

AMTRAK ENGINEERING PRACTICES Structures Department Standard Design Practices (SDP)	Section 3 – Minimum Technical Requirements	EP4000
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Finishes

I. Interior Construction Assemblies

A. General:

Interior Construction Assemblies shall, where appropriate, consist of the following:

B. Materials

1. Walls
 - a. Masonry; exposed or with wall finish
 - b. Metal stud and gypsum board construction

C. Installation

1. Walls enclosing secured areas shall be continuous from the floor to the underside of the structure above:
 - a. Telecommunications and Server Rooms.
 - b. Amtrak Police Offices and Security Rooms.
 - c. Toilet Rooms
 - d. Bathrooms
 - e. Locker rooms
 - f. Nursing Rooms

D. Interior Finishes

1. General

- a. Coordinate finish selections with the appropriate substrate system selected for the project.
- b. Finishes are project specific and should be determined within the context of the project design, and with the approval of the Amtrak Design Manager, but where practicable and appropriate, finishes should be selected from the finish schedule below.
- c. Other finishes shall be allowed where the finishes are intended to match the existing, are subject to historic commission approval, or for first class lounges or similar spaces.
- d. Additional trim, including, but not limited to wainscoting shall be permitted where that trim is intended to complement the design or where required to match existing.

E. Office Size

- a. Comply with Amtrak Standards for Corporate Office policy. Confirm current Amtrak standards with Project Manager or Design Manager prior to design.

F. Interior Finish Schedule for typical spaces in Facility Buildings

1. Amtrak Finish Schedules detail acceptable finishes in table form for typical spaces within structures and facilities. Alternate finishes may be used with written approval from Amtrak's Design Manager. See the Finish Preferences Table below.

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Finish Preferences Table P = Preferred; A = Avoid; # = Footnotes at Bottom of Table						
Finish Types ↓	Vestibule leading to lobby, entrance hall, etc.	Corporate Offices	Toilet Rooms	Locker Rooms	Janitor's Closet	Storage Rooms
Floors						
Rubber Sheet	P	P	P	P		P
Epoxy	P	P	P	P	P	
Vinyl Tile	A	A	A	A	A	
Porcelain tile (large format)			P	P		
Sealed concrete					P	P
Carpet tile		P				
Wood	A,10	A,10	A	A	A	A
Base						
Compatible with floor finish	P, 4	P	P, 5	P, 5		
Resilient base					P	P
Walls						
Masonry	P,6	P		P	P	P
Solid surface panels			P	P		
Porcelain tile (large format)			P	P		
Ceramic tile			P	P		
Gypsum Board	P,1,6	P	A	A, 3	P,1	P

Finish Preferences Table P = Preferred; A = Avoid; # = Footnotes at Bottom of Table						
Finish Types ↓	Vestibule leading to lobby, entrance hall, etc.	Corporate Offices	Toilet Rooms	Locker Rooms	Janitor's Closet	Storage Rooms
Ceiling						
Painted Gypsum Board	P	P, 2	P	P	P	
Suspended metal grid and acoustical ceiling panels	P	P	A	A		P
Open	P		P, 9	P, 9		
Exposed structure					P, 8	P, 8
Accessories						
Miscellaneous					7	

1. All gypsum board below 8'-0" above the finish floor shall be covered with a durable material such as ceramic tile, abuse-resistant gypsum board or other material.
2. Required if it is not possible to construct walls to underside of structure
3. Unless being used to match other existing walls
4. Where possible, use coved base to match floor finish
5. Form coved base with floor finish to minimum 6" above top of finished floor.
6. Appropriate modifications to wall finishes shall be made for wet applications.
7. Install stainless steel or solid surface panels at walls around service sink that are subject to water exposure as required by code
8. If this meets code requirements
9. If walls forming the room are to the underside of roof or floor above to prevent privacy and security concerns.
10. Except where trying to match an existing floor.

