



Lockers: Specifying the right product for schools and other applications



Presented by: Top Tier Storage Systems LLC

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Learning Objectives

Evaluate the different types and styles of lockers along with all the accessories for a complete quality locker installation.

Identify customers needs and requirements.

Select the correct locker design for the customer requirements.

Provide complete, clear, and consist specifications to insure there is no misunderstanding what locker and accessories are to be provided on the project

Understand the architect's goals and objective for every project:

- **Work with specification writers to meet the clients needs.**
- **Match the correct product with desired application.**
- **Provide complete instructions for a safe and quality installation.**
- **Review the complete scope of work of every project.**
- **Provide expert advice from project start to project completion.**

What we will cover today.

- ▶ **Locker Terms and Definitions**
- ▶ **Designs and Ideas**
- ▶ **Objectives**
- ▶ **Welded vs. Knock Down Design**
- ▶ **Implementation**
- ▶ **Features**
- ▶ **Basic Anchoring and Installation**
- ▶ **Question and Answer**

**What effect do the lockers
have on the overall impact of
a office, change room, club,
school, or athletic facility?**

- ▶ On the average school project the lockers are only **1%** of the overall cost of the project, but they are **20%** of the total exposure of the facility.
- ▶ Our goal is to be **0%** of the General Contractor's problems.

Terms and Definitions

What is a locker?

A locker is a six-sided metal box with a door for temporary storage for personal belongings.

How secure is a locker?

A locker is designed to accept various styles of locks, but it will only keep honest people out.

IT IS NOT A SAFE!!

Security Levels

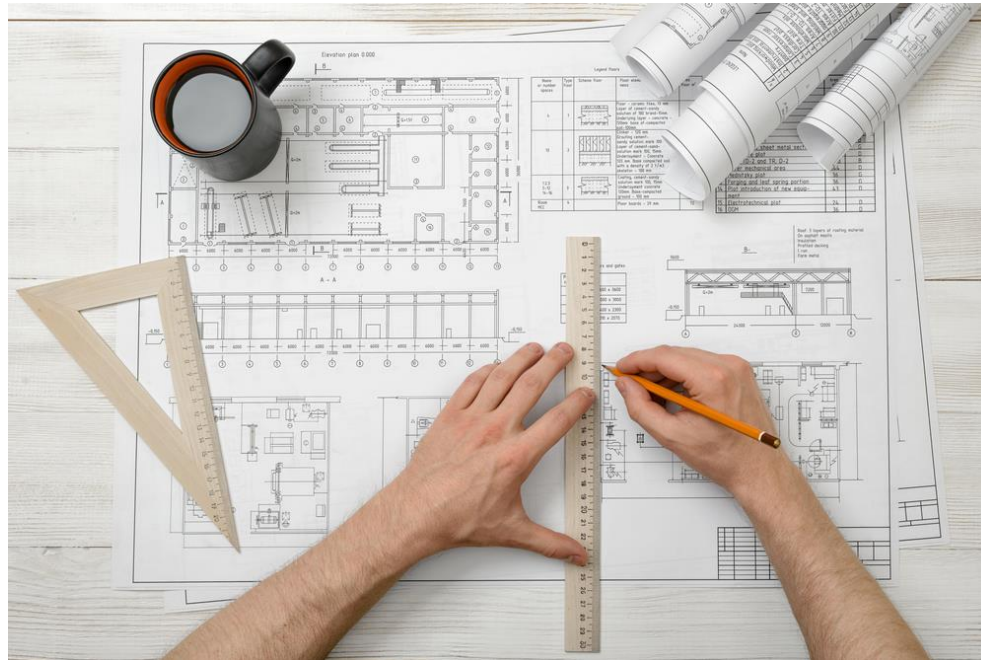
- ▶ Elementary schools may not require the same level of security as a high school or a public Facility.
- ▶ Is protecting belongings of an elementary student the same as those of a high school student or business professionals attending the local gym?

Review question #1

► How secure is a locker?

- a) Very secure, it's better than a safe
- b) Somewhat secure, but it's not a safe
- c) It is fire rated and will keep everything from a fire
- d) None of the above

Design Objectives



Meet or Exceed Client Expectations

Reliable

Will the locker function as designed and keep the end user's property secure and safe?

Dependable

The product designed must meet or exceed the expected life of the of the lockers, within reason.

The design must hold up to daily abuse and resist damage.

