



Wauwatosa, WI

Design Review Board

Meeting Agenda - Final

7725 W. North Avenue
Wauwatosa, WI 53213

Thursday, August 21, 2025

7:00 PM

Committee Room #1

CALL TO ORDER

ROLL CALL

NEW BUSINESS

1. 4035 N 110th Street - Residential Garage - Re-Review of Staff Decision - [25-1190](#)
Return to Board
1. 7200 West North Ave - Brick Options - Return to Board [25-0741](#)
4. 2500 N Mayfair Rd - Scheels - Exterior Renovations - Return to Board [25-1188](#)

ADJOURNMENT

NOTICE TO PERSONS WITH A DISABILITY

Persons with a disability who need assistance to participate in this meeting should call the City Clerk's office at (414) 479-8917 or send an email to tclerk@wauwatosa.net, with as much advance notice as possible.



Wauwatosa, WI

7725 W. North Avenue
Wauwatosa, WI 53213

Staff Report

File #: 25-1190

Agenda Date: 8/21/2025

Agenda #: 1.

4035 N 110th Street - Residential Garage - Re-Review of Staff Decision - Return to Board

PLAT OF SURVEY

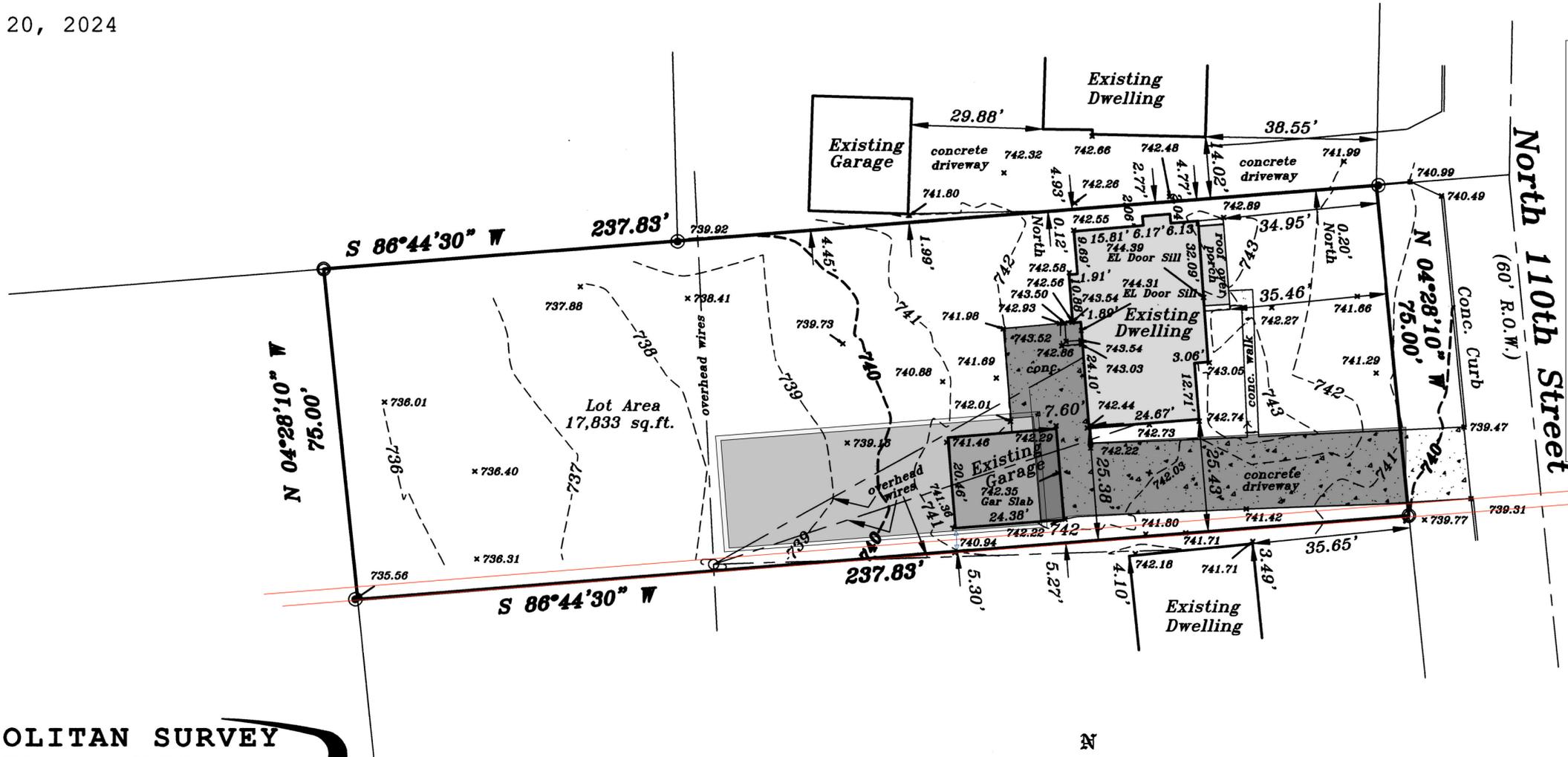
LOCATION: 4035 North 110th Street, Wauwatosa, Wisconsin

LEGAL DESCRIPTION:

The North 75 feet of that part of the Southeast 1/4 of Section 6, Township 7 North, Range 21 East, in the City of Wauwatosa, Milwaukee County, Wisconsin, bounded and described as follows, to-wit: Commencing at a pint in the South line and 898.50 feet West of the Southeast corner of said Southeast 1/4; running thence North on and along a line 366.30 feet to a point which is 925.60 feet West of the East line of said 1/4 Section; thence West on and along a line which is parallel to the South line of said 1/4 Section 237.83 feet to a point; thence South on and along a line 366.30 feet to a point in the South line of said 1/4 Section; thence East on and along the South line of said 1/4 Section 237.83 feet to point of commencement.

November 20, 2024

Survey No. 115433



GARCIA GARAGE
4035 N. 110TH ST.

CONTENTS

- SHEET - 1 - SITE SURVEY
- SHEET - 2 - FLOOR PLAN
FRONT ELEVATION
- SHEET - 3 - ELEVATIONS
- SHEET - 4 - SECTIONS
- SHEET - 5 - WIND BRACING
PARTIAL SITE PLAN
- SHEET - 6 - SCHEDULES, LEGEND
- SHEET - 7 - FOUNDATION DETAIL



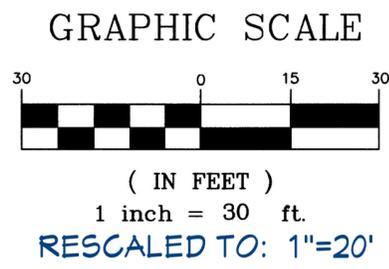
METROPOLITAN SURVEY SERVICE, INC.

PROFESSIONAL LAND SURVEYORS

8482 South 76th Street
Franklin, Wisconsin 53132
PH. (414) 529-5380
survey@metropolitansurvey.com
www.metropolitansurvey.com



- ⊙ — Denotes Iron Pipe Found
- — Denotes Iron Pipe Set



I HEREBY CERTIFY THAT I HAVE SURVEYED THE ABOVE DESCRIBED PROPERTY AND THAT THE ABOVE MAP IS A TRUE REPRESENTATION THEREOF AND SHOWS THE SIZE AND LOCATION OF THE PROPERTY. ITS EXTERIOR BOUNDARIES, THE LOCATION OF ALL VISIBLE STRUCTURE AND DIMENSIONS OF ALL PRINCIPAL BUILDINGS THEREON, BOUNDARY FENCES, APPARENT EASEMENTS AND ROADWAYS AND VISIBLE ENCROACHMENT, IF ANY.

THIS SURVEY IS MADE FOR THE EXCLUSIVE USE OF THE PRESENT OWNERS OF THE PROPERTY AND ALSO THOSE WHO PURCHASE, MORTGAGE, OR GUARANTEE THE TITLE THERETO WITHIN ONE (1) YEAR FROM THE DATE HEREOF.

Dennis C. Sauer
SIGNED _____

| | |
|--------|---------|
| DATE: | 8/11/25 |
| SHEET: | 1 |

ALFONZO & JEANETTE GARCIA
4035 N. 110TH ST.
WAUWATOSA, WI

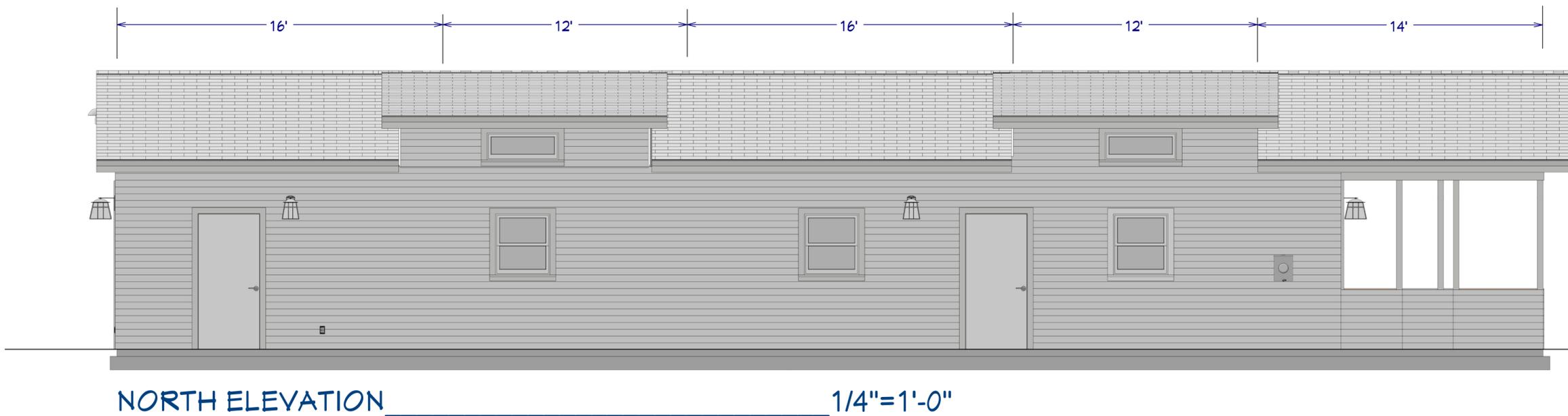
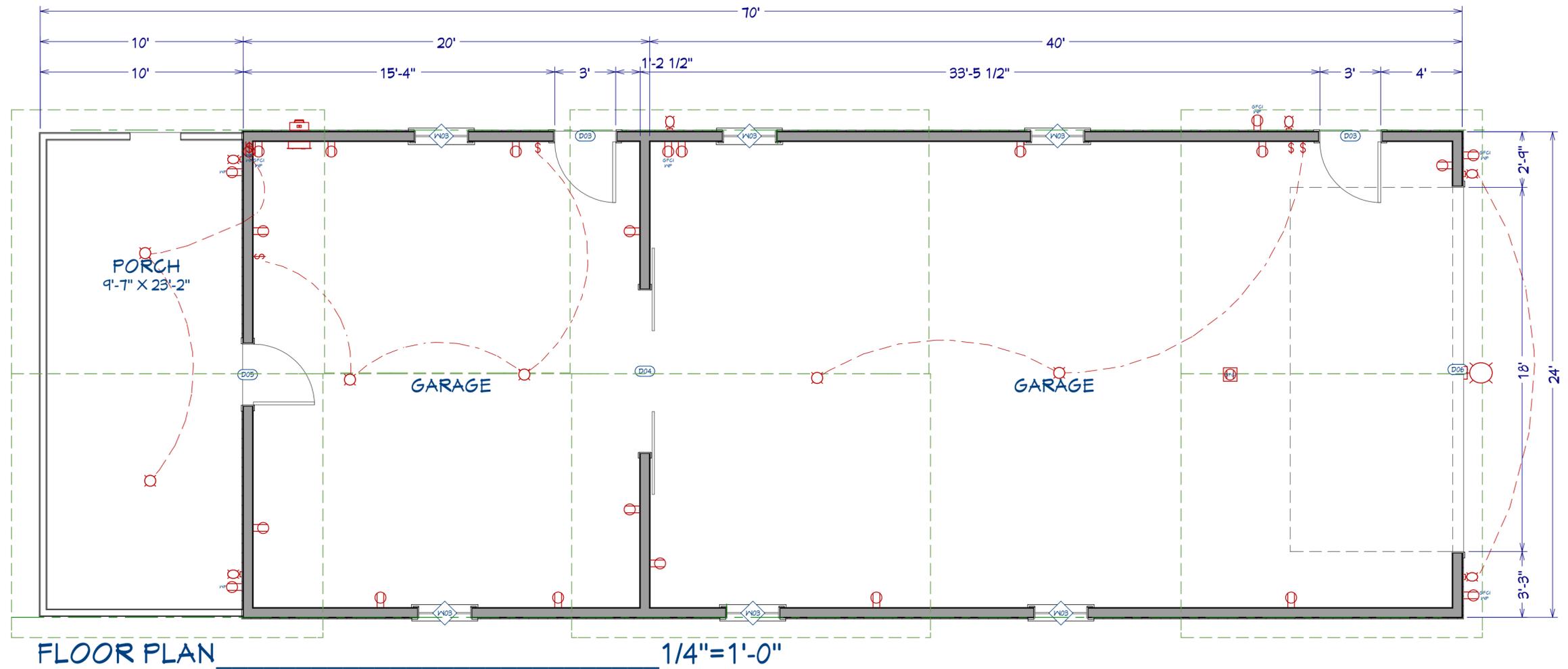
Liam Design
WILLIAM HAHN
262-893-9846
LIAMDESIGN01@GMAIL.COM

167 S. MAIN STREET
DOUSMAN, WI
53118

C & C CONTRACTING
INFO@CANDCCONTRACTING.COM

| REVISION TABLE | | | |
|----------------|------|------------|---------------------------------------|
| NUMBER | DATE | REVISED BY | DESCRIPTION |
| R 6.3.25 | | | ADD SHT 7, DETAIL A/7 |
| | | | HEADER SPECS ON WINDOW SCHEDULE |
| | | | OFFSET DIM FROM LOT LINE AND DWELLING |
| R 7.23.25 | | | SHED ROOF DORMERS, OPEN BACK PORCH |
| R 8.11.25 | | | SHED ROOF DORMERS, OPEN BACK PORCH |





DATE:
8/11/25

SHEET:
2

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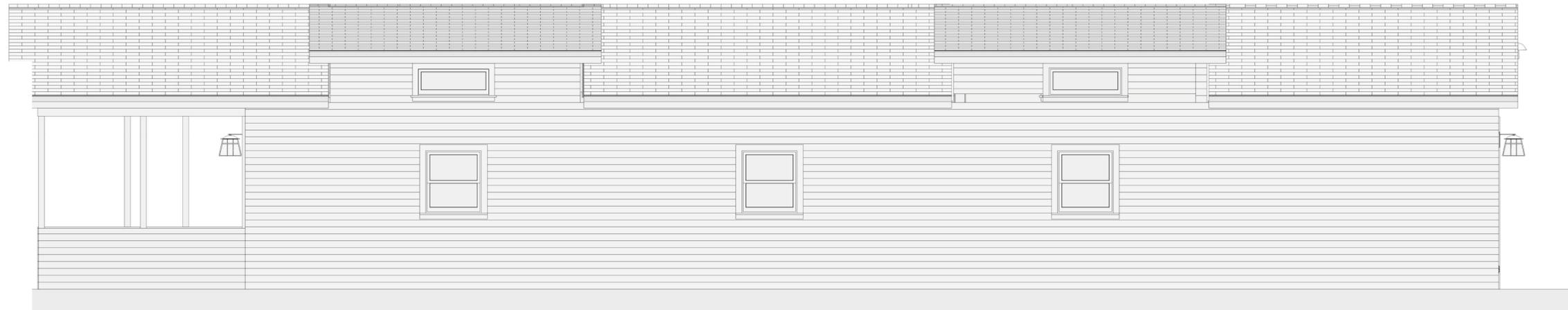
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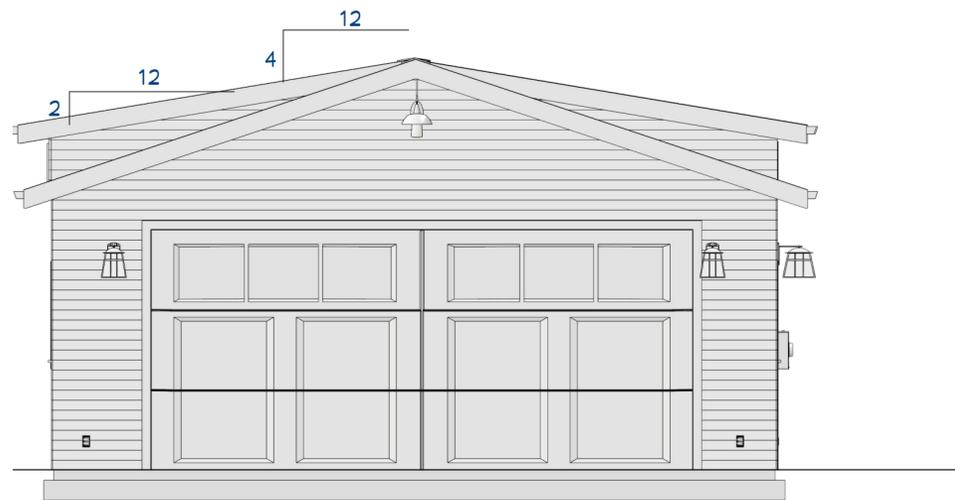
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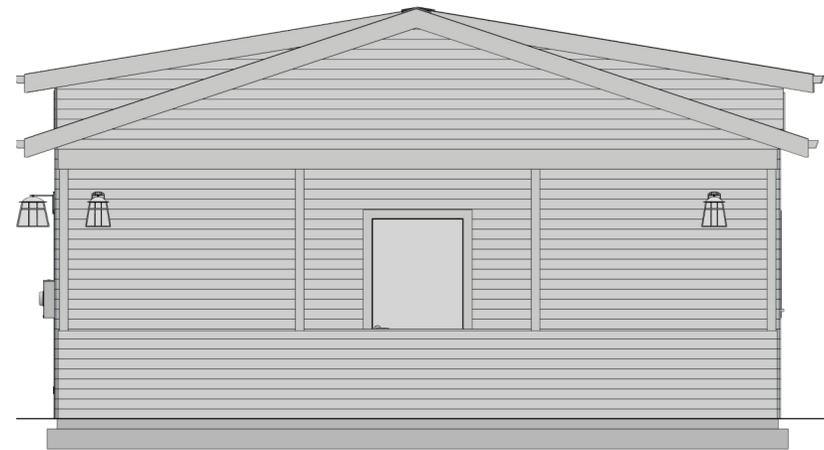




SOUTH ELEVATION _____ 1/4"=1'-0"



EAST ELEVATION _____ 1/4"=1'-0"



WEST ELEVATION _____ 1/4"=1'-0"

