

Designing & Specifying Custom Windows for Luxury Residences

EL602A

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Learning Objectives

- Understand the design considerations for selecting windows for custom luxury homes
- Review the variety of window materials, operating hardware, and home automation options available for luxury homes.
- Specify testing, performance and warranty requirements.
- Understand the installation issues common to luxury residential projects.

Premium or Luxury for Your Projects?



PREMIUM PRODUCT ATTRIBUTES

Broad audience-whoever can justify rationally and financially the added benefits has access to the brand.

The higher price is justifiable by the extra features versus a regular brand.

A variety of distribution channels can be used simultaneously: corporate stores, independent retailers, online, catalog.

Focused production. The goal is to produce profitably meet the customer's needs.

Immediate delivery. Customers are not willing to wait.

LUXURY PRODUCT ATTRIBUTES

Narrow audience-only a small percentage of the general population can afford the brand.

Greatly exceeds the functional value of the product. Acts as a selection tool that limits the access to the brand.

Highly selective, and almost exclusively through a corporate-owned channel.

Hand made. Method of production is part of the brand myth.

Not urgent. The wait for the product to be built/created/fully matured contributes to the overall luxury experience.



Move-up
250K-500K
140,000/yr.



Starter Home
0-250K
400,000/yr.



Housing Market



Ultra-Luxury
15M+
500 yr.



Core Luxury
4M-15M
1,500 yr.



Upper Premium
2M-4M
4,000/yr.



Premium
500K-2M
91,000/yr.

Project Differentiation

Design Considerations:

- Aesthetics
- Performance
- Function
- Budget



Traditional



Contemporary

Cost, Customization, & Complexity

Simple Configurations
Standard Sizes
Standard Hardware
Standard Glazing
Limited Material Choice
Simple Installation

Advanced Combinations
“Customized” Standard
Expanded Material &
Hardware Options
Expanded Glazing Options
Advanced Installation

100% Custom
Custom Wall Depth
Common Mullions
Broadest Material & Hardware
Options
Commercial Installation



Starter Home



Move-up



Premium



**Upper
Premium**



**Core
Luxury**



Ultra-Luxury



Fixed



Awning



Casement



Hung



Custom



In-swing French
Casement



French
Casement



In-swing
Casement



Tilt-Turn



Hopper

Wood &
Clad Wood



Bronze



Steel



Aluminum



Wood &
Clad Wood

- Renewable
- Thermally efficient
- Strong
- Easily customized, crafted, and shaped



Premium Woods



Mahogany



Douglas Fir



Pine



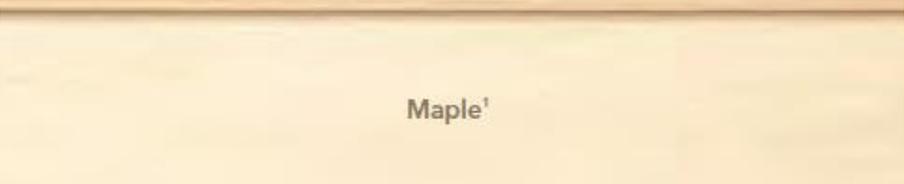
White Oak¹



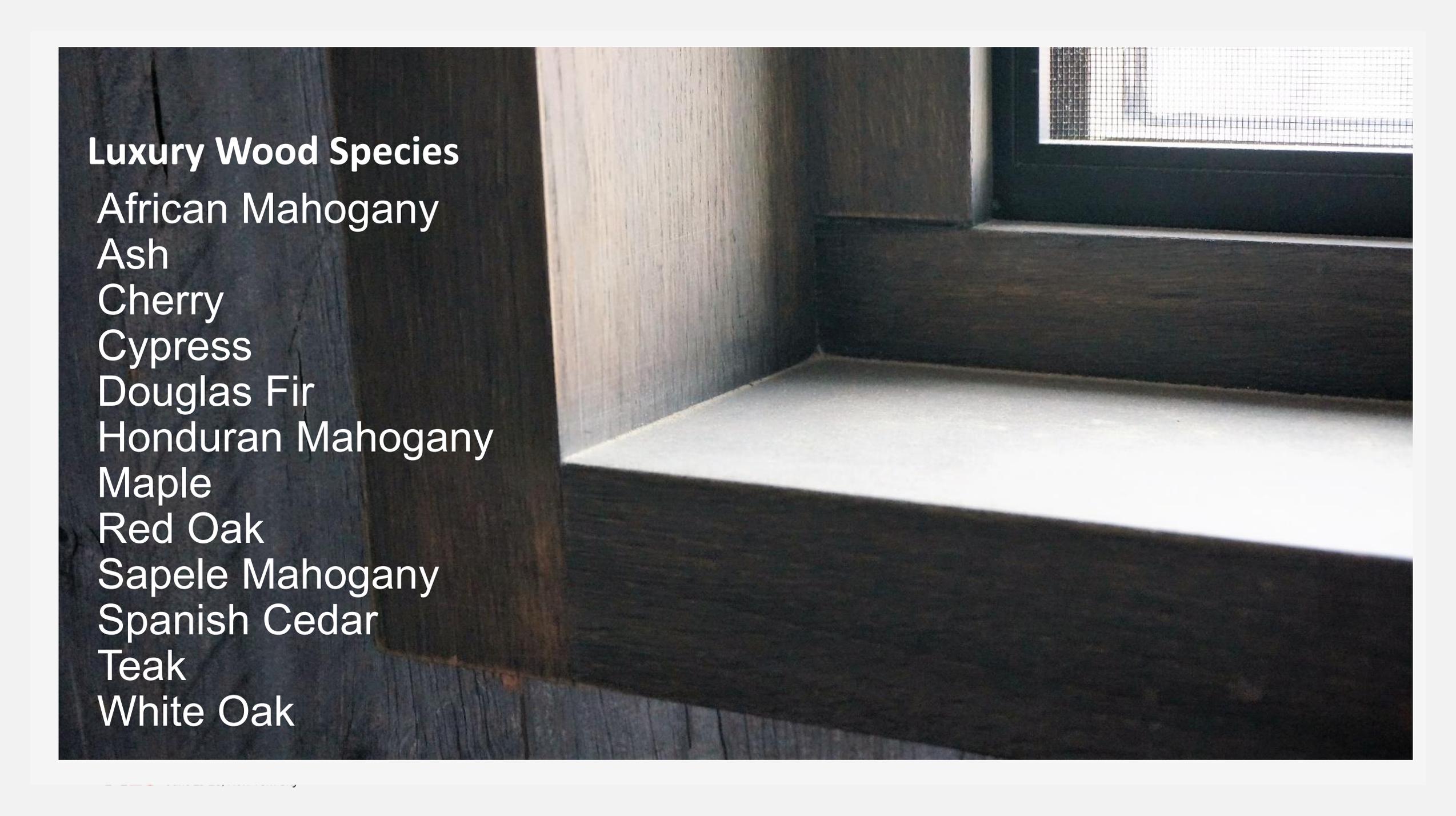
Cherry¹



Red Oak¹



Maple¹



Luxury Wood Species

African Mahogany

Ash

Cherry

Cypress

Douglas Fir

Honduran Mahogany

Maple

Red Oak

Sapele Mahogany

Spanish Cedar

Teak

White Oak

Bronze

- Strong
- Weather resistant
- Forms a Natural Patina
- Typically cladding on a wood window



