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DESIGN GUIDE and CODE COMPLIANCE

THIS DESIGN GUIDE DESCRIBES TYPICAL REQUIREMENTS FOR CALIFORNIA CODE COMPLIANCE. A CERTIFIED STRUCTURAL ENGINEER SHOULD BE CONSULTED TO DETERMINE THE ACTUAL FLOOR LOAD CONDITIONS AND SEISMIC DETAILS FOR EACH PROJECT. GOVERNMENT AGENCIES AND LOCAL BUILDING DEPARTMENTS MAY HAVE ADDITIONAL REQUIREMENTS THAT ARE NOT COVERED BY THIS GUIDE.

FLOOR LOADING

General Information

- ▶ Multiple rail styles available, including rails with structural properties
- ▶ Special rail locations available with factory approval
- ▶ 84" maximum distance between rails
- ▶ 18" minimum distance between rails
- ▶ Maximum allowable rail (floor) deflection
 - L/750 - Mechanical operation
 - L/550 - Mechanical operation with positioning clutch brake
 - L/480 - Power operation (dynamic braking provided by DC controlled motor)

SEISMIC SAFETY

Design and Installation Information

(Specific connection details to be provided by a certified structural engineer and may vary from the typical information listed below)

- ▶ Rail anchors – *typical* embedment 1 ¾" to 2 ¾" with 1/4" or 3/8" Hilti Kwik Bolt 3 anchor
- ▶ One (1) anchor, alternating along rail every 9"
- ▶ Concrete slab to be 4" minimum
- ▶ 4-Post shelving *may* require back-to-back configuration with seismic shear panel secured by 1/4" grade 2 screws
- ▶ 4-Post shelving uprights to be closed for lateral stiffness
- ▶ 4-Post shelving uprights *may* require stiffener insert
- ▶ Cantilever shelving requires welded frame with middle stiffener or X-brace and gussets

Required Engineering Information

- Seismic code standard - OSHPD, DSA, etc.
- Site address
- Location of local seismic faults
- Location within building (floor)
- Building elevation required by structural engineer
- Shelving height
- Media weight per shelf foot

FIRE PROTECTION

General Information

- ▶ Minimum clearance below sprinkler head is 18". Some jurisdictions may require 24"
- ▶ Elevated floor and ramp can be treated with fire retardant chemicals
- ▶ Powered systems are Underwriters Laboratories (U. L.) certified "in total"
- ▶ Powered systems are available with "fire park" and alarm interface

ACCESSIBILITY (ADA)

Ramps

- ▶ Ramp is required if change in levels is greater than 1/2"
- ▶ Must have slope of 1:12 maximum with a maximum rise of 6"

Turning

- ▶ If wheelchair turning (180 degrees) is needed, a clear space of 60" or a T-shaped space consisting of 36" minimum wide aisles is required
- ▶ ADA sets a maximum aisle length of 200' before a turnaround or passing space is required

Maneuvering Clearance at Doors

- ▶ The floor on each side of an exit door shall be level. The level area in the direction of the door swing shall be at least 60" and the length in the opposite direction of the door swing shall be at least 44" as measured from the door in it's closed position.
- ▶ Kick space for an interior door is 18" and 24" for an exterior door.

Corridor Width

- ▶ Corridor widths serving an occupancy load of 10 or more shall not be less than 44". Corridor widths serving an occupancy load of 10 or less shall not be less than 36".

Opening Force

- ▶ Cannot exceed 5 lb-ft. And does not require pinching or twisting of the wrist

Control Height

- ▶ From the floor, controls to be 35" to 48" for forward reach and no higher than 54" for side approach controls

Shelf Height

- ▶ Stack height is unrestricted
- ▶ 9" minimum low side reach / 54" maximum high side reach
- ▶ 15" minimum low forward reach / 48" maximum forward reach
- ▶ For items stored on shelving not within ADA reach ranges.... may come into compliance by providing conspicuous sign stating "*Persons with disabilities will be provided assistance upon request*"

Signage

- ▶ Mobile systems designed for access to people with disabilities should include instructions for operating the system and a list of carriage contents
- ▶ Everyone who will be using the system should receive an orientation on it's use and safety features

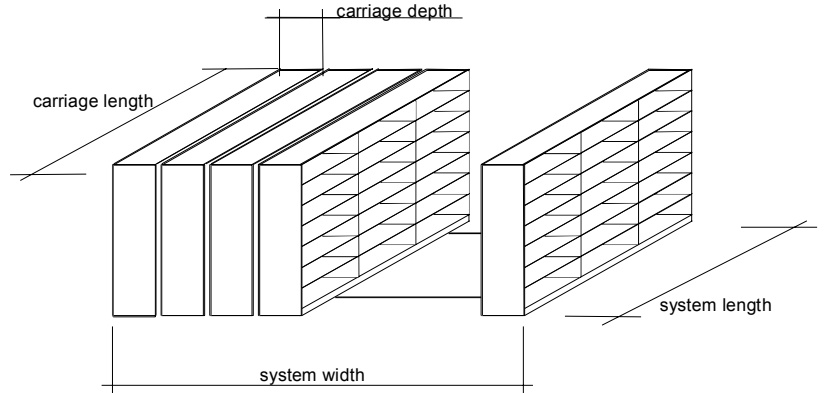
DIMENSIONAL PLANNING - MOBILE

Mobile Storage System

carriage depth 18" - 60" **carriage length** 3' - 81' **housing height** variable

method of operation

Manual
Mechanical Assist
Powered (Electric)



design criteria for system footprint

Shelving depth + 1 1/2" carriage depth
 Combined carriage depth + 36" minimum aisle width overall system width
 Combined shelving length + 6" overall system length
 Shelving height + 7" overall system height

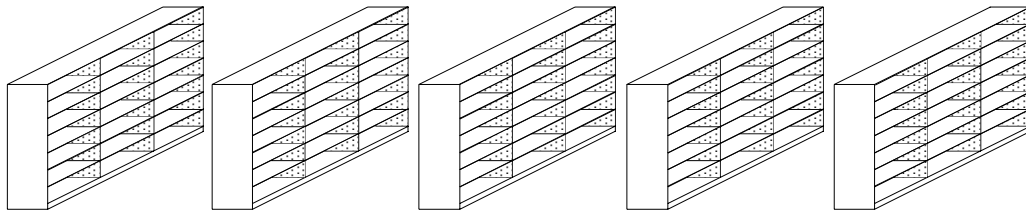
DIMENSIONAL PLANNING - SHELVING

Shelving: 4-Post / Case Style

depth	width	height
9"	12"	40 1/4"
10"	15"	64 1/4"
12"	18"	76 1/4"
13"	24"	85 1/4"
15"	30"	88 1/4"
16"	36"	97 1/4"
18"	42"	121 1/4"
20"	48"	
24"		
26"		
30"		
32"		
36"		

Shelving: Cantilever Bookstack

actual shelf depth	width	height
6"	24"	42"
7"	30"	66"
8"	36"	78"
9"		84"
10"		
11"		
12"		
15"		



Note: Non standard sizes available

FOR SPECIFIC PROJECT DESIGN INFORMATION CONTACT BOB RUSSO
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