Design Contract Technical Delivery

I. Technical Delivery Basis

A. Amtrak Reference Documents and Template Specifications

1. There are documents prepared by other Amtrak Departments that are relevant to the design and construction of Amtrak Structures and Facilities. The Amtrak Project Manager (PM) or Design Manager (DM) will upon request provide these documents to the Design Consultant, as appropriate to the project. See relevant discussions within Section 2.00 – Amtrak Adopted Codes and Standards.

B. Amtrak Engineering Practices

1. See detail and relevant links in Section 3.00 – Introduction to Minimum Technical Requirements. Reference sub-chapters of Section 3.00 as required to verify all additional technical requirements or code interpretations.

II. Design Consultant Contract Management and Staffing Administration

A. General

1. "Design Consultant" and "Design Contractor" shall be considered interchangeable for the purposes of this document, Amtrak design procurement, and all other design performance requirements.

2. Purpose

a. This section of the Standard Design Practices (SDP) defines typical standards and procedures for the design and documentation of Amtrak project designs as required by the Contract and the specifics of the project. These standards and procedures shall be adhered to and performed by the Design Consultant unless otherwise noted in the specific project's Scope of Work or directed otherwise by the Amtrak DM. All deviations must be discussed with and approved in writing by the Amtrak DM prior to implementation.

B. Staffing

1. Design Consultant Personnel

a. Qualified Contractor Personnel

i. Only qualified personnel shall perform the work of the contract tasks and services. Personnel shall be experienced in their respective types of work with appropriate educational background, licenses (e.g. registered architects and/or professional engineers in the State or District in which the project is located), and certifications, and shall be knowledgeable in pertinent codes, references, and guidelines.

(i) Electric Traction (ET) design must be performed using a Design Subcontractor that is on the current Amtrak ET Department's list of approved contractors.

(ii) Communications and Signals (C&S) design must be performed by a Design Subcontractor that is on the current Amtrak C&S Department's list of approved contractors, if it is not performed directly by Amtrak C&S.

b. Design Consultant's Project Manager

i. The Design Consultant shall identify a qualified member of their staff to act as the Project Manager; that individual shall have the requisite technical and administrative experience, and educational background to manage the Project successfully. The Project Manager shall be a licensed Professional Engineer, or Registered Architect in the state(s) where the Project is located except as permitted in writing by the Amtrak DM. The Design Consultant's Project Manager shall be considered one of the Design Consultant's key personnel and shall remain assigned to the Project for its duration unless Amtrak requests his/her replacement for reasons of performance or allows reassignment at the written request of the Design

Consultant. The PM will function as the primary and, where practicable, sole point of contact for the Design Consultant's team.

ii. Amtrak will also designate a Project Manager and Design Manager for the Project. Amtrak's Design Manager shall coordinate the project with the Design Consultant's Project Manager for a single point of contact with Amtrak related to all technical issues. All technical correspondence, communications, and submittals relating to the Project shall be directed to both the Amtrak Project Manager and Design Manager.

C. Meetings and Coordination

1. The Design Consultant shall hold a kick-off meeting with Amtrak's Design Manager and Project Manager within two weeks from the Notice to Proceed (NTP) issued by the Procurement Office. NTP is generally considered issuance of a Purchase Order (PO). At this meeting, the Design Consultant shall present an overall project schedule consistent with the period of performance for the contract, define and discuss key milestones, identify management procedures, and present preliminary approaches to anticipated design and management issues.
2. The Design Consultant shall schedule, administer and conduct all project meetings unless directed otherwise.
3. The Design Consultant shall record and distribute succinct minutes (including action items, critical decisions, resolved issues, responsible individual or party, etc.) to meeting participants and other members identified on the project's standard distribution list, individually packaged, within three business days following all meetings.
4. Meeting attendance shall include, at minimum, the Design Consultant PM, Amtrak DM and Amtrak PM, and shall include all (and only) appropriate Subject Matter Experts (SMEs) from all parties to ensure efficient knowledge share and decision making.
5. The Design Consultant's Project Manager shall be responsible for all communications with Amtrak and shall represent the entire team throughout the duration of the Project. It will be the responsibility of the Design Consultant's Project Manager to coordinate the activities of the multi-disciplined effort to provide Amtrak with a completed project within the designated schedule.
   a. The Design Consultant's Project Manager shall employ both formal and informal methods to monitor the progress and technical aspects of the Project with Amtrak's Design Manager and Project Manager. Day-to-day communication shall be used to identify problems and assess their importance, to clarify work objectives, to solve interface problems, and to make timely corrective action whenever needed. Informal coordination meetings may also be held on an as-needed basis or at an agreed-upon schedule.
6. Design Consultant's Staff Communications: As the project progresses, Amtrak's Design Manager and Project Manager and the Design Consultant's Project Manager may arrange, by mutual agreement, to promote the timely and efficient exchange of information, to have other staff members communicate directly on technical aspects of the project. For all significant communications and decisions by staff members, the Amtrak's Design Manager and Project Manager and the Design Consultant's Project Manager shall be kept fully informed of these communications via memoranda, e-mail, or other acceptable written means.
7. The Design Consultant shall plan for a minimum of monthly project coordination / status meetings as well as page-turn design review meetings for each in-scope Design Milestone.
8. Remote meetings (Microsoft Teams preferred) are acceptable and standard unless the demands of the subject matter or site-specific observations require collocation or a site visit. The Design Consultant shall be able to attend any recurring meeting in-person as defined in the SOW at Amtrak's request at no additional cost to the project.

D. Design Consultant Project Management

1. Where requested within the Scope of Work or required by the size and complexity of the project, the Design Consultant shall develop and maintain a Project Management Plan (PMP) with all key elements referenced within industry standards like the Project Management Institute's (PMI's) Project Management Body of Knowledge (PMBOK) and ISO 21500 (Guidance on Project Management), and industry best practices.

   a. Design schedules shall be represented by a graphical representation of the overall project duration, submission and meeting dates, milestones as well as Amtrak review periods for all design phases and tasks required by the Scope of Work that is consistent with the period of performance for the contract. The Work Breakdown Structure (WBS) for the Design Phase Schedule may be requested to be aligned with Amtrak's internal WBS structure. The schedule shall be submitted using Microsoft Office Project or Primavera software in PDF, native and/or Excel export formats. This document will serve as the baseline schedule for the project.

      i. If the draft design schedule included within the design services proposal contains specific dates, the Design Consultant shall issue a revised schedule to incorporate the actual NTP date and any other scheduling conflicts or constraints. Subsequent revisions shall be issued as circumstances dictate only with written consent of Amtrak's PM and DM prior to issuance of the revised schedule.

      ii. The Schedule shall include the period from the Notice to Proceed (NTP) of design and through the completion of the construction including commissioning, punch listing, substantial / final completion, training, as-builts / conformed document delivery, etc. such that the end date coincides, to the extent practicable and with adequate predictive placeholders, with project closeout.

E. Progress Reporting

1. The Design Consultant shall incorporate the following typical progress updates, coordination and administrative detailing as part of normal Project Management scope:

   a. Update and submission of a bi-monthly task update and milestone forecast in a format provided by the DM. All milestone dates shall be provided or forecast with no dates shown "to be determined".

   b. The Design Consultant shall, <u>on a monthly basis (or as frequently as dictated by the Scope of Work and/or contractual provisions, whichever is more stringent)</u>, submit to the Amtrak PM in a timely manner the following:

      i. A Project Invoice, submitted through Amtrak's Ariba on Demand web-based system, with attachments showing calendar date, hours worked and rate for all personnel for which payment is requested as well as a detailed breakdown of reimbursable costs. A draft "pencil copy" of the invoice shall be submitted by email to the PM and DM no later than the last Monday of the month for which work is completed. A regular monthly invoice cadence is imperative to monitor level of effort and budget in coordination with provided milestones while ensuring timely initiation of the contract's net pay terms and resulting payment. Refer to the commercial provisions of the contract and/or contact the Contract Officer for additional information.

      ii. A Task Memo including a summary description of all work performed for payment requested within the Project Invoice. Description shall be detailed enough to sufficiently justify the level of effort for the portion of payment requested. Accordingly, invoiced hours shall be applied by Task. Include actuals to date and budget remaining for each task, with the forward looking spend plan as requested below.

      iii. An estimated Monthly Spend Plan forecasting spending on a monthly, task-by-task basis through the end of the Period of Performance.

F. Quality Assurance/ Quality Control

1. The Design Consultant shall adhere to the following, or, if applicable, to the stated procedures of the Quality Assurance/ Quality Control (QA/QC) plan (e.g. CQI, TQM, ISO 9001 certification, etc.) as included in the Project Management Plan or as provided in the Design Consultants proposal for the individual project or IDIQ contract.