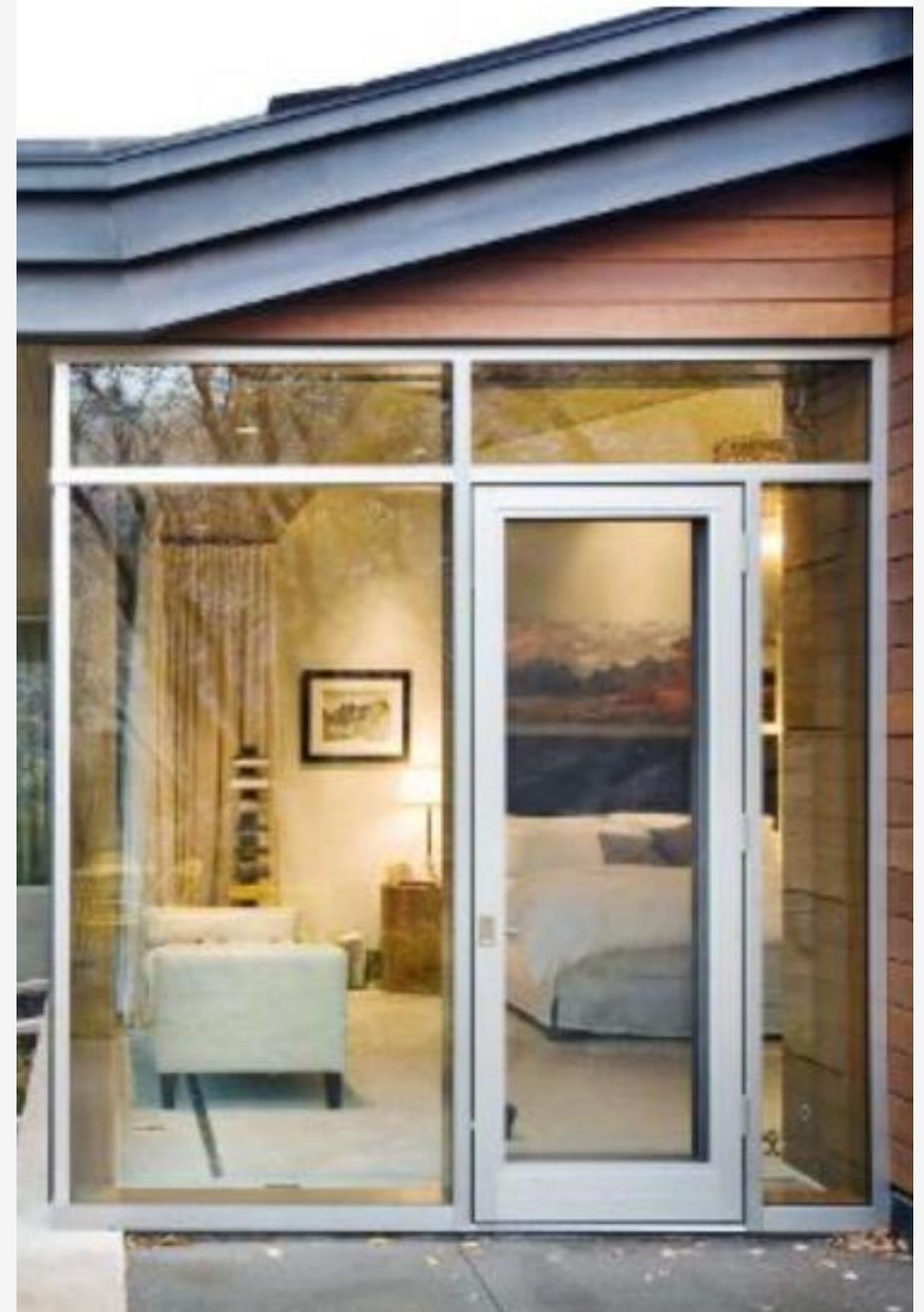


Steel

- Thermally broken & non-thermally broken frames
- Strength & Durability
- Good thermal performance
- Minimal sightlines
- Labor Intensive Fabrication

Aluminum

- Durable
- Site glazed large glass ratios
- Minimal sightlines
- Reduced thermal performance



MATERIAL**PREMIUM WINDOWS****LUXURY WINDOWS**

Wood Exterior & Interior

X**X**

Aluminum Clad Wood

X**X**

Bronze Clad

X

Steel

X

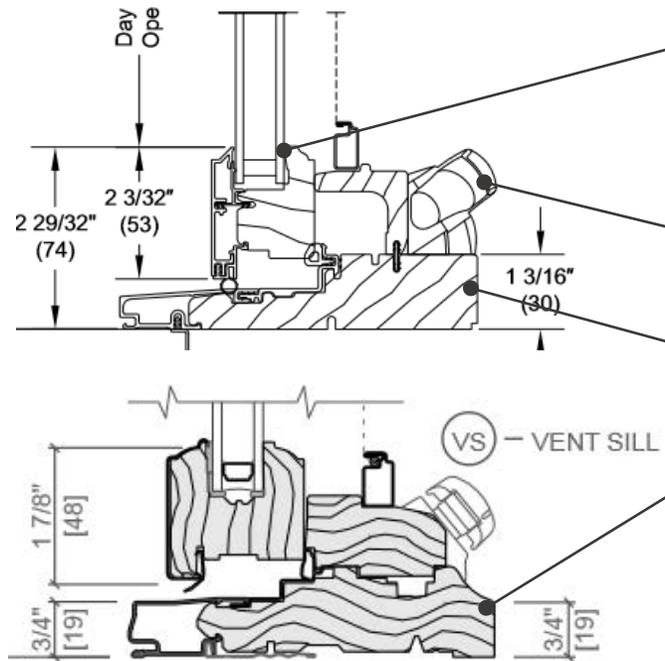
Aluminum Clad Steel

X

Aluminum

X**X**

Premium



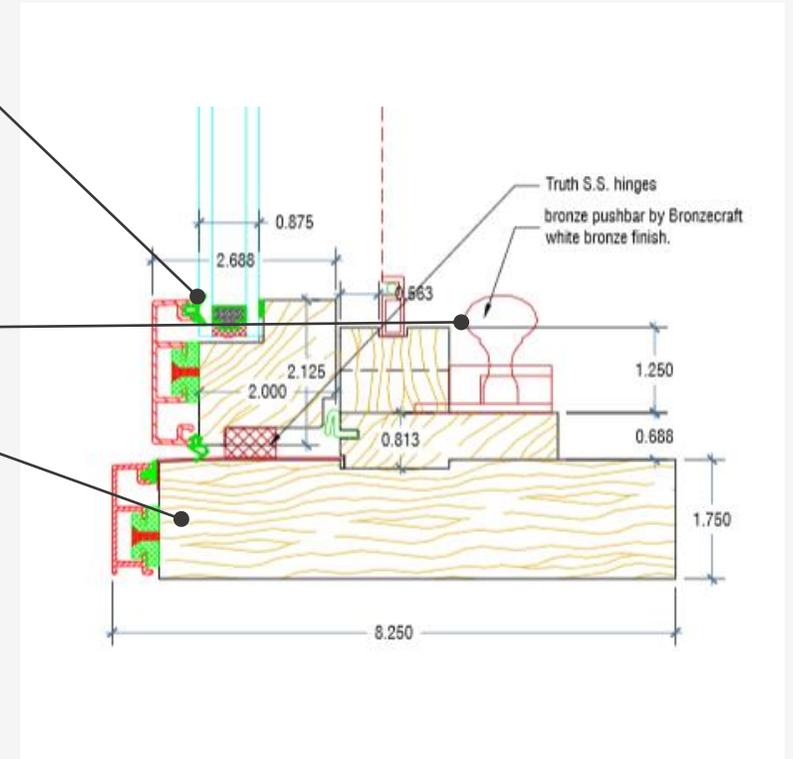
Glazing Depth

Hardware:

Frame Properties:

