

2.3.2 Construction Type

The IBC allows Covered Mall Buildings to be of Types I, II, III or IV Construction; these Construction Types are defined therein.

For the purposes of these Project Development Procedures, the Union Station Complex is considered to be Type IIB, Non-Combustible Unprotected. The entire building is classified as Type IIB as this is the highest Construction Type that is common to the entire building. Various Construction Types have been installed at Union Station from the "fireproof construction" of the original Burnham Structure to Type IIA & Type IB construction that have been provided at various times either by choice or as required by the building code at the time of construction.

Significant examples of Type IIB construction from 1986 and other times are listed below:

- Roof structure of barrel vault above Main Hall (original construction)
- Roof structure of barrel vault above West Hall (original construction)
- Arched roof structure of the Retail Concourse (original construction)
- Space frame above Claytor Course (Link Structure, 1987)
- Floors supporting retail occupancies on mezzanines in the Retail Concourse (1986 renovation)

The original "fireproof construction" is most similar to Type IB construction with a protected iron/steel floor or roof framing protected by terracotta and steel columns often protected by masonry. Type IIA Non-Combustible Protected Construction and Type IB Non-Combustible Protected construction are also present at Union Station.

It is important to note that new Type IIB Non-Combustible, Unprotected Construction cannot be installed throughout Union Station.

The International Existing Building Code (IEBC) controls the repair, modification of and additions to existing structures. Existing construction cannot be repaired or modified in a manner that would make it less safe than the existing condition prior to the repair or modification. Any construction in an area where the existing fire resistive construction has been compromised must be repaired to meet the original protection provided.

- Other existing levels of fire resistive construction in the building must be maintained without reduction. Field verification of structure type and existing fire protection level in proposed project area is required, and is understood to include the following:

    - Type IB (2-hr protected): Parts of Historic Headhouse floor structures and new stairs connection four (4) or more stories constructed in the 1986 renovation.

- Type IIA (1-hr protected): Pedestrian mall (circulation areas outside of retail) of mezzanine level of Retail Concourse

2.3.3 Allowable Area: Unlimited

IBC allows a Covered Mall Building to be of unlimited area if it does not exceed three floor levels at any point nor three stories above grade plane if it is of Types I, II, III or IV Construction and meets all other requirements listed in IBC Section 402.

The existing floor levels within Union Station include:

- Covered Mall: Unlimited. The Covered Mall at Union Station may be of unlimited area in that the Upper Floors are separated from the Covered Mall.
  - Lower Level
  - Concourse Level
  - Mezzanine Level

- Upper Floors, defined below: Unlimited due to existing Type IB Construction Type.
  - Floor 2
  - Floor 3
  - Floor 4

- The existing total square footage at Union Station is approximately 535,000 gross square feet.

2.3.4 Allowable Height and Number of Stories

2.3.4.1 Existing building height varies:
- Headhouse barrel roof above the Main Hall (Historic Structure): +/- 106'
- Retail Concourse roof (Historic Structure): +/- 55.5'
- 4th floor office roof (Historic Structure): +/- 69.6'
- Claytor Course roof: +/- 27'

2.3.4.2 The total number of stories in Union Station is six (6):
- Lower Level
- Concourse
- Mezzanine
- Second floor
- Third floor
- Fourth floor

2.3.4.3 The existing six (6) stories above grade is not code compliant, as it exceeds the allowable three stories for a "Covered Mall Building". A code modification, accomplished by means of a variance is required to define an acceptable separation between the taller elements of the Headhouse and the rest of Union Station.

2.3.4.4 The Claytor Concourse and Retail Concourse height complies with the three-story limitation (Lower Level, Main Level, and "Mezzanine" Level of these elements) for a Covered Mall Building.

2.3.4.5 Union Station is not a High-Rise Building as defined by the IBC.

2.3.5 Area Separation between Covered Mall and Office Uses at Headhouse:

The Fire, Life Safety and Building Code Report of March 11, 1986 proposed separating the 2nd, 3rd & 4th floor office levels of the Headhouse above the 3rd level of the enclosed mall, the mezzanine level to solve the problem of the office floors exceeding the allowable 3 stories of a Covered Mall as defined by BOCA 1984.

The 1986 Schirmer report proposed that the existing steel framed floor systems with clay tile arches and cementitious fill provided a 2 hour separation between the Covered Mall and the office floors as outlined in BOCA 1984 Section 313.0 Mixed Use and Occupancy and the referenced Table 1402 that specifies a 2 hour separation for Use Group B. Removal of and damage to fireproofing construction, both original and modern has been observed and should be repaired as soon as possible and when any space is renovated. Additionally, it has not been possible to inspect all of the columns supporting the 2nd floor of the Headhouse. Any columns lacking adequate fireproofing to support the 2-hour rated 2nd floor should be repaired as soon as possible.

2.4 DESIGN CRITERIA FOR THE FACILITY

2.4.1 Division 01 Specification Requirements

2.4.1.1 WUS Division 01 Specifications are provided in the Appendices and are to be included in every project that is within the USRC footprint and is not for the day-to-day operations of the Station. All retail and tenant projects under USI and shall follow USI requirements. Refer to 5.2 in the Appendices.

2.4.1.2 NOT USED.

2.4.1.3 Architectural Elements

The objective of this section is to provide design standards and guidance for architectural items in future projects at Washington Union Station. These standards and guidelines will apply to both new construction projects and renovation projects.

2.4.1.4 Applicable Codes and Standards

Refer to Section 2.2 Codes and Standards.

2.4.1.5 Special Design Criteria

2.4.1.5.1 Acoustics

Mechanical, Engineering, and Other Back of House Spaces:

Noise generating and rotating equipment including but not limited to generators, fans, pumps, air-handlers, chillers, etc. that are located within the building envelope, shall be located rooms with enhanced acoustic isolation. STC 50 wall are required and doors to mask mechanical noise. Effective vibration isolation shall be provided.

2.4.1.6 NOT USED.

2.4.1.7 NOT USED.

2.4.1.8 Floor Systems

Flooring materials vary widely throughout Union Station and can be delineated between public and private areas.

a. In public areas, flooring may include materials such as stone, quarry and porcelain tile, or terrazzo. Flooring should have a fifty (50) year durability and Class A properties for fire spread and smoke development, should provide ease of maintenance, and should minimize sound transmission from

foot traffic and luggage. Where necessary in contiguous flooring, a new finish shall match the existing floor finish. Control joints should be placed appropriately. Public areas include circulation, waiting, and open seating areas, and other areas which are open to the public on a regular basis.

b. Back-of-house spaces may be either tile, sealed concrete, epoxy coating, or other high-performance coating.

c. Flooring within historic areas of Union Station that has been identified as a character-defining element in the 2015 WUS Preservation Plan should be preserved to greatest extent possible. If replacement is required, replace with a similar material to match. Refer to Historic Preservation Requirements for Guidelines.

2.4.1.9 Exterior Wall Systems

2.4.1.9.1 Head House

Existing exterior wall systems at the Head House, Main Hall, the East Wing, and the West Wing are load-bearing red brick walls and piers with white granite masonry facing.

For historic exterior wall systems, every effort should be made to preserve and maintain the existing white granite masonry facing to the greatest extent possible. Replacement facing stones should match existing in size, profile, color, and finish to greatest extent possible. Mortar should be analyzed and repointed to match existing. Cleaning of dirt, grime, graffiti, and other types of stains from exterior masonry surfaces shall be accomplished with the least invasive methods possible and in accordance with the Secretary of the Interior's Standards and Guidelines. Refer to Historic Preservation Requirements for Guidelines.

2.4.1.9.2 Retail Concourse

The Retail Concourse is comprised of the following wall types: at the east and west ends, walls were re-constructed and enclosed with a steel frame box truss and clad in 3" thick granite panels. The south wall includes load bearing red brick with white granite masonry and glazed terracotta facing. The south wall contains historic fabric. The addition to the east end is comprised of EIFS (Exterior Insulation and Finish System).

Where existing white granite masonry facing occurs, refer to guidelines above. At other building areas, exterior materials and assemblies should be considered that provide longevity of use (50-year duration or better), maintain a waterproof enclosure, operate as an air barrier, provide thermal performance per the International Energy Conservation Code, (IECC) code requirements, and complement the existing building fabric. Where new portions are added or replaced, a moisture control assembly analysis should be conducted to check thermal performance, vapor pressure, and condensation.

2.4.1.9.3 Parking Garage

The parking garage is clad in precast concrete wall panels which anchor to the primary structure of the parking garage. A large curtain wall system at the east face of the building encloses vertical circulation elements serving the garage levels.

Replacement of exterior wall features at the parking garage should be considered that provide longevity of use (50-year duration or better), maintain a waterproof enclosure, and complement the existing building fabric. The garage is not conditioned space, therefore thermal performance and air barriers are not requirements.

2.4.1.10 Interior Wall Systems

Interior wall systems at Union Station include concrete masonry units (CMU), concrete, terra cotta, red brick masonry, gypsum board on metal studs, scagliola (an architectural finish that imitates decorative marble), glazed brick, and plaster. Limited instances of wood framing occur, and these should be removed and replaced with non-combustible whenever possible.

Main Hall

The main hall lower level is concrete masonry units (CMU) and gypsum board on metal stud framing. The main level is primarily white bethel granite on all wall surfaces.

East and West Halls

The lower levels of the East and West Hall are primarily CMU and brick masonry. The upper levels are a combination of red brick masonry and gypsum board on

metal studs. There is historic scagliola in the East Hall. Alcoves on the north and south elevations of the East Hall are faced in plaster. The concourse level of the West Hall is primarily granite with modern construction at retail areas.

Retail Concourse

The retail concourse interior partitions are primarily CMU at the lower level with some gypsum board and metal stud partitions. The main level includes a combination of gypsum board on metal studs and metal storefronts, and the south side includes a combination of historic glazed brick piers and historic terracotta.

Claytor Concourse

Interior partitions at the Claytor Concourse are gypsum board on metal studs, with terracotta tile in some locations.

Parking Garage

The parking garage interior walls are concrete.

2.4.1.10.1 Historic Areas

At locations where historic fabric is present, maintain and preserve historic material to greatest extent possible. Refer to Historic Preservation Requirements for Guidelines.

2.4.1.10.2 Non-Historic Areas

At other building areas, utilize materials that maintain the required fire ratings between spaces, the required STC ratings to minimize sound transmission, and the required security of spaces.

2.4.1.11 Roofing

2.4.1.11.1 Existing Roofing Information

Distinct roof areas exist among the different parts of the building including the Head House, Retail Concourse, Claytor Concourse, and Parking Garage.

At the Head House, the barrel vault is covered with a terne-coated stainless-steel batten seam roof. Low slope roof portions of the Head House have a PVC roofing system.

The East and West Halls include a combination of PVC roofing at low slope areas and glazed rooftop monitors to allow daylighting.

The Retail Concourse is covered with a PVC roofing system.

The Claytor Concourse has a PVC roofing system.

The Parking Garage roof is primarily concrete. A glazed roof encloses the vertical transportation zone that connect the different levels of the parking garage to the Claytor Concourse.

2.4.1.11.2 Roofing Systems

Roofing at Washington Union Station should have the following qualities: a minimum twenty (20) year durability and a high resistance to physical damage. Roofing shall not entrap water within the roofing assembly. All roofing shall employ a positive slope to prevent ponding of water. To support the sustainability goals, roofing material should have a high albedo for thermal efficiency.

Follow the applicable version of the International Energy Conservation Code, as referenced in this document, for prescriptive R values and other potential compliance approaches.

2.4.1.11.3 Skylights and Monitors

Glass skylights and monitors shall be rated for a fifty (50) year durability (with maintenance) and include adequate roof curbs to prevent water intrusion. Glazing systems shall be insulated glazing units that allow the maximum amount of natural light but screen out infrared radiation through Low-E coatings or other methods.

2.4.1.11.4 Stormwater Management

Stormwater management at roof areas shall conduct water down and off roof surfaces, either through internal drain leaders or via roof gutters. Piping and drains shall be composed of materials designed for longevity. Special care shall be employed where drain

leaders are encased behind historic building fabric. In these areas, coordination with the FRA AHJ and possibly DCHPO.

All roofs should have redundancy of drains.

2.4.1.11.5 Rooftop Equipment

Rooftop equipment present at the building shall be screened from view to greatest extent possible and integrated into the architectural design. Items should not be any more visible from major street elevations (Columbus Circle NE, First Street NE, Massachusetts Avenue NE) or from the U.S. Capitol Grounds than at present and will be subject to review by the DCHPO and the US Commission of Fine Arts (CFA) when appropriate. All equipment shall be raised on either roof curbs or steel dunnage to prevent water ponding issues. All equipment shall be readily accessible for service and maintenance, with either sufficient space or catwalks surrounding the equipment.

2.4.1.12 All Doors

2.4.1.12.1 Existing Door Information

Exterior doors at the Main Hall are recessed within stone portals. Each opening contains a glazed wood door and frame with a transom window above. The doors, frames, and door hardware within these openings are not original and have all been replaced. (The 1986 Construction Drawings which noted these wood frames as original were incorrect. Additional information regarding the construction dates of building elements is available in the 2015 Historic Preservation Plan produced by BCA.) At the east elevation of the East Wing, doors have been recently replaced with structural glazing, including glazed stainless-steel doors and frames. Within the Carriage Porch along the West Wing, a central portico contains a double door and frame with a transom window above. Flanking this portico on either side are glazed metal revolving doors. All doors within the Carriage Porch are replacements. Additional metal doors and frames were installed during the 1980s renovation at the north and south portions of the Carriage Porch.

The Retail Concourse has modern glazed metal doors which were installed when the Concourse was shortened at the time of the Metro excavation in the 1970's.

The Claytor Concourse has modern glazed metal exterior doors that lead to the tracks, along with glazed metal automatic sliding doors that connect to the Parking Garage.

At the Parking Garage, fire-rated metal doors and frames are used at stairs and elevator machine rooms. Modern exterior doors of varying materials are used at the prefabricated structures in the parking garage, including the restrooms and convenience stores. Some of the openings into the Garage stairs contain rated frames and doors with closers, some contain only frames, and some contain no frames at all (and are simply openings).

