Specifying Code-Compliant Toilet Partitions

Version 2.1

BOBRICK

BUILDING VALUE SINCE 1906

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This course will provide up-to-date information relative to selecting and specifying code-compliant toilet partitions for commercial restrooms. Fire and accessibility codes will be discussed, as will guidelines for writing toilet compartment specifications.

Course Description

1. Understand current toilet partition material fire code compliance.
2. Learn how to select the most appropriate toilet partition material, hardware and mounting configuration based on building type.
3. Describe three ADA accessible toilet compartment layouts.
4. Identify guidelines for writing toilet compartment specifications.

Learning Objectives

Discuss current toilet partition material fire code compliance.

Learning Objective One

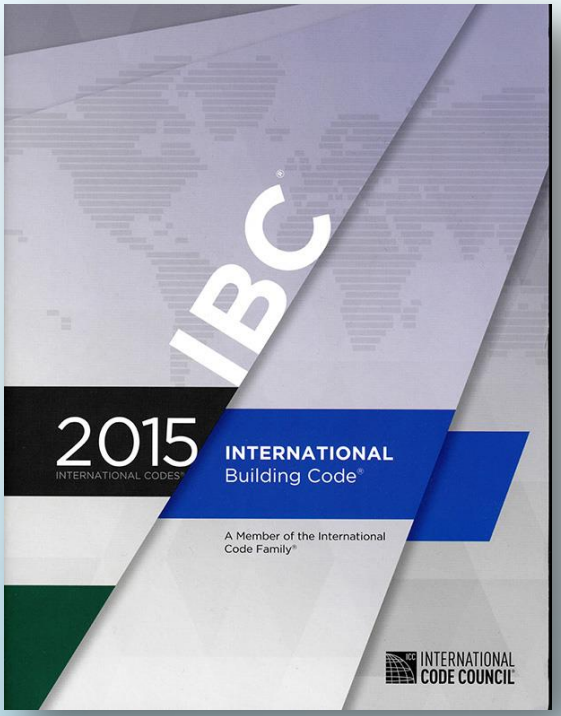
- Model codes and standards related to fire safety and building construction developed by:
  - ICC
  - NFPA
- Codes and standards mandatory when adopted by a jurisdiction.
- Many major corporations require compliance.

Toilet room privacy partition codes:

- International Building Code (IBC)
- International Fire Code (IFC)
- NFPA Life Safety Code® (NFPA 101®)
- NFPA Fire Code (NFPA 1)

ICC and NFPA codes have been revised:

- Toilet room privacy partitions are now regulated as interior finish and as such shall comply with interior finishes compliance standards.



Revised Toilet Partition Requirements

- Non-PP and Non-HDPE toilet partition materials:
  - Stainless steel
  - Painted metal
  - High pressure laminate (HPL)
  - Compact laminate (CL)
  - Color-through-solid phenolic core
  - Solid color reinforced composite (SCRC)
- Must be tested in accordance with:
  - ASTM E 84
  - UL 723
- Or alternatively,
  - NFPA 286 Room-Corner Test

ASTM INTERNATIONAL
Standards Worldwide

UL®

Non-PP and Non-HDPE Interior Finishes

Requirements for polypropylene and high-density polyethylene have been revised:

- ASTM E 84 is not best method for testing certain plastics.
- NFPA 286 Room-Corner Test is proper way to regulate them.
- All 4 codes require interior finishes using PP or HDPE be tested in accordance with NFPA 286 Room-Corner Test.

PP and HDPE Interior Finishes Compliance

Standard NFPA 286 test method with HDPE untreated panels mounted on fire test room walls.

HDPE untreated panels being tested as they would be installed as toilet partitions in the field.

NFPA 286 Room-Corner Test

Request Test Documentation Confirming Compliance

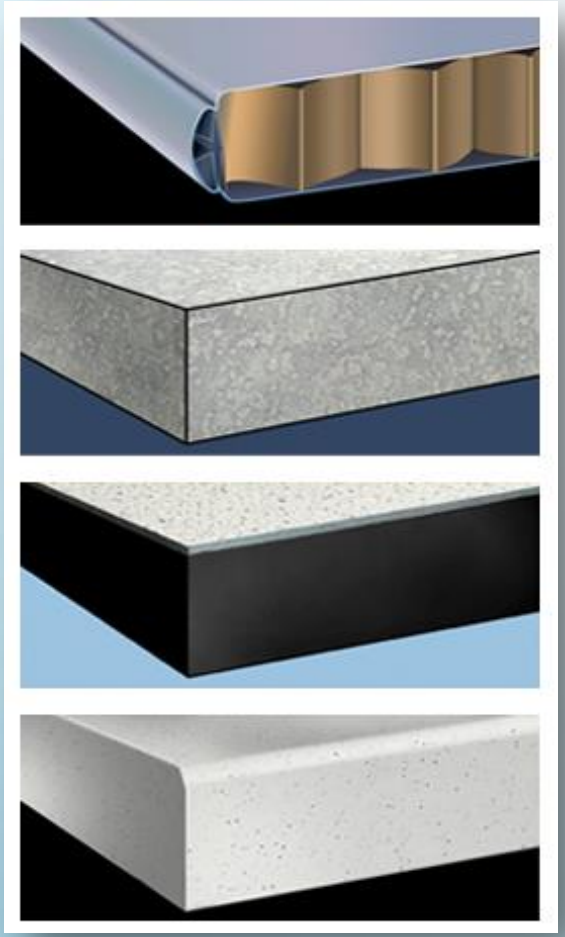
Material	Test
HPL, CL, Color-Through-Phenolic, SCRC	ASTM E 84, UL 723 or NFPA 286
PP, HDPE	NFPA 286

Confirm Compliance with Test Documentation

Learn how to select the most appropriate toilet partition material, hardware and mounting configurations based on building type.

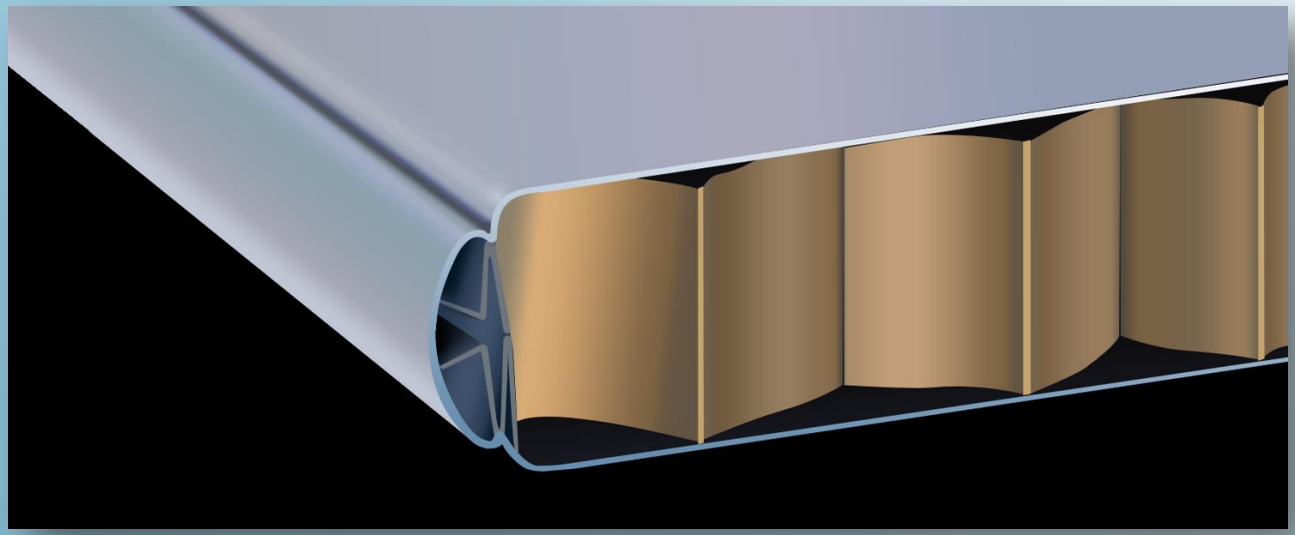
Learning Objective Two

- Honeycomb Construction
  - Painted metal
  - Stainless steel
- Bonded Construction
  - High pressure laminate
- Layered Construction
  - Compact laminate
- Homogeneous Construction
  - HDPE
  - SCRC



Materials and Construction Methods

Pros	Cons
• Availability	• Rusts
• Inexpensive	• Dents
• Can be painted	• Scratches
• Class “A” Interior Wall Finish Classification	• Graffiti
	• Odors
	• Limited warranty