2. Inadequate Quality Control:

a. Where the Amtrak Design Manager or Project Manager finds that there has been inadequate quality control done on the part of the Design Consultant, Amtrak reserves the right to reject the documents. Amtrak will continue review only after the Design Consultant has affirmed in writing that quality control has been done and has submitted revised documents.

b. Design and/or construction schedules will not be altered due to lack of quality control on the part of the Design Consultant.

c. Cost of resubmissions due to lack of quality control shall be borne solely by the Design Consultant with no additional cost to Amtrak or the Project.

3. Amtrak Review:

a. Amtrak retains the right to review the Design Consultant's documents and procedures in relation to adherence with the Design Consultant's established QA/QC policies. The Design Consultant 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 sole opinion, the Design Consultant's lack of conformance to QA/QC policies may affect the quality of the final product.

4. QA/QC Plan Deviations:

a. Nothing in the Design Consultant's QA/QC plan shall be construed to permit the Design Consultant, without prior written permission by Amtrak, 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.

III. Work on Railroad Property

A. General

1. Railroad Rules, Regulations, and Requirements:

a. 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 Consultant shall conduct all of the operations on the Railroad right-of-way (ROW) fully within the rules, regulations, and requirements of the Host Railroad.

b. Within Limits of ROW:

i. No individual shall come within the limits of Amtrak's or any other Host Railroad's ROW unless that individual has successfully completed that Host Railroad's Safety Orientation Class and has obtained the requisite certification of completion.

ii. A safety briefing administered by Amtrak personnel is required before initiating any on-site work prior to each work shift. Consult with the Amtrak PM and/or DM for local contacts and scheduling.

c. Railroad Worker Protection (RWP):

i. The Railroad will require Railway Worker Protection (RWP) services during all periods when the Design Consultant 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. When working on Amtrak property, the Design Consultant, Sub Contractors, and respective employees must first successfully complete Amtrak Railroad Safety Orientations class. The class is an on-line computer-based training program that is available 24 hours a day / 7 days per week, provided at the sole expense of the contractor and subcontractors on a per- person basis at http://www.amtrakcontractor.com. Participants

completing this course are required to read, comprehend, and demonstrate in English their understanding of the materials presented, as well as all the safety instructions, briefings, and warnings. All other costs encountered due to complying with the Amtrak safety requirements will be at the sole expense of contractors and subcontractors.

iii. Types of Protection:

(iii) 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.

(iv) Amtrak will bear all expense incurred for protection by railroad employees or host railroad employees.

(v) The providing of such watchmen, and other precautionary measures, shall not, however, relieve the Design Consultant from liability for payment of damages caused by their operations.

a. RWP Written Permission: The Design Consultant shall make a request in writing to the Railroad at least fourteen (14) calendar days prior to the date intending to enter upon railroad property. No work on railroad property shall proceed without proper protection on the site.

Note: longer advance notice <u>may not</u> be beneficial or increase Amtrak's ability to commit to the protection due to unforeseeable local or national exigencies imposed on the Railroad.

(i) Amtrak reserves the right to cancel support, outages, or site access up to immediately prior to or during a work shift. Coordination with the Amtrak PM, DM, and Procurement Officer on permittable sunk costs to be invoiced in these cases shall be performed ahead of time or otherwise be considered to be borne by the Design Consultant.

b. Work on other Host Railroad property may require additional training and certification. The Amtrak Project Manager will provide to the Design Consultant information on other Host Railroad training and certification requirements.

c. Track Occupancy:

i. The Design Consultant 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 Consultant 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 Consultant may have to coordinate his Work with Railroad operations and other contractor scheduled Work. The Design Consultant shall use all necessary care and precautions in order to avoid accidents, delay or interference with the Railroad's trains or other property.

d. Work adjacent to Electrified Track:

i. 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 or otherwise within proximity to an electrified catenary system. 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 regarding work in the vicinity of energized wires must be strictly observed whenever the tracks, structures, or properties of the Railroad are involved or affected. Allowable proximity to electric traction infrastructure and wires is in strict conformance with Amtrak AMT-2 "Electrical Operating Rules and Instructions."

e. Site Specific Safety Work Plan (SSSWP):

i. The Design Consultant shall submit a Site Specific Safety Work Plan (SSWP) for approval by the Railroad. The SSSWP 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.

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

iii. Approval shall not serve in any way to relieve the Design Consultant of complete responsibility for the adequacy and safety of his methods of procedure.

iv. A template SSSWP is available upon request (Amtrak internal link; request from DM).

f. Access to Amtrak Property:

i. 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.

ii. Access to Railroad property will be limited based on availability of protection, escort, other concurrent work, or as required to ensure that train or service operations are not interrupted.

B. Work by Amtrak Forces:

1. Amtrak is subject to agreements with its unions that may require some construction work to be done by in-house or "Force Account" (FA) labor. If Amtrak determines that force account labor will be used through Amtrak's labor clearance process, the Amtrak Project Manager will notify the Design Consultant.

a. The results of this process may require the repackaging or partitioning of design packages to accommodate an external contractor in addition to Amtrak Force Account. All work packages shall be coordinated to avoid overlap or gaps in required work. By default and unless / until instructed differently, design packages shall be adequately detailed for accurate bidding and execution by a 3rd party general contractor. Subsequent re-packaging will be considered a change to the contract unless noted in the original Scope of Work.

b. The Design Consultant shall coordinate with the Amtrak PM and Division (maintenance) forces to appropriately schedule and cost estimate the work with the consideration of Force Account impacts and costs. Appropriate risk should be implemented via float and/or contingency to account for unforeseen Amtrak emergencies that draw Force Account and/or the typical inefficiencies of scheduling and integrating multiple contractors.

IV. Security / Anti-Terrorism Considerations During Design

A. General:

1. Transit systems and their facilities / infrastructure are potentially vulnerable or attractive targets for security breaches, including Amtrak's national passenger rail network. Many Amtrak principal facilities are located in densely developed central cities, directly adjacent to rail and highway corridors and waterways, posing particular security challenges. Station facilities pose a particular challenge as public access is a fundamental requirement.

B. Security and Anti-terrorism Design Measures:

1. Based on the complexity of the project, the Scope of Work may include a Threat, Vulnerability, and Risk Assessment (TVRA) as part of the Preliminary Engineering Phase. Augmented criteria resulting from that study's approved conclusions will be incorporated into the Final Design.

2. The absence of a TVRA does not absolve the Design Consultant from considering, recommending, and incorporating appropriate security and anti-terrorism design measures into the facility to protect personal safety of passengers and employees, resources, structure, and continuity of operations against hazards. The Design

Consultant shall consider facility design, access management, communications, technology, and security system integration best practices to respond to the project's particular surrounding environment and needs. The Design Consultant shall implement best practices to harden the physical assets, prioritizing security sensitive areas, and collaborating with Amtrak operating / maintenance staff and security / police representatives. The Amtrak Project Manager will provide the Design Consultant with Amtrak's Emergency Management and Corporate Security's Design Guidance, Practices and Recommendations as relevant to the specific project.

C. Vandalism Protection:

1. The Design Consultant shall incorporate appropriate design measures to protect the facility against vandalism.

V. Investigation and Permitting

A. Existing Conditions:

1. General

a. The receipt of any available information from Amtrak, such as "as-built" plans, survey data or geotechnical information, shall not relieve the Design Consultant from responsibility for making a site visit and performing sufficient verification inspection and measurement to assure the reasonable adequacy and accuracy of subsequent designs. The Design Consultant shall survey the existing field conditions and report any discrepancies in writing to the Amtrak Design Manager and Project Manager prior to completing the 30% Design phase of the project. The Design Consultant shall prepare designs with provision for the actual, existing field conditions encountered. Locate and verify existing features and structures as required to ensure the successful installation of the Work.

2. Site Investigation and Survey

When applicable, the Design Consultant shall comply with the following:

a. Site Investigation:

i. Field Inspection: The Design Consultant shall conduct field inspections of all areas anticipated to be affected by the project. Specific restrictions or constraints may apply as directed by the Amtrak Design Manager or Project Manager.

ii. The Design Contactor shall field verify any Amtrak-furnished, if applicable, topographical data, location of available utilities, wetlands, boundary survey and other existing conditions information for possible changed conditions.

iii. The Design Consultant shall develop a complete and accurate existing conditions site survey for the Project including, but not limited to: a site plan with topography and all relevant site features; adjacent highway/roadway infrastructure including bridges; railroad infrastructure; aerial and underground utilities (location, reliability, capabilities, in-service, inactive, or abandoned); storm water management (storm sewers, sizes, invert elevations); property lines, benchmarks, right-of-ways, and easements; existing building locations; parking lot layouts; significant trees; platform and track alignments/profiles. The Survey shall be included within the 15% Draft / 30% Final Project Definition Report submittals.