2.4.1.12.2 Door Requirements

Existing doors and frames within Union Station that are part of the historic fabric should be maintained. Any work performed on these doors should be in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Doors and frames in non-historic areas should meet the following requirements based on type:

a. Door materials should be solid core wood, metal, or aluminum and glass depending upon location and function.
b. Doors to mechanical and engineering spaces should maintain an STC rating of 45.
c. Door finishes should be durable as well as stain and graffiti resistant.
d. Steel door frames excepting retail tenant construction should be welded.

2.4.1.13 Door Hardware Requirements

2.4.1.13.1 New Door Hardware

a. All new door hardware on non-historic doors within the building should be consistent with similar door type and function.

b. As existing hardware is replaced throughout the building, it should comply with requirements for new door hardware.

2.4.1.13.2 New Automatic Door Hardware

a. At locations of interior automatic doors, operator hardware shall match other door hardware in color, finish, and durability. Where automatic doors are present at exterior entrances, color and finish should match closely to the surrounding existing historic doors.

b. Exterior revolving door hardware shall match color, finish, profile, and durability of existing historic doors.

c. Existing historic doors shall maintain all existing door hardware to the greatest extent possible. Where new pieces are required, these elements shall match the existing color, finish, profile, and durability of their surroundings.

d. Electrified and panic door hardware where required will match new door hardware. At historic locations, consult with the FRA AHJ and DCHPO to minimize any potential visual impact.

2.4.1.14 Windows

2.4.1.14.1 Existing Window Information

There are a wide variety of windows present at Union Station, some original to the building and others more recent. Windows can be considered in two categories – those within the historic fabric, and those that are in non-historic areas of the buildings. The Main Hall Gallery Level features eight large semi-circular windows (lunettes) with ornamental steel grilles along the north and south walls, with an even larger semi-circular window with an ornamental steel grille along the east wall. Replacement glass panes within this east window contain a variety of tints; replacement of panes to achieve a consistent tint should be considered when possible. The East Wing has primarily rectangular window openings. Several of these are original wood but many have been changed to aluminum clad windows that are cap beaded with silicone sealant. Windows at upper levels have been retrofitted to have ½" insulated glazing. The West Hall contains a large lunette window on the north side of the carriage porch. There are large transom windows at the entry points at the West Hall entrance.

The Retail Concourse includes large arched windows at both ends which are supported by aluminum tubes.

The Claytor Concourse has a large skylight system supported by a space frame structure continuous along its entire length.

2.4.1.14.2 Historic Area Window Requirements

a. Windows within the existing historic fabric of the Head House and East and West Halls should be maintained and repaired in accordance with the guidelines established. Refer to Historic Preservation Requirements for Guidelines.

b. Materials and systems for windows in these areas should be durable, to be designed for a 50-year life span with limited maintenance.

c. Replacement windows should match existing windows in material, profile, color, size, glazing, frame and muntin styles, and window hardware to the greatest extent practicable.

d. Some allowance can be made for changing windows from single-pane float glass to insulating glass units (IGUs) with a low-E coating for increased thermal efficiency. Alternatively, interior storm panels may be considered. Glazing color should remain consistent with surrounding windows to maintain uniformity of the building façades.

e. Replacement and modern additions to the window hardware should match the original hardware in material, color, finish, and profile to greatest extent possible.

2.4.1.14.3 Non-Historic Area Window Requirements

a. Windows in these areas should comply with manufacturer's guidelines for wood, aluminum windows and steel windows. These windows should achieve the highest thermal resistance possible through the window system and glazing. Glazing color shall complement color used in the historic areas and be consistent throughout the building. These windows shall meet current code requirements for energy.

b. Additional window requirements include durability, a high shading coefficient for high thermal efficiency, and an optimal level of visible light transmittance inside the building. Window mullion and glazing colors should also complement the colors of the existing historic area windows.

c. Window hardware should be consistent in color and finish with historic area windows. Operability of windows is at the discretion of the FRA AHJ and may be possible in some areas but not others. Replacement windows should have an operable function if possible and acceptable to the FRA AHJ.

2.4.1.14.4 NOT USED.

2.4.1.15 Interior Finishes

2.4.1.15.1 Interior Finishes in Historic Areas

Interior finishes in the historic areas include granite, marble, plaster, and scagliola. Refer to the Secretary of the Interior's Standards for the Treatment of Historic Properties for preservation or replacement of these items. Refer to Historic Preservation Requirements for guidelines.

2.4.1.15.2 Interior finishes in Non-Historic Areas

New or replacement finishes shall comply with the following requirements:

a. Provide a durable finish that resists discoloration, staining, and graffiti.
b. Comply with allowable fire and smoke spread per the requirements of current applicable code requirements referenced in this document.

2.4.1.16 Ceilings

2.4.1.16.1 Ceiling Types

Ceilings within the Main Hall consist of plaster panels with recessed coffers, suspended from the steel structure above. The East and West Halls have a painted plaster finish. Ceilings in these spaces are ceilings are part of the original building fabric.

The Retail Concourse has three bands of plaster coffers, separated by two bands of metal and glass laylights, all suspended from the steel trusses above. These ceilings are also part of the original construction.

The Claytor Concourse is modern construction comprised of contemporary suspended ceilings and exposed space-frame structure.

The parking area primarily features exposed structure with no ceiling finishes.

Varying amounts of acoustic suspended panel, tile ceilings, and painted gypsum board ceilings are present throughout the building in offices and back of house spaces.

2.4.1.16.2 Ceilings in Historic Areas

Ceilings in the historic areas include those in the Main Hall, East Hall, West Hall, and Retail Concourse. Ceilings in these areas should remain intact to greatest extent possible. Refer to the Secretary of the Interior's Standards for the Treatment of Historic Properties. Any additions, penetrations or modifications to the historic ceiling fabric should be undertaken only after receiving written approval from the FRA AHJ and the DCHPO. Refer to Historic Preservation Requirements for guidelines.

2.4.1.16.3 Ceilings in Non-Historic Areas

Ceilings in non-historic areas including office spaces, back of house spaces, and other ancillary areas shall meet the following requirements:

Ceilings should be durable, comprised of high-quality materials, have impact resistance, moisture resistance, and high light reflectance. Ceilings should incorporate recycled content and low emitting materials.

- Refer to seismic requirements for suspended ceiling hanger requirements.

2.4.2 Historic Preservation Requirements

2.4.2.1 Introduction

Opened in 1908 and listed on the National Register of Historic Places in 1969, Washington Union Station is one of the city's most iconic buildings. The original building was composed of a Head House and Train Concourse. Over the course of several renovations and expansions, the building footprint has been modified by the Train Concourse being shortened for the installation of the Metro (subway) tunnel and converted into retail space, with this element now referred to as the Retail Concourse. A third concourse, the Claytor Concourse, now serves as the access point for trains. A large parking garage structure was added at the north edge of the site at the completion of the 1980s renovation of the building.

The Station, the railyards including the umbrella canopies as well as the First Street tunnel (long haul tunnel) both north and south of the station are considered historic. Refer to 4.7 in the Appendices.

In 2015 the Washington Union Station Historic Preservation Plan was issued. The Historic Preservation Plan includes a detailed assessment of the surviving historic building fabric and establishes an overarching preservation philosophy for Union Station that is intended to provide consistency for the stewards during planning and design efforts. The Historic Preservation Plan, in conjunction with the Secretary of the Interior's Standards for the Treatment of Historic Properties, will serve as the design guidelines for any work that involves renovations or alterations to, or interaction with, the existing historic building fabric.

2.4.2.2 Specific Guidelines

- USDOI – Secretary of the Interiors' Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings, 2017

- Washington Union Station Historic Preservation Plan; Building Conservation Associates, Inc., June 2015.

2.4.2.3 Union Station Special Criteria

Any Contractor working on the project will be required to secure approval in writing from the FRA AHJ, and potentially the DCHPO, for any activities that involve interface with the existing historic building fabric. These items include but are not limited to core-drilling, attachment of items to historic fabric, removal of historic elements (i.e., doors, windows, walls etc.), and replacement and/or repairs to any designated historic elements including walls, roofs, floors, ornamental metal, etc.

2.4.3 Sustainability Requirements

2.4.3.1 Introduction

Sustainability requirements and guidelines are indicated in 2.2 Codes and Standards as well as those listed below. They provide guidance for new construction as well as alterations, additions, and historic properties. Referenced Leadership in Energy and Environmental Design (LEED) requirements have been instituted by USRC for all work within the USRC building footprint.

2.4.3.2 Specific Codes and Guidelines

- LEED v4 for Existing Building Operations and Maintenance – U.S. Green Building Council, 2018
- LEED v4 for Interior Design and Construction – U.S. Green Building Council, 2018
- LEED certification for Interior Design and Construction is required.
    1. Gold certification is required for all Capital Improvement Projects
    2. Sections of the LEED certification are required for day-to-day operations and maintenance (building systems) as well as the retail, office, and Amtrak tenant projects.
    a. Sections 1.1-1.4 & 1.8 – required if the tenant is submitting for LEED certification
    b. Section 1.6
    c. Section 2.1
    d. Section 2.2
    e. Section 3.1
    f. Section 3.2
    g. Section 3.3

- Policies and Acts
    - Energy Policy Act of 1991 – Public law 102-486, 106 Statute 2776, 1992
    - EO 14008 Tackling the Climate Crises at Home and Abroad
    - EO 13990 Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis
    - Energy Act of 2020
    - Energy Independence and Security Act of 2007 (EISA 2007)
    - Energy Policy Act of 2005 (EPAct 2005)
    - Guiding Principles for Sustainable Federal Buildings (Guiding Principles)

- Farm Security and Rural Investment Act of 2002 (FSRIA)
- Resource Conservation and Recovery Act of 1976 (RCRA)
- Facilities Standards for Public Buildings P100

- ASHRAE 90.1 Energy Standards for Buildings Except Low-Rise Residential Buildings

2.4.3.3 Not Used.

2.4.3.4 Building Resilience

Building resilience is the design of buildings, landscapes, and communities to respond to natural and manmade disasters. These include the following: fires, floods, hurricanes, and earthquakes, as well as climatic changes to the environment including increases in the frequency of heat waves, flooding, wind events, and increases in storm rainfall intensity and amounts. Man-made disasters may include transportation accidents, power loss, rioting, acts of war, or terrorism.

A comprehensive plan should be developed at Union Station to mitigate these items through the use of operational procedures, utilization of robust building solutions capable of withstanding climatic events, implementation of passive security to protect building occupants, and redundancy of systems to allow uninterrupted building functionality.

2.4.4 Structural Engineering Requirements

2.4.4.1 Introduction

2.4.4.1.1 The procedures herein establish the structural design standards and criteria at Washington Union Station for both new structures and repairs/modifications to existing structures. The procedures are a mandatory standard for the structural design and is to be used in conjunction with the other referenced codes and standards.

2.4.4.1.2 The structural engineer of record (EOR) must review the project at each stage of development to ensure the requirements of the procedures have been met.

2.4.4.1.3 The procedures are not intended to prohibit structural systems or analysis methods not specifically addressed herein. Proposed alternative methods or any other deviations from the structural guidelines require a waiver request from the EOR to the AHJ, in the form of a signed and sealed letter describing the relief requested and the alternative method of satisfying the intent of the code.

2.4.4.2 Applicable Codes and Standards

Listed are referenced Codes and Standards that are used for structural design. Refer to 2.2 Codes and Standards.

2.4.4.2.1 Not Used.

2.4.4.2.2 Referenced Standards

- The applicable versions of the following standards below, which are referenced by the applicable version of the Model Building Codes referenced in this document, should be utilized.
- ASCE 7-16 “Minimum Design Loads for Buildings and Other Structures”
- ASCE 41-17 “Seismic Evaluation and Retrofit of Existing Buildings”
- ACI 318-19 “Building Code Requirements for Structural Concrete”
- TMS 402-2016 “Building Code for Masonry Structures”
- AISC 360-16 “Specification for Structural Steel Buildings”
- NDS 2018 “National Design Specification for Wood Construction”

2.4.4.2.3 Federal Laws/Standards

- Executive Order 13717 (EO 13717) “Establishing a Federal Earthquake Risk Management Standard”
  An Executive Order issued in 2016 by President Obama, which addressed earthquake risk management for federally owned and

leased buildings. The order encourages federal agencies to exceed code minimum levels of seismic safety, which is reflected by the seismic performance objectives herein.

- ICSSC RP 8 “Standards of Seismic Safety for Existing Federally Owned and Leased Buildings”
  The standard establishes criteria for evaluation and mitigation of seismic risks for all federal agencies. Note that the Standard references ASCE 41-06, but that ASCE 41-17 shall be followed for consistency with the ICC codes.

2.4.4.2.4 District of Columbia Building Code

2.4.4.2.4.1 As federal properties, the structural work at Washington Union Station Complex is exempt from the DC Building Code: however, the EOR shall reference the District of Columbia Building Code for the below criteria and utilize the most restrictive.

2.4.4.2.4.1.1 Snow Load, see Load & Design Parameters

2.4.4.2.4.1.2 Wind Load see Load & Design Parameters

2.4.4.2.4.1.3 Building Monitoring

2.4.4.3 Load & Design Parameters

Design loads shall be in accordance with the International Building Code. Load parameters provided herein are those which are commonly applicable for projects at Washington Union Station Complex. The EOR is responsible for verifying all load and parameters.

2.4.4.3.1 Risk Category

Given the importance of Washington Union Station Complex, the Owner requires all projects to assume the structure is Risk Category IV. Load

importance factors shall be based on this assumed Risk Category (see ASCE 7-16 table below)

Table 1.5-2 Importance Factors by Risk Category of Buildings and Other Structures for Snow, Ice, and Earthquake Loads[a]

Risk Category from Table 1.5-1	Snow Importance Factor, I_s	Ice Importance Factor—Thickness, I_i	Ice Importance Factor—Wind, I_w	Seismic Importance Factor, I_e
I	0.80	0.80	1.00	1.00
II	1.00	1.00	1.00	1.00
III	1.10	1.25	1.00	1.25
IV	1.20	1.25	1.00	1.50

[a]The component importance factor, I_p, applicable to earthquake loads, is not included in this table because it is dependent on the importance of the individual component rather than that of the building as a whole, or its occupancy. Refer to Section 13.1.3.

2.4.4.3.2 Live Loads

Live loads shall comply with the occupancy uses outlined in IBC and ASCE 7. Existing floors shall be assessed and reinforced (as needed) to meet current live loading requirements when triggered by the IEBC.