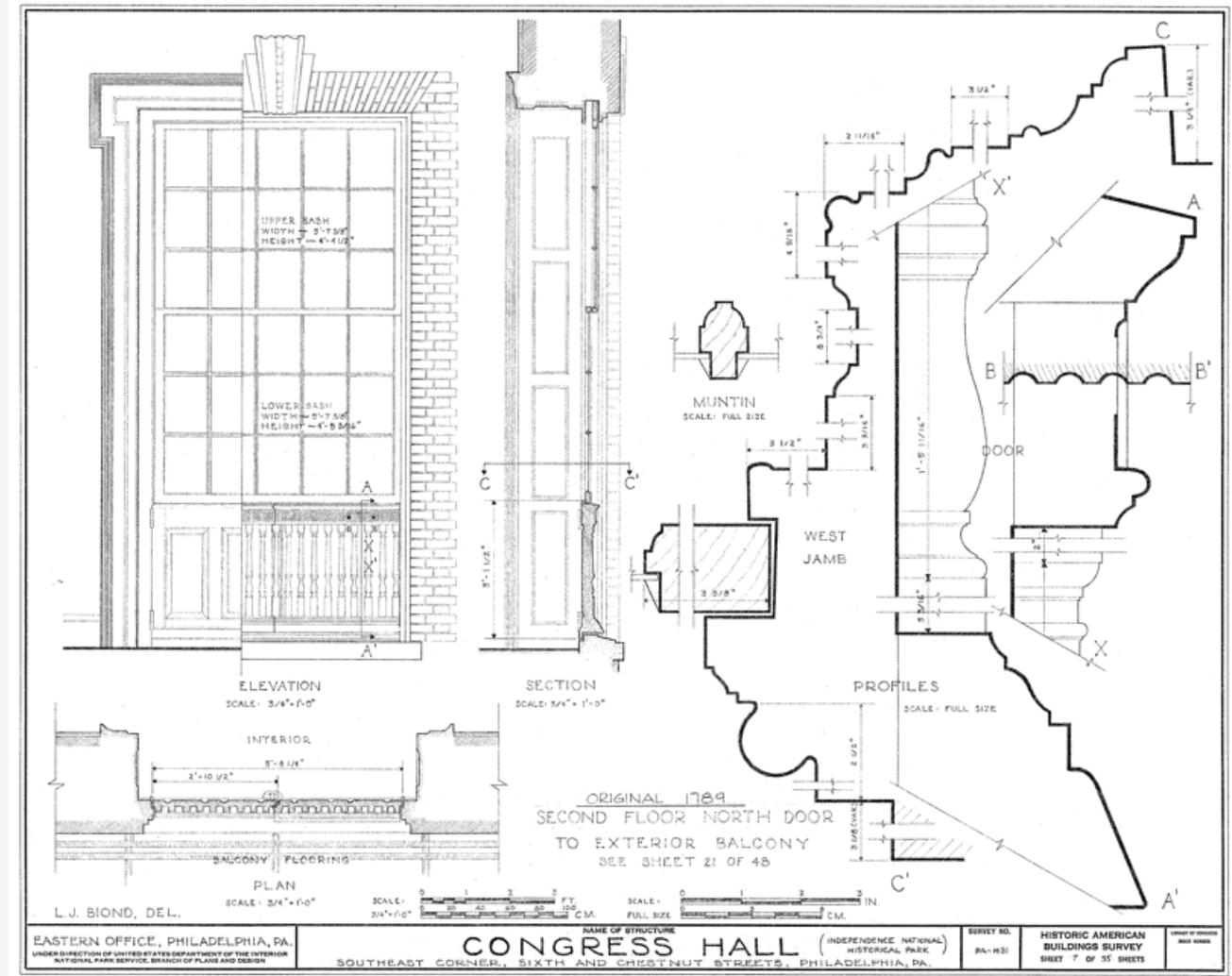
- Structural Capacity
- Frame Depth vs. Jamb Extensions
- Profile Customization

Luxury

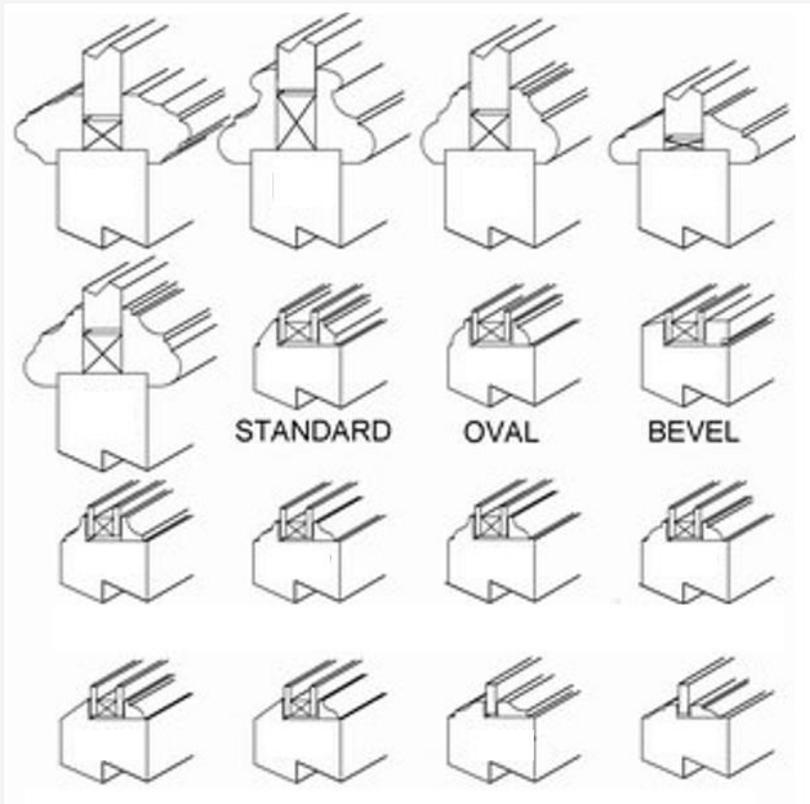


Customizing Profiles

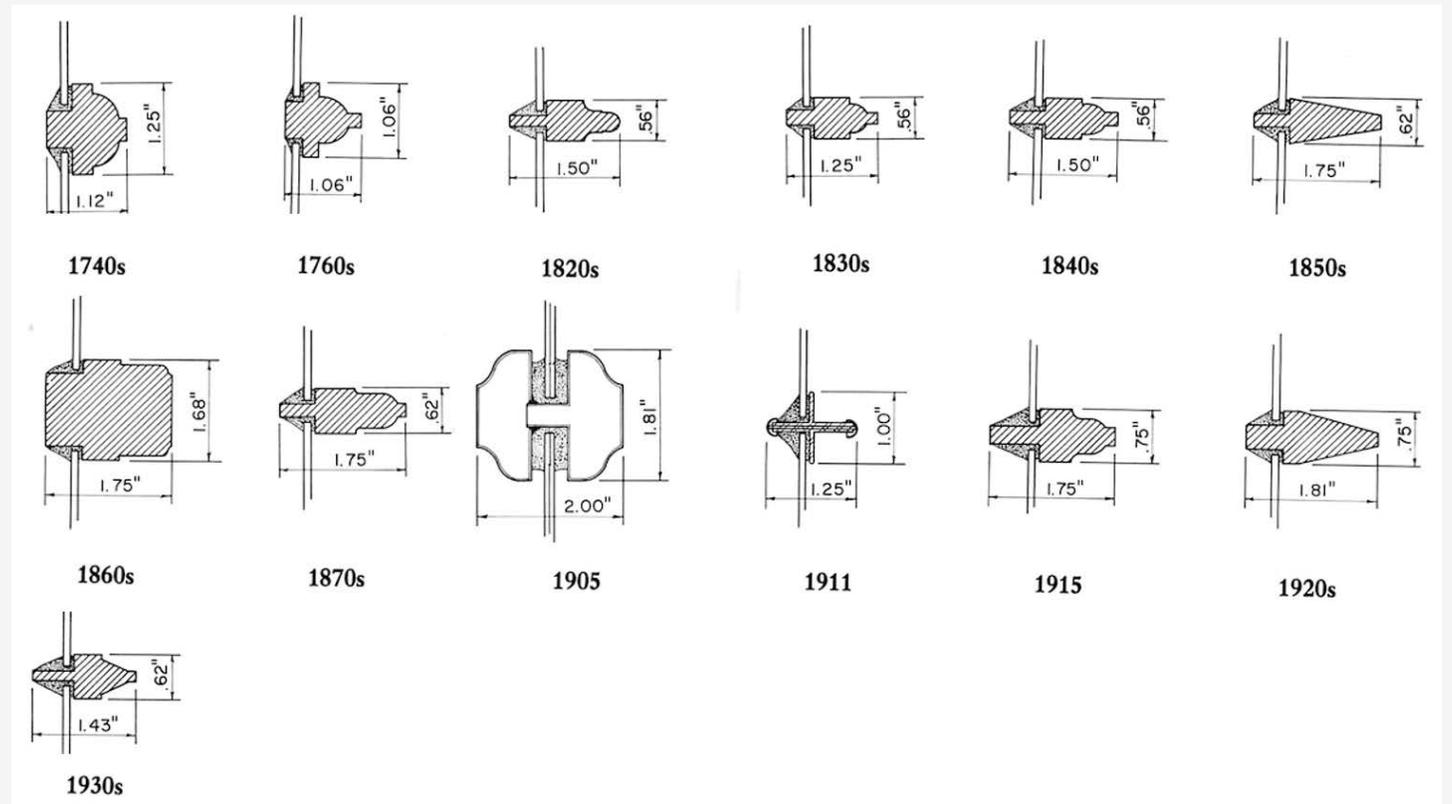
- Sash Profiles
- Muntin Profiles
- TDL vs SDL
- Light Patterns
- Sash Operation



Sash Profiles



Historic Sash Profiles



Historic Muntin Profiles

Modern Muntin Design

- **SDL vs TDL**
 - Complex patterns
 - Narrower muntins
 - Less leakage
 - More economical
 - Loss of faceting



Premium

- Clear, Low-E, Tinted, Reflective, Laminated, Impact-resistant, Obscure, Spandrel

Luxury

- Dual Pane IG
- Triple Pane IG
- Drawn Glass
- Bent Glass
- Switchable
- Electrochromic Glass
- Photochromic



Premium

- Base color pallet at entry price-point
- Expanded color pallet for smaller up-charge
- Custom colors available for a larger charge