Functionality

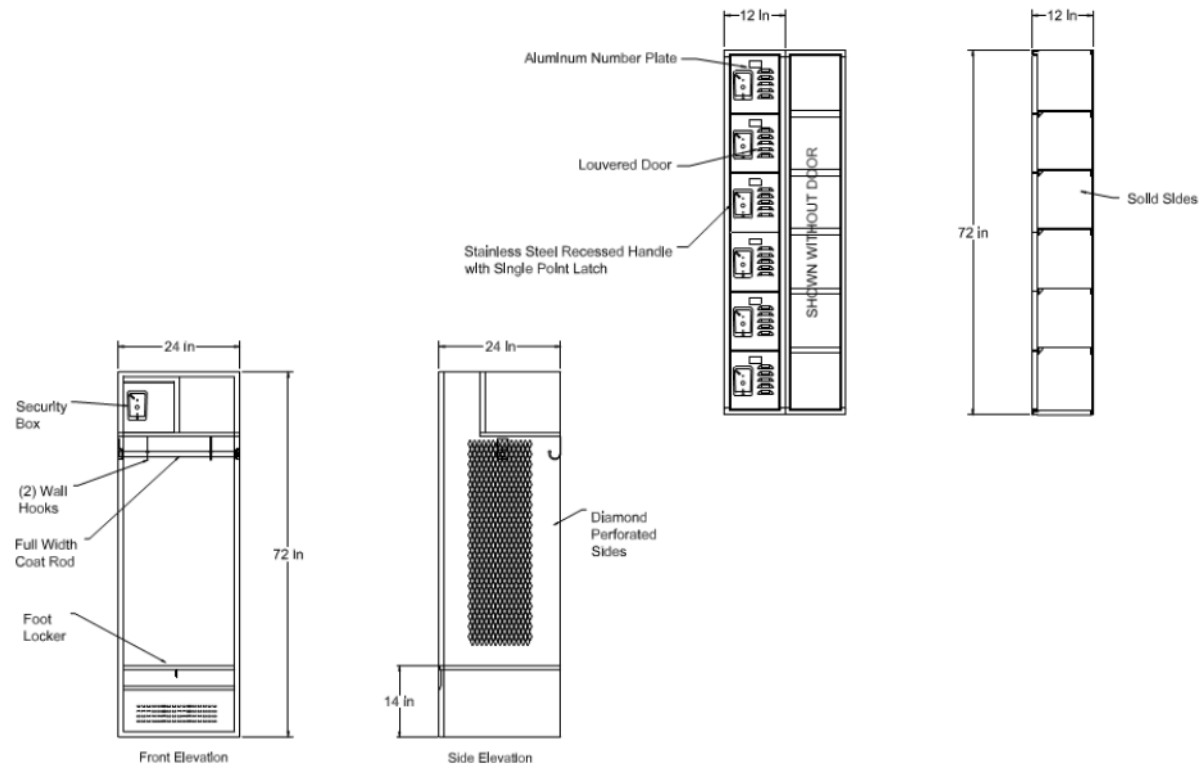
How will the product meet the customers needs?

Value is determined by the performance of the product over time.

Objective

- ▶ **Provide secure storage space for personal belongings**
- ▶ **Easy to understand and use**
- ▶ **Keep dishonest people out**
- ▶ **Design the space for maximum efficiency**
- ▶ **Make the design appealing to the end user**
- ▶ **Extend the life of the product by minimizing repair cost**
- ▶ **Design the lockers within the space to keep end users safe**

Locker Design



The backbone of the locker is the quality of the steel:

▶ Steel gauge is the thickness according to American Iron and Steel Institute

- ▶ 16 gauge steel is thicker than 24 gauge.
- ▶ Standard design features:
 - ▶ Locker body components: 24 gauge (.0239")
 - ▶ Doors, door frames and body components: 16 gauge (.0598")
- ▶ Heavy-duty design features:
 - ▶ Locker body components: 16 gauge (.0598")
 - ▶ Heavy Duty doors: 14 gauge (.0747")
 - ▶ Door frame: 16 gauge (.0598")
 - ▶ Locker back: 18 gauge (.0478")

Knock Down and All Welded Construction

Knocked-down: The lockers must be pre-assembled at the factory or hand-assembled in the field by nuts and bolts or rivets.

All-welded: Pre-assembled at the manufacturer's facility and arrive ready for installation.

What are pro and cons each style?