Vehicular bridges shall be designed per the loads outlined in AASHTO LRFD Bridge Specifications (American Association of State Highway and Transportation Officials Load and Resistance Factor Design). Rail transit bridges shall be designed per the requirements of the Manual for Railway Engineering (2019).

2.4.4.3.3 Snow Loads

2.4.4.3.3.1 Snow loads shall comply with IBC and ASCE 7-16 and District of Columbia Codes with consideration of:

- Unbalanced snow load
- Snow drifting at lower roofs and projections
- Roof valley snow drifting
- Sliding snow

2.4.4.3.3.2 The following snow load parameters shall be used, however, for consistency with DC Building Code, all projects at Washington Union Station Complex will need to use a minimum loading of either 30 psf (uniform flat roof snow load) or 25 psf + drifting, whichever is worst-case.

- Ground Snow Load *(ASCE 7-16, Figure 7.2-1)* p_g = 25 psf

- Terrain Category/Surface Roughness Category *(ASCE 7-16, §26.7)* B
- Exposure Factor*(ASCE 7-16, Table 7.3-1)* C_e = 1.0
- Thermal Factor *(ASCE 7-16, Table 7.3-2)* C_t = 1.0
- Importance Factor *(ASCE 7-16, Table 1.5-2)* I_s = 1.20
- Flat Roof Snow Load *(ASCE 7-16, Eqn. 7.3-1)* p_f = 21 psf

2.4.4.3.4 Wind Loads

Wind loads shall comply with the requirements of the IBC and ASCE 7-16 and District of Columbia Codes utilizing whichever is the worst-case.

The following wind load parameters shall be used:

- Basic Wind Speed *(ASCE 7-16, Fig. 26.5-1B)* V = 120 mph
- Wind Directionality Factor *(ASCE 7-16, Table 26.6-1)* K_d = 0.85
- Exposure Category *(ASCE 7-16, §26.7.3)* B
- Topographic Factor *(ASCE 7-16, §26.8.2)* K_{zt} = 1.0
- Gust Effect Factor (ASCE 7-16, §26.11.1) G = 0.85
- Enclosure Classification *(ASCE 7-16, §26.12)* Enclosed
- Internal Pressure Coefficient *(ASCE 7-16, Table 26.13-1)* GC_{pi} = +/- 0.18

2.4.4.3.5 Seismic Loads

Seismic load and parameters shall comply with the requirements of IBC, ASCE 7-16 and ASCE 41-17.

2.4.4.3.5.1 Performance Level

This performance is defined in ASCE 41-17 as a “post-earthquake damage state in which a structure remains safe to occupy and essentially retains its pre-earthquake strength and stiffness.”

The stated performance objective is consistent with the ICSSC RP 9, which encourages federal buildings to achieve performance objectives higher than Life Safety. An Immediate Occupancy is also in line with the

Basic Performance Objective (BPOE) for Risk Category IV structures (see ASCE 41-17 table below).

2.4.4.3.5.1.1 "Immediate Occupancy" performance level for structural components

2.4.4.3.5.1.2 "Position Retention" performance level for non-structural components

Table 2-1. Basic Performance Objective for Existing Buildings (BPOE)

Risk Category	BSE-1E	BSE-2E
I and II	Life Safety Structural Performance	Collapse Prevention Structural Performance
	Life Safety Nonstructural Performance (3-C)	Hazards Reduced Nonstructural Performance[a] (5-D)
III	Damage Control Structural Performance	Limited Safety Structural Performance
	Position Retention Nonstructural Performance (2-B)	Hazards Reduced Nonstructural Performance[a] (4-D)
IV	Immediate Occupancy Structural Performance	Life Safety Structural Performance
	Position Retention Nonstructural Performance (1-B)	Hazards Reduced Nonstructural Performance[a] (3-D)

[a] Compliance with ASCE 7 provisions for new construction is deemed to comply.

2.4.4.3.5.2 Seismic Hazard Level

2.4.4.3.5.2.1 New independent structures at the station complex shall be designed per ASCE 7-16.

2.4.4.3.5.2.2 Where a lateral assessment of existing elements is triggered per the IEBC, both structural and non-structural components shall be assessed and reinforced (as needed) to achieve the stated performance levels for a BSE-1E seismic hazard level. The BSE-1E is based on an earthquake with a 20% probability of exceedance in 50 years, or a mean return period of 225 years.

2.4.4.3.5.3 Seismic Parameters

The following seismic parameters shall be used in evaluation per ASCE 7-16 (new construction) and ASCE 41-17 (existing construction):

2.4.4.3.5.3.1 For New Construction:

- Soil Site Class *(unless shown otherwise by Geotech)* D
- Seismic Design Category C
- Design Short Period Spectral Response Acceleration S_{DS} = 0.142 g
- Design Spectral Response Parameter at 1 Second S_{D1} = 0.069 g

2.4.4.3.5.3.2 For Existing Construction:

- Soil Site Class *(unless shown otherwise by Geotech)* D
- BSE-1E Spectral Response Parameter at Short Periods S_s = 0.032 g
- BSE-1E Spectral Response Parameter at One-Second Period S_1 = 0.013 g
- Design Short Period Spectral Response Acceleration S_{XS} = 0.051 g
- Design Spectral Response Parameter at 1 Second S_{X1} = 0.031 g

2.4.4.3.6 Serviceability

The serviceability criteria shall be the most restrictive of either those in applicable code reference, or those presented below:

2.4.4.3.6.1 Gravity Deflections

The following deflection criteria shall serve as a minimum, but may need to increase for specific projects:

- For roof members live/snow load deflection shall not exceed L/240, and the dead + live load deflection shall not exceed L/180.
- For floor members the live load deflection shall not exceed L/360, and the dead + live load deflection shall not exceed L/240.
- For members supporting plaster ceilings the live load deflection shall not exceed L/480, and the dead + live load deflection shall not exceed L/360.
- For members supporting masonry walls the dead + live load deflection shall not exceed L/600.

2.4.4.3.6.2 Lateral Deflections

The following deflection criteria shall serve as a minimum, but may need to increase depending on the project design:

- Allowable story drift due to seismic *(Reference - ASCE 7-16, Table 12.12-1)*.
- Allowable lateral deflection due to wind shall be h/400 typically, or h/600 for walls with sensitive finishes, where h is the story height.

2.4.4.4 General Requirements

2.4.4.4.1 Building Monitoring

Where adjacent construction has the potential to impact existing structures a building monitoring plan shall be submitted to the AHJ for review. Monitoring plans shall be included as part of the permit submission and not left as a delegated design for the contractor. Monitoring requirements may include, but are not limited to, a pre-construction survey, movement monitoring and vibration monitoring. EOR shall clearly outline expected monitoring duration, locations, accuracy, thresholds, and deliverables.

2.4.4.4.2 Special Inspections Statements

A Statement of Special Inspections signed by all listed parties and a completed Schedule of Special Inspections outlining requirements for the project shall be included on the Construction Documents. Refer to 4.6 in the Appendices.

2.4.4.4.3 Special Inspections Records

2.4.4.4.3.1 The Owner shall be responsible for performing Special Inspections.

2.4.4.4.3.2 A Final Record of Special Inspections shall be signed by all listed parties. The Final Record must include a deficiency list with all deficiencies resolved, corrected, or accepted by the appropriate Design Professional and any inspections and testing reports that have not previously been submitted to the AHJ. Refer to 4.6 in the Appendices.

2.4.4.4.4 Deferred Design

For deferred design components, the Contractor shall submit signed and sealed drawings and calculations to the AHJ for review prior to construction.

2.4.4.4.5 **Post-Tensioned Concrete** (Union Station Parking Garage and connecting bridges/structures)

2.4.4.4.5.1 Projects at Washington Union Station Complex shall avoid post-installed attachments to post-tensioned concrete elements.

2.4.4.4.5.2 Consideration for post-installed attachments can only be made with written approval of the Owner.

2.4.4.4.5.3 No elements shall be attached or positioned within the existing structures that would restrict access for observation or maintenance of post-tensioned elements without written approval of the Owner. Refer to 4.7 in the Appendices for the USPG Bus Deck Maintenance Plan.

2.4.4.5 Mounting of Equipment

Mechanical Equipment items or other items of plumbing, electrical, or other engineering systems equipment shall not be suspended from structural clay tile arches above.

2.4.5 Mechanical Engineering Requirements

2.4.5.1 Introduction

2.4.5.1.1 All enclosed areas of the building shall be heated, cooled, and ventilated unless noted below.

2.4.5.1.2 The base building is served by steam and chilled water and district plant loops that cross through the building.

2.4.5.1.2.1 Steam is provided by the Architect of the Capitol (AOC) district plant. Steam service enters the building at the "steam tunnel" bridge across First Street at the main level of the building and descends into the lower levels, where it is piped to several steam pressure reducing stations and regulated at 10 psig for use by the building heating system. The services are available for year-round operations. The steam is converted to heating hot water to serve air handling and fan coil units.

2.4.5.1.2.2 The primary cooling system for the building is a district chilled water loop system. The chilled water is delivered from the AOC district system. 8” chilled water supply and return lines enter the building at the east side Lower Level. Direct expansion (DX) cooling systems are also utilized in the building, mostly for tenant spaces. Both split system condensing units and packaged DX rooftop units are located on several roofs.

2.4.5.2 Load & Design Parameters

2.4.5.2.1 Outside Conditions

a. Summer: 93.2 °F db / 75.2 °F wb
   i. Air Cooled Equipment 105°F db
   ii. Cooling Tower: 78°F wb
b. Winter: 9.5°F db

2.4.5.2.2 Inside Conditions

a. Summer (Occupied): 75°F +/- 2°F, <= 60% RH
b. Winter (Occupied): 70°F +/- 2°F >= 30% RH
c. Summer (Unoccupied): 80°F, <= 65% RH
d. Winter (Unoccupied): 64°F, >= 30% RH

2.4.5.2.3 Elevation

a. 80 feet above mean sea level

2.4.5.3 Ventilation

Outside air quantities shall be indicated on the drawings and will comply with ventilation requirements of ASHRAE 62.1. Additional outside air as necessary will be provided to meet pressurization and exhaust make-up air requirements.

All toilets shall be conditioned and exhausted per ASHRAE 62.1.

2.4.5.4 Pressurization

The building shall be pressurized through the use of controls and sequences to vary the outdoor air supply and relief from the spaces.

The building shall generally be pressurized by 0.01” wg (inches of water column) in relation to the outside.

2.4.5.5 NOT USED.

2.4.5.6 Controls

2.4.5.6.1 Thermostats shall be mounted on interior partitions, not on outside walls or in direct sun light. Mounting heights to meet accessibility standards.

2.4.5.6.2 Any new systems installed as part of ongoing renovation is to be provided with standalone BACnet Controller(s), the intent is that at a later date these standalone controllers will be connected to a common Building Automation System, front end of which will reside in the building engineers office

2.4.5.7 Mounting of Equipment

Mechanical Equipment items or other items of plumbing, electrical, or other engineering systems equipment shall not be suspended from structural clay tile arches above.

2.4.5.8 Commissioning

All equipment installed as part of the new work or modifications is required to be fully commissioned by an independent commissioning agent in compliance with the International Energy Conservation Code, (IECC) commissioning requirements,

2.4.5.9 NOT USED.

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2.4.6 Electrical Engineering Requirements

2.4.6.1 Distribution and Utilization Voltages

The following guidelines shall be used in the selection of utilization voltage for equipment, subject to the availability of the utilization voltage in the area of work in the station. At the time of writing of this guideline, the station's electrical distribution provides for both 480/277V as well as 208/120V; however, capacities, ampacities at various levels of distribution vary.

The project design shall adequately verify, document, and demonstrate how and where the project will connect to the existing electrical system, and demonstrate that adequate electrical capacity exists to support the proposed project. All new designs that increase the electrical loads on any primary or secondary feeds or circuits shall provide calculations of existing loading along with proposed increases in loading/distribution to verify for the AHJ that proposed increases will not compromise the existing services.

For major projects, if previous electrical distribution system studies are no longer valid, the contract should request an initial analysis of the electrical distribution system and capacities. This would not necessarily require a major study as the scope determines the impact on the station and main electrical distribution infrastructure. For smaller projects, the Project Sponsor should use as a basis of design, the existing available data from the most recent study (which should always be updated or supplemented upon completion new projects as they occur in order to remain current).

2.4.6.1.1 Lighting

- LED ambient lighting fixtures: 277 V
- Task lighting fixtures: 120 V

2.4.6.1.2 HVAC and Building Systems

- Above 5 KW: 480 V, 3-phase
- Between 1.5 KW and 5 KW: 277 V, 1-phase or 480V, 3-phase
- Less than 1.5 KW: 120 V, 1-phase or 277 V, 1-phase

2.4.6.1.3 Motors

- 1/3 hp and below: 120 V, 1-phase
- 1/2 hp and 3/4 hp: 480 V, 3-phase or 120 V, 1-phase
- 1 hp and above: 480 V, 3-phase

2.4.6.1.4 Controls

- 120V, 1-phase

Note: Motors furnished at 277 V single phase as an integral part of HVAC equipment are acceptable for all horsepower.

2.4.6.2 Emergency, Legally Required Standby and Optional Standby Systems

Emergency Electrical Systems are required to automatically supply power in the event of failure of the normal power supply, for illumination and equipment essential for safety to human life per code.

Legally Required Standby Systems are intended to automatically supply power to selected loads in order to prevent damage to the facility, to aid in rescue, to facilitate firefighting, evacuation, or similar operations per code.

Optional Standby Systems are intended to automatically supply power to selected loads that are important to the operations of the station but may differ for each project at the station per code.

2.4.6.2.1 Emergency Loads

The normal electrical distribution system demand loads are driven by code requirements, building systems and operational equipment necessities. In effect electrical distribution and demand serves other systems. The only optional criteria is the “optional standby power” demand, i.e.: equipment and loads that are determined should be on standby power for comfort or convenience of patrons or similar. This category is described Optional Standby Loads below. The Project Sponsor confirms the optional standby loads.