Luxury

- Custom color selection

Premium



Selected from Window Mfr. Offering

Luxury



Sourced from custom hardware suppliers

Premium

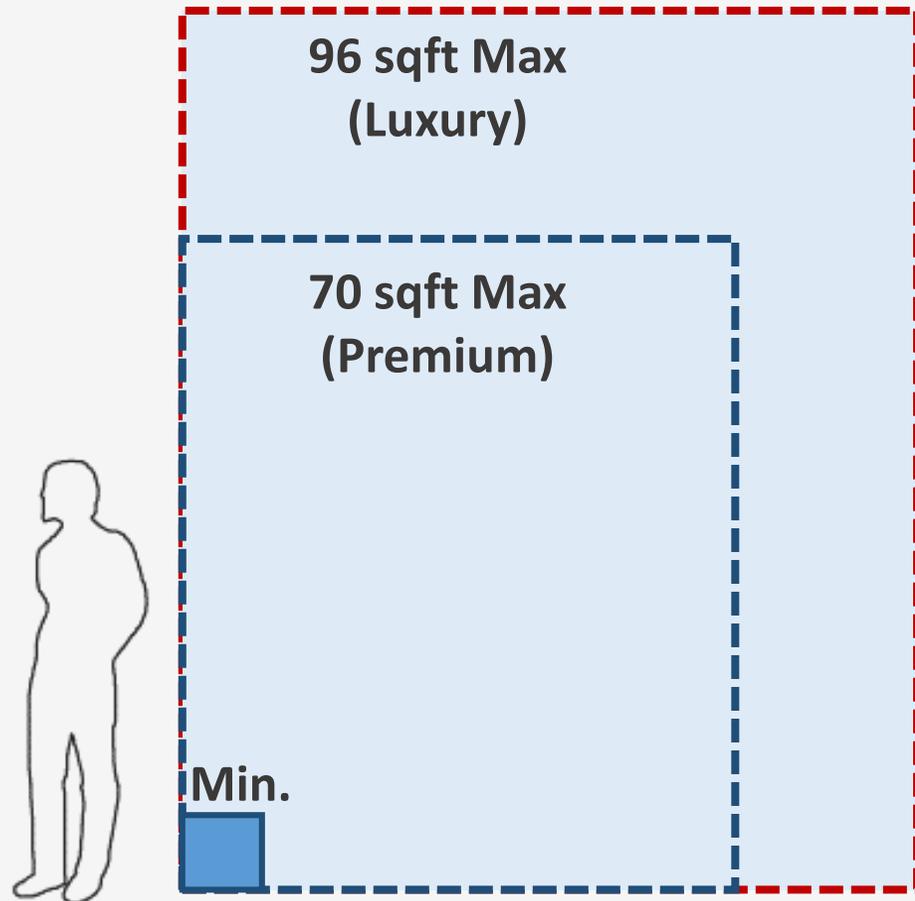
- Operate blinds & shades
- Monitor open/closed/ locked status
- Integrate w/ smart home systems

Luxury

- Operate blinds & shades
- Operate open/closed/ locked and monitor status
- Integrate w/ smart home systems

Smart Technologies & Automation

Frame Size Considerations



- Glazing Size Limits
- Energy Performance
- Air, Water, Structural Performance
- Frame Strength
- Manufacturing Process Limitations
- Shipping Limitations
- Site handling & Installation



Authenticity:

Premium

- Use products with a design based on historic window proportions and construction

Luxury

- Typically can replicate existing
- Weight & chain balances
- Frame & muntin profiles

Frame Size & Assembly:

Premium

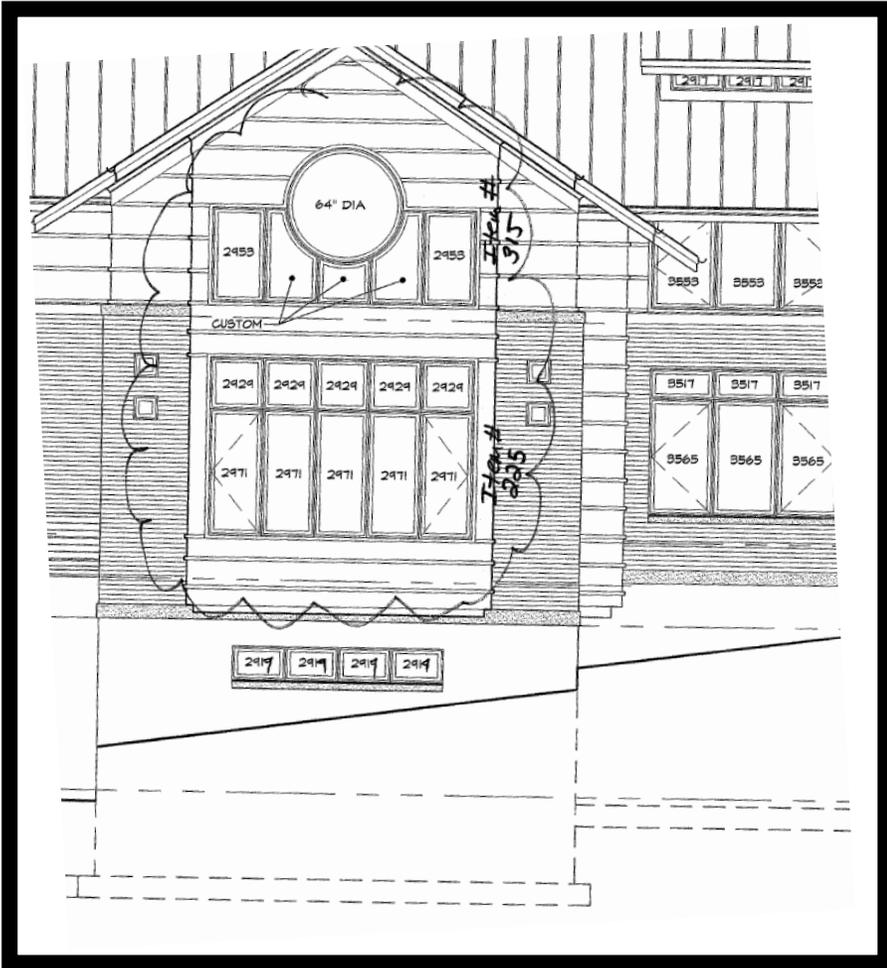
- Multiple windows joined as a combination
- Reinforced mullions

Luxury

- Built as a composite w/ integral mullions
- Frame sections typically have higher strength values



Installation Considerations



Installation Issues:

- Installation into multiple materials (concrete, brick, siding)
- Large Quantity
- Multiple Large Combinations
 - Product Handling (combination size)
 - Reinforcing for Wind Loads
 - Combination joints create multiple water infiltration opportunities

Installation Considerations



Performance Requirements:

- Site Design Pressure: 20psf

Specified Products:

- Clad Wood Casement, Large Awning, Fixed

Installation Considerations



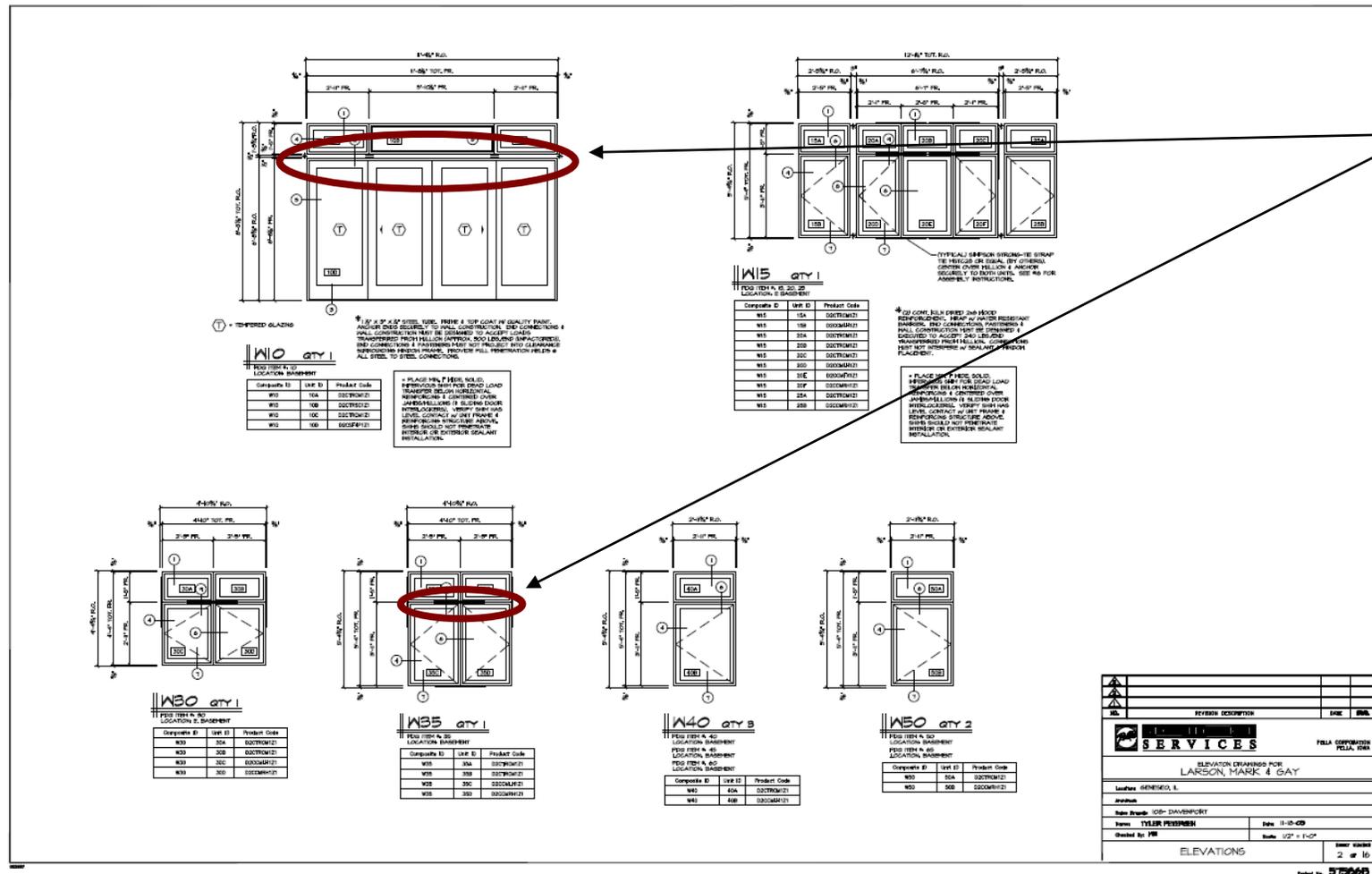
Multiple
Combinations

Installation Considerations



Multiple
Combinations

Installation Considerations



Combination issues:

- Reinforcing for deadloads (weight of units above)
- Reinforcing for lateral loads (design pressure)

REVISION	DESCRIPTION	DATE	BY

TYLER SERVICES FULLY CERTIFIED FELLA 2004

ELEVATION DRAWINGS FOR LARSON, MARK & GAY

Location: GENESEE, IL

Job No:

Job Group: COB - DAMPENBURY

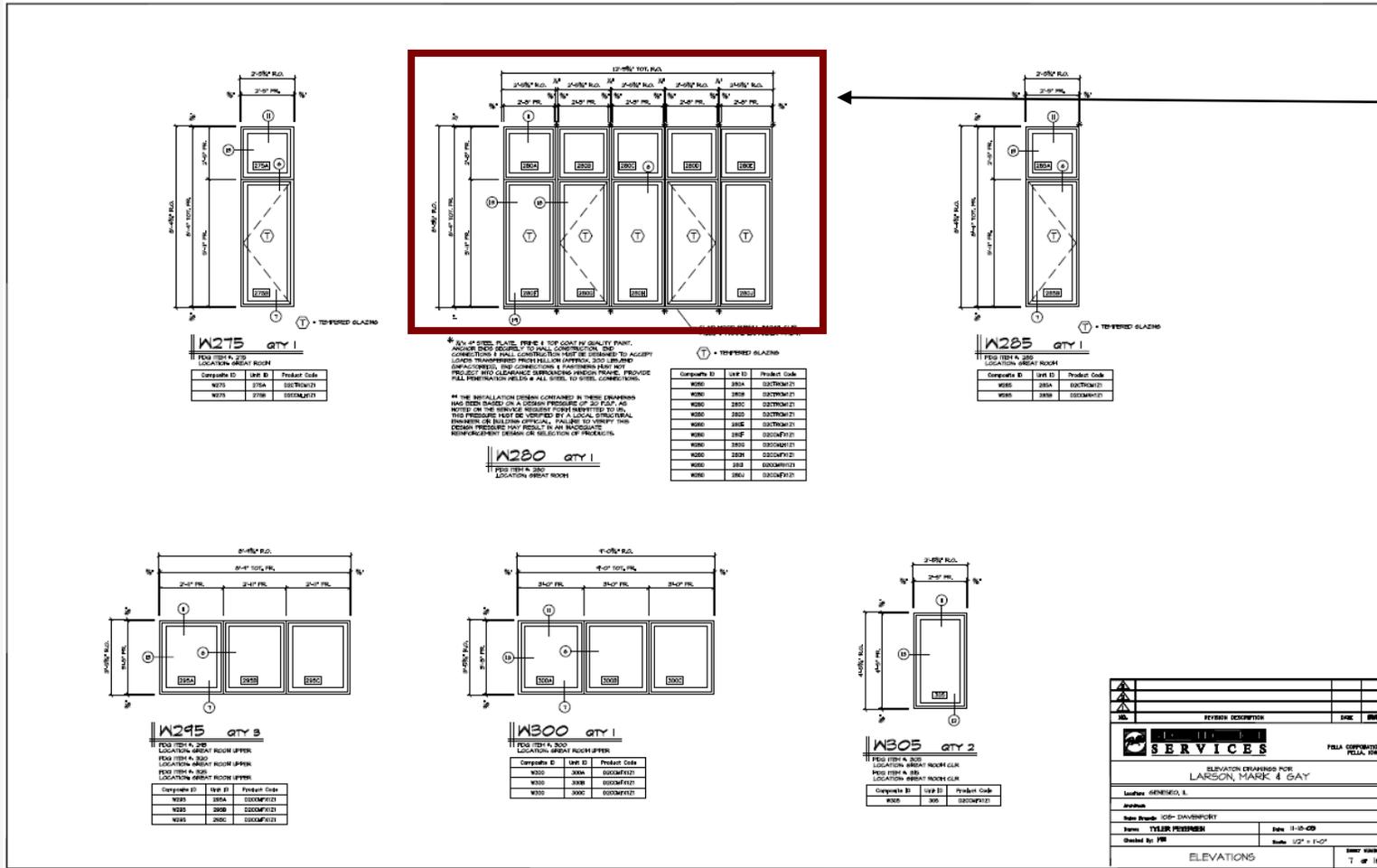
Drawn: TYLER PETERSON Date: 11-10-09

Checked by: FVR Scale: 1/2" = 1'-0"

ELEVATIONS Sheet Number: 2 of 16

Print No: 57366B

Installation Considerations



Combination issues:

- Larger combinations can not be pre-assembled because of handling issues (weight and size)
- Field assembly often leads poor water infiltration control
- Familiar fin installation method can't be used
- Integration with wall / drainage plane more difficult

REVISION	DESCRIPTION	DATE	BY

SERVICES FELLA CORPORATION TULLA, IN

ELEVATION DRAWINGS FOR LARSON, MARK & GAY

Location: GENESEE, IL

Job: GENESEE (05-DIVISION)

Drawn By: TYLER PERDUE Date: 11-05-09

Checked By: PIR Scale: 1/2" = 1'-0"

