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Division 00- Contract Requirements

00 70 00 Conditions of the Contract between Amtrak and the Design Contractor

I. General
   A. This Division of the Standard Design Practices defines procedures for the study and design of Amtrak Stations and Facilities projects. It is intended as a standard for Design Contractors to Amtrak (Design Contractor) including, but not limited to design professionals, primarily architects and engineers and their direct consulting firms, environmental consultants, surveyors, construction managers, and other firms that provide services related to design and construction for Amtrak.
      1. Where this document refers to the Design Contractor, it shall include all Sub Contractors, as well as their respective representatives, employees, and any manufacturers, suppliers, or other entities providing services to the Design Contractor.
   B. The requirements given apply in general to design projects of significant size and scope. In the interest of efficiency and economy, good judgment and common sense should be used in deciding when procedures may be streamlined or requirements do not apply to projects of limited size or scope. Deviations from these requirements must be discussed with and approved by the Amtrak Project Manager.
      1. The project specific Scope of Services describes the tasks and level of effort expected of the Design Contractor. Where no specific task descriptions are given in the Scope of Services, the Design Contractor shall provide all the services and deliverables indicated in this document.

II. Design Contractor personnel: Only qualified personnel shall perform the work of the various tasks and services. Personnel shall be experienced in the respective types of work and shall be knowledgeable in pertinent codes, references, and guidelines.

III. Project Progress Meetings
   A. Regular progress meetings shall be arranged on a monthly or biweekly basis, as progress may require or as directed by Amtrak. The Design Contractor shall:
      1. Prepare agendas
      2. Distribute written notice and agendas two days in advance of scheduled and called meetings
      3. Preside and record minutes
      4. Distribute minutes to participants and a standard distribution list, individually packaged, within two business days after the meeting.
      5. Attendance: Progress meetings shall have the following attendance: Project Manager, Engineer(s), and representatives from Amtrak; representatives from other interested/impacted agencies; the Design Contractor Project Manager; and the Design Contractor's key design staff representatives.
   B. Agenda: Progress meetings shall review progress according to the design phase schedule, identify outstanding or potential problems and proposed solutions, and consider actual versus budgeted costs. Both administrative and technical matters may be discussed.
   C. Technical Progress Reviews
      1. The Design Contractor shall attend a formal Submission Review Progress Meeting for each major design submission to receive and discuss Amtrak’s comments regarding the submission. Comments resulting from reviews will be presented to the Design Contractor no later than 30 days after submission, in accordance with the schedule approved by Amtrak. The Design Contractor shall have all applicable disciplines represented at the review meeting. The Design Contractor shall prepare formal responses to review comments, based on discussions at the submission review meeting, and shall submit the responses in written form with the next scheduled submission as part of the Basis of Design Report. The Design Contractor shall consider all review comments and take appropriate action prior to a subsequent submission.
2. Amtrak will review calculations, drawings, specifications, designs, and other contract documents on a continuing as well as scheduled basis. The Design Contractor shall make provisions for on-board review of drawings, calculations, and other contract documents by Amtrak personnel on an unscheduled basis. Amtrak will provide at least three business days’ prior notice for unscheduled reviews.

3. If Amtrak determines that any submission is incomplete or contains excessive discrepancies or errors, the submission will be rejected and returned to the Design Contractor for correction and resubmission. Amtrak reserves the right to approve or reject any proposed system or approach to the work. The concerns indicated by Amtrak are not considered closed until the Amtrak reviewer indicates that the concern is closed.

IV. Quality: The Design Contractor shall have its own written Quality Assurance/Quality Control (QA/QC) plan (e.g. CQI, TQM, ISO 9001 certification, etc.). The Design Contractor shall adhere to the stated procedures of its own plan.

A. Monitor quality control over the production of all construction documents.
   1. Where the Amtrak Project Manager finds that there has been inadequate quality control done on the part of the Design Contractor, Amtrak will reject the documents.
   2. Amtrak will continue review only after the Design Contractor has affirmed in writing that quality control has been done and has submitted revised documents.
      a. Design and/or construction schedules will not be altered due to lack of quality control on the part of the Design Contractor.
      b. Cost of resubmissions due to lack of quality control shall be borne by the Design Contractor.

B. Amtrak retains the right to review the Design Contractor’s documents and procedures in relation to adherence with the Design Contractor’s established QA/QC policies. The Design Contractor shall cooperate with Amtrak in providing reasonable access to non-confidential records and documents related to QA/QC. Amtrak shall have the right to request corrective action if, in Amtrak’s opinion, the Design Contractor’s lack of conformance to QA/QC policies may affect the quality of the final product.

C. Variations: Nothing in the Design Contractor’s QA/QC policies shall be construed to permit the Design Contractor to deviate from Amtrak’s administrative or technical requirements for the work. The QA/QC plan shall be used to assure that documents are prepared and professional services provided as specified, and that the processes required by Amtrak are followed.

V. Documentation

A. Property Rights: Documents prepared and submitted by the Design Contractor in connection with Amtrak projects shall become the property of Amtrak.

B. Drawing Standards: Refer to Amtrak CAD Standards

C. Specification Standards:
      a. Division 1 special master specifications will be supplied by Amtrak and must be edited by the Design Contractor to suit the specific project and site conditions.

VI. Deliverables

A. Hard Copies: Provide (1) full sized hard copy of each document unless noted otherwise below and in the Scope of Services.

B. Electronic Files
   1. On CD-ROM:
      a. One complete set of original AutoCAD files of Drawings
      b. MS Word files of Specifications, Basis of Design, and other documents.
      c. One complete set of printable Adobe PDF files of assembled documents.
         i. Each drawing shall be a separate PDF file that will print the complete drawing full-size.
ii. Specifications shall be on one single PDF file that will print complete booklet double-sided, including Cover and Table of Contents. (Table of contents and all sections shall start on front side of paper, with blank pages inserted at end of odd-page-length sections as needed).

C. At the discretion of the Amtrak Project Manager, informal interim progress documents may also be submitted electronically on multi-page Adobe PDF files only (without paper).

D. Property Rights: At the termination of the project, all software and files delivered to Amtrak shall become the property of Amtrak.

VII. Construction Packages: When separate contracts are expected to be advertised for construction, or when a portion of the work is to be performed by Amtrak Forces and a separate portion by Construction Contractor(s), the Design Contractor shall provide separate packaging of designs, suitable for creating separate Bid and Construction Documents.

VIII. Design Submissions

A. General

1. Submissions shall be delivered to the Amtrak Project Manager at 30th Street Station, Philadelphia, PA, 19104, unless otherwise stated in the Scope of Services or directed by the Amtrak PM.

B. Design Phase Schedule: Within two weeks from the Notice to Proceed, the Design Contractor shall provide a Design Phase Schedule to the Amtrak Project Manager that shows duration, submission and meeting dates, as well as review times for all design phases required by the Scope of Work and consistent with the period of performance for the contract.

   a. If a draft design schedule was included with the proposal, the Design Contractor shall issue a revised schedule to incorporate actual Notice to Proceed date and any other scheduling conflicts or constraints.

   b. The approved design phase schedule shall only be changed with the approval of the Amtrak Project Manager.

C. Design Phases and Deliverables

1. 15% (Concept) Submission: When included in the Scope of Services, the Design Contractor shall provide a 15% Submission to illustrate the program in diagrammatic layout form and include exterior site requirements and functional relationships with other Amtrak departments and units as required. Also, when included in the Scope of Services, the 15% Submission shall include several schemes or design alternatives for the work. The 15% Submission shall include:

   a. Basis of Design (BOD): The Design Contractor shall prepare a report indicating project assumptions and design criteria. The report shall provide complete information in an orderly format acceptable to Amtrak. It shall include a description of project intent for those elements that cannot yet be shown clearly on drawings. It shall include information from the items listed below, as well as information generated in previous work tasks if applicable:

      i. A narrative and summary of observations from site surveys, geotechnical reports, condition inspections, load ratings, etc.

      ii. Description, analysis, evaluation, and recommendations concerning the results of sampling, testing and monitoring programs.

      iii. Description of alternatives evaluated for each important element of the design. The elements investigated shall include those reasonable, appropriate or agreed beforehand with Amtrak.

      iv. Complete design intent for the architectural, mechanical, electrical, plumbing, data/communications, fire protection and fire alarm systems.

      v. Key planning assumptions (service levels, equipment required, fixture types, sustainability, flexibility, etc.).

      vi. Code and Zoning Analyses:
(1) Reference Applicable Codes, Regulations and Guidelines
(2) General overview of requirements and how they will be incorporated into this specific project.

vii. Room Criteria Sheets for each space, defining applicable criteria for all systems, including, but not limited to, architectural mechanical, electrical, data/communications, fire protection and fire alarm systems.

viii. A Constructability Review and cost analysis of alternatives, with particular emphasis on the operational impacts of performing construction during various potential outage windows.

ix. Additional information, constraints, or parameters that may have influenced the design.

b. Drawings and/or Renderings: As required to demonstrate the proposed concepts and alternatives.

c. Design Estimate of Construction Cost: Estimate shall be prepared based on historical, global costs for similar type of projects or work. The Design Contractor shall consider special conditions that may have significant impacts on the cost of construction. A reasonable contingency factor shall be included.

d. Design Estimate of Construction Schedule: The Design Contractor shall consider special conditions that may have significant impacts on the construction schedule. The schedule shall be from Notice to Proceed through the end of the construction phase and shall consider applicable lead times for specific equipment.

e. Design Contractor shall anticipate a 30 calendar day Amtrak review period for this submission.

2. 30% (Schematic Design) Submission: When included in the Scope of Services, after review and approval of the 15% Submission (if any), the Design Contractor shall provide a 30% Submission that will include all aspects of the design. The documents shall contain sufficient detail and documentation to effectively communicate the design intent to Amtrak and to those responsible for the preparation of a cost estimate. The 30% Submission shall include:

a. Updated Basis of Design Report, including the following additional information:
   i. Written responses to Amtrak review comments from all previous submissions.
   ii. Preliminary Design Calculations for all major systems.
   iii. Specialty Equipment: Provide a written list, by discipline, and manufacturer’s product data, of specialty equipment to be included in the project. The list shall include, but not be limited to, eyewash stations, white boards, ticket purchasing machines, display equipment, drop tables, bridge cranes, and other special items as required.
   iv. Building Materials: Provide Amtrak with comprehensive technical information, including manufacturer’s product data and specifications, for all proposed materials, with emphasis on ease of maintenance and meeting the design life requirements.

b. Drawings - The 30% Submission shall include the following information:
   i. Cover Sheet, including Vicinity Plan, Site Location Plan and Index of Drawings.
   ii. General Notes
   iii. Code Review Drawings
      (1) Reference applicable building codes
      (2) Indicate whether the building will include sprinkler, standpipe, or other fire protection systems.
      (3) Indicate the building construction type.
      (4) Indicate the building use (in a mixed use building, indicate the different uses).
      (5) Indicate required fire separations between the mixed uses.
      (6) Indicate new and existing fire ratings around stairs, elevator shafts, mechanical shafts, corridors, tenant separation walls, etc. and provide general description of fire rated construction as a detail or in the narrative.
(7) Indicate new and existing egress paths, travel distances and remote egress distances.
(8) Indicate capacity calculations for new and existing spaces and egress doors.
(9) Provide chart indicating required the amount of plumbing fixtures required by code and the number provided.
(10) Indicate new and existing fire extinguisher locations.

iv. Phasing Plans
(1) When a project must be completed in phases, indicate extent of work in each phase and temporary measures required.

v. Staging Plans (developed with assistance from Amtrak) showing the following:
(1) Work Limits / Restrictions on Contractor access and use of premises

vi. Site/Civil
(1) Prepare schematic site plan(s) showing new and existing structures, existing and preliminary proposed grading, layout of walks, pavements and curbs, fencing, landscape features, and utilities requiring rerouting or other modification.

vii. Demolition
(1) For renovations of existing buildings and sites, provide documentation of extent of demolition for all applicable trades, either graphically by indicating blocks of space to be demolished or inclusion of a narrative that differentiates between selective demolition and gut demolition.

viii. Architectural
(1) Prepare schematic floor plans showing all required spaces, walls, door swings, built-in equipment, preliminary locations of exterior window openings and room names (1/16”=1'-0” min. scale).
(2) Prepare schematic roof plans showing anticipated roof structures, equipment and drainage patterns (1/16”=1'-0” min. scale).
(3) Prepare schematic building elevations (1/16”=1'-0” min. scale).
(4) Prepare diagrammatic building sections showing preliminary floor-to-floor and ceiling heights and describing basic wall systems (1/8”=1'-0” min. scale).

ix. Structural
(1) Establish preliminary structural systems, including foundations, framing systems (floor, roof and walls), column and/or bearing and shear wall locations.
(2) Prepare typical bay drawings of foundation and framing.
(3) Assess architect-suggested materials as they affect structural design.

x. Mechanical
(1) Review existing conditions to identify all code deficiencies and approaches by which to address.
(2) Determine type of HVAC systems for existing and new spaces.
(3) Determine approximate sizes and locations of mechanical rooms, primary chases and duct shafts, approximate size and location of major pieces of equipment, such as cooling tower, roof top and air handling units, and major duct/piping runs
(4) Indicate the above on schematic plans

xi. Electrical
(1) Review existing conditions to identify all code deficiencies and approaches by which to address.
(2) Establish preliminary size and location of new switch gear, generator, and/or transformer rooms, electrical closets, control panels not located in electrical closets, and other equipment that require special construction and space needs.
(3) Indicate the above on schematic plans.

xii. Plumbing
(1) Review existing condition to identify all code deficiencies and approaches by which to address.

(2) Assessment of the adequacy of existing fixtures

(3) Establish the preliminary quantity and locations of roof drains; floor drains, drinking fountains/water coolers, water heaters and special equipment

(4) Establish locations of primary vertical and horizontal pipe runs;

(5) Indicate the above on schematic plans

xiii. Fire Protection

(1) Review existing conditions to identify all code deficiencies and approaches by which to address

(2) Establish preliminary size and location of fire standpipes or other primary sprinkler risers, hose racks, fire extinguishers and cabinets, and other special equipment

(3) Indicate the above on schematic architectural floor plans

xiv. Any other drawings that the Design Contractor deems necessary to represent the intent of the project.

c. Specifications:

i. Table of Contents listing proposed specification sections to be used for project.

ii. Prepare Outline or Narrative specifications describing Major Materials and Systems in CSI MasterFormat or UniFormat

d. Updated Design Estimate of Construction Cost:

e. Updated Design Estimate of Construction Schedule.

3. 60% (Design Development) Submission: When included in the Scope of Services, after review and approval of the 30% Submission, the Design Contractor shall provide a 60% submission. The 60% Submission shall include all information listed in the 30% Submission section as well as the following information:

a. Updated Basis of Design Report

b. Drawings - Drawings at this level should include the following in addition to what was provided in the 30% Submission:

i. Cover Sheet

(1) Index of Drawings shall indicate the complete set of drawings proposed for the project, including those that are not included in the 60% submission. Clearly indicate which of the drawings are including and not included.

ii. General Notes

(1) Updated and edited for specific project conditions.

iii. Updated Code Review Drawings

iv. Updated Phasing Plans

v. Updated Staging Plans

vi. Site/Civil

(1) Property, building and contract limit lines

(2) Track centerlines and elevations

(3) Easements, setbacks, projections dimensioned beyond building line

(4) Ground floor elevations and grades at building

(5) Parking plans, and drainage pitch

(6) All structures, flagpoles, signs, seating, fountains, play fields, etc.

(7) Fences, walls, existing structures, trees, planting, etc.

(8) Existing and revised contours, boring locations, datum, monuments

vii. Demolition

(1) For renovations of existing buildings and sites, provide demolition plans for all applicable trades with keynotes of typical items to be selectively demolished or with spaces to be gutted so labeled.
viii. Architectural

1. Floor Plans
   (a) Dimensions: overall, columns, and other critical dimensions
   (b) Room name, number and finish numbers (with symbol for elevations, if shown)
   (c) Floors: changes in elevation or material, curbs, special patterns
   (d) Walls: interior partition types and typical details including materials fire ratings, acoustical, etc., movable or folding partitions, louvers, etc.,
   (e) Chases and shafts: locations and construction
   (f) Ceilings: breaks and skylights shown dotted, heights noted
   (g) Doors: swing and number
   (h) Windows: number for schedule or elevation
   (i) Toilet rooms: fixtures, accessories, partitions, and other equipment, accessible clearances and clear floor spaces.
   (j) Stairs, elevators, escalators, ramps: handrails, number and size of treads and risers, clear shaft dimensions.
   (k) Built-in Equipment: counters, cabinets, and layouts of special spaces at appropriate scale
   (l) Miscellaneous: fire protection equipment, expansion and control joint locations, gratings, drinking fountains, building and wall section symbols, and other special equipment (label all NIC items).

2. Roof Plan
   (a) Drainage: drains, pitch, crickets, valleys, indicate high point by (+) figures above drains
   (b) Miscellaneous: critical dimensions, canopies, changes in elevation, expansion joints, scuttles, skylights, mechanical equipment, coping materials, chimney, railings, ladders, walkways

3. Exterior Elevations
   (a) Materials: all materials, noted or rendered to the extent needed for clarity
   (b) All windows, doors and louvers, including conventional symbols for swing or operation.
   (c) Dimensions: all floor levels, parapet and canopy heights in relation to floor lines, column center lines
   (d) Finish grades at building, areaways, curbs, steps, railings, retaining walls.
   (e) Miscellaneous: expansion and control joints, roof structure, if visible

4. Building Sections
   (a) Dimensions: overall, floor-to-floor
   (b) Space identification
   (c) Stair and elevator sections when possible

5. Wall Sections (Typical)
   (a) Dimensions: vertical relationship of floor, ceiling, window sills and head, parapet, floor-to-floor, and top of steel (1/2"=1'-0" min. scale).
   (b) Materials: floors, walls, windows, spandrels, ceilings, sills, mechanical enclosures, flashing, insulation, soffits, roofing membranes, grades, footing drains, etc. rendered to the extent needed for clarity

6. Interior Details
   (a) Interior elevations of important spaces
   (b) Special details: ornamental stairs, acoustical details, etc.
   (c) Typical reflected ceiling with lights, diffusers, sprinkler heads detailed to the degree necessary to establish design intent

7. Furniture layouts
ix. Structural
   (1) General
      (a) Indicate all loads, soil bearing capacity
      (b) Standard details and general notes edited for the specific project.
   (2) Foundations
      (a) Analysis of sub-soil conditions
      (b) Establish preliminary structural system
   (3) Framing systems (including floor, roof and walls)
      (a) Bearing or shear wall locations
      (b) Final column locations and configuration
      (c) Size of structural members, which are typical or important for clearances
          (maximum beam depth, columns), etc.

x. Mechanical
   (1) General
      (a) Standard details and general notes edited for the specific project.
   (2) Floor Plans:
      (a) Ductwork - single line, showing location of outlets and duct heaters
      (b) Location of duct and pipe chases
      (c) Location of radiators, convectors, cabinet unit heaters, unit ventilators, fan coil units, etc.
      (d) Louvers or grilles in exterior walls
      (e) Block layout and dimensions of Boiler Room
      (f) Block layout and dimensions of Mechanical Equipment Rooms
      (g) Clearances required for ductwork in ceiling plenums
      (h) Temporary systems or utilities that need to be installed to maintain operating continuity
   (3) Roof Plan:
      (a) Location of equipment, if applicable: fans, cooling tower, condenser, roof-mounted equipment, etc.
   (4) Site Plan:
      (a) Location of equipment if applicable: fuel oil tank, cooling tower, condenser, etc.
   (5) Catalogue cuts of all equipment (i.e. diffusers, grilles, registers, etc.) exposed to view.

xi. Electrical / IT and Data / Security
   (1) General
      (a) Standard details and general notes edited for the specific project.
   (2) Floor Plans:
      (a) Lighting
      (b) Location of all receptacles, TV and Data outlets, clocks, speakers, display systems, alarm devices, security cameras, and other auxiliary devices
      (c) Panels, transformers, switchgear, equipment racks, etc.
      (d) Graphic representation of required operating and service clearances for all devices and equipment
      (e) Basic symbol list and fixture schedule
      (f) Temporary systems or utilities that need to be installed to maintain operating continuity
   (3) Site Utilities Plan:
      (a) Proposed route of electrical, telephone, and data service
      (b) Outdoor lighting, control boxes or other equipment
(4) Catalogue cuts of all equipment (i.e., lighting fixtures, emergency lights, fire horns, etc.)

xii. Plumbing
(1) General
(a) Standard details and general notes edited for the specific project.
(2) Floor Plans:
(a) Vertical stacks, risers, leaders, floor drains
(b) Horizontal piping runs
(c) Water heaters and other equipment
(d) Temporary systems or utilities that need to be installed to maintain operating continuity
(3) Site Utilities Plan:
(a) Water and gas service, pump houses or pumping stations, as required
(b) Sanitary sewer or sewage disposal system
(c) Storm drainage piping and catch basins
(4) Catalogue cuts of all equipment (i.e., plumbing fixtures, faucets, water coolers, hose cabinets, etc.) exposed to view as well as concealed fixture hangers.

xiii. Fire Protection
(1) General
(a) Standard details and general notes edited for the specific project.
(2) Floor Plans:
(a) Head and piping layout
(b) Fire hose cabinets
(c) Fire extinguisher and cabinet locations
(d) Temporary systems or utilities that need to be installed to maintain operating continuity

xiv. Any other drawings that the Design Contractor deems necessary to represent the intent of the project.

c. Specifications:
   i. Table of Contents listing all proposed specification sections to be used for project.
   ii. Include all specification sections developed to the extent possible.

d. Finish Boards: Two (2) finish boards, mounted on minimum ¼” thick foam core, showing the proposed finishes and associated colors that the Design Contractor has selected for the project.
   i. Both finish boards will remain in the possession of Amtrak.

e. Updated Design Estimate of Construction Cost
f. Updated Design Estimate of Construction Schedule.
g. The Design Contractor should anticipate a 30 calendar day period for Amtrak review at this milestone.

4. 95% Construction Document Submission: When included in the Scope of Services, the Design Contractor shall provide a 95% Submission. This is a final design. The design package materials shall be complete and ready for packaging as Bid Documents. The Design Contractor shall consider the drawings, specifications, cost estimates, construction schedule and all other parts of the design to be finished, including coordination, checking and any other Quality Control or Quality Assurance procedures. Amtrak will provide final review comments. The 95% Submission shall incorporate all previous review comments provided by the Amtrak Project Manager and shall include the following:
b. Complete, detailed drawings for all disciplines, ready for bidding and construction.
c. Complete and fully edited Specifications
d. Updated Design Estimate of Construction Cost: The estimate shall update and complete the effort from the 60% level. The estimate shall be summarized in itemized CSI Masterformat. Detail back-up calculations shall be clearly cross-referenced to the summary sheets.

e. Updated Design Estimate of Construction Schedule.

f. The Design Contractor should anticipate a 30 calendar day period for Amtrak review at this milestone.

5. Bid Submission: This is the set of Construction documents to be Issued for Bid and Construction. The documents shall incorporate all 95% Construction Documents Submission review comments as provided by the Amtrak Project Manager and shall provide adequate information to bid and construct the project. The Bid Submission shall include all of the documents provided in the 95% submission as well as any other documents that may be required by the Amtrak Project Manager for a complete bid and construction set.

a. Deliverables:

i. Drawings: One (1) full size set of construction drawings on Bond, marked “Issued for Bid”, signed and sealed by a Professional Engineer and/or Registered Architect, licensed in the state where the construction work will be performed. If the construction is to be performed by Amtrak forces, the drawings shall be marked “Amtrak Forces Work - Issued for Construction”.

ii. Specifications: One (1) complete project manual printed on 8½” X 11” bond paper, signed and sealed by a Professional Engineer and/or Registered Architect, licensed in the state where the construction work will be performed. Specifications shall be printed double-sided on 20 lb., 8 ½” x 11” white paper. A cover sheet and Table of Contents shall be included. These pages, and all sections, shall begin on the front side of the sheet, with blank sheets inserted at the end of odd-page-length sections as needed for reproduction purposes.

iii. Electronic Media: One (1) copy of a CD-ROM containing electronic files of the Basis of Design (PDF), Construction Drawings (PDF and DWG), Specifications (PDF), Design Estimate of Construction Cost (PDF) and Design Estimate of Construction Schedule (PDF).

iv. The Design Contractor shall reproduce up to 5 sets of the bidding documents for distribution to bidders in the format and quantity indicated in the Scope of Services.

