# Introduction and Glossary

## I. Introduction

### A. Engineering Practices, Specifications, Manuals and Standard Plans (Engineering Services Documents)

**1.** The Amtrak Engineering Services Department has established a system of uniform instructions, or Engineering Services Documents, as part of an overall framework of engineering directives and standards for the purpose of supporting the National Passenger Rail Corporation's overall mission to provide high quality service in a safe, efficient, and effective manner.

a. These Engineering Services Documents are regularly reviewed and revised as part of the Amtrak Engineering Departments continued commitment to meeting the Organization's growing and ever-changing operational and capital needs.

b. See definitions of the various Engineering Services Documents in the Glossary below.

c. Engineering Services Documents are formally issued as official Amtrak documents and are distributed company wide.

d. The Engineering Services Documents serve to coordinate and support the activities of in-house Amtrak employees as well as those of A/E firms, Amtrak Consultants, Contractors, Sub-Contractors, etc. who provide services to National Passenger Rail Corporation directly and indirectly.

e. Engineering Services Documents from either the Structures department or other Engineering Services disciplines (Electric Traction, Communication and Signals, Track) are available upon request (when applicable to the Project) by the Amtrak Project Manager and/or Design Manager

f. **External facing Engineering Services Documents** can be located here: https://allaboard.amtrak.com/s/engineering-services

### B. Engineering Practice 4000 (EP4000)

**1.** EP 4000 defines certain technical requirements, responsibilities, and procedures expected of a Design Consultant (interchangeable with "Design Contractor," but not to be confused with a Construction or General Contractor) in providing professional Design and Construction Phase technical services for Amtrak Engineering Services – Structures in compliance with their agreement or contract for professional architectural/engineering design and engineering services.

a. At Engineering Services' discretion (as determined by the Deputy Chief Engineer, Structures), EP4000 may also be applied to a third-party DOR (i.e. design services not directly contracted by Amtrak and/or not under Amtrak's direct oversight) for other work on, over, adjacent to, or with the potential to impact Amtrak property.

b. These requirements are also applicable to a DOR providing services in partnership with a GC under any project execution relationship (e.g. Design-Build, delegated designs, etc.).

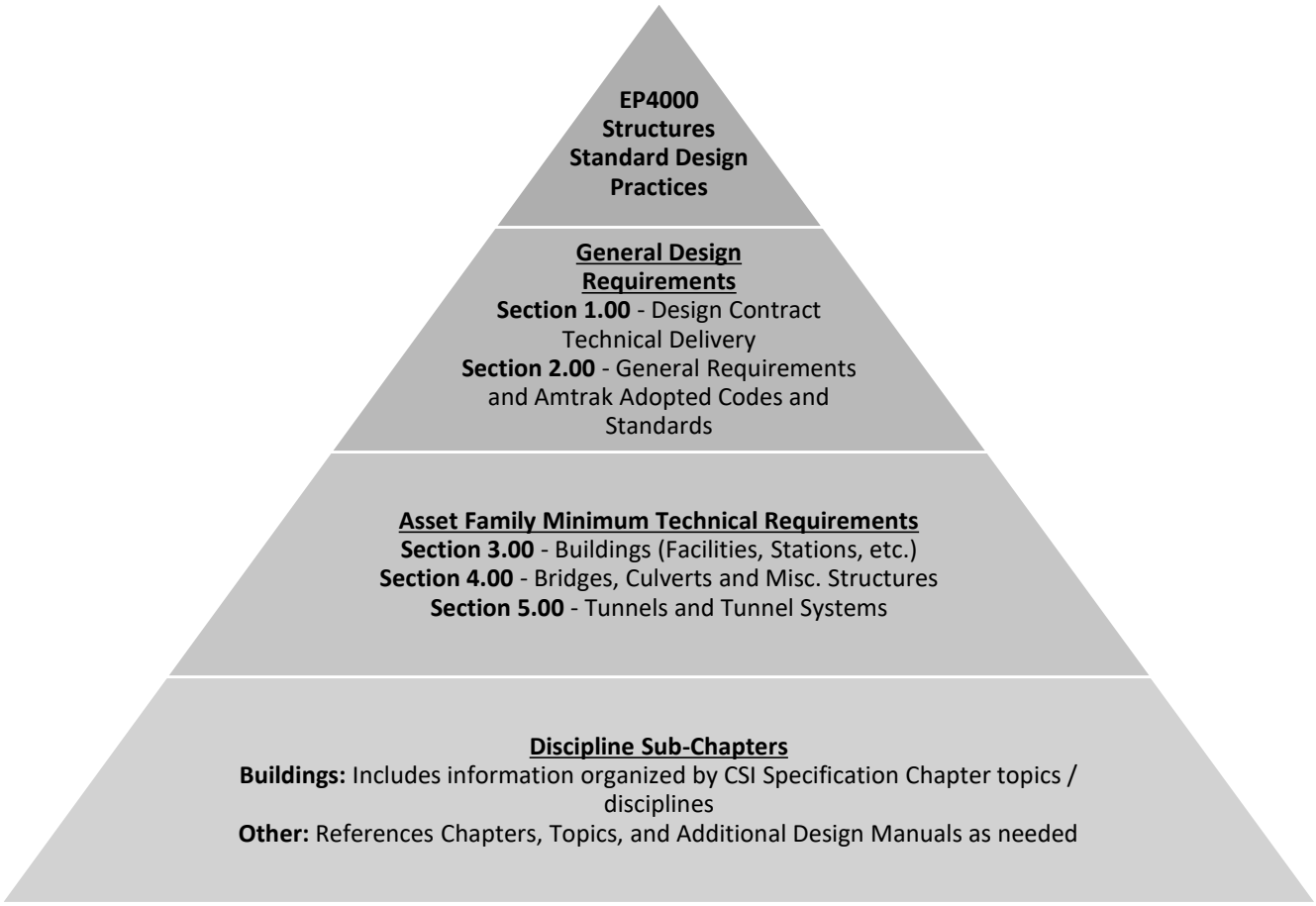
**2.** Amtrak Engineering Services has authored and maintains this document.