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8/11/25

SHEET:
3

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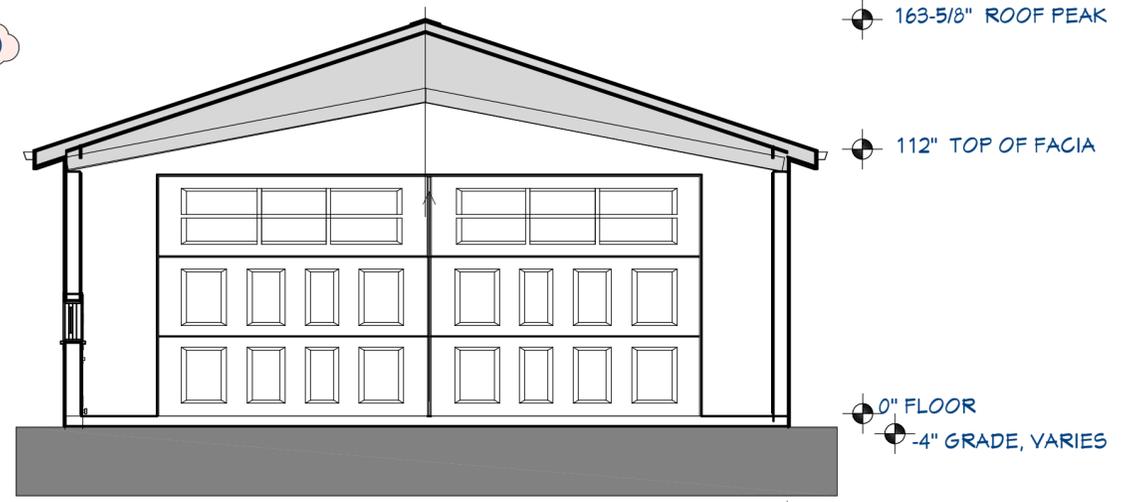
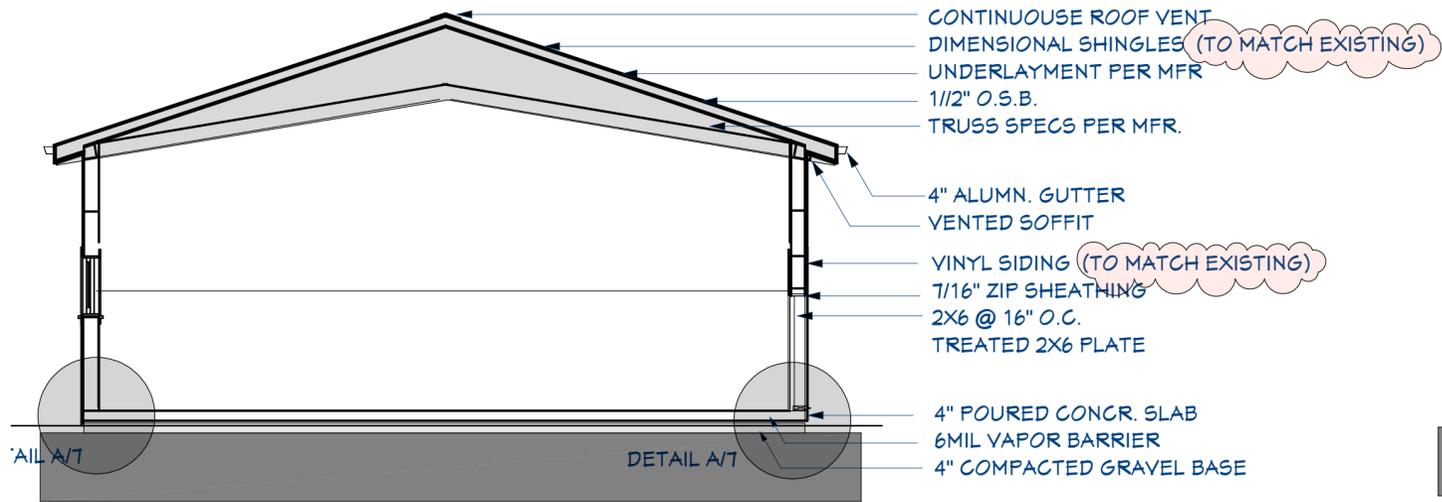
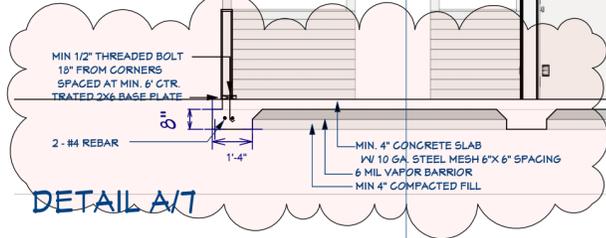
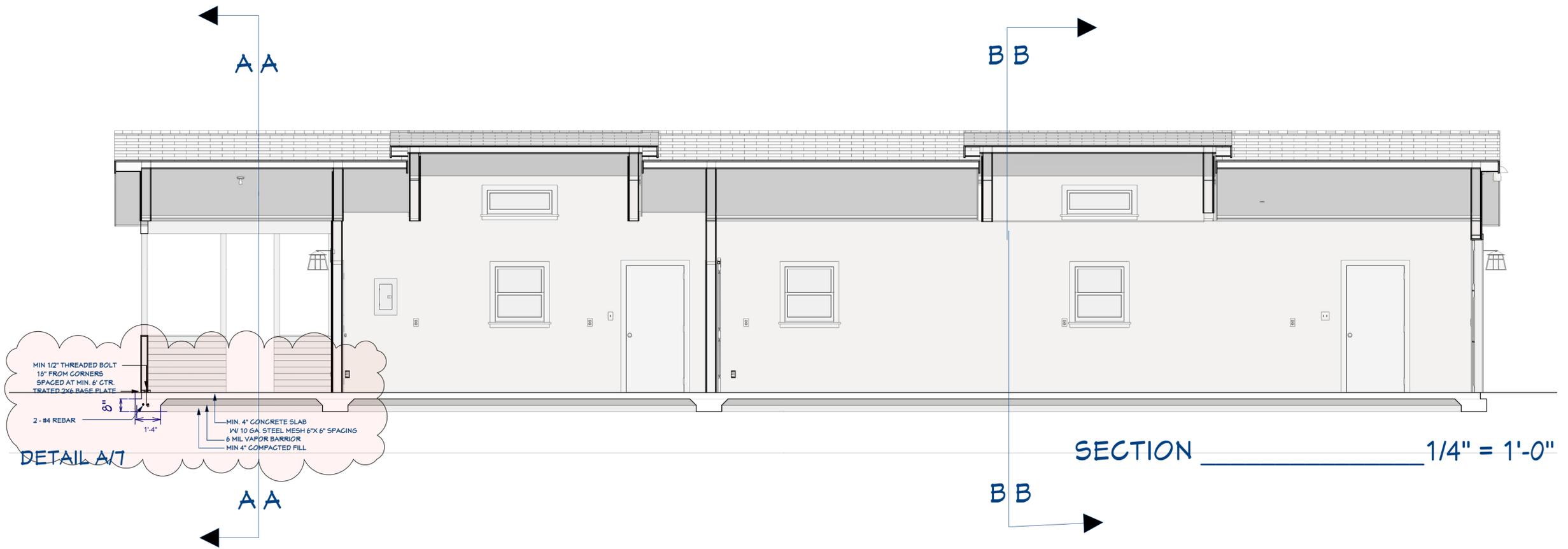
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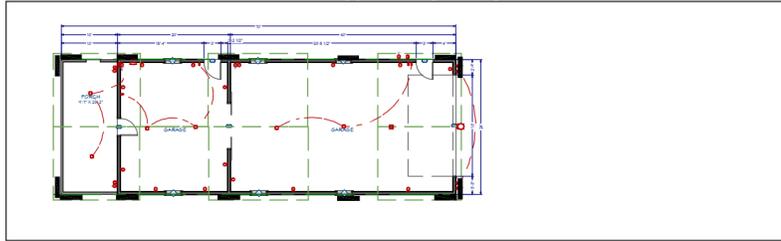
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Wall Bracing Compliance Worksheet

Complete this worksheet or provide equivalent information on the plans submitted with the permit application.

Sketch and dimension the building plan and the wall bracing rectangle(s) per 321.25(8)(c)1. and Figure 321.25-B. Provide and label additional sketches if the building plan/rectangles change at different floor levels.



Indicate applicable Wall Bracing Method for each level (see Table 321.25-G), each labeled rectangle if more than one [see 321.25(8)(c)], and amount of bracing (# of braced panels or length of braced wall required) per the respective table (provide additional worksheets for additional rectangles as needed):

Rectangle: **A** Wall Ht. = **9'** Eave to Ridge Ht. = **4'2"** Max. Opening Ht. = **8'0"** Wind Exp. = **B**

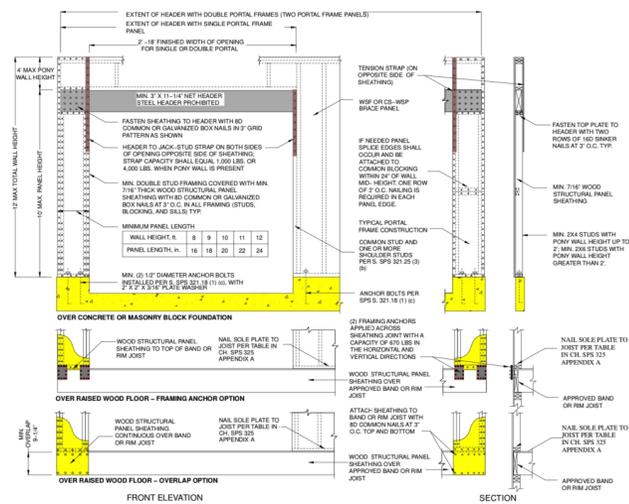
| Walls Supporting: | Intermittent method (LIB, DWB, WSP, SFB, GB, PCP) and # of panels per Table 321.25-I | | Continuous method (CS-WSP, CS-SFB) and total length required per Table 321.25-J | | PF Method (see Figure 321.25-A). Indicate number of PF panels 16-24" wide provided. | |
|------------------------------|--|------------|---|------------|---|------------|
| | Long side | Short side | Long side | Short side | Long side | Short side |
| Roof and ceiling only | | | 70' | 24' | | |
| One floor, roof and ceiling | | | | | | |
| Two floors, roof and ceiling | | | | | | |

WIND BRACING

Published under s. 35.93, Wis. Stats., by the Legislative Reference Bureau.
SPS 321.25 WISCONSIN ADMINISTRATIVE CODE 48

Figure 321.25-A

METHOD PF - PORTAL FRAME BRACE CONSTRUCTION



Note: Steel headers are permitted if designed by structural analysis.

Note: As shown in the above cross-section, 1/2-inch gypsum wallboard is not required on the interior side of the wall.

(c) **Bracing amount.** Bracing methods and materials complying with Table 321.25-G shall be applied to walls in accordance with all of the following requirements:

- For the purpose of determining bracing amounts, the outer-most extents of the building plan at each floor level shall be circumscribed with a rectangle to define the overall length of each building side as shown in Figure 321.25-B.
- In no case may the amount of bracing be less than two braced wall panels on walls parallel to each rectangle side for each floor level of the building.
- Where used, the number of intermittent braced panels applied to walls parallel to each rectangle side shall comply with Table 321.25-I.
- Where used, the total length of continuous sheathed braced panels applied to walls parallel to each building side shall comply with Table 321.25-J.
- The location of braced panels applied to walls parallel to

each building side shall comply with Figure 321.25-C.

6. Balloon-frame walls may be no longer than 21 feet and shall have a maximum height of two floors unless constructed in accordance with an approved design. Wall framing shall be continuous from the lowest floor to the wall top plate at the roof. All edges of sheathing shall be supported on and fastened to blocking or framing. Braced wall panels may not be required on the balloon-frame wall portion provided the bracing amount and bracing requirements are satisfied for the building side. Where braced panels are located on the balloon-frame wall portion, they shall have a height-to-width ratio of not more than 2.5:1.
7. For a gable end wall, if the brace-panel height does not exceed 12 feet at the highest portion and if the 12-foot and 21-foot spacing requirements in Figure 321.25-C are met, the wall is adequately braced. Where a brace panel exceeds 12 feet in height, it shall have a height-to-width ratio of not more than 2.5:1, and comply with Figure 21.25-C.

PORTAL WIND BRACING



PARTIAL SITE PLAN 1/8"=1'-0"

DATE:

8/11/25

SHEET:

5

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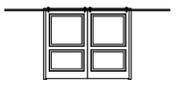
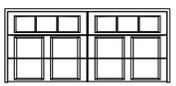
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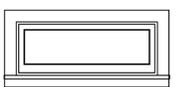
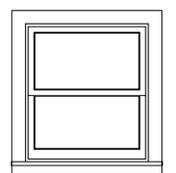
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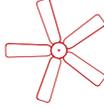
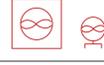
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| DOOR SCHEDULE | | | | | | | | | | | |
|--|--------|-------|-----|-------|-----------|-------------|--------------------------|-----------------|------|--------------|----------|
| 3D EXTERIOR ELEVATION | NUMBER | LABEL | QTY | FLOOR | SIZE | R/O | DESCRIPTION | HEADER | CODE | MANUFACTURER | COMMENTS |
|  | D02 | 2668 | 1 | 1 | 2668 L IN | 32"X82 1/2" | HINGED-DOOR P04 | 2"X6"X35" (2) | | | |
|  | D03 | 3068 | 2 | 1 | 3068 L EX | 38"X83" | EXT. HINGED-SLAB | 2"X6"X41" (2) | | | |
|  | D04 | 8068 | 2 | 1 | 8068 L/R | 98"X82 1/2" | DOUBLE BARN-DOOR P04 | 2"X6"X101" (2) | | | |
|  | D05 | 3068 | 1 | 1 | 3068 R EX | 38"X83" | EXT. HINGED-SLAB | 2"X6"X41" (2) | | | |
|  | D06 | 18080 | 2 | 1 | 18080 | 218"X99" | GARAGE-GARAGE DOOR CHD08 | 2"X12"X224" (2) | | | |

| WINDOW SCHEDULE | | | | | | | | | | | | |
|---|--------|--------|-----|-------|--------|---------|--------|-------------|---------------|------|--------------|----------|
| 3D EXTERIOR ELEVATION | NUMBER | LABEL | QTY | FLOOR | SIZE | R/O | EGRESS | DESCRIPTION | HEADER | CODE | MANUFACTURER | COMMENTS |
|  | W02 | 3614FX | 4 | 2 | 3614FX | 43"X17" | | FIXED GLASS | 2"X6"X46" (2) | | | |
|  | W03 | 2830DH | 6 | 1 | 2830DH | 33"X37" | | DOUBLE HUNG | 2"X6"X36" (2) | | | |

ELECTRICAL - DATA - AUDIO LEGEND

| SYMBOL | DESCRIPTION |
|---|---|
|  | Ceiling Fan |
|  | Ventilation Fans: Ceiling Mounted, Wall Mounted |
|  | Ceiling Mounted Light Fixtures: Surface/Pendant, Recessed, Heat Lamp, Low Voltage |
|  | Wall Mounted Light Fixtures: Flush Mounted, Wall Sconce |
|  | Chandelier Light Fixture |
|  | Fluorescent Light Fixture |
|  | 240V Receptacle |
|  | 110V Receptacles: Duplex, Weather Proof, GFCI |
|  | Switches: Single Pole, Weather Proof, 3-Way, 4-Way |
|  | Switches: Dimmer, Timer |
|  | Audio Video: Control Panel, Switch |
|  | Speakers: Ceiling Mounted, Wall Mounted |
|  | Wall Jacks: CAT5, CAT5 + TV, TV/Cable |
|  | Telephone Jack |
|  | Intercom |
|  | Thermostat |
|  | Door Chime, Door Bell Button |
|  | Smoke Detectors: Ceiling Mounted, Wall Mounted |
|  | Electrical Breaker Panel |

DATE:
8/11/25

SHEET:
6

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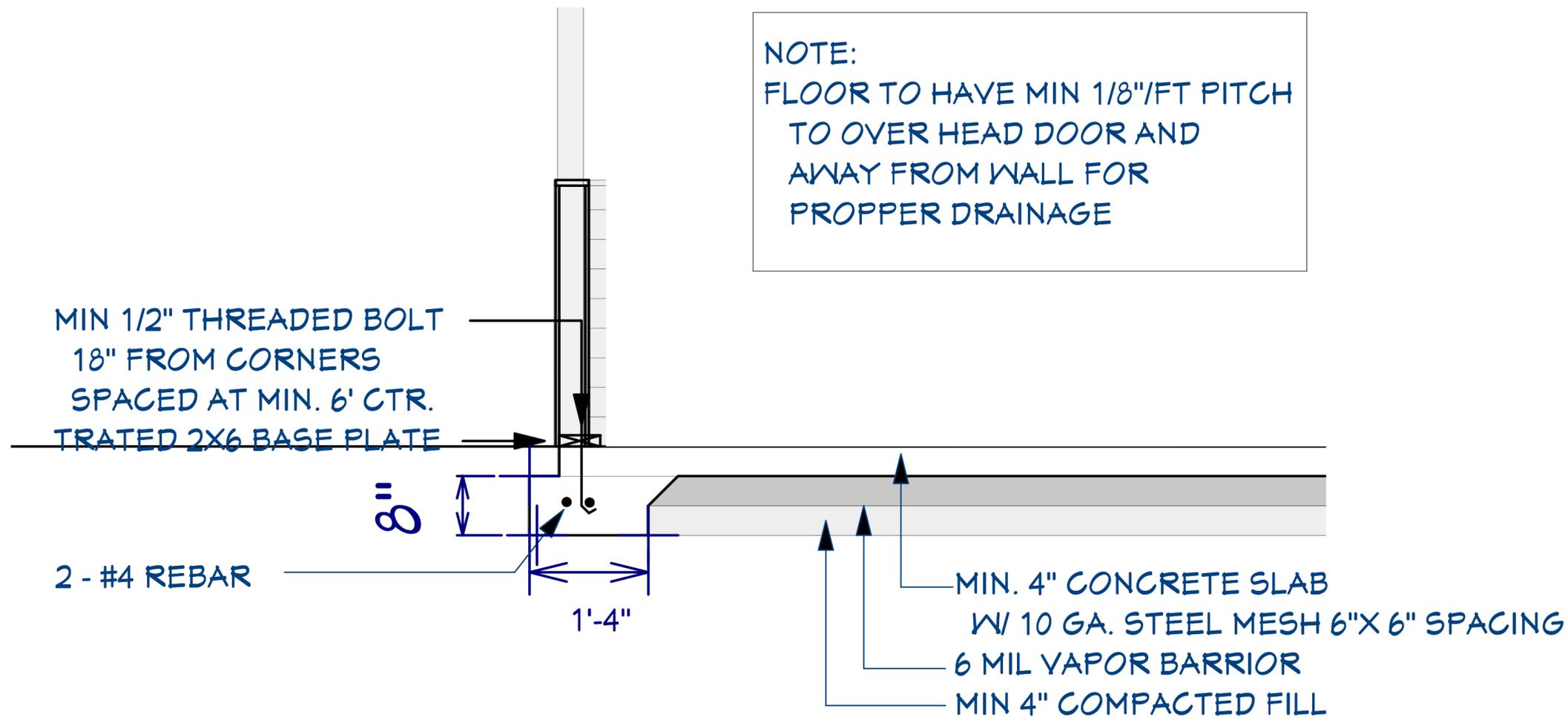
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NOTE:
 FLOOR TO HAVE MIN 1/8"/FT PITCH
 TO OVER HEAD DOOR AND
 AWAY FROM WALL FOR
 PROPPER DRAINAGE



DETAIL A/7 _____ 1"=1'-0"