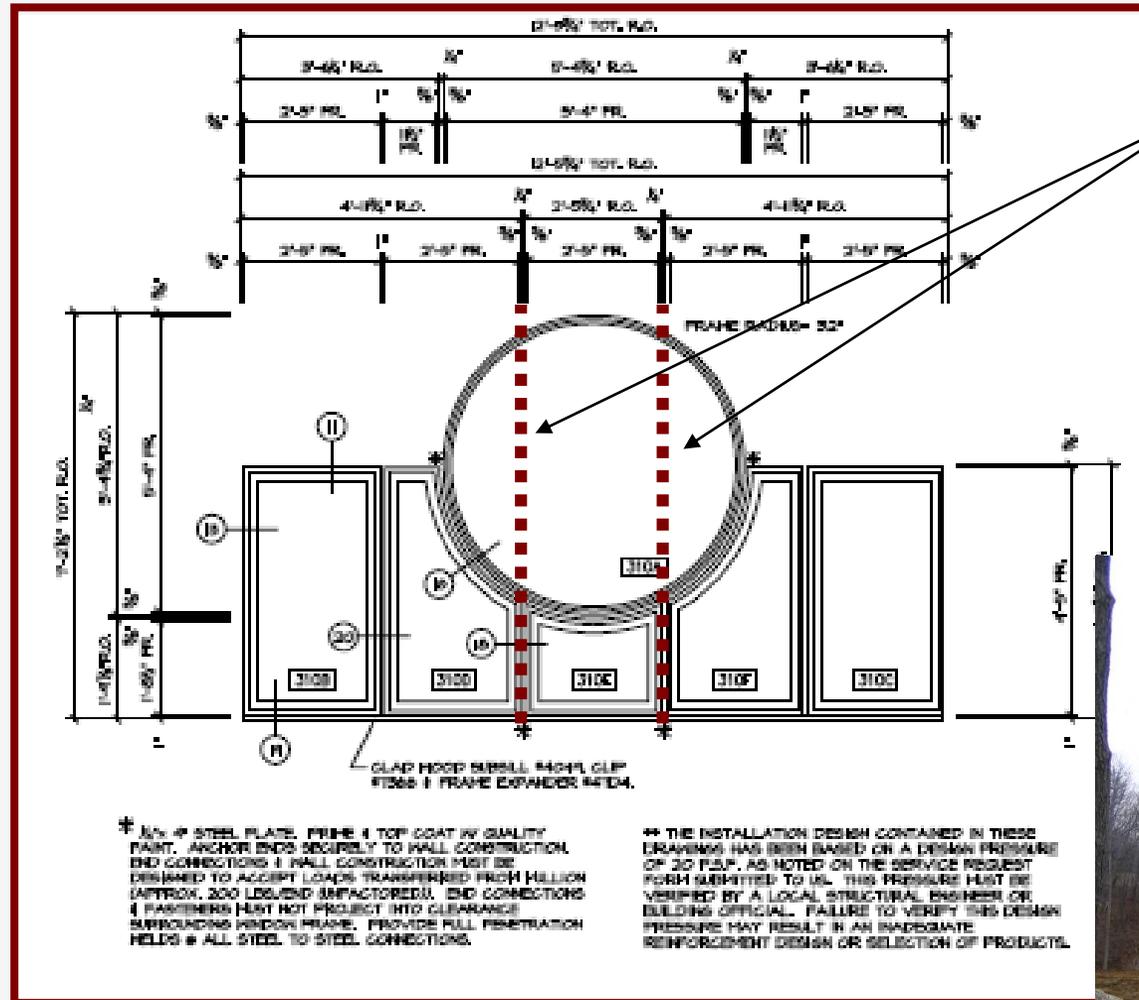
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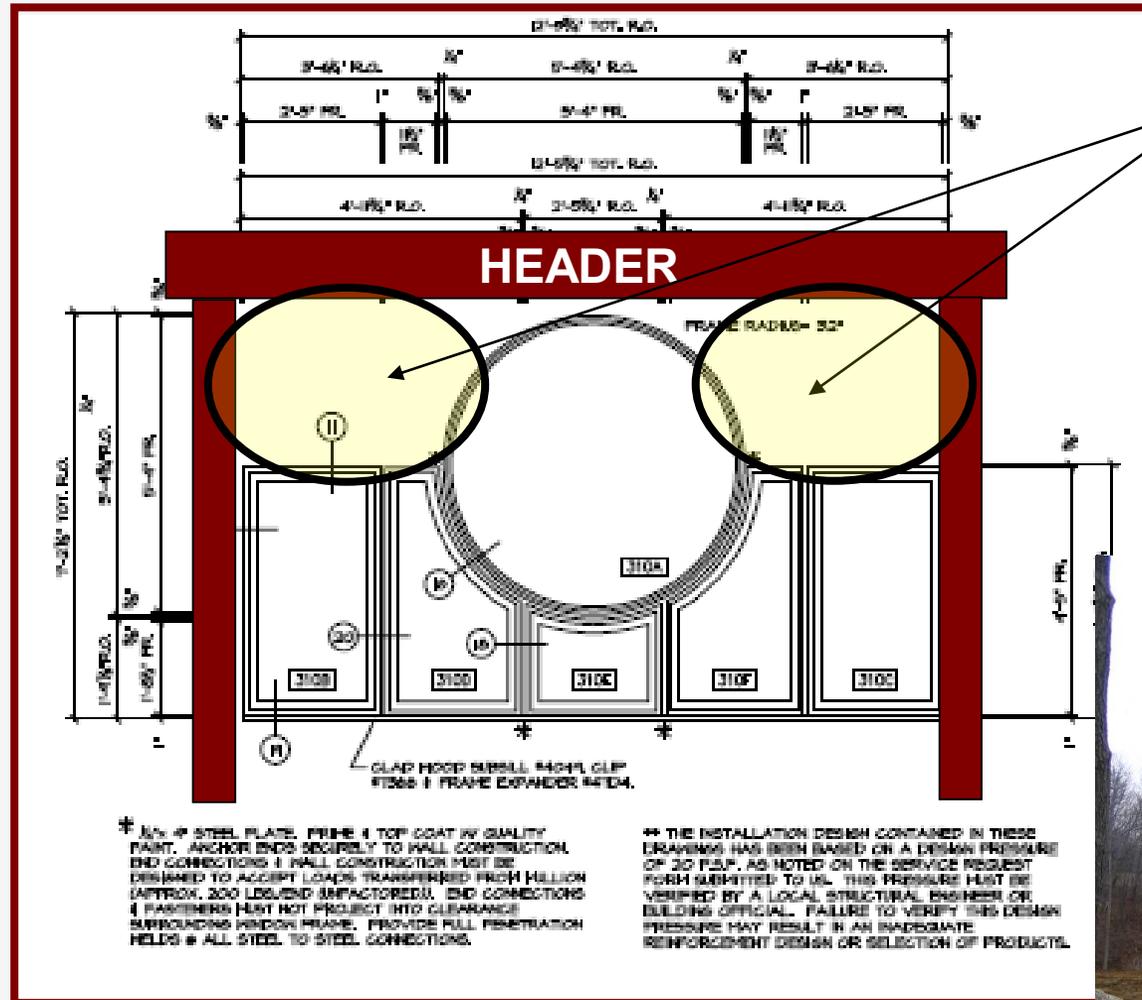
Installation Considerations

Combination Challenges:

- Reinforcing can't run through



Installation Considerations

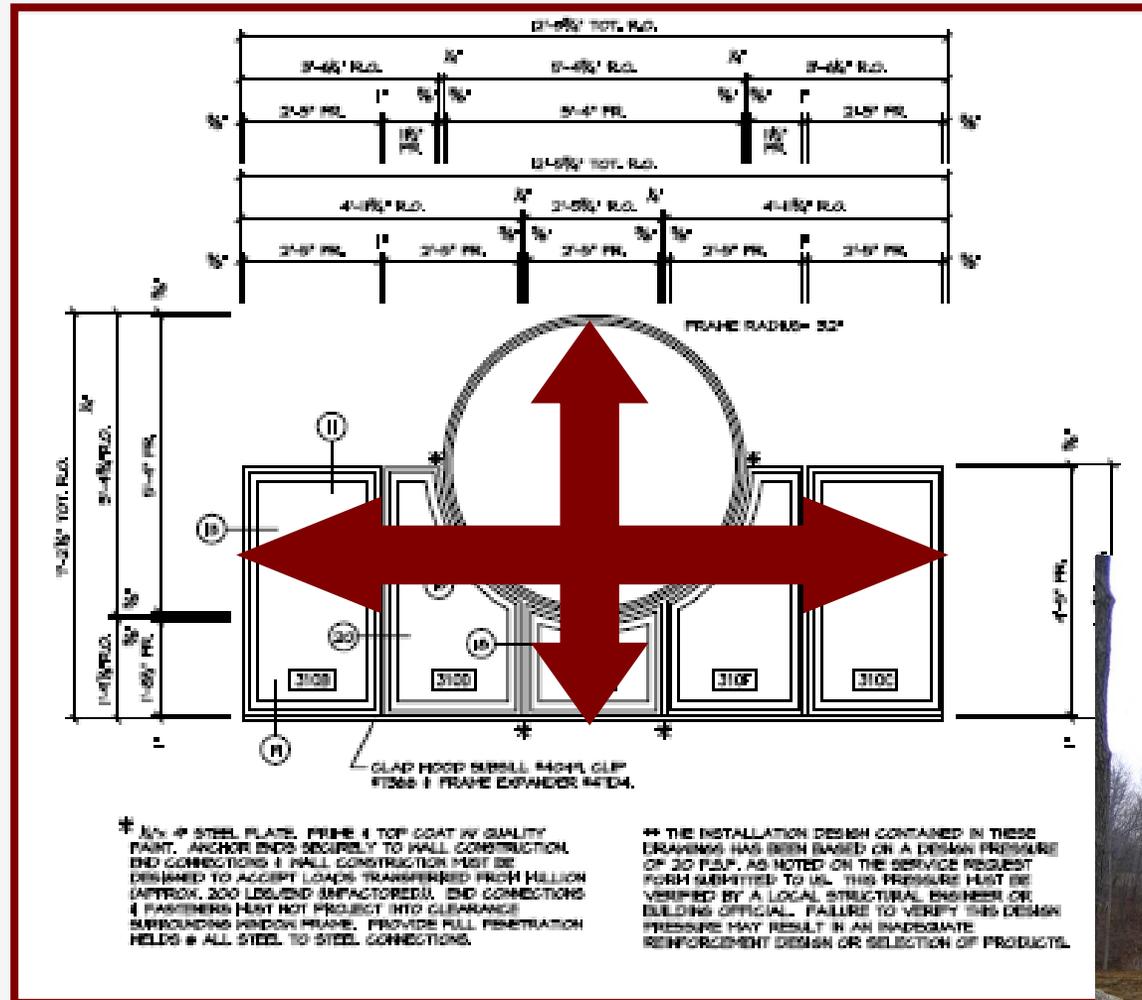


Combination Challenges:

- Normal wall framing does not supply continuous support



Installation Considerations

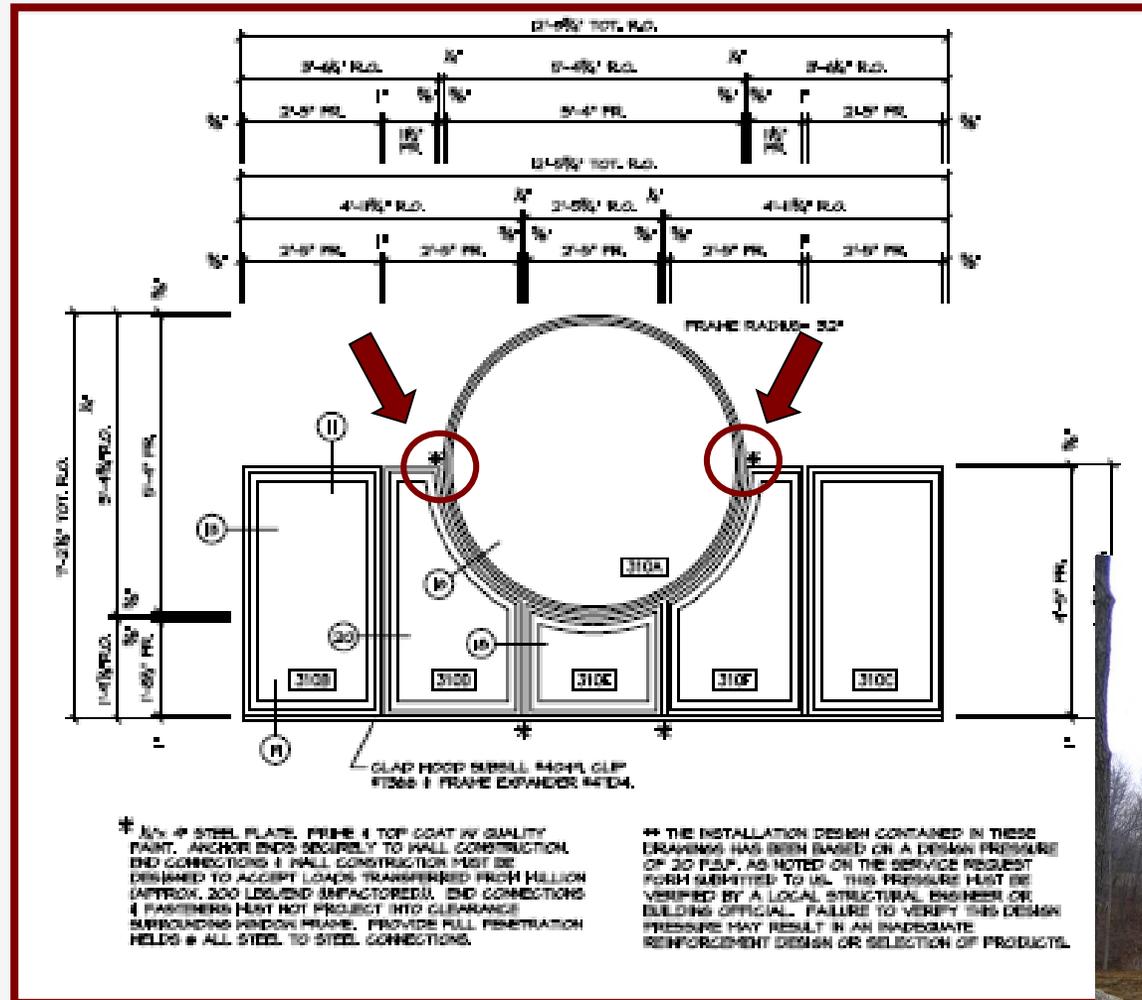


Combination Challenges:

- Shape and size difficult to pre-assemble



Installation Considerations



Combination Challenges:

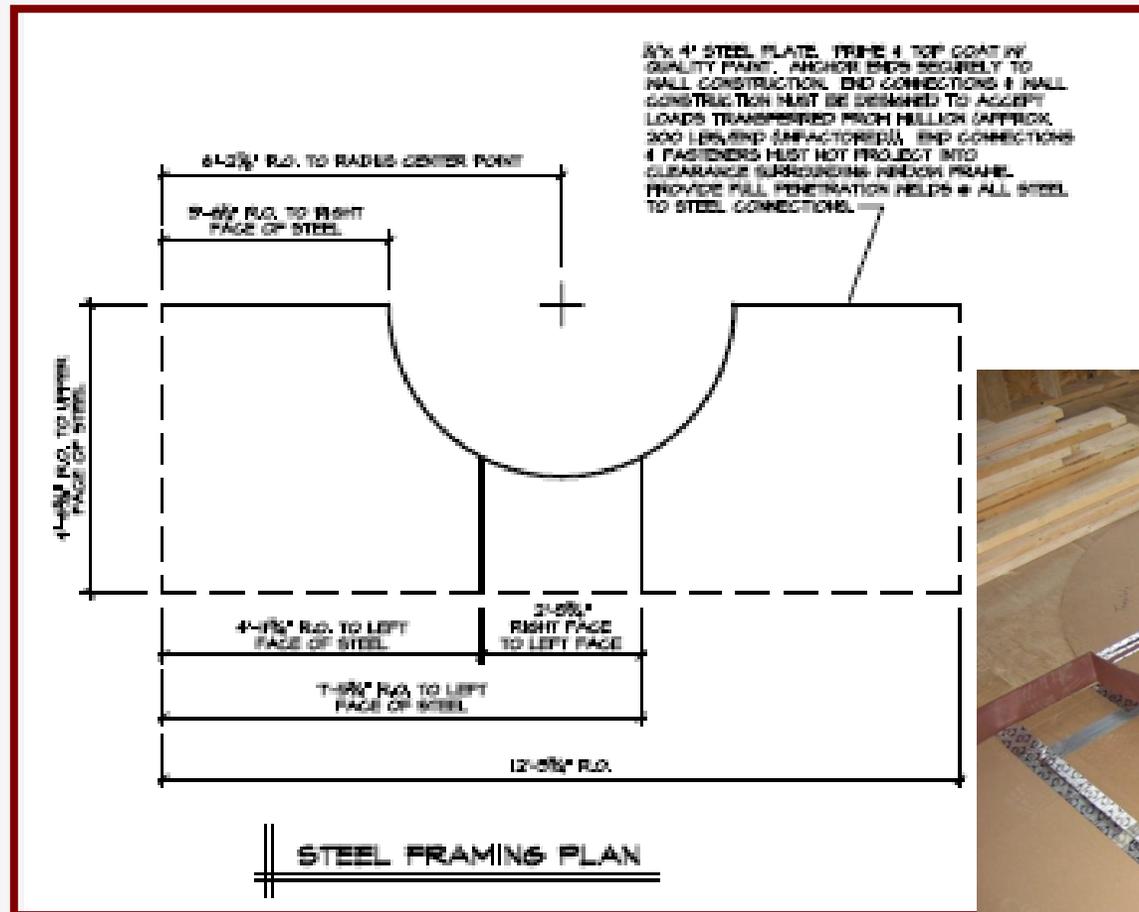
- Circle window creates “funnel” for water