(i) Existing Site Survey Documentation: If Amtrak provides existing site survey documentation, the Design Consultant shall be responsible for obtaining any supplemental survey data necessary to complete the design at their cost. The Design Consultant assumes full responsibility for the accuracy of data furnished. The final survey shall identify the extent and location of all existing site features (e.g. buildings, structures, easements, foundations, wells, underground tanks, utilities, etc.).

iv. Work shall be surveyed utilizing the following horizontal and vertical datums:

(i) On Amtrak's Northeast Corridor: ACS 2021 Coordinate System - https://epsg.org/crs_20050/NAD83-2011-Amtrak-NECCS21-ft.html?sessionkey=cjt8v9ziua

(ii) Off Amtrak's Northeast Corridor: State Plane Coordinate System

(iii) Vertical Datum: NAVD 88

b. Easements, Zoning and Covenants:

i. The Design Consultant shall identify any on-site and off-site easements, zoning restrictions and/or property covenants which could affect the design or future use of the site. Those easements, zoning restrictions and/or property covenants, which are determined to impact the design, shall be immediately brought to the attention of Amtrak's Design Manager and Project Manager, and confirmed with a written summary.

c. Location of Site Utilities:

i. The Design Consultant shall provide locations of existing site utilities (i.e. surface structures) within the building and on the site. The Design Consultant shall utilize the best available information to indicate locations of underground utilities and/or recommend an appropriate Subsurface Utility Engineering (SUE) data quality level to pursue as part of the design phase.

d. Site Investigation Report and Drawings:

i. The Design Consultant shall submit a report that summarizes the findings of the site investigation, including drawings, as applicable for the Project. The submittal is to coincide with the 15% Project Definition Report submittal. A summary of this report shall be included in the Project Definition Report.

B. Environmental

When applicable the Design Consultant shall comply with the following:

1. National Environmental Policy Act (NEPA) / National Historic Preservation Act (Section 106):

a. Design Consultant, upon request by Amtrak, shall perform Scope of Services as outlined in Amtrak Engineering Practices 0002 (EP0002). Typical services may include, but are not limited to, NEPA documentation, Section 4(f) documentation, public outreach, studies, draft agreements, agency or consulting party outreach, historic documentation, sampling, investigations and reports. The Design Consultant shall not progress the design beyond the 30% submittal until confirmation is received that all applicable NEPA / Section 106 approvals have been granted for the Project.

2. Categorical Exclusion Worksheet (CE), Environmental Assessment (EA). or Environmental Impact Statement (EIS) Requirements:

a. If already complete, Amtrak will furnish a copy of the CE, EA, Draft EIS, EIS and/or any other environmental reports within the National Environmental Policy Act (NEPA) process, including those recommending mitigation for the project to the Design Consultant prior to moving beyond the 30% design phase. The Design Consultant shall be responsible for incorporating the requirements from the CE, EA, Draft EIS or EIS and/or other reports into the project's design. The Design Consultant shall give special consideration to mitigation measures which affect design and construction activities, including projection of costs and schedule extensions associated with mitigation tasks. While there are standard mitigation measures (e.g., controlling erosion and sedimentation; preventing excess noise and air pollution during normal business hours; maintenance of construction vehicles and equipment), special attention shall be given to case-specific mitigation measures indicated in the report(s).

2. National Pollutant Discharge Elimination System (NPDES)

a. Amtrak is subject to the NPDES and State PDES Systems and as such, if the Design Consultant is responsible for securing permits within the Project Scope of Work, all associated design / investigation tasks, applications, and

correspondence (with the permission and supervision of the Amtrak Design Manager) shall be included tasks. It is typical that the states have been authorized to administer these permits, but conditions may vary and should be investigated by the Design Consultant.

b. Refer to 40 CFR 122-124 for regulations and clarifications. Note that under this regulation, an NDPES or SPDES permit is required for "construction activities that result in a land disturbance of greater than or equal to one (1) acre." Segmentation of the disturbance area is not allowed.

VI. Deliverable Requirements and Review Process

A. General

1. The Design Consultant shall comply with all Submission Deliverable Requirements. All submissions outlined within this document shall be considered included in the Design Consultant Scope of Services for a Project unless specifically excluded by contract or otherwise not required by the Amtrak PM and/or DM.

2. All milestone submissions shall include applicable drawings, specifications, engineer's opinion of probable construction cost and engineer's probable construction schedule reflective of the level of project progress. This progress of detailed architectural/engineering design and construction documents shall be demonstrated by submission of the Minimum Milestone Deliverables outlined in **Table 1 – Minimum Milestone Deliverables Matrix** included below.

If a Milestone Deliverable is omitted or adjusted within the SOW, the contents of the altered Milestone listed in **Table 1 – Minimum Milestone Deliverables Matrix** shall be provided in the prior Milestone listed in the SOW, unless otherwise directed by the DM. For example, if the 90% Milestone is omitted, all 90% deliverables and levels of completion will be expected within the 60% Milestone Deliverable.

Except as modified by Table 1, general industry guidelines include:

a. American Institute of Architects (AIA) D200 (Project Checklist)

b. AIA E202 / G203 (BIM Requirements and Coordination)

c. Construction Specifications Institute (CSI) Project Delivery Practice Guide (PDPG) and Construction Specifications Practice Guide

d. National Institute of Building Sciences (NIBS) Whole Building Design Guide (WBDG)

e. Applicable local government or planning authority publications (e.g. City of New York Design Guidelines)

2. The Minimum Milestone Deliverables outlined in Table 1 below shall be delivered in accordance with the Design Phase Schedule produced in alignment with the contract Period of Performance noted in the Scope of Work for the Project.

3. Delivery Methodology and Requirements

a. Deliverables shall be submitted electronically to the Amtrak Design Manager or other representative(s) as designated.

b. Documents and digital files prepared and submitted by the Design Consultant in connection with Amtrak projects shall become the property of Amtrak for the purposes of use, reproduction, and distribution.

c. Electronic Files shall be submitted for all submissions as outlined within this document. Paper copies shall also be submitted upon request as / if documented in the Scope of Work. If the Design Consultant is unable to provide digitally signed or sealed documents, preparation and delivery of paper deliverables in quantities of Amtrak's request is to be considered included within the Scope of Work.

d. All deliverables shall be provided in both PDF and native format (including but not limited to MS Office files, STAAD and other model or calculation files, all drawings and renderings, 4D / Virtual Design and Construction models, etc.) for Amtrak's modification and further distribution or use as required.

B. Document Development Standards

1. Design Drawings

a. The Design Consultant shall prepare and submit design drawings in compliance with Amtrak Engineering Practices 4010 (EP4010) "CAD and BIM Standards" (Amtrak-internal link; request from Design Manager).

b. Design Drawings shall be prepared using the latest version of AutoCAD or Revit software. All submissions shall include one complete set of drawings formatted as a PDF file that will print the complete full-size drawing set in correct order and orientation. Final document submission shall also include a complete set of bound and purged DWG files including all data, survey control points and reference files as necessary for a complete printable electronic file. Revit models shall yield both DWG export drawings as well as the native RVT model file.

i. Where required by other disciplines (e.g. Amtrak Track Department), other formats like Microstation DGN may be required. The final product shall be an integrated, contiguous, and accurately cross-referenced drawing set.