Honeycomb Construction – Painted Metal

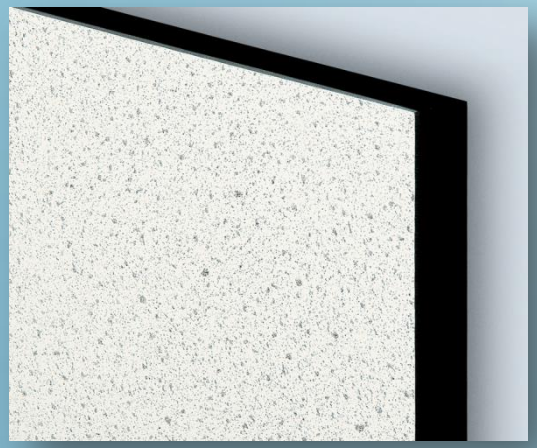
Pros	Cons
• Corrosion resistant	• Dents
• Cleanliness	• Scratches
• High design appeal	• Odors
• Class “A” Interior Wall Finish Classification	• Expensive
	• Limited warranty

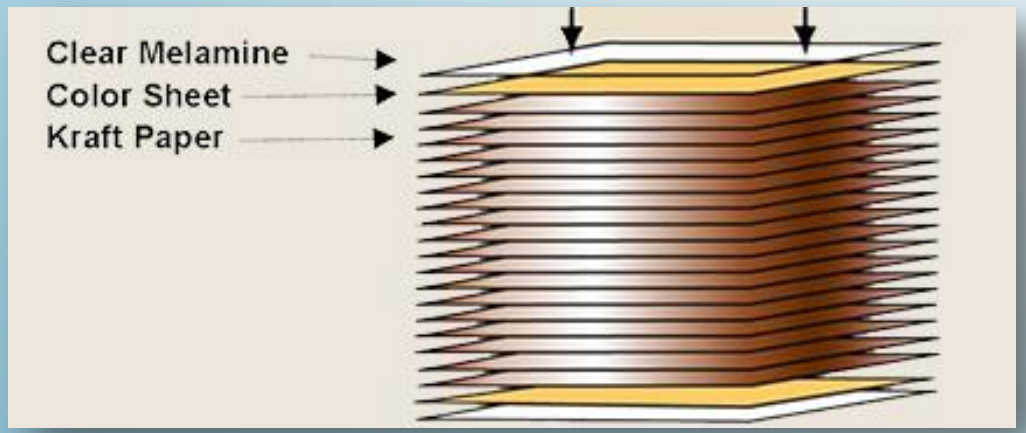
Honeycomb Construction - Stainless Steel

Pros	Cons
• Wide color selection	• Visible brown or black edges
• Graffiti resistant	• Deep scratches may expose dark Kraft paper
• Scratch resistant	• Core material may swell when exposed to excessive moisture
• Dent resistant	• Odors
• Inexpensive	• Special laminates may increase cost and lead time
• Class “B” Interior Wall Finish Classification	• Limited warranty

Bonded Construction - High Pressure Laminate

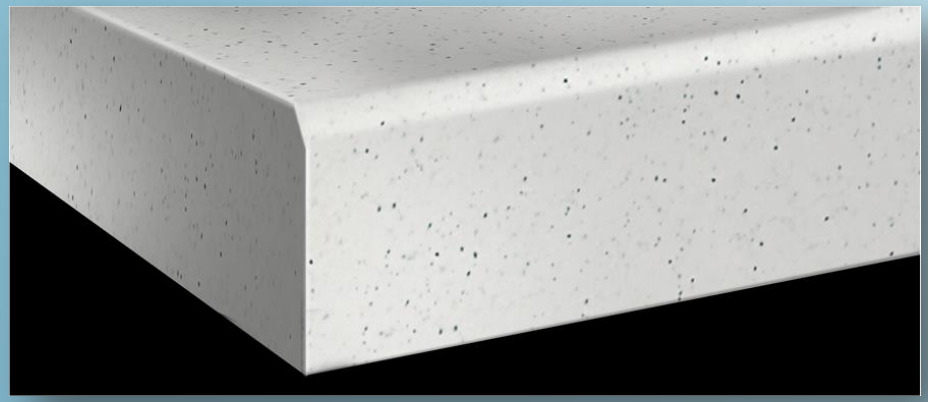
Pros	Cons
• Water resistant, can “hose” down for cleaning	• Layered construction – black core can be exposed by deep scratches
• Hard material	• Black or brown edges
• Dent resistant	
• Scratch resistant	
• Graffiti resistant	
• Wide color selection	
• Class “A” or “B” Interior Wall Finish Classification	
• 15-year warranty	





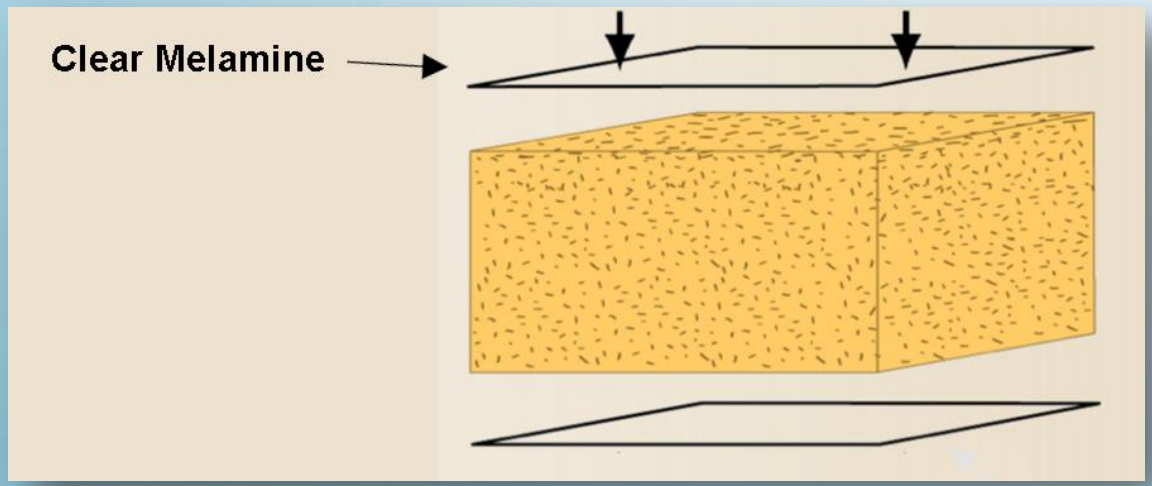
Layered Construction – Compact Laminate

Pros	Cons
• Homogeneous solid color throughout	• Graffiti containing xylene solvents "ghosts" into material
• Repairable, can sand out gouges/scratches	• Moderate color selection
• Water resistant, can "hose down" for cleaning	• Softest material surface; easily scratches
• High recycled content	• Untreated HDPE does not meet requirements for NFPA 286 Room-Corner Test
• Extended warranty	



Homogeneous Construction - HDPE

Pros	Cons
• Homogeneous solid color throughout	• Limited colors
• Repairable, can sand out gouges/scratches	• Price is higher than HDPE partitions
• Graffiti resistant surface (no ghosting)	
• Hard material	
• High resistance to scratches/dents	
• Water resistant, can “hose down” for cleaning	
• Class “B” Interior Wall Finish Classification	
• 10-year warranty	