Emergency loads shall include, but not necessarily be limited to:

- Emergency egress lighting
- Security and intrusion alarm systems
- Signage (egress only)
- Communication systems (include station’s public address systems)
- Fire alarm systems
- Fire suppression systems
- Energy Management and Control System
- Union Station Security Systems
- Amtrak Security Systems
- Elevators cab lighting
- Lighting of all electrical rooms – 100% of fixtures
- Lighting of mechanical equipment – 50% of fixtures

- Lighting Communications – 50% of fixtures
- Lighting of fire control rooms – 100% of fixtures
- Receptacles of critical rooms in electrical, communications and fire control

2.4.6.2.2 Legally Required Standby Loads

Legally Required Standby Loads shall include, but not necessarily be limited to:

- Sanitary drain sewage ejector pump systems
- Stormwater drain sump pump systems
- Smoke evacuation systems
- Security and Communications Systems Centralized UPS Units
- Electrically operated faucets and flush valves

2.4.6.2.3 Optional Standby Loads

Optional Standby Loads will be identified in the scope of work for each project. Generally, these loads include:

- Station's non-critical operations that provide passenger comfort and convenience
- Loads that are generally provided added benefit to services at the station and while they facilitate better passenger experience, lack thereof does not cause issues or concerns for the station.

2.4.6.3 Electrical Equipment Rooms

All substations, switchgear, switchboards, transformers, and, in general, panelboards, shall be installed in dedicated electrical rooms or closets. In special cases, such as tenant / retail leased areas and areas with heavy concentration of electrical loads (kitchens, communications equipment rooms, etc.), transformers and panelboards may be located in other rooms or areas near the load served.

2.4.6.4 Minimum Requirements

- Plumbing, mechanical, or other facility or operational pipes shall not be routed through electrical rooms or closets per the National Electrical Code requirements.
- Plumbing pipes or mechanical ducts in the electrical rooms or closets that are existing to remain shall not be routed directly above electrical equipment.
- Electrical outlets and lighting in electrical rooms and electrical closets shall be served from dedicated circuits.
- Branch circuits supplying emergency power for lighting and receptacles in substation rooms shall not supply emergency lighting in any public area.
- Equipment that is part of the emergency power system (other than lights and receptacles, as noted above) shall not be located in substation rooms.
- Each electrical room and electrical closet shall have at least one receptacle installed in it.

- All walls of electrical rooms and closets shall be painted a light color.
- Electrical substations containing switchgear shall be sized to provide clear space around the equipment of not less than 6'-0" in front and 3'-6" in the rear and at both ends.
- Adequate egress shall be provided for the installation and removal of equipment
- Where columns are within the rooms, they shall not encroach on the required space around equipment
- Electrical closets shall be provided in adequate quantity, size, and location to allow for top and bottom conduit entry and exit from the closet.
- Electrical rooms and closets shall be located central to the loads served.
- Space shall be provided in electrical closets for future conduit and equipment.

2.4.6.5 Equipment Pads

- Floor mounted equipment such as switchgear, switchboards, motor control centers, and transformers shall be placed on concrete pads.
- For switchgear and motor control centers, a pair of steel “C” channels shall be embedded in the pads.
- Channels shall be flush with or slightly above the top surface of the pad.
- Channels shall be level along their entire length, and front channel shall be level with rear channel.
- Location of channels shall be per equipment manufacturer’s recommendation.

2.4.6.6 Grounding System

2.4.6.6.1 Equipment Grounding Conductor

a. A separate grounding conductor shall be provided in all raceway systems containing power circuits, including indoor lighting and receptacle circuits.

b. The ground conductor shall be insulated and color-coded green, sized per the National Electrical Code requirements.

c. A 4/0 ground conductor shall be provided with all power circuits over 600 volts.

2.4.6.6.2 Grounding Electrode System

a. Ground rods shall be ¾" diameter by 10' long of copper or copper clad steel.

b. All underground connectors shall be made using exothermic welds or U.L. listed compression type connectors and installed utilizing the appropriate tool as recommended by the manufacturer.

2.4.6.6.3 Lightning Protection System

a. The existing lightning protection system is a building-wide cohesive system for the entire station and Master Label requirement can only be met when the entire station is under one uniform system. The installation of the system components, down conductors, bonding to the grounding systems and the multitude array of air terminals can be installed in phases and uniformity of the system can be achieved when all components have been installed and the system mesh is bonded, tested and commissioned.

b. The Union Station shall be completely protected with a lightning protection system and any modification, modernization or renovation of the system shall continue to enhance and provide extension of coverage to newly renovated areas.

c. The system and all future modifications of the system shall be a U.L. Master Label

d. Lightning protection conductors shall be installed in conduit where the conductors are routed inside buildings.

e. All materials used expressly for lightning protection shall be copper, except where copper components cannot be used due to material compatibility requirements. In such cases aluminum materials may be used, but only for the connection to the incompatible material.

f. All installation and incorporation of the protection systems shall be installed in accordance with these codes and standards:

- Lightning Protection Institute 175
- NFPA 780
- U.L. 96A
- Main electrical feed(s) and service shall be provided with a surge arrestor that is listed under U.L. category “OWHX.”

2.4.6.7 Electrical Power Distribution

In all main electrical rooms or what has been traditionally called substations at Union Station and where the anticipated load is 1000 KVA or more:

a. All secondary substations shall be double-ended secondary selective systems. This shall consist of two primary feeders, two transformer primary overcurrent protective devices, two transformers, and two sets of low voltage switchgear.

b. Substations shall be provided with closed transition automatic transfer.

c. The Owner will provide the designer with schematic diagrams and other information on the automatic transfer system where the designer shall review and revise the supplied information to suit the particular project requirements.

d. A manual transfer may be used, subject to prior written approval by the Owner for secondary substations serving the parking garage lighting only.

e. In areas of the station that are currently equipped with only a single feeder system, connection to the single feeder may be allowed, with written permission of the Owner. However, provisions must be included for future addition of the second feeder and the associated transfer equipment as described above.

2.4.6.8 Distribution Equipment

2.4.6.8.1 Primary Medium Voltage Overcurrent Protection

a. Where fusing is utilized for transformer primary protection, fusing shall be full range current limiting type “Under oil” type fuses shall not be used.
b. In substations, primary switches shall not be interlocked with the secondary main breaker.
c. All busses shall be copper

2.4.6.8.2 Transformers with Medium Voltage Primary

a. Transformers shall be delta primary.
b. Transformer secondary shall be Y-connected solidly grounded, with neutral terminal.
c. The transformers shall have adequate self-cooled capacity for 100% load plus 25% capacity for future growth.

d. The temperature rise rating shall be 55/65°C rise above 40°C ambient for liquid-filled transformers and 115°C for dry-type transformers.
e. Liquid-filled transformers shall be supplied with liquid level gauge, pressure/vacuum gauge, and temperature gauge with alarm contacts.
f. Transformers shall have lightning/surge arresters on the primary, on the load side of the disconnecting means.
g. Winding material and internal bussing and connections shall be copper.
h. Insulation for dry-type transformers shall be rated at 150°C and 220°C hotspot and shall be silicon or polyester resin type "VPI".
i. Dry-type transformers used in substations shall be equipped with a two-stage temperature-sensing device. The first stage shall activate forced air fans (if fans are provided), and the second stage shall initiate an alarm.
j. For double-ended substations, the fan cooled rating at the higher temperature rise rating of the transformer is to be used in determining the load carrying capacity of the substation where one transformer is out of service.
k. All cable connections to transformers shall utilize compression type connectors where cables are #6 or larger.

2.4.6.8.3 Low Voltage Switchgear

a. Secondary low-voltage switchgear shall be rated at 480 volts, 3-phase, 60 - hertz, and shall be free-standing, metal enclosed, draw-out, ANSI type.
b. The switchgear shall have a main circuit breaker on the secondary of each unit substation transformer.
c. In general, loads of less than 600 amperes shall be served from distribution panels and not directly from the switchgear.
d. A minimum of 20% spare circuit breakers shall be provided.
e. All cubicles shall be complete, with bus work rails, wiring, and circuit breakers.
f. Rear (cable) compartments shall have full height metal barriers between each vertical section.
g. All busses shall be copper.
h. Where automatic transfer is provided, the secondary main breakers and tie breaker shall be electrically operated with manual and electrically operated trips.
i. Feeder circuit breakers shall be manually operated.
j. Where automatic transfer is not provided, all breakers shall be manually operated.
k. Where ground-fault protection is required on main circuit breakers, it shall also be provided on feeder circuit breakers to provide selective tripping of breaker closest to the fault.

l. The control power for low-voltage circuit breakers shall be 120 volts AC.
m. Over-current devices shall have short-time, long-time, ground-fault, and instantaneous trip settings.
n. Each incoming line shall be provided with over/under-voltage, and phase sequence protection.
o. All cable connections to the switchgear shall utilize compression type connectors where cables are #6 or larger.
p. Compression connectors shall be copper, two hole, and long barrel type.

2.4.6.8.4 Panelboards (Power and Lighting)

a. Panelboards shall have copper busses.
b. Panelboard circuit breakers shall be bolt-in type.
c. Panelboards shall have hinged front cover.
d. Where single-phase power is supplied by a 3-phase source, the loads shall be balanced on each phase.
e. Each 480/277V panelboard shall be provided with a minimum of 20% spare circuit breakers.
f. Each 208/120V panelboard shall be provided with a minimum of 25% spare circuit breakers.
g. All cable connections to panelboards (both incoming line and outgoing circuits) shall utilize compression type connectors where cables are #6 or larger.
h. Mini Power Centers (combination transformer/load centers) shall be allowed only for special applications and with prior approval by the Owner; generally exterior applications or in the parking garage where only a few circuits are required, and the concentration of project loads are at a long distance from the supply source.

2.4.6.8.5 Raceway systems

a. All conduits shall be installed parallel with the building features, except for conduits that run in or under the slab.
b. Where slab on grade thickness is 8 inches or less, conduits shall not be installed in the slab on grade.
c. Conduits shall not be attached to box covers, except for ½" or smaller flexible conduit terminated on a flush mounted box cover.
d. Smallest conduit size shall be ½”.
e. All conduits shall be marked every 150' indicating its use.
f. All conduits shall be supported independent of other systems and equipment and shall be supported with approved devices (tie-wire is not acceptable).

g. Conduit shall not be run exposed on top of roof surfaces.
h. Rigid Galvanized Steel (RGS) Conduits shall be used:

    i. In elevator shafts
    ii. All exterior areas
    iii. Any location where physical damage is possible.
    iv. Where exposed within 8' of the finished floor level and continuing beyond 8' to the next nearest point of conduit support, with the following exceptions:
    v. Where EMT descends vertically from overhead and the raceway terminates onto electrical equipment at an elevation of 6 feet or above, the EMT may continue down to the termination at the equipment.
    vi. Within communications equipment rooms, EMT may be used for all wiring.
    vii. All fittings shall be threaded.

i. PVC Schedule 40 or Rigid Galvanized Steel (RGS) Conduits shall be used:

    i. In all occurrences where a conduit is to be run below a concrete slab on grade.
    ii. In all occurrences where a conduit is to be run within a concrete slab.
    iii. For stub-up out of floor into bottom of floor-mounted equipment, provided conduit will not be exposed.

j. Flexible Metal Conduits shall be used:

    i. In all occurrences where a conduit is to be run below concrete slab on grade
    ii. Where conduit is fished in existing walls or through mullions, metal tubing, etc.
    iii. Where restricted space does not allow use of ¾”
    iv. Where flexibility is required, such as connections to motors or control devices (maximum length shall be 18")
    v. For fixture “whips” to recessed lighting fixtures (minimum size ⅜")
    vi. When used in wet or damp locations, liquid-tight flexible metal conduits shall be used.

k. Electrical Metallic Tubing may be used:

    i. Where allowed by code in all other interior spaces.
    ii. All fittings used with EMT shall be compression type. MC cable may be substituted for EMT in some instances and will be subject to the approval by FRA.

2.4.6.8.6 Boxes and Wiring Devices

a. Boxes for interior electrical systems shall be hot dipped galvanized steel or malleable iron.
b. Cover plates for receptacles, switches, and boxes shall be steel.
c. Receptacles
d. Duplex receptacles shall be rated at 20 amperes, 125 volts (NEMA 5-20R configuration) with side wired, copper alloy screw terminals.
e. All exterior receptacles shall be GFCI type.
f. GFCI receptacles shall not be wired to protect downstream receptacles, except in indoor installations where the downstream receptacles are in the same room.
g. Receptacles shall be identified according to normal power, emergency power or data with isolated ground with the following color-coding:
    - Normal Power: Brown or Ivory
    - Emergency Circuit: Red
    - Isolated Ground: Orange
h. Toggle Switches used as lighting control shall be rated for use on 120- and 277-Volt circuits and shall be rated for a minimum of 20 amperes.

2.4.6.8.7 Wire and Cable

a. All wire and cable shall be copper.
b. All wiring shall be run in raceways, except for communications cabling.
c. Except as expressly permitted by the Owner, open wiring and direct buried wiring are not permitted
d. All abandoned wiring and conduits shall be removed.
e. Low-Voltage Wiring and Cabling

    i. Conductors to be used on circuits rated 600 volts and less shall be rated for 600 volts and shall be types THHN, XHHW, or THWN
    ii. Conductors run below grade for outdoor lighting circuits shall be type XHHW only.
    iii. MC Cable shall be permitted to be used in certain spaces, subject to FRA approval.
    iv. Wiring larger than number 10 AWG shall be stranded.
    v. Wire sizes number 10 AWG and smaller may be solid or stranded.
    vi. Conductor size 6 and larger shall use a compression type connector.

vii. Conductor's size 8 and smaller may use “wire nuts” or crimp connectors.
viii. Where necessary to meet code requirements for fire resistance, fire resistant low voltage cable types such as RHW and MI cable may be used following FRA’s approval.

f. Medium Voltage Cable

i. All medium voltage cables installed underground shall be installed in concrete encased ducts.
ii. Medium voltage cables installed in manholes and pull-boxes shall be wrapped with fireproofing tape, with each conductor separately wrapped.
iii. Where separable connectors are used, fireproofing shall not prevent separation of connectors.
iv. Medium-voltage cables shall be identified in each manhole with laminated plastic tags that will indicate the voltage, phase, and feeder number.
v. Tags shall be permanently marked, and a sample shall be submitted for FRA’s approval prior to installation.
vi. Only single-conductor cables shall be used.
vii. Cable shall have EPR type insulation.

g. The minimum size for 15 KV feeder cables shall be 500 MCM, except that size 4/0 may be used as follows:

i. On feeder taps to individual substations or multiple substations where the anticipated and future load is within the capacity of the cable
ii. A 4/0 ground cable shall be run with each circuit.
iii. Terminations and splices shall utilize compression-type cable lugs.
iv. Alternate circuit cables shall be racked on opposite sides of manholes.
v. Cable insulation levels rated at 15 KV shall be 133%
vi. Taps, and splices other than straight two-way splices on medium-voltage cable shall be made utilizing separable connectors conforming to IEEE 386.
vii. Terminations shall conform to IEEE 48 Class 1
viii. Separable connectors shall consist of all-copper components.
ix. Medium-voltage cable splices and taps shall be made with a minimum of 3' of slack cable on each side of the splice or tap and shall be made by a certified cable splicer.
x. Record of certification shall be submitted to FRA.

xi. All medium voltage cables shall be hipot tested by an independent testing agency after installation and before energizing, per NETA procedures and records shall be submitted to FRA.