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II. Common Materials

A. The Following sections refer to some of the commonly used materials in Amtrak projects with guidelines and Amtrak standards required for use of these materials on Amtrak projects. All materials used on Amtrak projects whether listed in this section or not must be installed to comply with applicable codes, Amtrak Standards, Project specific standards, manufacturer installation instructions, and all warranty requirements.

B. Gypsum Board Assemblies

1. General

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

2. Gypsum Board

a. All interior gypsum board shall be paperless moisture- and mold-resistant glass-mat gypsum wallboard products with moisture-resistant surfaces complying with ASTM C 1396/C 1396M as well as ASTM C 630 and ASTM C 1177.

i. At fire rated walls, use fire rated gypsum board complying with ASTM E 119 as required by Code.

ii. At locations where paint shall be the only finish, the gypsum board shall be abuse-resistant.

(i) Surface Abrasion Resistance: Classification Level 3 in accordance with ASTM C 1629.

(ii) Indentation Resistance: Classification Level 1 in accordance with ASTM C 1629.

(iii) Soft Body Impact Resistance: Classification Level 2 in accordance with ASTM C 1629.

(iv) Hard Body Impact Resistance: Classification Level 1 in accordance with ASTM C 1629.

b. Toilet rooms, Janitor's closets, and other rooms receiving solid surface or tile finish.

i. Use glass mat water resistant backing board with water resistant coating complying with ASTM C1178/C1178M.

c. All exterior gypsum board shall comply with ASTM C1177/C1177M.

3. Accessories

a. All interior and exterior concealed trim and accessories shall be rolled zinc or extruded aluminum complying with ASTM C1047.

b. Joint Materials

i. General Interior

(i) Joint tape shall be a fiberglass mesh tape.

(ii) Prefilling, embedding and the first coat shall be a setting type joint compound.

(iii) Additional layers may be with a standard joint compound.

ii. Tile Backer Board

(i) Joint tape shall be a fiberglass mesh tape.

(ii) Joint compound shall be a setting type.

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c. Sound Attenuation Blankets

- i. Recycled cotton fiber insulation complying with ASTM E90-02, ASTM423
- ii. Glass fiber acoustical batts complying with ASTM C 665, Type I

4. Installation:

- a. Installation shall be in strict accordance with the referenced material and with the written instructions of the manufacturers.

5. Finish Level

- a. Finish panels as required by gypsum panel manufacturer for the particular application, but not less than to levels indicated below and according to ASTM C 840:
 - i. Level 1
 - (i) Ceiling plenum areas, and fully concealed locations
 - ii. Level 2
 - (i) Areas that are substrate for tile or solid surfaces and semi-concealed locations
 - iii. Level 4
 - (i) All other locations fully exposed to view and to be painted where abuse-resistant gypsum board is not employed.
 - iv. Level 5
 - (i) All locations where abuse-resistant gypsum board is employed.

C. Portland Cement Plaster (Stucco)

1. General

- a. All materials, accessories, preparation, installation methods, finishes and repairs shall be in strict accordance with the requirements and recommendations of the Portland Cement Plaster/Stucco Manual published by the Portland Cement Association.

2. Materials

- a. Ready-Mixed Finish-Coat Plaster: Mill-mixed Portland cement, aggregates, coloring agents, and proprietary ingredients.
 - i. All ingredients including water shall be portioned in exact quantities and prepared consistently to maintain a consistent product at all locations throughout the project.

3. Accessories

- a. Expanded-Metal Lath: ASTM C 847 with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
- b. Screeds, joints, and other accessories as required: zinc and zinc-coated (galvanized)

4. Mockups

- a. Before plastering, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

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- i. Mockup shall include a vertical and horizontal joint, an inside and outside corner, top and bottom conditions, and connections to other materials.

5. Installation

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

D. Tiling

1. General

- a. Comply with all the requirements and recommendations of the TCNA, Tile Council of North America, Inc. and the most current version of the TCNA Handbook for the product specified and the particular application.