6. Design Estimates of Construction Cost and Schedule

a. General: The Design Contractor shall prepare cost estimates to a level of detail appropriate for each submission. Schedules and time lines shall be in calendar days, not working days.

b. Computerization: Construction cost estimates and schedules shall be prepared using computerized methods, in compliance with good engineering practice and as described herein. The Design Contractor may use other rational and orderly estimating and scheduling methods, if prior agreement is obtained from Amtrak.

c. Work Restrictions: The project may require work to be accomplished during hours outside the normal workday schedule, or where work restrictions impact productivity, or where work may have to be performed within specified time constraints. For a project that requires these types of considerations, special attention must be paid to labor rates, productivity loss, equipment usage, etc.

d. Separate Packages: The Design Contractor shall develop separate and complete cost estimates and schedules for each separate construction contract or bid package.

e. Work Papers: To permit the validation of the cost estimates and schedules, the Design Contractor shall prepare and maintain work papers in sufficient detail and clarity to support and validate all values contained in the estimating and scheduling worksheets.
For Amtrak to consider an estimate to be complete, the Design Contractor must identify all values on the summary sheets such that they are traceable to the detail worksheets.

f. Escalation: Cost estimates shall be first developed based on current prices. Escalation for work to be bid and performed in the future shall be taken into account and shall be developed and applied separately by the Design Contractor to the construction period as necessary.
   i. Escalation factors shall be clearly indicated.

7. Calculations: Calculations shall be submitted by discipline with each design phase submission to show how the design was developed. Calculations shall be performed in accordance with current recommendations and guidelines of corresponding technical associations, e.g. IES for illumination, ASHRAE for heating, ventilating and air-conditioning, NFPA for electrical, ASCE for structural and site work, AREMA for railway engineering, etc. Calculations may be attached to the Basis of Design Report as an appendix, or provided as a separate bound volume.
   a. Calculations must be based upon specified systems rather than general “rules of thumb” i.e. heat loss calculations must be based on actual R and/or U-values of roof and wall construction, actual SHGC of glass specified, etc. Actual R and/or U values, SHGC, and similar factors must be indicated in product data or calculated with all calculations provided.

8. Bid Assistance (Optional, based on Contract)
   a. Pre-Proposal / Pre-Bid Meeting: Attend the Pre-proposal or Pre-bid meeting and the site visit that follows. Answer technical questions raised by prospective bidders after the meeting, in writing, through Amtrak.
   b. Response to Requests For Interpretation (RFIs) during Bidding Period: Respond, through Amtrak, to RFIs from bidders (construction contractors) during the Advertisement for Construction or bidding period.
   c. Bid Document Addenda: Prepare addenda and answer questions in writing within FIVE (5) calendar days of the request.
   d. Bid Assistance: Assist Amtrak in technical review of bids or proposals from construction contractors.

9. Construction Phase Services (CPS) (Optional, based on Contract)
   a. General: Technical support services during the construction phase of the project, known as Construction Phase Services (CPS), shall be option priced if requested by Amtrak. These services may, at Amtrak’s option, be added to the design contract or be awarded under a separate contract. The Design Contractor’s Cost Proposal for CPS is also subject to future negotiation at Amtrak’s discretion. Details below provide the usual scope of these services should they be authorized.
   i. The number of meetings, site visits, submittal and RFI reviews, technical support and clarifications, change order support, and site visits shall not be limited except as indicated below, indicated in the Scope of Services, or by the by the Period of Performance.
   b. Timeliness: The Design Contractor shall take due care to ensure that construction phase services are performed in an expeditious and timely manner to prevent any delays to the Contractor's performance of construction work. The Design Contractor shall be liable for damages for Contractor claim(s) or delays, due to the Design Contractor's untimely performance or non-performance of construction support services.
   c. Meetings: As needed attend pre-construction and job progress meetings held at the construction site office or where requested, and assist Amtrak in resolving design-related technical issues that arise.
   d. Submittal Review: Review and respond to contractor submittals, shop drawings and samples, including substitutions, for conformity with the contract documents within
FIFTEEN (15) calendar days of receipt. If the submittal is rejected, reasons must be clearly stated in the submittal. Review and respond to re-submittals within SEVEN (7) calendar days of receipt. Maintain separate records of time spent for each resubmittal and substitution.

e. Requests for Interpretation (RFIs): When the Contractor requests clarification, the Design Contractor shall prepare a response, prepare necessary clarification sketches and provide interpretation required during construction to clarify the intent of the contract documents. Clarification sketches shall be prepared expeditiously so as not to impact the contractor's construction schedule, and no later than five (5) calendar days after the receipt of the request from Amtrak. If differences of opinion exist between Amtrak and the Contractor, the Design Contractor shall provide interpretation of the design documents to Amtrak. “Clarifications” are defined as additional documentation not requiring changes in the cost of a prime contractor's price. The Design Contractor shall visit the site, if necessary, to resolve the differences of opinion.

f. Technical Support and Design Clarifications: Provide technical support to the Project Manager during construction on questions relating to the design.

g. Change Order Support: Assist Amtrak in preparing support documentation for change orders relating to unforeseen conditions or changes requested by the Project Manager.

h. Site Visits: The Design Contractor shall visit the site bi-weekly, or as directed in the Scope of Services.

i. Site Visit Reports: The Design Contractor shall observe the construction and report to Amtrak on the progress of the work and its conformance to the contract documents.

i. Non-Conformance Reports (NCR's): The Design Contractor shall assist Amtrak in the investigation and review of Contractor-proposed corrective action of construction work that does not conform to the Contract Documents and/or approved shop submittals.

j. Punch List: The Design Contractor shall provide a punch list of items that do not meet the level of quantity or quality presented in the construction documents or approved shop submittals. The punch list shall include references to the applicable drawing and specification sections.

k. Testing: Review the results of material and equipment testing required of the Contractor by Amtrak's construction contract. Recommend acceptance or rejection of construction material and/or equipment that has been tested. Provide suggestions to Amtrak for corrective action, if possible, in case of failing results.

i. Final Acceptance, Inspection and Testing: The Design Contractor shall provide multi-discipline field representation for final inspection, testing and acceptance of systems.

ii. Factory Tests: When requested by Amtrak, the Design Contractor shall witness factory tests of products to be incorporated in the construction work, and provide written reports.

l. As-Built Drawings: The Design Contractor shall review the contractor's as-built drawings for conformance with final shop drawings and observed field conditions.

m. Operation and Maintenance (O&M) Manuals: The Design Contractor shall review the contractor's O&M manuals for conformance with the contract documents.

D. Special Considerations

1. Work on Railroad Property

   a. General

   i. The proposed Work involves operations on property owned or controlled by Amtrak or another Host Railroad. Railroad traffic shall be maintained at all times with safety and continuity. The Design Contractor shall conduct all of the operations on the Railroad right-of-way fully within the rules, regulations, and requirements of the Host Railroad.
ii. No individual shall come within the limits of Amtrak’s or any other Host Railroad’s right-of-way unless that individual has first attended that Host Railroad’s Safety Orientation Class.

   (1) The Design Contractor shall, with the aid of the Amtrak PM schedule the Safety Orientation Class. The Safety Orientation Class will be given free of charge. All other costs encountered due to complying with Amtrak’s safety requirements shall be at the sole expense of the Design Contractor. Amtrak’s Safety Orientation Class will be repeated when employee turnover or groups of Design Contractor employees are such that another Amtrak Safety Orientation Class is justified.

   (2) Work on other Host Railroad property may require additional training and certification. The Amtrak Project Manager will provide the Design Contractor information on other Host Railroad training and certification requirements.

iii. The Design Contractor shall obtain verification of the time and schedule of track occupancy from the Railroad before proceeding with any Work over, under, within, or adjacent to the Railroad right-of-way. All Work to be done under, upon or over the Railroad right-of-way will be performed by the Design Contractor in a manner satisfactory to the Railroad. It shall be performed at such times and in such manner, as not to interfere with the movement of trains or traffic upon the tracks of the Railroad. The Design Contractor may have to coordinate his Work with Railroad operations and other contractor scheduled Work. The Design Contractor shall use all necessary care and precaution in order to avoid accidents, delay or interference with the Railroad’s trains or other property.

iv. In some cases, Work will be performed adjacent to the high-speed main line electrified tracks of the Railroad in the vicinity of high voltage lines of the Railroad. In working near these lines, great care must be exercised. The Railroad’s rules outlining requirements for clearances between equipment and energized wires, as well as other interactions with regard to working in the vicinity of energized wires must be strictly observed whenever the tracks, structures, or properties of the Railroad are involved or affected.

v. The Design Contractor shall submit a Site Specific Work Plan for approval by the Railroad. The SSWP shall include any schedules, plans, and a detailed description of all equipment and methods of procedure for accomplishing the Work as well as provisions for temporary storage and parking. The Work in the field shall not proceed until the Railroad has reviewed and approved SSWP in writing.

   (1) This submission must be made at least (14) calendar days prior to proceeding with any Work.

   (2) Approval shall not serve in any way to relieve the Design Contractor of complete responsibility for the adequacy and safety of his methods of procedure.

vi. Amtrak will provide access to railroad property that is under its control and, where necessary, will coordinate with Host Railroads for permission to access their property.

   (1) Access to Railroad property may be limited based on availability of protection, other concurrent work, or as required to ensure that train operations are not interrupted.

b. Roadway Worker Protection

i. The Railroad will require protection services during all periods when the Design Contractor is working on, over, or adjacent to the right-of-way of the railroad, or as may be found necessary in the opinion of the Railroad.

ii. The Railroad shall determine the type of protection required to ensure safety and continuity of railroad traffic incident to the particular methods of operations and
equipment to be used during the contract. The Railroad will furnish such qualified
flagman, signalman, inspectors, protection personnel, or other employees as may be
required to ensure the safety of all people, trains, operations, and facilities.
(1) Amtrak will bear all expense incurred for protection by railroad employees.
(2) The providing of such watchmen, and other precautionary measures, shall not,
however relieve the Design Contractor from liability for payment of damages
caused by their operations.
iii. The Design Contractor shall make a request in writing to the Railroad at least (7)
days prior to the date that they intend to enter upon railroad property. Amtrak will
respond to the request within four days of receipt of the request. No work on railroad
property shall proceed without proper protection on the site.

2. Security / Anti-Terrorism
   a. Since the events of September 11, 2001, security and anti-terrorism considerations have
      played a larger role in most design projects. Amtrak’s national passenger rail network is
      an obvious target for possible attack, especially in areas like the Northeast where it plays
      a major role in regional transportation. Many of Amtrak’s principal facilities are located in
densely developed central cities, directly adjacent to rail and road transportation corridors
and waterways, and therefore difficult to protect. The issues of securing Amtrak facilities
against vandalism and protecting the personal safety of passengers and employees must
also be considered in project design.
   b. The Design Contractor must be aware of the surrounding environment and the purpose
      of each project, and incorporate appropriate security and anti-terrorism measures into
      facility design. The Amtrak Police Department may be asked to suggest security criteria
and program requirements for facility construction projects. An outside Security
SubDesign Contractor may also be used in some cases

3. Work by Amtrak Forces: Amtrak is subject to agreements with its unions that require some
   construction work to be done by in-house or “force account” labor. Typically a greater level of
detail is required in drawings intended for use by force account labor than that typically
provided in Design Contractor bid documents. If Amtrak determines that force account labor
will be used, the level of detail on drawings will be discussed, and negotiated, with the Design
Contractor.
**Division 01- General Requirements**

01 10 00 Summary

I. The purpose of this and the following Divisions is to establish standard design criteria that should be used as a reference for Design Contractors to Amtrak preparing construction documents for systems supporting Amtrak stations and facilities. The information provided are minimum requirements. The designer shall also use current industry standards and practices for any portion of the design that is not specified by the applicable codes and these guidelines.

II. The Design Contractor to Amtrak shall acknowledge receipt, use, and compliance with this document and Amtrak Standard Details, including any applicable revision dates, on the construction documents.

III. The specification sections indicated in this document are only a guideline for the creation of drawings and specifications by the Design Contractor. It does not represent any complete section nor does it represent a complete list of all specification sections that may be required for the project, but rather is information that Amtrak believes should be included in the construction documents when applicable. The Design Contractor to Amtrak shall be responsible for the creation of the complete drawings and project manual that is specific to the project for which they have been contracted.

A. The Design Contractor shall also include the standard Amtrak Division 1 specifications edited to suit the specific site and project within their specifications or project manual.

IV. Occasionally, a variation or deviation from the Standard Design Practices may be in the best interest of Amtrak. Requests by the Design Contractor to use new or non-standard products or techniques will be evaluated by the Amtrak Project Manager.

A. Use of a new product at a specific facility does not mean its use in other similar cases will be automatically approved. An unspecified testing period will be employed for new products.

B. A Design Contractor who desires to use a new or non-standard product or technique on a project shall provide the Amtrak Project Manager with a proposal that includes a written argument that presents a clear and concise rationale for the variation from the standard as well as any supporting material from the manufacturer and third party organizations to support the argument.

01 41 00 Regulatory Requirements

01 41 13 Codes

I. The design shall be in strict compliance with the Amtrak adopted codes and standards as indicated below or as directed by the Amtrak Project Manager.

A. Referenced codes and standards are a minimum requirement. The Amtrak Project Manager may require the code to be exceeded where it may be deemed necessary.

II. Amtrak Adopted Codes and Standards

A. All buildings as well as platforms that are adjacent to, above, or below a building and/or covered by a canopy shall comply with the following codes and standards:

   1. The most current editions of the ICC Family of Codes
      a. International Building Code
      b. International Existing Building Code
      c. International Plumbing Code
      d. International Mechanical Code
      e. International Energy Conservation Code
      f. Other ICC codes may be used or referenced depending on specific site or building conditions


B. All platforms that are NOT adjacent to, above, or below a building, or covered by a canopy shall comply with the following:

   1. The most current revision of the Amtrak Standard Platform Egress Drawing
C. Accessibility Standards
   1. All spaces used by passengers and employees as well as access to and from those spaces, Public Right of Ways, parking lots, platforms, and other related locations shall comply with the ADA Standards for Transportation Facilities, effective 11/29/2006 (2006 DOTAS)
      a. The 2006 DOTAS can be found at http://www.access-board.gov/ada-aba/ada-standards-dot.cfm

D. Sustainability Code
   1. All new and extensively renovated sites and structures must comply with the most current edition of the ICC International Green Construction Code
      a. Comply with all mandatory portions of the IGCC
      b. Comply with all Amtrak jurisdictional requirements of IGCC table 302.1.
      c. Comply with the minimum number of project electives indicated.
         i. See IGCC table 303.1 for Amtrak recommended project electives.

III. Local Codes and Standards
   1. A provision of the Rail Passenger Service Act, 49 U.S.C. §24902(j), provides that Amtrak is exempt from state and local building, zoning, subdivision and similar laws, including those requiring permits and approvals, in connection with the construction, use or operation of any improvement undertaken by or for the benefit of Amtrak for any project that Amtrak initiates or commits to in a year in which it receives federal operating subsidies.
      a. If a Design Contractor of Amtrak seeks permits and/or code review services from the local code enforcement agency or with any other authority, then the Design Contractor shall be responsible at their own risk and expense to ensure that the design complies with all local codes and standards, as well as any amendments that have been adopted by those agencies.
         i. Where the locally adopted code and the Amtrak adopted codes and standards conflict, the more stringent regulation shall govern.
   2. See Amtrak specification 011000 for additional information

IV. Historic and Environmental Permits and Approvals
   A. The Design Contractor shall provide Amtrak with list of historic and/or environmental reviews, permits and approvals that would be required if the Owner were a private corporation and not Amtrak. Amtrak will direct Design Contractor which permits and approvals to obtain at Amtrak’s expense.
      1. If Design Contractor applies for any permits or approvals or consults with their respective review boards without being directed to do so by Amtrak, they do so at their own risk and expense. The Design Contractor shall then be responsible for all associated costs, including fees, modifications to work as may be requested by permitting authorities, and any other increased costs of construction or design related to Design Contractor’s decision to apply for such additional permits.
<table>
<thead>
<tr>
<th>Section</th>
<th>Section Title or Description and Directives</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CH 1. ADMINISTRATION</strong></td>
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<td></td>
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<tr>
<td>102.4.12 302.1 (1)</td>
<td>ICC 700 Environmental Performance Level.</td>
<td>NA</td>
</tr>
<tr>
<td><strong>CH 3. JURISDICTIONAL REQUIREMENTS AND PROJECT ELECTIVES</strong></td>
<td></td>
<td></td>
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<tr>
<td>302.1 (2)</td>
<td>Optional compliance path – ASHRAE 189.1</td>
<td>☑ Yes ☐ No</td>
</tr>
<tr>
<td>302.1 (3)</td>
<td>Project Electives – The jurisdiction shall indicate a number between 0 and 14 to establish the minimum total number of project electives that must be satisfied.</td>
<td>14</td>
</tr>
<tr>
<td><strong>CH 4. SITE DEVELOPMENT AND LAND USE</strong></td>
<td></td>
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<tr>
<td>402.2.1.2</td>
<td>Floodplain preservation</td>
<td>☐ Yes ☑ No</td>
</tr>
<tr>
<td>402.2.3</td>
<td>Conservation area</td>
<td>☐ Yes ☑ No</td>
</tr>
<tr>
<td>402.2.5</td>
<td>Agricultural land</td>
<td>☐ Yes ☑ No</td>
</tr>
<tr>
<td>402.2.6</td>
<td>Greenfields</td>
<td>☑ Yes ☐ No</td>
</tr>
<tr>
<td>403.4.1</td>
<td>High occupancy vehicle parking</td>
<td>☑ Yes ☐ No</td>
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<td>403.4.2</td>
<td>Low emission, hybrid and electric vehicle parking</td>
<td>☑ Yes ☐ No</td>
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<tr>
<td>405.1</td>
<td>Light pollution control</td>
<td>☐ Yes ☑ No</td>
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<tr>
<td><strong>CH 5. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY</strong></td>
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</tr>
<tr>
<td>502.1</td>
<td>Enhanced construction material and waste management</td>
<td>☑ Yes ☐ No</td>
</tr>
<tr>
<td>502.1</td>
<td>Minimum percentage of waste material diverted from landfills</td>
<td>☐ 50% ☑ 65%</td>
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<tr>
<td><strong>CH 6. ENERGY CONSERVATION AND EARTH ATMOSPHERIC QUALITY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>602.1, 602.3, 602.3.2, 302.1.1</td>
<td>Enhanced energy performance - for buildings pursuing performance based compliance and buildings greater than 25,000 square feet in total building floor area</td>
<td>☐ Yes ☑ No</td>
</tr>
<tr>
<td>Table 602.1, 302.1, 302.1.1</td>
<td>TANEU of Jurisdictional Choice - Where “Yes” is selected in the previous row, the jurisdiction shall indicate a TANEU of 63 or less in Table 602.1 for each occupancy for which it intends to require enhanced energy performance.</td>
<td>See Table 602.1 and Section 302.1</td>
</tr>
<tr>
<td>602.3.2.4</td>
<td>Reduced CO2e emissions calculations and reporting</td>
<td>☐ Yes ☑ No</td>
</tr>
<tr>
<td>613.2</td>
<td>Post C. of O. TANEU, energy demand, and CO2e emissions reporting</td>
<td>☐ Yes ☑ No</td>
</tr>
<tr>
<td><strong>CH 7. WATER RESOURCE CONSERVATION AND EFFICIENCY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>702.1.2</td>
<td>Enhanced plumbing fixture and fitting flow rates</td>
<td>☑ Yes ☐ No</td>
</tr>
<tr>
<td>702.1.2</td>
<td>Enhanced plumbing fixture and fitting flow rate tier – Select a tier only where “Yes” is selected in the previous row.</td>
<td>☐ Tier 1 ☑ Tier 2</td>
</tr>
<tr>
<td>702.7</td>
<td>Municipal reclaimed water.</td>
<td>☑ Yes ☐ No</td>
</tr>
<tr>
<td><strong>CH 9. COMMISSIONING, OPERATION AND MAINTENANCE</strong></td>
<td></td>
<td></td>
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<tr>
<td>904.1.1.1</td>
<td>Periodic reporting</td>
<td>☑ Yes ☐ No</td>
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</tbody>
</table>
### CH 10. EXISTING BUILDINGS

<table>
<thead>
<tr>
<th>Section</th>
<th>Section Title or Description and Directives</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1007.2</td>
<td>Demolition</td>
<td>☑ Yes ☐ No</td>
</tr>
<tr>
<td>1007.3</td>
<td>Sale of existing buildings and tenant spaces</td>
<td>☐ Yes ☑ No</td>
</tr>
<tr>
<td>1007.4</td>
<td>Evaluation of existing buildings</td>
<td>☐ Yes ☑ No</td>
</tr>
</tbody>
</table>

#### APPENDICES

<table>
<thead>
<tr>
<th>Appendix B</th>
<th>Greenhouse gas reduction in existing buildings</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>B103.1</td>
<td>Compliance level – The <em>jurisdiction</em> to select phases only where “Yes” is selected in the previous row.</td>
<td>☐ Phase 1 ☑ Phase 2 ☑ Phase 3 ☑ Phase 4</td>
</tr>
<tr>
<td>B103.2</td>
<td>Where “Phase 1” is selected under Section B103.1 – <em>jurisdiction</em> to indicate the number of months to be used in association with Section B103.2.</td>
<td>______ months</td>
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<tr>
<td>B103.3</td>
<td>Where “Phase 2” is selected under Section B103.1 – <em>jurisdiction</em> to indicate the number of years and the percentage to be used in association with Section B103.3.</td>
<td>______ years ______ %</td>
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<tr>
<td>B103.4</td>
<td>Where “Phase 3” is selected under Section B103.1 – <em>jurisdiction</em> to indicate the number of years to be used in association with Section B103.4.</td>
<td>______ years</td>
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<tr>
<td>B103.5</td>
<td>Where “Phase 4” is selected above – <em>jurisdiction</em> to indicate the number of years and the percentage to be used in association with Section B103.5.</td>
<td>______ years ______ %</td>
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<table>
<thead>
<tr>
<th>Appendix C</th>
<th>Sustainability measures</th>
<th>Requirements</th>
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<tbody>
<tr>
<td></td>
<td>☐ Yes ☑ No</td>
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<table>
<thead>
<tr>
<th>Appendix D</th>
<th>Enforcement procedures</th>
<th>Requirements</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>☐ Yes ☑ No</td>
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</table>
### IGCC Table 303.1: Amtrak Recommended Project Electives