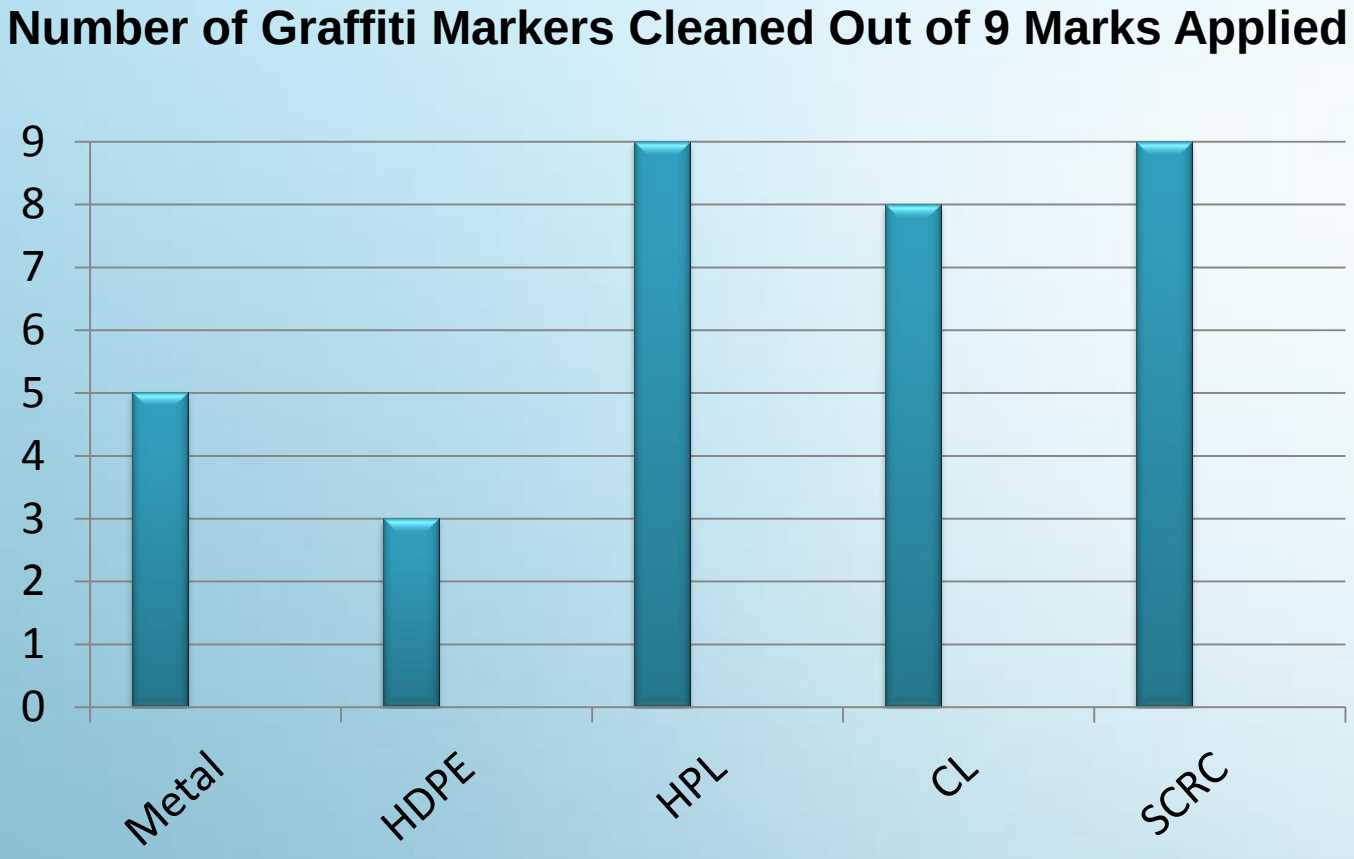


Homogeneous Construction - SCRC

Graffiti-Resistance Test :

- Material samples prepared with marks from 9 different staining agents.
- Marks cleaned after 24 hours using different cleaning methods.
- Removability or non-removability of marking agents recorded

Graffiti-Resistance Test - Protocol ASTM D 6578



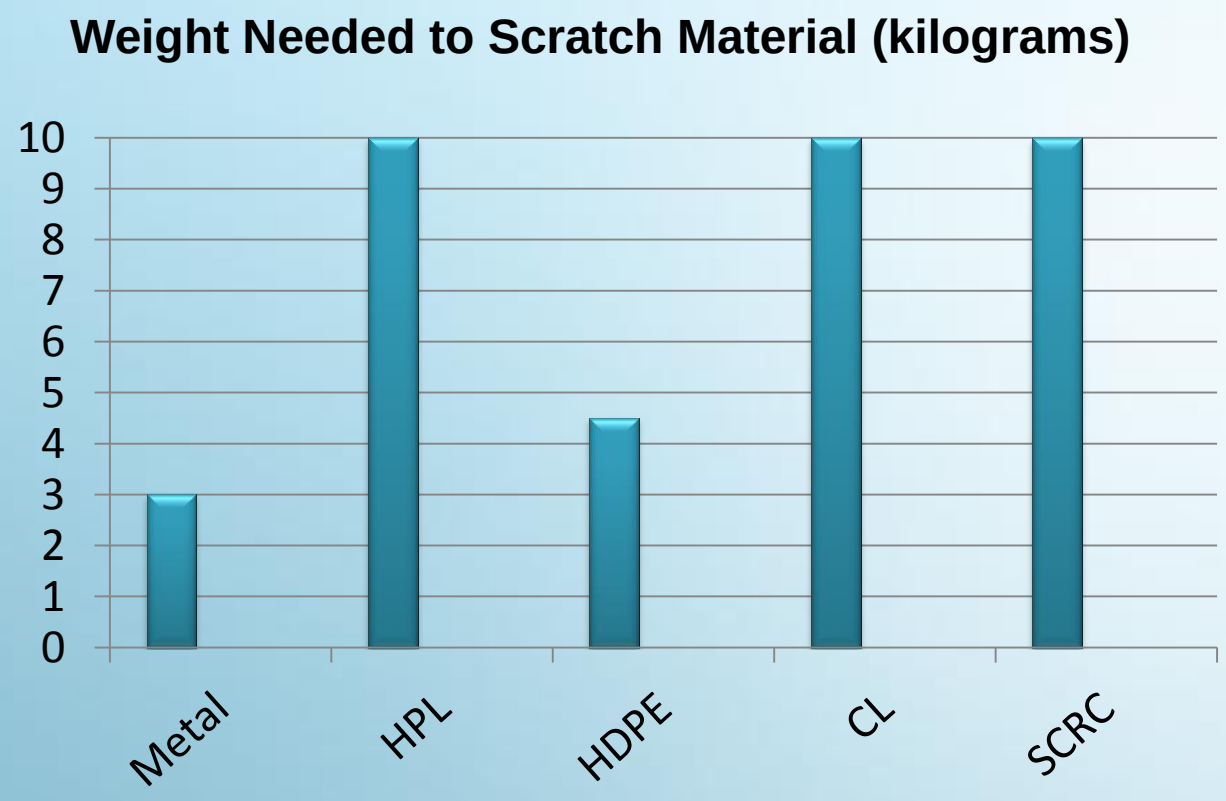
- Higher readings perform better
- High Pressure Laminate (HPL), Compact Laminate (CL) and SCRC are the most graffiti resistant

Graffiti-Resistance Test - Protocol ASTM D 6578

Scratch-Resistance Test:

- Tests scrape resistance of coatings such as paints.
- Weight added to a scraper and material sample is dragged underneath.
- When scratch occurs weight is recorded.

Scratch-Resistance Test - Protocol ASTM D 2197



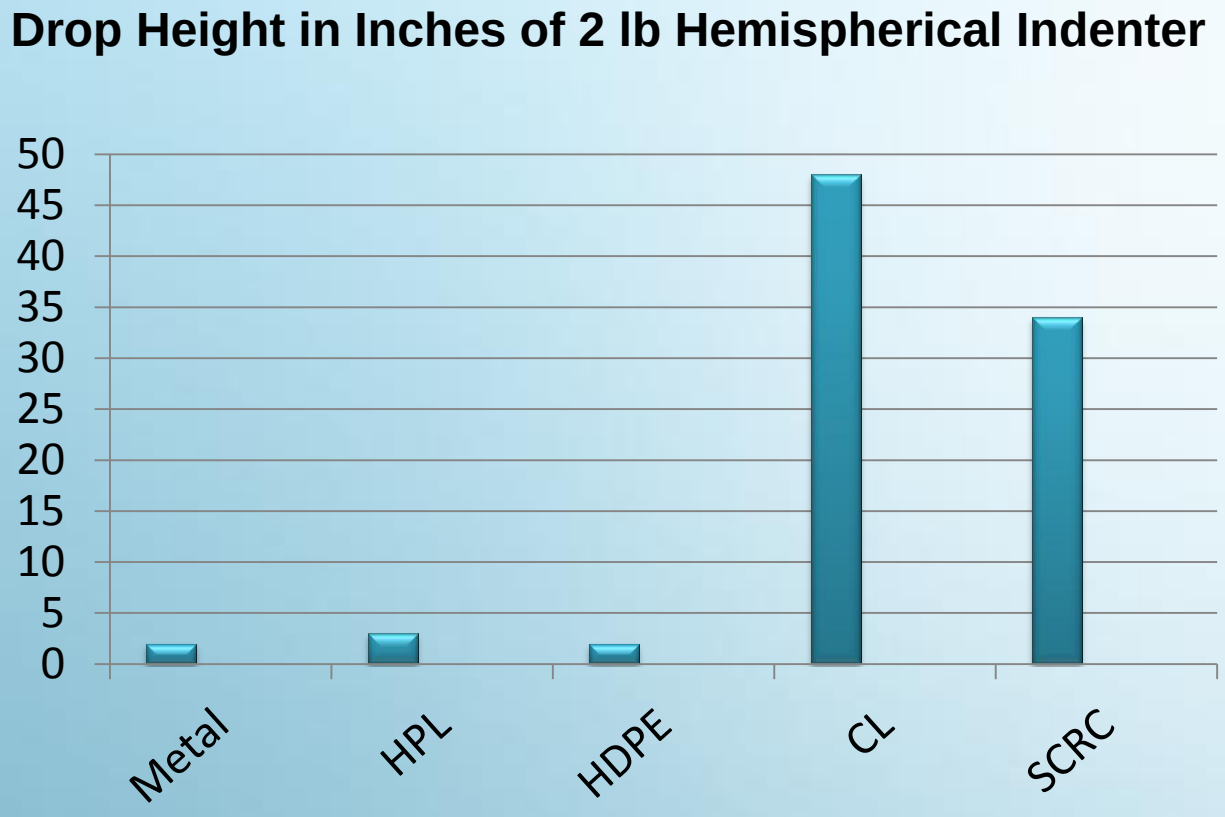
- Higher readings perform better
- High Pressure Laminate (HPL), Compact Laminate (CL) and SCRC are the most scratch-resistant