2. Specifications

a. The Design Consultant shall specifically create and prepare performance and/or prescriptive specifications for the project. The performance specifications shall be based on the function and performance of a product or service under specified conditions, preferably conditions that can be reproduced for testing purposes. Performance specifications may include at a minimum useful life, reliability in terms of average intervals between failure, and capacity. Current Construction Specifications Institute (CSI) MasterFormat standards shall be used as a basis for organization and nomenclature.

i. Template specifications may be available from Amtrak (Amtrak-internal link; request from Design Manager) for typical equipment upon request from the DM, but assumption of availability shall not be made for the purpose of assuming design level of effort.

b. Specifications shall be originally prepared using the latest version of Microsoft Word and then shall be formatted as a single PDF file that when printed will be double-sided on 8 ½" x 11" white paper to form a complete manual, including Cover and Table of Contents. 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. Both PDF and native format version shall be delivered with each milestone.

c. Amtrak Minimum Technical Requirements are provided in Section 3.00 – Minimum Technical Requirements for reference and use by the Design Consultant in developing project-specific Specifications.

d. Specifications and drawing notes shall be written in accordance with the General Provisions Section covering Preparation of Specifications, restated here for clarity (confirm with current iteration of GP's), with **emphasis**:

"To the extent possible, Contractor shall edit or produce all specifications in Construction Specifications Institute (CSI) format, for items and materials required for the Project. All specifications, whether of a prescriptive or performance nature, shall be documented by providing a clear and accurate description of the technical requirements, providing a description of the qualitative nature of the items or materials, and, when necessary, by providing those minimum essential characteristics and standards (including measurable technical and functional acceptance criteria) to which the items or materials must conform. **With the approval of the Contracting Official, when it is impractical or uneconomical to make a clear and accurate description of the technical requirements, a "brand name or equivalent" description may be used along with a listing of**

the salient features of the items or materials. Project manuals, specifications, and drawings for systems and materials shall be non-proprietary, unless specifically approved in writing by the Contracting Official. For any proprietary or "brand name or equivalent" descriptions, a justification shall be provided to the Contracting Official and Design Manager for review and acceptance or rejection by Amtrak."

i. The noted review and acceptance of a "brand name or equivalent" should be requested prior to documentation on the contract documents.

ii. Examples that may warrant an exception may include: matching historic finishes, matching existing fire/security/BAS/SCADA systems to facilitate/allow integration, warranty-compliant maintenance, etc.

iii. For the basis of this requirement, reference 2CFR § 200.319(d)(2).

3. Engineering Calculations

a. Engineering calculations shall be submitted by discipline with each design phase submission to describe how the design was developed. Engineering 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 Project Definition Report as an appendix or provided as a separate bound volume.

b. Engineering 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 material values provided.

c. Engineering calculations must be recorded neatly and kept in an orderly fashion for easy review and shall serve as a suitable permanent record of the design work.

d. Signed and sealed calculations are required to be submitted at the close of the contracted DOR responsibility phase as part of the last signed and sealed deliverable required by the SOW (e.g. Bid Package, conformed CPS as-builts, Design-Build bridging documents).

C. Review Process

1. Review:

a. Amtrak will review and provide written comments and/or redline PDF markups for each of the submissions or deliverables described in the Scope of Work. The timeline for reviews will be confirmed during the Project Kick-off by the Amtrak PM and DM. Typical Amtrak review windows range from twenty-eight (28) to fifty-six (56) calendar days from the receipt date of the submittal or deliverable, but are modulated to suit the scope, emergency status, and/or complexity of each project. The Design Consultant shall provide a point-by-point response in similar format to Amtrak's review comments within seven (7) calendar days of receipt of Amtrak review comments, or within a mutually agreed upon timeframe.

2. Submission Review Meeting:

a. At Amtrak's request the Design Consultant shall attend a formal Submission "Page-Turn" Review Meeting for each major design submission or deliverable identified in the Scope of Work to discuss Amtrak's written comments, if any, and obtain verbal comments from Amtrak's relevant stakeholders. The Design Consultant shall have all applicable disciplines represented at the review meeting. The Design Consultant shall document verbal comments and the content of the discussions at the submission review meeting, and shallsubmit point-by-point responses in written form addressing all comments received to date, both verbal and written, as part of the next scheduled construction documents progress milestone submission. Subsequent meetings to review comments submitted may be held as deemed necessary.

3. Updated Submissions:

a. For submissions updated to include revisions and/or additions of design development (PDRs, reports, calculations, estimates, etc.), the Design Consultant shall also submit a "track changes" version to highlight the revisions and/or additions of the updated submission for the Amtrak reviewers.

4. Contract Document Review:

a. Amtrak may review reports, calculations, drawings, specifications, designs, and other contract submission or deliverables on an informal basis in addition to the formal reviews of each milestone submission. The Design Consultant shall make provisions for on-board review of drawings, calculations, and other in-progress contract submission or deliverables by Amtrak personnel upon the request of the Amtrak DM or PM.

5. Incomplete Submission:

a. If Amtrak determines that any formal submission required by the Scope of Services is incomplete, is not internally coordinated or properly coordinated between disciplines, or has not been properly reviewed for quality control, the submission will be rejected and returned to the Design Consultant for correction and resubmission. Amtrak reserves the right to approve or reject any proposed system or approach to the work that is judged to be inconsistent with the SDP or inappropriate for the project requirements. The concerns indicated by Amtrak are not considered closed until the Amtrak reviewer indicates that the concern is closed.

VII. Post Design Services: Upon request by Amtrak, the Design Consultant shall perform post design services including any of, but not necessarily limited to, the following:

A. Bid Phase

1. **Bidders List:** The Design Consultant shall prepare a bidder's list identifying potential construction contractors from whom bids may be solicited. The potential construction contractors listed shall be technically qualified and have demonstrated adequate experience on a minimum of three (3) projects similar in scope and complexity.
2. **Pre-Construction Proposal / Pre-Construction Bid Meeting:** The Design Consultant shall attend the pre-proposal / pre-bid meeting and if requested a pre-bid site walk. The Design Consultant shall answer in writing technical design related questions submitted by prospective bidders during the construction bidding period.
3. **Response to Requests for Information (RFIs):** The Design Consultant shall respond, through Amtrak, to RFIs from prospective construction bidders (Construction Contractors) during the Advertisement for Construction or bidding period. Response shall be within three (3) business days after receipt or as otherwise mutually agreed upon with Amtrak.
4. **Bid Document Addenda:** When required the Design Consultant shall assist in preparing Addenda and responses and/or clarifications to Construction Contractor's inquiries, supplementary design documentation in the form of sketches or re-issued Drawings or amended Specifications text or other Design/Construction Documents within five (5) business days of request or as otherwise mutually agreed upon with Amtrak.
5. **Bid Assistance:** Assist Amtrak in technical review of bids or proposals from Construction Contractors. The technical review shall include analysis, comparison and professional recommendations in accordance with criteria defined by Amtrak at that time.
6. **Conformed Contract Documents:** Upon award of the Construction Contract the Design Consultant shall modify the technical Bid Submission documents to incorporate all addenda to produce conformed Contract Documents. The fully conformed set shall be submitted to Amtrak at least five (5) business days prior to the Construction Contract(s) award. Amtrak may request the Design Consultant to incorporate any additional changes that the Construction Contractor may require after their review of the conformed Contract Documents.

B. Construction Phase Services (CPS): Upon request by Amtrak, the Design Consultant shall perform CPS including but not necessarily limited to the following:

1. **Meetings:** The Design Consultant shall attend construction progress meetings remotely, in-person at the project site, or at other locations on a frequency as requested by Amtrak. This includes, but shall not be necessarily limited to, meetings to discuss any pre-construction, substantial completion, post-construction or construction progress activities.
2. **Submittal Review:**
   a. The Design Consultant shall review and respond to Construction Contractor submittals, shop drawings and samples, substitution requests and any other required construction submittal within ten (10) business days after receipt or as otherwise mutually agreed upon with Amtrak.
   b. All submittals shall be reviewed for conformity with the Contract Documents and established Code or Standards. If the submittal is indicated to be resubmitted or rejected, specific reasons shall be clearly stated in the submittal review returned to the Construction Contractor.
   c. Review and response to re-submittals shall be within 5 business days after receipt or as otherwise mutually agreed upon with Amtrak. Separate records of time spent for each review shall be maintained and made available to Amtrak upon request.
   d. Submittal review results shall be statused as one of the following:
      i. No Exceptions Taken
      ii. Proceed as Noted
      iii. Do Not Proceed – Revise and Resubmit
      iv. Rejected
      v. Not Applicable
   e. Submittals shall only be rejected if the proposed product, system or equipment is clearly not in conformance with the Drawings, Specifications or other project requirements. The Design Consultant shall identify the specific provisions in the Construction Documents that have not been satisfied for any rejected submittal.
3. **Mock-ups:** Where the Construction Documents require mock-ups, or where Amtrak has requested the Construction Contractor to construct or install a mock-up the Design Consultant shall inspect, provide comments and approve the mock-up when demonstrated to be in compliance with the Contract Documents.
4. **Request for Interpretation (RFIs), Engineering Change Requests / Notices (ECRs/ECNs), Technical Support and Design Clarifications:** The Design Consultant shall provide technical design support to Amtrak during construction on questions relating to design. When the Construction Contractor requests clarification, the Design Consultant shall prepare a response for Amtrak review, prepare necessary clarification sketches and provide a written interpretation to clarify the intent of the contract documents or to address unforeseen conditions encountered during the course of construction. Responses to RFIs shall be submitted to Amtrak so as not to delay the construction schedule and no later than five (5) business days after receipt, or as otherwise mutually agreed upon with Amtrak.
5. **Change Order Support:** The Design Consultant shall assist Amtrak in the preparation or review of change order documentation related to unforeseen conditions or changes requested by Amtrak.
6. **Errors and Omissions:** Errors and Omissions are defined as those changes that result from ambiguities, errors, or omissions in the design as determined by Amtrak. The Design Consultant shall resolve all Errors and Omissions at no additional cost to Amtrak.
7. **Substantial Completion:** The Design Consultant shall participate in the review of the “substantially” completed work of the Construction Contractor and provide a punch list of items that are deficient in workmanship or do not otherwise meet the requirement of the Construction Documents or approved submittals. The punch list shall

include references to the applicable drawing and specification sections. The Design Consultant shall review the work of the Construction Contractor when the punch list items have been addressed and recommend final acceptance of the work to Amtrak when satisfactorily completed.