**3.** This document is separated into distinct Sections and Chapters which may be implemented individually or together to suit the needs of the Project or asset class at the discretion of Engineering Services.

**4.** Where this document refers to the Design Consultant, it shall include all subcontractors / subconsultants to the Design Consultant, as well as the subcontractor's respective representatives, employees, and any manufacturers, suppliers, or other entities that may be providing services to the Design Consultant.

5. Suggestions or reports of potential errors, omissions, redundancies or oversights are welcome at this address: **EngDesign.Review** EngDesign.Review@Amtrak.com

6. EP4000 organizational hierarchy:




This graphic represents the general hierarchy of this document. Notwithstanding this layout, the design process for several Amtrak assets and Projects cannot walk through this hierarchy in a linear fashion. As noted below in Terms and Definitions: A station may simultaneously include aspects of a bridge or a tunnel while also being a building. A tunnel fan plant is also a building. A comprehensive design criteria and code analysis report will be required to ensure seamless handoff and simultaneous compliance across all boundary conditions, with conflicts resolved by Amtrak Engineering Services following due diligence, supporting research / analyses, and notice by the Design Consultant.

a. “Additional manuals” include:

   i. Amtrak Bridge Design Manual

   ii. Amtrak Stations and Corporate Facilities Design Manual

**C. Minimum Technical Requirements**

**1. Purpose**

a. The purpose of the following Minimum Technical Requirements (Sections 3 and onward, as dictated by the Project asset) is to establish standard minimum design criteria to produce and document designs, including development of both prescriptive specifications and/or performance specification sections, that may differ from, augment, or explain Amtrak's application of adopted codes (EP4000 Section 2.00) as well as State and Local codes and standards. Per to the direction in Section 2.00, follow the Design Exception Request (DER) process for deviations from the provided Minimum Technical Requirements.

b. The information provided is intended to represent Amtrak-unique minimum standards. The Design Contractor shall also incorporate current industry standards and practices for any portion of the design that may not be addressed by applicable local codes and standards.

c. The Minimum Technical Requirements do not represent any complete specification section, nor do they represent a complete list of all specification sections that may be required for the Project, but rather provide information (Section 3 - Buildings being organized approximately in parallel to the Masterspec standardized construction specification chapter sequencing) that shall be incorporated into the construction documents as applicable in accordance with EP4000, Section 1.00. The Design Contractor shall use their developed specifications in conjunction with other Amtrak Performance Specifications (if/as established) in creating a complete set of drawings and specifications that are specific to the Project for which they have been contracted.

d. Where sections refer to "Installation" requirements, which are typically directed toward the Construction Contractor, the intent is for the Design Consultant to include adequate detail in the drawings and/or specifications to convey this instruction as part of the Bid Package. EP4000 is not intended to be a part of a construction bid package.

e. Where a "preference" is noted, that wording should be interpreted as Amtrak's default requirement that should only be deviated from via the DER process or by explicit written instruction from the Amtrak Design Manager.

**D. Project Requirements**

**1.** In addition to this EP4000's Sections and References, the following documents also serve to establish the minimum expectations and requirements for a Project:

a. Requests for Proposal / Scope of Work (SOW) as issued by Amtrak for a Project

i. These documents are project-specific and may modify or augment the core requirements dictated herein.

b. Conditions of any Contract or Agreement established between Amtrak and the Design Contractor

i. See Section 1.00 for additional information on the standard Design Contract Technical Delivery Requirements.