Knocked-Down (KD) Locker

■ Pros:

- Mass produced to keep cost lower
- Lower freight cost: More lockers per truck, thus reducing carbon footprint
- Inventory: More material in less space, also reducing carbon footprint
- Flexibility to change: If jobsite conditions change, KD lockers are designed to easily adapt to the change
- Quick Ship: Ability to ship inventory items within 48 hours to keep project on schedule
- Repairs due to damage and abuse can be accomplished in a timely manner
- Provide custom installations

■ Cons:

- Suited for light and intermediate applications (e.g. office or back room – not athletic facility).
- Require field-assembly – labor cost can be higher than welded.

Welded lockers

■ Pros:

- **Pre-assembled for reduced installation time**
- **Custom design for unique applications**
- **Strong, durable, and more abuse-resistant**
- **Quick installation**

■ Cons:

- **Longer lead times**
- **Higher freight costs**
- **Higher manufacturing costs**
- **Cannot be adjusted in the field**

Review question #2

- ▶ Which of the following is the heaviest gauge of steel?
 - a) 14 gauge
 - b) 16 gauge
 - c) 18 gauge
 - d) 24 gauge

Review question #3

- ▶ Which of the following are pros of knocked down lockers?
 - a) Lower cost
 - b) Quicker to ship
 - c) Easier to repair
 - d) All the above

Review question #4

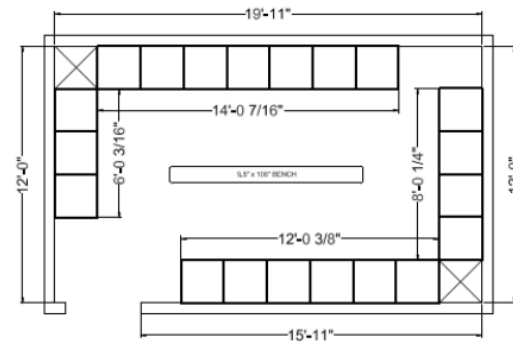
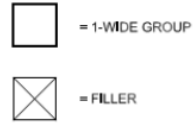
- ▶ Which of the following are pros of welded lockers?
 - a) Quicker to install
 - b) Higher cost
 - c) Stronger
 - d) Both (a) and (c)

Application



CORRIDOR LOCKERS, WELDED
(44) OPENINGS, (22) FRAMES 24 x 24 x 72 2-TIER
W/ ZEE BASE
COLOR:
NUMBERING SEQUENCE: INDICATE ON LOCKER RUNS

LEGEND:



Application

Objective: Complete understanding of client's facility and personnel that will be using the lockers.

► **Understanding:**

- **Building type and clientele**
- **Security level and storage requirement**
- **Maximum users and high traffic periods**
- **ADA requirements and other special needs**

► **Solutions:** Design the space for maximum use

- **Single tier: Single user maximum storage**
- **Tiered lockers: Smaller storage area per user but accommodates more users in area**
- **Box lockers: High-density minimum storage and high-traffic crowded facilities**
- **Custom configurations for special application and unique shaped spaces**

► Understanding clients priorities:

- **Secure** – Accommodates personal locks, tamper-resistant
- **Durable** – Strong, abuse-resistant
- **Maintenance** – Easy to replace parts and repair
- **Low Noise Level** – Quiet design
- **Practical** – Adequate size, useful features, accessible to the handicapped
- **Aesthetic** – Customized appearance

Locker Design by Features

Feature: Latches (or locking mechanism)

▶ Multi-Point (2-point or 3-point) Lock Bar Latch

- ▶ Best for one, two, and three tier lockers
- ▶ Enhances frame rigidity
- ▶ Latches/locks automatically upon closing
- ▶ Recessed Pockets



▶ Single-Point Latch

- ▶ Low maintenance but requires a heavy-gauge door
- ▶ For one- through six-tier lockers
- ▶ Recessed or padlock hasp variations



▶ 3-point (Cremone)

- ▶ Most Secure: positive locking action (top, bottom, middle)
- ▶ Least Convenient: cannot pre-lock before closing
- ▶ Enhances frame rigidity



Review question #5

► Which locking mechanism enhances frame rigidity?