DATE:
8/11/25

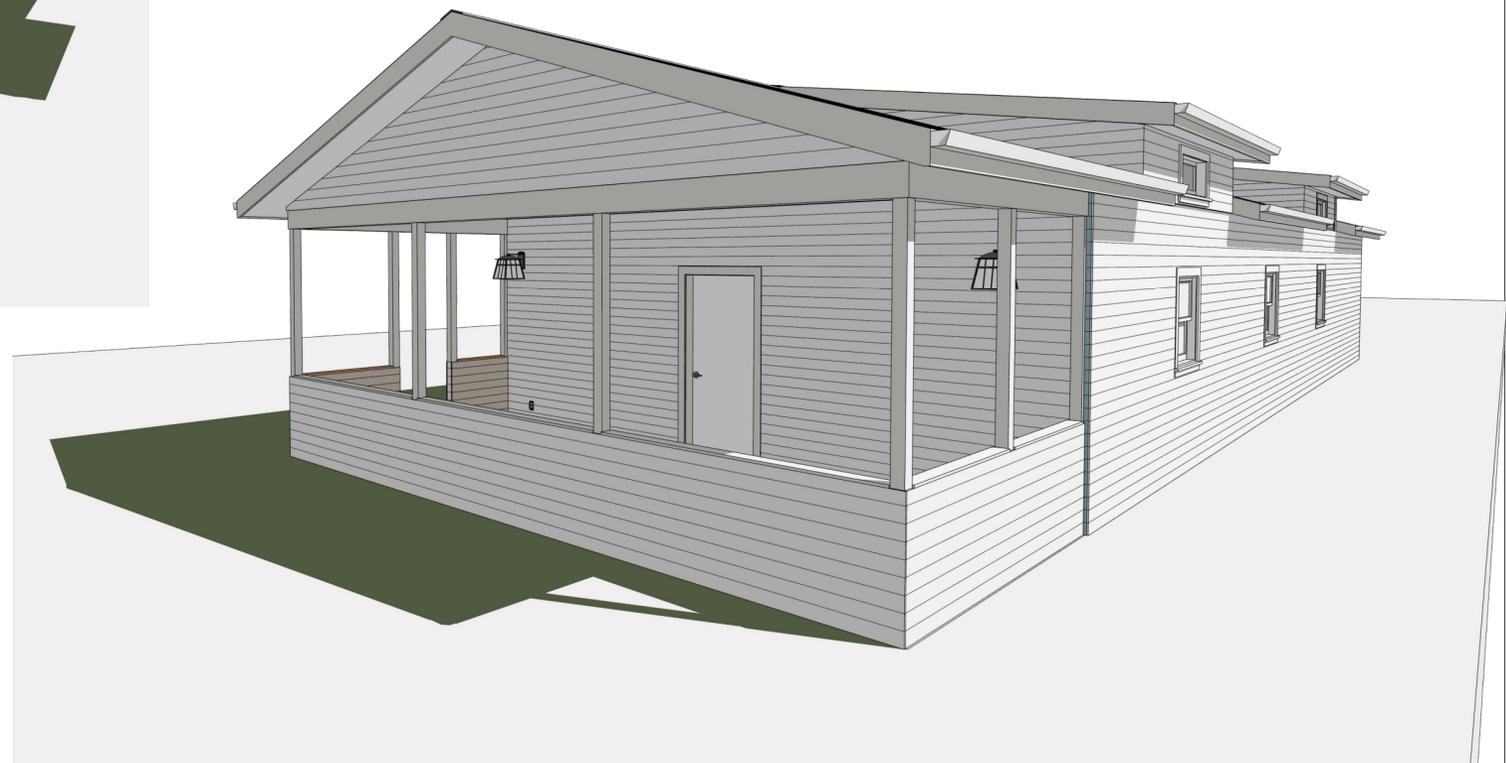
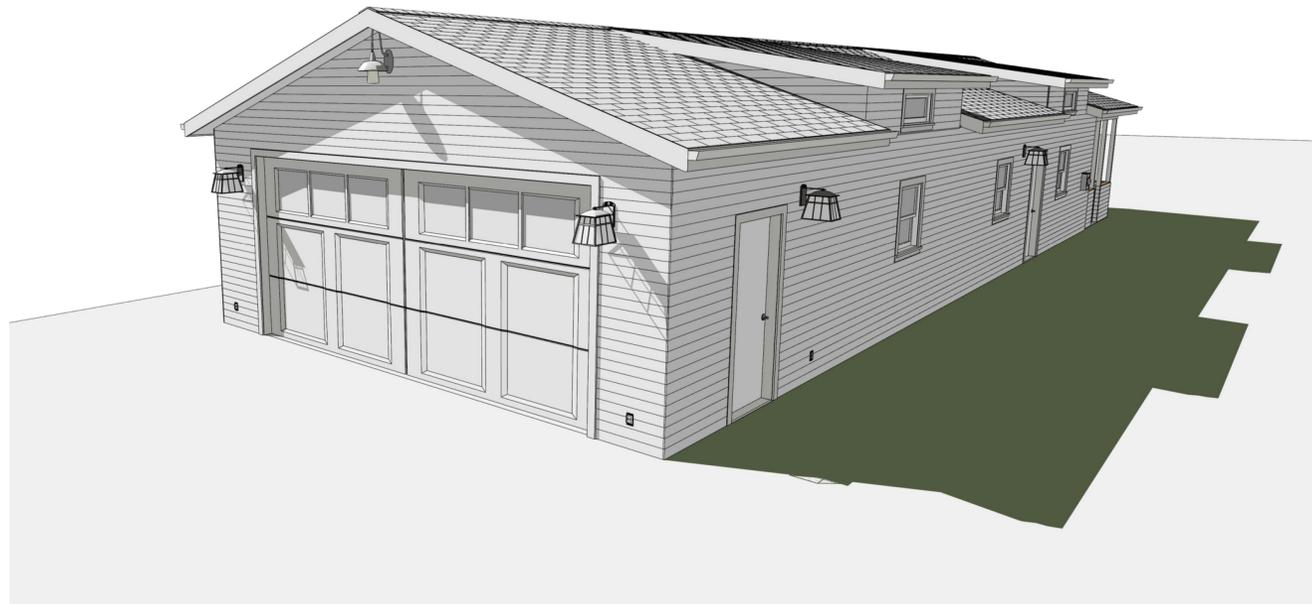
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Staff Report

File #: 25-0741

Agenda Date: 8/21/2025

Agenda #: 1.

7200 West North Ave - Brick Options - Return to Board



SOUTH ELEVATION
1/4" = 1'-0"

2



EAST ELEVATION
1/4" = 1'-0"

1

GENERAL NOTES

1. PRIOR TO PENETRATION OF ANY EXTERIOR WALL SURFACE THE LOCATION OF THE PENETRATION MUST BE COORDINATED AND APPROVED BY THE ARCHITECT. FAILURE TO OBTAIN PERMISSION MAY RESULT IN RELOCATION OF THE INSTALLED ITEM AND REPAIR OF THE AFFECTED SURFACES AT NO COST TO THE OWNER.
2. NOTE ONE ABOVE APPLIES TO ALL PENETRATIONS INCLUDING BUT NOT LIMITED TO ROOF SCUPPERS, UTILITY CONNECTIONS, VENTS, AIR INTAKES, ETC.
3. ALL JOINTS IN EXTERIOR MATERIALS ARE AN INDICATION OF DESIGN INTENT ONLY. ALL JOINTS TO FOLLOW MANUFACTURERS RECOMMENDATIONS OR GOOD PRACTICE FOR INSTALLATION AND REQUIRED JOINT LOCATIONS. NOTIFY ARCHITECT OF ANY DEVIATION FROM JOINT PATTERN PRIOR TO EXECUTION.
4. REFER TO A300 SHEETS FOR WINDOWS AND DOORS AND ASSOCIATED NOTES.

ELEVATION KEY NOTES

- 1 EXISTING BRICK MASONRY
 - 2 EXISTING BRICK SOLIDER COURSE
 - 3 EXISTING CAST TRIM
 - 4 EXISTING CLAY TILE ROOF
 - 5 EXISTING WOOD BRACKET
 - 6 EXISTING CLAY COPING
 - 7 EXISTING STONE COPING
 - 8 NEW 1x4 ENGINEERED COMPOSITE TRIM, PAINTED
 - 9 NEW 1x6 ENGINEERED COMPOSITE TRIM, PAINTED
 - 10 NEW SMOOTH FINISH FIBER CEMENT SIDING-1 ON COR-A-VENT SHIM SYSTEM, PAINTED
 - 11 NEW FIBER CEMENT SIDING ALUMINUM REVEAL TRIM SYSTEM
 - 12 NEW ALUMINUM STOREFRONT SYSTEM, PAINTED
 - 13 NEW BRICK MASONRY TO MATCH EXISTING MASONRY AND GROUT
 - 14 NEW CAST SILL
- ED EXISTING DOOR TO REMAIN
EW EXISTING WINDOW TO REMAIN

EXTERIOR DOOR / WINDOW NOTES

1. ALL WINDOWS ARE TO MEET ALL CODE REQUIREMENTS - GC TO COORDINATE WITH SUPPLIER.
2. T = TEMPERED SAFETY GLASS PER CODE.
3. SWINGING DOORS WITH FULL LITES TO HAVE MINIMUM 10" HIGH BOTTOM RAIL PER ICC/ANSI A117.1 - 2009, 404.2.9.
4. REFER TO ELEVATION DRAWINGS FOR WINDOW OPERATION OR GROUPINGS.
5. GC TO VERIFY ALL WINDOW AND DOOR ROUGH OPENINGS IN FIELD PRIOR TO ORDERING WINDOW UNITS.
6. ALL GLAZING TO COMPLY WITH IBC 2015, CHAPTER 24 FOR SAFETY GLAZING MATERIALS, REQUIRED APPLICABLE TESTING AND LOCATIONS, GC AND SUPPLIER TO VERIFY.
7. CHANGES IN LEVEL GREATER THAN 1/4" IN HEIGHT AND NOT MORE THAN 1/2" MAXIMUM IN HEIGHT SHALL BE BEVELED WITH A SLOPE NOT STEEPER THAN 1:2. VERIFY WITH DOOR LOCATIONS AND COORDINATE WITH MANUFACTURER / SUPPLIER.
8. WINDOW AND DOOR SIZES ARE APPROXIMATE UNIT DIMENSIONS, NOT ROUGH OPENINGS. GC TO COORDINATE APPROVED WINDOW AND DOOR MANUFACTURERS REQUIRED ADDITIONAL SHIM SPACE GIVEN POTENTIAL BUILDING SHRINKAGE AT WOOD FLOORS AND RESULTANT REQUIRED WINDOW AND DOOR ROUGH OPENINGS AND REPORT TO ARCH.
9. EXTERIOR DOOR CLEAR OPENING WITH DOOR SWUNG OPEN TO 90 DEGREES OR FULLY SLID OPEN TO BE MINIMUM 32" CLEAR WIDTH, GC AND SUPPLIER TO VERIFY AND REPORT TO ARCH.
10. REFER TO A3 SHEETS FOR EXTERIOR CLADDING MATERIALS ADJACENT TO WINDOW UNITS AND NUMBERED DETAILS.
11. 'EW' WINDOWS ARE UNITS TO BE REPLACED IN PLACE; VERIFY THESE UNIT SIZES IN FIELD.

STRIEGEL AGACKI STUDIO
1430 UNDERWOOD
WALWATOSA, WI 53213
TEL 414.793.3586

Owner:
North 7200, LLC
PO BOX 510932
MILWAUKEE, WI 53203

| DATE | NO. | REVISION |
|----------|-----|--------------|
| 04-10-25 | | PROGRESS SET |

project name

TENANT IMPROVEMENT

7200 W. NORTH AVENUE
WALWATOSA, WI 53213

ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

SCALE:
COMPUTER FILE:

DRAWN BY:
PLOT DATE:
JOB NUMBER:
TITLE:
EXTERIOR ELEVATIONS

SHEET NUMBER
A301

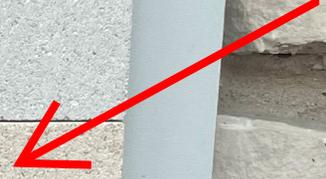
© STRIEGEL AGACKI STUDIO, INC.



Black brick
proposed on
A301



Smooth material mix



Rusticated stone material mix





Wauwatosa, WI

7725 W. North Avenue
Wauwatosa, WI 53213

Staff Report

File #: 25-1188

Agenda Date: 8/21/2025

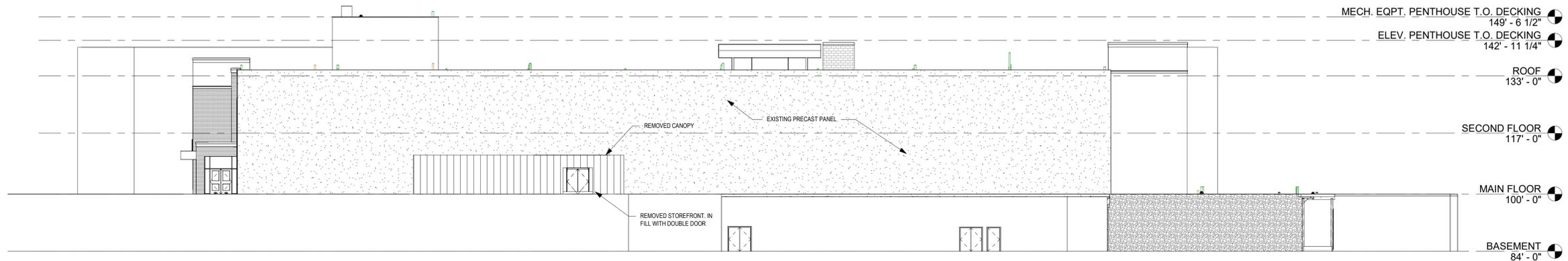
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2500 N Mayfair Rd - Scheels - Exterior Renovations - Return to Board

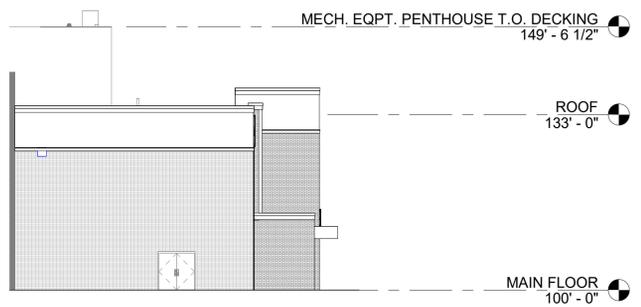
SUGGESTED MATERIALS

EXISTING PRECAST PANEL

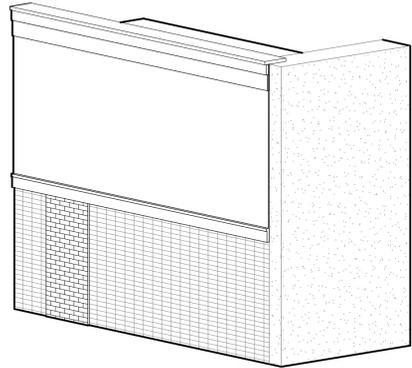
EIFS



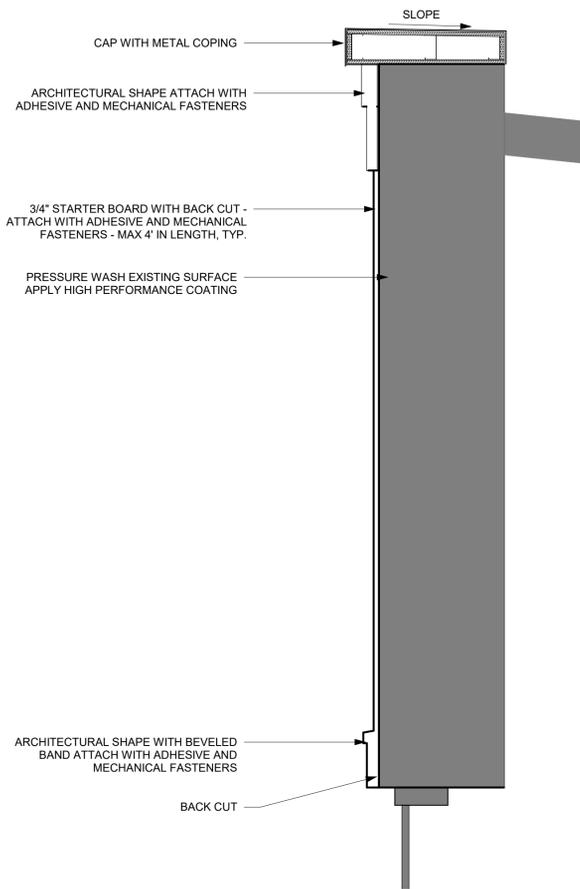
1 SOUTH ELEVATION
1/16" = 1'-0"



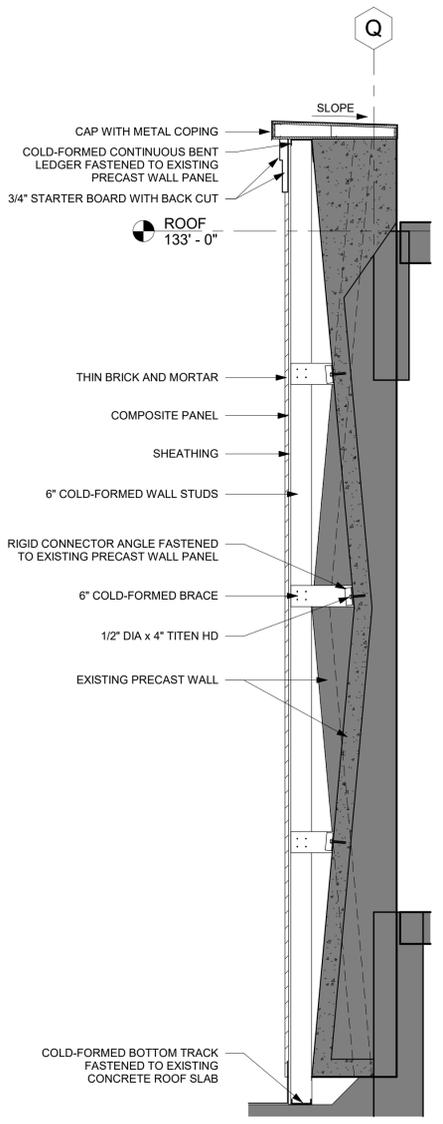
2 NORTH ELEVATION
1/16" = 1'-0"



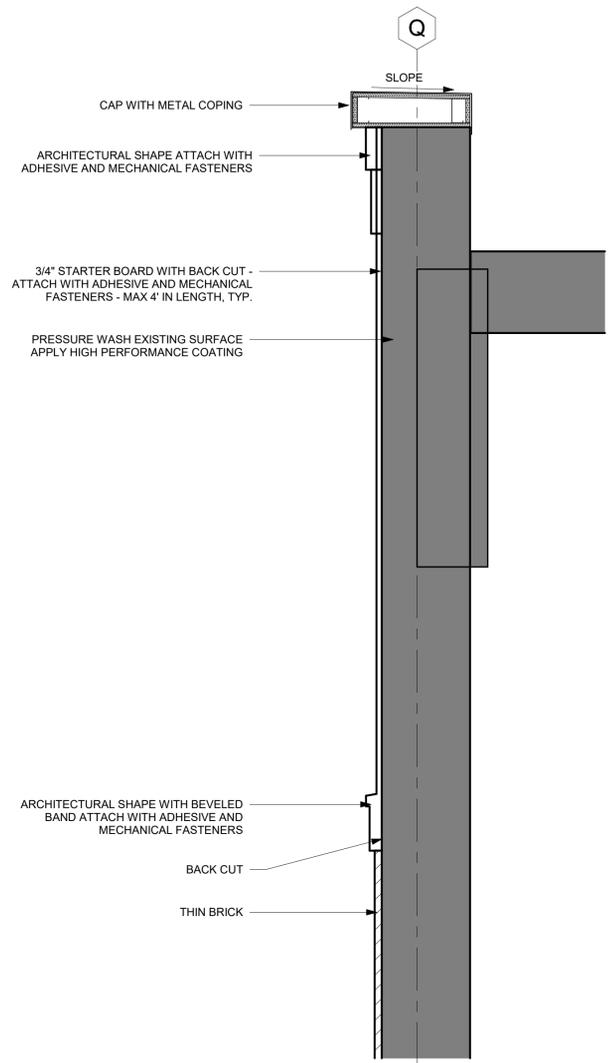
5 SW BUILDING CORNER



3 PARAPET DETAIL @ EIFS
1" = 1'-0"



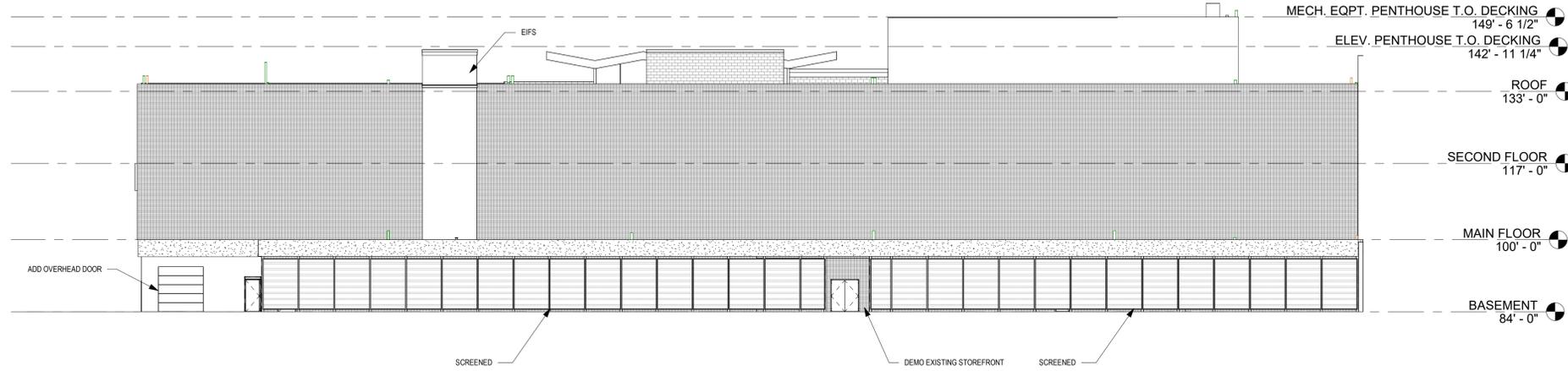
4 PARAPET DETAIL @ BRICK
1/2" = 1'-0"



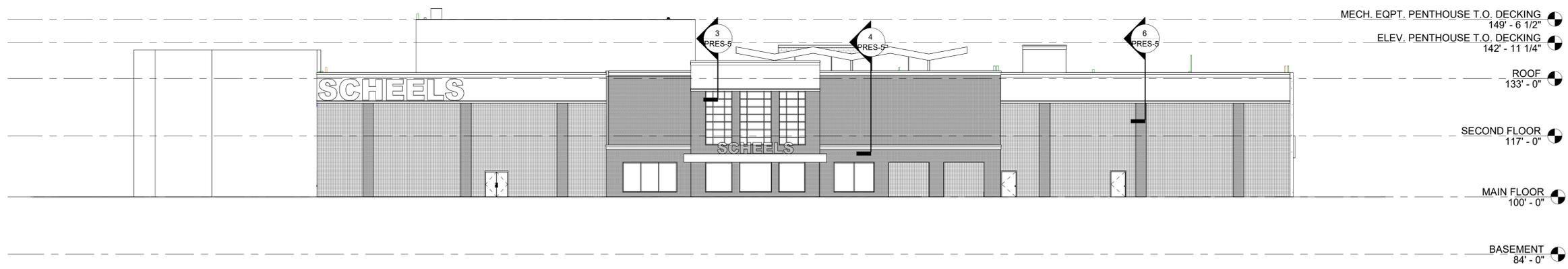
6 PARAPET DETAIL @ BRICK COLUMNS
1" = 1'-0"