8. **Commissioning:** Upon request by Amtrak the Design Consultant shall assist with Commissioning of equipment, systems or other items identified. The scope of Commissioning services shall be coordinated with and determined by Amtrak depending on the complexity of the design equipment, systems, etc. requiring commissioning.

VIII. Post Construction Services: Upon request by Amtrak the Design Consultant shall perform Post Construction services including but not necessarily limited to the following:

A. As-Built Drawings: The Design Consultant shall review the Construction Contractor's as-built drawings for conformance with final shop drawings, with changes initiated by RFIs, supplemental design, change orders and observed field conditions.

B. Conformed Record Drawings: The Design Consultant shall prepare reproducible record drawings showing on-site changes the Construction Contractor noted in the as-built drawings and other Contract Documents.

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents
Geotechnical Investigation NEPA Submittal			**Summary:** As early as is practicable (including potentially within the Design Proposal itself), the Design Consultant shall provide the information required within the "NEPA / Section 106 Geotechnical Boring Form" which facilitates, via a brief questionnaire, an expedited NEPA approval process that is required before subsurface investigations. Consult with the Amtrak DM and PM for additional information.
15% Conceptual Design Submittal			**Summary:** The Design Consultant shall provide a Project Definition Report and associated Conceptual Plans, Sketches, and / or Models to convey the project assumptions, code determination, design criteria, and project intent.

15%	Project Definition Report (PDR)	Draft	The Design Consultant shall prepare a report indicating project assumptions, a code analysis, 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 illustrated clearly on drawings. It shall include information from the items listed below, as well as information generated in previous work tasks if applicable:
			• A definition and summary of all project goals, assumptions, scope constraints, and objectives, including design parameters.
			• A narrative and summary of observations from site surveys, geotechnical reports, condition inspections, load ratings, etc.
			  ○ Definition of functional requirements and feasibility analysis.
			• Description, analysis, evaluation, and recommendations concerning the results of sampling, testing, and monitoring programs.
			• Complete design intent for the recommended rail systems / infrastructure, mechanical, electrical, plumbing, data/communications, fire protection and fire alarm systems.
			• Description, evaluation criteria, comparison analysis of design alternatives developed, and recommendation of a preferred alternative as applicable to the project.
			  ○ In accordance with the SOW, if alternate options are requested, consider at least three conceptual options and provide a recommendation.
			• Prepare an analysis for the selection and design of the primary architectural, structural, mechanical, and electrical building systems. The analysis shall compare the alternatives taking into account the aesthetic, constructability, initial costs, life cycle costs, energy efficiency, resiliency, lead times, market conditions, and energy and sustainability considerations.
			  ○ Sustainable design and environmental considerations shall be categorized by type and quantify potential benefit.
			  ○ Stakeholder identification
			  ○ Adequate detail for Amtrak to fully comprehend the extent and totality of improvements needed and make sound informed decisions in advancing project design.
			• Key planning assumptions (service levels, equipment required, fixture types, sustainability and resiliency, flexibility, accessibility, security, TVRA, etc.)
			• <u>Code Analysis</u> to include:
			  ○ Refer to "EP4000.2.00 – Adopted Codes and Standards" as a basis for further analysis
			  ○ Include references to applicable Codes, regulations, standards, and guidelines; identify and recommend resolution to jurisdictional interfaces
			  ○ For renovations of existing buildings and sites, review conditions to identify all relevant Code deficiencies and remediation approaches as may be required by specific provisions of the applicable codes or standards.
			  ○ Zoning review as/if applicable
			• Permitting requirements discussion and list – The Design Consultant shall provide a list of historic and/or environmental reviews, permits and approvals typically required for the Project. Amtrak will direct the Design Consultant which permits and approvals to obtain at Amtrak's expense. Amtrak is generally subject to all Federal permitting requirements and associated state and local level jurisdictional flow downs.
			• General overview of requirements and how they will be incorporated into this specific project. If required, also include any external reviews.
			  ○ 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.
			  ○ A constructability review and cost analysis of alternatives, with particular emphasis on the operational impacts of performing construction during various potential outage windows.
			  ○ Additional information, constraints, or parameters that may have influenced the design.
			  ○ Track Work or other railroad systems (electric traction, communications & signals, etc.)
			• Initial/estimated right of way impacts as well as other potential impacts.
			• Site constraints shall be identified through a conceptual sketch of geometry (for example buildings, roadways, catenary poles, utilities, etc.)
			  ○ Initial site access plan proposed.
			• Identification of all safety, health, historic (Section 106), environmental (NEPA, State permitting, hazardous material, etc.), aesthetic, and security requirements.
			• Design phase milestone schedule
			• Construction Cost Estimate AACE 17R Class 5 (0% Design - Feasibility based on judgment)
			• All associated supporting documentation

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents
15%	Conceptual Plans, Sketches, Renderings and / or Models	Concept	As required to convey scope extents, concepts, alternatives, and design intent.
15%	NEPA / Section 106	Draft	Adequate information to determine the project's NEPA Class of Action (CE/EA/EIS), in coordination with Amtrak (PM, DM, Environmental / Historic Preservation specialists) and the FRA, including draft deliverables when available at this stage and a list of in-progress or pending work products that will be required to satisfy NEPA/Section 106 (e.g. traffic studies, historic documentation, site investigation, baseline environmental monitoring, etc.). **Note**: the earlier the Final NEPA Submittal, the more design can proceed in parallel to the NEPA approval process, given the Stage Gate on continued effort noted below after the 30% Design Milestone.
30% Preliminary Engineering Submittal			**Summary:** After review and approval of the 15% Submission (if applicable), the Design Consultant shall provide a 30% Submission that shall include all aspects of the design. The documents shall further the architectural / engineering concepts and design treatment and 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 provide a point-by-point response addressing and otherwise incorporating all prior Amtrak comments. The submission demonstrates compliance with relevant standards, specifications, codes, site (building envelope) and functional requirements.
30%	Project Definition Report (PDR)	Final	Living document **except** for code analysis and design criteria – see 15% Milestone for additional detail • Include written responses to Amtrak review comments from all previous submissions. • Include an open item list if appropriate based on Project Delivery method or limited design scope such that subsequent Final Design can utilize the PDR as a Project Record and forward-looking roadmap for required coordination, detailed design, studies, stakeholder engagement, and critical decision points. • A clear and concise description of the project including a description of the planned work in a narrative form contained within the PDR. • Final required Permit List following Amtrak input on 15% master list.

30%	General, Site, and Civil Plans	Preliminary	• Includes survey, existing conditions, proposed conditions, etc.
			• Drawings - The 30% Submission shall include the following information:
			  ○ Cover Sheet, including Vicinity Plan, Site Location Plan, and Index of Drawings.
			  ○ General Notes
			  ○ Code Review Drawings
			  ○ References to applicable building codes
			  ○ Indicate whether the building will be provided with sprinkler, standpipe, or other fire protection systems.
			  ○ Indicate the building construction type.
			  ○ Indicate the building use (in a mixed-use building, indicate the different uses).
			  ○ Indicate required fire separations between the mixed uses, if applicable.
			  ○ 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 within a narrative outline in the PDR.
			  ○ Indicate new and existing egress paths, travel distances and remote egress distances.
			  ○ Indicate occupant load calculations for new and existing spaces and required capacity for egress doors, corridors, and stairways.
			  ○ Provide chart indicating the required census of plumbing fixtures required by code and the number proposed to be provided.
			  ○ Indicate new and existing fire extinguisher locations.
			• Construction Phasing Plans: When a project must be completed in phases clearly indicate the following:
			  ○ Construction Phases: Extent and sequencing of work in each phase.
			  ○ Maintenance of Operations: Temporary measures required to maintain operations to the maximum extent possible and to minimize disruption to adjacent property owners, if applicable, and pedestrians during construction incorporating criteria established in the BOD.
			  ○ Construction Staging Plans (developed with assistance from Amtrak) showing the following:
			  ○ Work Limits / Restrictions on Contractor access and use of premises
			  ○ Trackwork to minimize outages, temporary tracks.
			• Site/Civil
			  ○ Site Plan(s): Prepare schematic site plan(s) showing new and existing structures, existing and preliminary proposed grading, layout of walks, parking lots and driveways, pavements and curbs, fencing, landscape features, new utilities and utilities requiring rerouting or other modification.
			• Material Storage and Soil Stockpile Areas