(i) OPTION Tasks of the Contract between Amtrak and the Design Contractor

1. Options that are documented within the Scope of Work and activated in writing by the Amtrak Contracting Officer's Technical Representative (COTR) and granted combined or independent Notice to Proceed by Amtrak Procurement define the additional optional tasks and particular deliverables expected from the Design Contractor.

2. These Option tasks are generally required for more complex projects or projects with an undetermined delivery, design, or regulatory path.

c. Amtrak's Adopted Codes and Standards

i. See Section 2 for the list of currently adopted Codes and Standards and additional detail on jurisdictional conditions.

d. Amtrak Structures – Minimum Technical Requirements

i. See Section 3 for Amtrak "Minimum Building Technical Requirements."

(i) These criteria are organized by typical CSI Technical Specification Chapter notation to facilitate understanding of applicability and are intended to represent Amtrak-unique code interpretation, deviation, or augmentation.

(ii) These Chapters are written as instruction to the Design Consultant during their design phase work and are **not** organized as, or intended to be, full or partial replacements for final design and/or technical specifications. The Design Consultant is responsible for developing final design specifications to the extent required as outlined in other Sections of this document and the Scope of Work.

ii. See Section 4 for Amtrak "Minimum Bridge Technical Requirements" which also applies to Culverts and miscellaneous ROW structures.

iii. See Section 5 for Amtrak "Minimum Tunnel Technical Requirements" which also applies to Tunnel / Overbuild Systems and associated Fire and Life Safety direction unique to enclosed railways.

e. Other Engineering Services Documents

i. Other categories of Engineering Services Documents include General, Structures, Track, Communications and Signals, or Electric Traction and are produced and maintained by their respective departments as noted within each document.

ii. Compliance with, application of, and exceptions to those Engineering Services Documents are at the direction of the Amtrak Engineering Services - designated technical Subject Matter Expert(s) providing project input on behalf their department.

iii. Applicable Engineering Services Documents will be provided to the Design Consultant by the Amtrak Project Manager or Design Manager as appropriate, or can be found at the link above.

f. Template Specifications

i. Select Amtrak-specific specifications templates have been developed where appropriate to accommodate unique railroad conditions, safety requirements, or provide a starting point for performance specifications of railroad maintenance machinery or other non-standard requirements.

ii. Structures Template Specifications

(i) Certain railroad-specific technical master specifications are included in sub-sections of referenced EPs or otherwise provided within the Structures Template Specification Library located here (or provided by the DM): https://amtrak.sharepoint.com/sites/ENGStructures-Facilities-Tunnels/Specification%20Templates/Forms/AllItems.aspx (Internal Amtrak link, DM to provide)

iii. Division 1 Template Specifications

These specification sections shall be included for all projects unless specifically omitted by the Design Manager (DM).

(i) Division 1 Template Specifications (Amtrak Internal Link, PM to provide) and other "up front" but non-commercial and non-technical requirements are maintained by Amtrak's Capital Delivery Project Services group. The Design Consultant will tailor these templates to the anticipated delivery strategy and project-specific requirements.

(ii) At a minimum, the following sections shall be included (and redlined by the Design Contractor for Amtrak DM/PM review and acceptance) within the Project Specifications to suit the individual project:

1. 011000 – Summary of Work
2. 012500 – Substitution Procedures
3. 013000 – Project Management and Coordination
4. 013513.23 – Special Procedures for Railroad Facilities
5. 013543 – Environmental Procedures
6. 014000 – Quality Requirements
7. 015000 – Temporary Facilities and Controls
8. 017300 – Execution
9. 017700 – Closeout Procedures
10. 017839 – Project Record Documents
11. 019113 – General Commissioning Requirements