NEW EXTERIOR ELEVATIONS





1 EAST ELEVATION
1/16" = 1'-0"



2 WEST ELEVATION
1/16" = 1'-0"

SUGGESTED MATERIALS

POWER WASH EXISTING BRICK

SCREENING

GRAY FACE BRICK

EIFS CORNICE

NEW EXTERIOR ELEVATIONS



Architecture + Engineering + Environmental + Planning

SCHEELS, WAUWATOSA
WAUWATOSA, WISCONSIN - 2025-08-12
ISG PROJECT NO. 25-32525

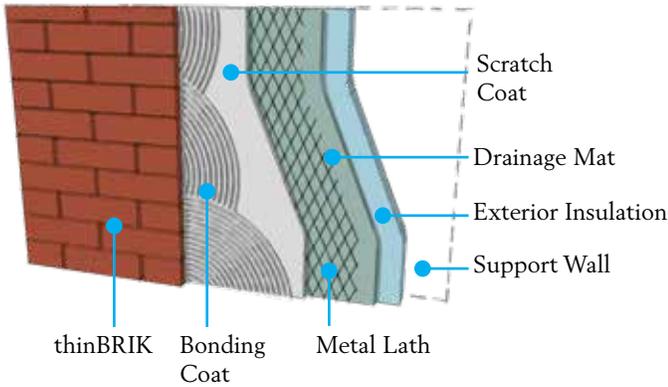


ISGinc.com

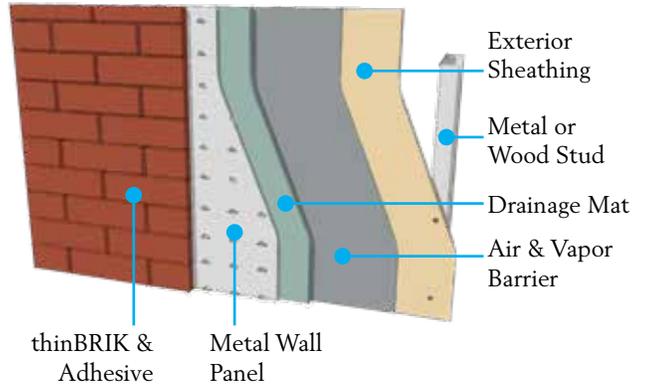


APPLICATIONS

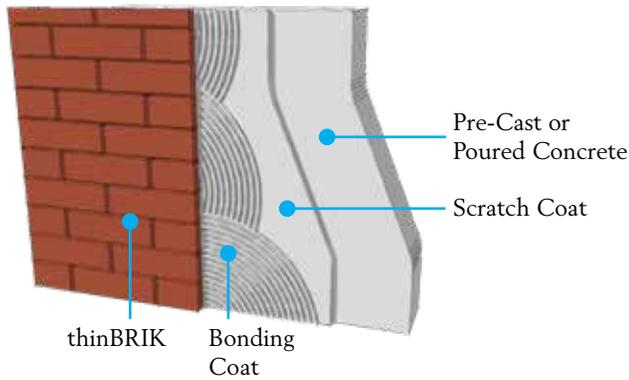
THICK SET MORTAR SYSTEM
Over Exterior Insulation



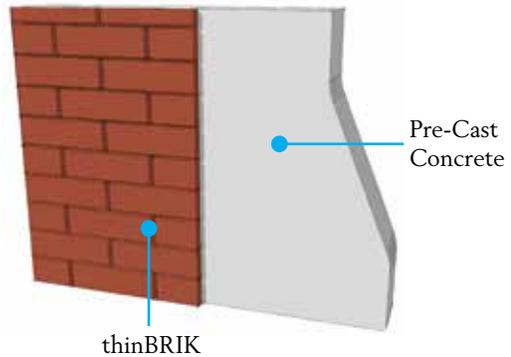
MODULAR PANEL SYSTEM
Over Stud Wall



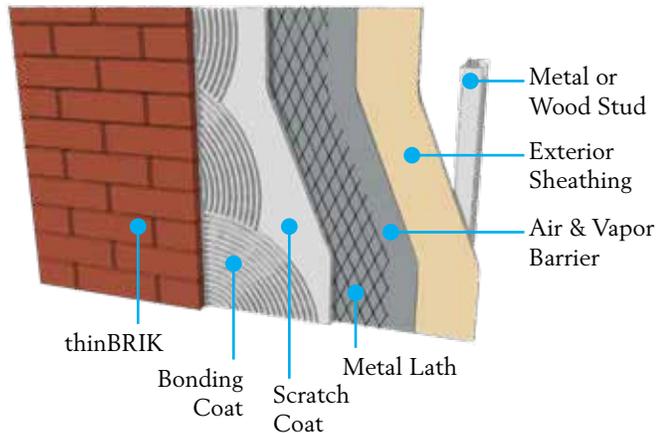
THIN SET MORTAR SYSTEM
Over Concrete Wall



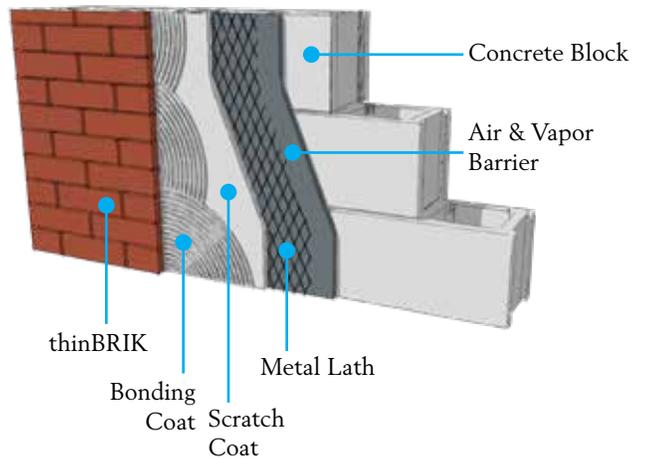
PRE-CAST WALL SYSTEM



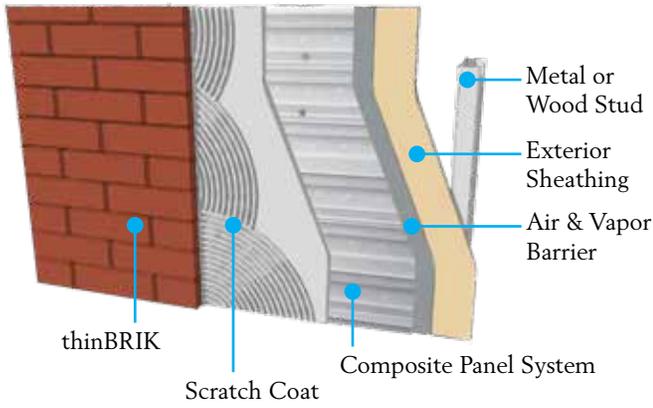
THICK SET MORTAR SYSTEM
Over Stud Wall



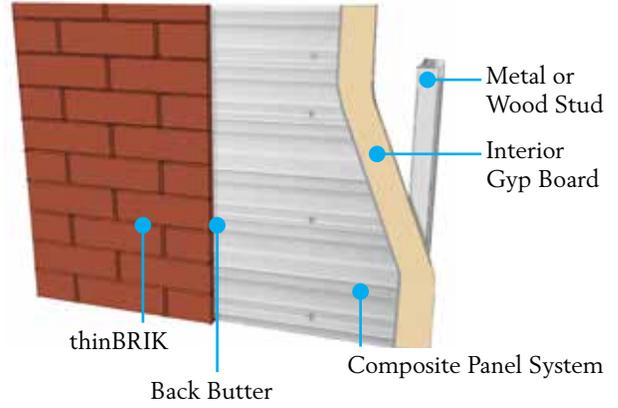
THICK SET MORTAR BED SYSTEM
Over CMU Wall



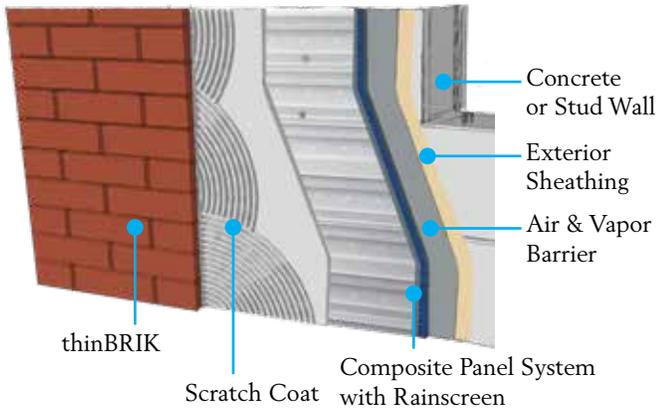
SPEEDYMASON™ SYSTEM EXTERIOR APPLICATION
Over Stud Wall



SPEEDYMASON™ SYSTEM INTERIOR APPLICATION
Over Stud Wall



SPEEDYMASON™ EXTERIOR RAINSCREEN APPLICATION
Over Concrete Wall



| INSTALLATION METHOD | RECOMMENDED MATERIALS | SPECIAL CONSIDERATIONS | thinBRiK - Sawn <i>for commercial & residential use, varies in thickness</i> | | |
|---------------------|---|---|---|--|---|
| | | | thinBRiK - Extruded <i>typically for commercial use, feasible applications</i> | thinBRiK - Kerfed Extruded <i>commercial use only, embedded in precast concrete</i> | |
| THICK SET | Mortar: Type N or Latex-Modified | Follow mortar manufacturer's instructions for thickness of bond coat and other brick setting requirements. | ● | ● | |
| THIN SET | Mortar: Latex-Modified | Follow mortar manufacturer's instructions for thickness of bond coat and other brick setting requirements. | ● | ● | |
| MODULAR PANELS | Mortar: Type N or Latex-Modified Panels & Adhesive: Per Panel Manufacturer Instructions | Check thin brick thickness tolerances for panel system. In the absence of guidelines, maximum tolerance of $\pm 1/16$ th inch is recommended. | | ● | |
| PRE-CAST PANELS | Verify Brick System Requirements Form Liner: Architectural Polymers, Innovative Brick Systems LLC, Advanced Formliners LLC | PCI compliance may be required. In some cases, PCI dimensional tolerances have been waived when products meet all other testing requirements. | ● | ● | ● |



thinBRiK Sawn



thinBRiK Extruded



thinBRiK Kerfed Extruded

These are recommendations only for typical applications. Always follow the requirements of your local codes and manufacturers recommendations. For more information visit www.gobrick.com/docs/default-source/read-research-documents/technicalnotes/28c-thin-brick-veneer.pdf

3024 Acme Brick Plaza, Fort Worth TX 76109 • (800) 792-1234 • brick.com





DECORATIVE ARCHITECTURAL SHAPES

*Fully-Finished, Ready-to-Install Coated Architectural Shapes in a Variety of Shapes and Sizes
Bands | Cornices | Custom Shapes | Sills | Specialty | Starter Boards | Trim*





Architectural Shapes to Complement Any Design

Dryvit® architectural shapes can add a stately, classical architecture aesthetic to any building — without the structural demands, material weight, labor requirement, or environmental impacts of actual stonework.

Turn to Dryvit to enhance your structure’s curb appeal with these architectural shape options:

- Arches
- Bands
- Columns & Pilasters
- Corbels & Dentils
- Cornices
- Custom Trim, Signage & Decorative Elements
- Panel Weep System
- Sills
- Specialty Pieces
- Starter Boards
- Trim

And Dryvit architectural shapes are compatible with most Dryvit specialty finishes, Modulite™ panelization systems, and Tremco sealants and adhesives — giving you a world of colors, textures and finishes to create the exact aesthetic you envision for your structure.

Dryvit is now part of Tremco Construction Products Group (CPG).

The Tremco Construction Products Group Difference

Speed construction or restoration. Simplify installation. Extend the construction season. A Tremco CPG single-source building envelope means more for everyone – more satisfied contractors, more comfortable occupants or tenants, and more efficient structures and cost-effective operation for owners.



Faster Construction Time

Lightweight, fast-curing and prefabricated products mean less occupant disruption, faster return to service, less revenue lost — and no call-backs.



Any Look You Want

A wide range of colors and finishes like brick, granite, metals, stucco and more provide maximum flexibility in your roof and façade aesthetic.



Stronger and More Resilient

Our systems are designed for maximum durability, many with service lives far surpassing that of competing systems.



Leak-Free Performance

Products provide maximum protection from air, moisture and thermal infiltration — and are performance tested in our one-of-a-kind Sustainable Building Solutions Test Facility.



Cost Effective for the Long Term

A broad range of products can fit any project budget — but our energy efficiency and maintenance solutions can also help you ensure cost-effective ownership and operation for the long term.



Better Insulated

Industry-leading brands provide solutions for more efficient building construction and operation, and exceed strict energy codes for insulation.



One Point of Contact

Our products and systems are backed by industry-leading warranties — all from a single point of contact. We can also help with everything from asset management to diagnostics to installer training.



Leading Edge Sustainability

Our building solutions help you meet green building standards like Net Zero, Living Building Challenge, Passive House and more.

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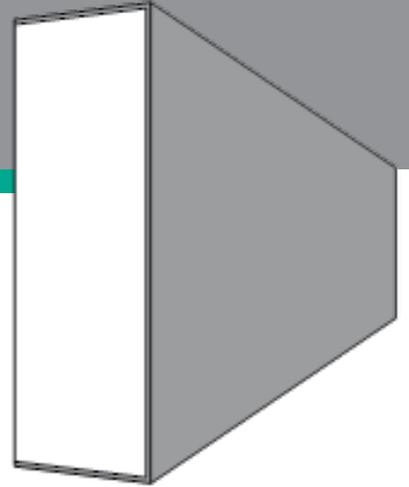
BANDS

Features & Benefits

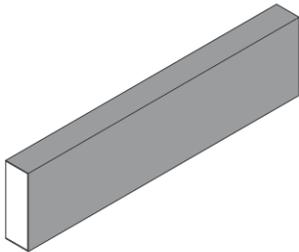
- Coated areas are indicated by darker lines. (Back and ends not coated.)
- Mesh is returned onto the back at tops and bottoms.
- All are produced in 8' lengths.

Additional Finishing Options

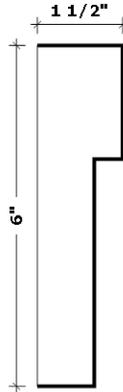
- Mitered ends (outside/inside corners)
- Coped ends (wall returns, outside/inside corners)
- Coated ends (mitered, coped, & straight ends)
- Uncoated shapes (foam only)
- Coped window sills produced to required lengths
- Fully-finished trim pieces, ready to install



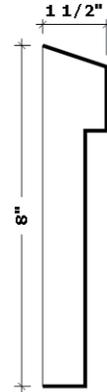
Flat Bands



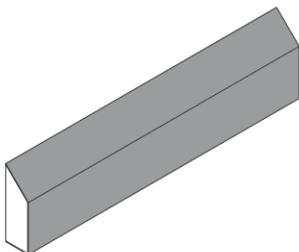
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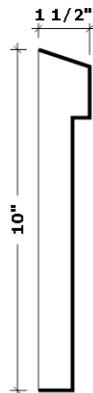
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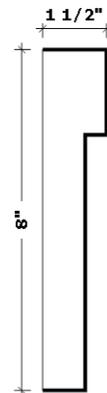
Beveled Bands



205B104 604



205B113 604



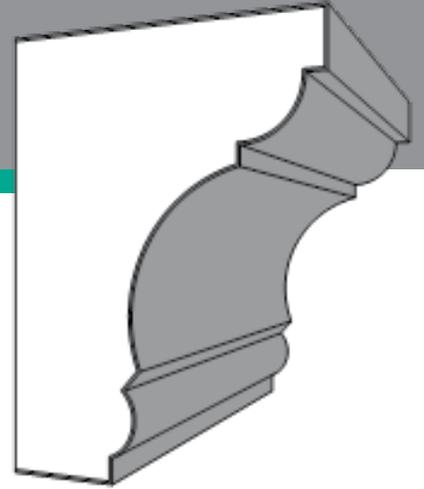
CORNICES

Features & Benefits

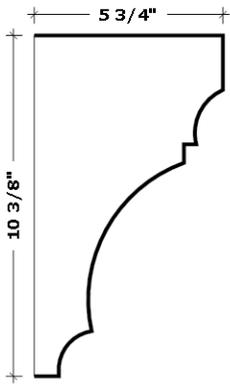
- Coated areas indicated by darker lines. (Back and ends not coated.)
- Mesh returned onto back at top and bottom.
- Produced in 8FT lengths.