Scratch-Resistance Test - Protocol ASTM D 2197

Impact-Resistance Test:

- Developed to evaluate the effect of denting by dropping a 2-lb steel ball on a coating film and its substrate from increasing heights.
- When dent occurs drop height is recorded.

Impact Resistance Test - Protocol ASTM D 2794



- Higher readings perform better
- Compact laminate (CL) is the hardest to dent

Impact-Resistance Test - Protocol ASTM D 2794.

- Test used by ICC and NFPA to evaluate burning characteristics of materials classified as Interior Wall and Ceiling Finishes.
- Material placed in tunnel and flame introduced to surface of material.
- Rate of flame spread and degree of smoke development, measured by visibility in tunnel, are recorded throughout a 10-minute test.
- Test relevant for all partition materials except HDPE and PP:
  - Stainless steel
  - Painted metal
  - High pressure laminate
  - Compact laminate
  - Color-through phenolic
  - Solid color reinforced composite

Surface Burning Characteristics – Protocol ASTM E 84

Surface Burning Characteristics

Material	Flame Spread Index	Smoke Developed Index	Interior Wall & Ceiling Finish Classification
Painted Metal	5	0	Class A
High Pressure Laminate	60	195-300	Class B
HDPE Untreated	55	705	Unclassified
Compact Laminate	15 / 30	20 / 55	Class A / B
SCRC	45	95-120	Class B

- HDPE may be ordered with a fire classification if treated. Treated HDPE was not tested.
- Stainless steel was not tested
- ASTM E 84 provides comparative classifications used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire-hazard or fire-risk assessment of the materials, products, or assemblies under actual fire conditions.

Flame Spread Index requirements are as follows:

- Class A, 25 or less
- Class B, between 26 and 75, and
- Class C, between 76 and 200.

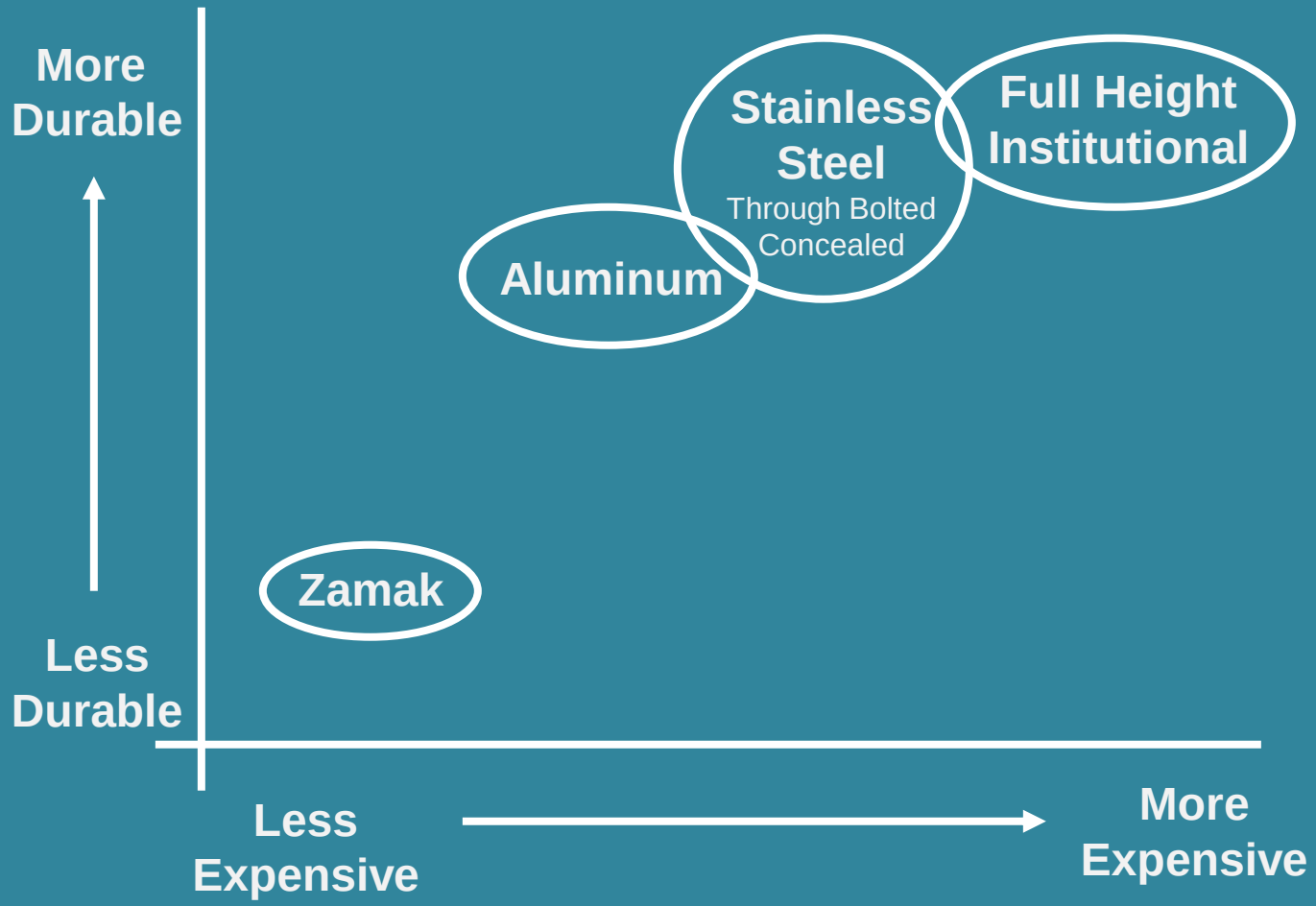
The test concluded the following:

- Painted metal tested as a Class A, and
- High pressure laminate as Class B.
- Untreated HDPE did not meet Smoke Development requirement of 450 and therefore was Unclassified.
- Compact laminate is Class B, and can be ordered as a Class A.
- SCRC is Class B.