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents
30%	Railroad Track Plans	Pre-Final	• **NOTE: The track layout and design are to be highly developed and considered Pre-Final at this stage. DER's shall be in-process or complete.** ○ The electric traction and signaling plans are dependent upon this submission of an accurate final track alignment. • Finalized horizontal track layout including relevant degree of curvature, spiral lengths, underbalance, super-elevation, curve limits, jerk rate, and Vmax. • Vertical track layout including percent grade, acceleration, curve limits, rate of change, and relevant infrastructure (stations, turnouts, crossovers, bridges, crossings). • Identification of any restrictive clearance points. • Turnout identification including hand, type, and number.
30%	Railroad C&S, ET, and Infrastructure Structures Plans	Preliminary	• Prepare schematic site plans showing new and existing structures and equipment. • Construction phasing plan with proposed outage windows defined for work which will affect normal train traffic. • All efforts must be made to comply with Amtrak's standards and specifications; if compliance is not possible (or in some cases, not practical) a completed Design Exception Request (DER) with proper supporting background information to justify the exception must be submitted to the Amtrak Design Manager and Project Manager. • Site plans illustrating existing site conditions including survey control points, wetlands, utilities, structures, and access roads.

30%	Architectural and Structural plans and elevations	Preliminary	• Demolition
			  ○ For renovations and alterations of existing buildings and sites, provide documentation of the 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.
			• Architectural
			  ○ Prepare schematic floor plans showing all required spaces, walls, door and door swings, built-in equipment, preliminary locations of exterior window openings and room names (1/16"=1'-0" min. scale).
			  ○ Prepare schematic roof plans showing anticipated roof structures, equipment and drainage patterns (1/16"=1'-0" min. scale).
			  ○ Prepare schematic building elevations (1/16"=1'-0" min. scale).
			  ○ Prepare diagrammatic building sections showing preliminary floor-to-floor and ceiling heights and describing basic interior and exterior wall systems (1/8"=1'-0" min. scale).
			• Structural
			  ○ Establish preliminary structural systems, including foundations, framing systems (floor, roof and walls), column and/or bearing and shear wall locations.
			  ○ Prepare typical bay drawings of foundation and framing.
			  ○ Provide analysis of proposed building cladding materials effect upon the structural design.

30%	Mechanical, Electrical, and Plumbing plans and details	Preliminary	• Mechanical
			  ○ Review existing conditions to identify all code deficiencies and approaches by which to address.
			  ○ Determine type of HVAC systems for existing and new spaces.
			  ○ Determine approximate sizes, routing, and locations of mechanical rooms, primary chases and duct shafts, approximate size and location of major pieces of equipment, such as cooling tower, rooftop and indoor air handling units, and major duct trunks and piping mains.
			  ○ Indicate the above on schematic plans.
			• Electrical
			  ○ Review existing conditions to identify all code deficiencies and approaches by which to address.
			  ○ Establish preliminary size and location of new power source, feeders, 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.
			  ○ Indicate the above on schematic plans.
			• Plumbing
			  ○ Review existing condition to identify all code deficiencies and approaches by which to address. Identify, if providing a greater number of fixates than required by code, is desirable to a particular use.
			  ○ Assessment of the adequacy of existing fixtures
			  ○ Establish the preliminary quantity and locations of roof drains; floor drains, drinking fountains/water coolers, restroom fixtures, water heaters and special equipment.
			  ○ Establish locations of primary vertical and horizontal pipe runs.
			  ○ Indicate the above on schematic plans.

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents

30%	Fire Protection plans and details and Specialty Equipment	Preliminary	• Fire Protection
			  ○ Review existing conditions to identify all code deficiencies and approaches by which to address.
			  ○ Establish preliminary size and location of fire standpipes or other primary sprinkler risers and other special equipment. Identify need for fire pump and fire alarm system.
			  ○ Indicate the above on schematic fire protection floor plans.
			  ○ Any other drawings that the Design Consultant deems necessary to represent the intent of the project.
			• Specialty Equipment
			  ○ Include details and dimensions for all proposed specialty equipment such as drop tables, wheel true machines, cranes, or others.

30%	Outline Specifications	Preliminary	• Specifications:
			  ○ Table of Contents listing proposed specification sections to be used for project.
			  ○ Outline or Narrative specifications describing major materials and systems.
			• Specialty Equipment: Provide a written list, by discipline, and ***example*** manufacturers' product data, of specialty equipment to be included in the project. The list shall include, but not be limited to, eyewash stations, whiteboards, display equipment, drop tables, bridge cranes, and other special items as required. This will provide a basis for performance-based specifications. Identify any specialty equipment that due to market / industry status, existing conditions at the installation location, or lead times against a public exigency or emergency, may need to be procured on a non-competitive basis (i.e. sole source).

30%	ROM Construction Cost Estimate	AACE 17R Class 3	The DOR's Construction Cost Estimate shall be prepared based on historical, local costs for similar types of projects or work. The Design Consultant shall consider special conditions that may have a significant impact on the cost of construction. Reasonable contingency factors for design and construction shall be included. General Requirements: • The Construction Cost Estimate shall be prepared in accordance with the current Association for the Advancement of Cost Engineering (AACE) recommended practices, principles, and guidelines for project estimates for engineering, procurement, and construction for the building and general construction industries to the Estimate Class shown, <u>which adjusts based on each milestone</u>. • Itemize and calculate costs per current CSI MasterFormat specification division structure. Itemize and break out costs at a minimum by quantity, unit, labor hours, and labor; tally and total cost by division; including, at a minimum, the costs for general and special conditions, profit, insurances, bonds, contingency, overhead/profit, additional soft costs, and Amtrak force accounts (or example safety briefings, track and electric traction protection, inspections, etc.). • Work Restrictions: The Project may require work to be accomplished during hours outside the normal workday schedule, or where work restrictions constrain productivity, or where work may have to be performed within specified limited time periods. Considerations should be made for costs associated with premium labor rates, productivity loss, equipment rental costs, etc. for work performed outside the normal workday schedule or under various constraints. For a project that requires these types of considerations shall be included within the construction cost estimate. • When requested by Amtrak the Design Consultant shall develop separate and complete cost estimates and schedules for each separate construction contract or bid package.

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents

30%	Construction Schedule Estimate	AACERP 37R Level 1	The Design Consultant shall provide a Critical Path Method (CPM) construction schedule for the execution of the work and shall consider special conditions that may have a significant impact on the construction schedule. The Design Consultant shall employ the guidance of a cost estimating and/or scheduling firm for complex or large projects as outlined in the requirements within the Scope of Services. General requirements:
			• The Construction Schedule Estimate shall be prepared in accordance with the current AACE Recommended Practice (RP) Schedule Level shown, which adjusts based on each milestone.
			• The construction schedule shall include the period from the Construction Notice to Proceed (NTP) to the final completion, commissioning, and acceptance of the project.
			• All major activities as outlined in the scope of work shall be represented in this schedule including, but not limited to, work to be performed by Amtrak forces, and operational and phasing requirements including track and catenary outages.
			• Integrate, as appropriate, any other authorities having jurisdiction such as the Federal Railroad Administration (FRA) or other local governmental agencies.
			• Milestones
			  ○ Milestones for completion of key construction phases shall be incorporated into the Construction Schedule and coordinated with construction phasing plans included Design Phases Submission Deliverables, and the development of any liquidated damages, if determined as necessary by the Amtrak Project Manager / Design Manager.
			• Schedules shall be refined as necessary to account for the following factors as they may apply:
			  ○ The magnitude of the scope of work and phasing requirement due to contract duration.
			  ○ The coordination of all disciplines defined on the project.
			  ○ Limitation on work hours and limited access to work and staging areas due to Amtrak operations or project site conditions.
			  ○ Working near active lines, including tracks with an energized overhead contact rail or overhead catenary and overhead structure.
			  ○ Maintaining passenger pedestrian and vehicle egress and safety.
			  ○ Productivity of work crews during nights, weekends, and extended track outages.
			  ○ Limitations on activities due to allowable material working ranges for temperature and/or humidity.
			  ○ Dust and noise control and other environmental protection factors.
			  ○ Track outage restrictions.
			  ○ Availability and limitations of staging and stockpiling areas.