2. Materials

- a. Porcelain Tile
 - i. Maximum reasonable size for the particular application.
- b. Ceramic Tile
 - i. Floor tile
 - (i) Unglazed ceramic tile in maximum reasonable size for particular application.
 - ii. Wall tile
 - (i) Glazed ceramic tile in maximum reasonable size for particular application.
- c. Trim Units
 - i. Provide cove bases, wainscot caps, corner units, and other trim as required.
 - (i) Where pre-formed pieces are not available, specify a silicone sealant at inside corners (not grout).
 - ii. Thresholds
 - (i) Install ADA compliant threshold compatible with the selected floor finish that will prevent water migration.
- d. Substrate:
 - i. Floors
 - (i) Concrete structure.
 - (ii) Portland Cement mud bed.
 - (iii) 1/2" cementitious tile backer board.
 - ii. Walls
 - (i) Masonry wall.
 - (ii) Portland cement mud bed.
 - (iii) Cement backer board.

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(iv) Glass-Mat faced gypsum backing boards.

e. Waterproof membrane

i. Provide waterproof membrane compatible with TCNA installation at floors and walls of all toilet rooms, locker rooms, shower rooms and other wet areas as applicable.

f. Setting Materials

i. As per TCNA recommendations for the particular substrate and application.

g. Grout

i. All grouts shall be epoxy and installed as per manufacturer’s written instructions.

3. Installation

a. Install all products in strict accordance with the latest TCNA guidelines and with manufacturer’s written instructions.

b. Large-scale tiles cannot be installed on an uneven or warped surface. A floor installation of large-scale tiles may require a mud bed installation.

c. Layout tile to minimize cutting, align and provide uniform joint widths.

d. Fit tile tight to all edges, abutting trim, built-in items, and to penetrations. Terminate work neatly at all edges.

e. Layout tile wainscots to next full tile beyond dimension indicated unless this would restrict another critical alignment.

4. Cleaning and Protection

a. Clean all surfaces and protect in accordance with tile and grout manufacturer’s written instructions.

E. Acoustical Ceiling Panels

1. Materials

a. General

i. Acoustical ceiling systems are to be used judiciously in public areas due to potential concealment of contraband or other undesirable materials above the suspended panels by individuals with malicious intent.

ii. Fire Resistance: The system specified should have a fire resistance rating of composite Class “A” per ASTM E1264.

iii. Considerations:

(i) Light Reflectance: Ceiling systems may be utilized to reflect indirect light to create a desirable quality of lighting within a space and to maximize natural daylight. Consult with the Amtrak Project Manager if such considerations are appropriate for the application and should be investigated. If so, consult with the Amtrak Project Manager about criteria of light reflectance to be used.

(ii) Sound Absorption: Acoustical ceiling systems are an effective way to reduce noise within a space. Consideration of the noise reduction properties of a product and its effect in a space should occur in the design process. Consult with the Amtrak Project Manager if such considerations are

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appropriate for the application and should be investigated. If so, consult with the Amtrak Project Manager about criteria of noise resistance to be used.

iv. Security /Vandal Resistance

- (i) If proposed in a public area of a station, security ceiling systems, such as metal torsion spring ceiling systems, should be examined and presented to the Amtrak Project Manager for review for appropriateness in the given application. Consideration must be given to ease of maintenance by Amtrak forces, as well as security.

b. Ceiling Panels

- i. Standard thickness should be ¾” minimum.
- ii. Tile should be made of 50% recycled content, pre and post production, at minimum.
- iii. Avoid using patterned and multiple tegular beveled panels which tend to cost more to replace when damaged, due to additional labor associated with their edge/joint detail and finish.
- iv. Specify moisture resistant panels, rated to 99% humidity resistance where they are to be installed at in unconditioned spaces, or any other locations subject to high humidity.