Additional Finishing Options

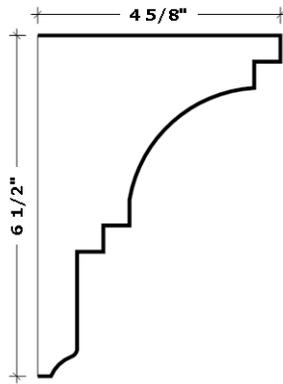
- Mitered ends (outside/inside corners)
- Coped ends (wall returns, outside/inside corners)
- Coated ends (mitered, coped, & straight ends)
- Uncoated shapes (foam only)
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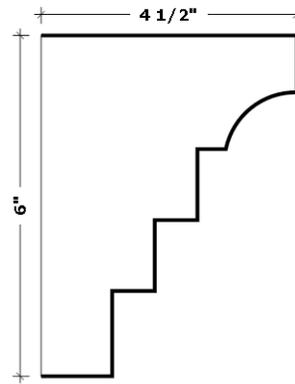
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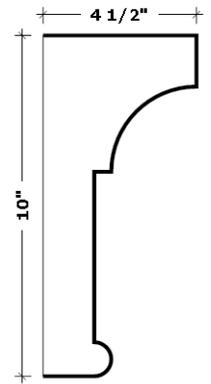
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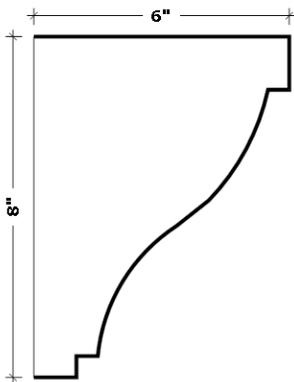
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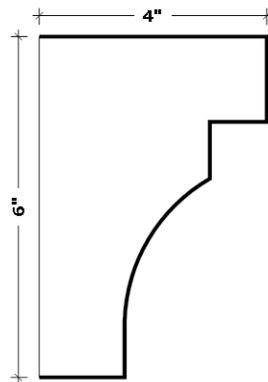
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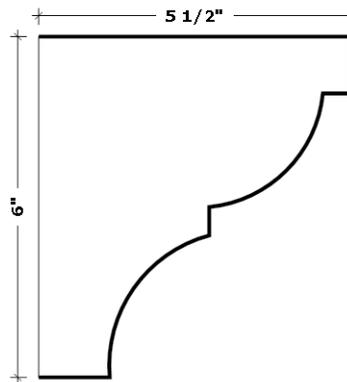
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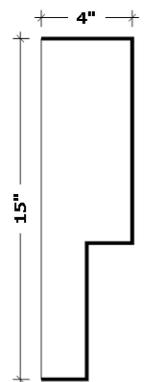
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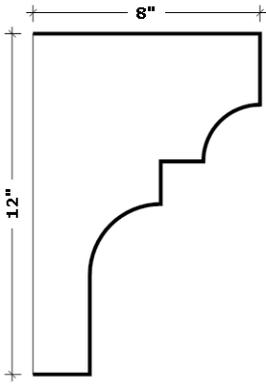
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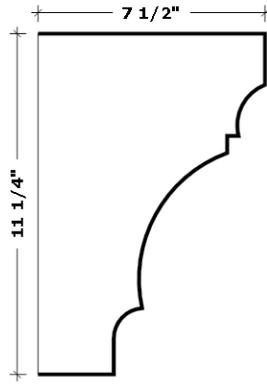
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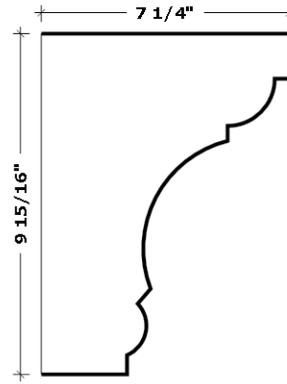
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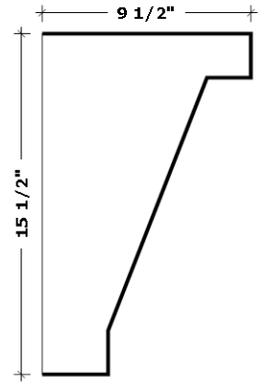
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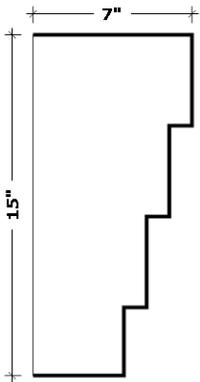
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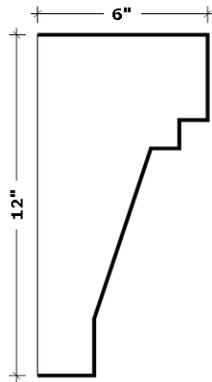
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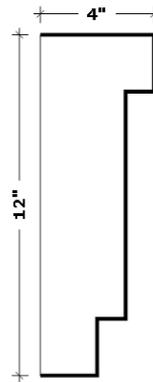
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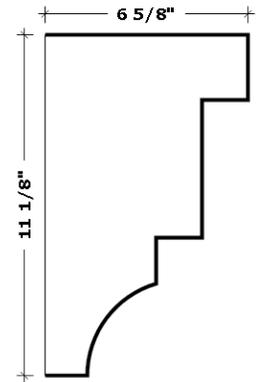
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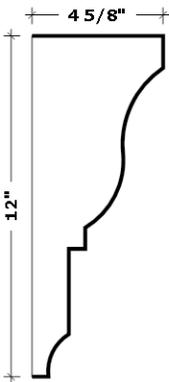
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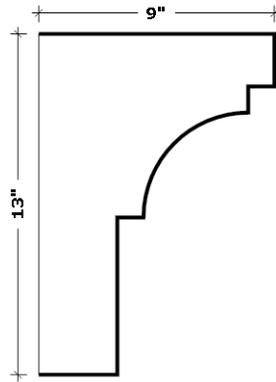
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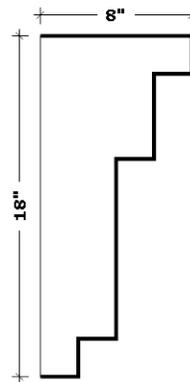
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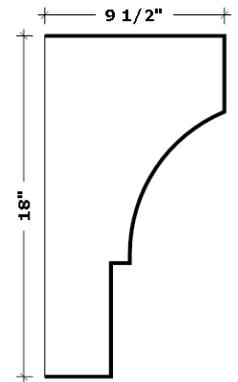
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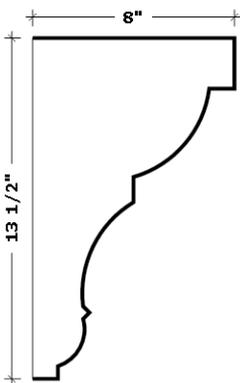
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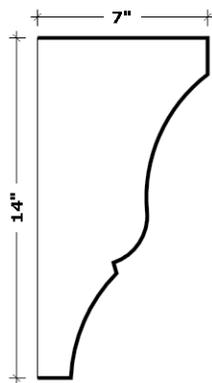
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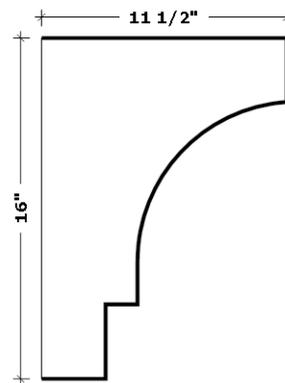
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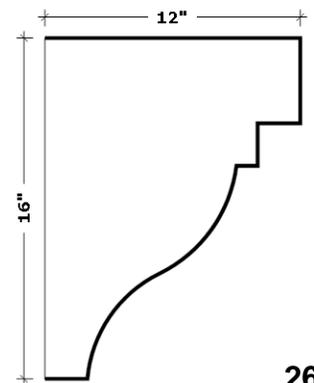
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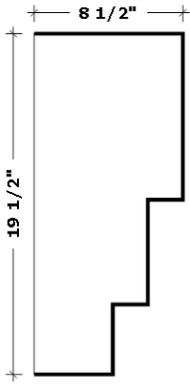
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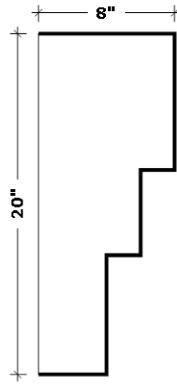
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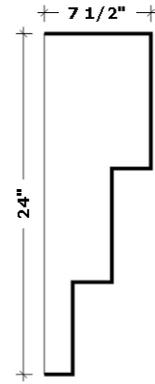
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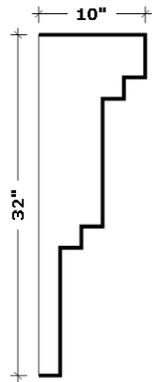
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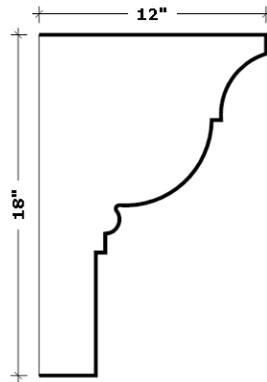
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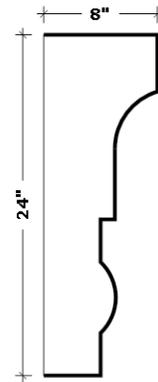
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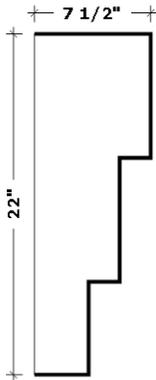
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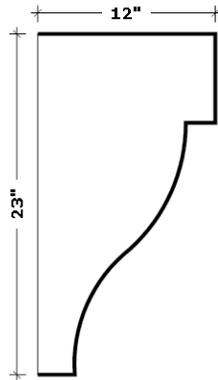
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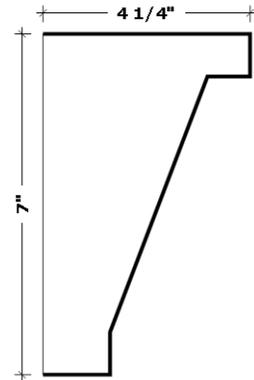
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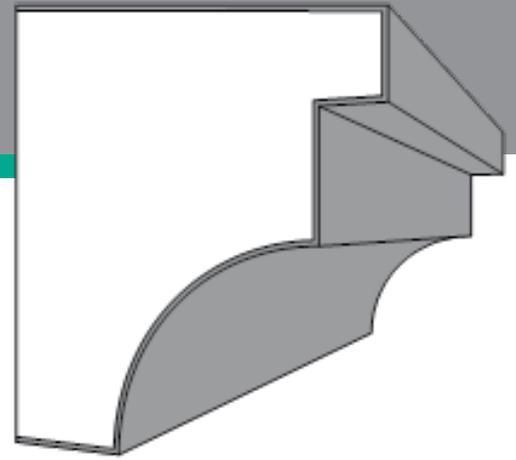
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SILLS

Features & Benefits

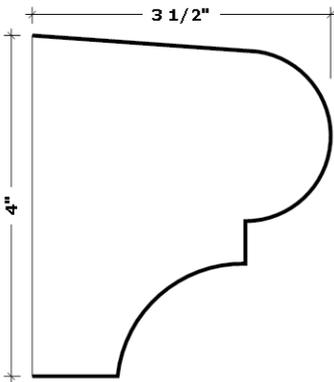
- Coated areas indicated by darker lines. (Back and ends not coated.)
- Mesh returned onto back at top and bottom.
- Produced in 8FT lengths.



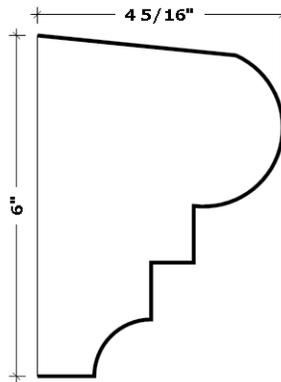
Additional Finishing Options

- Mitered ends (outside/inside corners)
- Coped ends (wall returns, outside/inside corners)
- Coated ends (mitered, coped, & straight ends)
- Uncoated shapes (foam only)
- Coped window sills produced to required lengths
- Fully-finished trim pieces, ready to install

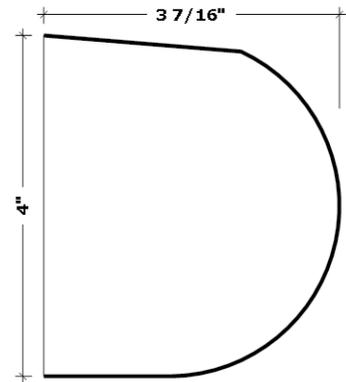
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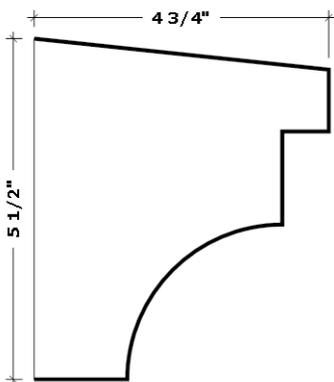
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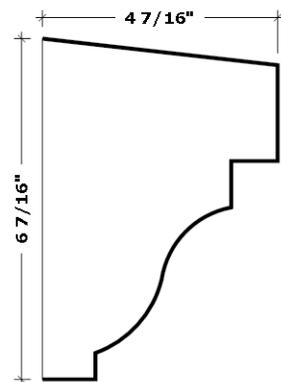
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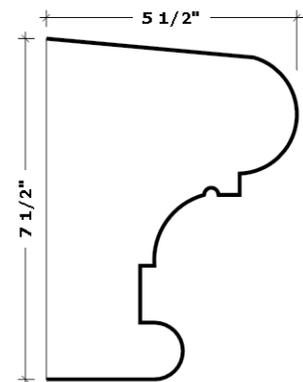
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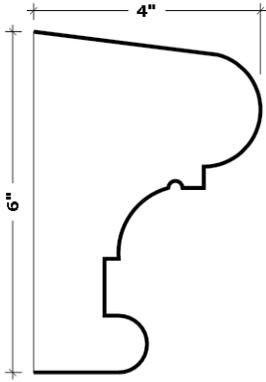
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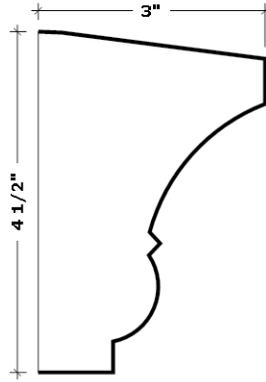
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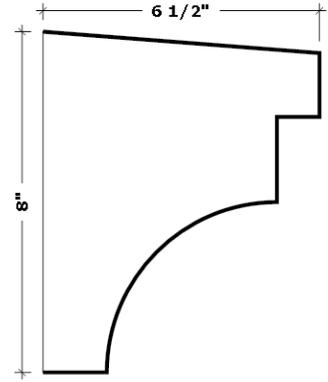
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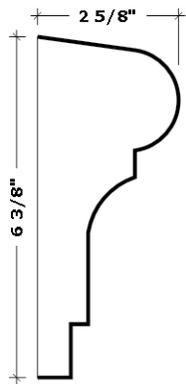
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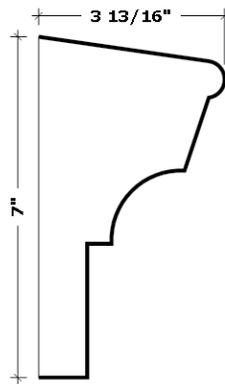
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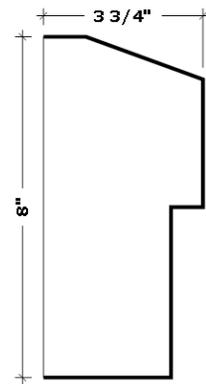
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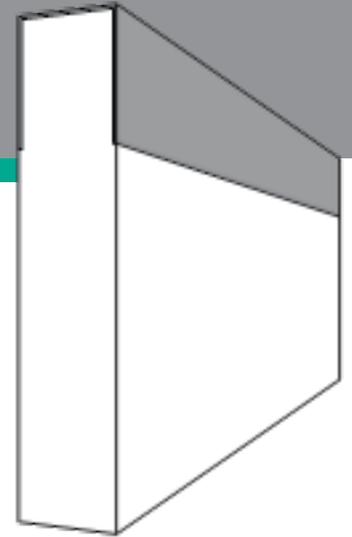
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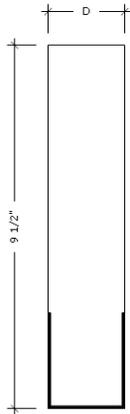
STARTER BOARDS

Features & Benefits

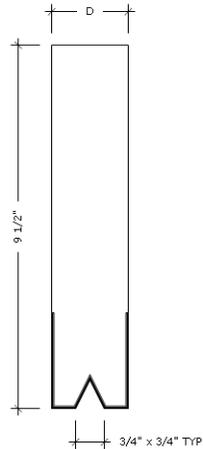
- Coated areas are indicated by darker lines.
- Standard, w/ Drip, w/ Backcut and w/ Slope boards all measure 9.5" H x 96" L, and are available in various thicknesses
- Available thicknesses are 1", 1-1/2", 2", 2-1/2", 3" and 4"
- **Starter Board with Drip**, the continuous drip edge groove measures 3/4" x 3/4" typically.
- **Starter Board with Backcut** along one side is to accept drainage strips, flashing or sealant.
- **Starter Board with Slope** is used to maintain drainage capabilities at expansion joints.
- **Window Corner** dimensions are 9-1/2" H x 11" L legs, and 20-1/2" H x 20-1/2" overall. Variable thicknesses available.



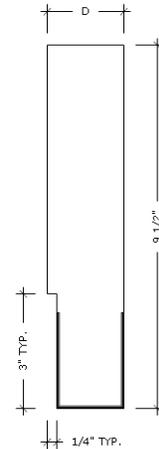
Standard Starter Board



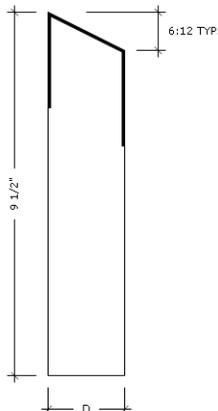
Starter Board w/ Drip



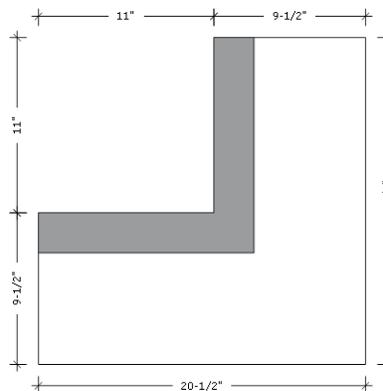
Starter Board w/ Backcut



Starter Board w/ Slope



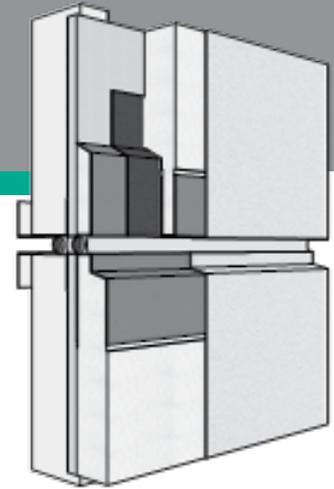
Window Corner



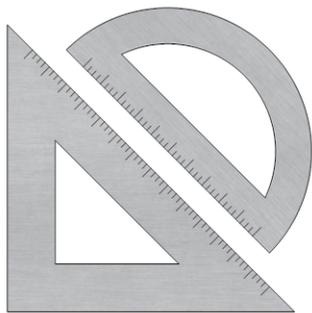
SPECIALTY

Features & Benefits

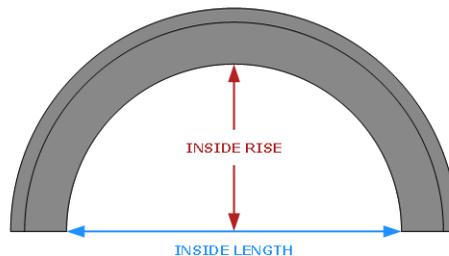
- **Custom EIFS Trim** profiles can be fabricated as either a coated, or a foam-only shape
- **Arches:** Any of our shape profiles can also be fabricated as an arch, using the inside width and inside rise of the arch.
- **Columns or Pilasters** can give your building's entrance a stately appeal. They can be fabricated to your exact specifications.
- **Corbels and Dentil** moldings are another way to add classic architectural style to your facade. We can fabricate corbels, dentils and other small architectural details to give your building a classic look.
- **Custom Signage and Decorative Elements** can be made to your specifications. When inquiring about these pieces, please include design drawings for reference. Signs require a vector file of your logo.
- **Panel Weep System** is a two-piece, horizontal weep system for EIFS panels. It is customizable to work with various thicknesses of EPS foam. *U.S. Patent No. 10,472,820 B2*



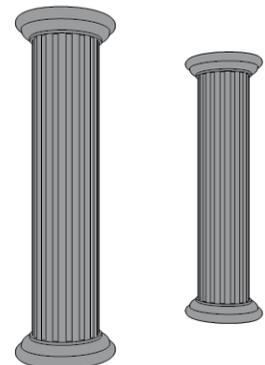
Custom EIFS Trim



Arches



Columns & Pilasters



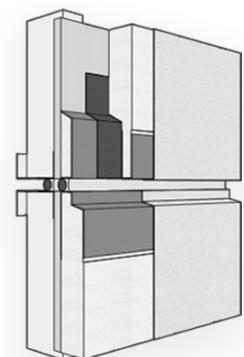
Corbels & Dentils



Custom Signs & Decorative



Panel Weep System



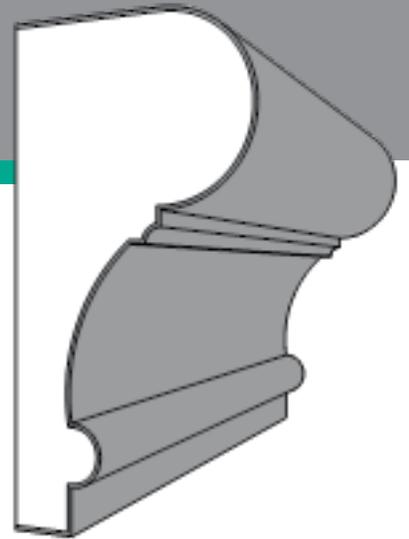
TRIM

Features & Benefits

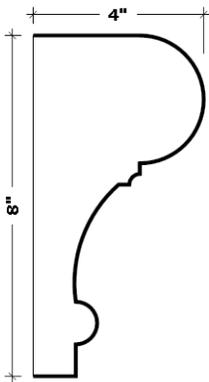
- Coated areas indicated by dark line. (Back and ends not coated.)
- Mesh returned onto back at top and bottom.
- Produced in 8FT lengths.