**II. Glossary of Terms and Definitions**

- **Amtrak Engineering Services:** Amtrak department responsible to define and approve Project scope, design standards and design decisions. Amtrak Engineering Services is Amtrak's ultimate technical authority for all of Amtrak's fixed infrastructure assets, including all Buildings and Stations.
- **Amtrak Engineering Services, Structures:** Department within Engineering Services responsible for infrastructure and building assets, including miscellaneous associated stationary equipment. General assets under Engineering Structures oversight are as follows:
    - Bridges: includes all undergrade bridges, culverts. and other miscellaneous structures that support the ROW
    - Tunnels: includes all tunnel systems that may extend beyond the physical boundaries of the tunnel, including egress paths, SCADA systems, fire detection and alarm, standpipes, drainage, and ventilation systems (including both fan plants and plenums to open air), etc.
    - Buildings: generally subdivided into Stations and Facilities
    - Stations: includes traditional passenger stations as well as Corporate Facilities (office spaces, operations centers, etc.)
    - Facilities: includes Maintenance of Equipment (MOE), Maintenance of Way (MOW), Wayside Support, and other Yard presences including employee welfare facilities, material control, modular / relocatable buildings, corporate security / APD, etc.
    - **Note**: These asset families overlap. A station may simultaneously include aspects of a bridge or a tunnel. A tunnel fan plant is also a building. The Design Consultant will evaluate all boundary conditions and understand and apply all technical requirements appropriately and with common sense. In all cases, Engineering Services can arbitrate and dictate the applicable requirements as needed.
- **Amtrak Engineering Practice (EP):** One of a series of uniform instructions issued and maintained by Amtrak Engineering Services, that provide engineering directives and standards to coordinate and support the activities of in-house Amtrak employees as well as those of A/E firms, Amtrak Consultants, Contractors, Sub-Contractors, etc. who provide services to National Passenger Rail Corporation directly and indirectly.
- **Amtrak Engineering Specifications:** In this usage, Engineering Specifications are prescriptive requirements documents issued by Amtrak Engineering Services for use by non-Amtrak professional engineers in the design of railroad infrastructure. This differs from Specifications developed and customized for a specific Project by the Design Consultant.
- **Amtrak Standard Plans:** Technical drawing documents issued by Amtrak Engineering Services that establish pre-approved, repeatable design details, assemblies, or equipment / structure layouts for commonly used infrastructure elements. Standard Plans may be incorporated directly into contract documents or recreated with minor Project-specific customizations with the permission of the Design Manager.
- **Amtrak Design Manual:** A document issued by Amtrak Engineering Services that establishes the design requirements, preferences and guidelines specific to a defined class of assets (e.g. Bridges). A Design Manual is code-adjacent and details criteria, interpretations, exceedances, or deviations from established code and regulatory requirements to reflect Amtrak's policies, performance objectives, operational constrains, or asset management and maintenance strategies. This is a binding reference similar to Engineering Practices.
- **Amtrak Contract Officer (CO):** Designated Procurement representative with commercial approval authority for a given contract.

- **Amtrak Design Manager (DM):** The Amtrak Engineering Services employee who represents the Engineering Department for the Project. This individual typically leads the scope development, coordinates all technical aspects of the Project, and provides technical direction to the Design Consultant. Note there may be multiple DMs assigned to a Project, particularly if there are multiple design disciplines involved.
- **Amtrak Project Manager (PM):** The individual employed by Amtrak to oversee and have ultimate responsibility for the scope, schedule, and budget of a Project. The Amtrak Project Manager will consult with Amtrak Engineering Services on behalf of a Project.
- **Deliverable:** Any of the specific services such as construction drawings, specifications, construction budgets, construction timelines, or other documents which the Design Consultant will provide to Amtrak as identified and described herein and in Requests for Proposal and Scope of Work (SOW) documents.
- **Design Consultant (Designer of Record, DOR, EOR, DC, "Design Contractor"):** Contractor engaged by Amtrak to provide professional services for a Project or other initiative. Definition extends to all outsourced consultants and sub-contractors as well as all respective representatives and employees. The entity awarded the Contract shall be responsible for fulfillment of all Project requirements.
- **Design and/or Code Directive:** A formal document issued by Amtrak Engineering Services that serves to articulate the resolution of a technical issue, to override standards or guidelines for specific elements or conditions, to provide clarification, to resolve conflicts, or to supplement standards. See EP0007, "Design Directives and Variances."
- **Design Exception Request (DER, Variance):** The process and form through which Amtrak may grant targeted exceptions to Amtrak Standards, Amtrak Engineering Practices or Prescriptive Code requirements on an individual basis and with adequate substantiation, justification, and support. See EP0007, "Design Directives and Variances."
- **Project:** As described in Requests for Proposals and Scope of Work (SOW) Documents. This includes any other enterprise or initiatives for which Amtrak may engage a Design Consultant.
- **Project Definition Report (PDR):** Deliverable document which includes, but is not necessarily limited to; scope description, code analyses / summaries, potential design issues, all pre-design scopes (geotechnical, utility surveys, topographical surveys), NEPA/SHPO/Section 106 summaries, and further due diligence. The PDR must include a Statement of Criteria and Basis of Design for the Project. The PDR is considered a living document and shall be updated and reissued throughout the design phase as needed to capture changes. See Section 1.00 Deliverables for more information.
- **Scope of Work (SOW)** / **Request for Proposal:** Documents issued by Amtrak to a Design Consultant which are Project specific and define the work a Design Consultant will complete for Amtrak. Also: "Scope of Services".