Installation Considerations

Combination Solutions:

- Design custom reinforcing solution using plate steel



Installation Considerations

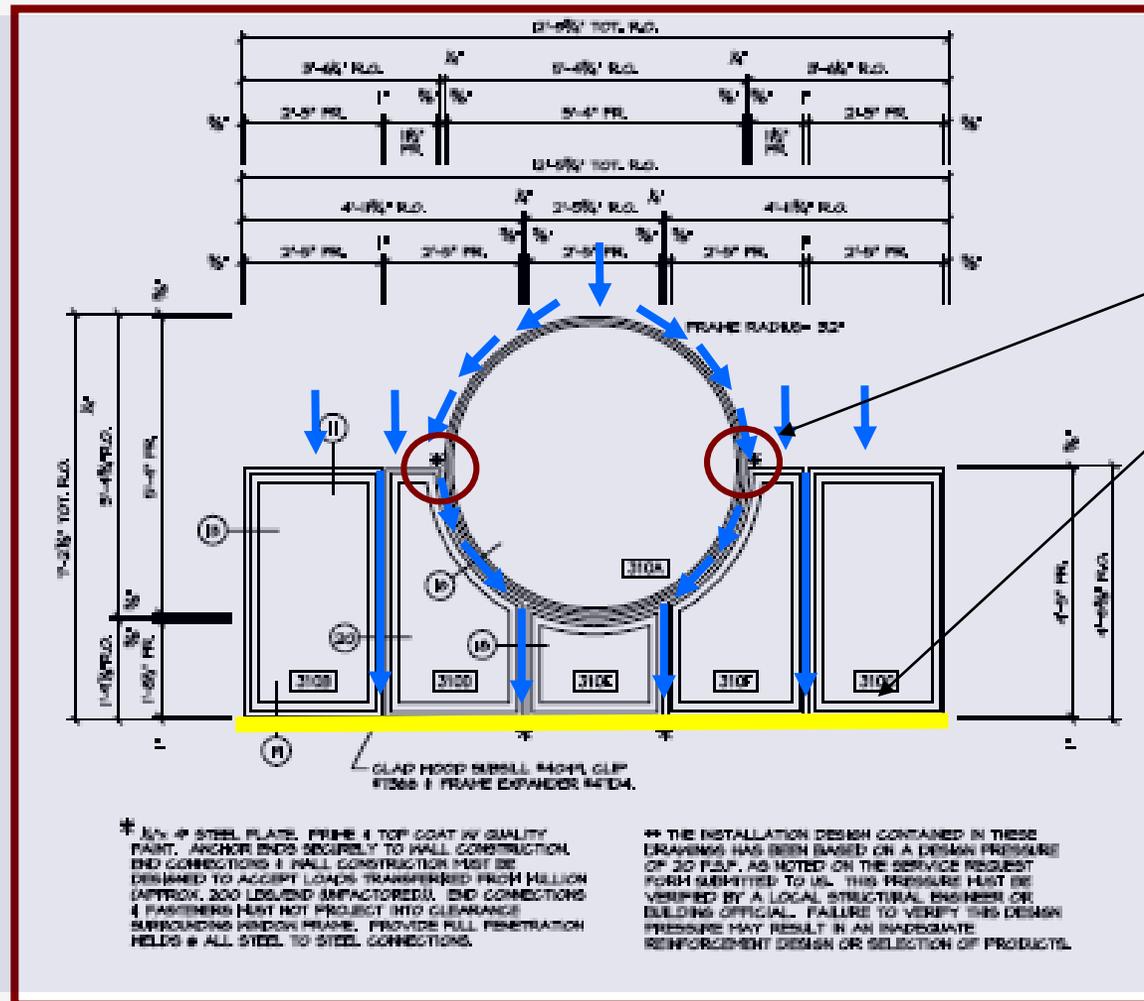


Attachment at sill



Attachment at jambs

Installation Considerations



Combination Solutions:

- Planning for water infiltration
- Subsill Drainage

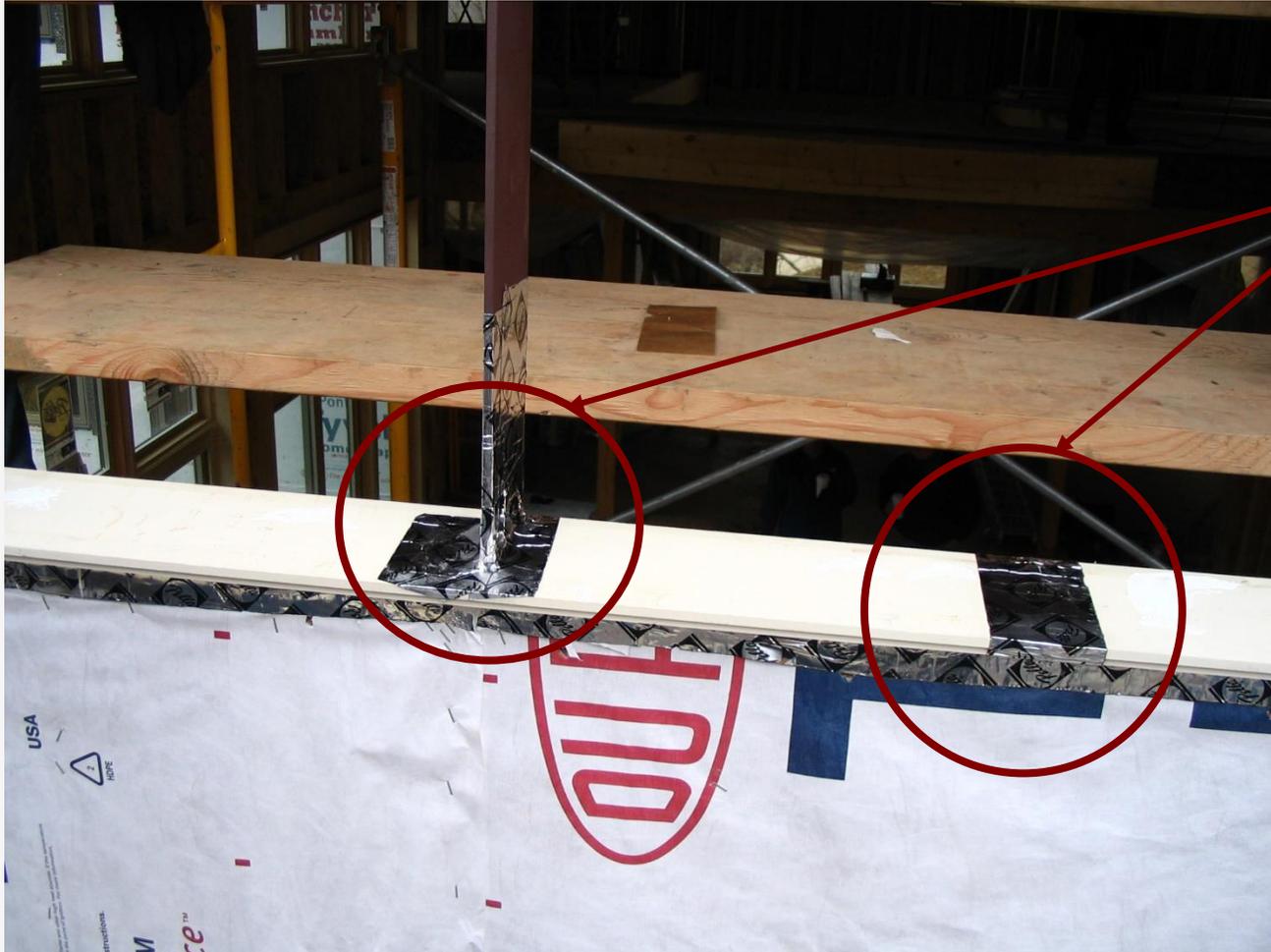
Installation Considerations



Combination Solutions:

- Sill protected, and integrated with drainage plane of wall using Flashing Tape

Installation Considerations



Combination Solutions:

- Subsill is integrated with steel using sealant and Flashing Tape
- Subsill splices are sealed and covered with Flashing Tape

Installation Considerations



Combination Solutions:

- Units are set with clearance around steel for shim space, and installation of sealant.
- Space also allows for water to flow around the units, down to the subsill

Installation Considerations



- Integrate and protect the head of the unit using flashing and tape behind the weather barrier at the head.

Installation Considerations

The same principles apply to ALL combinations!



Cost, Customization, & Complexity



**Upper
Premium**



**Core
Luxury**



Ultra-Luxury

Learning Objectives

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Thank you!

Contact Information

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