- a) Single point latch
- b) Multi-point (2-point or 3-point) lock bar latch
- c) Cremone
- d) Both (b) and (c)

Feature: Ventilation

- Door Standard Louvers
 - Louvers



Feature: Ventilation

- **Concealed Ventilation**
 - Ventilation at top and bottom of door returns
- Very clean flush look



Feature: Ventilation

Diamond Perforated Ventilation

- Best for storing moist items
- Battery chargers, cell phones, and laptop computers generate heat



Feature: Ventilation

- Door Ventilation Options

Mini Louvers



Diamond Perforations



Feature: Ventilation

Body Component Options

- Ventilated (perforated) components must be heavier gauge material to ensure door rigidity



Review question #6

- ▶ Which ventilation option is best for storing moist items?
- a) Louvers
- b) Diamond perforated
- c) Concealed vents
- d) Mini louvers

Corrosion Resistance

Corrosion-Resistant Options:

- **Galvanized steel (ASTM A 653, Type B, A60)**
- **Stainless-steel bottoms (ASTM A 666, Type 304)**
- **Heavier finish applications**



User friendliness

► Size

- Football helmets generally require 18" width minimum
- Coat hangers require 18" depth
- Are the gauges correct for the locker size?
 - Large lockers with light gauges are a bad combination
- Are the lockers large enough for the book load?
- Would a mix of sizes best suit the requirement?
 - i.e., athletic applications

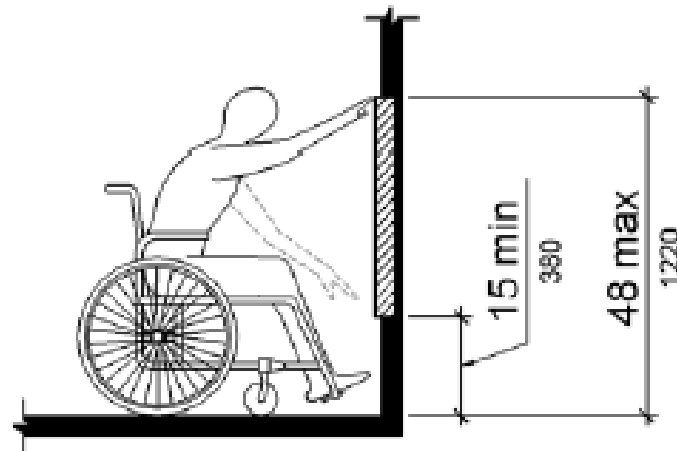


Accessibility

▶ ADA



- Quantity: refer to individual state's code
- Space and height requirements
- Reach requirements



Applications

- ▶ What lockers go into what application and why?

Application K thru Third Grade

- Elementary school lockers see less abuse than higher grades.
- Locker heights include 36", 48", 60" cubbies and single tier
- Lighter duty: 16-gauge frames and doors, 24-gauge body

Middle School Corridor

- Need to be sturdier than elementary school lockers.
- Common sizes include:
 - Width: 12" - 15"
 - Depth: 12" - 15"
 - Height: 60" / 72" single or double tier
- Medium duty: 14- or 16-gauge doors, 24-gauge body, 16-gauge bottoms and shelves.

High School Corridor

- Receive more abuse than elementary or middle school lockers.
- Common sizes include:
 - Width: 12" - 15"
 - Depth: 12" - 15"
 - Height: 60" / 72" single or double tier
- Medium to Heavy duty: 14- or 16-gauge doors, 16-gauge body, 16-gauge bottoms and shelves. Welded is an option.

Typical Locker Configurations

- ▶ **Elementary school**
Pre-K to 5th/6th Grades
36", 48", or 60" High



- ▶ **Middle school**
60" or 72" high



Typical Locker Configurations

- ▶ High school
9th through 12th
72" High

- ▶ Athletic rooms
middle and high school
72" on 4" Base



Typical Locker Configurations

This application is 60" (30") high on a 18" Base



Review question #7

- ▶ Which locker height is best for middle school?
- a) 48" high
- b) 60" high
- c) 72" high
- d) Both (b) and (c)

Review question #8

- ▶ Which gauge door is best for a high school?
- a) 24 gauge
- b) 18 gauge
- c) 14 or 16 gauge
- d) None of the above

Options: Locks

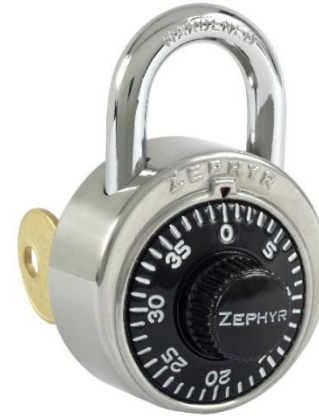
Built-In Combination



Built-In Combination



Padlock



Electronic



Grooved Key



Options: ADA Locks

Three ways to open locks: ADA Student Key; Master Key; Combination



Offers:

- Easy ADA Use: One hand, no twist
- ADA Compliant
- Mainstream: Looks like other locks
- Flexibility – ADA or standard use
- Cost Effective

Electronic



Installation



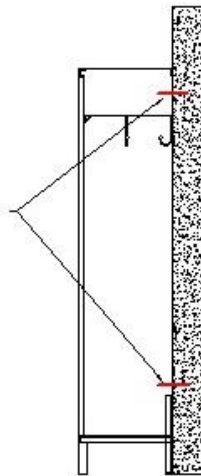
Installation

▶ Anchoring to walls

- ▶ Install anchors at top and bottom of locker
- ▶ Secured to wall with masonry type fastener
- ▶ Use anchors with a pull-out value of at least 150 lb. with a maximum horizontal spacing of 36"

WITH LEGS AGAINST WALL

Anchor to wall near top and bottom of locker at both ends of each row of lockers, and with a maximum spacing of 36" along the length of the row.



ON BASE AGAINST WALL

Anchor to wall near top of locker and to base at both ends of each row of lockers, and with a maximum spacing of 36" along the length of the row.



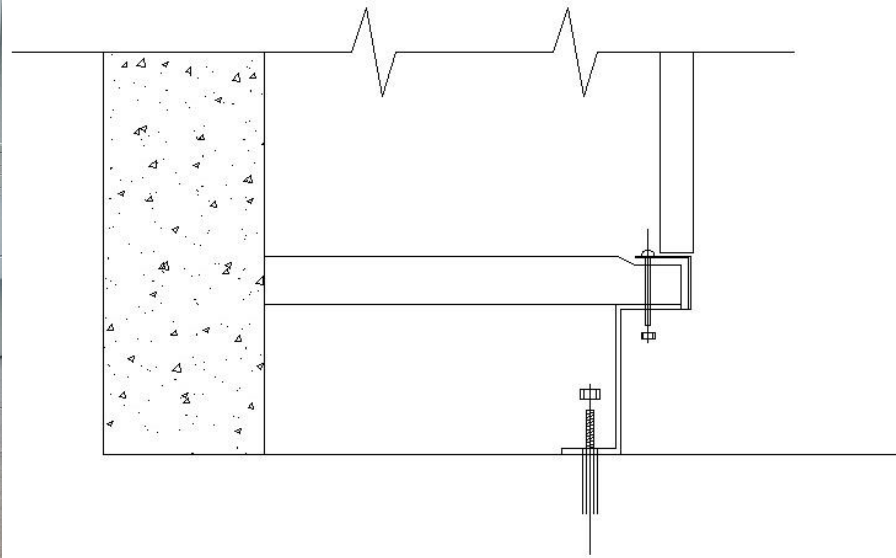
Installation

- ▶ Anchoring to floor
 - ▶ Base: standard legs with closed bases
 - ▶ Use anchors with a pull-out value of at least 200 lb. with a maximum horizontal spacing of 36"