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Amtrak Recommended Electives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CH 3. Jurisdictional Requirements and Project Electives</strong></td>
<td></td>
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</tr>
<tr>
<td>304.1</td>
<td>Whole Building Life Cycle Assessment</td>
<td>☒</td>
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<tr>
<td><strong>CH 4. Site Development and Land Use</strong></td>
<td></td>
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<tr>
<td>407.2.1</td>
<td>Flood hazard avoidance</td>
<td>☐</td>
</tr>
<tr>
<td>407.2.2</td>
<td>Agricultural land</td>
<td>☐</td>
</tr>
<tr>
<td>407.2.3</td>
<td>Infill site</td>
<td>☐</td>
</tr>
<tr>
<td>407.2.4</td>
<td>Brownfield site</td>
<td>☒</td>
</tr>
<tr>
<td>407.2.5</td>
<td>Greenfield development</td>
<td>☐</td>
</tr>
<tr>
<td>407.2.6</td>
<td>Greenfield proximity to development</td>
<td>☐</td>
</tr>
<tr>
<td>407.2.7</td>
<td>Greenfield proximity to diverse uses</td>
<td>☐</td>
</tr>
<tr>
<td>407.3.1</td>
<td>Changing and shower facilities</td>
<td>☐</td>
</tr>
<tr>
<td>407.3.2</td>
<td>Long term bicycle parking and storage</td>
<td>☐</td>
</tr>
<tr>
<td>407.3.3</td>
<td>Preferred parking</td>
<td>☒</td>
</tr>
<tr>
<td>407.4.1</td>
<td>Site hardscape 1</td>
<td>☒</td>
</tr>
<tr>
<td>407.4.2</td>
<td>Site hardscape 2</td>
<td>☒</td>
</tr>
<tr>
<td>407.4.3</td>
<td>Site hardscape 3</td>
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<tr>
<td>407.4.4</td>
<td>Roof covering</td>
<td>☒</td>
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<tr>
<td>407.5</td>
<td>Light pollution</td>
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<tr>
<td><strong>CH 5. Material Resource Conservation and Efficiency</strong></td>
<td></td>
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</tr>
<tr>
<td>507.2</td>
<td>Waste management (502.1 + 20%)</td>
<td>☒</td>
</tr>
<tr>
<td>507.3(1)</td>
<td>Reused, recycled content, recyclable, bio-based and indigenous materials (60%)</td>
<td>☒</td>
</tr>
<tr>
<td>507.3(2)</td>
<td>Reused, recycled content, recyclable, bio-based and indigenous materials (80%)</td>
<td>☒ (2 Electives)</td>
</tr>
<tr>
<td>507.4(1)</td>
<td>Multi-story building – footprint reduced by at least 45%</td>
<td>☐</td>
</tr>
<tr>
<td>507.4(2)</td>
<td>Multi-story buildings – footprint reduced by at least 70%</td>
<td>☐ (2 Electives)</td>
</tr>
<tr>
<td>507.5</td>
<td>Reduced building volume</td>
<td>☐</td>
</tr>
<tr>
<td>507.6.1</td>
<td>Service life – 100 year design service life category</td>
<td>☒</td>
</tr>
<tr>
<td>507.6.1</td>
<td>Service life – 200 year design service life category</td>
<td>☒ (2 Electives)</td>
</tr>
<tr>
<td>507.6.2</td>
<td>Interior adaptability</td>
<td>☐</td>
</tr>
<tr>
<td>507.7</td>
<td>Moisture control</td>
<td>☒</td>
</tr>
<tr>
<td><strong>CH 6. Energy Conservation, Efficiency and Earth Atmospheric Quality</strong></td>
<td></td>
<td></td>
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<tr>
<td>613.3.1</td>
<td>Project TANEU is at least 7 points lower than required by Table 302.1.</td>
<td>☒</td>
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<tr>
<td>613.3.2</td>
<td>Project TANEU is at least 14 points lower than required by Table 302.1</td>
<td>☒ (2 Electives)</td>
</tr>
<tr>
<td>613.3.3</td>
<td>Project TANEU is at least 21 points lower than required by Table 302.1</td>
<td>☒ (3 Electives)</td>
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</table>
### Section Description

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<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Amtrak Recommended Electives</th>
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<tbody>
<tr>
<td>613.3.4</td>
<td>Project TANEU is at least 28 points lower than required by Table 302.1</td>
<td>✗ (4 Electives)</td>
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<td>613.3.5</td>
<td>Project TANEU is at least 35 points lower than required by Table 302.1</td>
<td>✗ (5 Electives)</td>
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<td>613.3.6</td>
<td>Project TANEU is at least 42 points lower than required by Table 302.1</td>
<td>✗ (6 Electives)</td>
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<td>613.3.7</td>
<td>Project TANEU is at least 49 points lower than required by Table 302.1</td>
<td>✗ (7 Electives)</td>
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<td>613.3.8</td>
<td>Project TANEU is at least 56 points lower than required by Table 302.1</td>
<td>✗ (8 Electives)</td>
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<td>613.3.9</td>
<td>Project TANEU is at least 63 points lower than required by Table 302.1</td>
<td>✗ (9 Electives)</td>
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<td>613.3.10</td>
<td>Project TANEU is at least 70 points lower than required by Table 302.1</td>
<td>✗ (10 Electives)</td>
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<tr>
<td>613.4</td>
<td>Building thermal envelope systems</td>
<td>✗</td>
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<tr>
<td>613.5</td>
<td>Mechanical systems</td>
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<tr>
<td>613.6</td>
<td>Passive design</td>
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### CH 7. WATER RESOURCE CONSERVATION AND EFFICIENCY

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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<tbody>
<tr>
<td>710.2.1</td>
<td>Fixture flow rates are one tier above that required by Table 302.1</td>
<td>✗</td>
</tr>
<tr>
<td>710.2.2</td>
<td>Fixture flow rates are two tiers above that required by Table 302.1</td>
<td>✗ (2 Electives)</td>
</tr>
<tr>
<td>710.3</td>
<td>On-site wastewater treatment</td>
<td>✗</td>
</tr>
<tr>
<td>710.4</td>
<td>Non-potable outdoor water supply</td>
<td>✗</td>
</tr>
<tr>
<td>710.5</td>
<td>Non-potable water for plumbing fixture flushing</td>
<td>✗</td>
</tr>
<tr>
<td>710.6</td>
<td>Automatic fire sprinkler system</td>
<td>✗</td>
</tr>
<tr>
<td>710.7</td>
<td>Non-potable water supply to fire pumps</td>
<td>✗</td>
</tr>
<tr>
<td>710.8</td>
<td>Non-potable water for industrial process makeup water</td>
<td>✗</td>
</tr>
<tr>
<td>710.9</td>
<td>Efficient hot water distribution system</td>
<td>✗</td>
</tr>
<tr>
<td>710.10</td>
<td>Non-potable water for cooling tower makeup water</td>
<td>✗</td>
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<tr>
<td>710.11</td>
<td>Graywater collection</td>
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### CH 8 INDOOR ENVIRONMENTAL QUALITY AND COMFORT

<table>
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<tr>
<th>Section</th>
<th>Description</th>
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<tbody>
<tr>
<td>809.2.1</td>
<td>VOC emissions - flooring</td>
<td>✗</td>
</tr>
<tr>
<td>809.2.2</td>
<td>VOC emissions – ceiling systems</td>
<td>✗</td>
</tr>
<tr>
<td>809.2.3</td>
<td>VOC emissions- wall systems</td>
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</tr>
<tr>
<td>809.2.4</td>
<td>Total VOC limit</td>
<td>✗</td>
</tr>
<tr>
<td>809.3</td>
<td>Views to building exterior</td>
<td>✗</td>
</tr>
</tbody>
</table>
01 60 00 Product Requirements  
I. Specifications for system manufacturers and materials shall be non-proprietary, unless specifically approved by Amtrak. Where possible, specifications shall not be “performance” based, but instead shall provide at least three (3) acceptable manufacturers and shall provide specific and comparable products, by name, for each specified manufacturer along with an indication of which is the BOD (Basis of Design).
   A. Basis of Design must be approved by Amtrak in advance.
   B. Single-source specifications with provisions for "or equals" are not acceptable, unless authorized in writing by Amtrak.
   C. Since several manufacturers are to be specified, and the manufacturer’s "typical" details may vary, it is the responsibility of the Design Contractor to select the methods of construction judged to be in the best interest of Amtrak, and provide construction documents that reflect those methods as the minimum acceptable project standard.
II. See Amtrak Division 1 specifications for additional information.

01 74 19 Construction Waste Management and Disposal  
I. Performance Goals
   A. Amtrak requires the recycling of non-hazardous demolition and construction materials and other waste generated on the construction site, in order to divert as much material as possible from the waste stream, to promote responsible use of resources, and to conserve energy.
   B. Recycling shall be required on both renovation and new construction projects.
   C. Comply with the requirements of the Amtrak adopted sections of the Sustainability Code.

01 81 00 Facility Performance Requirements  
I. General
   A. The purpose of the following performance requirements and assembly descriptions is to establish standard design criteria that should be used as a reference for engineers and/or architectural firms preparing construction documents for Amtrak stations and facilities.
   B. The information in this section is general in nature. See the following sections of this document for specific system and assembly requirements.
   C. The designer shall also use current industry materials and practices for any portion of the design that is not specified by the applicable codes and these guidelines.

01 81 10 Structural Performance Requirements  
I. General
   A. The information provided is a minimum requirement from Amtrak. It does not relieve the designer of record from designing the structural system in compliance to these guidelines and all applicable codes.
   B. Coordinate selection of the appropriate structural system with the Architect of Record to best support the structure and fit into the Architect’s design philosophy. Unless approval is obtained from the Amtrak Project Manager, the structural systems will be limited to following:
II. Station Buildings
   A. Foundation system
      1. Reinforced, cast in place concrete footings with concrete piers.
      2. Reinforced, cast in place concrete continuous footings with cast in place concrete or solid masonry block or hollow masonry blocks - grouted solid, strip/wall foundations.
      3. Drilled piers with reinforced cast in place concrete.
      4. Driven or helical steel or pre cast concrete piles with reinforced, cast in place concrete pile caps.
   B. Superstructure
      1. Structural steel.
2. Reinforced cast in place concrete.
3. Pre cast concrete.
4. Reinforced masonry.
5. Cold formed light gage structural steel sections can be used for truss members of gabled roof or sloped roofs with a minimum 4:12 pitch.
6. Timber can only be used in buildings where timber is currently a structural element and use of another material would have an adverse impact on the historic fabric of the building.
7. Pre engineered building systems may only be used with the approval from the Amtrak Project Manager.

C. Floor Systems
1. Slab on grade shall be a minimum of 4” thick cast in place concrete with the required steel reinforcing bar or welded wire fabric reinforcing as determined in the slab design.
2. Elevated floors shall be reinforced cast in place concrete, pre cast plank or composite cast in place concrete/steel deck systems. Reinforcing of the cast in place concrete floors shall be steel rebar or welded wire fabric.
   a. Fiber reinforcing will not be allowed as structural reinforcing of any floor system.
3. Fire ratings of all floor systems must meet the requirements of the Architects code review for the building.

D. Roof Systems
1. Light gage cold formed metal decking.
2. Cast in place concrete.
3. Pre cast concrete.

E. Curtain Wall Systems – Selection of the system to support the building cladding and components shall be based on the most effective system that works in conjunction with the facade selected by the Architect of Record. Design of the system shall take into account all vertical and horizontal loading on the cladding or component.
1. Cold formed light gage structural steel sections
2. Masonry
3. Steel

III. Platforms
A. Foundation system – The foundation system selected to support the platform shall be chosen based on applicability for the existing soil conditions and parameters and minimization of impact to train operations during construction.
1. Cast in place concrete footings with concrete piers.
2. Cast in place concrete continuous footings with cast in place concrete strip/wall foundations.
3. Drilled piers with reinforced, cast in place concrete.
4. Driven or helical steel or concrete piles with cast in place concrete pile caps.
5. Micro Piles with cast in place concrete pile caps.
B. Platform structure
1. Pre cast concrete. Pre cast planks shall be solid.
2. Reinforced, cast in place concrete.

IV. Canopies
A. Foundation system
1. Reinforced, cast in place concrete footings with concrete piers.
2. Drilled piers with reinforced, cast in place concrete.
3. Driven steel or concrete piles with cast in place concrete pile caps.
B. Superstructure
1. Steel.
2. Reinforced, cast in place concrete.
3. Pre cast concrete.
C. Roof System
1. Light gage metal decking.
2. Cast in place concrete.
3. Pre cast concrete

V. Design of Structural system
   A. Design of the structural system must be in accordance with the local building code’s site-specific requirements for snow, ice, wind, frost depth and seismic zone or the following Amtrak minimum design loads requirements:
   B. Dead Load
      1. Dead load shall include the weight of the structural system being used, weight of exterior wall façade, interior walls, flooring and ceiling and mechanical and electrical equipment.
   C. Live Loads
      1. Floor Live Load
         a. Passenger waiting area – 100psf
         b. Baggage storage areas – 150psf
         c. Train Platform – 150psf
      2. No live load reduction will be allowed for any portion of the structure design.
   D. Roof Live Load - Per local code requirements for but not limited to snow, ice, drifting, and ponding with a minimum of 30psf.
   E. Wind Loads
      1. Design of main wind force resisting system per local code requirement with a minimum:
         a. Walls - Minimum 20psf for windward walls and 10psf for leeward walls. (Assume internal pressure act on all surfaces and thus cancel unless openings dictate otherwise)
         b. Roofs – Minimum 30psf for corner and overhangs, 25psf for eave areas, and 15psf for interior areas.
      2. Design of building cladding and component system per local code with a minimum:
         a. For walls - 30psf for the internal zone, 35psf for the edge zones and 40psf for the corner zones.
         b. For roof panels - 35psf for the internal zone, 45psf for the edge zones and overhangs and 60psf for the corner zones.
      3. Uplift pressure due to wind with out gravity live loads must be analyzed.
   F. Earthquake Loads
      1. Per local code requirements.
   G. Deflection Criteria
      1. Reserved
   H. Structural Analysis Requirements
      1. Designer shall analyze the main structural components with all combination of loads required by code.
      2. Foundation design shall support all loading conditions and shall be in conformance with the geotechnical capacity of the soil at the location of construction. Design shall be in accordance with the site specific geotechnical recommendations and site specific requirements including frost depth and seismic zone.

VI. Documentation Requirements
   A. Designer shall include on the drawings the following information in tabular form: Dead, Live, Roof, Wind, Earthquake loads including listing the code from which the loads was derived.
      Include wind loads for cladding and roofing design for all portions of the building in tabular form.
   B. Designer shall include on the drawing maximum design loads at all connection points and at the top of foundations.
   C. The construction documents shall include all member sizes, required reinforcing, connection details and material specifications.

01 81 13 Sustainable Design Requirements
I. See Amtrak adopted sustainability code in section 01 41 13 Codes

01 83 17 Exterior Enclosure Assemblies
I. General
A. The information in this section is general in nature. See the following sections of this document for specific system and assembly requirements.

II. Exterior Wall Construction
A. Unless approval is obtained from the Amtrak Project Manager, the exterior wall construction will be limited to the following:
   1. Masonry cavity wall construction
   2. Metal siding on masonry or cold formed metal framing backup.
   3. Mineral-fiber cement siding on masonry or cold formed metal framing backup.

III. Roof and Floor Construction
A. See 01 81 10 Structural Performance Requirements

01 83 20 Roofing Assemblies
I. General
A. The information in this section is general in nature. See the following sections of this document for specific system and assembly requirements.
B. All roofing shall comply with the current version of the NRCA Roofing and Waterproofing Manual and the SMACNA Architectural Sheet Metal Manual
C. Roof insulation, overlay boards and fasteners/adhesive are to be considered components of a total roof system assembly, and must be included in a "total system" warranty/guaranty issued by the roofing system manufacturer. In addition, insulation, overlay boards, and fasteners/adhesive must be specifically listed as a component of a Factory Mutual (FM) tested and approved roof system assembly in the latest edition of the FM Approval Guide for Building Materials or other written approval or acceptance from Factory Mutual.
D. Regardless of the roofing system selected, all roofs shall be one of the following:
   1. Energy Star Certified Cool Roof
   2. Vegetated Roof
   3. Paved with high SRI pavers
   4. Covered by Photovoltaic or Solar Hot Water panels

II. Roofing system selection
A. Unless approval is obtained from the Amtrak Project Manager, the roofing systems will be limited to following:
   1. Roofs with a slope of 2:12 or greater shall be metal as per section 07 41 13 Metal Roof Panels
   2. Roofs with a slope less than or equal to 2:12 shall be a membrane roofing system as per section 07 50 00 Membrane Roofing
      a. Low-slope roof systems shall be designed with 1/4" per foot (min.) slope to drains, but not greater than the recommended limits of the specified system.
      b. Provide walkway protection pads leading from roof access points to and/or around all serviceable mechanical equipment and appurtenances for all Membrane Roofing
   3. Other systems shall only be allowed where the specified system must match an existing roof, or is subject to historic commission approval.

III. Warrantees and Maintenance:
1. The entire roofing system is to be covered by the manufacturer’s warranty including, without limit, the insulation and any recovery board, the roofing material, the flashings, any through-penetration systems or fabrications, equipment mounting curbs or saddles, etc.
2. A minimum 20 years warranty shall be specified in the design documents for roofing system. The roof membrane manufacturer shall provide a full 20 year labor and materials "no dollar
limit” guarantee. The guarantee shall be a total system, term type, without deductibles or limitations on coverage amount.

3. The design documents shall also contain a separate specification for a four (4) year guarantee covering all work performed by the contractor for the project. The guarantee should include all labor and materials required to replace any defects in the work resulting from workmanship or material failure.

01 84 14 Interior Construction Assemblies

I. General
   A. The information in this section is general in nature. See the following sections of this document for specific system and assembly requirements.

II. Materials
   A. Interior Wall Construction
      1. Masonry
      2. Metal stud and gypsum board construction
   B. Ceilings
      1. As indicated in the finish schedule, 01 84 20 Interior Finishes
   C. Floors
      1. As indicated in the Structural Performance Requirements 01 81 10

III. Installation
   A. Walls of secured areas shall be continuous from the floor to the underside of the structure above
      1. Ticket Offices
      2. Baggage Rooms

01 84 20 Interior Finishes

I. General
   A. The information in this section is general in nature. See the following sections of this document for specific system and assembly requirements.
   B. Coordinate finish selections with the appropriate substrate system selected for the project.
   C. Finishes are project specific and should be determined within the context of the building design, and with the approval of the Amtrak Project Manager, but where feasible, finishes should be selected from the finish schedule below.
      1. Other finishes shall be allowed where the finishes are intended to match the existing, are subject to historic commission approval, or for first class lounges.
      2. Additional trim, including, but not limited to wainscoting shall be permitted where that trim is intended to compliment the style of the station or where required to match existing.

II. Finish Schedule
   A. Finishes are listed for the typical spaces in station buildings in the order of Amtrak preference. Unless approval is obtained from Amtrak’s Project Manager, the finish systems should be limited to the following:
   B. Vestibule
      1. Floors
         a. Entrance Floor Mat and Frame
         b. Terrazzo
         c. Porcelain Tile
         d. Resilient Tile
      2. Base
         a. Compatible with floor finish
            i. Where possible, use cove base to match the floor finish
      3. Walls
         a. Masonry
b. Painted gypsum board
4. Ceiling
   a. Painted gypsum board
   b. Suspended metal grid and acoustic ceiling panels.

C. Waiting Room
1. Floors
   a. Terrazzo
   b. Porcelain Tile
   c. Resilient Tile
2. Base
   a. Compatible with floor finish
      i. Where possible, use cove base to match the floor finish
3. Walls
   a. Masonry
   b. Painted gypsum board
4. Ceiling
   a. Painted gypsum board
   b. Suspended metal grid and acoustic ceiling panels.

D. Ticket Office and other Amtrak utilized offices
1. Floors
   a. Terrazzo
   b. Porcelain Tile
   c. Resilient Tile
2. Base
   a. Compatible with floor finish
      i. Where possible, use cove base to match the floor finish
3. Walls
   a. Masonry
   b. Painted gypsum board
4. Ceiling
   a. Painted gypsum board (required if it is not possible to construct walls to underside of structure)
   b. Suspended metal grid and acoustic ceiling panels.

E. Baggage Rooms
1. Floors
   a. Sealed Concrete
   b. Resilient Tile
2. Base
   a. Resilient base
3. Walls
   a. Masonry
   b. Painted gypsum board
4. Ceiling
   a. Exposed Structure (if this meets code requirements)
   b. Painted gypsum board (required if it is not possible to construct walls to underside of structure)

F. Toilet Rooms
1. Floors
   a. Terrazzo
   b. Seamless and slip resistant epoxy troweled mortar floor as per 09 67 23 Resinous Flooring
c. Porcelain Tile

2. Base
   a. Form cove base with floor finish to 4” above top of finished floor

3. Walls
   a. Solid Surface Panels
   b. Porcelain Tile
   c. Ceramic Tile

4. Ceiling
   a. Painted gypsum board

G. Janitor’s Closet

1. Floors
   a. Sealed Concrete
   b. Resilient Tile

2. Base
   a. Resilient base

3. Walls
   a. Masonry
   b. Painted gypsum board

4. Ceiling
   a. Exposed Structure (if this meets code requirements)

5. Accessories
   a. Install stainless steel or solid surface at walls around service sink that are subject to wetting as required by code.

H. Storage Rooms

1. Floors
   a. Sealed Concrete
   b. Resilient Tile

2. Base
   a. Resilient base

3. Walls
   a. Masonry
   b. Painted gypsum board

4. Ceiling
   a. Exposed Structure (if this meets code requirements)

I. ClubAcela, Metropolitan, or similar first class lounges and their accessory spaces

1. There is no standard for finishes for these types of spaces, but all finishes utilized should be of the highest quality and durability and shall be approved by the Amtrak PM.

01 91 00 Commissioning

I. Projects shall be commissioned for all systems as required by Amtrak adopted sections of the Sustainability Code.

   A. All commissioning services and documentation shall be in conformance with the latest issue of ASHRAE Commissioning Standards and Guidelines.

   B. The scope of commissioning services and documentation provided shall match the sophistication of the systems designed.

II. The Design Contractor to Amtrak shall retain a commissioning agent for the project who shall report directly to Amtrak.

   A. Amtrak reserves the right to hire a third party Commissioning Agent.
Division 02- Existing Conditions

02 21 00 Surveys
02 21 10 Investigation of Existing Conditions
I. Archive Investigation
   A. Amtrak’s Document Control Center is located at 30th Street Station, Philadelphia, PA. The Design Contractor shall provide professional, technical and support services to retrieve existing pertinent project drawings from the Center, if available. Original construction drawings and some renovation drawings are available as linen, Mylar, bond paper, microfilm, TIF files, PDF files or DWG files.
   B. Documents, electronic information and drawings furnished by Amtrak that illustrate or describe conditions relevant to the project are the property of Amtrak and shall not be copied and used for any other project without Amtrak’s written permission. All such documents shall be returned to Amtrak at the completion of the project.

II. Existing Site and Structures: The receipt of any available information from Amtrak, such as “as-built” plans, survey data or geotechnical information, shall not relieve the Design Contractor from responsibility for making site visits and performing sufficient verification inspection and measurement to assure the reasonable adequacy and accuracy of subsequent designs. The Design Contractor shall survey the existing field conditions and report any discrepancies in writing back to Amtrak prior to completing the analysis phase of the project. The Design Contractor shall prepare designs with provision for the actual, existing field conditions encountered. Locate and verify existing features and structures as required. Locate and verify specific existing bridge and track conditions that may affect designs.
   A. Site Surveys
      1. Amtrak may or may not be able to provide survey data for the Design Contractor’s use. In either case, the Design Contractor is responsible for obtaining any additional survey data necessary to complete the design. The Design Contractor assumes full responsibility for the accuracy of data furnished if the data are used as a basis for professional judgments or incorporated into the construction documents.
         a. Unless otherwise directed, the Design Contractor shall provide a full existing civil survey to Amtrak as part of the Schematic Design Package.
      2. The survey shall include all metes and bounds, ownership information for the project site as well as all adjacent properties, easements, wetlands (if applicable), track locations and elevations, site contours at an increment appropriate to the site, all structures, wells, underground tanks, areas of pavement, locations of existing site utilities within the building and on the site, and all other necessary information.
         a. Verify the survey limits with the Amtrak PM
   B. Building and Structure Surveys
      1. When no existing building or structure drawings exist, or where required, the Design Contractor shall provide a full existing conditions survey of all building and structures on the site that are within the scope of the project or may affect of be affected by the project in some way.
         a. The existing conditions survey shall include all relevant spaces and components, including all architectural, structural, MEP, Security, and FP elements.
         b. Where required for historic commissions, provide all necessary surveying and documentation as required by historic commission.

III. Geotechnical Investigation
   A. Where required, provide a geotechnical investigation by a licensed geotechnical engineer with borings, test pits or other methods appropriate to the site and proposed construction along with an appropriate level of analysis to determine soil capacity and any other factors that may affect the proposed construction.
1. Provide engineering analyses in a signed and sealed report including interpretation of subsurface conditions, evaluation of conditions with respect to the proposed construction, settlement analyses, foundation analyses and other appropriate information and recommendations.

B. The Design Contractor is responsible for verifying that the final design takes into consideration the recommendations contained in the final geotechnical report. A copy of the report shall be included in the Basis of Design.

IV. Historic and Environmental Investigation

A. Investigate the potential historic or environmental impacts of a project
   1. Some buildings and bridges owned or used by Amtrak are historically significant or are in proximity or within sight of a historic building or site. Certain scenic views, especially those of historic battlefields or view corridors to major landmarks, are also protected under applicable law.