2.4.7 Plumbing Engineering Requirements

2.4.7.1 Purpose

Requirements for Plumbing engineering including planning and design of the sanitary waste, vent, water distribution, storm drainage, and natural gas systems at Washington Union Station are included in this section. These requirements shall be utilized for all renovation and new construction projects in order to maintain the safety, reliability, and sustainability of the plumbing systems in the facility. Plumbing systems shall be designed to meet all applicable codes and Federal mandates for optimal energy efficiency and water conservation.

2.4.7.2 Plumbing Codes and Standards

All plumbing systems shall be designed to meet the codes and requirements per Section 2.2 Codes and Standards as well as those specifically stated below.

2.4.7.3 Domestic Water Systems

All domestic water systems, which include potable and non-potable water, shall be designed, and constructed to provide adequate flow and pressure to all fixtures, appliances, and equipment being served. Protection against cross-contamination shall be provided by the means of a reduced pressure principal type backflow preventer between potable and non-potable systems, mechanical make-up water, and at locations where required for appliances. Only potable water systems shall serve plumbing fixtures and appliances. Pipe sizing and distribution design criteria are governed by the applicable codes and standards.

The central building and tenant domestic cold water distribution systems shall be designed to not exceed a flow velocity of 8 fps (feet per second), and domestic hot water shall not exceed 4 fps. The maximum operating systems pressure shall not exceed 80 psi (551.6 kPa). The domestic hot water circulation system shall be maintained for optimal temperature and system performance. All tenants utilizing building central domestic hot water shall be required to maintain proper circulation by recirculating upstream of their hot water sub-meter so as to not create dead legs in the system. Isolation valves shall be provided at all supply branches, equipment, and serviceable components to facilitate necessary service shutdowns. All ball valves shall be three-piece type to allow easier maintenance and upkeep.

2.4.7.3.1 Domestic Water Piping Materials

Above ground domestic water piping shall be Type L copper complying with ASTM B88, lead free soldered joints for pipe sizes 2 ½" and smaller. Brazing shall be the preferred method for pipe sizes 3" and larger. Press fitting systems may be used for piping between ½" to 2" in diameter where allowed by code and with proper approvals and certifications but shall not be used in concealed locations.

2.4.7.3.2 Sanitary, Waste, Vent, and Storm Systems

Sanitary and storm pipe design slopes to be in accordance with International Plumbing Code.

Designs should not include storm or sanitary waste piping buried in slabs under electrical rooms and similar areas. Avoid routing waste piping above electrical rooms, computer rooms, and similar areas. Waste piping shall be properly insulated in areas where condensation is possible. Drainage systems shall be designed for flow by gravity and the use of a pumping system shall be avoided wherever possible. If pumping systems are required, equipment shall be duplex type with each pump having the capacity of discharging 100 percent of the incoming peak flow. Design of the plumbing system shall be arranged to prevent sewage backflow in the building due to stoppage in the exterior sewer by providing relief on the exterior of the building at the sewer manhole. The storm drainage system shall collect clear water from roof drains. Condensate from air conditioning units shall be collected by the storm water drainage system unless prohibited by the FRA AHJ.

A minimum of one floor drain with trap primer shall be provided in public toilet rooms containing two or more water closets or a combination of one water closet and one urinal. Floor drains shall be provided in all mechanical rooms.

2.4.7.3.3 Sanitary, Waste, Vent, and Storm Piping Materials

Sanitary, waste, vent, and storm piping above ground shall be hub and spigot service weight cast iron pipe and fittings with compression gaskets conforming to the requirements of ASTM C564. Hubless pipe and fittings shall be service weight cast iron pipe and fittings conforming to ASTM A 888 with heavy duty couplings complying with ASTM C1277 and ASTM C1540, stainless steel shield with stainless steel bands steel bands with tightening devices. Two-strap fittings are required on each side of the coupling (four straps total). ASTM C564 rubber sleeve with integral enter rubber stop will not be accepted.

PVC pipe and fittings shall be DWV type meeting the requirements of ASTM D2665. Type DWV copper piping with soldered joints may be used for piping above ground (except for urinal drains) in lieu of

cast-iron pipes for pipe sizes 4" and under. Where copper tubing is used for urinal drains, the tubing shall be "K" copper.

Sanitary, waste, vent, and storm piping below ground shall typically be hub and spigot service weight cast iron pipe and fittings with compression gaskets conforming to the requirements of ASTM C564. Plastic piping used for underground installations shall be one standard schedule or SDR higher than required by code or calculations.

2.4.7.4 Natural Gas System

Design of natural gas piping systems shall be in accordance with the IFGC. A solenoid valve shall be provided in the natural gas supply line to all restaurant tenants, with an emergency shut-off valve at the exit in a conspicuous location for each area. The shutoff valve must be specifically designed and listed for this intended purpose at the system operating pressure, fuel type, and location. Valve shall be the type that shuts off the flow of gas in the event of electrical current failure (normally closed). The valve remains closed until manually reopened.

2.4.7.5 Plumbing Fixture, Faucets, Fittings, and Equipment

Plumbing fixtures must comply with the International Plumbing Code and with local building codes per the P100 Water Conservation Requirements. In compliance with EISA 2007 water conservation technologies must be applied to the extent that the technologies are life-cycle cost-effective. They will also be determined by the sustainability requirements.

WaterSense is a partnership program sponsored by the U.S. Environmental Protection Agency. Its mission is to protect the future of our nation's water supply by promoting and enhancing the market for water-efficient products and services.

Plumbing fixture accessibility clearances, installation, and accessories must be compliant with all adopted codes and standards including the Americans with Disabilities Act (ADA), and ANSI 117.1. In the case of conflict among the codes and standards, the most restrictive shall govern.

2.4.7.5.1 Water Closets (Toilets) – Flushometer Valve Type

Water closets must be either dual-flush or low-flow type, manually controlled. For single flush, maximum flush volume when determined in accordance with ASME A112.19.2 to be 4.8 L

(1.28 gal). For dual-flush, effective flush volume determined in accordance with ASME A112.19.14 and USEPA WaterSense Tank-Type High Efficiency Toilet Specification to be 4.8 L (1.28 gal).

2.4.7.5.2 High-Efficiency Toilets (HET) Water Closets – Tank Type

Tank-type water closets must comply with the performance criteria of the U.S. EPA WaterSense Tank-Type High-Efficiency Toilet Specification.

2.4.7.5.3 High-Efficiency Urinals (HEU)

Urinals must be low-flow, flush-type fixtures. Maximum flush volume when determined in accordance with ASME A112.19.2 to be 0.5 L (0.125 gal).

2.4.7.5.4 Public Lavatory Faucets

Use metered-type faucets for lavatories. Maximum water use to be 1.0 L (.25 gal) per metering cycle when tested in accordance with ASME A112.18.1/CSA B125.1.

2.4.7.5.5 Kitchen Faucets

Maximum water use to be 6.8 L/min (1.8 gpm) when tested in accordance with ASME A112.18.1/CSA B125.1.

2.4.8 Fire Protection Engineering Requirements

2.4.8.1 Compliance Approach, Historic Provision and Compliance Alternatives

The National Fire Protection Association (NFPA) has developed *NFPA 914- Code for the Fire Protection of Historic Properties* specifically to address the unique conditions and challenges of historic structures. NFPA 914 is the appropriate code to utilize for work on Washington Union Station, a listed historic structure that is irreplaceable. This would apply to the historic building, but not be applicable to the Claytor Concourse or the Garage. The primary reason for requiring the use of this NFPA code is that it provides a clear guideline for analyzing or managing the historic and compliance alternatives provisions of the building code using a total concept approach to the overall life safety, fire protection, and preservation of the building through comprehensive design, program, or administrative requirements, as well as operations and maintenance requirements.

This total concept management approach to all aspects of protection of historic properties and landmarks provides administrative direction and guidance to:

- help stakeholders define over-arching fire safety goals and objectives.
- provide a consistent framework for comprehensive Fire Safety Management.
- identify a process for either prescriptive or performance-based options in evaluating alterations and renovations.
- outline the management of fire & life safety systems including inspections, testing, and maintenance.
- provide fire prevention requirements tailored to historic buildings.
- identify key fire precautions for alterations and renovations in historic buildings.
- provide specific requirements for management of special events related to or within the resource, which appropriately supports the mission and preservation of Washington Union Station.

NFPA 914 provides a well-defined path or options for the applications of either prescriptive or performance-based design solutions as determined by Building & Fire Code requirements. Improvements in the application and acceptance of performance-based engineering analysis and evaluation tools provides the Federal Railroad Administration (FRA), Station Operations Management, and Architectural/Engineering designers (A/E) with direction on implementation of performance methodologies and tools to assess, define, and establish requirements to achieve or define a level of performance for a safe environment. Specifically, the development and application of fire and smoke modeling tools and personnel egress modeling provide recognized methods of

demonstrating, with a measured amount of certainty, that unique or alternative approaches can achieve a uniform and defined level of safety in situations where compliance to prescriptive requirements is difficult or not technically feasible. NFPA 914 provides a recognized framework to compliment the Building Code that is also recognized by the national historic and cultural resource community.

2.4.8.2 Applicable NFPA Standards

- NFPA 10 – 2018, Standard for Portable Fire Extinguishers
- NFPA 13 – 2019, Standard for the Installation of Automatic Sprinkler Systems
- NFPA 14 – 2019, Standard for the Installation of Standpipe and Hose Systems
- NFPA 17A – 2021, Standard for Wet Chemical Extinguishing Systems
- NFPA 20 – 2019, Standard for the Installation of Stationary Pumps for Fire Protection
- NFPA 24 – 2019, Standard for the Installation of Private Fire Mains and Hydrants
- NFPA 72 – 2019, National Fire Alarm and Signaling Code
- NFPA 92 – 2018, Standard for Smoke Control Systems
- NFPA 110 – 2019, Standard for Emergency and Standby Power Systems
- NFPA 130 – 2020, Standard for Fixed Guideway Transit and Passenger Rail Systems
- NFPA 170 – 2018, Standard for Fire Safety and Emergency Symbols
- NFPA 241 – 2019, Standard for Safeguarding Construction, Alterations and Demolition Operations
- NFPA 914 – 2019, Code for the Protection of Historic Structures
- NFPA 1600 - 2019, Standard on Continuity, Emergency, and Crisis Management
- NFPA 1616 – 2020, Standard on Mass Evacuation, Sheltering and Re-Entry Programs
- NFPA 1620 – 2020, Standard for Pre-Incident Planning

2.4.8.3 Fire Areas & Fire Zones

The station is organized into three (3) hour fire areas size and six (6) fire zones for annunciation reporting and coordination of the building complex smoke control zones. The smoke management system is a hybrid system that employs a simultaneous exhaust sequences and pressurization and airflow method (directed air flow) to exhaust and mitigate smoke spread throughout the station. Both the automatic sprinkler system zones and the fire detection within

them are arranged and coordinated to manage smoke movement and migration for fire emergencies within the station complex. The system is arranged into two evacuation zones. Fire Areas A & B are one evacuation zone, and Fire Area C is a separate and distinct evacuation zone.

2.4.8.3.1 Union Station Fire Areas

- Fire Area A – Lower Level Main Hall (Former Cinema Space)
- Fire Area B – Lower Level, Street & Mezzanine Levels Main Hall, West Hall, East Hall, Retail Galleries and East Concourses, Claytor Concourse, Presidential Suite spaces, the Amtrak north-of-the-wall areas (i.e., Acela Lounge).
- Fire Area C – Office Occupancy Floors 2 through 4

2.4.8.3.2 Station Fire Detection & Alarm and Smoke Zones

- Fire Alarm Zone A – Lower Level Unoccupied Tenant Space (former Cinema)
- Fire Alarm Zone B - Baggage/Sub-Basement Tunnel/Fire Pump Room
- Fire Alarm Zone C – Lower Level East Service Area
- Fire Alarm Zone D – Lower, Street and Mezzanine Levels of the Retail Gallery, the Link (Claytor Concourse), the Amtrak north-of-the-wall areas (i.e., Acela Lounge)
- Fire Alarm Zone E – Street Level Main and West Halls
- Fire Alarm Zone F – Street Level East Hall & Presidential Suite
- Fire Alarm Zone G – Floors 2 through 4 East & West Office Towers

2.4.8.4 Automatic Sprinkler & Standpipe Systems

Automatic sprinkler system zones shall be arranged and organized by the station fire areas and fire alarm zones. Automatic sprinkler system zone control valve assemblies are arranged and organized by Fire Alarm Zone to provide alarm reporting initiation of the Station's smoke control and management system as a simultaneous sequence for all three fire areas. Sprinkler protection for the mall of a covered mall building shall be independent from that provided for tenant spaces; where tenant spaces are supplied by the same system, they shall be independently controlled. The Station standpipe system is a Class I, wet-pipe manual system in accordance with the International Building Code and NFPA 14.

Fire Department use Class I hose valves shall be provided in the station and throughout the train concourses and platforms in accordance with the International Building Code, NFPA 14, and NFPA 130. Note: The 1986 Schirmer Report and Grinnell Sprinkler drawings detail a Class III standpipe system, but this does not seem to have been installed.

2.4.8.4.1 Standpipe Systems

The manual wet-standpipe system consists of 2½-inch hose valves with 1½-inch reducers. This system is to be provided at main floor level landings in each stair enclosure and at other locations required by the International Building Code, NFPA 14, and NFPA 130 to provide compliant hose reach to all areas of the building. The Garage is protected with a Class III manual dry pipe standpipe system.

2.4.8.4.2 Hose station cabinets

Class I hose station cabinets shall be provided in all areas and locations outside of station egress stairs.