Hardware Selection



Hardware Selection

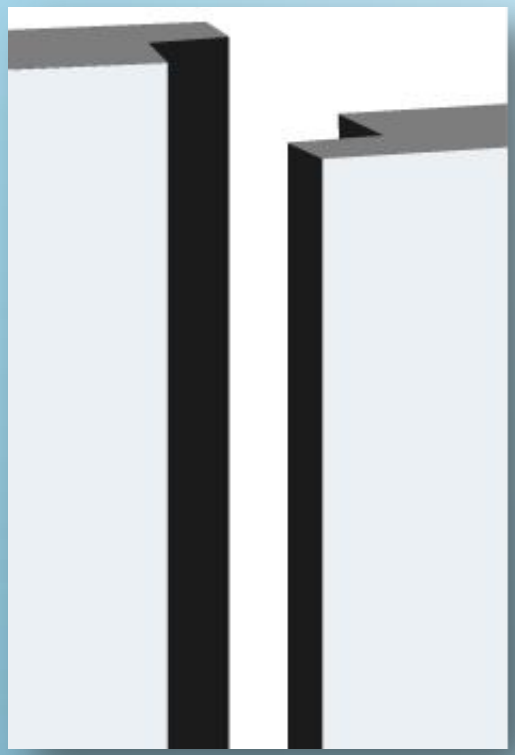
Overhead-Braced

Floor-to-Ceiling

Floor-Anchored

Ceiling-Hung

Mounting Configurations



Front views of gap-free partitions opened and closed

Maximum height compartment

Privacy Options

Toilet Partition Material Price Comparisons

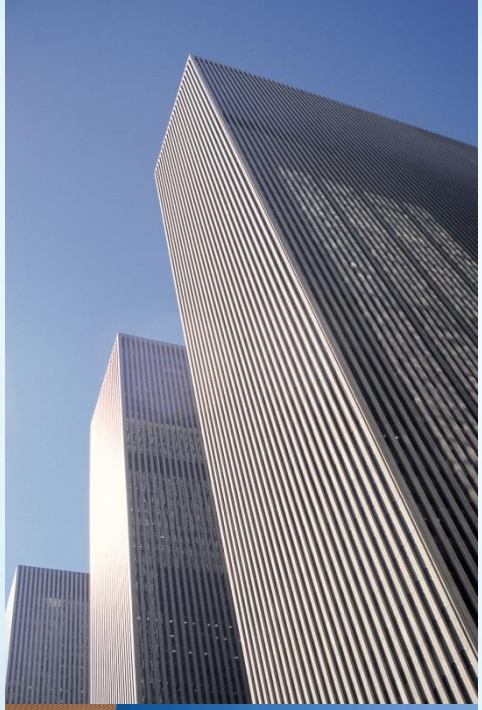
	Painted Metal	High Pressure Laminate	HDPE (Untreated)	Compact Laminate	SCRC	Stainless Steel
Price Index	1	1.1	1.9	2.4	2.7	2.7

Note: Painted metal prices have increased, closing the price difference with high pressure laminate, which offers more design freedom.

Stainless steel is the most expensive, at about 2.7 times the price of painted metal or high pressure laminate.

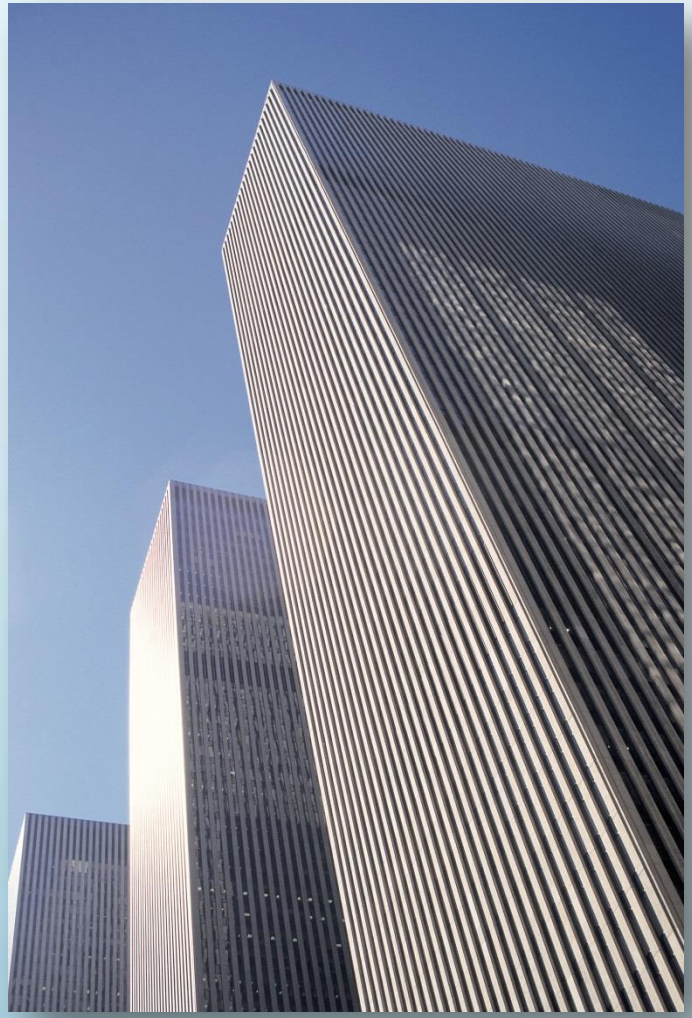
Client Needs

- Building type forms a base line for the design.
- Three building types:
  - Prestige
  - Standard Use
  - Heavy Traffic
- Understand building types so it is easy to match toilet partition material to client needs.



Building Type

- Signature facilities
- Moderate to low traffic flow
- Minimal use and abuse
- Architectural design excellence
- Quality materials and equipment
- Buildings Include:
  - Corporate headquarters
  - Class A office projects
  - Civic center icons
  - Major universities



Prestige Buildings

- Moderate to heavy traffic and incidence of vandalism
- Price-driven
- Buildings include:
  - Commercial office facilities
  - Healthcare centers
  - Hospitality projects
  - Manufacturing plants
- Restroom usage and accessory requirements:
  - Moderate to heavy traffic
  - Some heavy use and abuse
  - Equipment durability is important
  - Budget-sensitive specifications

Standard Use Buildings

- Heavy traffic flow
- Possible high incidence of vandalism
- Consider heavy traffic occupancy first in design
- Buildings include:
  - K-12 schools
  - Retail malls
  - Amusement / recreation facilities
  - Transportation centers
- Restroom usage and accessory requirements:
  - Periods of extreme traffic flow
  - Vandal-prone use and abuse
  - Equipment durability over design
  - Extra-large capabilities

Heavy Traffic Buildings

Matching Partition Materials to Building Needs

Building Type	Painted Metal	Stainless Steel	HPL	HDPE	Compact Laminate	SCRC
Heavy Traffic						
Standard Use						
Prestige						

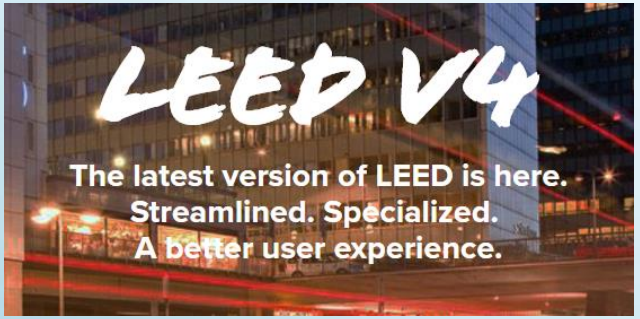
 Best Choice

 Good

 Poor

Building Type Summary

- Voluntary standards for developing environmentally responsible, low emission and sustainable buildings
- Individual products and materials used in buildings not certified.
- Project earns “points” in each section.
- LEED v4 applies to projects after October 31, 2016.



LEED Introduction

Material and Resources

LEED v3/2009	LEED v4 (projects start after 10/31/2016)
MR Credit 4 Recycled Content	*Environmental Product Declaration
MR Credit 5 Regional Materials	
MR Credit 6 Rapidly Renewable Materials	*Sourcing of Raw Materials
MR Credit 7 Certified Wood	

*Regional Requirement. Products sourced (manufactured and purchased) within 100 miles of the project site are valued at 200% of their base contributing cost.

- Option 1: Environmental Product Declaration (1 point).

  Disclosure Criteria:

  - Product-specific declaration.
  - Environmental Product Declarations (EPDs) which conform to specific ISO and EN protocols.

MR Credit 2 Environmental Product Declarations

- Option 1: Raw Material Source and Extraction Reporting (1 point).

  Publicly released reports on raw material suppliers include:

  - Manufacturers with self-declared reports.
  - Third-party verified Corporate Sustainability Reports (CSR).