Additional Finishing Options

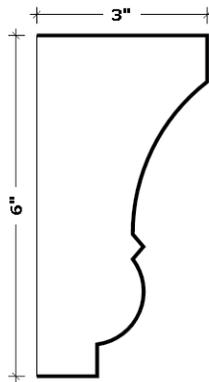
- Mitered ends (outside/inside corners)
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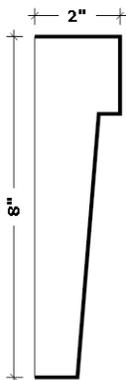
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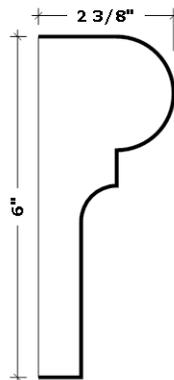
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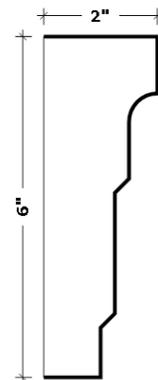
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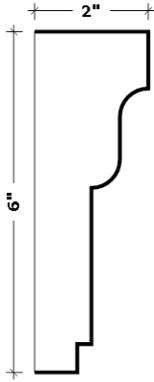
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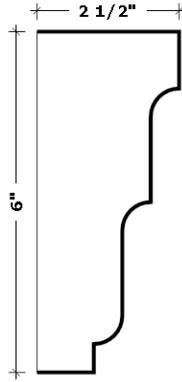
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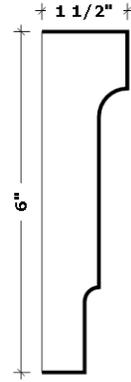
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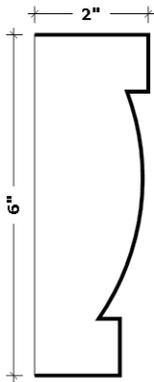
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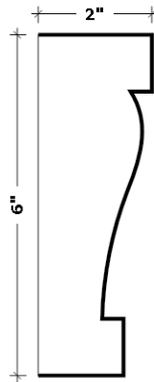
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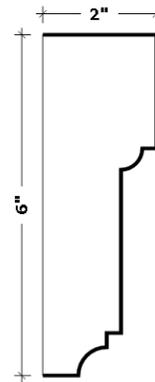
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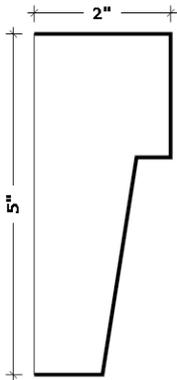
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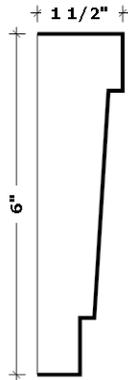
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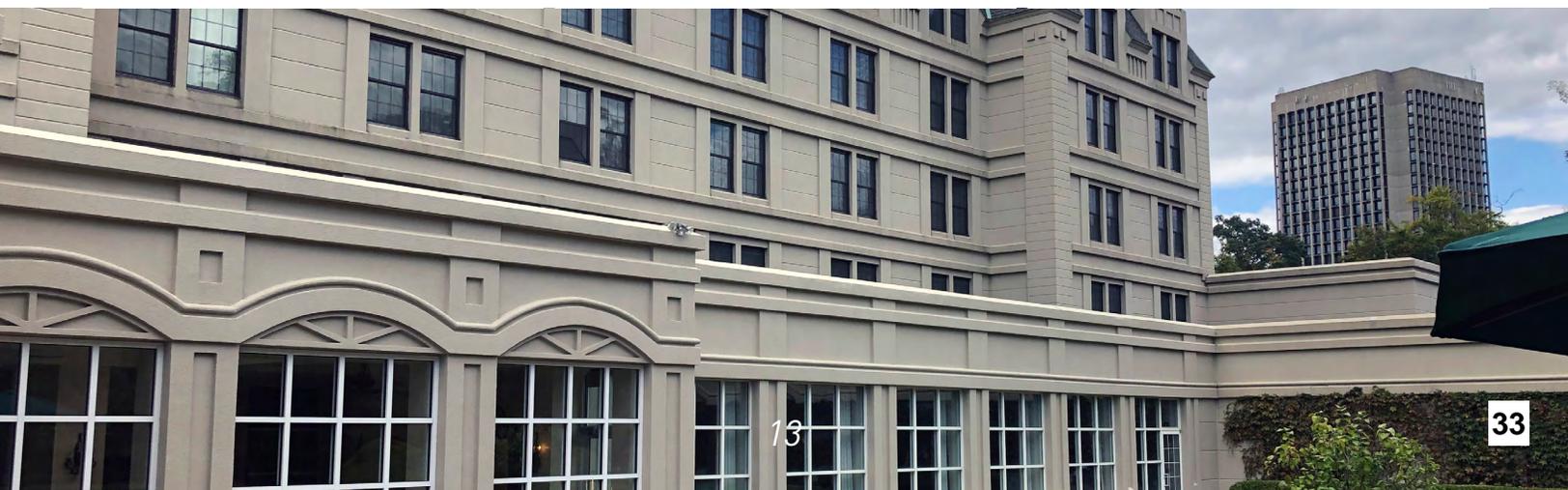
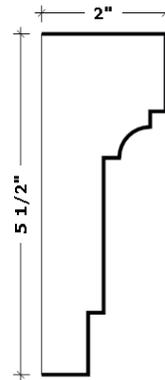
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205T159 604



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FINISH & COLOR OPTIONS

We all want our buildings to stand out and be noticed. That's why Dryvit manufactures a wide array of finishes that replicate everything from brick, to stone, to granite, to metal panels, woodgrain and more. Use them alone or in any combination to create the exact exterior you want, at a fraction of the weight — and cost — of the traditional materials.

And, when you factor in the enormous palette of color and detail options for each finish, your design options are all but limitless.

DRYVIT® FINISH OPTIONS | *Choose from almost unlimited color and finish combinations!*



AMERISTONE™



FERROS™



LYMESTONE™



QUARZPUTZ®



STONE MIST



REFLECTIT™ TEXTURE



CUSTOM BRICK™



SANDPEBBLE™



TERRA NEO®



REFLECTIT™ SMOOTH



NEWBRICK™



TUSCAN GLAZE™



TIBUR STONE



WOODGRAIN FINISH



FINESSE™



FREESTYLE®

Energy-Efficiency.
All-Weather Performance.
And a World of Finish Options.

Outsulation® 

Dryvit shapes and starter boards are compatible with Dryvit Outsulation® systems. As the name suggests, Outsulation systems place insulation on the outside of the building, and are the most effective solution for meeting today's energy code requirements for continuous insulation (CI).

But there's much more to Outsulation than CI alone. Outsulation systems deliver the latest in building science — resulting in operationally energy-efficient, cost-effective construction, low maintenance, low embodied energy structures.

All Outsulation systems include adhesive, continuous insulation (CI), fiberglass mesh embedded in base coat, and finish, which are installed sequentially by a trained professional contractor. Some Outsulation systems protect underlying walls with air- and water-resistive barriers under the CI to maximize energy efficiency. Outsulation systems can be customized in many configurations to perform in any climate and on any type of structure.

Tremco Construction Products Group: A Complete Family of Products

- Nudura® Insulated Concrete Form (ICF) Systems
- Dryvit® and Tremco Flashing, and Air and Vapor Barrier Systems
- Willseal™ Pre-Compressed Foam Expansion Joints
- Tremco Traffic Coating Systems, Sealants, Adhesives and Transition Assemblies
- Dryvit Coatings, Stains, Textured Finishes and Continuous Insulation Systems





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Construction Products Group

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1. Materials Required for Installation of Dryvit Pre-Wrapped Architectural Shapes

- A Dryvit Pre-Wrapped Architectural Shapes
- B Adhesive by Dryvit: Primus®, Genesis®, Primus® DM™, or Genesis® DM™
- C Adhesive by Tremco: TREMPPRO Chem-X Pro
- D Portland Cement: Type I, II or 1L (required when using Primus® or Genesis® material)
- E Reinforcing Mesh: Dryvit Detail Mesh® weighing 4.3 oz/yd² (146 g/m²), measuring 9 ½ in (241 mm) wide and colored blue for product identification
- F Clean potable water

2. Pre-Application Inspection

- A Substrates
 - 1. Acceptable substrates for application of Architectural Shapes
 - a) -EIFS (reinforced base coat)
 - b) Expanded Polystyrene (EPS), Graphite Polystyrene (GPS) and Extruded Polystyrene (XPS) of an EIFS before base coat
 - c) Gypsum Sheathing complying with ASTM C 1396 or C 1177 and treated with a Dryvit/Tremco approved water resistive barrier
 - d) Unpainted Brick, Concrete, or Masonry
 - e) Uncoated Cured Cement Plaster
 - f) Nudura Insulated Concrete Form (ICF)
 - g) Brown coat of a stucco system
 - 2. Wall sheathing must be securely fastened per applicable building code requirements and manufacturer's instructions.
 - 3. The substrate must be structurally sound, clean, dry, free of loose material, voids, projections or any other irregularities.
 - 4. There shall be no planar irregularities greater than ¼ in (6.4 mm) within any 4 ft (1.2 m) radius.

Notify the general contractor and/or builder and/or architect and/or owner of all discrepancies. DO NOT PROCEED UNTIL ALL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3. Mixing Instructions

- A General
 - 1. No additives such as sand, aggregates, rapid binders, anti-freeze, accelerators, etc. shall be added to any Dryvit materials under any circumstances. Such additives will adversely affect the performance of the material and void all warranties.
 - B Adhesive and Base Coat
 - 2. Primus, Genesis
 - a) Open the bucket with a utility knife or lid-off.
 - b) Due to shipping and storage, there may be some separation of materials. Prior to splitting the material and adding Portland cement, mix the material thoroughly. Use a "Twister" paddle or equivalent mixing blade powered by a ½ in (12.7 mm) drill, at 500 – 1200 rpm only. **Note: A minimum 7 amp drill works best for Portland cement based materials. CAUTION: Do not over-mix or use other types of mixing blades as air entrapment and product damage may occur and result in workability and performance problems.**
 - c) Pour ½ of the freshly mixed material [approximately 30 lbs (13.5 kg)] into a clean plastic container.
 - d) Add 1/3 of a bag [approximately 30 lbs (13.5 kg)] of fresh, lump free Type I, Type II, or Type 1L Portland cement. Either gray or white cement is acceptable. Add cement slowly and mix thoroughly. **Do not add large quantities of cement at one time.**
 - e) Clean potable water may be added to the mixture to adjust the workability.
 - 1) Primus®
 - i. Once Primus® and Portland Cement are thoroughly mixed, add water in small increments to adjust for workability. **Do not over water as this will degrade the performance and promote efflorescence.**
 - ii. After mixing, wait five – ten (5 – 10) minutes, then restir to break the initial set. A small amount of additional water may be added for workability. The material will have a pot life similar to other Portland Cement based plaster material and will depend on temperature and humidity. At the end of the pot life, the material will begin to premanently set; re-tempering at this point is not permissible.
 - 2) Genesis®
 - iii. After opening the pail, stir the material and add up to 1 qt (950 ml) of water to the full pail. Split the Genesis into two equal parts.
 - iv. Thoroughly mix the Genesis® with an equal amount (by weight) of Portland cement; wait five – ten (5 – 10) minutes, then re-stir to break the initial set. A small amount of additional water may be

added to adjust for workability. The pot life of the mixture is similar to other Portland cement plaster material and will depend on temperature and humidity. Once the material begins to permanently set, do not retemper material. Mix only as much material as can be conveniently used during a work period.

3. Primus® DM™
 - f) Pail Mixing
 - 3) One 50 lb (23 kg) bag of material will produce approximately 5 gal (19 L) of Primus® DM™ mixture. Add 1.5 gal (5.7 L) of clean potable water into a clean plastic container.
 - 4) Add Primus® DM™ slowly while mixing using a “Twister” paddle or equivalent mixing blade, powered by a ½ in (12.7 mm) drill at 500 – 1200 rpm. **Note: A minimum 7 amp drill works best for Portland cement based materials.**
 - 5) Thoroughly mix until uniformly wetted, adjusting consistency with a small amount of water or Primus® DM™ material.
 - 6) Allow the mixture to set a minimum of five – ten (5 – 10) minutes and mix again to break the initial set. Retemper, adding a small amount of water if necessary. Material must be free of lumps before using.
 - g) Motar Mixer
 - 7) Add 1.5 gal (5.7 L) of clean potable water for each 50 lb (22.7 kg) bag of Primus® DM™ into a clean mortar mixer.
 - 8) Add the Primus® DM™ while the mixer is running. Mix three to five (3 – 5) minutes, shut mixer off five – ten (5 – 10) minutes then run mixer for another two to three (2 – 3) minutes to break the initial set adding a small amount of water if necessary to adjust the workability. The pot life is one – three (1 – 3) hours depending on weather.
4. Genesis® DM™
 - h) Pail Mixing
 - 9) One bag of Genesis® DM™ will produce approximately 5 gal (19 L) of Genesis® DM™ mixture. To a clean 5 gal (19 L) pail, add 1.5 – 1.75 gal (5.7 – 6.6 L) of clean potable water.
 - 10) Add the Genesis® DM™ slowly while constantly mixing with a “Twister” paddle or equivalent mixing blade, powered by a ½ in (12.7 mm) drill, at 500-1200 rpm. **Note: A minimum 7 amp drill works best for Portland cement based materials.**
 - 11) Thoroughly mix until uniformly wetted, adjusting consistency with a small amount of water or Genesis® DM™ material.
 - 12) Allow the mixture to set a minimum of five – ten (5 – 10) minutes and mix again to break the initial set. Retemper, adding a small amount of water if necessary. Material must be free of lumps before using.
 - i) Mortar Mixer
 - 13) Add 1.5-1.75 gal (5.7 – 6.6 L) of clean potable water for each 50 lb (22.7 kg) bag of Genesis® DM™ into a clean mortar mixer.
 - 14) Add the Genesis® DM™ while the mixer is running. Mix three – five (3 – 5) minutes, shut the mixer off for five – ten (5 – 10) minutes, then run mixer for another two – three (2 – 3) minutes to break the initial set adding a small amount of water if necessary to adjust workability. The potlife is 1 – 1 ½ hours depending weather.

Note: Primus DM and Genesis DM will take longer to dry when used as an adhesive than the Primus or Genesis product in a pail.

4. Installation of Architectural Shapes

C General

1. Ensure that the Architectural Shapes have been manufactured using Dryvit base coat and mesh, and Dryvit approved Expanded Polystyrene (EPS).
 - j) The Architectural Shapes shall:
 - 15) Measure a maximum of 4 ft (1.2 m) in length unless approved otherwise.
 - 16) Not exceed the thickness listed in Table 1.
 - 17) Shall be sloped for drainage on the skyward-facing surface at a 3:12 pitch when slope length does not exceed 4”, and a 6:12 pitch for a maximum slope length of 12” if shapes are exposed to precipitation on this surface.
 - 18) Have base coat and reinforcing mesh installed in accordance with typical Dryvit Application Instructions (see DS218, section 9.E.) or manufactured by Dryvit.
 - 19) For installation on an EIFS and on bare EPS/GPS/XPS of an EIFS, have mesh that overhangs a minimum of 2 ½ in (64 mm) from the top and bottom edges to allow for embedment and overlap on to the face of the wall.
 - 20) For installation over a non-EIFS substrate, have reinforced base coat that back wraps a minimum of 2 ½ in (64 mm) behind the top and bottom edges.

Table 1: Maximum Thickness of EPS for Architectural Shapes

| Substrate name | AWRB | Maximum Thickness of Insulation | |
|---|---------------|---|--------------------------|
| OPMD, OMD | BSNTX | 12 3/4" (324 mm) in total EPS | |
| OPMD, OMD | EA230 | 12 1/2" (318 mm) in total EPS | |
| SE430 OPMD | EA430 | 12 3/4" (324 mm) in total EPS | |
| Nudura ICF with 2 5/8" and Outsulation or OPMD | NONE | 9 7/16" (240 mm) total EPS | |
| | BSNTX | 9 11/16" (247 mm) total EPS | |
| | EA230 | 9 3/8" (238 mm) total EPS | |
| Nudura ICF with 4 "and Outsulation or OPMD | NONE | 7 5/8" (193 mm) total EPS | |
| | BSNTX | 7.35" (187 mm) total EPS | |
| | EA230 | 7 1/2" (191 mm) total EPS | |
| OX | BSNTX | Thickness of XPS | Thickness of EPS shape |
| | | 1" (25 mm) | 4 5/8" (117 mm) |
| | | 1 1/2" (38 mm) | 3 13/16" (97 mm) |
| | | 2" (51 mm) | 2 7/8" (74 mm) |
| | | 2 1/2" (64 mm) | 2 1/8" (53 mm) |
| | | 3" (76 mm) | 1 5/16" (33 mm) |
| | | 3 1/2" (89 mm) | 3/8" (10 mm) |
| 3 3/4" (95 mm) | not permitted | | |
| OX | EA230 | Thickness of XPS | Thickness of EPS shapess |
| | | 1" (25 mm) | 3 13/16"(97 mm) |
| | | 1.5" (38 mm) | 3.0" (76 mm) |
| | | 2" (51 mm) | 2.3" (58 mm) |
| | | 2.5" (64 mm) | 1.5" (38 mm) |
| | | 3" (76 mm) | 0.8" (20 mm) |
| | | 3.5" (89 mm) | Not Permitted |
| LCMD, OMVS | | 4" (102 mm) | |
| Outsulation | | 13" (330 mm) | |
| EPS and XPS before base coat | | See system listed above | |
| Gypsum Sheathing complying with ASTM C 1396 or C 1177 Unpainted Brick, Concrete, or Masonry Cement Plaster Brown Coat of Uninsulated Stucco System | | 13" (330 mm) | |
| EIFS, non-Dryvit | | Thickness depends on fire testing (NFPA 285) for the EIF System | |

Notes

1. EPS – Expanded Polystyrene
2. XPS – Extruded Polystyrene
3. BSNTX – Backstop NTX
4. EA230 – ExoAir 230
5. OPMD – Outsulation Plus Moisture Drainage
6. SE430 OPMD – Securock ExoAir 430 Outsulation Plus Moisture Drainage
7. EA430 – ExoAir 430 (only available as factory applied over USG Sheathing – Securock ExoAir 430)
8. OMD – Outsulation Moisture Drainage
9. ICF – Insulated Concrete Forms
10. OX – Outsulation X
11. LCMD – Light Commercial Moisture Drainage
12. OMVS – Outsulation Masonry Veneer System
13. **Note that maximum thickness of architectural shapes is based on NFPA 285 testing and does not apply to Type V structures.**

D Application

2. The Architectural Shapes may be attached directly to the acceptable substrate. **NUDURA ICF MUST BE RASPED IN PREPARATION OF ADHERING TREMCO/DRYVIT AIR-WATER RESISTIVE BARRIERS AND EIFS MATERIALS INCLUDING ARCHITECTURAL SHAPES.**
3. Strike a chalk line on the substrate or EPS wall insulation to mark the location of the Architectural Shapes as detailed in contract documents.
4. Mix adhesive as described in Section 3 above. **Application Tip: To promote high, initial grab, in the area to receive the shape, apply a tight coat of adhesive onto the EPS wall insulation prior to setting the shape. In many cases this will prevent having to use mechanical fasteners or pins to keep the shape in place.**
5. Prior to applying adhesive to the backside of the shape, peel the overhanging mesh from the backside to keep it clean since it will be necessary to embed that mesh into the adjacent wall after the adhesive cures.
6. With a notch trowel measuring 3/8 in x 1/2 in (9.5 mm x 12.7 mm) with notches at 1 1/2 in (38 mm) on center, apply the Dryvit adhesive to the backside of the Architectural Shape.
7. Apply the shape to the wall with firm pressure to prevent slippage. It may be necessary to use mechanical fasteners in conjunction with adhesive or it may be necessary to provide temporary support until the adhesive cures. **WHEN INSTALLING OVER EIFS, ONLY FASTEN INTO INSULATION. DO NOT FASTEN THROUGH THE WATER RESISTIVE BARRIER AND INTO THE SUBSTRATE OF AN EIFS.**
8. Once the adhesive cures the mesh that was peeled back shall be embedded in the base coat mixture. Reinforcing mesh shall extend a minimum of 2 1/2 in (64 mm) onto the adjacent wall surface.
9. Dryvit Detail Mesh is required at the abutment of each Architectural Shape. Cut Detail Mesh to a working length allowing for a 2 1/2 in (64 mm) overlap on either side of the joint. Center mesh over the joint and embed in base coat mixture.
10. Allow base coat to cure prior to finish application.

5. Field Quality Control

- E Dryvit assumes no responsibility for on-site inspections or for workmanship. Tremco CPG, Inc. and/or its distributors will provide field service support if reasonably requested by the Applicator. The designer, general contractor or their appointed representative should make periodic on-site inspections to ensure that the Dryvit materials are being installed in strict accordance with Dryvit specifications and application instructions.

6. Cleaning

- F The applicator shall remove from the job site all remaining materials associated with the application of the Architectural Shapes.
- G The applicator shall clean the work area, adjacent materials and surfaces of foreign materials resulting from their work.
-

Tremco Construction Products Group (CPG) brings together Tremco CPG Inc. and its Dryvit and Nudura brands; Willseal; Prebuck LLC; Tremco Barrier Solutions, Inc.; Weatherproofing Technologies, Inc. and its Pure Air Control Services and Canam Building Envelope Specialists offerings; and Weatherproofing Technologies Canada, Inc.