2.4.8.4.3 Hydraulic requirements

The standpipe system shall be hydraulically calculated to provide 500 GPM at the most remote standpipe riser/hose valves and 250 GPM at the top of other risers and shall be sized to provide a minimum residual pressure of 100 PSI at each hose valve.

2.4.8.4.4 Water supply sources

Water supply will be from the Garage fire pump, station fire pump or by DCFD fire department apparatus supplying the fire department connections (FDC) with a minimum 1000 gpm at a source pressure of 150 psi at the FDC.

2.4.8.4.5 Control Valves

Automatic sprinkler protection will be provided via UL listed and FM Global approved integral zone or floor control valve assemblies. All automatic sprinkler systems in the station or garage will be protected throughout by a hydraulically calculated automatic sprinkler systems designed and installed in accordance with NFPA 13.

2.4.8.4.6 Sprinkler Specific Requirements

The sprinkler systems shall be designed to Light Hazard criteria for all office, lobby, and corridor areas. All retail tenant spaces in the gallery or main hall, all locations where ceilings exceed 35 feet in height, and mechanical room and storage spaces shall be designed to Ordinary Hazard Group 2criteria.

a. Minimum system design density shall be 0.10 GPM/ft^2 over the hydraulically most remote 1,500 square feet for light hazard areas and 0.15 GPM/ft^2 over the hydraulically most remote 1,500 square feet for Ordinary Hazard Group 1 areas.

b. All general storage rooms and spaces, elevator related spaces and equipment rooms, communications rooms, or server rooms in which there are concentrated amounts of plastic or unprotected cables shall be protected with an Ordinary Hazard Group 2 system with 0.20 GPM/$ft^{2.}$over the most hydraulically remote 1,500 square feet.

c. Quick response sprinklers shall be installed throughout the Station, except where prohibited by NFPA 13. All sprinklers shall be ordinary temperature rated unless required to be intermediate temperature rated by NFPA 13. Concealed sprinklers will be specified in all areas with finished ceilings.

d. All sprinkler standpipe system piping shall be concealed, except in mechanical equipment spaces and similar areas not provided with finished ceilings. Schedule 40 black steel pipe with black cast iron screwed sprinkler fittings suitable for 175 psi working water pressure will be used for all piping 2 inches and smaller.

e. Schedule 10 welded and seamless steel pipe in accordance with ASTM-A135, joined with groove fittings and couplings approved for service with grooves rolled on the pipe by an approved groove rolling machine, shall be used. Minimum wall thickness shall be Schedule 10 for sizes up to 5-inch pipe, 0.134 inch for 6-inch pipe, and 0.188-inch pipe for 8-inch pipe. Fittings and couplings shall be designed specifically for use in grooved piping systems and suitable for 175 psi minimum working pressure. Fittings, couplings, and gaskets shall be by the same manufacturer.

f. Alarm check valves shall be UL/FM approved vertical type for a wet system complete with all trim, excess pressure pump, water motor gong, pressure gauges, and drain valves. Gate valves shall be OS&Y type iron or bronze body, bronze seated, flanged, or threaded ends and shall be UL/FM approved, 175 psi working pressure. Check valves shall be swing type iron or bronze body, bronze seated, flanged, or threaded ends with UL/FM approved, 200 psi working pressure.

g. Sprinklers in areas subject to temperatures below 40 degrees Fahrenheit are required to be protected from freezing with an approved method listed in NFPA 13. Dry pipe sprinklers systems shall utilize external reset type valves and black steel pipe with a nitrogen generation system. Garage sprinkler systems shall be

Ordinary Hazard, Group 1 and loading docks shall be Ordinary Hazard, Group 2.

h. All piping shall be properly supported from building structure in accordance with NFPA Codes and the manufacturer's recommendations. Provide Schedule 40 steel sleeves, extend 1" above floor, make watertight and seal with material that maintains fire rating. Provide core-drilling where required and provide fire rated link seal penetration closures.

2.4.8.5 Fire Alarm & Emergency Communications

A Fire Control Panel (FCP) Room is on the Street Level of the Station. The station is a high-value property that serves as a major transit transportation hub and it is critical that the FCP contains the following items:

- All controls and interfaces for access control door locking/unlocking systems
- A station remote fire pump status panel
- Elevator status panels
- The building main or primary fire alarm & mass notification control panel
- The firefighters smoke control station (FSCS) panel
- Controls for the building air handling systems and other critical systems required by other sections of the Building and Fire Codes

The Fire Alarm System shall be an EST3 networkable for UL 864 and 2572 dual fire alarm and mass notification service. All FACUs shall be UUKL listed for smoke control service. The FCP will interface with the make-up air doors, smoke dampers, and smoke control exhaust fans for automatic control per the sequence of operations. The FCP will be equipped with a Main FACU networked via a Class A optical fiber connection to the remote FACU located in other locked and secured rooms in the station and the Parking Garage. The Main FACU will be networked to all other FACUs via a Class A data backbone. All network FACUs shall be located in locked electrical, mechanical, or information technology rooms with controlled access. Supplemental remote command center network annunciators will be located at Security Office and at the Facilities Maintenance Manager’s office. A printer shall also be provided at the Facility Maintenance Manager’s Office.

2.4.8.6 Fire and Smoke Detection

Automatic fire detection coverage by the fire alarm system will be provided via waterflow switches and smoke detectors. Smoke detection coverage will be

provided by photoelectric smoke detectors in all corridors, lobbies, open office areas, shared office areas, tenant-less or shared spaces, mechanical rooms, electric rooms, telecommunication or computer/data rooms, equipment rooms, and at each FACU or NAC extender panel. Manual fire alarm boxes will be located at approved locations that are not accessible to the public. Addressable monitor modules will be provided to accomplish kitchen hood fire suppression system supervision and discharge reporting.

The Fire Alarm System shall interface with the mechanical system BAS to initiate smoke control sequences and smoke damper positioning for the control of smoke spread by in-duct smoke detection. Smoke damper isolation or closure for control of smoke spread will be accomplished by an alarm condition for general area smoke detection by pressurization zone or floor; sprinkler water flow by pressurization zone or floor; and by in-duct smoke detectors by pressurization zone or floor provided in accordance with the International Mechanical Code and the referenced NFPA Standards. The Fire Alarm System will provide alarm contacts to signal the BAS that a fire condition exists in each fire alarm zone.

2.4.8.7 Control modules

Control modules will be provided at each make-up air door and smoke damper to coordinate door and smoke damper position for passive and active control of smoke spread from general area smoke or heat detection or sprinkler water flow by floor or pressurization zone.

2.4.8.8 Interface with Building Automation System

The Fire Alarm System shall also interface with the Building Automation System (BAS) to accomplish manual smoke exhaust or purge functions as directed by the Station Basis of Design (BOD), supplemental NFPA Standards, and these Project Development Procedures. Addressable control monitor and relay modules will be provided to accomplish HVAC shutdown, smoke control & smoke management, door locking/unlocking, Phase I Elevator Recall, and Phase II Elevator Shunt Trip functions.

2.4.8.9 Supervisory and Trouble Codes - Required and Supplemental Fire Alarm System Supervisory and Trouble Signaling Systems.

The Fire Alarm System shall provide supervisory signals for the combined automatic fire sprinkler standpipe system. Supervisory signals will be initiated when a change in position occurs for a sprinkler/standpipe control valve. All fire alarm circuits will be electrically supervised to monitor for open circuits, wire-to-wire short circuits, ground fault conditions, and removal of devices. All initiating device circuits, signaling device circuits, and notification appliance circuits shall be Class A performance/supervision, (i.e., a continuous loop, in order to provide redundancy to ensure continued system operation in the event of a circuit break). A trouble signal will be initiated in the event of an open circuit, a ground fault condition, a wire-to-wire short circuit, or if a device is removed from the system. The Fire Alarm System will be provided with secondary power via integral batteries and a connection to the emergency generator. Loss of normal AC power, low voltage in the battery system, and disconnection of the batteries will initiate a trouble signal.

2.4.8.10 Smoke Control & Management

The fire alarm system will be provided with a firefighter's smoke control station (FSCS) panel to provide control of the existing smoke exhaust zones and fire pressurization and airflow zones in the existing station mechanical systems, and to provide a means to shut-down the station exhaust system. This FSCS will replace an existing fire alarm system annunciator panel provided with HOA switches for the stair pressurization fans. The main fire alarm control panel (FACP) will also interface with the BAS and the individual fans, dampers, current sensors, and flow switches to report and graphically illustrate the operation and status of these existing building smoke control and management systems and equipment in automatic and manual sequences of operation. The FSCS will have LEDs to indicate the status of and switches to control make-up air for doors, dampers and smoke control exhaust fans manually controlled.

2.4.8.11 Type I Kitchen Hood Fire Suppression Systems

A kitchen hood suppression system shall be provided for Type I kitchen or cooking equipment as required by the International Mechanical Code.

2.4.8.12 Portable Fire Extinguishers

Portable fire extinguishers rated a minimum of 4A:60B:C dry chemical extinguisher shall be provided throughout the building in accordance with the International Building Code and NFPA 10.

2.4.8.13 Firefighters Communication System - Bi-Directional Antenna (BDA)

Provide a building wide bi-directional antenna (BDA) to enhance signal strength of Fire Department and Station Public Safety portable radios. The BDA will be installed in accordance with District of Columbia Fire Department (DCFD) performance requirements and be provided with an exterior antenna in a location approved by DCFD. The BDA equipment, wiring, and raceways shall be secured in security or electric rooms.

2.4.8.14 Mass Notification (Reserved)

2.4.9 Telecom Engineering Requirements

This section provides design standards and guidelines for the incorporation of Telecommunications into renovation and new construction projects at Washington Union Station.

2.4.9.1 Codes and Standards

Telecommunications and technology driven systems are not as code sensitive as electrical, mechanical, and structural engineering. Telecom is governed by industry standards, which are critical to establish a minimum level of quality, capability, and performance. These basic standards are the following:

- American National Standards Institute (ANSI)
- Telecommunications Industry Association (TIA)
- Building Industry Consulting Services International (BICSI)

Updated 8/16/22

ANSI/TIA-568.0-E	Generic Telecommunications Cabling for Customer Premises
ANSI/TIA-568-1.E	Commercial Building Telecommunications Infrastructure Standard
ANSI/TIA-568.2-D	Balanced Twisted-Pair Telecommunications Cabling and Components Standard
ANSI/TIA-568.3-D	Optical Fiber Cabling and Components Standard
ANSI/TIA-568.4-D	Broadband Coaxial Cabling and Components Standard
ANSI/TIA-569-E	Telecommunications Pathway and Spaces
ANSI/TIA-606-D	Administration Standard for Commercial Telecommunications Infrastructure
ANSI/TIA-607-D	Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
ANSI/TIA-758-B	Customer-Owned Outside Plant Telecommunications Infrastructure Standard
ANSI/TIA-862-C	Structured Cabling Infrastructure Standard for Intelligent Building Systems
ANSI/TIA-942-B	Telecommunications Infrastructure Standard for Data Centers
ANSI/TIA-1005-A	Telecommunications Infrastructure Standard for Industrial Premises
ANSI/TIA-1152-A	Requirements for Field Test Instruments and Measurements for Balanced Twisted-Pair Cabling
ANSI/TIA-5017	Telecommunications Physical Network Security Standard
TSB-140	Additional Guidelines for Field-Testing Length, Loss, and Polarity of Optical Fiber Cabling Systems
TSB-155-A	Guidelines for the Assessment and Mitigation of Installed Category 6 Cabling to Support 10GBASE-T

TSB-162-A	Telecommunications Cabling Guidelines for Wireless Access Points
TSB-184-A	Guidelines for Supporting Power Delivery Over Balanced Twisted-Pair Cabling
TSB-190	Guidelines for Shared Pathways and Shared Sheaths
TIA-526-7	Measurement of Optical Power Loss of Installed Single-mode Fiber Cable Plant
TIA-526-14A	Measurement of Optical Power Loss of Installed Multi-mode Fiber Cable Plant
TSB-1197	Mode Conversion Parameters for Balanced Twisted Pair Cabling
TSB-5008	Mechanically Generated Cable Impulse Noise Detection and Characterization
TSB-5019	High Performance Structured Cabling Use Cases for Data Centers and Other Premises
BICSI TDMM	13th Edition

In addition, it is highly recommended that all designers and installers utilize the services of a Registered Communications Distribution Designer (RCDD) for all telecommunications design and installation projects. Best practice would be to require a BICSI RCDD on staff for all design firms and contractors.

2.4.9.2 Union Station Special Criteria

Designing state-of the-art technology hardware in an historic space creates special challenges. Extra care must be given to install pathways and system which are the most subtle and unobtrusive as possible. This includes raceways which blend into the environment, as well as the use of wireless devices, which are well shielded from a security standpoint.

2.4.9.3 Basis of Design Products

2.4.9.3.1 Cabling

Cabling is the basic unit of design for technology systems. We recommend the following minimum cabling design standards for WUS:

a. Current 2019 cabling recommended is Category 6 (CAT 6) unshielded twisted pair (UTP) copper for voice and data; CAT 6A

(2) UTP copper for each Wireless access point (WAP) location; and Optical Single mode (OS2) and Optical Multi mode (OM3) fiber for the backbone.

b. Standard calls for (2) copper cables minimum to each outlet.

c. UTP for copper is recommended, shielded twisted pair (STP) is acceptable. However, cabling must be properly grounded when using STP.

d. If running fiber to the outlet, we recommend (2) strand OM3 at minimum, 4- strand preferred.

e. Fiber back bone cable should be 12 strand OM3 at minimum, with 12 strand OS2 as required. We do not recommend less than 12 strands for either inside or outside plant backbone fiber cable. If copper back bone cabling is required, we recommend 25 pair CAT 5e UTP. There is currently no 25 pair CAT 6 UTP available in the market.

f. Industry standard is a minimum of 20-year warranty on all installed structured cabling systems. These systems have cable and connectivity which is matched to improve performance.

g. All cabling must be tested end to end with an approved, recently calibrated (within 1 year) tester, and submitted for the above chosen warranty program.