2. Installation

- a. Install in accordance with manufacturers' specifications and in accordance with ASTM 635, Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings, and ASTM 636, Standard Practice for Installation of Acoustical Tile and Lay-in Panels.
 - i. Where required for fire-rating, vandal resistance, or at ceilings located in drafty locations, employ grid manufacturer’s hold-down clip accessories.
- b. Ceiling grids shall be symmetrical on each space and/or room, unless specifically noted otherwise.

F. Wood Flooring

1. Existing Installations

- a. The use of wood flooring should be avoided unless the station or facility is existing and/or historic and where the new wood floors are intended to match the existing or replace the existing in-kind.

G. Resilient Base and Accessories

1. Materials

- a. Rubber base is preferred over vinyl base, where appropriate.

2. Accessories

- a. When available, specify prefabricated inside and outside corners.

H. Resilient Tile Flooring

1. Materials

- a. Resilient Tile.
 - i. Resilient floor tile shall be commercial or heavy-duty grade.
 - ii. Where alternatives are available, vinyl flooring should be avoided.

b. Adhesive

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- i. Use only adhesives that are approved for the particular product and application by the resilient tile manufacturer.

2. Accessories

- a. Provide transition/reducing strips tapered to meet abutting materials.

3. Installation

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

I. Terrazzo Flooring

1. General

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

2. Materials

- a. Terrazzo shall be a thin-set epoxy resinous terrazzo except where matching existing cementitious terrazzo finishes or where accepted by the Amtrak Project Manager to suit particular project requirements.
- b. Thin-set epoxy resinous terrazzo shall not be employed over light-weight concrete installed at elevated slabs.

3. Accessories

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

4. Installation

- a. Field verify actual dimensions of construction prior to installation of joints and pre-casting of units.
- b. Comply with NTMA’s and manufacturer’s details written instructions for preparation of surfaces, and terrazzo and accessory installation.
 - i. Due to the extended time required for moisture curing, epoxy terrazzo should not be used on light weight concrete.

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- ii. Concrete slabs-on-grade shall be installed over a vapor barrier as indicated in the concrete section.
- iii. Ensure that in-situ moisture vapor transmission testing is performed and that the results meet manufacturer’s criteria before applying finish.
- c. Protect other work from dust, water, and noise generated by grinding operations. Control dust, water, and noise by erecting temporary enclosures or by other methods acceptable to Amtrak.
- d. When installing precast terrazzo tiles or other components, seal joints between precast units with an epoxy grout to match the terrazzo matrix.
- e. Clean, seal, and protect finished surfaces according to NTMA’s and manufacturer’s written recommendations.

J. Resinous Flooring

1. General

- a. Resinous flooring shall be seamless and slip resistant heavy duty epoxy troweled mortar floor system.

2. Materials

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

3. Accessories

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

4. Installation

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

5. Warranty

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

K. Carpeting

1. General

- a. Carpet should be avoided except within office spaces.
 - i. Where carpet is installed, all materials and installation methods shall be in compliance with Carpet and Rug Institute standards including the Green Label and Green Label Plus programs.

2. Materials

- a. Carpets shall be modular or tile type that are easily replaceable and have a very dense loop-pile carpet with a low pile height for heavy-traffic areas.
- b. The carpet design shall have diversity of color variations to conceal soiling and all fibers shall be solution dyed.

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c. All carpeting, backing, transitions, and all other accessories shall be in strict conformance with the ADA requirements for walking surfaces.

3. Accessories

a. Provide ADA-compliant transitions where required.

4. Installation

a. All carpet shall be installed in accordance with the Carpet and Rug Institute (CRI-104) Standard for installation of Commercial Carpet, latest edition.

i. Carpet installations shall be direct glue-down and shall not include any additional padding other than padding that may be an integral part of the carpet backing system.