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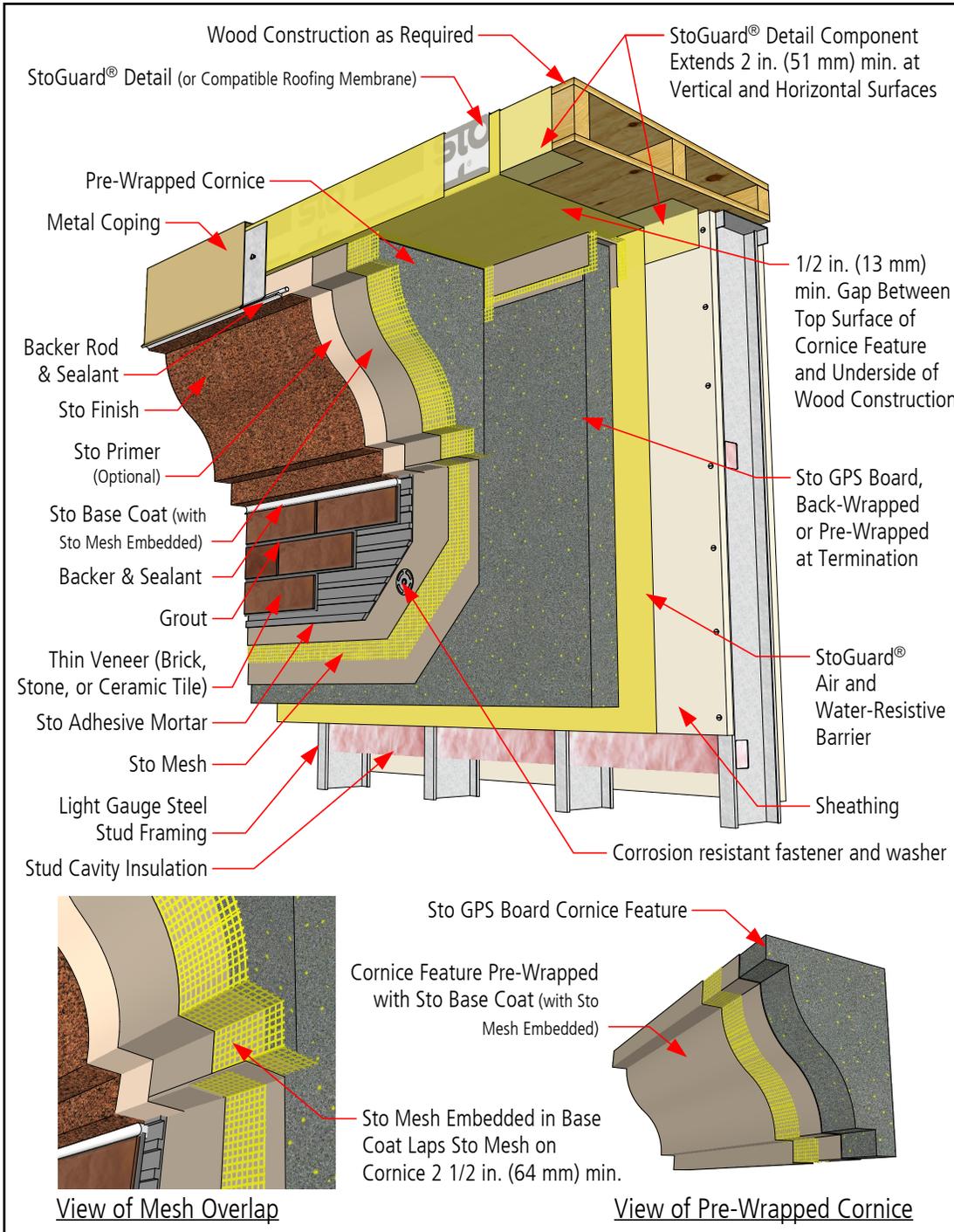


Construction Products Group

3735 Green Rd. | Beachwood, OH 44122
800.321.7906 | tremcocpg.com

StoTherm® ci MVES Parapet with Cornice Feature

Detail No.: 57s.61
Date: August 2023



Notes:

1. Refer to StoGuard Product Use Chart (Table 1.1) for StoGuard detail components; joint treatment, rough opening protection, backing for masonry anchors, or transitions to dissimilar materials, joints and seams in construction.
2. Refer to General Notes for specific information and design guidance on wall assembly components.
3. Components not identified as Sto are furnished by other manufacturers and are not necessarily installed by trades who install the Sto products. Refer to project specific contract documents.

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Thin Brick Veneer

Abstract: This *Technical Note* presents design and construction information on the use of thin brick in adhered veneer systems. Methods of thin brick construction discussed include thick set, thin set, modular panels and prefabricated panels consisting of architectural precast concrete, tilt-up concrete and wood or steel stud frame panels. Properties of the finished construction and comparisons to other systems are presented.

Key Words: adhered veneer, precast concrete, modular, panel, prefabricated, steel stud, thick set, thin brick, thin set, tilt-up, wood stud.

SUMMARY OF RECOMMENDATIONS:

Substrate

- Surfaces should be structurally sound and free of coatings, loose debris and other bond-impeding substances
- Max. variation from plane, ¼ in. in 10 ft (6 mm in 3.05 m)
- Max. deflection of L/360 for wall stud framing

Water-Resistive Barrier

- For exterior applications over stud-framed assemblies, install two layers or one layer with a drainage mat

Flashing and Weeps

- For exterior applications, install corrosion-resistant flashing, integrated with the water-resistive barrier at through-wall penetrations, substrate transitions and terminations of adhered veneer
- Install weep screed or flashing of corrosion-resistant material at base of adhered veneer, with vertical leg or attachment flange extending at least 3½ in. (89 mm) vertically

Thin Brick

- Use brick complying with ASTM C1088, with Type and Grade as appropriate for project requirements

Mortar and Adhesive

- Use ASTM C270, Type S, mortar applied to a thickness of ¾ to 1¼ in. (10 to 32 mm) or one of the following with a minimum shear strength between the thin brick and substrate of 50 psi (345 kPa):
 - ASTM C270, Type S, mortar modified with latex or other suitable polymers
 - Modified mortar complying with ANSI A118.4, Latex-Portland Cement Mortar
 - Non-sagging adhesive compatible with masonry and substrate surfaces

Movement Joints

- Extend movement joints through thickness of entire veneer assembly, for full length or height of veneer, including parapets
- Space no more than 18 ft (5.5 m) o.c. in either direction
- Max. area between movement joints should not exceed 144 sq ft (13.4 m²) or length-to-height or height-to-length ratio of 2½ to 1
- Align veneer movement joints directly over substrate movement joints
- For proprietary modular and prefabricated panels, follow manufacturer's instructions
- See *Technical Note* 18A for recommended placement of additional movement joints

Installation Methods

- Use **Table 1** to determine an appropriate thin brick installation method for substrate wall and application. Use one of the following installation methods:

- Thick Set:

- Attach reinforcing lath or mesh to substrate and apply scratch coat of mortar or modified mortar in one or two layers to a nominal thickness of ½ to ¾ in. (12 to 19 mm)
- To scratch coat, apply bond coat of mortar or modified mortar to nominal thickness of ⅛ in. (3.2 mm), and groove with notched trowel

- Thin Set:

- Use cement backer board with treated joints as substrate for exterior applications over wood or steel studs
- Apply bond coat of modified mortar to a nominal thickness of ⅛ in. (3.2 mm) or non-sagging adhesive in accordance with adhesive manufacturer's instructions

- Modular Panel Systems:

- Install thin brick on panel and attach panel to substrate in accordance with panel manufacturer's instructions

- Prefabricated Panels:

- For architectural precast and tilt-up concrete panels, install in accordance with panel manufacturer's instructions
- For wood or steel stud framing panels, install using panel manufacturer's instructions, or one of the installation methods above

Thin Brick Placement

- Use either of the following:
 - Completely cover back of thin brick when using mortar or modified mortar or, when using adhesive, follow manufacturer's instructions or apply 1 in. diameter (quarter-sized) dabs at each end
 - Firmly press or tap thin brick into mortar or adhesive while maintaining joint width and coursing

Mortar/Grout Joints

- Force mortar to fill joints as thin brick are placed or fill joints using a grout bag, mortar gun or other mortar delivery device
- When thumbprint hard, tool with concave, vee or grapevine profile jointer

INTRODUCTION

Thin fired clay units, commonly known as thin brick, have gained increasing popularity by combining the aesthetic of traditional brick masonry with the economic benefits that may be realized in thinner wall sections. Though thin brick were first developed in the 1950s as a way to reface existing construction, current applications include both new and existing structures in residential and commercial construction.

Thin brick veneer, also referred to as adhered veneer, is available in many varieties but can be classified by four basic installation methods: thick set, thin set, modular panel systems and prefabricated panels. The first two involve field installation of each brick unit on a substrate with either a thick mortar bed for thick set or a thin layer of modified mortar or adhesive for thin set. Modular panel systems use an intermediary panel with a typical area of 4 to 6 sq ft (0.33 to 0.5 m²) made of polystyrene, metal or other materials to assist in supporting the thin brick. The modular panels are either fastened to the substrate wall with thin brick already adhered to them or the thin brick are adhered to the panels in the field. Prefabricated panels involve creating larger, structurally independent panels (typically) larger than 10 sq ft (1 m²) that are lifted into place on the building. Panels consisting of architectural precast concrete or steel or wood stud framing are usually constructed off-site, while concrete for tilt-up panels is usually poured in the field.

This *Technical Note* describes thin brick and its use in various interior and exterior adhered veneer applications. Typical installation methods, material requirements and applicable code requirements are also presented. For information on anchored brick veneer, refer to other *Technical Notes* in this series.

PROPERTIES OF THIN BRICK VENEER

Thin brick are made from the same materials and similar processes as other brick but are thinner and weigh less. Thin brick are a single element among many within an adhered veneer system that influence its characteristics. System performance can be accurately determined only when an assembly is evaluated as a whole. When compared with common light-weight cladding systems, thin brick veneer generally provides superior resistance to noise, minor impacts, abuse, heat and vandalism. The durability, fire resistance, security and acoustic comfort provided by thin brick systems are primarily due to their mass.

Adhered brick veneer can be installed where providing support for heavier, anchored brick veneer may be difficult. Thin brick systems also impart less load to buildings. Adhered thin brick veneer may be installed by masons, tilesetters or other workers. Some manufacturers can “match” thin brick with brick used in anchored veneer applications found elsewhere on the building.

SYSTEM DESCRIPTIONS

Adhered veneer is bonded to and dependent upon its backing for stability and strength. This bond is achieved by embedding the thin brick in a mortar or modified mortar setting bed, applying an adhesive or modified mortar and pressing the thin brick onto a panel substrate material, or by casting concrete onto the backs of thin brick. Thin brick can be applied either on-site or off-site. There are four primary methods for the installation of adhered thin brick veneer: thick set, thin set, modular panels and prefabricated panels.

Thick Set

The thick set method consists of applying thin brick with a bond coat of mortar onto a mortar scratch coat, as shown in [Figure 1](#). The thick set method requires a reinforcement layer of either lath or mesh within the scratch coat to assist in controlling cracking due to shrinkage of the mortar behind the thin brick.

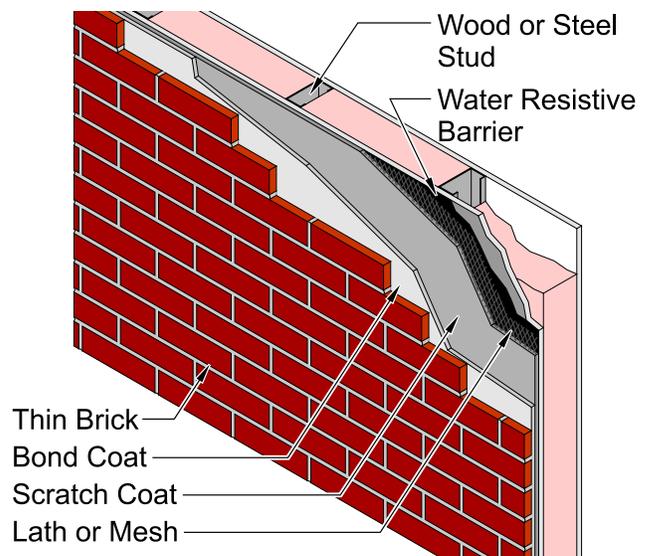


Figure 1
Thick Set Application on Studs

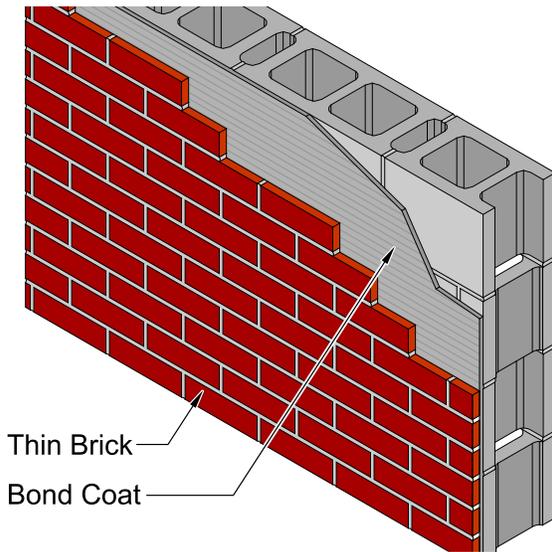


Figure 2
Thin Set Application on CMU

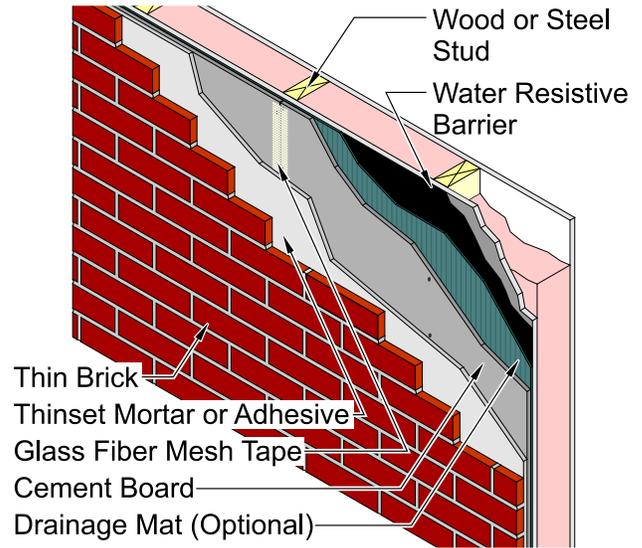


Figure 3
Exterior Thin Set Application on Stud with Drainage Mat

Thin Set

Thin brick installed using the thin set method is adhered directly to the substrate by a thin (typically around 1/8 in. [3.2 mm]) layer of adhesive or modified mortar, as shown in [Figure 2](#). The surface of the veneer closely mimics the surface condition of the substrate. Due to its reduced thickness, the thin set method does not include a reinforcement layer of lath or mesh. Cement backer board is the recommended substrate for exterior adhered veneer installed over stud walls using the thin set method, as shown in [Figure 3](#).

Modular Panel Systems

In these applications, thin brick are adhered or mechanically secured to a modular panel, usually made of metal, rigid foam insulation, wood or other materials, that is fastened to the substrate wall, as shown in [Figure 4](#). Modular panel systems often have integral water resisting elements such as drainage mats or drainage spaces. Thin brick are adhered to some modular panels prior to installation, while other panels are attached to the substrate before thin brick are adhered. Unlike thick set or thin set, panels usually have grooves, tabs or rails to align the thin brick courses and to provide support while the mortar or adhesive cures. Some proprietary modular panel manufacturers provide all the components needed for installation and warranty the panel and components as complete systems.

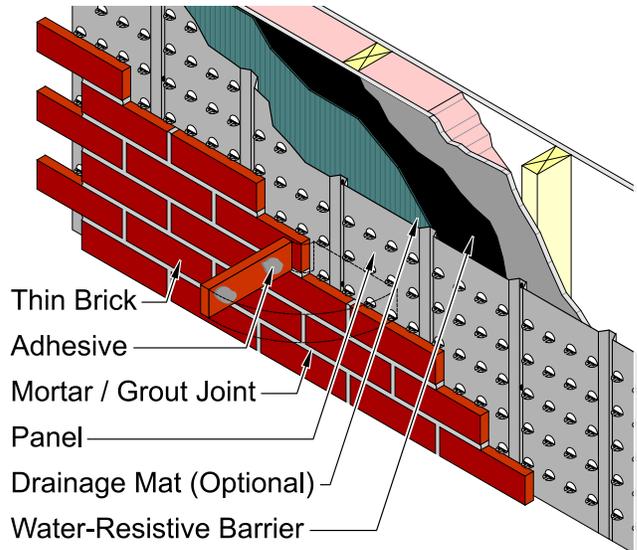


Figure 4
Modular Panel on Stud

Prefabricated Panels

Thin brick can be integrated into tilt-up and architectural precast concrete panels. To create prefabricated panels, thin brick are typically placed facedown into a form liner made of rubber or plastic (used to hold the thin bricks in place), and concrete or a fluid grout is poured directly over the backs of the thin brick (as shown in [Photo 1](#)). In some cases, a retarder or wax is applied to the thin brick's exposed face (finished face) to prevent staining. The concrete that flows into the space between the thin brick forms the appearance of mortar joints. Reinforcement is included in the concrete as necessary to meet project requirements.

Once cured, the panel is stripped from the form to reveal the thin brick surface. The thin brick are bonded to the concrete on the back and all four sides of the brick. Once the panel has cured, the exposed concrete between the brick typically serves as the mortar joint. Alternatively, joints between the brick may be finished by filling with mortar or modified mortar and tooling to the desired profile.

Prefabrication using thin brick can also be accomplished by building panels on sections of wood or steel stud framing and applying thin brick to the panel. In addition to straight walls, this system is well suited to soffits and other locations where lighter-weight prefabricated components are needed. The thin brick are typically attached to the panels using the thick set method.



Photo 1

Fabrication of Precast Panel with Thin Brick

SYSTEM SELECTION

Table 1 lists acceptable installation methods for different substrates and applications. Where indicated, the substrate or installation method must comply with the notes below the table to be considered acceptable.

TABLE 1
Acceptable Installation Methods for Thin Brick

| Substrate Wall | Application | Thin Brick Installation Method | | | |
|----------------------------|-------------|--------------------------------|---------------------|---------------------|----------------------|
| | | Thick Set | Thin Set | Modular Panels | Prefabricated Panels |
| Wood or Steel Stud Framing | Exterior | Notes 1, 2, 4 and 5 | Notes 1, 3, 6 and 7 | Notes 1, 2, 5 and 7 | Notes 1, 2, 5 and 7 |
| | Interior | Notes 1, 2 and 4 | Notes 1, 3 and 7 | Notes 1, 2 and 7 | Notes 1, 2 and 7 |
| Masonry or Concrete | Exterior | Notes 2 and 4 | Note 3 | Note 2 | Note 2 |
| | Interior | Notes 2 and 4 | Note 3 | Note 2 | Note 2 |

See below for notes referenced in table.

1. Maximum deflection of L/360 is recommended for wall stud framing. Maximum deflection of L/240 is permitted for walls by the *International Building Code (IBC)* when rigid finishes like thin brick are applied. For interior adhered veneer applications supported by wood floors, the IBC limits the vertical deflection of the flooring system to L/600.
2. Maximum allowable variation of ¼ in. in 10 ft (6 mm in 3.05 m) from plane.
3. Acceptable only when surface is bondable and variation from plane is no more than ¼ in. in 10 ft (6 mm in 3.05 m).
4. Use only with reinforcing lath or mesh in scratch coat.
5. Use exterior-grade sheathing. Wood stud framing is required by the *IBC* and the *International Residential Code (IRC)* to have water-resistant barrier with the equivalent performance of two layers of Grade D paper.
6. Acceptable only when cement backer board is used as substrate.
7. For *IBC*, the system must comply with the alternative design requirements of the *Building Code Requirements for Masonry Structures (TMS 402)* since the installation method does not include metal lath.

Factors that influence the selection of a particular system or installation method may include the substrate, weather conditions, cost, and experience and skill level of the installer. Performance characteristics of each system should also be considered in the selection process.

Thick set installation provides a greater thickness to absorb some of the irregularity in substrates that are uneven. It also incorporates lath or mesh reinforcement that is fastened to the substrate to provide a mechanical connection to the veneer and to accommodate some differential movement between the veneer and the substrate.

Thin set installations require a more plumb and level substrate surface than thick set installations because the veneer is adhered directly to the substrate. Unevenness in substrate surfaces will also be evident in the thin brick wall surface. Further, the location of movement joints in thin set installations requires more careful attention than in thick set installations, as movement between the substrate and the veneer is accommodated only where movement joints are placed.

Modular panel systems, like thick set installations, accommodate substrates that are uneven or have questionable bonding surfaces relatively easily. Because modular panels systems are designed to align brick units properly, to securely attach thin brick units and to promote drainage of penetrant water, their installation typically requires less skill than other methods.

Wood and steel stud frames and architectural precast panels are fabricated in a manufacturing facility, which permits them to be assembled without interruption from weather. The size of panels can be limited by the maximum size allowed on the roads to the project site. Large variations in the building's frame may make it difficult for panels to be installed to typical masonry tolerances. Since tilt-up panels are assembled and poured directly at the job site, the panel size is not limited by transportation issues but may be limited by job site restrictions.