B. Potential historic significance and/or potential requirements for historic or environmental permits and approvals should be brought to the attention of the Amtrak Project Manager.
   1. See section 01 41 00 Regulatory Requirements for procedures where Historic and Environmental Permits and Approvals may be required.
Division 03- Cast-In-Place Concrete

03 01 30 Maintenance of Cast-in-Place Concrete

I. General
   A. Where existing concrete has shifted, sunk, or heaved and has become an uneven walking surface or an unsafe condition for pedestrians and vehicles, cut and/or grind concrete to create an smooth and safe ADA compliant surface using equipment specifically designed to make concrete repairs.
   B. Where concrete has deteriorated and needs to be patched, provide concrete repair materials and methods at each condition as per the written instructions of the repair material manufacturer.
      1. Concrete Resurfacer
         a. Design Basis: Grind-All Concrete Resurfacer
      2. Crack Repair
         a. Design Basis: Grind-All ONE STOP Crack Repair
      3. Concrete Patch
         a. Design Basis: Grind-All ONESTOP

II. Documentation
   A. The Design Contractor shall prepare drawings documenting the different deficient conditions that require repair and the material and methods to be used at each condition.
   B. The Contractor and representative from the grinding equipment operators and/or repair material manufacturer shall review the documents and verify all conditions in the field and confirm the proposed repair materials and methods or propose others based upon field conditions.

III. Accessories
   A. Crack stitching steel reinforcement shall be stainless steel.
   B. Where concrete has been ground, apply concrete sealer to the affected area to protect the newly exposed surface.

IV. Installation
   A. Concrete repair work shall be performed by contractors trained and certified to use the necessary equipment and by the repair material manufacturer for the type of repair work required.
   B. All deteriorated materials requiring replacement shall be removed by saw cutting. Cut lines shall be straight and shall be parallel or perpendicular to the existing construction edges or joints to the maximum extent possible. Once all deteriorated materials have been removed, clean and prepare the existing sound surface as per concrete repair manufacturer’s written directions.
   C. Install patch and repair materials only after the surface has been prepared and environmental conditions are as required by the manufacturer.

V. Finish
   A. Match adjacent existing concrete color, finish and texture
      1. Where is not feasible to match the existing adjacent materials, notify the Amtrak PM in writing with an explanation why the repair materials will not match the existing and describe what methods will be used to minimize aesthetic differences.

VI. Field Quality Control
   A. Engage a qualified testing agency to test materials and perform installation inspections.

03 30 00 Cast-In-Place Concrete

I. General
   A. Strength – min. 4000psi @ 28 days.
   B. Water/Cement Ratio – maximum .45.
   C. Concrete shall contain silica fume and other additives as needed in accordance with ACI 318.
   D. All concrete work shall comply with the requirements of the latest edition of the ACI building code (ACI 318), ACI detailing manual (ACI 315), and the specifications for structural concrete for buildings (ACI 301).
II. Reinforcement
   A. Rebar detailing to be in accordance with ACI 315.
   B. Reinforcing steel shall conform to ASTM A615 grade 60 and shall be epoxy coated in accordance with ASTM A775.
      1. Lap all bars a minimum of 48 bar diameters
   C. WWF shall comply with ASTM A185 and shall be epoxy coated in accordance with ASTM A884 type 1 coating.
      1. Lap all WWF a minimum of 6 inches.

III. Admixtures
   A. Provide only the following Admixtures. No other admixtures will be accepted without the approval of the Amtrak Project Manager
      1. Concrete exposed to the ground or weather shall be air entrained between 4-5% as determined by ASTM C-231 or C-173.
      2. Silica Fume
      3. High-range water-reducing admixture (super plasticizer) which conforms to ASTM C-494, type F or G and contain not more than 0.1 percent chloride ions.
      4. Where the use of other concrete admixtures is requested by the Design Contractor, provide the following information to the Project Manager:
         a. Benefits to using admixture
         b. Potential negative effects, as well as their contributions to workability, durability and adjustment of set time.
            i. Long-term test data supporting benefits and negative effects of admixture.
         c. Effects of the admixture on the total chloride content of the concrete so that the limits prescribed by ACI 318, are not exceeded

IV. Finish
   A. Walls: Remove form ties and patch
   B. Floors: Wood float finish
   C. Exterior Paving: Broom Finish

V. Accessories
   A. Expansion joint filler: Use preformed strips, non-extruding and resilient bituminous type.
   B. At interior locations, unless site conditions require additional protection, provide polyethylene sheet 8 mil thickness vapor barrier membrane below slabs-on-grade. Overlap seams a minimum of 12" and seal all seams, edges, and penetrations.
   C. Provide sleeves in footings and walls for plumbing, electrical and other utilities

VI. Curing
   A. All Concrete shall be protected and cured in strict accordance with ACI 318

VII. Concrete Sealing
   A. Seal concrete surfaces where shown on the drawings and at all interior locations where no additional finish is scheduled.

03 40 00 Precast Concrete
I. Strength – min. 5000psi.
II. Design in accordance with ACI 318 and PCI MNL-120.
**Division 04- Masonry**

04 20 00 Unit Masonry

I. General
   A. All Masonry work shall be in accordance with Amtrak adopted codes and other applicable references, including the BIA and NTMA technical notes.
   B. Coordinate masonry with all trades requiring items to be built-in.
   C. Particular care is to be taken in designing interfaces of masonry anchors and waterproofing membrane and in placement of through-wall flashings to bring any water that penetrates the system out to the exterior.
   D. Mock up
      1. Mockups are to be built to demonstrate aesthetic effects and set quality standards for materials and execution.
      2. Minimum 4 ft. long by 3 ft. high, showing the proposed color range, texture, bond, mortar, flashing, weeps, drainage mats, damp or waterproofing, and workmanship of each type of masonry construction including conditions at windows and doors, base of wall, parapets, and inside and outside corners.
      3. Erect mockups in the presence of the Architect/Engineer before installation of materials.
      4. Use mockup as standard of comparison for all masonry work built of same material.
      5. Do not destroy or move mockup until work is completed and accepted.

II. Masonry Wall Construction

A. Repair of existing masonry or new masonry construction to match existing
   1. On projects requiring masonry to match the existing, the research, selection and specification of matching masonry units and mortar are the responsibility of the Design Contractor. During the design process, the Design Contractor to Amtrak shall utilize SubDesign Contractors as required to determine the most appropriate selections and details. All related costs are to be included in the Design Contractor’s design fee. Contract documents must specify the specific manufacturer and brick designation of the matching brick.
   2. See section 04 90 00 MASONRY RESTORATION AND CLEANING for additional notes on repair of existing masonry walls.

B. Exterior masonry walls enclosing conditioned spaces, shall be masonry cavity wall construction
   1. Masonry Cavity Walls shall include the following components
      a. Exterior Masonry Veneer
         i. Masonry veneer as selected by Design Contractor for the particular project, see below for masonry unit specifications
      b. Adjustable Masonry Veneer Anchors
      c. Air Space
         i. Provide minimum 1 ½” clear airspace, continuous for the entire height of the wall above grade.
         ii. To prevent blockage of weeps and mortar bridging of cavities, open cavity spaces are to be filled with continuous inorganic Cavity Drainage Mat from all thru-wall flashings to approximately 10” above the weeps or continuous within the cavity.
         iii. All hollow masonry units and wall cavities shall be grouted solid below the exterior grade level.
      d. Vents and Weeps
         i. Weeps and vents shall be spaced no more than 2’-0” o.c., horizontally.
         ii. The designer is to specify water-testing of the weep systems during construction at approximately four foot vertical intervals.
      e. Continuous Rigid Insulation
      f. Continuous Air Barrier
      g. Thru-Wall flashing
i. Thru-wall flashing shall be provided at tops and bases of walls, and at all interruptions in the wall cavity
  ii. All thru-wall flashing shall be metal as per section 07 62 00 Sheet Metal Flashing and Trim
h. Masonry backup
  i. Interior finish
  i. Finished masonry or painted gypsum board on metal furring as per specific project.

III. Mortar and Grout
A. Mortar shall conform to ASTM C270
  1. Structural Mortar
     a. Mortar for walls below the ground shall be type M.
     b. All other structural mortar shall be type S.
  2. Veneer Masonry Mortar
     a. Type N
  3. Mortar for repointing or in historic masonry walls
     a. See notes in section 04 90 00 MASONRY RESTORATION AND CLEANING
  4. All mortar shall be mixed from Portland cement, lime, sand and potable water only. No “Masonry Cement” or “Mortar Cement” products will be accepted.
  5. All mortar ingredients shall be proportioned according to volume with a cubic foot mixing box in amounts specified in the International Building Code.
B. Grout shall be high slump mix conforming to ASTM C476 with a minimum compressive strength of 3000psi and installed in accordance with ACI-531 for high or low lift procedures.
C. Do not use admixtures, including but not limited to air-entraining agents, accelerators, retarders, water repellents, antifreeze compounds, or any other type of admixture unless otherwise indicated.
D. Pigments may be added to mortar to obtain colored mortars, provided that they are produced specifically for use in mortar mixes and they can be demonstrated to have been successfully employed for this purpose. All colored mortars must be pre-approved by Amtrak.
E. Tool all exposed joints with a concave jointer
F. Cut joints flush or rake where masonry walls will receive plaster or another direct applied finish.

IV. Reinforcement
A. All running bond masonry walls are to have horizontal reinforcing at every other course. Where masonry is laid in other than running bond, horizontal joint reinforcement is to be provided at every horizontal joint. Provide fabricated corner sections at all corners.
B. All structural reinforcement shall conform to ASTM A615 grade 60 and shall be epoxy coated according to ASTM A775

V. Accessories
A. Flashing
  1. All flashing shall be sheet metal, see 07 62 00 Sheet Metal Flashing and Trim
B. Weeps and Vents
  1. Woven Plastic Mesh Weep Vents the full height and width of head joint.
  2. Color to match the mortar
C. Cavity Drainage Mat
  1. Drainage mat full depth of cavity and 10 inches high with dovetail shaped notches that prevent mesh from being clogged with mortar droppings.
D. Lintels
  1. Loose lintels shall comply with Metal Fabrications 05500
E. Veneer Anchors
  1. Provide stainless steel Adjustable Masonry Veneer Anchors that allow vertical adjustment but resist tension and compression forces perpendicular to the plane of wall
2. The Adjustable Masonry Veneer Anchors shall be designed for the specific use and design loads.
   a. Where required, provide seismic resistant Adjustable Masonry Veneer Anchors
3. Adjustable Masonry Veneer Anchors for stone veneers shall be fabricated with tabs or dowels designed to engage kerfs or holes in stone trim units and holes for fasteners or post-installed anchor bolts for fastening to substrates or framing.

F. Compressible filler
   1. Premolded compressible filler strips shall comply with ASTM D 1056, Grade 2A1. The premolded compressible filler strips shall be compressible up to 35 percent of width and thickness indicated for the project. The premolded compressible filler strip shall be formulated from neoprene.

VI. Installation
   A. Use full sized units without cutting wherever possible. Where cutting is required, saw cut and provide clean, sharp, unchipped edges. Conceal cut edges where possible.
   B. Layout walls in advance for accurate spacing of bond patterns with uniform joint thicknesses and for accurate location of openings, movement control joints, returns, and offsets. Avoid using less than half-sized units wherever possible.
   C. Coursing shall be coordinated with windows and door heads so that fractions of courses are avoided at openings.
   D. Unless otherwise required for by historic commissions, all masonry shall be laid in standard running bond.
   E. Remove and replace masonry units that are loose, damaged, or do not match the adjacent quality of work. Install new units to match the adjacent with fresh mortar pointed to eliminate evidence of replacement.
   F. Placement of reinforcement, veneer anchors, flashing, and similar items to be built into masonry systems are to be coordinated by the system installers.
   G. Cavity walls shall be designed so that all components including the air space, air/vapor barrier, flashing, cavity drainage mat, weeps and vents and all other elements work in an integrated fashion to allow free drainage of water through the cavity, out of the weeps and away from the structure as well as allowing the movement of air through weeps and vents to allow drying of the cavity.

VII. Cleaning and Protection
   A. Clean and protect brick masonry according to BIA technical notes.
   B. Clean and protect concrete masonry according to NTMA technical notes.
   C. See section 04 90 00 MASONRY RESTORATION AND CLEANING for additional notes on cleaning.

04 21 13 Brick Masonry
   I. All Brick shall be grade SW, type FBX as per ASTM C216
      A. Hollow brick shall comply with ASTM C 652, Class H40V (void areas between 25 and 40 percent of gross cross-sectional area) as a minimum
      B. Provide solid units without cores or frogs at ends of sills, caps, or in other locations which exposes the top or bottom surface.
      C. Provide special shapes at all curves, angles other than 90 degrees, and for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

04 22 00 Concrete Unit Masonry
   I. Concrete Masonry
      A. Common concrete masonry units shall be type N-1 conforming to ASTM C90 with a minimum compressive strength of 1900psi.
      B. Laid up masonry design f'm is 1350psi.
II. Concrete Facing Brick:
   A. Concrete face brick shall comply with ASTM C 1634

III. Finish
   A. Exposed common CMU shall be painted.

04 40 00 Stone Assemblies
 I. Stone shall be used as a veneer only, see Unit Masonry for cavity wall and masonry backup wall information as well as all information on general masonry construction.
 II. All anchors, mortars, grouts, sealants, flashings, weeps and vents, and other accessories shall be approved by the manufacturers and the stone suppliers as appropriate to the specified materials, details, and proposed conditions.
   A. All stone anchors, shelf angles, fasteners, and other support members for stone veneers shall be stainless steel.

III. Products:
   A. Granite:
      1. Shall comply as a minimum with ASTM C 615
      2. Comply with recommendations in NBGQA's "Specifications for Architectural Granite."
   B. Limestone:
      1. Shall comply as a minimum with ASTM C 568
      2. Comply with recommendations in ILI's "Indiana Limestone Handbook."
   C. Quartz-based stone:
      1. Shall comply as a minimum with ASTM C 616
   D. Slate:
      1. Comply with ASTM C 629, Classification I Exterior
   E. Travertine:
      1. Comply with ASTM C 1527, Classification I Exterior
   F. Other Stone:
      1. Provide as a minimum with the followings:
         a. Maximum Absorption per ASTM C 97: 3 percent.
         b. Minimum Compressive Strength per ASTM C 170: 7500 psi.

04 72 00 Cast Stone Masonry
 I. Cast Stone shall be defined as highly refined architectural concrete product.
   A. Standards:
      2. ASTM C 1364
   B. Casting Method: Vibrant Dry Tamp.
   C. Compressive Strength, ASTM C 1194: 6,500 psi minimum at 28 days.
   D. Absorption, ASTM C 642 or C 1195: 6 percent maximum at 28 days
   E. Surface Texture: Fine grained texture, similar to natural stone.
      1. No bugholes, air voids, or other surface blemishes

II. Cleaner: general-purpose cleaner expressly approved for intended use by Cast Stone manufacturer and expressly approved by cleaner manufacturer for use on Cast Stone and adjacent masonry materials for removing mortar and grout stains, efflorescence, and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces.

III. Water Repellant
   A. Apply water repellant for weatherproofing Cast Stone approved by and in accordance with manufacturer’s written instructions after pointing, patching, cleaning, and inspection are completed.

04 90 00 Masonry Restoration and Cleaning
I. General
   A. Before undertaking repair, restoration or cleaning of masonry, the Design Contractor shall investigate the specific materials and techniques used in the original construction. Proposed processes, replacement materials and techniques shall be compatible with existing materials. Historically significant structures, including properties listed on the National Register of Historic Buildings, shall comply with the Secretary of the Interior's Standards for Rehabilitation, as applicable to masonry cleaning and restoration.
   B. Identify and correct underlying problems such as structural issues and water intrusion into the wall at roofs and junctures with other systems before proceeding with repairs to masonry.
   C. Firms performing masonry cleaning and restoration work shall have a minimum of 5 years of documented experience in masonry cleaning and restoration.

II. Masonry Cleaning
   A. Tests of proposed cleaning methods and materials shall be conducted on limited areas of the materials to be cleaned and observed for both immediate and long term effects before proceeding.
   B. Cleaning of masonry shall be by the gentlest method possible. All cleaning materials shall be thoroughly rinsed off of masonry at completion of washing. Water or liquid chemical solutions shall not be used when there is a possibility of freezing temperatures.
      1. Natural bristle brushes and low pressure water.
      2. Diluted detergents may be used, subject to testing.
      3. Proprietary masonry cleaners may be used, subject to testing.
         a. Use only cleaners expressly approved in writing by cleaner, unit masonry and mortar manufactures.
      4. Steam Cleaning
         a. Apply at low pressures not exceeding 80 psi.
         b. Remove softened dirt with wood scrapers, brushes, or cold water wash.
      5. Dry ice blasting may be used, subject to testing
      6. Sandblasting and high-pressure power-washing (greater than 150-200 psi) of masonry are prohibited.

III. Masonry Restoration/Repair
   A. Modern mortars are stronger and harder than older mortars. The use of modern mortars to re-point walls incorporating older, softer mortar can damage masonry. The properties of the existing mortar must be ascertained by the Design Contractor and new mortar matching the existing for color, texture, hardness, strength and composition specified.
Division 05- Metals

05 12 00 Structural Steel Framing
I. Materials
   A. Rolled wide flange sections shall conform to ASTM A992 Grade 50.
   B. All other rolled sections shall conform to ASTM A36.
   C. Rectangular hollow sections shall conform to ASTM A500 Grade B Fy – 46ksi.
   D. Hollow pipe sections shall conform to ASTM A53 Type E.
   E. Welding rods shall be E70XX.
   F. Steel joists shall be designed in accordance with the Steel Joist Institute for Series K, LH, DLH, G joists and girders.
II. Accessories
   A. Bolts shall be minimum ¾” diameter ASTM A325. All bolted connections shall be full depth of the section web.
III. Finishes
   A. All steel that will be exposed to the environmental elements shall be hot dipped galvanized with a minimum of 4 mil thickness in accordance with ASTM A153 prior to painting.
   B. All interior steel shall have a shop coat of rust inhibitive paint
      1. Coordinate the selection of structural steel primers with the types of fireproofing proposed. Some fireproofing designs prohibit primed steel, or require additional steps be taken to ensure adhesion of the fireproofing

05 31 00 Steel Decking
I. Materials
   A. Roof deck shall be minimum 1 ½” deep, 18 gage (.0474 inches), metal deck that complies with the design properties of Type B metal deck as manufactured by United Steel Deck.
   B. Steel composite floor deck shall be a minimum 18 gage (.0474 inches), composite metal deck that complies with the design properties of Lok-Floor deck as manufactured by United Steel Deck.
II. Finishes
   A. Steel roof deck shall be hot dipped galvanized with a G90 coating in accordance to ASTM A653.
   B. Steel composite floor deck and cold formed steel trusses shall be hot dipped galvanized with a G60 coating in accordance to ASTM A653.

05 40 00 Cold-Formed Metal Framing
I. General
   A. Cold-formed metal framing includes non-load-bearing interior and exterior metal wall studs, curtain wall or veneer support, and roof trusses.
II. Materials
   A. C-Stud section only conforming to AISI standards with a minimum 1 5/8” flange and 4” web and minimum 16 gage (.0625 inches) steel thickness.
III. Structural design
   A. Design of cold-formed metal framing must take into account all axial and lateral loading imposed on the system, and details must accommodate movement in the primary structural system, avoiding unintended load transfer to non-loadbearing studs. Lateral deflection must be within limits appropriate for the proposed cladding materials.
      1. See 01 81 10 Structural Performance Requirements for additional information.
   B. Design steel in accordance with AISI NASPEC
   C. Submit signed and sealed shop drawings and calculations for record.
IV. Finish
   A. All cold-formed metal framing shall be galvanized to inhibit corrosion. A minimum G60 coating is required;
B. As per BIA provide G90 for masonry veneer/steel stud backup applications.

V. Installation
   A. Installation to be in strict accordance with shop drawings and manufacturer's recommendations. 
      Brace all walls during erection as per manufacturer's recommendations.
   B. All welds are to be by a certified welder.

05 50 00 Metal Fabrications
I. General
   A. All exterior metal fabrications shall be hot dip galvanized and prime painted, after fabrication, 
      ready for field finishing. Holes and other modifications shall be completed prior to hot-dip 
      galvanizing.

05 52 00 Metal Railings
I. Materials
   A. All metal pipe railings and components shall be fully welded steel or stainless steel
II. Finish (other than stainless steel)
   A. All steel railing components and hardware exposed to the weather or in moisture prone locations 
      shall be hot-dip galvanized to 5 mil: per ASTM A123. Prime and paint galvanized components.
   B. Steel railing components and hardware at other locations shall be primed and painted.
III. Installation
   A. Railing and components shall be installed as per details and as per manufacturer's written 
      instructions and specifications.
   B. Railing supports or posts shall be set using non-shrink, non-metallic grout that is premixed, 
      factory-packaged, non-staining, non-corrosive, and non-gaseous. Special care shall be taken to 
      avoid the use of setting materials which will deteriorate or fail in the presence of moisture, or 
      which are incompatible with the railing or surrounding materials.
   C. When railings are proposed at the roof, the designer shall explore methods of mounting the 
      railings that do not require penetration of roof membranes, copings and other roof components.

05 53 00 Metal Gratings
I. Reserved
Division 06- Woods and Plastics

06 10 00 Rough Carpentry
I. Materials
   A. All wood in contact with masonry or concrete, exposed to the weather, or within 8” of grade shall be preservative pressure treated or a naturally rot resistant species of wood.
   B. Lumber for misc. uses: Unless otherwise indicated, use standard grade lumber for support of other work, including bucks, nailers, blocking, furring, grounds, fire blocking, stripping and similar members.
      1. Fire-resistant wood grounds, furring, blocking, nailers, etc to be used in non-combustible construction.
   C. All plywood shall be exterior rated or marine grade.
II. Accessories
   A. Fasteners and anchors:
      1. All connectors, nails, lag bolts, thru-bolts being used in contact with Alkaline Copper Quaternary (ACQ) treated lumber, at the exterior, or in high humidity are to be hot-dipped zinc galvanized, triple zinc-coated (electroplated) or stainless steel.
III. Installation
   A. Provide fire blocking and draft stopping at all concealed joist, rafter, stud, and similar cavities in combustible framing as required by Code.
IV. Accessory/equipment support
   A. Where accessories, fixtures, equipment, or any other components are to be installed and supported at stud walls, provide continuous 5/8” exterior rated plywood backup behind gypsum board and/or tile backer board or as required by manufacturer of component to be installed.

06 13 23 Heavy Timber Construction
I. Materials
   A. Structural timber shall have the following properties as minimums, Fb = 850psi, Fv = 75psi, E = 1300ksi.
   B. Glued laminated members shall conform to AITC 117-84 and shall have the following properties as minimums, Fb = 2200psi, Fv = 165 psi, E = 1500 ksi.
   C. Parallam beams shall have the following properties as minimums, Fb = 2900psi, Fv = 290 psi, E = 2000ksi.
II. Installation
   A. Installation to be in strict accordance with manufacturer’s recommendations.

06 40 23 Interior Architectural Woodwork
I. General
   A. Fabricate and install all millwork in accordance with Premium Grade quality as specified in AWI Quality Standards Illustrated (QSI), current edition.
II. Execution
   A. Examination
      1. Verify all on-site dimensions.
      2. Verify adequacy of backing and support framing.
      3. Verify mechanical, electrical, and building items affecting work of this section are in place and ready to receive this work.
   B. Installation
      1. Install additional support as per section 06 10 00 ROUGH CARPENTRY.
      2. Set and secure materials and components in place, plumb and level.
      3. Countertops are to be scribed to fit to ensure no gaps remain.
   C. Adjusting and Cleaning
1. Adjust moving or operating parts to function smoothly and correctly
2. Clean cabinets and leave in perfect working order with all doors, shelves and drawers aligned and plumb

III. Ticket Window Millwork
A. General:
   1. Provide built-in cabinets, counters, and accommodate the equipment of the ticket agents as indicated in the Station Program and Planning: Standards and Guidelines, as specified herein and as needed for a complete and proper installation.

2. Cabinets
   a. Core
      i. Plywood
      ii. Moisture resistant MDF made from wood, straw, or other rapidly renewable fibers acceptable to veneer or laminate manufacturer
   b. Veneer
      i. Wood veneer
      ii. Plastic Laminate
   c. Edge banding to be hardwood, minimum of ¼” thick

3. Countertops:
   a. Solid Surfacing:
      i. A durable solid surface material is the preferred countertop material.
      ii. Solid surface materials shall have an edge depth of not less than 1-1/4”
      iii. All solid surface seams shall be located at inconspicuous locations and shall be fully adhered or welded as per manufacturer instructions.
   b. Stainless Steel:
      i. Countertops shall be fabricated of 16 gauge type 304 stainless steel and shall be installed over solid substrate for additional strength and sound deadening.
      ii. Counter edges shall be rolled or marine edge continuous with the surface.
      iii. When a backsplash is included in the design, the backsplash shall be integral with the counter surface
      iv. Stainless Steel surfaces shall NOT be polished, but shall have a satin or other pattered finish
      v. All seams and corners shall be welded, ground, and polished.
   c. Plastic laminate:
      i. Plastic laminate shall not be used for countertops.
   d. Wood:
      i. Wood shall only be used where required to meet SHPO requirements or where intended to match existing construction.
      ii. Where it is determined that a wood counter shall be used, the wood species and finish shall be a durable hardwood suitable for use as a countertop.