Installation

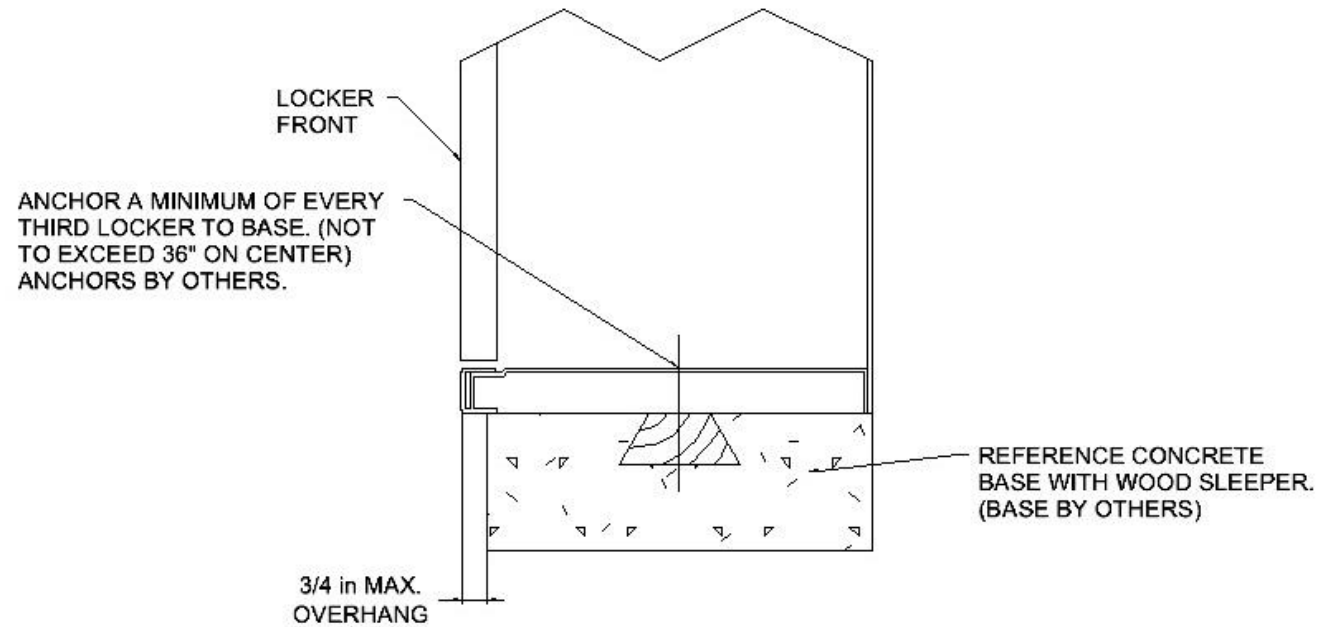
- Zee-base
 - Zee-base should be anchored to the floor before installing lockers
 - Use anchors with a pull-out value of at least 200 lb. with a maximum horizontal spacing of 36"
 - Each locker frame should be bolted to the zee-base.



Installation

► Anchoring

► Concrete Base



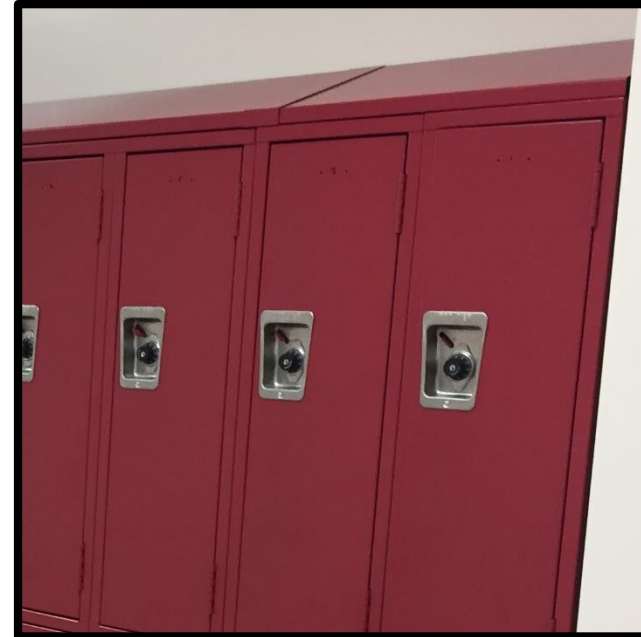
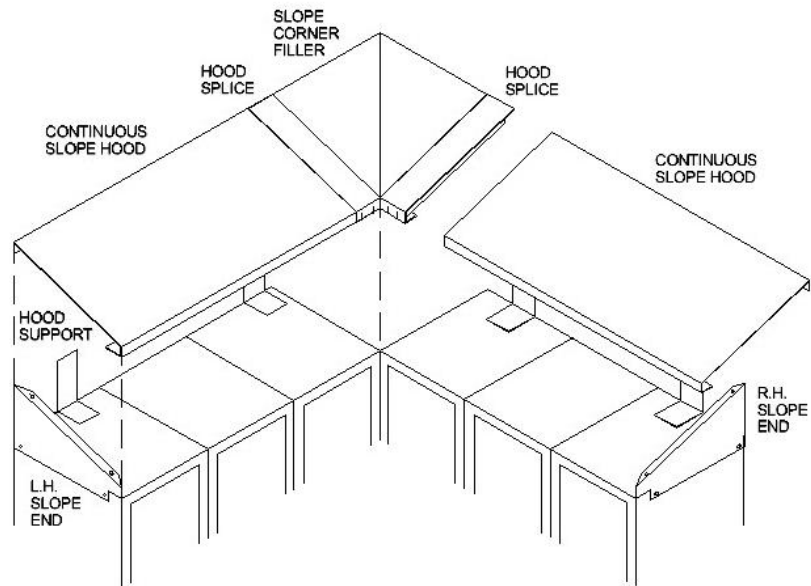
Finishing