MR Credit 3 Sourcing of Raw Materials

Low-Emitting Materials

LEED v3/2009	LEED v4 (projects start after 10/31/2016)
EQ Credit 4.1 Low-Emitting Materials – Adhesives and Sealants	*Low-Emitting Interiors
EQ Credit 4.4 Low-Emitting Materials – Composite Wood and Agrifiber Products	

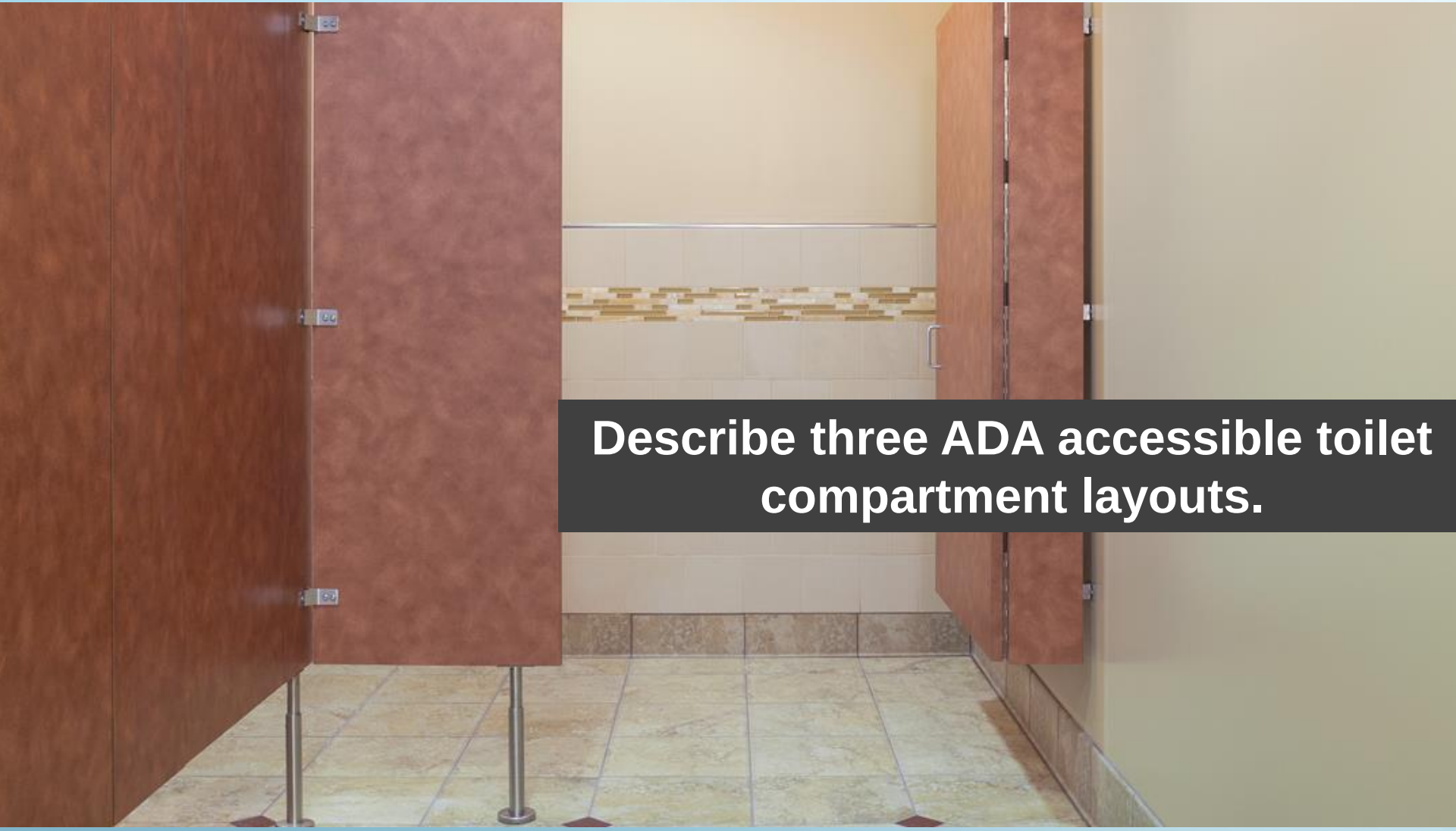
*Regional Requirement. Products sourced (manufactured and purchased) within 100 miles of the project site are valued at 200% of their base contributing cost.

- Option 1: Product Category Calculations (1 point).

  Applicable Product Categories:

  - Composite Wood (100% not covered by other categories).
  - Furniture (at least 90%, by cost).

LEED v4 Low-emitting materials

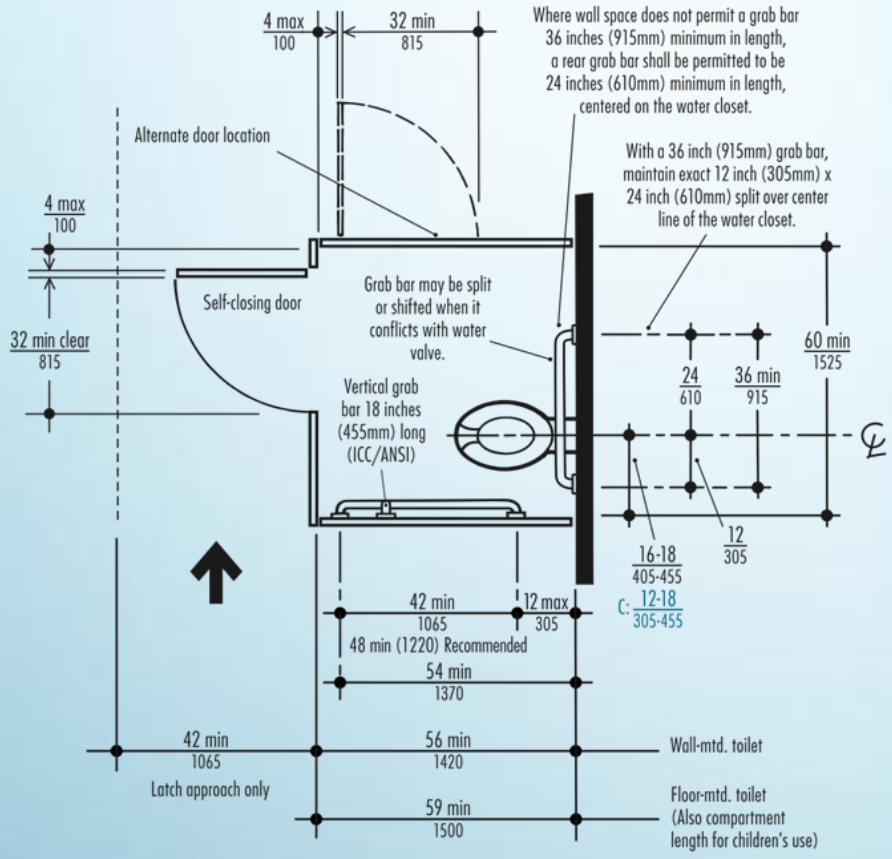


Learning Objective Three

- Accessible toilet compartments required in all public restrooms
- 3 toilet compartment designs:
  - Wheelchair Accessible
  - Ambulatory Accessible
  - Large Wheelchair Accessible