4. Ticket Window Opening
   a. For security the window should be allowed to be open during the day while being closed and locked at night or during special circumstances.
   b. A sliding glass panel system shall be utilized. The glass should be min. 1/4” single pane temp glass. Sliding hardware shall be commercial grade utilizing sealed ball bearings for smooth operation.
   c. Where historic requirements or other site constraints preclude the use of sliding glass windows, a roll down grill may be utilized to secure the area.
   d. In some locations, a bullet proof transaction window and enclosure may be required. The Amtrak Project Manager will coordinate enclosure protection requirements with Amtrak Police and provide to the Design Contractor.
      i. Bullet proof glazing shall be minimum class 3 as per UL std. 752
5. Baggage Door  
ad. Where baggage checking is available at the station, provide a baggage door as per the standards details, notes listed below, and Division 8 of this document.  
i. Opening shall be 36” clear in width and height minimum  
ii. Metal door w/ 2" hollow metal frame; door to swing in towards agent.  
iii. Hardware to include magnetic hold open and lock function on agent side of counter.

6. Data and Electrical Outlets  
a. Provide data and electrical outlets for each ticket station. Verify requirements with Amtrak Information Technologies. See Station Program and Planning: Standards and Guidelines for general locations.

7. Equipment  
a. Computers, printers, monitors and cable connections will be supplied by Amtrak. See Station Program and Planning: Standards and Guidelines for general locations and space requirements.

b. Baggage Scale  
i. Where baggage checking is available at the station, provide a baggage scale as per section 11 20 00 COMMERCIAL EQUIPMENT

c. Security Panic Button  
i. Include a security/panic button as part of the ticket counter design to notify local authorities to dispatch police immediately to the location.  
(1) Coordinate with Amtrak Police and/or local law enforcement for feasibility and requirements
Division 07- Thermal and Moisture Protection

07 00 00 Thermal and Moisture Protection
I. General
   A. All buildings and structures for human and equipment occupation shall be impervious to water infiltration from ALL surfaces.
      1. Where existing buildings are to be renovated, and it is not feasible to provide a complete waterproofing system below grade, provisions shall be made to direct all infiltrating water to an interior drainage and discharge system.

07 10 00 Dampproofing and Waterproofing
I. General
   A. Provide exterior applied waterproofing at walls where there are any spaces or slabs at or below finished grade
   B. When recommended by a geotechnical or civil engineer, or where the water table is known or suspected to be near the level of the lowest floor, provide underslab waterproofing.
      1. Underslab waterproofing shall connect to, be compatible with, and form a continuous waterproof barrier with the waterproof system at the walls
   C. Where waterproofing or dampproofing systems are installed, provide a water drainage system at the exterior of the foundation (and below slabs where applicable) that prevents hydrostatic pressure as per section 33 46 13 Foundation Drainage
      1. Protect waterproofing or dampproofing systems with insulation as per section 07 21 00 Thermal Insulation
      2. Provide additional drainage as required by actual site conditions.
II. Dampproofing
   A. General
      1. Dampproofing shall only be allowed at locations below grade if there are no spaces or slabs at or below finished grade, and a geotechnical report certifies that there is minimal risk for ground water at the site.
   B. Materials
      1. Asphalt dampproofing shall be cut-back asphalt complying with ASTM D 4479, Type I. Acceptable alternative is asphalt emulsion complying with ASTM D 1227, Type III or IV may be used as an alternative provide it is accepted by the designers of record as such.
III. Waterproofing
   A. Materials
      1. For walls, Amtrak prefers a fluid applied waterproofing system that is compatible with the air barrier system.
         a. Other systems may be allowed if appropriate and if compatible with the air barrier system.
      2. All components of the waterproofing system shall be obtained from a single source
   B. Warranty
      1. Furnish manufacturer’s lifetime warranty.
   C. Installation
      1. Preparation and installation shall by a contractor that has experience with the specified product and is approved and certified by the manufacturer.
      2. All preparation, installation, and protection shall be in strict accordance with the manufacturer’s written instructions.
      3. Where applicable, adhere insulation and/or drainage panels to the membrane system as per the manufacturer’s written instructions.
   D. Inspections and Testing
      1. All waterproofing shall be tested before it is covered.
a. Where possible, waterproofing shall be flood tested.
b. Where flood testing is not practical, test as per manufacturer’s recommendations as per specific site constraints.

2. Waterproofing shall be inspected by the manufacturer before and after testing and prior to being covered.

07 21 00 Thermal Insulation

I. General
   A. Insulation values shall meet or exceed those required by Amtrak adopted codes
   B. Provide exterior continuous insulation at all exterior wall and roof surfaces to prevent thermal bridging.

II. Materials:
   A. Rigid Insulation
      1. Extruded Polystyrene
      2. Polyisocyanurate
   B. Foamed-in-place insulation
      1. General Cavity Insulation
         a. Water blown, two part, closed cell, soy based, polyurethane foam
      2. Small gaps around windows, doors, and other components where high pressure expansion may affect the operation of components
         a. Low Pressure One-Component Closed Cell Polyurethane Foam Insulation
   C. Glass-Fiber Blanket Insulation (Batt Insulation)
      1. Batt insulation shall only be used as thermal insulation in renovations where use of other insulation is not feasible or advisable.
      2. Facing: unfaced
      3. Thickness: Provide the maximum thickness of insulation within cavities without compressing the insulation

III. Accessories
   A. Vapor Retarders at interior face of stud construction.
      1. Polyethylene Vapor Retarders: ASTM D 4397, 6 mils thick, with maximum permeance rating of 0.13 perm.
      2. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
   B. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

IV. Installation
   A. Rigid Insulation
      1. Bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
      2. Seal joints between foam-plastic insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
   B. Foamed-in-place insulation
      1. Foamed-in-place insulation must be installed by certified installers who have successfully completed a manufacturer approved training program and have installed the product in at least 3 other locations.
      2. Fill all voids, crevices and building cavities at exterior envelope unless specifically noted otherwise
      3. Completely fill all voids, shim spaces, and other small gaps with low pressure expanding foam insulation.
4. Install and trim foam in strict accordance with manufacturer’s written instructions.

C. Batt Insulation
   1. Do not compact or compress insulation in cavities.
   2. Insulation to be cut neatly and installed around and behind outlet boxes.
   3. Insulation to be split and installed both behind and in front of electrical wires that intrude into stud wall cavity.
   4. Insure there are no gaps between framing and insulation.
   5. Completely fill all voids, shim spaces, and other small gaps with low pressure expanding foam insulation.
   6. Baffles to be installed at all eaves to insure adequate airflow.
   7. Install vapor barriers on the conditioned side of the insulation
   8. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
   9. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

07 24 00 Exterior Insulation and Finish Systems
I. EIFS systems should be avoided. When required, only the "hardcoat" systems defined as Class PM, Type A, polymer modified protective finish coating, externally reinforced as developed by the Exterior Insulation Manufacturers Association (EIMA) may be used. Such systems require mechanical fastening of extruded polystyrene insulation and reinforcing mesh, and rigid acrylic modified cement plaster finish.
   A. The EIFS system shall be completely drainable and shall be installed over a waterproof membrane.
   B. Pay special attention to locations of crack control joints and details of flashing and sealing at penetrations to insure a properly designed and watertight installation.

07 27 00 Air Barriers
I. General
   A. Install a continuous air barrier system at all new construction and major renovations.
      1. The air barrier system shall be a complete assembly consisting of all materials and components and installed as per ASTM E 2357
      2. Amtrak prefers fluid applied systems, but will allow other systems when appropriate.
      3. All components of the air barrier system shall be obtained from a single source
   B. The air barrier system shall be joined in an airtight and flexible manner to the air barrier of the adjacent systems to allow for the relative movement of systems. Specific considerations should be given to the connections between the following systems:
      1. Foundation and walls
      2. Walls and windows or doors
      3. Different wall systems
      4. Wall and roof
      5. Wall and roof over conditioned space
      6. Walls, floor, and roof across construction, control, and expansion joints
      7. Walls, floor, and roof to all penetrations
      8. Walls, floor, and roof to all flashings
   C. The substrate shall be prepared and the air barrier system installed in strict accordance with the manufacturer’s written instructions
   D. The air barrier system shall be installed by a contractor licensed by the Air Barrier Association of America (ABAA)
E. The air barrier system shall be tested as part of the envelope commissioning process before and after any siding or veneer is installed.

07 31 13 Asphalt Shingles
I. General
A. The use of asphalt shingles should be limited to projects that are existing and/or historic and where the new roof surfaces are intended to match the existing or replace the existing “in-kind”.
B. Asphalt shingle roofs should have slopes no less than a 4:12 pitch, or as required by the roofing manufacturer to obtain the warranty required by 01 83 19 Roofing Performance Requirements

II. Materials
A. The shingle roof shall be a glass-fiber-reinforced asphalt shingle roof system. This roof system shall be applicable to the location and climate chosen to be used. Glass-fiber-reinforced asphalt shingle roof systems shall comply with ASTM D 3462. The glass-fiber-reinforced asphalt shingle roof system shall be laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
B. All Shingle roof systems granules shall be algae resistant depending on their location to be installed. Color and blends of the glass-fiber-reinforced asphalt shingle roof system shall match the existing in-kind as best as possible and the style of the building. Glass-fiber-reinforced asphalt shingle roof system laminated and three-tab strips must comply with UL 2218, Class IV.

III. Underlayment
A. 30 lb asphalt saturated roofing felt or high performance synthetic underlay approved by the roofing manufacturer.
B. Ice & water shield at roof edges & penetrations

IV. Accessories
A. Ridge vents shall be manufactures rigid section high-density polypropylene or other UV-stabilized plastic ridge vent with nonwoven geotextile filter strips and external deflector baffles for use under ridge shingles.
B. Sealants for shingle roof system shall be JS-2: urethane self leveling paving sealant; traffic bearing, 2 part, movement capability plus/minus 25 percent. ASTM C920, Type M, Grade P, Class 25-minumum.

V. Installation
A. Install roofing and all components in strict accordance with manufacturer's instructions.
B. Provide metal flashings and drip edges as per section 07 62 00 Sheet Metal Flashing and Trim at all valleys, roof to wall connections, changes in slope, at all locations indicated or required by the roofing manufacturer and at all locations indicated in the NRCA Roofing and Waterproofing Manual and the SMACNA Architectural Sheet Metal Manual.

VI. Warranty
A. Warranty shall not be less than what is required by section 01 83 19 Roofing Performance Requirements

07 31 29 Wood Shingles and Shakes
I. General
A. The use of wood shingles and shakes should be limited to projects that are existing and/or historic and where the new roof surfaces are intended to match the existing or replace the existing “in-kind”.
B. Wood roofs should have slopes no less than a 4:12 pitch

II. Materials
A. Wood shingles and shakes shall be clear, premium grade, heart cedar

III. Underlayment
A. Drainage and Ventilation Underlayment
B. 30 lb asphalt saturated roofing felt or high performance synthetic underlayment.
C. Ice & water shield at roof edges & penetrations

IV. Accessories
   A. Nails: Standard round wire shingle type, hot dipped zinc coated steel or stainless steel of sufficient length to penetrate roof sheathing.

V. Installation
   A. Shingles to be spaced 1/4".
   B. Shakes to be spaced 1/2".
   C. Double first course with drip edge of 1 inch.
   D. Joints spaced minimum of 1-1/2" from adjacent course.

VI. Warranty
   A. Warranty shall not be less than what is required by section 01 83 19 Roofing Performance Requirements

07 37 00 Underlayment
I. Examination
   A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
   B. Examine sheathing to verify that joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances, substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through roofing.
   C. Proceed with installation only after unsatisfactory conditions have been corrected.

II. Self Adhering Sheet Underlayment (Ice and Water Shield)
   A. Material:
   B. Installation:
      1. Install self-adhering sheet underlayment, wrinkle free, on substrate. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations required by the roofing manufacturer and all locations indicated in the NRCA Roofing and Waterproofing Manual and the SMACNA Architectural Sheet Metal Manual. Lap in direction to shed water not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days

III. Felt
   A. Material:
      1. 30# asphalt-saturated organic felt that meets or exceeds the minimum physical property values listed in ASTM D 226, Type II, non-perforated.
   B. Installation:
      1. Single-Layer Felt Underlayment: Install single layer of roof felt underlayment on substrate perpendicular to slope in parallel courses. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt underlayment nails.
      2. Double-Layer Felt Underlayment: Install double layers of felt underlayment on substrate perpendicular to slope in parallel courses. Install a 19-inch wide starter course at eaves or base of wall and completely cover with full-width second course. Install succeeding courses lapping previous courses 19 inches in shingle fashion. Lap ends a minimum of 6 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt underlayment nails.
IV. Synthetic High Performance Underlayment  
A. May be used when the roofing manufacturer has approved the material and installation method in writing.  
B. Install in strict compliance with the underlayment and roofing manufacturer’s written instructions.  

V. Drainage and Ventilation Underlayment  
A. Material: non-woven plastic mesh ventilating underlayment  
B. Installation:  
1. Install horizontally over surface to receive siding or roofing in parallel courses, butting edges and ends to form a continuous layer, and fasten to substrate.  

VI. Slip Sheet  
A. Red rosin paper or other type of slip sheet that is approved in writing by the roofing or sheet metal manufacturer for the specific application. Install as per the NRCA Roofing and Waterproofing Manual and the SMACNA Architectural Sheet Metal Manual.  

07 41 13 Metal Roof Panels  
I. General  
A. Fabricate sheet metal roofing and accessories to comply with the design, details, dimensions, metal and all recommendations in the NRCA Roofing and Waterproofing Manual and SMACNA "Architectural Sheet Metal Manual"  

II. Materials  
A. Metal roof panels vary in configuration, including seam style and height, pan stiffening, metal type, and metal thickness. During the design phase, it is the responsibility of the Design Contractor to confirm that potential metal roof panels can be installed in accordance with the details developed using NRCA and SMACNA.  

III. Underlayment  
A. Slip sheet between metal and underlayment.  
B. Double layer 30 lb asphalt saturated roofing felt or synthetic high performance underlayment when approved by the metal roof manufacturer.  
C. Ice & water shield at roof edges, hips, valleys, & penetrations  

IV. Accessories  
A. All roof penetrations shall be protected with metal flashings to match the roofing material.  
B. All metal roof systems shall incorporate snow guards at all roof eaves.  
1. Snow guards shall be mounted in such a way that there is no penetration of the metal panels.  

V. Installation  
A. Installation shall be in strict accordance with the NRCA Roofing and Waterproofing Manual and SMACNA "Architectural Sheet Metal Manual"  
B. Touch-up: Only minor scratches and abrasions shall be allowed to be touched up. Any other damaged materials shall be replaced.  

VI. Warranty  
A. In addition to the warranty required by section 01 83 19 Roofing Performance Requirements, the metal roofing manufacturer shall provide a twenty (20) year guarantee on all metal finishes.  

07 46 00 Siding  
I. General  
A. Where feasible, all siding systems shall be designed as a rain screen with an air/drainage space behind the siding, vents at the top and weeps at the bottom  

II. Materials  
A. See the following sections for siding that is acceptable to Amtrak. Other systems require approval by the Amtrak Project Manager  

III. Accessories  
A. Flashing: flashing complying with Division 7 Section "Sheet Metal Flashing and Trim"
IV. Installation
   A. Comply with details and siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
   B. Prior to the installation of siding, examine the integrity of the air barrier and/or underlayment. Siding or veneer installed without Design Contractor’s site visit and approval will be rejected.

07 46 10 Metal Siding
I. General
   A. Metal siding system shall include all panels, attachment system components, miscellaneous metal framing, and all accessories necessary for a complete weather tight wall system.
      1. All siding system components and accessories, shall be obtained from a single source and single manufacturer

II. Materials
   A. Metal siding shall be concealed-fastener type with lapped-seams.

III. Underlayment
   A. Slip sheet, if metal is in direct contact with barrier.
   B. Continuous Rigid Insulation
   C. Air barrier

IV. Accessories
   A. The wall panel system shall include all accessories and components required for weather tight system with a finished appearance, including but not limited to trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. All exposed and semi-exposed components shall match material and finish of metal wall panels.
   B. Provide closure strips where necessary to ensure weather tight construction. Closure strips shall be closed-cell, expanded cellular, rubber or cross linked, polyolefin-foam or closed-cell laminated polyethylene; with minimum thickness, flexible closure strips; cut or pre-molded to match metal wall panel profile.

V. Installation
   A. Factory-formed metal siding systems shall be designed to be field assembled by lapping and interconnecting side edges of adjacent panels. The factory-formed metal panels shall be mechanically attached through panels to supports using concealed fasteners in side laps.
   B. Metal siding shall be coordinated with flashings and other adjoining construction installations in order to ensure proper sequencing and building water tightness.

VI. Warranty
   A. The standard form of a warranty for metal siding systems shall be one in which the manufacturer agrees to replace siding and other components of the system that fail in materials or workmanship within the warranty period. The period of the warranty is a minimum of 15 years. A warranty for metal siding systems shall include fading of the finish. The minimum requirement is that after a year of cleaning with products recommended by the siding manufacturer if more than 4 Hunter color-difference units occur, as measured according to ASTM D 2244, the system must be fully replaced.

07 46 23 Wood Siding
I. General
   A. The use of wood siding should be limited to projects that are existing and/or historic and where the new wall surfaces are intended to match the existing or replace the existing “in-kind”.

II. Materials
   A. Wood siding shall be clear, premium grade, heart cedar

III. Underlayment
   A. Drainage and Ventilation Underlayment
   B. Continuous Rigid Insulation
C. Air Barrier

IV. Accessories
   A. Nails: Standard round wire shingle type, hot dipped zinc coated steel, or stainless steel of sufficient length to penetrate sheathing and studs.

V. Installation
   A. Prime all sides of wood siding after final cutting.
   B. Double or triple shingles at foundation.
   C. Shingles to be spaced 1/8" - 1/4" apart.
   D. Joints to be minimum 1-1/2" from joints of adjacent course.
   E. Exposure to match existing
   F. Corner treatment to match existing

07 46 33 Plastic Siding
   I. Vinyl Siding Wall, Trim, and Soffit Systems:
      A. Vinyl products are not acceptable.

07 46 46 Mineral-Fiber Cement Siding
   I. Materials
      A. Fiber Cement siding, panels shall be Type A, Grade II as per ASTM C 1186
         1. The fiber cement shall be non combustible as per ASTM E 136 and have a flame-spread index of 25 or less when tested according to ASTM E 84
         2. Fiber cement siding shall be installed as part of a ventilated and drainable rain screen system over a waterproof barrier.
   II. Accessories
      A. Use accessories as provided by or as recommended by the manufacturer for the specific installation.
         1. Where feasible, fasteners and accessories shall be stainless steel and concealed.
      B. Install metal flashing as per section 07 62 00 Sheet Metal Flashing and Trim.
   III. Finish:
      A. All fiber cement shall be factory primed by the manufacturer
      B. In addition to factory priming, where feasible all fiber cement shall be factory finished otherwise final finish shall be as per section 09 91 00 Painting.
   IV. Installation:
      A. Installation shall be as per the manufacturer’s written instructions
      B. All cut surfaces shall be straight and smooth and shall be finished with the manufacturer provided primer and finish touch up paint.
   V. Warranty:
      A. The Standard form of a warranty for fiber wall systems shall be in which the manufacturer agrees to replace sidings and soffits that fail in materials or workmanship within the warranty period. The period of the warranty is a minimum of 50 years preferred.

07 50 00 Membrane Roofing
   I. Materials
      A. Membrane roofing shall be one of the following systems (not in order of preference):
         1. 07 52 00 Modified Bituminous Membrane Roofing
         2. 07 53 23 Ethylene-Propylene-Diene-Monomer (EPDM)Roofing
         3. 07 54 23 Thermoplastic Polyolefin (TPO) Roofing
         4. 07 55 63 Vegetated Protected Membrane Roofing
   II. Accessories
      A. Cover Board
1. Where approved by the membrane manufacturer and appropriate to the application, use a polyisocyanurate cover board to increase the overall roof insulation value and protect the underlying roof insulation.

B. Vegetated Protected Membrane Roofing
   1. Supply and install engineered soil mix
   2. Supply plants as recommended by the manufacturer for the geographic location and specific application
      a. Plantings shall be installed as densely spread cuttings or pre-grown trays

III. Installation
   A. Install roofing membrane and all flashings in strict accordance with the drawings and with the manufacturer’s instructions and details
   B. Substrate: Provide smooth substrate surface of material approved by membrane manufacturer.
      1. Preparation and installation shall be by a contractor that has experience with the specified product and is approved and certified by the manufacturer.
      2. All preparation, installation, and protection shall be in strict accordance with the manufacturer’s written instructions.
      3. Test membrane as per manufacturer’s recommendations.

IV. Warranty
   A. Warranty shall not be less than what is required by section 01 83 19 Roofing Performance Requirements

07 62 00 Sheet Metal Flashing and Trim
I. General
   A. Fabricate sheet metal flashing and trim to comply with the details and with recommendations in SMACNA’s “Architectural Sheet Metal Manual” that apply to design, dimensions, metal, and other characteristics.

II. Materials
   A. All metal flashings, copings, fascias, termite shields or other metal moisture protection systems shall be fabricated from one of the following sheet metals.
      1. Min. 20 oz. copper
      2. Min. 24 ga. stainless steel
      3. Alloy coated copper or stainless steel of the same thickness indicated above
   B. Lead or lead alloy sheet metal or coatings will not be accepted.

III. Accessories
   A. All accessories including nails, clips, cleats, etc. shall be of the same or a compatible metal with the sheet metal.

IV. Fabrication and Installation:
   A. General
      1. Fabricate and install in strict accordance with the details of the latest addition of the Architectural Sheet Metal Manual by SMACNA
      2. Fabricate continuous flashings in sections not less than 96”.
      3. Flashing details shall not rely on sealant for water-tightness. Sealants shall only be a secondary means of preventing water infiltration and should only be used where required for movement control joints (slip joints)
         a. Joints in metal flashing shall be joined with 1 inch lock seams and soldered, except at slip joints.
      4. Metal flashings and trims shall only be secured with concealed fasteners.
      5. Backpaint sheet metals with bituminous paint, where expected to be in contact with cementitious materials or dissimilar metals.
   B. Wall Flashing
1. Provide preformed end dams at edges of all sills and at all locations where flashing is interrupted by openings or a change in construction.

C. Through-wall flashing
   1. Through-wall/counter flashing shall be two-piece type with receiver and removable counterflashing of the same material to allow for re-roofing.
   2. Through-wall embedded metal flashing shall be fabricated with ribs at 3-inch intervals along the length of flashing. This is to provide an integral mortar bond with the masonry and the flashing material. Through-wall flashing shall be fabricated with drip edges and sealant stops.

D. Roof Flashing
   1. Flashings at roof penetrations, curbs, and transitions should extend up a minimum of 8" above the surface of the roof.
   2. Valley flashings are to have 1" raised center rib, continuous intermediate “S” bend to receive hemmed edge of roof panels and continuous hemmed edge to receive fastening cleats, similar to NRCA Manual Figure 4.13C. All valleys should have “ice and water shield” membrane installed, covered with rosin paper, before installation of the metal valley flashing. Metal panels are to be hemmed onto valley flashing and shall not utilize exposed fasteners.
   3. Metal crickets are to be used on the upslope side of all chimneys and curbs.

E. Gutters and downspouts
   1. Gutters and downspouts for shingle roofs shall have shapes and sizes that match the style of the building. The preferred shape of the gutters shall be "K". If the building is historic, then match the existing in kind. All corners are to be mitered and soldered.
   2. The following features are to be provided and fabricated from the same metal as the gutters and downspouts.
      a. Downspout starters (fascia sump) with downspout starter hole.
      b. Flow-through gravel stop with perforated vertical leg.

07 92 00 Joint Sealants
I. General
   A. Provide sealants meeting applicable specifications where shown on the drawings and elsewhere as required to provide a positive barrier against moisture and passage of air.
   B. The sealant systems selected shall be commercial or heavy duty grade, be durable, easy to maintain and be able to withstand deicing chemicals. Use the manufacturer’s recommendation when applicable and verify that a warranty will be provided at the end. The colors shall match the aesthetics of the building.