2.4.9.4 Pathways

Pathways systems must be as “transparent” as possible, blending into the background in any public spaces. We therefore recommend basket tray or “wire mold” which is color coordinated for such a purpose. Back of house basket tray and ladder rack can be more “industry standard” in nature. Hanger systems must be subtle as well; for example, avoid the use of ceiling mounted threaded rod. In order to support ease of upgrades and changes to the backbone fiber system, many historic sites use air-blown fiber systems, utilizing from 7 to 19 tubes available to make easy additions or changes to the network.

Coordinate installation of pathways with FRA-AHJ and DCHPO at any locations where routing is through existing historic building fabric.

2.4.9.5 Telecommunications Rooms

The telecommunications rooms and related spaces (TRs) should be designed with future needs in mind. Adequate space, at least 9'x12', is the single most important factor. It is recommended that walls be lined with fire retardant plywood, and that the ceiling include a ladder rack system around the perimeter and through the middle of the room, above the cabinets or racks, for ease of cable management.

2.4.9.6 Templates, Checklists & Forms

It is recommended that each selected vendor provide a commissioning or QA/QC plan, a labeling scheme (per WUS guidelines), and a testing plan as part of their design submissions.

2.4.9.7 Future Proofing

Technology, which changes significantly in as little as 3-5 years, creates unique challenges to the future of any design initiative. Several key points worth considering:

- Pathways are the key to future proofing, create the least amount of damage to the historic fabric while considering growth and changes to the devices they support.

- Promote the utilization of wireless technology with a secure operating system. The more flexible the design, the less pathways need to be considered.

- Use approved, industry standard products whenever possible, avoiding proprietary designs.

- Build in growth in all systems, even when none is assumed to be needed. Too much expansion capability is never an issue, but not enough room certainly is.

2.5 PROJECT DEVELOPMENT

2.5.1 Project Initiation

Project Sponsors shall coordinate directly with and obtain approval from the FRA AHJ for all proposed projects. The Project Sponsor will then coordinate the process of design review and Building Permit request.

Permission and approval for all projects is required initially by the Project Sponsor; USI, and/or USRC within the USRC footprint and parking garage and Amtrak for projects north of the USRC footprint. .

Refer to 4.2 in the Appendices for a graphic illustration of the FRA AHJ Project Approval Procedure Process.

2.5.2 Project Types

The Project Type designation as defined below will determine the Building Permit requirements for the project being submitted. Using these definitions, the applicant should designate which Project Type under which they are submitting when forwarding the documents for review. If the FRA AJH does not concur with this designation, the applicant will be advised prior to commencement of the review.

2.5.2.1 All projects require a Building Permit issued by the FRA AHJ, unless listed as "Work exempt from permit" in Section 105 of the IBC.

2.5.2.2 Project Type 1: FRA AHJ Building Permit required

- Maintenance and Repair as listed in Section 105 of the IBC. This work falls under the requirements for annual permits in Section 105 of the IBC and specific individual permits are not required.

2.5.2.3 Project Type 2: FRA AHJ Building Permit required

- Dry tenant fit-outs are either modifications or renovation of leased tenant space that do not involve modification of utilities.
- Wet tenant-fit outs are the same as dry tenant fit-outs but also include connection to the base building domestic water, gas, or sewer lines.
- Structural repairs to maintain existing structural capacity to allow existing systems to continue their function.
- Retail Fit-Outs inside "Tenant Area" locations as designated by 1986 Rehabilitation Project.
- Retail Fit-Outs Outside "Tenant Area" locations as designated by 1986 Rehabilitation Project.
- Capital improvements involve the addition of a permanent structural change or restoration of some aspect of the property that enhances the value,

prolongs its useful life, or adapts to new uses. Examples of this would be adding or renovating bathrooms, creation of additional office spaces, etc.

- Infrastructure renovations are upgrades and additions to the base building infrastructure systems that serve all tenants such as: mechanical systems, domestic water and sewer, fire protection systems and vertical transportation.
- Major renovations/Substantial Alterations are capital projects undertaken by any entity within Union Station and require careful consideration/planning for the project's effect on station infrastructure, structure, services and utilities, operation, and egress.
- Additions are the extension or increase of floor area, number of stories or height of the buildings.
- Modifications of seating
- Exterior Envelope Non-Historic Maintenance and Repairs
- Exterior Envelope Non-Historic Element Replacements and Alterations

2.5.2.4 Project Type 3: DC Historic Preservation Office (DCHPO) approval and FRA AHJ Building Permit required

- Any of the above projects that alter or impact the Historic Fabric of the building
- Exterior Envelope Historic Maintenance and Repairs
- Exterior Envelope Historic Element Replacements and Alterations
- Interior Historic Elements

2.5.2.5 Project Type 4: FRA AHJ Building Permit and approval by District of Columbia District of Columbia Department of Health / Food Safety and Hygiene Inspection Services Division (FSHISD) required

- Renovations, alterations, and additions that include food service.
- The tenant must obtain a District of Columbia Department of Health permit and follow their inspection process. The application of this permit by the tenant may occur after the first set of comment responses to the AHJ review are returned by the tenant allowing for the tenant to incorporate any changes to the plumbing required by the Department of Health.

2.6 PROJECT REVIEW AND ACCEPTANCE

2.6.1 Building Permit and Approval

2.6.1.1 A Building Permit issued by the FRA AHJ is required for all work performed at Washington Union Station, similar to permit requirements described in the IBC Code. The Building Permit serves as written communication that the design of the proposed project generally meets minimum life safety requirements as outlined in the Codes.

2.6.1.2 Modifications to the exterior of the identified historic areas of the building and some key interior spaces shall be reviewed and approved by the DC Historic Preservation Office (DCHPO), and the Commission of Fine Arts (CFA) (as identified by USRC and/or FRA), as well as (FRA) and/or (USRC), prior to submitting a project to the FRA AHJ for code review.

2.6.2 Design Review and the FRA AHJ Building Permit Process

All projects and work at the Washington Union Station Complex are subject to the review and approval of the FRA AHJ and/or the Owner's agent (USRC) when designated by FRA AHJ.

It is incumbent upon the Project Sponsor to engage professional design services from an entity which can both anticipate issues that will result in a code compliant design and facility and can provide the documents required to adequately demonstrate that the design incorporates all code requirements. That design entity shall be licensed in the District of Columbia.

WUS stakeholders are to submit a list of anticipated projects to the FRA AHJ on a quarterly basis (every three months) relative to the fiscal year start to provide the FRA AHJ with the ability to plan its resources.

The FRA AHJ shall be informed of and approve of a project prior to submission to the FRA AHJ for review. The Project Sponsor is responsible for informing the FRA AHJ and obtaining approval.

The Project Sponsor may request code consultation with FRA AHJ at any time during the design review process. The Project Sponsor will coordinate the code compliance review with FRA AHJ.

An FRA AHJ Review sheet transfers the initial review comments and is to be returned with the DOR and Project Sponsor comments with each review. It remains an active and live record throughout the process.

2.6.2.1 Type 1 Projects: No Permit review required

- USRC, USI and Amtrak shall submit quarterly summary reports to the FRA AHJ describing the type of maintenance and repair projects that are anticipated for the upcoming 3-month period.
- USRC, USI and Amtrak shall submit summary quarterly reports of all work completed.

2.6.2.2 Type 2, Type 3, and Type 4 Projects: Permit Review of design documents required

- The size and complexity of the project determines the design review process. Smaller projects may have two (2) submissions: a recommended Design Concept Review, and the required 100% Construction Documents submission.
- Larger or complex projects may require additional intermediate reviews. With larger projects, it is recommended to have five (5) submissions which would include a Design Concept Review and submissions at 30%, 60% and 90% and the required 100% Construction Document submission. Specific submission requirements shall be coordinated with USRC (and the FRA AHJ) during the project initiation phase.
- Any demolition work will require review and acceptance by the FRA AHJ. If included as part of a construction project, this work should be defined in the submission. If the demolition work is a standalone project, submission of a Construction Documents package (Demolition Package) for review and acceptance by the FRA AJH is required.

Refer to 4.2 in the Appendices, for a graphic illustration of the Permit Process.

2.6.3 Submissions

The FRA AHJ can provide Courtesy Reviews in the Concept, Schematic Design, and/or the Design Development phases of a project, or of an interim submission or submissions in the Construction Documents phase of a project, and issue comments. Submissions for Courtesy Reviews are extremely useful in making FRA aware of the parameters of a project and in anticipating any potential issues or concerns. Courtesy Reviews are strongly encouraged but are not required.

The required review for issuance of a Permit by FRA AHJ is the Signed and Sealed, 100% Construction Documents submission.

Applicant will upload project documents for submissions to a DOT Sharesite, in a folder designated for the project.

2.6.3.1 Concept, Schematic Design, and/or Design Development Submissions

This submission shall consist of adequate documentation to describe the project appropriate for the phase being submitted, including, but not limited to design narrative, floor plans, code analysis, life safety plans, schematic diagrams, elevations, 3D views, and ceiling plans.

The FRA AHJ will complete a design review and issue comments to the applicant.

For projects that impact the historic fabric, USRC, on behalf of the applicant, shall engage the DC Historic Preservation Office (DCHPO) prior to submission of the drawings to the FRA AHJ for review, and DCHPO input shall be incorporated prior to this submission.

This phase continues until applicant receives concept approval from the FRA AHJ.

2.6.3.2 Interim Construction Documents Submissions (30%, 60%, or 90%)

A submission during this period consists of an in-progress set of Construction Documents which may include but is not limited to code analysis, life safety plans, schematic diagrams drawings, calculations, specification, product data, and finish boards/samples).

The FRA AHJ will determine if submission is at acceptable level of completion for review or is required to be resubmitted. If the submission is acceptable, the FRA AHJ will complete a design review and issue comments to the applicant.

2.6.3.3 100% Construction Documents Submission

This submission is required for issuance of a Permit by the FRA AHJ. This submission consists of a full set of Construction Documents which may include but is not limited to code analysis, life safety plans, drawings, calculations, specifications, and product data for all proposed special equipment. Refer to the IBC for additional information on requirements for Construction Documents.

- All previous FRA AHJ review comments must be incorporated.
- Permit Submission documents shall be signed and sealed by design professionals registered in the District of Columbia.
- The Project Sponsor will submit these documents to the FRA AHJ for code compliance review.
- Documents shall be submitted in pdf format.
- The FRA AHJ will conduct a comprehensive code review of the documents and provide comments on any code deficiencies.
- The Designer of Record (DOR) shall respond to all comments in the FRA AHJ's comment tracking sheet and make revisions as needed.

- The Process will continue until all comments have been resolved. Additional deficiencies discovered during subsequent reviews shall be rectified in the same manner.
- At minimum, each Permit submission shall include a Building Code Analysis and Life Safety Plan that include, but are not limited to:
    - The Occupancy and Use Group of the proposed construction.
    - The Construction Type of the proposed construction.
    - Area Separation requirements of the proposed construction.
    - Proposed modifications/penetrations of any floor/ceiling or roof/ceiling construction.
    - Identification of the construction type and fire rating of any element proposed to be penetrated or modified and specific actions to maintain the fire rating of these elements.
    - Documentation that demonstrates the occupancy load and compliance with maximum allowable for the building.
    - Maintenance of Egress - documentation that demonstrates that no existing paths of egress within the public areas will be altered by the proposed construction OR provide a complete egress analysis that demonstrates that there is no reduction in the current egress widths or lengths of travel.

2.6.4 Food Use Type Space Permit Requirements

Permits for Food Service projects are required to be obtained from the District of Columbia government. It is the responsibility of the applicant to coordinate FRA AHJ and DC Department of Health Food Safety and Hygiene Inspection Services Division (FSHISD) comments in the submission to the FRA AHJ. The inspection processes of the DC Department of Health Food Safety and Hygiene Inspection Services Division (FSHISD) must be followed.

2.6.5 Delegated Design (Deferred Design)

Portions of projects that are intended to be Delegated Design (also known as Deferred Design) shall be clearly indicated in the Drawings and Specifications in accordance with the IBC.

Delegated Design submissions intended to be executed during construction shall be signed and sealed by design professionals licensed in the District of Columbia.

Following the issuance of the Permit from the FRA AHJ, Delegated Design submissions that are approved by the DOR shall be submitted and reviewed for approval by the FRA AHJ. Written approval from the FRA AHJ shall be obtained prior to commencement of the related construction activity. Any Delegated Design items that remain unsubmitted past the permit review process will be listed in the Permit, which will give the Permit a “Conditional” status.

Fire protection shop drawings are one of the generally accepted and typical Delegated Design submittals and are to be noted in the design drawings as such, along with any other intended Delegated Design items.

2.6.6 Trade Permits

[RESERVED]

2.7 CONSTRUCTION INSPECTION PROCESS

2.7.1 The Construction Phase begins after a project is awarded to a Contractor and/or when with mobilization of staff and machinery to the project site.

2.7.2 The FRA AHJ will conduct periodic code compliance and safety inspections during the construction phase to ensure the in-place or in progress work is code compliance and in conformance the approved permit documents.

2.7.3 Special Inspection: Responsibility of the FRA AHJ to complete.

2.7.4 Separate inspections may be conducted by FRA, DCHPO, and or DCRA. Refer to Union Station specific guidelines for addition construction inspection information.

2.7.5 Refer to 4.2 in the Appendices for a graphic illustration of the Construction and Inspection Process.

2.8 CERTIFICATE OF OCCUPANCY

2.8.1 Upon successful completion of all construction inspections, the FRA AHJ will issue a Certificate of Occupancy thereby permitting the use and occupancy of the project area. No portion of a project may be occupied until the FRA AHJ has issued either the certificate of occupancy or a Limited Certificate of Occupancy.

2.8.2 Additional occupancy permission or final approvals may be required by DCHPO or DCRA.

2.8.3 Refer to 4.2 in the Appendices, for a graphic illustration of the Certificate of Occupancy Process.

2.9 UNION STATION SPECIFIC REQUIREMENTS

2.9.1 Document Security

2.9.1.1 Drawings or documents that delineate or describe below listed information at the Union Station Complex are considered Sensitive But Unclassified (SBU) and shall be marked and handled accordingly if they indicate any base building systems beyond a single tenanted space.

2.9.1.2

- Structural Systems
- Alarm and Security Systems
- Fire Life Safety Systems
- Emergency evacuation plan drawings
- Emergency Response Action Plans
- Electrical drawings related to emergency backup systems and main feeder distribution equipment
- Traffic Control

2.9.1.3 Reports or written documents that identify vulnerabilities at the Station are considered SBU and shall be marked and handled accordingly.