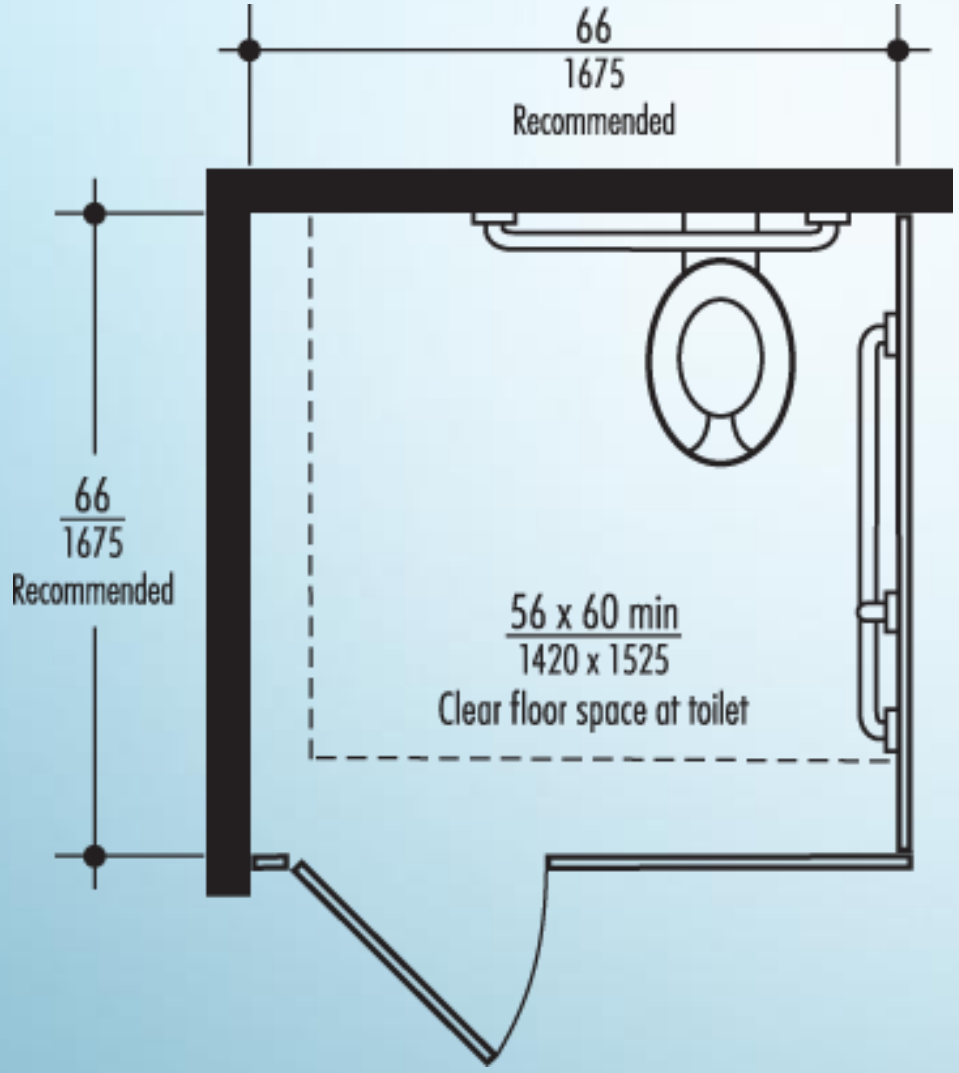
Accessibility

- Depth 56" min. for wall-hung toilets and 59" min. for floor-mounted toilets.
- Width is 60" min.
- Toilet offset on back wall with toilet centerline 16" min. to 18" max. from side wall or partition.
- Grab bars mounted on rear wall and on closest side wall or partition to toilet.



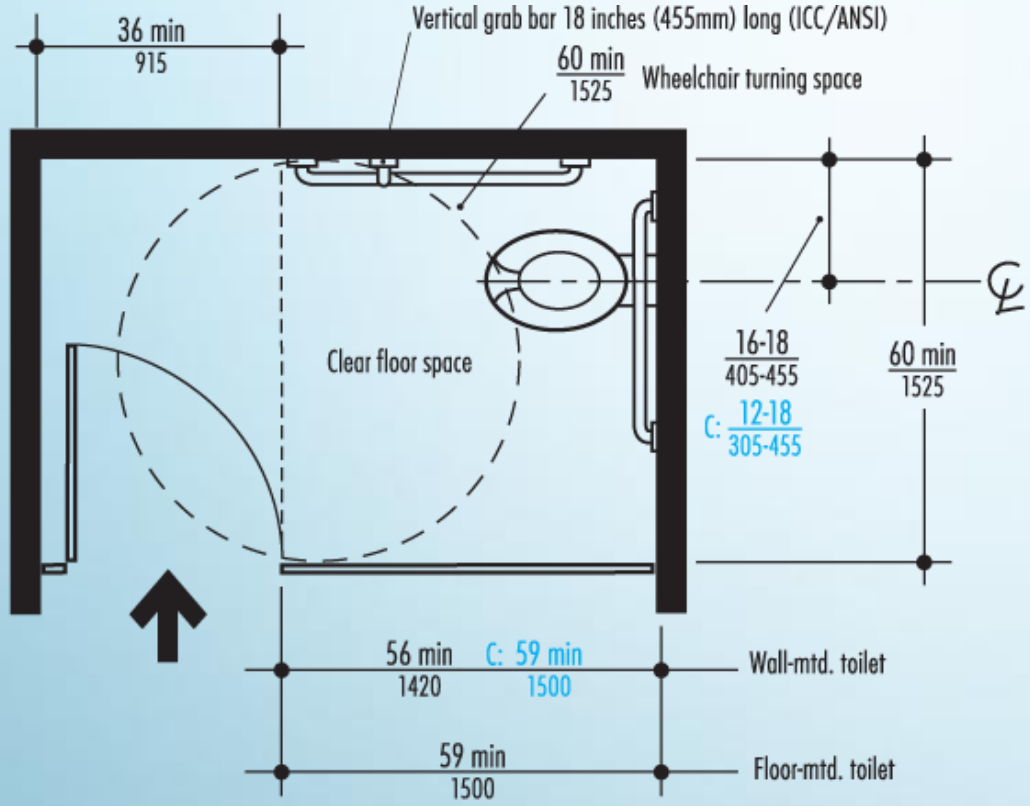
Wheelchair Accessible Toilet Compartment

- 66" x 66" toilet compartment interior
- 56" x 60" clear floor space at toilet



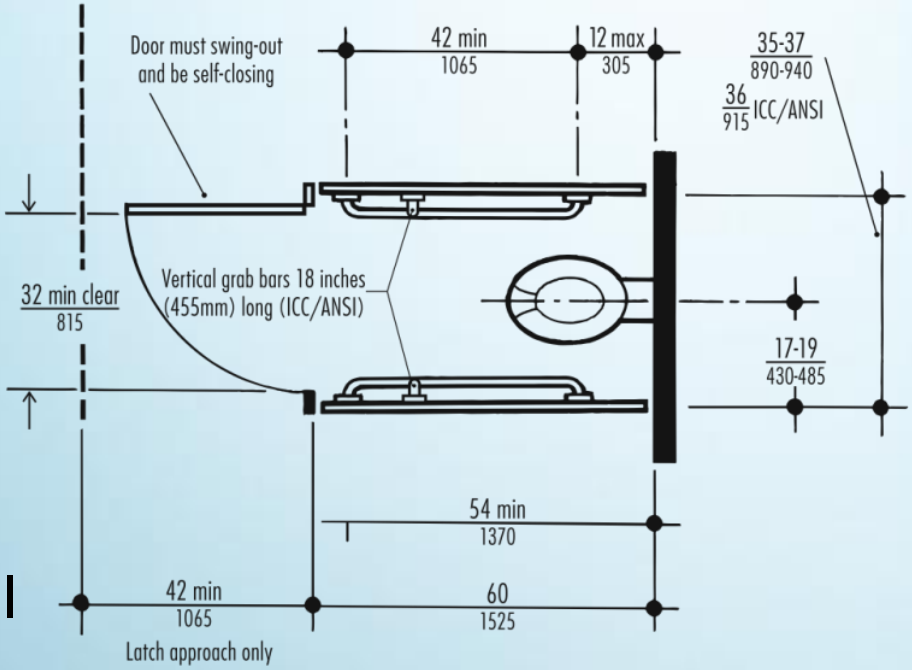
Large Wheelchair Accessible Toilet Compartment

- Alternative alcove layout toilet compartment:
  - 5’ deep and 8’ long with an internal 60" diameter wheelchair turning space.
  - In-swing doors must not overlap required toilet clearance.