II. Materials:
   A. Sealants shall be high quality, non hardening, non sagging compatible with intended locations and adjacent materials
      1. Pay special attention to the use and misuse of the word “caulk”. Such materials are generally no longer used in modern construction and consist of oil-based materials used to glaze windows. “Caulk” is not used as a sealant in exterior joints.
      2. The use of 2-part polysulfide, 2-part polyurethane or silicone-synthetic rubber type sealants is preferred. The Design Contractor shall determine with sealant manufacturer which particular sealant type is best applicable to each individual design.
         a. Specify pourable urethane base sealants for construction joints in traffic bearing locations such as concrete walks, steps and similar locations.
   B. Back-up materials and primers: Shall be as required and recommended by the manufacturers of the sealant

III. Installation:
   A. All sealing operations shall be performed by workmen thoroughly experienced in this type of work.
   B. Prepare surfaces and install joint sealants in accordance with manufacturer’s recommendations.
1. Surfaces shall be clean and free of all dust, oils, and any other material which may reduce the bond between the sealant and the substrate.

C. Before application of sealant, all surfaces adjacent to the area shall be masked with tape so as to obtain a neat sealant line and to allow pressure tooling of the material. Grade gun sealant shall be applied with pressure equipment and tooled so as to solidly fill the groove and be flush contoured. Special care shall be exercised when sealing in the vicinity of porous surfaces.

D. Masking tape shall be removed immediately after application and finishing the joint of sealant. All adjacent surfaces shall be thoroughly cleaned of any surplus sealant material immediately and left in a neat condition.

IV. Warranty
   A. The sealant shall be warranted for a minimum of 10 years. The sealant manufacturer should have and provide a full labor and materials total system guarantee.
Division 08- Doors and Windows

08 10 00 Doors and Frames
I. General
   A. Doors and all related components and clearances must be ADA compliant, durable, easy to
   maintain, and be able to withstand deicing chemicals.
   B. All doors and frames shall be commercial or heavy duty grade.
II. Exterior doors
   A. Exterior doors shall be one of the following:
      1. Metal and glass curtain wall or storefront entry systems
         a. All metal and glass doors shall be wide stile doors including ADA compliant bottom rails
      2. Hollow metal
         a. Exterior doors shall be not less than 16 gauge steel.
         b. The top channel of each metal door shall be solid without pockets which collect dirt and
            water.
         c. All exterior doors shall be galvanized, primed and painted.
   B. Exterior wood doors shall not be used unless historic requirements govern and require their
      usage
III. Interior Doors
   A. Interior doors shall be one of the following
      1. Metal and glass curtain wall or storefront entry systems
      a. All metal and glass doors shall be wide stile doors including ADA compliant bottom rails
      2. Hollow Metal
         a. Interior doors shall be not less than 18 gauge steel.
      3. Wood
         a. Wood doors shall be solid core, either mineral core where a fire rating is required, high
density particle board core, or wood stave core.
         b. Wood doors which are to receive clear or stained finish shall be factory finished and pre-
machined for hardware. Specify that the door edges are fabricated of matching wood to
the face.
IV. Frames
   A. Metal curtain wall or storefront entry framing
      1. Door frames in metal and glass curtain wall or storefront entry systems shall be an integral
parts of the main framing system and shall not be secondary members or subframes installed
within the main framing members.
   B. Hollow Metal Frames
      1. Hollow metal door frames shall be 16 gauge.
      2. Knock-down frames are prohibited unless specifically approved by the Amtrak Project
Manager
      3. Exterior hollow metal frames shall be galvanized, primed and painted.
   C. Wood frames shall not be used unless historic requirements govern and require their usage

08 31 13 Access Doors and Frames
I. General
   A. Access doors and frames at toilet rooms, janitor’s closets, mechanical rooms and all
unconditioned spaces shall be stainless steel.
   B. Provide lockable access doors when required by the project.
   C. Where required by code, provide fire-rated access doors and frames

08 50 00 Windows
I. General
A. All windows and related accessories shall be commercial grade

II. Exterior Windows
A. Exterior windows shall be one of the following:
   1. Metal and glass curtain wall or storefront systems
   2. Individual metal framed windows
B. Wood Windows
   1. Wood windows shall not be used unless historic requirements govern and require their usage.
      a. Specify compliance with AWI and WDMA “Premium Grade” quality standards for the fabrication, reproduction, repair and installation of wood windows.
      b. For wood repair, specify structural adhesive putty (no Bondo)
C. Plastic or fiberglass framed windows will not be accepted.

III. Interior Windows
A. Interior windows shall be one of the following:
   1. Fixed glass in hollow metal frames
   2. Sliding glass windows as described in the ticket window section of 06 40 23 Interior Architectural Woodwork

08 62 00 Unit Skylights
I. General
A. Skylights should only be considered where required to provide daylight to interior spaces that can not be provided with wall windows or where required for passive solar heating.
B. Before specifying a skylight, the Design Contractor shall consider the following
   1. How to reduce heat gain from direct sunlight during cooling periods
   2. How to reduce visual glare from direct sunlight
   3. How to reduce heat loss during heating periods

II. Materials
A. Skylights shall be commercial grade metal framed units with all framing, glass, flashings, and all other accessories supplied by a single source.

III. Installation
A. Install all skylights and roof windows in strict accordance with skylight and roofing manufacturer’s written instructions.

IV. Warranty
A. The manufacturer shall warranty all materials and workmanship for at least 5 years from the date of final completion.

08 71 00 Door Hardware
I. General
A. Door hardware shall be commercial or heavy duty grade and must be durable, easy to maintain, and be able to withstand deicing chemicals.
B. Hardware selected from manufactures shall be selected as a complete system and not as a part unless approved by the manufacturer.
C. At existing buildings, the hardware selected should match what is currently in use at that location, unless the existing hardware is not code compliant.
D. All hardware for doors in curtainwall, storefront and entry systems, with the exception of cylinders, shall be provided and installed by the system manufacturer.

II. Hardware
A. Hinges
   1. Provide minimum 3 per door
B. Door Handles and Locks and latch sets
1. Provide Lever Handle lock and latch sets as indicated below
   a. Exterior Doors: Entrance function
   b. Office Doors: Office Function
   c. Closet Doors: Passage Function
   d. Single Occupant Toiletsroom Doors: Privacy Function
   e. Baggage, Mechanical, and Storage rooms: Storage room function
   f. Other Doors: verify with Amtrak
2. Provide Push/Pull hardware with no latch at all multiple occupant toiletsroom doors.

C. Deadbolts
   1. Deadbolts shall not be permitted at any doors that are a means of egress from any passenger occupied spaces.
   2. Use of deadbolts and their locations should be determined on a case-by-case basis

D. Cylinders and Keys
   1. Verify all keying requirements with the station master who is required to operate the station
      a. A master key set shall be provided to the station master

E. Closures
   1. Provide closures at the following locations
      a. Toilet room doors
      b. Exterior doors and doors between conditioned and unconditioned spaces.
      c. Interior vestibule doors
      d. Any doors required by code to have a closure

F. Floor or Wall Stops at all doors

G. Weather Seals
   1. Provide compressible neoprene or rubber weather seals at all exterior doors and at all doors between conditioned and unconditioned spaces.
   2. Seals shall be continuous at full perimeter of doors

H. Thresholds
   1. Provide thermally broken aluminum thresholds at all exterior doors and at doors between conditioned and unconditioned spaces.
   2. Set threshold in full bed of sealant

I. Provide other hardware as required for fully functioning, weather tight, and code compliant doors

III. Finish
   A. Except when there are historic considerations, or there is intent to match existing hardware, all hardware shall be satin stainless steel or the nearest equivalent available from the hardware manufacturer.

08 71 13 Automatic Door Operators
   I. Automatic door operators shall only be installed at existing and historic locations where it is not possible to achieve ADA requirements with manually operated hardware.

08 81 00 Glass Glazing
   I. Reglazing of existing windows or doors
      A. The glazing selected should match what is currently in use.
   II. Exterior Glass
      A. Unless otherwise required for passive solar heating, all exterior wall glazing shall be minimum 1” double pane argon filled insulated glass with low-E coating
         1. Provide tempered safety glass as required by code.
            a. Where tempered safety glass is required in a curtainwall, storefront, or entry system, all glass units in that wall shall be tempered safety glass.
         2. Provide laminated safety glass at skylights
   III. Interior Glass
A. Preglazed Windows or millwork: Provide standard clear float glass as provided by the manufacturer.
B. Where manufacturer does not provide glass, provide 6mm clear float glass.
C. Provide Tempered safety glass where indicated, or as required by code.

IV. Requirements for other types of glass will be determined on a case-by-case basis,

08 91 00 Louvers
I. Where louvers are required in exterior walls, they shall be storm resistant type and rated to resist water infiltration for the location where they are to be installed.
**Division 09- Finishes**

09 21 16 Gypsum Board Assemblies

I. General
   A. All materials, accessories, preparation, installation methods, finishes and repairs shall be in strict accordance with the requirements and recommendations of the Gypsum Association and all of its applicable publications and *The Gypsum Construction Handbook* published by USG

II. Materials
   A. Gypsum Board
      1. All Interior gypsum board shall be paperless moisture- and mold-resistant glass-mat gypsum wallboard products with moisture-resistant surfaces complying with ASTM C 1396/C 1396M as well as ASTM C 630 and ASTM C 1177.
         a. At fire rated walls, use fire rated gypsum board complying with ASTM E 119 as required by code
      2. Toilet rooms, Janitor's closets, and other rooms receiving solid surface or tile finish
         a. Use glass mat water resistant backing board with water resistant coating complying with ASTM C1178/C1178M
      3. All exterior gypsum board shall comply with ASTM C1177/C1177M

III. Accessories
   A. All interior and exterior concealed trim and accessories shall be rolled zinc or plastic complying with ASTM C1047
   B. Joint Materials
      1. General interior
         a. Joint tape shall be a fiberglass mesh tape
         b. Prefilling, embedding and the first coat shall be a setting type joint compound
         c. Additional layers may be with a standard joint compound.
      2. Tile Backer Board
         a. Joint tape shall be a fiberglass mesh tape
         b. Joint compound shall be a setting type
      3. Exterior Gypsum board
         a. Finish as recommended by the gypsum board manufacturer for the particular application.
   C. Sound attenuation blankets
      1. Recycled cotton fiber insulation complying with ASTM E90-02, ASTM423
      2. Glass fiber acoustic batts complying with ASTM C 665, Type I

IV. Installation:
   A. Installation shall be in strict accordance with the referenced material and with the written instructions of the manufacturers.

V. Finish Level
   A. Finish panels as required by gypsum panel manufacturer for the particular application, but not less than to levels indicated below and according to ASTM C 840:
      1. Level 1
         a. Ceiling plenum areas, and fully concealed locations
      2. Level 2
         a. Areas that are substrate for tile or solid surfaces and semi-concealed locations
      3. Level 5
         a. All other locations fully exposed to view and to be painted.

09 24 23 Portland Cement Plaster (Stucco)

I. General
   A. All materials, accessories, preparation, installation methods, finishes and repairs shall be in strict accordance with the requirements and recommendations of the *Portland Cement Plaster/Stucco Manual* published by the Portland Cement Association
II. Materials  
      1. All ingredients including water shall be portioned in exact quantities and prepared consistently to maintain a consistent product at all locations throughout the project.

III. Accessories  
   B. Screeds, joints, and other accessories as required: Zinc and Zinc-Coated (Galvanized)

IV. Mockups:  
   A. Before plastering, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.  
      1. Mockup shall include a vertical and horizontal joint, an inside and outside corner, top and bottom conditions, and connections to other materials.

V. Installation  
   A. Prepare all materials and substrate and install in strict accordance with the written instructions of the referenced manual and the manufacturer.  
      1. Stucco shall be detailed and installed to allow the drainage and weeping of moisture from behind the stucco.

09 30 00 Tiling  
I. General  
   A. Comply with all the requirements and recommendations of the TCNA, Tile Council of North America, Inc. and the most current version of the TCNA handbook for the product specified and the particular application.

II. Materials  
   A. Porcelain Tile  
      1. Maximum reasonable size for particular application
   B. Ceramic Tile  
      1. Floor tile  
         a. Unglazed ceramic tile in maximum reasonable size for particular application
      2. Wall tile  
         a. Glazed ceramic tile in maximum reasonable size for particular application
   C. Trim Units  
      1. Provide cove bases, wainscot caps, corner units, and other trim as required.  
         a. Where pre-formed pieces are not available, specify a silicone sealant at inside corners (not grout).
      2. Thresholds  
         a. Install ADA compliant threshold compatible with the selected floor finish that will prevent water migration.
   D. Substrate:  
      1. Floors  
         a. Concrete structure
         b. Portland Cement mud bed
         c. 1/2" cementitous tile backer board
      2. Walls  
         a. Masonry Wall
         b. Portland Cement Mud bed
         c. Glass-Mat Faced Gypsum Backing Boards
   E. Waterproof membrane
1. Provide waterproof membrane compatible with TCNA installation at floors and walls of all toilet rooms

F. Setting Materials
1. As per TCNA recommendations for the particular substrate and application.

G. Grout
1. All grout shall be epoxy and installed as per manufacturer’s written instructions

III. Installation:
A. Install all products in strict accordance with the latest TCNA guidelines and with manufacturer’s written instructions
B. Large scale tiles can not be installed on an uneven or warped surface. A floor installation of large scale tiles may require a mud bed installation.
C. Layout Tile to minimize cutting, align and provide uniform joint widths.
D. Fit tile tight to all edges, abutting trim, built-in items, and to penetrations. Terminate work neatly at all edges
E. Layout tile wainscots to next full tile beyond dimension indicated, unless this would restrict another critical alignment.
F. Provide waterproof membrane at floors and walls of all toilet rooms

IV. Cleaning and Protection
A. Clean all surfaces and protect in accordance with tile and grout manufacturer’s written instructions.

09 51 00 Acoustical Ceilings
I. Materials
A. Tiles
1. Avoid using patterned and multiple tegular beveled panels which tend to cost more to replace when damaged, due to additional labor associated with their edge/joint detail and finish.
2. Specify moisture resistant tiles where tiles are to be installed at toilet rooms, janitor’s closets, unconditioned spaces, or any other locations subject to high humidity.

II. Installation
B. Ceiling grids shall be symmetrical on each space and/or room, unless specifically noted otherwise.

09 64 00 Wood Flooring
I. The use of wood flooring should be avoided unless the station is existing and/or historic and where the new wood floors are intended to match the existing or replace the existing “in-kind”.

09 65 13 Resilient Base and Accessories
I. Materials
A. Rubber base is preferred over vinyl base, where appropriate.

II. Accessories
A. When available, specify prefabricated inside and outside corners

09 65 19 Resilient Tile Flooring
I. Materials
A. Resilient Tile
1. Resilient floor tile shall be commercial or heavy duty grade
2. Where alternatives are available, vinyl flooring should be avoided.
   
   B. Adhesive
   1. Use only adhesives that are approved for the particular product and application by the resilient tile manufacturer.

II. Accessories
   A. Provide transition/reducing strips tapered to meet abutting materials.

III. Installation
   A. Perform any testing on substrate as recommended by the tile manufacturer.
   B. Prepare substrate and install tile in strict accordance with manufacturer’s written instructions.
   C. Layout tile to minimize cutting, align and provide uniform joint widths.
   D. Fit tile tight to all edges, abutting trim, built-in items, and to penetrations. Terminate work neatly at all edges.
   E. Install flooring and accessories with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.
   F. Clean and perform initial maintenance as recommended by the manufacturer.

09 66 00 Terrazzo Flooring

I. General
   A. Comply with all the requirements and recommendations of the NTMA, The National Terrazzo and Mosaic Association, Inc. for the product specified and the particular application.

II. Materials
   A. Terrazzo shall be a thin set epoxy resinous terrazzo.

III. Accessories
   A. Metal divider strips, control joints, elastomeric joint fillers, adhesives, and any other accessories shall be in accordance with NTMA standards.
   B. Sealer
      1. Penetrating type sealer that complies with NTMA’s “Terrazzo Specifications and Design Guide” for the terrazzo type indicated and as recommended by the terrazzo manufacturer for the specific application.
         a. Stain resistant at walls.
         b. Stain and slip resistant at floors and cove base.

IV. Installation
   A. Field verify actual dimensions of construction prior to installation of joints and precasting of units.
   B. Comply with NTMA’s and manufacturer’s details written instructions for preparation of surfaces, and terrazzo and accessory installation.
   C. Protect other work from dust, water, and noise generated by grinding operations. Control dust, water, and noise by erecting temporary enclosures or by other methods acceptable to the owner.
   D. When installing precast terrazzo tiles or other components, seal joints between precast units with an epoxy grout to match the terrazzo matrix.
   E. Clean, seal, and protect finished surfaces according to NTMA’s and manufacturer’s written recommendations.

09 67 23 Resinous Flooring

I. General
   A. Resinous flooring shall be seamless and slip resistant heavy duty epoxy troweled mortar floor system.

II. Materials
   A. Floor system shall be 3/16” to 1/4” in depth and shall extend to a continuous cove base at walls.

III. Accessories
A. Provide all accessories required for a complete and seamless floor system, including but not limited to all mix components, substrate repair materials, movement control joints, etc.

IV. Installation
A. Preparation, installation, curing and protection of system shall be in strict accordance with manufacturer’s written instructions.
B. Installation must be performed by a manufacturer certified contractor with skilled mechanics having not less than three (3) years satisfactory experience in the installation of the type of system as specified in this section, and must be certified in writing by the manufacturer of the system.

V. Warranty
A. The contractor and the manufacturer shall furnish a standard guarantee of the system for a period of two years after installation. The labor and material guarantee shall include loss of bond and wear-through to the substrate from normal use.

09 68 00 Carpeting
I. General
A. Carpet should be avoided
   1. Where carpet is installed, all materials and installation methods shall be in compliance with Carpet and Rug Institute standards including the Green Label and Green Label Plus programs

II. Materials
A. Carpets shall be modular or tile type that are easily replaceable and have a very dense loop-pile carpet with a low pile height for heavy-traffic areas
B. The carpet design shall have diversity of color variations to conceal soiling and all fibers shall be solution dyed
C. All carpeting, backing, transitions, and all other accessories shall be in strict conformance with the ADA

III. Accessories
A. Provide ADA compliant transitions where required

IV. Installation
A. All carpet shall be installed in accordance with the Carpet and Rug Institute (CRI-104) Standard for installation of Commercial Carpet, latest edition.
   1. Carpet installations shall be direct glue-down and shall not include any additional padding other than padding that may be an integral part of the carpet backing system.

09 91 00 Painting
I. Materials
A. Paints shall be commercial or heavy duty grade expected for long durability and reliability.
   1. All external systems in contact with any walking surface will require protection from salt corrosion.
B. Use only low-odor and low VOC products that meet or exceed code requirements
C. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
D. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

II. Accessories
A. Incorporate breaks, reveals, or other architectural details to divide large expanses of painted surface

III. Installation
A. Comply with manufacturer’s written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates  
B. Apply paints according to manufacturer’s written instructions.  
C. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.  
D. All exposed structure, ductwork, conduit, piping, and miscellaneous items shall be primed and painted unless otherwise noted.  
E. All surfaces visible through mechanical or architectural slots, louvers, grilles, diffusers, or similar components shall be painted (matte black).  
F. Apply minimum 1 coat primer and 2 finish coats  
   1. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.  
   2. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.  
   3. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, pin holes or other surface imperfections. Cut in sharp lines and color breaks.

09 96 00 High-Performance Coatings  
I. General  
A. Long-lasting exterior finishes are encouraged, and special coatings may be specified as part of a planned low-maintenance building project. Among the special coatings that can be used are anodized finishes, tnemic paints, and epoxy paints.  
   1. Shop-applied special finishes are preferred to site-applied, due to better control of conditions.  
   2. Exterior metals must be coated if not naturally weather-resistant such as copper and brass.  
      a. Steel should be galvanized prior to receiving finishes, unless the specifications for a special coating will not permit galvanizing.  
B. Regardless of finish used, manufacturers’ instructions for on-site application and touch-up of finishes are to be followed. As part of the submittal process, those instructions are to be provided to the Project Manager, with a copy for the Maintenance Paint Shop foreman.  
II. Traffic paint shall be state or federal DOT approved waterborne reflective traffic coating
**Division 10- Specialties**

10 14 00 Signage  
A. See the Amtrak Signage Manual for all signage information

10 17 00 Telephone Specialties  
I. Emergency call box  
A. Where supported by Amtrak Police or by local emergency response authorities, provide an emergency call box near the main platform access point.  
1. Equipment minimum requirement shall be 3R unless environmental conditions require 4X.

10 21 13 Toilet Compartments  
I. General  
A. Toilet compartments partitions and screens shall be heavy duty construction and wall & ceiling mounted.  
1. Materials  
   a. Stainless Steel  
      i. minimum 22 gauge, reinforcement to be 12 gauge minimum.  
   b. Solid Surface  
   c. Solid Color Reinforced Composite (SCRC)  
   d. Plastic Laminate partitions will not be accepted  
B. Head-rails should be standard tubular steel  
C. Wall brackets to be cast socket type  
D. Where required, pilaster shoes are to be stainless steel minimum 3 inches high.  
II. Finish  
A. Stainless steel shall be a satin finish.  
III. Accessories  
A. Attachments are to have tamper-proof, extra heavy duty extruded aluminum brackets with stainless steel screws and bolts.  
B. Hinges shall be gravity type pivot hinges, adjustable for door close positioning; door strike and keeper with rubber bumper.  
IV. Installation  
A. Partitions shall be mounted to the structure in strict compliance with the written instructions of the manufacturer.  
   1. Verify that the structure has the capacity to support all components and associated loads.  
   2. Where partitions are to be mounted to stud walls or joist framed ceiling, provide support as per 06 10 00 Rough Carpentry  
V. Warranty  
A. Manufacturer supplied 10 year warranty

10 28 13 Toilet Accessories  
I. General  
A. All toilet room accessories shall be mounted as per ADA requirements  
B. Provide ADA required clearances and floor space at all toilet room fixtures and accessories.  
II. Materials  
A. All toilet room accessories shall be commercial grade and theft and vandal resistant.  
B. Except for electric hand dryers, mirrors, paper towel dispensers, and baby changing stations, all toilet room accessories shall be stainless steel, satin finish.  
III. Accessories Schedule: Provide the following accessories for each room as indicated:  
A. Men’s Toilet Room  
   1. Grab bars
a. Provide number and sizes as required by ADA
b. Provide type with finished trim to conceal/protect mounting hardware

2. Electric air hand dryer
   a. Design Basis: Dyson Airblade
   b. Provide 1 per 3 lavatories.

3. Paper towel dispensers
   a. Paper towel dispensers are to be used to service all restrooms only where electrical hand dryers are NOT installed.
   b. Roll-towel units
   c. Provide 1 per 3 lavatories

4. Trash Disposal Units
   a. Recessed or semi recessed
   b. Provide 1 below each paper towel dispenser

5. Toilet Tissue Roll Dispenser
   a. Provide 1 per water closet

6. Heavy duty robe and towel hook
   a. Mount at inside face of doors and/or toilet partition doors
   b. Provide 1 per water closet.

7. Foldable Baby Changing Table
   a. Mount away from toilet room door and path of travel.
   b. Where feasible, mount within the wheelchair accessible toilet compartment.

8. Mirror
   a. Standard units, individually framed for ease of replacement
   b. Provide 1 per Lavatory

9. Soap Dispensers
   a. Provide 1 per 2 lavatories

B. Women's/Unisex Toilet Room
   1. Provide the accessories listed above for Men's toilet rooms in addition to those listed below.
   2. Sanitary-Napkin Dispenser Unit
      a. Surface mounted
      b. Operation: Single coin (25 cents),
      c. Lockset: Tumbler type with separate key for coin box.

3. Sanitary-Napkin Disposal Unit:
   a. 1 per water closet at women's and unisex toilets

C. Janitor's Closet
   1. Friction-type mounting brackets for mops, brooms, etc. on wall over receptor with shelf above.

IV. Installation
   1. Install fixtures, accessories and items in accordance with manufacturer's instructions.
   2. Install plumb and level, securely and rigidly anchored to substrate.
   3. Provide details providing adequate structural support for all accessories.
      a. Where accessories are installed at stud walls, provide support as per 06 10 00 Rough Carpentry or as required by accessory manufacturer.