2.9.1.4 Refer to DOT SBU Handling Guidelines for marking requirements and approved methods of transmitting SBU information in 4.4 in the Appendices.

2.9.2 Existing Conditions

2.9.2.1 Building foundations and superstructure and interior improvements

2.9.2.1.1 Certain As-Built drawings exist for the Union Station Facility. Each project is solely responsible to investigate the as-built condition of the area that will be impacted by the proposed project. Project Sponsors shall research the available information directly with USRC.

2.9.2.1.2 The project design shall adequately verify, document, and demonstrate how and where new work will be connected to main building and demonstrate that adequate capacity exists to support the proposed project.

2.9.2.2 Utility Verification and Connections

2.9.2.2.1 Certain As-Built drawings exist for the Union Station Facility. Each project is solely responsible to investigate the as-built condition of the engineering systems and utilities that will be impacted by the proposed project. Project Sponsors shall research the available information directly with USRC.

2.9.2.2.2 The project design must adequately accommodate, in compliance with code, any changes, relocations of existing to remain systems.

2.9.2.2.3 The project design shall adequately verify, document, and demonstrate how and where new utilities will be connected to main building systems and demonstrate that adequate capacity exists in the system to support the proposed project.

2.9.3 Building Structure

2.9.3.1 No modifications of any type to the building structure; floor/ceiling assemblies, roof/ceiling assemblies or any load bearing or supporting element including bearing walls may be altered without specific review and approval by the FRA AHJ, USRC and USI. It is the specific responsibility of the Project Sponsor and their design team to familiarize themselves with the existing structure of the building.

2.9.3.2 Any project proposing any of these modifications shall provide a preliminary submission to Project Sponsor and the FRA AHJ for approval well in advance of any permit submission.

2.9.3.3 Attachment or modification to the USPG structure is specifically prohibited without prior written approval.

2.9.4 Historic Fabric

2.9.4.1 No modifications of any type to the historic fabric of Union Station may be made without specific approval of the FRA AHJ.

2.9.4.2 Consultation with the Washington DC Historic Preservation Office (DCHPO) may be required and adequate time for such consultations must be included in any such project schedule. USRC is the point of contact between Union Station and the DCHPO.

2.9.5 Fire Resistive Assemblies

2.9.5.1 The International Existing Building Code requires that the safety of an existing building may not be reduced by any alteration to the structure.

2.9.5.2 While the overall Construction Type of Union Station is Type IIB this is only because Type IIB is the lowest or least restrictive Construction Type common to almost all parts of the station. Union Station includes Construction Types IIB, IIA & IB. New fireproofing provided during the 1986 renovation is outlined on sheets A142 & A143 of the Harry Weese Architectural drawings. These fireproof assemblies were provided to meet requirements of Covered Mall provisions of Chapter 4 of BOCA 1996 current at the time of the renovation. Additionally, the 2nd floor of the east and west office wings is identified as a 2- hour assembly that separates office areas that exceed the allowable 3 stories for a Covered Mall from the three office floors above. (Schirmer Engineering Analysis of 1986) The fire ratings of all existing portions of the structure and their supporting structures must be maintained as required by the International Existing Building Code.

2.9.5.3 In certain areas the fireproofing materials may have been omitted or damaged at some time in the past. Current omission or damage to fireproofing materials is not an acceptable reason to continue or extend this condition. Projects that encounter these conditions shall include the installation or repair of fireproofing to remedy these deficiencies. rectification of the deficiencies. Consult with USRC as soon as the condition is known to allow adequate time to develop solutions.

2.9.5.4 Complete fireproofing systems of all elements of fire rated structures will be provided throughout the Union Station Complex.

2.9.6 Maintenance of Egress

2.9.6.1 No temporary work at Union Station shall be allowed to obstruct the means of egress from any part of the station without an impairment plan that includes the location, duration, and mitigation of the restriction to egress. The impairment plan shall be approved by the USRC and USI and the FRA AHJ prior to any obstruction.

2.9.6.2 Where infringement on egress is unavoidable, scheduling such work during off hours when station attendance is low is required.

2.9.7 Penetrations and Core-drilling

2.9.7.1 Core-drilling or penetration operations in the Station and the Parking Garage shall be coordinated in advance and approved in writing with the FRA prior to commencement of work. Such proposed work shall be documented in the design drawings with structural elements and fire protection enclosures clearly identified.

2.9.7.2 Where penetrations are required in historic fabric, work shall be documented in the design drawings and all such operations need to be coordinated in advance and approved in writing by the FRA and all historic preservation stakeholders.

2.9.8 Fire-Rated Construction

All new walls, floors and ceilings or modifications to existing fabric shall meet the required fire-rating of affected portion of the building.

2.9.9 Utilities

2.9.9.1 Building Utilities
Utilities present at Union Station include Domestic water, Sanitary sewerage, Storm drainage, Natural Gas, Electrical power, Steam from the Architect of the Capitol (AOC) district system, Hydronic chilled and hot water lines, Fire suppression water, and telecommunication infrastructure.

2.9.9.2 Temporary Utilities
Temporary utilities for projects shall be coordinated in writing with USRC and the building management.

2.9.9.3 Interruption of Utilities
Utilities shall not be disturbed or disrupted running through the ceiling or floor area of the common areas of other tenants without advance approval of USRC and the building management.

2.9.10 Firestopping

All penetrations of ductwork, piping, conduit, etc. shall be fire-stopped to meet the required fire rating of the existing or new floor, ceiling, or wall being penetrated.

2.9.11 Equipment Supports

No temporary or permanent equipment, fixtures, or support may be connected to the USPG structure without prior FRA AHJ written approval.

2.9.12 Hot Work

Hot work includes cutting, welding, thermal welding, brazing, soldering, grinding, thermal spraying, thawing pipe, and installation of torch-applied roof systems, chemical welding or any other similar activity and shall be minimized within Union Station and especially within all historic areas of the station. Hot work anywhere in Union station shall comply with the International Fire Code.

Additionally, when hot work is proposed within the station a detailed specific protection plan shall be submitted with the Hot Work permit application indicating the name of the employee or contractor authorized to do the work, special equipment being used, the location of all fire extinguishers and sprinklers, a site plan showing the location and layout of the job site, a safety plan, area and duration of the hot work and the proposed substantial, non-combustible protections to be provided. Within normally occupied areas the minimum fire watch shall be one (1) hour and in normally unoccupied areas the minimum fire watch shall be two (2) hours after the completion of the work.

2.9.13 Site Access

Contractor shall have access to the project site during construction. Contractor should maintain site security to eliminate uncontrolled access by the public. Access to other areas of the building shall be contingent upon the work necessary and shall require written approval requested of and written approval granted by the FRA AHJ. Contractor to notify FRA AHJ 48 hours in advance for access to any roof. (Fans, ductwork, etc.).

For projects requiring construction aids such as elevators, hoists, cranes, scaffolding, platforms, swing stages, etc. refer to Division 01 specifications for specific requirements.

2.9.14 Construction Facilities

Requirements for construction and temporary facilities will depend upon the size and scope of the project. Refer to Division 1 specifications for information regarding field offices, sheds, first aid and sanitary facilities.

2.9.15 Temporary Barriers and Enclosures

The extent of temporary barriers and enclosures for project sites will depend on the location and disposition of the project. Depending upon the scope of work requirements for barriers and enclosures may change. Contractor shall provide a written plan for temporary barriers and enclosures for review by the FRA AHJ prior to construction operations. Existing access and means of egress for the station shall not be impeded or reduced. Refer to Division 01

specifications for additional requirements as well as Schedule C and C-1 for tenant construction guidelines.

A. USRC or USI shall provide, at Tenant's expense, a temporary barricade constructed with drywall and painted. The barricade must cover entire construction area. The construction must be unseen from the public's view. The barricade is not to be bolted, fastened, affixed, or anchored into any building's structure (marble floor, columns, etc.) unless deemed acceptable by USRC or USI.

B. General Contractor shall install plastic sheathing such as fire-retardant grade Visqueen or other dust barrier product affixed to the top of the drywall barricade, depending on the location.

C. The temporary barricade may not be removed until all construction is completed, fully merchandised, and reviewed by USRC or USI. Maintenance of the barricade is the General Contractor's responsibility. Removal of the barricade is by the Contractor upon approval by USRC or USI. Unauthorized removal, improper access of any barricade will result in a fine determined by USRC or USI and/or loss of Construction Deposit.

D. Standard Tenant Graphics signage and graphics are to be provided as needed to conform with life safety requirements and subject to AHJ approval. Standard Tenant Graphics and signs are to be fabricated per applicable WUS Standards, including the stakeholder criteria. Refer to 5.2 of the Appendices.

2.9.16 Vehicle Parking

Parking is not permitted at the Loading Dock areas. Parking is available, at the advertised rates (no discounts), in the Parking Garage managed by the Union Station Parking Garage (USPG) management office. Garage tickets can be validated at the validation machine in the garage if parking has been for two hours or less. Monthly parking passes are available through USPG.

2.9.17 Temporary Controls

Temporary controls for project sites including but not limited to erosion and sediment control, pest management, and storm water management shall vary depending upon the location and scope of the project. A temporary controls plan shall be developed by the contractor for review and approval by the FRA-AHJ prior to construction. Refer to the Division 1 specifications for additional information.

2.9.18 Laydown Storage

Laydown storage space at Union Station is limited. Use of storage space must be coordinated in writing with the FRA-AHJ. Storage space may not impinge upon any existing means of egress or public areas. Refer to Division 1 specifications for additional information.

2.9.19 Demolition

Selective demolition of building elements must be coordinated in writing with the FRA prior to the beginning of construction. A comprehensive demolition plan including areas of removal, support and shoring of existing elements as required, dust mitigation, and barrier control shall be submitted for approval to the FRA. For additional information refer to the Division 1 Specifications.

2.9.20 Hazardous Materials

For the abatement and removal of contaminated materials in the buildings within the USRC footprint including but is not limited to asbestos, lead paint, and polychlorinate biphenyl, mold and bird and bat droppings (Histoplasmosis), refer to the latest Hazardous Materials Report for identified areas of hazardous materials. [The most recent report appears to have been prepared in 1992 by Diagnostic Environmental Inc. (DEI) and documents the investigation performed by DEI from October 15-17, 1992. The report mentions that after the 1986 abatement effort, there appear to be a selected few remaining areas and items containing hazardous materials which were identified as present at the time of the report.]

All hazardous materials within the USRC footprint and the buildings and soils north of the USRC footprint must be processed and disposed in accordance with all local and federal regulations and laws. If unidentified hazardous materials are encountered during construction, notify the Project Sponsor immediately before proceeding with any work. Removal of any hazardous materials shall require written coordination and a plan of action between the Contractor and the and the Project Sponsor.

2.9.21 Soil Erosion and Sediment Control

A statement of project compliance with all local and federal regulations and laws shall be provided by the sponsor at the first project review. This assurance of responsibility is required due to the probability of negative impact on the complex if requirements are not followed.

2.9.22 As-Built Drawings

The General Contractor is to provide a PDF set of As-Builts at the time of Final Inspection Approval. These are archived by USI and shared with USRC. If work is north of the USRC footprint, then Amtrak will receive and archive the documents.

2.10 OPERATIONS AND MAINTENACE INSPECTIONS AND REPORTING

2.10.1 The responsible Project Sponsor shall perform regular periodic inspections of various items and equipment within the WUS Complex, including those items listed below, and maintain up-to-date records of inspection dates and results for each inspection for the review by the FRA AHJ when requested.

2.10.2 For inspections not performed per schedule or adequately, the Project Sponsor will rectify any deficiencies in a timely manner and resubmit the results to the FRA AJH for another review.

2.10.3 Items and Equipment to be periodically inspected shall include:

2.10.3.1 **Elevator and Escalator Inspections**
- **2.10.3.1.1** Per ASME 17-1, 2019 Edition
- **2.10.3.1.2** Every 6 months

2.10.3.2 **Fire Alarm/Mass Notification System Testing Report**
- **2.10.3.2.1** Per NFPA 72, Table 14.4.3.2
- **2.10.3.2.2** Every 6 months

2.10.3.3 **Fire Sprinkler and Standpipe System Testing Report**
- **2.10.3.3.1** Per NFPA 25, Tables 5.1.1.2 and 6.1.1.2
- **2.10.3.3.2** Every 3 months

2.10.3.4 **Smoke Control System**
- **2.10.3.4.1** Per NFPA 92, Section 8.6
- **2.10.3.4.2** Every 12 months

2.10.3.5 **Kitchen Hood Fire Suppression System Testing Report**
- **2.10.3.5.1** Per NFPA 96, Section 12.2
- **2.10.3.5.2** Every 6 months

2.10.3.6 **Fire Extinguisher Inspection Report**
- **2.10.3.6.1** Per NFPA 10, Section 7.2
- **2.10.3.6.2** Every 1 month

2.10.3.7 **Fire Pump Test Report**
- **2.10.3.7.1** Per NFPA 25, Section 8.3
- **2.10.3.7.2** Every 1 month (no flow); every 12 months (flow)

2.10.3.8 **Emergency Generator Test Report**
- **2.10.3.8.1** Per NFPA 110, Section 8.4
- **2.10.3.8.2** Every 1 month

2.10.3.9 **Grease Interceptor Test Report**
- **2.10.3.9.1** Per NFPA 96, Table 12.4
- **2.10.3.9.2** Every 1 month

2.10.3.10 **Water Heater Flush**
- **2.10.3.10.1** Every 1 month

2.10.3.11 **Backflow Preventor**
- **2.10.3.11.1** Every 1 month

2.10.3.12 **Preventative Maintenance of Electrical Panels**
- **2.10.3.12.1** Per NFPA 70B
- **2.10.3.12.2** Every 1 month

2.11 SAFETY

2.11.1 Authority. Federal Railroad Administration, Office of Railroad Safety (FRA-RSS): Authority Having Jurisdiction (FRA AHJ). By statute, FRA is the Authority having Jurisdiction (AHJ) for the WUS buildings, the USPG, and any other structures on the grounds it owned by the FRA.

2.11.2 WUS Accident Prevention Plan

2.11.2.1 All construction projects shall submit for approval by the FRA AHJ a project specific Accident Prevention Plan which is in full compliance with U.S. Occupational Safety and Health (OSHA) standards.

2.11.2.2 Refer to 4.5 in the Appendices, WUS Accident Prevention Plan, for additional information.