30%	Material selections and performance requirements	Preliminary	Building Materials: Provide Amtrak with comprehensive technical information, including high level performance information from which viable manufacturers can be derived, for all proposed materials, with emphasis on ease of maintenance, meeting the design life requirements, and sustainability / resiliency considerations.
30%	Engineering calculations	Preliminary	Preliminary Design Calculations for all major systems to, at minimum, justify feasibility of concept. Documented verification of available utility services in adequate size and capacity, including, but not limited to, electricity, natural gas, water, sanitary sewage, stormwater, and telecommunications. • Calculations supporting the basis for the design including assumptions, standards, specifications, codes and other constraints used to determine the preliminary selections. • **Note: Hydraulic calculations for all sprinkler/standpipe systems in accordance with NFPA standards and requirements to show that the system demand can be met by the available water supply.** • **Note: All Track calculations and geometry is to be Pre-Final and DER's, if required, shall be in-progress or complete**
30%	Responded comment matrix on prior submission	Progress	Indicates where, when, and how each comment will be resolved
30%	Geotechnical report (if applicable)	Pre-Final	Revision only required in the case of unclear design direction or constructability concerns

30%	NEPA / Section 106	Final	• Adequate information and studies in support of:
			  ○ Section 106 (and Section 4(f) as applicable) approvals and associated information in support of consultation, APE determination, alternative evaluations, adverse effect resolution evaluation and Memorandum of Agreement or Programmatic Agreement preparation.
			  ○ NEPA Class of Action, including, in order of increasing complexity: Categorical Exclusion (CE) Memorandum, Categorical Exclusion (CE) Worksheet, Environmental Assessment (EA), and an Environmental Impact Statement (EIS)

Stage Gate	**NEPA / Section 106 Approval (CE Memo, CE Worksheet, EIS, EA)**	**Final**	**Work cannot proceed past delivery of the 30% Milestone without full NEPA / Section 106 Approval from FRA; this gate exists with or without the 30% milestone deliverable, via progress as defined by general design completion. Consult with DM and PM for additional direction.**
60% Design Progress Submittal			**Summary**: After review and approval of the 30% Submission, the Design Consultant shall provide a 60% submission. The 60% Submission shall incorporate the 30% review comments previously provided and include a point-by-point response for each comment. The 60% Submission shall at a minimum include all information listed in the 30% Submission with the added detail listed below.

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents
60%	Project Definition Report (PDR)	Revision Only	If required

60%	General, Site, and Civil Plans	Detailed	• Cover Sheet
			  ○ 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 included and not included within the set.
			• General Notes
			  ○ Updated and edited for specific project conditions.
			  ○ Updated Code Review Drawings.
			  ○ Updated Construction Phasing Plans.
			• Milestones:
			  ○ Coordinate the completion of key construction phases and milestone development with the Construction Schedule.
			• Updated Construction Staging Plans
			• Site/Civil
			  ○ Property, building and contract limit lines.
			  ○ Easements, setbacks, projections dimensioned beyond building line.
			  ○ Ground floor elevations and grades at building.
			  ○ Parking layout plans with proposed locations of curbing and storm water inlets noted.
			  ○ All structures, flagpoles, signs, seating, fountains, play fields, etc.
			  ○ Fences, walls, existing structures, trees, planting, etc.
			  ○ Grading plans, boring locations, datum, and monuments.
			• Demolition
			  ○ 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.

60%	Railroad Plans	Detailed	• Railroad: ET, C&S, Track
			  ○ Develop site plans showing locations and property lines, standard details, elevations, sections.
			  ○ **Final** Track centerlines and elevations.
			  ▪ All track elements/components are selected, defined, and incorporated into the design documents.
			  ▪ Final roadbed, drainage and fencing design/layout are completed.
			  ▪ Clearance issues are fully defined, and solutions are incorporated into the design.
			  ▪ Proposed grades are finalized, cross-sections and profile drawings are included showing underground utilities and drainage facilities.
			  ○ Operation and maintenance manuals and training on installed systems are included where applicable.
			  ○ Specifications for material and equipment testing performed at the construction site or at an offsite location are defined.

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents
60%	Architectural floor plans, elevations and miscellany	Detailed	• Floor Plans o Dimensions: overall, column centerlines, and other critical dimensions. o Room name, number and finish numbers (with symbol for elevations, if shown). o Floors: changes in elevation or material, curbs, designation of areas to receive special patterns and/or finish treatments. o Walls: interior partition types and typical details including materials fire ratings, acoustical, etc., movable, or folding partitions, louvers, etc. o Chases and shafts: locations and construction. o Ceilings: Changes in ceiling height and skylights shown with dashed lines. o Doors: arrangement of door swing and door number. o Windows: number for schedule or elevation. o Toilet rooms: fixtures, accessories, partitions, and other equipment, accessible clearances, and clear floor spaces. o Stairs, elevators, escalators, ramps: handrails, number and size of treads and risers, clear shaft way dimensions. o Built-in Equipment: counters, cabinets, and layouts of special spaces at appropriate larger scale o Miscellaneous: fire protection equipment, expansion and control joint locations, gratings, drinking fountains, building and wall section symbols, and other special equipment; label, as appropriate any items shown on the drawings not in the contract as ‘ NIC. ‘ o Show compliance with ADA. • Roof Plan o Drainage: drains, pitch, crickets, scuppers, valleys, indicate high point by (+) figures relative to the drains. o Details showing proposed roof materials and roof construction. • Miscellaneous: o Critical dimensions, canopies, changes in elevation, expansion joints, scuttles, skylights, mechanical equipment, coping materials, chimney, railings, ladders, walkways, and railings. o Exterior Elevations • Materials: o All materials, noted and rendered to the extent needed for clarity. o All windows, doors and louvers, including conventional symbols for swing or operation. o Dimensions: all floor levels, parapet and canopy heights relative to floor lines or top of steel elevations, column centerlines o Finish grades at building, areaways, curbs, stairways, railings, retaining walls immediately adjacent to the building. o Miscellaneous: expansion and control joints, roof structure, if visible • Furniture layouts and schedule showing item / quantity for any Amtrak direct purchase items.
60%	Architectural sections and details	Detailed	• Building Sections o Dimensions: overall, floor-to-floor o Space identification o Stair and elevator hoistway sections, as applicable o Crane dimensions with hook height (if applicable). • Wall Sections (Typical) o Dimensions: vertical relationship of floor, ceiling, window sills and head, parapet, floor-to-floor, and top of steel elevations (1/2”=1’-0” min. scale). o Materials: o floors, walls, windows, spandrels, ceilings, sills, mechanical enclosures, flashing, insulation, soffits, roofing membranes, grades, footing drains, etc. rendered to the extent needed for clarity. • Interior Details o Interior elevations of important spaces o Special details: ornamental stairs, acoustical details, etc. o Reflected ceiling with ceiling heights and finishes indicated, light fixtures, diffusers and grilles, sprinkler heads detailed to the degree necessary to establish design intent. • Schedules (door/hardware, window, finish, etc.) and details.

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents

60%	Structural floor plans, elevations and details including all systems	Detailed	• General
			  ○ Indicate all loads, soil bearing capacity.
			  ○ Standard details and general notes edited to suit the specific project.
			• Foundations
			  ○ Analysis of sub-soil conditions
			  ○ Establish preliminary structural system.
			  ○ Approximate depth to water table if available from a datum.
			• Framing systems (including floor, roof and walls)
			  ○ Bearing or shear wall locations
			  ○ Column locations and configuration
			  ○ Size of structural members, which are typical or critical for coordination of clearances (maximum beam depth, columns), etc.
			• Details – adequate location-specific non-typical details to demonstrate design and construction intent

60%	Mechanical floor plans and details for all systems	Detailed	• General
			  ○ Standard details and general notes edited to suit the specific project.
			• Floor Plans:
			  ○ Ductwork - single line, showing location of outlets and return air inlets as well as VAV boxes and duct heaters.
			  ○ Location of duct and pipe chases
			  ○ Location of radiators, convectors, cabinet unit heaters, unit ventilators, fan coil units, etc.
			  ○ Louvers or grilles in exterior walls
			  ○ Block layout and dimensions of Boiler Room
			  ○ Block layout and dimensions of Mechanical Equipment Rooms
			  ○ Clearances required and routing for ductwork / piping in ceiling plenums and walls / chases.
			  ○ BAS controls in coordination with Amtrak's Digital Technology Department for a secure connection to the Amtrak network.
			  ○ Temporary systems or utilities that need to be installed to maintain operating continuity.
			• Roof Plan:
			  ○ Location of equipment, if applicable: fans, cooling tower, condenser, roof-mounted equipment, etc.
			  ○ Provide calculations proving that the existing structure can accomodate the proposed new system (if applicable)
			• Site Plan:
			  ○ Location of equipment if applicable: fuel oil tank, natural gas service, propane tank, cooling tower, condenser, etc.
			• Catalogue cuts of all equipment (i.e. diffusers, grilles, registers, etc.) exposed to view.