L. Interior Wall Paneling

1. Standards of the following, as referenced herein:

- a. American National Standards Institute (ANSI)
- b. American Society for Testing and Materials (ASTM)
- c. National Electrical Manufacturers Association (NEMA)
- d. NSF International

2. Intent

a. The following are preferred advantages for the use of this material and should be considered while selection, design and specification of products. Products should not be specified or designed if they do not meet the following requirements.

- i. Vandalism Resistance and Remediation: This material can facilitate the removal of defacing and surface scratch vandalism with common buffer tools.
- ii. Reduced number of joints: This material can reduce the number of exposed joints by Panelization, which facilitates hygiene and speed of installation. Tile-like installation is not the intent of such a product unless the panel merely “mimics” a tile application while being installed as a panel.

3. Materials

a. Acrylic solid surface with a non-porous, homogeneous material that maintains the same surface composition throughout, with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

b. Thickness

- i. ½” thickness is preferred for impact resistance.
- ii. ¼” thickness is acceptable in low-impact areas.

c. Color requirements:

- i. Must be opaque (i.e. not translucent) on wall surfaces to limit visibility of substrate and adhesive beneath.
- ii. Amtrak Project Manager to establish if a standard color chart is applicable for a particular project.

(i) If a standard color chart is applicable, color to match standard.

(ii) Matte; gloss range of 5–20.

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4. Fire test response characteristics:

- a. Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - i. Flame Spread Index: 25 or less.
 - ii. Smoke Developed Index: 450 or less.

5. Shop assembly

- a. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer’s instructions and technical bulletins.
- b. Form joints between components per manufacturer’s recommendation without conspicuous joints.
- c. Reinforce with strip of solid polymer material, 2" wide.
- d. Rout and finish component edges with clean, sharp returns.
- e. Rout cutouts, radii and contours to template. Smooth edges.
- f. Repair or reject defective and inaccurate work.

6. Installation

- a. Joint types allowed:
 - i. Monolithic panels with hard seamed joints creating an inconspicuous joint.
 - ii. Butt joint (chamfer allowed per designer discretion) joint between panels no bigger than 1/16" at joint detail. Seal with silicone sealant.
 - iii. Utilize butt joint to allow for expansion / contraction per manufacturer’s recommendation.
- b. Substrate requirements:
 - i. Substrate to be glass-mat faced gypsum backing boards or cement board.
 - ii. Panels attached to substrate with clear silicone adhesive per manufacturers recommendations.
 - iii. Color matched silicone sealant used in corners and butt joints.

M. Painting

1. Materials

- a. Paints shall be commercial or heavy-duty grade expected for long durability and reliability.
- b. All external systems in contact with any walking surface will require protection from salt corrosion.
 - i. Use only low-odor and low VOC products that meet or exceed Code requirements.
- c. Provide materials for use within each paint system that are compatible with one another, and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- d. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- e. Utilize graffiti-resistant paint as appropriate for the application and project.

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2. Accessories

- a. Incorporate breaks, reveals, or other architectural details to divide large expanses of painted surface.

3. Installation

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

N. High-Performance Coatings

1. General

- a. Long-lasting exterior finishes are encouraged, and special coatings may be specified as part of a planned low-maintenance building project. Among the special coatings that can be used are powder coat finishes applied off-site, anodized finishes, tnemec paints / high-performance protective coatings, and epoxy paints.
 - i. Shop-applied special finishes are preferred to site-applied, due to better control of conditions.
 - ii. Exterior metals must be coated if not naturally weather-resistant such as copper and brass.
 - (i) Steel should be galvanized prior to receiving finishes unless the specifications for a special coating will not permit galvanizing.
- b. Regardless of finish used, manufacturers' instructions for on-site application and touch-up of finishes are to be followed. As part of the submittal process, those instructions are to be provided to the Project Manager, with a copy for the Maintenance Paint Shop foreman.

2. Traffic paint

- a. Traffic paint shall be state or federal DOT approved waterborne reflective traffic coating.