10 44 13 Fire Extinguisher Cabinets
   I. General
      A. Mechanical and storage rooms
         1. Bracket mounted
      B. All other locations:
         1. Recessed or semi-recessed solid cabinet, unlocked, with window made of polycarbonate or other plastic glazing to verify the presence of fire extinguisher.
a. Recessed cabinets should have a trimmed edge for a cleaner appearance and finish.
b. Semi-recessed cabinets should be used where overall wall thickness is a concern. Careful consideration should be used when specifying semi-recessed and surface-mounted cabinets for meeting requirements of ADA.
c. Where required, provide Fire-Rated Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

10 44 16 Fire Extinguishers
I. General
   A. Fire extinguisher classification, sizes, types, and number of units per square foot of area shall be based on occupancy hazard protection and shall follow NFPA 10

10 51 00 Lockers
I. General
   A. Lockers shall be for Amtrak Personnel only.
   B. Lockers shall be heavy duty, with ventilated doors
   C. Locker design, size, width and depth should be dependent on the operation it will be serving.
      1. Typically for stations a full size high locker is needed. This is usually for Amtrak employees where uniforms and exterior type clothing are used and stored. An example of this would be lockers for ticket agents that wear uniforms.
      2. Half size lockers should be used only in areas where objects may need to be stored. An example of this would be for lost and found items and other such material. All lockers are to be 12" x 18" minimum.

II. Materials
   A. Lockers shall be constructed from 16 ga. steel with 14 ga. doors with flanges to give double thickness of metal at corners and edges.
      1. Factory applied baked enamel finish in standard color

III. Accessories
   A. Hardware and anchoring system shall be commercial grade.

IV. Installation
   A. Where lockers are to be installed at a stud framed wall, provide support as per 06 10 00 Rough Carpentry Warranty
**Division 11- Equipment**

11 20 00 Commercial Equipment

I. Baggage Scale

A. Materials
   1. Low profile model mounted above floor.
   2. Maximum dimensions for scale is 29.5” x 32” x 2” height, in an opening slighter larger.
   3. Maximum weight capacity – 500 lbs.
   4. Material to be stainless steel platter (or shroud) and galvanized base.
   5. Must be shock mounted to prevent sensor overloading and other damage.

B. Accessories
   1. Baggage scale digital display
      a. (2) LED weight displays.
         i. One display is to be located on the guest side of the counter facing the passenger
         ii. The second display is to be located on the agent side of the counter, facing agent.
         iii. Numeric display must be bright, red preferred, and at a minimum height of one-half
              inch (readable at up to 20’); any ADA-related requirements supersede the minimum
              height requirement.
         iv. Display mounting should be attractive; stainless steel preferred.
   2. Data Feed
      a. The unit must have the capability to feed baggage weight information to a printer or other
         system for the collection of data.
      i. Amtrak does not currently capture this information, but it should begin to do so, within
         the life of these scales. (eTicketing functionality will enable this action.)
Division 12- Furnishings

12 48 13 Entrance Floor Mats and Frames
I. General
   A. All entrance mats, either recessed or surface mounted, shall meet the Americans with Disabilities Act (ADA), Accessibility Guidelines

II. Materials
   A. Entrance mats shall be of the type that are easily picked up and moved for cleaning purposes.
   B. Mats should be recessed wherever possible

12 50 00 Furniture
I. Interior Waiting Room
   A. The preferred system waiting room seating should be an industrial type grade, and should be stain resistant and waterproof. The system must be durable, seamless and as maintenance free as possible.
      1. Station Program and Planning: Standards and Guidelines indicate the suggested interior waiting room seating system and manufacturer.
         a. Manufacturer and system substitutions for interior seating may be considered on a case-by-case basis
      2. All benches should be firmly attached to the floor with tamper proof fasteners.
      3. Intermediate arms should be provided for all interior benches.

12 93 43 Site Seating
I. Materials
   A. Site seating shall be pre-manufactured steel benches with backs.
      1. Wood bench systems shall not be used unless historic requirements govern and require their usage.
      2. All seating shall be engineered to accept minimum 250 LB vertical or horizontal force applied at any point on bench.
   B. Fabrication: All joints to be shop welded, ground smooth, and prepared for finishing.
   C. Length: 4’-0” and 8’-0” lengths.
   D. Finish: Manufacturer standard pre-finished powder coat paint. Hot dip galvanized prior to powder coating to add salt resistance. Color: Black. Provide touch up paint as required after field installation.
   E. Basis of Design
      1. Victor Stanley “City Sites CBF12 series”
      2. Alternate acceptable manufacturer: Landscape Forms.

II. Accessories
   A. Provide welded end arms on all benches. On 8’-0” long units provide one intermediate arm to impede pedestrians from lounging on bench. Provide a minimum of 42” and a maximum 48” clear width between arms.
   B. All visible fasteners to be tamper resistant.

III. Installation
   1. Benches shall be fixed in place and shall not promote undesirable uses when arranged at the station.
      a. Provide dedicated compliant wheelchair clear floor spaces adjacent to benches configured to allow for Companion Seating per ADA standards. Calculate the total number of seating positions in a waiting area and platform and provide a minimum 5% (but not less than one) wheelchair spaces adjacent to the ends of the benches in the waiting area. Provide ADA compliant signage to identify the dedicated wheelchair spaces.
2. Surface mount to concrete deck with manufacturer recommended tamper proof mechanical fasteners which will be resistant to salt corrosion.
3. Install units in accordance with manufacturer's recommendations, plumb, level and free of warp or twist.
Division 14- Conveying Systems

14 20 00 Elevators

I. Elevator Design Criteria
   A. New Passenger and Freight Traction and Hydraulic
      1. Minimum passenger elevator capacity shall be 3,500#. For freight elevators the minimum capacity 4,000#. Elevator operation systems and machines shall have solid-state equipment. In addition to primary operation system features the following minimum requirements shall be provided:
         a. Standby power operation.
         b. Standby powered lowering.
         c. Battery-powered lowering.
         d. Automatic dispatching of loaded car.
         e. Security features, such as cameras, phone, etc including car to lobby features as required by client or Amtrak.
         f. Emergency communication system with a call out to a specified location such as building management or local police.
         g. Key-switch operation.
      2. The following items must also be considered based on the location, client or Amtrak needs when selecting the elevator system.
         a. Door reopening devices.
         b. Door finish material for location of elevator.
         c. Car enclosures type such as one side sliding doors or bi-parting doors, etc.
         d. Elevator signal equipment.
         e. Interior design and lighting should compliment all spaces where that the car will land.
         f. Hoistway and hoistway entrances shall be designed and located to address any safety concerns.
      3. Where components are not otherwise indicated, provide commercial grade components published by manufacturer as included in commercial grade pre-engineered elevator systems and as required for a complete system.
   B. Existing Traction & Hydraulic Modernization:
      1. Provide new operational and control systems. Commercial grade levels are the minimal requirements expected for durability and reliability.
   C. New Roped Hydraulic or Hydraulic
      1. Rope hydraulic or hydraulic elevator systems shall be commercial grade and have a power unit and lifting assembly capable of lifting the gross load to all required levels. The following minimal requirements are expected for durability and reliability:
         a. The design of the power unit shall be a compact, self-contained integral unit consisting of all necessary equipment and connections. If required the system should provide energy efficient and low noise operation. Required equipment shall be mounted on a rubber isolated inner base, have removable drip pan, and enclosed with sound insulated sheet steel panels. A structural steel outer base if required shall support any hydraulic oil tank and controller.
         b. Hydraulic oil pump system, oil tank, oil control unit shall be commercial or heavy duty grade. The control unit shall be designed for safe and efficient operation. The oil tank shall be sized to store the volume of oil to lift the elevator to all landings plus reserve capacity to prevent air or other gas from entering the system.
         c. The tank shall have a removable cover, protected vent opening, drain valve, and at least one oil level gauge glass for the system.
         d. The roped hydraulic type elevator system rotational sheaves shall be commercial or heavy duty grade.
e. The governor and safety equipment shall be in compliance with the local elevator code.
f. Elevator exposed supporting steel along with connections shall be primed and painted.
g. The controller will need to be designed to accomplish the type of elevator operation indicated by the client.

D. New Traction
1. Design of traction elevator shall be either a commercial or heavy duty grade and shall be designed with standard components published by the manufacturers selected as included in standard pre-engineered elevator systems and as required for a complete system. Based on the system and manufactures selected the following minimum criteria shall be met:
   a. Solid-state power equipment.
   b. Shall be non-regenerative system.
   c. Limit total harmonic distortion of regenerated power to 5 percent per IEEE 519.
   d. Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system.

II. Application, Inspections and Test
A. The elevators shall be designed so a certificate of inspection can be obtained at the end of the project.
B. The design documents shall be written to require the contractor to obtain and pay for all necessary applications and perform tests that may be required to obtain a certificate of inspection.

III. Warranty
A. The designers documents shall specify a manufacturer's standard warranty in which manufacturer agrees to repair, restore, or replace defective elevator work within five years from date of substantial completion.

IV. Maintenance Service
A. Design documents shall specify a minimum five years full maintenance service by the elevator installer. Service shall include but not limited to monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Parts and equipment provided shall be the same as those used in the manufacture and installation of original equipment. The following service is also required to be specified in the design documents during the maintenance period:
   1. Perform maintenance, including emergency callback service, during normal working hours.
   2. Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of two hours or less.

14 31 00 Escalators
I. Escalator Design Criteria. The following are minimum requirements for escalators:
   A. Escalators need to be of the heavy-duty type for use in transit systems. The escalators shall be designed with provisions for thermal expansion and contraction of escalator assemblies due to changing ambient temperature and humidity conditions as well as any movement of the facility caused by trains braking when trains are fully loaded.
   B. The escalators shall be designed for operations twenty-four (24) hours per day, seven (7) days per week. The design shall provide for bi-directional travel. All components to be heavy duty with up and down reversibility with a delay of no more than 2 minutes between directional changes. The speed of operation shall be heavy duty usage with at lease a minimal rate of speed of 100 feet per minute.
   C. Electrical power services shall be designed for heavy duty usage elevator drive systems. The escalators drive system shall terminate in a disconnect switch located in the escalator pit. Lighting and receptacles shall be included in the escalator pit.
   D. The escalator’s truss, machinery, motors and brakes shall be designed with a minimum design load for 320 pounds per 40” exposed step.
E. The escalators shall be designed to operate with full specified performance capability while exposed to temperature ranges of plus twenty-five (+25) to plus one hundred and twenty (+120) degrees Fahrenheit, dry bulb; and all conditions of relative humidity, and while exposed to airborne dust and debris.

II. Structural Requirement
A. The escalators shall be designed with escalator truss mounting angles and intermediate truss supports with attachments. The design shall provide for sizes as required to install escalators into the well-way structural support systems.

III. Operation Requirements
A. The design of the escalator sound level shall be to operate at or below a sixty-five (65) decibels, measured five (5) feet above the escalator at any location, with the escalator operating normally, either free-running or under load as a minimum. For multiple escalator installation, the design shall indicate that the noise measurements shall be made with only one (1) escalator unit in operation including that the entire installation is complete and in operating condition. Ambient level noises shall not exceed forty-nine (49) decibels and that the ambient level shall be maintained prior to units being turned on.
B. The design of the escalators vibration shall be at a maximum velocity reading of four-tenths (0.4) of an inch per second. The escalator shall be tested in order to achieving maximum velocity readings of four-tenths (0.4) of an inch per second.

IV. Application, Inspections and Tests
A. The escalators shall be designed so a certificate of inspection can be obtained at the end of the project.
B. The design documents will require the contractor to obtain and pay for all necessary applications and perform tests that may be required for acceptance and approval of escalators certificate of inspection.

V. Warranty
A. Design documents shall specify a manufacturer’s standard warranty in which manufacturer agrees to repair, restore, or replace defective elevator work within at least 12 months from date of substantial completion.

VI. Maintenance Service
A. Design documents shall specify a minimum 12 month full maintenance service by escalator Installer. Service shall include but be not limited to monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper escalator operation at rated speed and capacity. Parts and equipment provided shall be the same as those used in the manufacture and installation of original equipment. The following service is also required to be specified in the design documents during the maintenance period:
   1. Perform maintenance, including emergency callback service, during normal working hours.
   2. Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of two hours or less.

14 43 00 Platform Lifts
I. General
A. Install new outdoor inclined wheelchair platform lift and all associated components and accessories to provide ADA compliant access.

II. Materials
A. The lift system shall consist of a platform, drive system, and continuous guide tubes and all required components for a complete and code compliant system. Provide additional structure as required to support system.
B. The lift system shall be rated for exterior use and shall include stainless steel components as recommended by the manufacturer for the location where the lift will be installed. Any
components that the manufacturer does not require to be stainless steel shall be protected from corrosion according to the manufacturer's written specifications.

III. Accessories
   A. Provide call stations at top and bottom landings. Operation shall be keyless.
   B. Include all standard safety systems and any additional safety systems as required by codes and standards and as recommended by the manufacturer for the specific application.
   C. Provide other accessories as required by ADA regulations and all authorities having jurisdiction.
   D. Provide lockable and weather proof cabinet for all electrical and drive systems.
   E. Provide vandal resistant platform storage.
   F. Auxiliary power: provide battery back-up system for normal operation during power failure for a minimum period of 1/2 hour with rated load.

IV. Installation
   A. The lift system, installation, and installer shall meet all applicable codes and standards including all ADA requirements and recommendations and the system shall be installed, operated, and maintained as per the manufacturer's written instructions and specifications.
   B. Ensure that code compliant handrails are easily accessed when lift is not in use. If required, run lift further or provide additional railings.

V. Warranty
   A. Provide the manufacturer's standard warranty.
**Division 22- Plumbing**

22 11 00 Water Distribution

I. Domestic Water
   A. Domestic water shall be provided to any devices and fixtures that require a domestic (potable) water supply. Domestic cold water shall be supplied from a connection to the site or entrance main upstream from existing domestic water backflow preventers. Domestic cold water supplied to a building addition shall incorporate dedicated backflow preventers located next to the existing site or entrance water main.

   B. Design Criteria
      1. Piping shall be sized to limit the velocity in any section of the system to a maximum of 8 fps for cold water and 6 fps for hot water.
      2. The entire domestic hot and cold water system shall be insulated with 1 inch of mineral fiber or elastomeric type insulation.

C. Hot Water
   1. Domestic hot water at 120°F shall be supplied to each fixture or equipment requiring domestic hot water, unless a different temperature is required for the application.
   2. Process water heating systems shall be provided if required.
   3. An evaluation shall be made to determine the most economical and feasible method of generating hot water.
   4. Water heating equipment shall be sized to satisfy the hot water fixture, equipment and process demands of the facility.
   5. Domestic hot water may be supplied from new water heating equipment, or from an existing hot water system with capacity to serve the additional load.
   6. When centrally located hot water generators are provided in large facilities, hot water mains shall be fitted with recirculation pumps and the water recirculated back to the central water heaters. Consider providing time clocks or other means to turn off recirculation during unoccupied hours. Recirculation pumps shall not be connected to emergency power.
   7. When duplex central hot water generators are provided, each generator shall be sized to satisfy a minimum of 65% of the system demand.
   8. Point-of-use water heaters may be provided instead of a central hot water system, or for remotely located points of use or higher temperature applications.

D. Emergency fixtures (showers and eyewashes), if provided, shall be supplied with tempered water at 85°F through a thermostatic mixing valve. Emergency equipment thermostatic mixing valve shall incorporate a built-in cold-water bypass with positive hot water shutdown device in the event of cold water shutdown.

II. Distribution
   A. Above-ground domestic hot and cold water piping shall be Type L copper tube with wrought copper fittings.
   B. Underground domestic hot and cold water piping shall be Type K copper tube with wrought copper fittings.
   C. Solder shall be lead-free, 95-5 tin-antimony.
   D. The reliability of the domestic cold water system shall be dependent on the reliability of the site domestic cold water system. The reliability of the domestic hot water system shall be dependent on the reliability of the hot water generator(s).
   E. Prior to use, the water distribution system shall be sterilized with hypochlorite solution.
   F. Isolation valves shall be provided at riser connections, branch piping run-outs to fixture groups, and at fixtures requiring maintenance.

22 13 00 Sanitary Sewerage

I. General
A sanitary waste and vent system shall be provided for toilet rooms, other domestic fixtures and equipment in the mechanical spaces. Plumbing fixtures shall be drained by gravity through soil, waste and vent stacks, building drains, and building sewers to the site sanitary sewer.

B. Sewage ejector pumps may be required for areas below grade. Ejector pump discharge shall be connected to the building house sanitary drain or sewer. Duplex pump package shall consist of a main control pump panel, lead/lag controls, alternators and alarms. Pumps shall be sized for 100% redundancy.

C. Fixtures shall be trapped and vented to atmosphere. Vents shall be extended through the roof. Sanitary vent gases shall not be treated.

II. Design Criteria
A. The sanitary waste system shall be designed to maintain a minimum velocity of 2 fps.
B. The sanitary vent system shall be designed so that the differential pressure at any point in the building does not exceed 1 inch water column. Design and installation shall be in accordance with applicable codes and local requirements.

III. Equipment and Material
A. Below ground sanitary waste and vent piping shall be service weight cast iron with pushon bell and spigot ends. Drainage pipe shall be cast iron DWV with drainage pattern fittings. ASTM A74.
B. Above ground sanitary waste and vent piping shall be Schedule 40 PVC DWV with drainage pattern fittings and solvent cement joints. ASTM D2665-94, D2122-90.

IV. Industrial Waste and Vent System
A. A separate industrial waste and vent system shall be provided to receive the discharge of any fixture into which acid or corrosive chemicals are intended to be placed.
B. No industrial waste shall be discharged into the ground, local sewer, or elsewhere without being thoroughly diluted, neutralized or treated by passing through an approved dilution or neutralizing device.
C. Design Criteria
   1. Industrial waste system capacity shall be based on drainage fixture unit values with appropriate code factors, and actual equipment demands.
   2. Sampling capability for effluent testing shall be provided prior to the sewer connection.
   3. Equipment and Material: Industrial waste and vent pipe and fittings shall be approved materials that are resistant to corrosion and degradation from the type and concentration of industrial waste involved.

22 40 00 Plumbing Fixtures
I. General
   A. Plumbing fixtures are to be made of graffiti and vandalism resistant materials
   B. All plumbing fixtures and controls and mounting locations shall be ADA compliant

II. Plumbing Fixture Count
   A. Provide the minimum number of fixtures as required by code. Additional fixtures in addition to those required by code may be proposed by Amtrak or the Design Contractor to meet specific demands.

III. Toilets(Water Closets)
   A. Water closets and urinals are to be commercial grade, wall-mounted, with low flow flush valve, rather than tank.
      1. Fixture carriers shall be heavy duty and vandal resistant
         a. Small stations shall have carriers rated for a minimum of 500 pounds.
         b. Medium stations shall have carriers rated for a minimum of 750 pounds.
         c. Large stations shall have carriers rated for a minimum of 1000 pounds.
      2. Floor mounted may be considered if there is inadequate room for wall mounted supports.

IV. Urinals
   A. Wall mounted, with low-flow flush valves
V. Lavatories
   A. Lavatories are to be commercial grade wall mounted units
      1. Countertop vanities are not acceptable unless the fixture is intended to match an existing adjacent fixture.
   B. No pop-up drains (strainer only).

VI. Floor Drains
   A. At least one floor drain should be installed in each bathroom, more if layout dictates.
   B. Provide additional floor drains at areas where water is expected to collect.

VII. Electric Water Fountains
   A. Code compliant dual level ADA compliant modular drinking fountain, fully-recessed, or semi-recessed drinking fountain. The equipment must be durable and easy to maintain. The finish shall be standard stainless steel cabinet finish. The manufacturer shall provide a minimum 5 year warranty. The units selected shall be ENERGY STAR® certified.

VIII. Service Sink
   A. Floor Mounted 36” square
Division 23- Heating, Ventilating, and Air-Conditioning (HVAC)

23 00 00 Heating, Ventilating, and Air-Conditioning (HVAC)

I. General
   A. The purpose of this guideline is to establish standard design criteria that should be used as a reference for engineers and/or architectural firms preparing construction documents for HVAC systems that condition Amtrak stations.
   B. The information provided is a minimum requirement from Amtrak. It does not relieve the designer of record from designing the HVAC system in compliance to these guidelines, all applicable codes and in strict accordance with the authority having jurisdiction.
   C. The designer shall also use current industry materials and practices for any portion of the design that is not specified by the applicable codes and these guidelines.

II. Preparation of load calculations
   A. Design engineer shall provide Amtrak with detailed load calculations used to select all equipment for project. Load calculations shall include the minimum parameters:
      1. Temperature/humidity conditions – outdoor
      2. Temperature and humidity conditions – indoor
      3. Ventilation rate
      4. Individual room loads
      5. Zone Load Summary
      6. Psychrometric Chart

III. Ambient Weather Criteria
   A. Refer to Latest volume of ASHRAE Fundamentals, Climatic Design Information
      1. Summer
         a. Dry bulb design temperature-ASHRAE 1% city data.
         b. Wet bulb design temperature – ASHRAE mean coincident with 1%
         c. Wind speed for design city – ASHRAE
      2. Winter
         a. Dry bulb design temperature – ASHRAE 99% city data
         b. Wind Speed for city – ASHRAE Extreme Annual WS – 2.5%

IV. Interior Space Temperature And Humidity Criteria
   A. Station Waiting Room, ticket offices, restrooms
      1. 78° F. D.B., 55% R.H. Maximum
      2. 70° F. D.B., 30% R.H. Minimum (Amtrak does recommend the use of humidification to achieve 30% RH)
   B. Baggage and Storage
      1. 60° F. D.B., Minimum

V. Internal Load Criteria
   A. Lighting
      1. Account for lighting loads for HVAC equipment sizing to reflect conditions as designed by lighting designer. Distribute loads to plenums as required and recommended in ASHRAE fundamentals.
      2. People
         a. 250 BTU/HR per person – Sensible
         b. 200 BTU/HR per person – Latent
      3. Equipment
         a. Size HVAC equipment to handle loads for equipment such as computers, printers, copy machines etc. in occupied spaces. Utilize appropriate diversity factors

VI. Fuel Selection
   A. Natural Gas
      1. Natural gas is the preferred fuel for Amtrak facilities
B. Heating Oil
1. If natural gas is not available, heating oil should be utilized.
2. Fuel oil storage shall be above ground.
C. Electricity
1. In the event the project location cannot accommodate natural gas or fuel oil, electricity may be utilized.
2. First consider the use of electric heat pumps followed by electric resistance heat.

VII. Building Envelope and Energy Conservation Criteria
A. General
1. Design in strict accordance with the Amtrak adopted codes and sustainability code.
2. Stations originally designed with perimeter heat to offset conduction losses shall be redesigned with perimeter heat in place. Perimeter heated buildings shall not be redesigned with all-air systems as a replacement.

VIII. Air system design Criteria
A. System Selection
1. HVAC systems shall be selected to achieve the highest level of comfort for Amtrak passengers and employees while focusing on energy efficiency and ease of maintenance. Air conditioning systems 7-1/2 tons and less shall be specified with a minimum EER of 16 or as prescribed in local energy codes.
2. Engineering designers shall evaluate the use of variable air volume systems complimented with variable frequency drives on supply and return air fans.
3. Air handling units shall be specified with double-wall construction. Single wall with exposed insulation shall not be specified.
4. Design professional shall evaluate and recommend low ambient and/or hot gas bypass control based on internal loads and climatic conditions.
5. All air handling systems shall be designed with a ducted return air system. Plenum returns of any kind are not acceptable.
6. The following safety factors will be employed in the design calculations:
   a. Cooling calculations: 5%
   b. Heating Calculations: 15%
B. System Security
1. Outside air intakes shall not be located to allow introduction of potentially life threatening chemical agents.
2. No intake shall be located in sidewalks. Pad mounted, exterior units shall be installed behind an Amtrak approved secure fence system.
3. Preferred locations are at roof level.
C. Ventilation
1. Outside air shall be provided in accordance with the latest edition of ASHRAE standard 62.
2. Minimum outside air shall not be less than 20CFM per person.
3. All HVAC systems shall utilize full economizer control.
4. Exhaust public restrooms at a rate of 50 CFM per water closet or urinal minimum.
5. Return air shall not exceed 85% of supply air under any condition.
D. Pressurization Criteria
1. All Amtrak buildings shall be maintained at a positive pressure relative to ambient.
2. Designers shall consider toilet exhaust, kitchen exhaust etc. when performing load calculations to achieve positive pressure.
3. Make up air shall be conditioned.
4. Building pressure relationships shall be documented on a simple airflow diagram within the construction documents.
E. Filtration Criteria
1. All air handling systems shall have a filtration system.
2. Minimum filter rating shall be MERV 8. The preferred level of filtration shall be MERV 13 for systems 15 tons and higher.