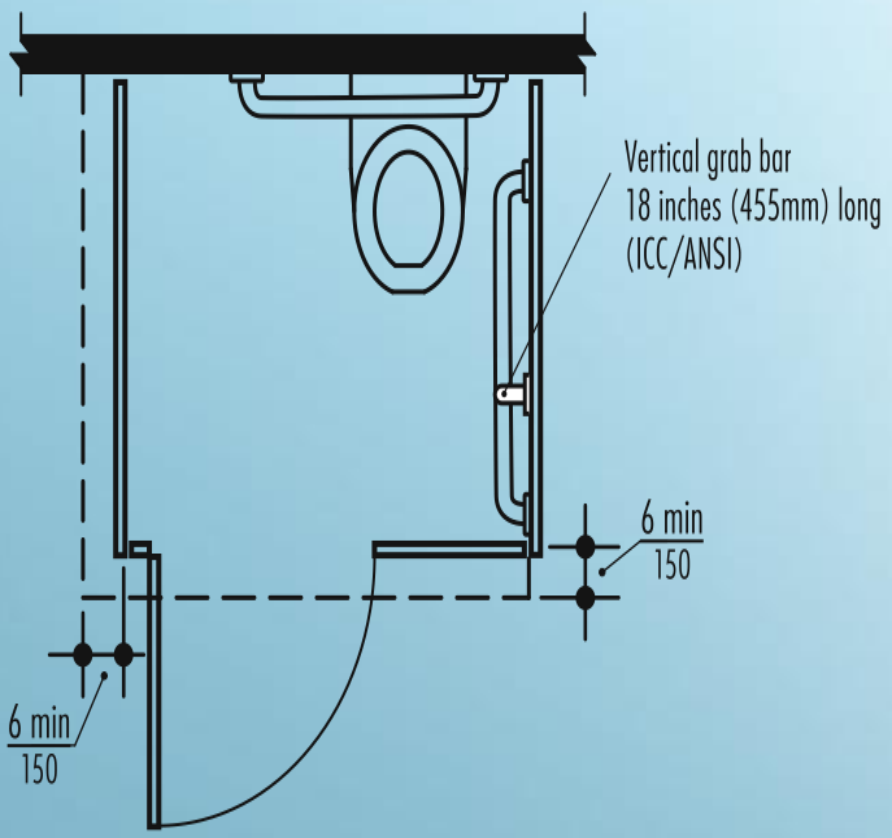


Large Wheelchair Accessible Toilet Compartment

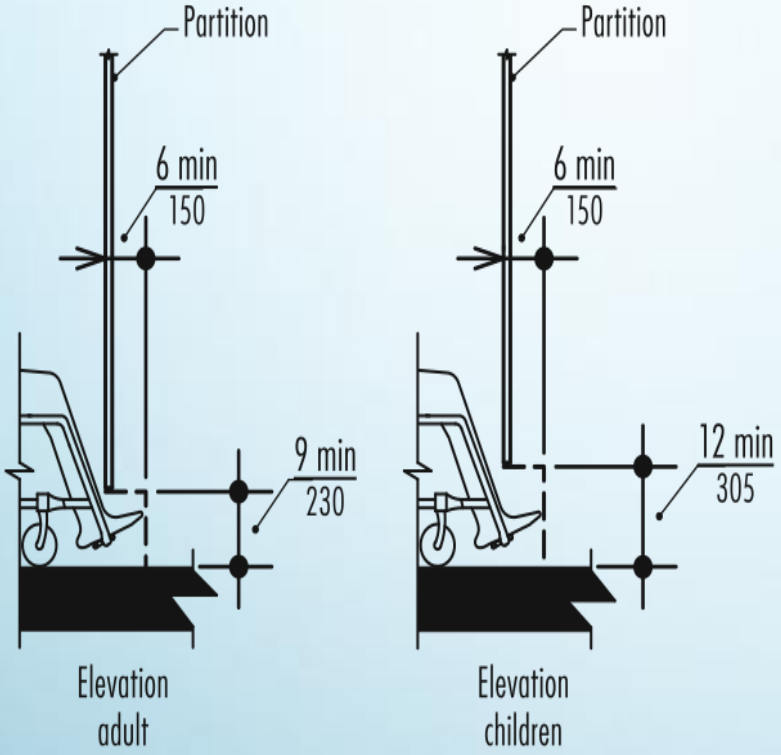
- Used where 6 or more fixtures are provided.
- Depth is 60" min. with 2009 ICC/ANSI Standards retaining the 36" absolute width dimension.
- Doors must swing out and be self-closing.
- Toilet must be located on back wall with toilet centerline 17" min. and 19" max. from side wall or partition.
- Grab bars must be provided on both sides per side wall requirements.



Ambulatory Accessible Toilet Compartment

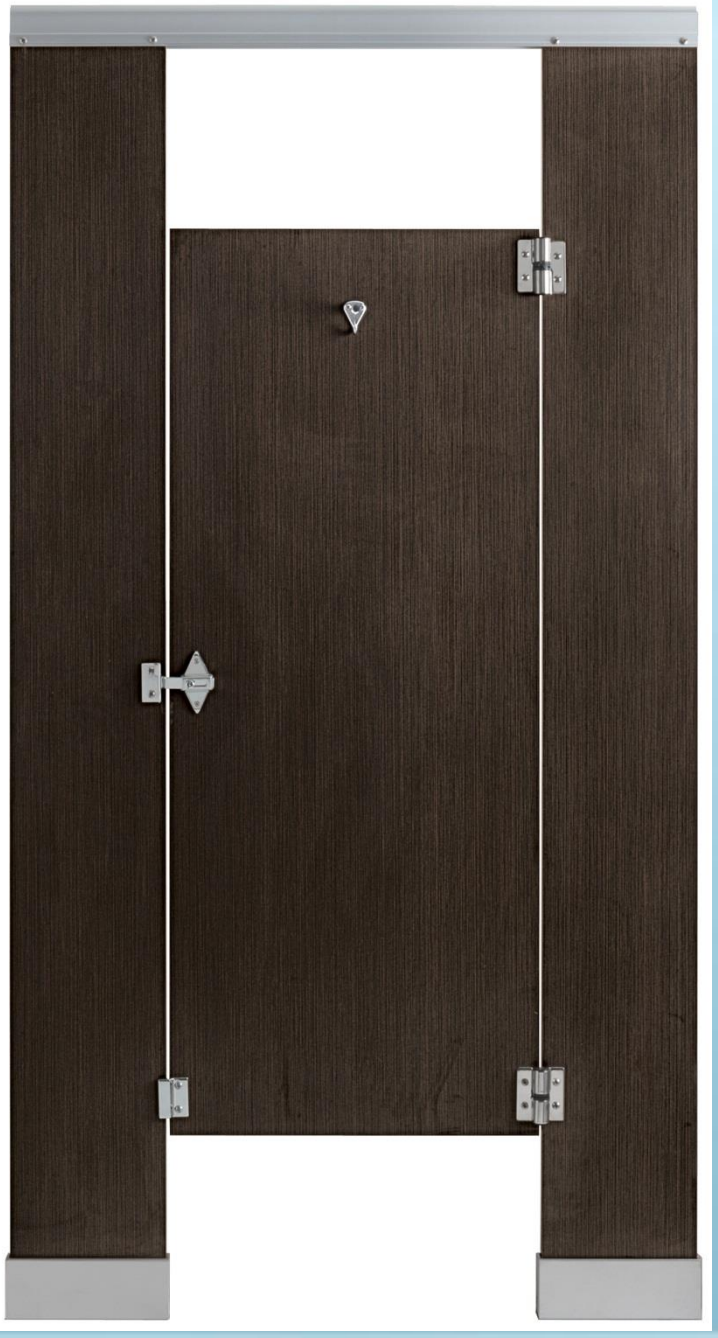


Horizontal Toe Clearance



Vertical Toe Clearance

Toe Clearance



Identify guidelines for writing toilet compartment specifications.

Learning Objective Four

In this example:

- Specifying a High Pressure Laminate with particle board substrate with steel core reinforced stiles.
- Mounting configuration is floor-anchored, overhead-braced.
- Material Description and Hardware Features language serve as guideline text for all toilet partition specifications.

Writing an Enforceable Toilet Compartment Specification

MATERIAL DESCRIPTION

- Cores panels, doors, stiles, screens: 45 lb density, 3-ply resin-impregnated particle board.
- Surfaces: High Pressure Laminate ANSI/NEMA LD3-2005. Minimum thickness 0.035 inch.
- Finished Thickness: Stiles, doors, panels, screens, 1 inch. Uniform thickness of stiles and doors ensures flush front.
- Stile Reinforcement: 11-gauge sheet steel core; leveling device welded to steel core sheet.
- Fabrication: High Pressure Laminate edges bonded to core material prior to bonding face sheets.
- Fire-Resistance: NFPA/IBC Class B Interior Wall and Ceiling Finish Classification.

Example Toilet Compartment Specification

HARDWARE FEATURES

- Materials: 18-8, Type 304 stainless steel with satin finish. Chrome-plated “Zamak”, aluminum, plastic hardware not acceptable.
- Fastening: Stainless steel machine screws into factory-installed inserts. Fastening directly into core material not acceptable.
- Mounting: Hardware and fasteners concealed inside compartment. Exposed hardware and fasteners on exterior of compartment not acceptable except on accessible compartment.
- Latching: Slide latch into keeper, track prevents door from swinging beyond stile. Twist-style door latch not acceptable.
- Hinges: Field-adjustable cam permit door to be fully closed or partially open when compartment is unoccupied.
- Compliance: Operable with one hand, without tight grasping, pinching or twisting of the wrist; force to operate does not exceed five pounds.
- Emergency Access: Hinges, latch allow door to be lifted over keeper from outside of compartment.

Example Toilet Compartment Specification

You should now understand:

- Importance of specifying appropriate material, hardware and mounting configuration for toilet partitions.
- Building type and budget are important considerations in specifying the most appropriate toilet partitions for the needs of a project.
- Toilet Partition compliance with accessibility standards and fire codes is mandatory.

Summary

Thank you for your interest in specifying code-compliant toilet partitions.

Please contact Bobrick with any questions.

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Thank You