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents

60%	Electrical / IT / Data / Security plans and details for all systems	Detailed	• General
			  ○ Standard details and general notes edited for the specific project.
			• Floor Plans:
			  ○ Lighting
			  ○ HVAC
			  ○ Fire Alarm Panel
			  ○ Battery backup, UPS systems
			  ○ Location of all receptacles, telephone, cable television and data outlets, clocks, speakers, display systems, alarm devices, security cameras, card readers, time clocks, and other auxiliary devices in compliance with the current Amtrak Digital Technology requirements.
			  ○ Panels, transformers, switchgear, equipment racks, equipment rooms, wiring, junction boxes, etc.
			  ○ Graphic representation of required operating and service clearances for all devices and equipment.
			  ○ Basic symbol list and fixture schedule
			  ○ Temporary systems or utilities that need to be installed to maintain operating continuity.
			• Site Utilities Plan:
			  ○ Proposed route of electrical, telephone, and data services
			  ○ Outdoor lighting, control boxes or other equipment
			• Product literature for all equipment (i.e., lighting futures, emergency lights, fire horns, etc.)

60%	Plumbing plans and details for all systems	Detailed	• General
			  ○ Standard details and general notes edited for the specific project.
			• Floor Plans:
			  ○ Vertical stacks, risers, leaders, floor drains
			  ○ Horizontal piping runs and pipe sizes / types
			  ○ Water heaters and other equipment
			  ○ Temporary systems or utilities that need to be installed to maintain operating continuity.
			• Site Utilities Plan:
			  ○ Water and gas service, pump houses or pumping stations, as required.
			  ○ Sanitary sewer or sewage disposal system
			  ○ Storm drainage piping and catch basins.
			  ○ Product literature for all equipment (i.e., plumbing fixtures, faucets, water coolers, hose bibs, etc.) exposed to view as well as concealed fixture hangers.

60%	Fire Protection plans and details for all systems	Detailed	• General
			  ○ Standard details and general notes edited for the specific project.
			• Floor Plans:
			  ○ Head and piping layout
			  ○ Fire hose cabinet’s locations
			  ○ Fire extinguisher and cabinet locations
			  ○ Temporary systems or utilities that need to be installed to maintain operating continuity.
			• Distribution:
			  ○ Provide riser diagrams.
			• BAS Control and Monitoring:
			  ○ Provide equipment control schematics, points list, and sequence of operations.
			  ○ Coordination with Amtrak’s Digital Technology Department for secured connection to the Amtrak network.
			• Any other drawings that the Design Consultant deems necessary to represent the intent of the project.

60%	Division 1 specifications with changes tracked for Amtrak acceptance	Detailed	Edits as required to reflect project-specific requirements and the selected delivery-method

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents
60%	Material, prescriptive, and performance Specifications	Detailed	• Table of Contents listing all proposed specification sections to be used for project. • Include all specification sections, developed to the extent possible. • Amtrak Force's Labor Clearance: ○ The Design Consultant shall coordinate the summary of "Work by Owner" paragraph in specification Section 011000 –with Amtrak Force's Labor Clearance process, as directed by the Amtrak Project Manager. Additionally, the Design Consultant shall assist the Amtrak Project Manager in completing the Required Information for Requesting Labor Clearance form.
60%	Engineering calculations	Detailed	
60%	Construction Cost Estimate	AACE 17R Class 2	See 30% Design for additional detail in coordination with the AACE class listed here.
60%	Construction Schedule Estimate	AACERP 37R Level 2	See 30% Design for additional detail in coordination with the AACE level listed here.
60%	Recommended site phasing	Draft	This is to be considered part of the design if required to reasonably convey the feasibility and constructability of the design within the site operational constraints
60%	Responded comment matrix on prior submission	Progress	Indicates where, when, and how each comment will be resolved
60%	Final permits list and record of applications and correspondence	Progress	Based upon Amtrak direction on required permits, all draft submittal plans and applications.
90% Pre-Final Design Submittal			**Summary: The 90% Pre-Final submittal is intended to be functionally complete**. This level of design shall be substantially complete and without ambiguities as to the requirements of the project including all pertinent details so that the documentation is sufficiently detailed, coordinated, and complete to serve as construction documents. The 90% submission shall be sufficient to submit for external, constructability and code reviews, as required. The Design Consultant shall fully cooperate in the external, constructability and code review processes, attending any meetings, if required. Amtrak will provide review comments, including comments from external, constructability and code reviews if applicable. The 90% Submission shall address or otherwise incorporate all previous review comments provided, coupled with a point-by-point response targeting resolution of each comment. The 90% Pre-Final Submittal shall, at a minimum, include the following:
90%	Project Definition Report (PDR)	Finalized	Revisions if/as required. Finalized for record to include decisions made (and reasoning) during design development and any open items required in subsequent phases, as dictated by the Project Delivery Method.
90%	General, Site, Demolition, Civil, Railroad, Architectural, Structural, M/E/P, IT/Comms, and Fire Protection Plans, Sections and Details	Complete	Includes survey, existing conditions, proposed conditions, phasing, etc.
90%	Division 1 specifications with changes tracked for Amtrak acceptance	Conformed	Includes all prior edits reflecting Division of Labor as determined by coordination with Amtrak Project Manager via the Labor Clearance process.
90%	Material, prescriptive, and performance Specifications	Complete	
90%	Engineering calculations	Complete	

Table 1 – Minimum Milestone Deliverables Matrix[1]

Milestone	Contents	State	Notes / Contents
90%	Construction Cost Estimate	AACE 17R Class 1	See 30% Design for additional detail in coordination with the AACE class listed here.
90%	Construction Schedule Estimate	AACERP 37R Level 3	See 30% Design for additional detail in coordination with the AACE level listed here.
90%	Responded comment matrix on prior submission	Pre-Final	Indicates where, when, and how all prior comments are resolved
90%	Recommended site phasing	Final	
90%	Permit status update	Progress	The Design Consultant shall submit the 90% submission to any regulatory authorities, agencies and jurisdictions from which design approvals are required by the Scope of Services.
100% Design / Issue for Bid			**Summary:** This level of design shall be complete and without ambiguities as to the requirements of the project including all pertinent details to allow for bidding and construction with no or minimal need for bid addenda. The Drawings and Specifications shall be complete and will be used for Bid and Construction. All parts of the design documentation shall be finished, including coordination, checking and any other Quality Control or Quality Assurance procedures. The 100% Submission shall incorporate the 90% review comments provided by the Amtrak, and by external, constructability and/or code reviews as applicable. • 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 Consultant shall provide separate and coordinated Bid and Construction Documents. • Reference Documents: As a cohesive Bid Package, all required reference documents (Geotechnical reports, archive drawings, adjacent reference drawings, studies, phasing models, etc.) shall be included and cross-referenced as required.
100%	Final iteration of all prior deliverables	Conformed	Includes all 90% content and comment resolution and associated revisions to any prior deliverables including Signed and Sealed calculations.
100%	Final comment resolution matrix	Resolved	Resolved via the Design Consultant's QA process; provides full project history of all milestones and path to comment resolution and / or closure
100%	Finalized Quality Control reviews	Final	
100%	Signed and Sealed document package	Final	• Drawings shall be labeled “Issued for Bid,” signed and sealed by a Professional Engineer for each specific discipline and/or Registered Architect, each licensed in the state where the project is located. • The Specification Binder PDF shall include a cover sheet, Table of Contents and digital bookmarks for each section. The cover sheet of specifications which must be signed and by a Professional Engineer for each specific discipline and/or Registered Architect, licensed in the state where the project is located.
100%	All necessary permits and approvals	Final	The Design Consultant shall provide originals of all approvals required from regulatory authorities, agencies, and jurisdictions, as applicable.
100%	CAD / BIM / Native Files of all designs, models, and renderings	Final	Resolved external references for a stand-alone project file in native format or exported as directed by Amtrak
100%	Specification-coordinated Submittal List	Final	A list of all the Construction Contractor submittals (shop drawings, product data, certifications, etc.) required in the Bid Documents.

[1] *– Per the Deliverable Requirements and Review Process section above, if a Milestone Deliverable is omitted or adjusted within the SOW, the contents of the altered Milestone listed in Table 1 – Minimum Milestone Deliverables Matrix shall be provided in the prior Milestone listed in the SOW, unless otherwise directed by the DM. For example, if the 90% Milestone is omitted, all 90% deliverables and levels of completion will be expected within the 60% Milestone Deliverable.*

<reserved continuation – end of Chapter>