F. Ductwork
1. Low, medium and high pressure ductwork shall be constructed in accordance with SMACNA guidelines.
2. In all cases, Amtrak requires that all ductwork shall be seal class “A” with traverse and longitudinal joints sealed.
3. Fire dampers, smoke dampers, and smoke detectors shall be provided in accordance with the NFPA code or authority having jurisdiction.
4. All outside air and supply air ductwork shall be insulated.

IX. Steam and hydronic system criteria
A. General
1. Pipe guides, anchors, expansion loops, expansion joints, vents, drains, controls etc. shall be provided where required for all piping systems.
2. Gauges, thermometers, gauge cocks, thermo-wells, shut-off valves control valves, and other devices will be provided for each piece of equipment for operation, maintenance, and balancing purposes.
3. All piping systems shall be specified to be cleaned and flushed.
4. All piping systems shall be specified to be tested in excess of service pressure.
5. All hydronic systems shall be balanced for specified design flow rate and pump head. Balancing will be performed by an independent agency, contracting directly with Amtrak.
6. Hydronic systems shall be designed with 2-way control valves, differential bypass and centrifugal pumps with full cut impellars controlled by variable speed drives.
7. Pumps shall be installed with N+1 redundancy.

B. Water Systems
1. All closed loop water systems shall be designed on a friction factor coefficient of C=130. All open piping systems will be sized on a friction coefficient of C=100. The following sizing criteria applies to both open and closed piping systems.
   a. Chilled water, hot water (<2 inch)
      i. Maximum Pressure Drop: 4 ft.-hd per 100 equivalent feet of pipe
      ii. Maximum velocity: 8 feet per second
      iii. Minimum velocity: 1.5 feet per second
   b. Chilled water, hot water (>2 inch)
      i. Maximum Pressure Drop: 4 ft.-hd per 100 equivalent feet of pipe
      ii. Minimum Pressure Drop: 0.75 ft-hd per 100 equivalent feet of pipe
      iii. Maximum velocity: 12 feet per second within mechanical rooms
      iv. Maximum velocity: 8 feet per second outside mechanical rooms
   c. Pipe Material
      i. 2” and smaller shall be type “L” copper
      ii. 2-1/2” and larger – schedule 40 black steel, welded or seamless.

C. Steam Systems
1. Low pressure (up to 15 PSIG)
   a. Low pressure drop: ¼ PSIG per 100 equivalent feet of pipe.
      i. Maximum velocity within mechanical room shall not exceed 12000 feet per minute.
      ii. Maximum velocity outside mechanical room shall not exceed 8000 feet per minute.

D. Condensate Systems
1. All condensate should be returned.
2. Gravity flow condensate will be sized at 4 ounce pressure drop per 100 equivalent feet of pipe.
3. All gravity condensate piping should be designed for a slope of 1/8” per linear foot of piping.
4. Sizing safety factor for warm-up loads: 2 to 1
5. Condensate pumps shall be duplex type.

E. Piping Materials:
   1. Steam piping shall be Schedule 40 welded steel or seamless black steel pipe.
   2. Condensate piping shall be schedule 80 welded steel or seamless black steel pipe.
   3. Insulation
      a. Pipe insulation shall be in accordance with ASHRAE 90.
      b. Aluminum jackets shall be utilized on piping exposed to the elements.

F. Propylene/Glycol Solution
   1. Propylene glycol solutions shall be evaluated by design professional to achieve non-freeze operating ability as required by climate conditions.

G. Water Balancing
   1. All hydronic systems shall be balanced to +/- 5% for specified design flow rate and system pump head. The balancing effort shall be documented and submitted in a balancing report.

H. Water Treatment
   1. All water systems shall be treated with a chemical water treatment system.
   2. Construction documents shall include necessary piping arrangement to feed chemicals.
Division 26- Electrical

26 00 00 Electrical

I. General
   A. The purpose of this guideline is to establish standard design criteria that should be used as a reference for engineers and/or architectural firms preparing construction documents for electrical systems supporting Amtrak stations.
   B. The information provided is a minimum requirement from Amtrak. It does not relieve the designer of record from designing the electrical system in compliance to these guidelines, all applicable codes and in strict accordance with the authority having jurisdiction.
   C. The designer shall also use current industry materials and practices for any portion of the design that is not specified by the applicable codes and these guidelines.

II. Electrical Service Requirements
   A. Calculations
      1. Design engineer shall provide Amtrak with detailed load calculations used to select all equipment for project. Load calculations shall provide (as a minimum) information for determining the following:
         a. Primary vs. Secondary service
         b. 1Ø vs. 3Ø service
         c. Short circuit and Arc Flash Calculations
         d. Include all AMEP and Amtrak Equipment loads
   B. Equipment selection
      1. Design engineer shall provide Amtrak with detailed written summary used to select all equipment for project. As a minimum the summary will describe the following:
         a. Outdoor vs. indoor transformers
         b. Panel vs. Switchgear
         c. Electric metering

III. Power Distribution
   A. Switchgear
      1. Allow capacity for anticipated future growth
      2. Bus shall be copper
      3. Neutral & Ground bus to be 100% rated
   B. Panelboards
      1. Outdoor
         a. Equipment minimum requirement shall be 3R unless environmental conditions require 4X.
         b. Internal heater shall be provided unless particular conditions show that is unneeded.
      2. Indoor – panels shall use door-in-door construction
      3. Bolt on breakers are required
      4. Bus shall be copper
      5. Neutral & ground bus to be 100% rated
      6. Allow capacity for anticipated future growth
   C. Transformers
      1. Outdoor - Oil Filled or Cast Coil
      2. Indoor – Dry type, ventilated unless particular environmental issues dictate otherwise
      3. Copper windings
      4. Evaluate loads for distribution transformers to determine “k” rating
      5. Allow capacity for anticipated future growth
   D. Motor Control Centers
      1. Copper bus & wire
      2. Main Disconnect required
3. Allow capacity for anticipated future growth

IV. Wiring Methods

A. Wire
   1. Insulation type
      a. Indoor – THHN
      b. Exterior and underground – XHHW-2
   2. Conductor type
      a. Copper only

B. Cables
   1. MC cables may be used in indoor concealed locations not subject to moisture or physical damage. Where subject to moisture or outdoors, PVC coated MC shall be used.

C. Conduit & Raceway
   1. RGS – where subject to damage and/or moisture, also elbows for PVC (minimum size ¾“)
   2. EMT – where not subject to moisture or physical abuse (minimum size ¾“) Couplings shall be compression, set screws are not permitted.
   3. PVC – underground or encased in concrete, use RGS elbows on long pulls (minimum size 1”)
   4. FMC – indoor connection to transformers, machinery and lighting whips (minimum size ¾“)
   5. Liquidtite – where flexible connection is required in an area subject to moisture (minimum size ¾“)
   6. Surface mounted (ie – Wiremold™) – retrofits in office area only. Construction shall be metal only with the ability to accept paint

D. Boxes
   1. Sheet steel – galvanized
      a. Device boxes
      b. Junction boxes not subject to precipitation
   2. Stainless steel – where subject to precipitation or corrosives
      a. Junction boxes
      b. Equipment (panelboards, contactors etc)
         i. Heaters to be installed where moisture infiltration must be prevented
   3. Cast - where subject to moisture or precipitation
      a. Devices
      b. Junction box
   4. Non-metallic
      a. Use with PVC conduit

E. Devices
   1. Switches – commercial or industrial grade
   2. Receptacles– commercial or industrial grade
   3. Covers – metallic in all areas except office areas

F. Grounding
   1. Ground conductor required for each circuit
   2. Do not use metallic conduit as a substitute for a ground or neutral conductor.
   3. Ground rods shall be copper coated steel ground rod unless particular soil conditions mandate SS.

V. Lighting
   A. Illumination values – As per chart below or IES minimums if not indicated in chart.
### AMTRAK ENGINEERING STATIONS

#### STANDARD DESIGN PRACTICES (SDP)

<table>
<thead>
<tr>
<th>Description</th>
<th>Foot-Candles (1)</th>
<th>Max/Min (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station Platforms - covered (during train occupancy)</td>
<td>17 (4)</td>
<td>20/15</td>
</tr>
<tr>
<td>Station Platforms - uncovered (during train occupancy)</td>
<td>6 (4)</td>
<td>7/5</td>
</tr>
<tr>
<td>Station Platforms (except during train occupancy)</td>
<td>3 (4)</td>
<td>4/2</td>
</tr>
<tr>
<td>Waiting Rooms</td>
<td>25 (3)</td>
<td>30/20</td>
</tr>
<tr>
<td>Ticket Counters</td>
<td>50 (3)</td>
<td>55/45</td>
</tr>
<tr>
<td>Baggage Check-in Areas</td>
<td>40 (3)</td>
<td>45/35</td>
</tr>
<tr>
<td>Toilet, Restroom, Break areas</td>
<td>20 (3)</td>
<td>25/15</td>
</tr>
<tr>
<td>Storage</td>
<td>25 (3)</td>
<td>30/20</td>
</tr>
<tr>
<td>Stairs and Ramps</td>
<td>15 (3)</td>
<td>20/10</td>
</tr>
<tr>
<td>Vending Areas</td>
<td>25 (3)</td>
<td>30/20</td>
</tr>
<tr>
<td>Office</td>
<td>45 (3)</td>
<td>50/40</td>
</tr>
<tr>
<td>Locker Rooms and Showers</td>
<td>30 (3)</td>
<td>25/35</td>
</tr>
<tr>
<td>Exterior Station Lighting</td>
<td>8 (4)</td>
<td>10/5</td>
</tr>
<tr>
<td>Exterior Monument/Sign Lighting</td>
<td>15 (4)</td>
<td>20/10</td>
</tr>
<tr>
<td>Vehicle Parking – uncovered</td>
<td>3 (4)</td>
<td>4/2</td>
</tr>
<tr>
<td>Vehicle Parking – covered</td>
<td>5 (4)</td>
<td>8/2</td>
</tr>
</tbody>
</table>

**NOTES:**

1. All designated lighting levels are average and Max/Min Lighting levels are to be achieved at the brightest and the dimmest point.
2. Additional task lighting may be required based on specific working details.
3. Ceramic Metal Halide lamps with pulse start ballast with minimum of 85 CRI. Interior T-8 fluorescent lamp (TL835-3500k) with program start electronic ballast. CFL lamps to be utilized in lieu of incandescent lamps unless approved by Amtrak LED source to be comparable in color.
4. Ceramic Metal Halide lamps with pulse start ballast with minimum of 85 CRI. T-5 fluorescent lamp (TL835-3500k) with program start electronic ballast. LED source to be comparable in color.

**B. Exterior – except platform**

1. Housing shall be IP 54 location rated as a minimum
2. MH, LED or fluorescent lamp
3. Style of fixture to compliment overall Architectural design of the station and platform.
4. Lighting fixture selection to be “dark sky” compliant.

**C. Platform**

1. Housing - IP65 minimum
2. MH, LED or fluorescent lamp
3. Style of fixture to compliment overall Architectural design of the station and platform.
4. The location of the fixtures must be studied and coordinated with signage and signal location.
5. Lighting shall not interfere with train crew operations or train signals.
6. Lighting fixture selection to be “dark sky” compliant.

**D. Emergency**

1. Quartz re-strike shall not to be used with HID
2. See “Emergency Power”

**E. Exit signs**

1. LED
2. Provide Internal battery if UPS or generator is not available

**F. Lighting Controls**

1. Prefer electronic switchable breakers – controlled by internal panel controller with TC and external PC
2. Retrofit or alternate to switchable breakers - Contactor – PC & TC control. (PC – photocell, TC – time clock)
VI. Emergency Power
   A. Stations without conditioned space
      1. Battery packs or internal ballasts with battery backup for lighting shall be provided if the
         emergency load is minimal.
   B. Stations with conditioned space
      1. Station or platforms - lighting inverter or UPS for lighting only
      2. For lighting and station computer loads – UPS
      3. Where operation of station is required, other than for emergency egress, provide an
         emergency generator (If HID lighting, provide UPS or lighting inverter in addition to generator)
      4. Provide appropriate environmental equipment to maintain operating conditions for the lighting
         inverter or ups.
   C. UPS
      1. UPS shall be rated for the environment where it is to be installed. Provide appropriate
         environmental equipment to maintain operating conditions for the lighting inverter or ups.
      2. UPS shall provide remote alarm annunciation.

VII. Standby power for trains
   A. Where required by Amtrak, provide a 3-phase, 3-wire, plus ground, 60-Hz 480 V 800 amp
      standby-power cabinet shall be provided in all maintenance shops and adjacent yard areas for
      connection to locomotives, multiple-unit (MU) cars, and passenger cars. Standby power cabinets
      shall be provided for each track except for train-wash track. They are to be located adjacent to
      the track to coincide with the end point of cars. Final location shall be coordinated with track
      layout and standby power cabinet dimensions. Feeders from the power source to the cabinet
      shall be sized to limit the voltage drop at any cabinet, under full circuit load, to less than 5%. All
      internal wiring shall conform to National Electrical Code and NEMA specifications.
         1. Acceptable manufacture Staneco, Snyder Equipment or equivalent.
         2. For additional information, see Standard Practice Drawings SP6001 and SP6002.

Division 28- Electronic Safety and Security

28 31 00 Fire Detection and Alarm
I. Design Criteria
   A. Stations requiring one or two zones may be zoned systems
   B. Stations requiring more than two zones shall be addressable
II. Notification
   A. Local authorities – dial-up
   B. Amtrak Police at 30th Street – Ademco long protocol
Division 31- Earthwork

31 21 13.13 Radon Venting
I. General
   A. Where code indicates that the station is in a moderate to high potential radon zone, install a radon control system as per the International Residential Code
   1. Prepare walls, slabs, base courses, sump pits, etc. as per the code
   2. Install a subslab depressurization system
      a. System shall be installed as passive with the potential to be made active if required.
      b. Subslab system may be part of the foundation drainage system as described in 33 46 13 Foundation Drainage

31 22 00 Grading
I. Grade areas to provide drainage away from all structures and tracks and to prevent ponding.

Division 32- Exterior Improvements

32 00 00 Exterior Improvements
I. General
   A. Exterior improvements shall follow Low Impact Development-Best Management Practices:
   1. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss
   2. Minimize impervious surfaces and break-up and disconnect the flow of runoff over impervious surfaces
   3. Maximize the protection of natural drainage features and vegetation
   4. Minimize the decrease in “time of concentration” from preconstruction to post construction. “Time of Concentration” is defined as the time it takes for runoff to travel from the hydraulically most distant point of interest within the watershed.
   5. Minimize land disturbance including clearing and grading
   6. Minimize soil compaction
   7. Provide low-maintenance landscaping that encourages retention of planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides
   8. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas.
   9. Provide other source controls to prevent or minimize the use of exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into stormwater runoff.
   10. Site design features that help to prevent accumulation of trash and debris in drainage systems
   11. Site design features that help to prevent discharge of trash and debris from drainage systems
   12. Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants

32 12 16 Asphalt Paving
I. General
   A. Asphalt paving shall conform to AASHTO M140 MS-2 or SS-1 type paving.

32 13 13 Concrete Paving
I. General
   A. See standard paving details and section 03 30 00 Cast-In-Place Concrete for all concrete paving requirements
32 17 26 Tactile Warning Surfacing
I. General
   A. All Tactile Warning Surfaces shall be ADA compliant.
   B. Install Tactile warning Surfaces at all locations indicated in the Amtrak standard details and at all
      locations required and recommended by the most current version of the ADA and ADA
      guidelines.
II. Materials
   A. The Tactile Warning Surfaces shall include all of the following characteristics:
      1. Unless otherwise approved by the Amtrak Project Manager, the surface shall only be
         installed on materials which the manufacturer has approved as a suitable substrate.
      2. Color shall be “federal yellow” unless the project is at an existing and/or historic site and
         where the new tactile warning surfaces are intended to match the existing, replace the
         existing “in-kind”, or where the SHPO has determined that the standard color may not be
         used.
         a. Where the standard color can not be used, the tactile warning surface shall be a
            contrasting color as required by the ADA.
      3. It shall durable to withstand constant mechanical wear from normal passenger traffic,
         baggage equipment, snow clearing equipment, and other equipment used by Amtrak or
         others for the maintenance of the site, platform, or tracks.
      4. It shall be resistant to chemical degradation from salts and any other deicing chemicals
      5. Where feasible, it shall be removable and allow the installation of a new surface without
         affecting the adjacent materials.
III. Accessories
   A. All accessories, including but not limited to any removable anchors shall be the same material as
      the surface or shall be stainless steel.
IV. Installation
   A. Prepare the substrate and install the Tactile Warning Surface in strict accordance with the
      manufacturer’s written instructions.

32 32 19 Unit Masonry Retaining Walls
I. General
   A. These notes apply only to retaining walls that retain 8’ or less vertically of soil. If actual conditions
      require more than 8’ of retained soil or if site or soil conditions are beyond the capabilities of Unit
      Masonry Retaining Wall systems, the engineer of record shall provide a design per the specific
      site conditions.
II. Engineering services
   A. The contractor shall employ the services of an independent geotechnical or materials engineering
      firm to provide soil testing and quality assurance inspection for wall construction and soils work.
   B. The selected retaining wall manufacturer shall provide complete design certification for the
      specific site and soil conditions. All drawings and specifications shall be signed and sealed by a
      professional engineer registered in the state where the retaining wall shall be installed.
      1. The design shall be per NCMA design guidelines for segmental retaining walls, and AREMA
         standards
III. Materials
   A. The precast modular concrete retaining wall blocks shall be straight faced, largest standard units
      available, smoothest finish available, standard sized units, color to be selected from manuf.
      standard colors
   B. The precast modular concrete retaining wall system shall include all standard and custom precast
      units as well as any associated materials including, but not limited to reinforced backfill, shear
      keys, drainage mats and/or fill, reinforcing fabrics, filter fabrics, drainage pipes, and other
      components as required by the manufacturer for a complete system.
IV. Installer qualifications
   A. The contractor shall have successfully installed at least three projects similar to that of this project within the last two years. Contractor shall maintain at least one mechanic on site at all times that worked on one or more of these previous installations.

V. Installation
   A. Install the retaining wall system in strict accordance with manufacturer's written instructions and as per the signed and sealed drawings provided by the manufacturer for the specific project.

VI. Cleaning
   A. After completion of wall installation, remove construction debris and restore any adjacent finished areas affected by wall construction to their pre-construction state.
   B. Wash wall face to remove soiling and stains. Do not use acid or detergents that may “burn” or discolor face.
   C. When recommended by the manufacturer, prepare and seal surfaces in accordance with manufacturer's instructions.

32 90 00 Planting
I. Plant Materials:
   A. Where feasible, specify and install plants and trees that are native to the region, non-invasive, drought tolerant, require minimal maintenance, and provide a varied habitat for local wildlife.
      1. Turf should be avoided unless requested and maintained by a local municipal or state authority, or other private entity that has legal responsibility for the site.
   B. All plants, including trees, shrubs, vines, groundcovers, annuals and perennials shall comply in form and vitality with industry standards as described in the American Standard for Nursery Stock as published by the American Association of Nurserymen.

II. Accessories
   A. Provide all accessories and materials necessary for the quick establishment of all plantings, including, but not limited to mulch, supporting structures, temporary irrigation, organic fertilizer, etc.

III. Existing Tree and Plant Protection
   A. The Contractor, while working the site, is responsible for protecting all existing trees and plants to remain such that they will be free from any damage. If damage is done, the Contractor shall be responsible for replacement.
      1. Trees and plants which are not healthy, are dying, or the design value of which, in the opinion of Amtrak, have been destroyed through root damage, loss of branches, bark damage, etc., shall be replaced by the Contractor at no additional cost.
         a. Exceptions are defects resulting from abuse or damage by others, or unusual phenomena or incidents which are beyond landscape installer’s control.

IV. Installation
   A. Plant Installation: All trees shall be installed according to the standards as prescribed by International Society of Arboriculture.

V. Guarantee of Plants:
   A. The Contractor shall guarantee newly installed plants for a period of one year after date of acceptance against defects, including death and unsatisfactory growth.
   B. Plants which are determined to be defective shall be replaced at the proper season or planting time after the guarantee period is complete, and replacement plants will be guaranteed by the Contractor for an additional growing season under an extended guarantee at no additional cost.
   C. During the guarantee period, the Contractor shall, from time to time, inspect the watering and other maintenance practices and promptly report any practices which he considers unsatisfactory and not in his interests or good horticultural practices. The failure of the Contractor to inspect or report shall be construed as an acceptance by him of the maintenance practices and shall not thereafter claim that any defects which may later develop are the result of such practice.
Division 33- Utilities

33 40 00 Storm Drainage Utilities

I. General
   A. The design for all stormwater systems should meet all State and Federal laws, rules and regulations.
   B. The storm drainage system should be designed for positive drainage away from all surface structures that are not intended to receive drainage such as railroad tracks, building foundations, manholes, cleanouts, fire hydrants, valve boxes, light poles, junction boxes, conduit, etc.
   C. Volume and velocity calculations for stormwater running onto the site in addition to the anticipated runoff from the site must be prepared early in the design process.
   D. Designs should incorporate to the maximum extent practical best management practices-low impact development indicated in section 32 00 00 Exterior Improvements
   E. Stormwater systems shall at no time be connected to a sanitary system
   F. All stormwater systems shall be designed to the 100-year storm unless otherwise indicated by a professional engineer licensed in the state where the project is located.
   G. No stormwater drainage system shall have standing water lasting longer than 72 hours unless specifically designed to accommodate ponding.

II. Building Storm Drainage
   A. A storm drainage system shall be provided to convey water from building roofs to the site storm sewer system. New buildings shall be equipped with a separate relief overflow storm drainage system with a secondary independent piping system to grade near a sidewalk or public area, in addition to the primary storm drainage system. Scuppers should be avoided.

III. Distribution
   A. Below ground storm water piping shall be service weight cast iron with push-on, bell and spigot ends. PVC may be used with Amtrak approval.
   B. Above ground indoor storm water piping shall be Schedule 40 PVC DWV with drainage pattern fittings and solvent cement joints. ASTM D2665-94, D2122-90.
   C. Horizontal aboveground storm drainage piping shall be insulated to control condensation.
   D. Piping exposed to freezing conditions shall be insulated and heat traced.

33 46 13 Foundation Drainage

I. Slabs-on-grade
   A. Provide 6" minimum crushed stone drainage below slabs-on grade.
   B. Where recommended by a geotechnical or civil engineer, or where the water table is known or suspected to be above or at the level of the lowest floor, provide additional drainage below the slab designed by the engineer.

II. Foundation Perimeter Drain
   A. Provide an exterior perimeter drain at the entire building perimeter.
      1. Drainage shall include a continuous and sloped 4” drainage tile or perforated pipe set in gravel or crushed stone containing not more than 10 percent material that passes a no. 4 sleeve. Drainage pipe shall be set on no less than 2” of crushed stone and be covered with no less than 12” of crushed stone. The top of the drainage pipe shall be below the top of the lowest floor and slope down to the point of discharge. The drainage pipe and crushed stone shall be protected at all sides with a continuous filter fabric.
         a. The perimeter drainage system described is a minimum requirement. Provide additional components and capacities based on the recommendations of geotechnical or civil engineer.

III. Drainage Discharge.
   A. Any foundation and underslab drainage shall drain by gravity to daylight or to the storm drainage system.
1. Where drains carry water to grade, install ¼” welded mesh rodent screening at next to last joint.

B. Where it is not feasible to drain completely by gravity, mechanical drainage, including backup systems shall be provided.

**Division 34 - Transportation**

34 10 00 Guideways/Railways
34 11 93 Track Appurtenances and Accessories

I. Pedestrian Railroad Grade Crossing
   A. The railroad crossing shall be heavy duty ADA compliant full depth rubber pedestrian grade crossing as approved by Amtrak and where required, approved by the Host Railroad.
   B. Accessories
      1. Include any accessories, including sloped walking surfaces to provide an ADA accessible path.
   C. Installation
      1. Railroad crossing system shall be installed as per manufacturer’s instructions.