Finishing

► Slope Tops

- Keep objects from being stored on top of the lockers



Finishing

▶ Recess Trim

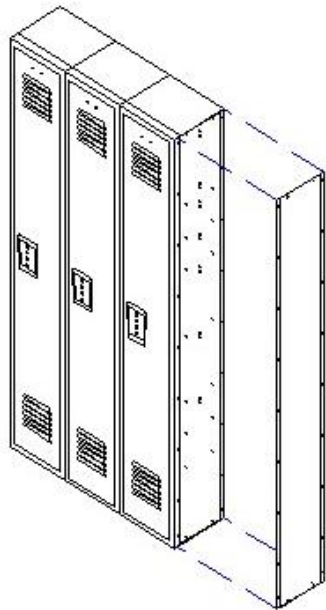
- ▶ Will finish locker projects when lockers are recessed flush into walls or beneath soffit.



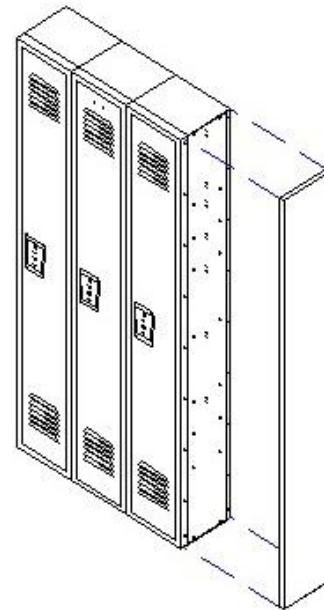
Finishing

► Ends

- Provide a finished look to exposed ends
- Provide greater strength



FINISHED END PANEL COVERS
ALL BUT PERIMETER HOLES



BOXED END PANEL COVERS
ALL HOLES

Finishing

► Filler Location Options

- Filler requirement is driven by growth of 1/16" per locker in a run, due to material thickness
- Filler centered between walls
- Filler pushed to one side
- Fillers of equal width at both ends of locker run

Finishing

► Benches

- Floor mounted
- Most secure



- Movable
- Can be reconfigured



Review question #9

- ▶ What is the main purpose of slope tops?
 - a) Keep objects from being stored on top
 - b) They're easier to clean
 - c) Make the lockers look taller
 - d) So you can see the tops easier

Review question #10

► When would recess trim be used?

- a) When the lockers are set flush between walls or beneath soffits
- b) To fill gaps between lockers
- c) When the lockers have slope tops
- d) None of the above

Successful Projects, Stage by Stage

▶ **Design Stage:**

- ▶ Assess the owner's needs in design development
- ▶ Involve a product representative in construction documents stage

▶ **Bidding/Procurement Stage:**

- ▶ Watch for substitutions that change the design

▶ **Construction Stage**

- ▶ Field measurements, shop drawings, and scheduling are critical
- ▶ Pre-construction meetings coordinate the installation
- ▶ Finalize the numbering sequence

Checklist for a successful locker project:

Consult with a professional manufacturer's representative to prepare a specification that will ensure:

- **Bid process and approval is based on common specification**
- **Competitive bid results, since competitors are estimating costs of "known" requirement and not allowing for contingency**

Allow sufficient time for project quotations

- **Delays in bid reviews, approval, and award can squeeze physical realities of steel lead times and manufacturing process time**

Address submission approvals expediently, ensuring details are defined:

- **Color, number plate requirements, and sequencing**
- **Specification addendum?**

Checklistcontinued:

Communicate schedule changes:

- **If schedule is advanced or delayed**
- **Plan for site access....openings prior to finish framing? ...second floor?...prior sub-contractors finished?**
- **Manufacturers and installers need to coordinate ship dates**

Ensure prior sub-contractors (floor, bases, electrical, drywall, etc.) are finished to avoid damage and delay.

Understand the seasonality of the industry. Manufacturers operate below capacity in fall and winter – peak times for everyone are summer months!

- Option: Order product early – allow for site storage

Attention to these details will ensure a timely finish to a quality job!

This concludes the American Institute of Architects
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THANK YOU!

QUESTIONS?



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