SYSTEM DESIGN

For residential applications, the *IRC* [Ref. 2] requires thin brick adhered veneer to be installed over a water-resistive barrier and to comply with the adhered veneer provisions of the *Building Code Requirements for Masonry Structures* (TMS 402/ACI 530/ASCE 5) [Ref. 5]. For commercial construction, the *IBC* [Ref. 1] also requires thin brick adhered veneer to meet the requirements of TMS 402.

TMS 402 allows both prescriptive and alternate methods of design. Prescriptive design requirements limit the specified thickness of the brick to a maximum of 2 in. (67 mm) and require the substrate to be masonry, concrete or metal lath and portland cement plaster applied to masonry, concrete, steel framing or wood framing. If other than $\frac{3}{8}$ in. to $1\frac{1}{4}$ in. (10 to 32 mm) of Type S mortar is used to adhere the thin brick, then the shear strength between the veneer units and backing should be tested in accordance with ASTM C482 for the gross unit surface area and have a shear strength of 50 psi (345 kPa) minimum.

Water-Resistive Barrier and Means of Drainage

The *IRC* and *IBC* require exterior walls to include a water-resistive barrier and a means of draining exterior water that enters the assembly, with a few exceptions. The water-resistive barrier must be installed over the sheathing or studs of frame wall assemblies but may be omitted over concrete or masonry walls designed and flashed in accordance with applicable code requirements. Exterior wall assemblies that demonstrate resistance to wind-driven rain through testing in accordance with ASTM E331 under code-prescribed conditions are also exempt from water-resistive barrier and means-of-drainage requirements.

The code indicates that a water-resistive barrier can be either one layer of No. 15 asphalt felt complying with ASTM D226, Type 1, or other approved material. As noted in the *2009 IRC Commentary* [Ref. 2], field experience and testing [Ref. 7] have shown that using two layers of building paper in exterior applications of stucco considerably decreases the penetration of moisture. Where installed over wood-based sheathing, the *IRC* and *IBC* require two layers of vapor-permeable water-resistive barrier with a performance equivalent to two layers of Grade D building paper, or a single layer of water-resistive barrier with a water resistance equal to or greater than 60-minute Grade D paper that is separated from the veneer by a designed drainage space or a layer of material that does not absorb water. These codes do not indicate specific materials or methods that qualify as providing a means of drainage; however, products such as drainage mats are often used to meet means-of-drainage requirements. Because they are specifically designed to provide the separation and means of drainage required by code, inclusion of designed drainage spaces or drainage mats as shown in [Figure 3](#) is preferred.

A water-resistive barrier is not required for interior applications but may be beneficial in protecting building materials from moisture during installation. For further information, refer to the *IBC* [Ref. 1] and *IRC* [Ref. 2].

Flashing/Weep Screed

Flashing is a material that collects water drained from the veneer assembly and directs it out of the wall through weeps. Building codes require flashing and weeps at the following locations:

- Beneath the first course of veneer above final grade. The *IRC* requires the flashing (or weep screed) to extend a minimum of 1 in. (25 mm) below the foundation plate line for exterior applications over stud walls. To promote drainage, install the first course of veneer directly above the flashing or screed, without a mortar/grout joint.
- At points of support, such as shelf angles, lintels and structural floors.
- At wall and roof intersections.

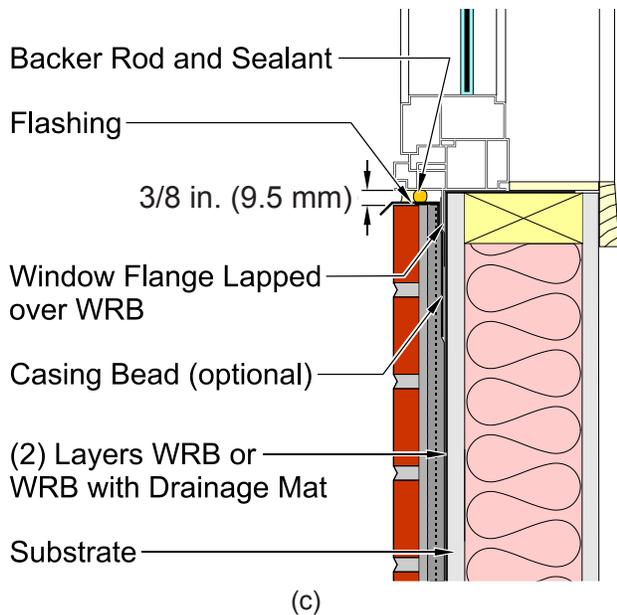
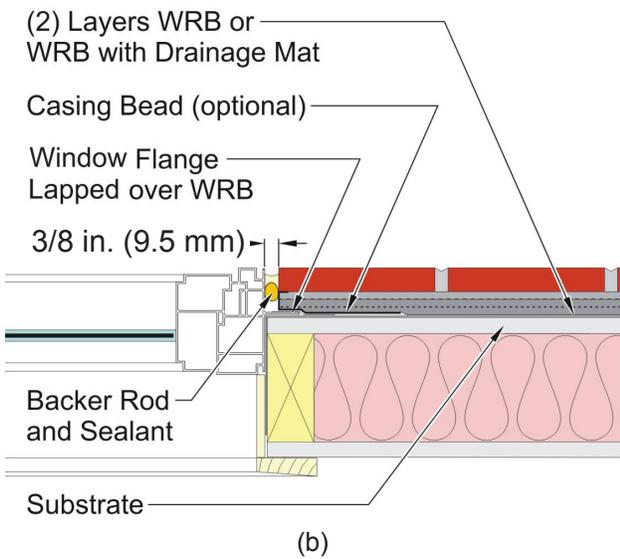
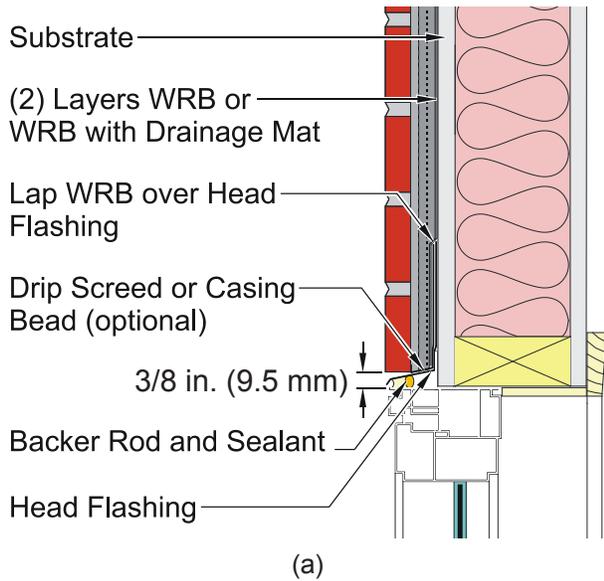


Figure 5
Flashing Details at (a) Window Head,
(b) Window Jamb and (c) Window Sill

- At the heads, jambs and sills of exterior window and door openings.
- At the intersection of chimneys or other masonry construction with frame or stucco walls.
- Under and at the ends of copings and sills.
- Where exterior porches, decks or stairs attach to a wall or floor assembly of wood or steel stud construction.

The flashing or weep screed should extend to the exterior wall surface or beyond, with the back edge (attachment flange) turned up at least 3½ in. (89 mm) vertically. The water-resistive barrier should lap over the flashing or weep screed. In assemblies with two layers of water-resistive barrier installed over a wood-based sheathing, direct the flashing between the layers. Extending flashing beyond the wall surface to form a drip is recommended. When using a flashing that deteriorates with UV exposure, a separate drip edge or weep screed can accomplish this. When a drip edge/weep screed is not used, such flashings should stop, or be cut, flush with the face of the wall. Typical head, jamb and sill flashing details are shown in Figure 5.

Foundations

Figure 6 shows a typical foundation detail for thin brick veneer. The IRC and IBC require exterior applications of thin brick veneer over stud walls to be installed a minimum of 4 in. (102 mm) above grade, a minimum of 2 in. (51 mm) above paving, and a minimum of ½ in. (12 mm) above exterior walking surfaces supported by the same foundation. The thin brick are required to extend a minimum of 1 in. (25 mm) below the top of a concrete or masonry foundation wall.

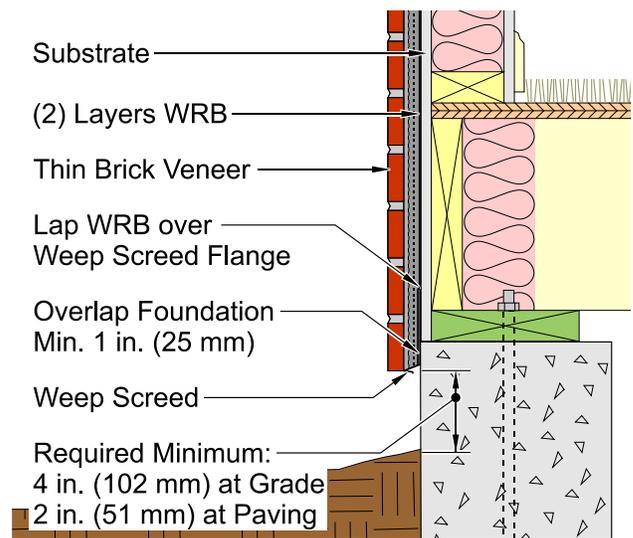


Figure 6
Foundation Detail and Required Clearances

Deflection

For thin brick veneer with a substrate of masonry or concrete, deflection is not a concern, because the flexural stiffness of the veneer is similar to that of masonry and concrete. When the substrate wall is wood or steel stud framing, out-of-plane deflection of the framing must be considered, because the stiffness of the veneer can be substantially greater than the stud framing. The *IBC* limits the deflection of stud framing to a maximum of $L/240$ when rigid finishes like thin brick are applied. For interior adhered veneer applications supported by wood floors, the *IBC* limits the vertical deflection of the floor system to $L/600$. To decrease potential cracking and the potential for the veneer to separate from the stud framing, a wall deflection limit of $L/360$ is recommended when a wood or steel stud framing substrate is used.

Movement Joints

Thin brick veneers may experience differential movement as the brick expand and the substrate or mortar bed shrinks. To accommodate this movement, a system of movement joints should be installed through the entire layer of adhered thin brick veneer. If movement joints are not placed properly or are not used at all, cracking may occur. It is important to note that architectural precast and tilt-up concrete panels that incorporate movement joints where they are joined together usually do not require additional movement joints within the face of the panel. For movement joints of proprietary modular panel systems, follow manufacturer's instructions. For other thin brick installation methods, incorporate movement joints at regular spacings.

Spacing. The distance between movement joints should not be more than 18 ft (5.5 m) either vertically or horizontally. Areas between movement joints should not exceed 144 sq ft (13.4 m²). Veneer areas between movement joints should preferably be square in shape but may have a maximum length-to-height or height-to-length ratio of 2½ to 1. Where thin brick veneer is adhered to a masonry or concrete substrate, the movement joints through the veneer should be installed directly over and aligned with movement joints in the substrate. Where thin brick veneer is installed on studs, the movement joints through the veneer are not necessarily required to be aligned with movement joints through the sheathing on the studs. Where lath or mesh are used, attachment should allow free movement of the veneer between movement joints.

Construction. Movement joints should extend from the exterior surface of the adhered veneer to the substrate beneath the thin brick. Where modular panels are used, construct movement joints in accordance with manufacturer's instructions. Alignment of movement joints with those in the substrate is more easily achieved when they are formed during installation of mortar beds. A compressible filler strip set during mortar placement can provide the space needed for the joint as well as aid in keeping the joint free of mortar or other obstructions. At the exterior surface, a backer rod and sealant prevent water penetration, as shown in [Figure 7](#). Movement joints must be at least as wide as joints in the substrate that they are placed directly over. The minimum recommended width of movement joints through adhered veneer is ⅜ in. (10 mm). In thick set applications, lath or mesh reinforcement should stop on each side and not continue through the movement joint, as shown in [Figure 8](#).

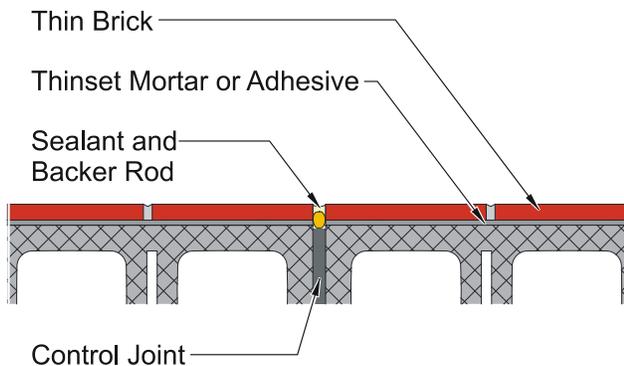


Figure 7

Thin Brick Movement Joints on CMU Backing

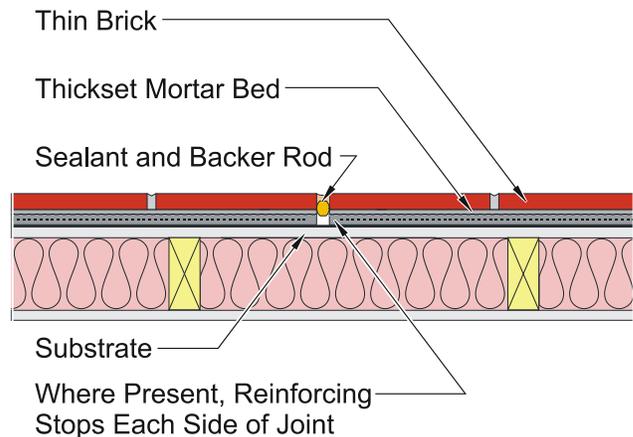


Figure 8

Thin Brick Movement Joints on Stud Backing

Continuous Insulation

In order to meet prescriptive thermal performance requirements found within various energy codes, continuous insulation is increasingly incorporated into adhered veneer systems. Adhered veneer may be installed over continuous insulation; however, longer, more robust fasteners capable of carrying the weight of the veneer unsupported through the thickness of the insulation will typically require design by an engineer. “Guide to Attaching Exterior Wall Coverings through Foam Sheathing to Wood or Steel Wall Framing” [Ref. 6], published by the Foam Sheathing Committee of The American Chemistry Council, provides a directed approach that may assist engineers in designing adequate connections through continuous insulation.

MATERIALS

Thin Brick Units

Thin brick are available in a wide variety of colors, textures and face dimensions. Most thin brick units are ½ to 1 in. (13 to 25 mm) thick but can be as thick as 1¼ in. (45 mm). Thin brick shapes such as those depicted in Figure 9 allow the adhered veneer to be applied around corners, giving the appearance of traditional face brick facades. Manufacturers should be contacted to determine available shape options.

Manufacturing Methods. Two methods are used to manufacture thin brick. The first is to extrude or mold the clay at the desired thickness with any surface modifications (coatings, impressions, etc.) made to the exposed face during forming. The second approach involves forming and firing a thicker brick and either splitting it lengthwise or cutting the brick to the desired thickness. In some cases, this process can produce multiple thin brick from each fired unit. Corner units may be formed in their final shape, cut to their final shape from a single unit or assembled (often mitered) by adhering multiple units. Some thin brick are manufactured with textured, keyed or dovetailed backs.

Due to the asymmetrical configuration of corner and edge units, thin brick are typically stacked in boxes or strapped in smaller packages rather than stacked in cubes like most brick.

Thin Brick Specifications. Thin brick should comply with ASTM C1088, *Standard Specification for Thin Veneer Brick Units Made from Clay or Shale* [Ref. 4]. As with other clay brick standards, C1088 includes requirements for durability, physical appearance and tolerances for dimensions. For exterior applications, Grade Exterior should be used. For interior applications, Grade Interior brick are generally used, but Grade Exterior may be used if desired.

The standard has varying appearance requirements for the brick based on Type. By default, the requirements for Type TBS apply. For some applications, the higher precision of Type TBX may be required. Type TBX may be necessary when using some form liners to position thin brick for use in prefabricated concrete panels. For thin brick with non-uniform features, such as tumbled, distressed or other non-uniform effects, the requirements of Type TBA apply. For further information regarding ASTM C1088, refer to *Technical Note 9A*.

Although thin brick are typically specified according to ASTM C1088, some architectural precast concrete and tilt-up concrete panel manufacturers require thin brick incorporated into their panels to meet the “PCI Standard for Embedded Clay Thin Brick” as published by the Precast/Prestressed Concrete Institute [Ref. 8]. The PCI criteria for thin brick are more stringent than those in ASTM C1088, Type TBX; however, BIA is not aware of research and testing that has demonstrated that these criteria are required for the successful use of thin brick in concrete panels. Some PCI criteria may not be attainable within the normal manufacturing processes used for thin brick.

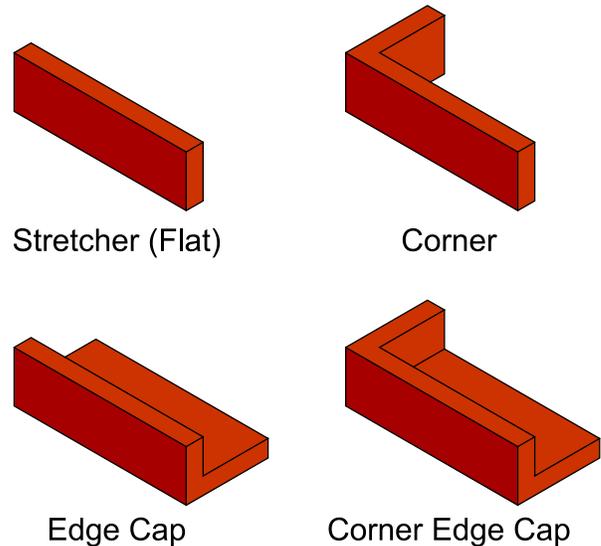


Figure 9
Thin Brick for Adhered Applications

Reinforcing Lath and Mesh

Reinforcing lath and mesh should be made of corrosion-resistant materials. Galvanized or stainless steel are most common; however other materials such as glass fiber lath may be acceptable with a product evaluation approval. Metal lath should be either 2.5 lb/sq yd (1.4 kg/m²) or 3/8 in. (10 mm) rib, 3.4 lb/sq yd (1.8 kg/m²) metal lath complying with ASTM C847. Self-furred lath or lath attached with self-furring fasteners is recommended. Woven wire mesh should be minimum 18 gauge complying with ASTM C1032. Glass fiber lath should comply with applicable building code requirements. Glass fiber lath is not recommended for applications over open stud framing.

Mortar

Mortar and modified mortar used for scratch and bond coats should comply with ASTM C270, Specification for Mortar for Unit Masonry, Type S, with or without a latex or polymer modifier specifically designed for use with thin veneer; or with ANSI 118.4. Mortar used to fill joints may have a higher water content as required by installation method. For more information on mortar, refer to *Technical Note 8*.

Modified mortar. Typically a modified mortar is a portland cement mortar modified by adding a polymer/latex additive or a bond enhancer. Latex additives may improve adhesion, reduce water absorption and provide greater bond strength and resistance to shock and impact. When using the liquid form of latex, it is added as a replacement for part or all of the water used when mixing the mortar.

Flashing

Many materials are suitable for use as flashing in adhered veneer walls. Flashing materials should be corrosion-resistant, waterproof, durable and sufficiently tough and flexible so as to resist puncture and cracking. Flashing should also be compatible with other materials in the veneer assembly, such as adhesives and sealants. *Technical Note 7A* discusses characteristics of some common flashing materials. The use of superior materials reduces the potential for system failure and exceedingly expensive costs associated with replacement.

Weep screeds or flashing used at the base of the wall must be a minimum 0.019 in. (0.48 mm) or 26-gage galvanized or plastic with a minimum vertical attachment flange of 3½ in. (89 mm). Asphalt-impregnated felt, building paper and house/building wraps are not acceptable for use as flashing.

Cement (Backer) Board

Cement (backer) board, which consists of a cementitious binder reinforced by fiber mats, is a dimensionally stable substrate for decorative finishes in wet or dry areas. Cement board used as a substrate for exterior wall applications of thin brick should be at least ½ in. (13 mm) thick and conform to ASTM C1325, Type A, or ANSI 118.9.

INSTALLATION

The following sections provide recommended procedures for installing thin brick via the thick set and thin set methods and describe the installation of modular and prefabricated panels. Installation of mortar in thin brick veneer applications should be scheduled when temperatures will be between 40 °F (4 °C) and 90 °F (32 °C). Otherwise, cold or hot weather construction measures, as described in *Technical Note 1*, should be employed.

Installation methods for ceramic tile, as published by the Tile Council of North America in the *TCNA Handbook for Ceramic, Glass, and Stone Tile Installation* [Ref. 3], may also be used to install thin brick in thick set and thin set applications. For thick set with a masonry or concrete substrate, use Method W201. For thin set with a masonry or concrete substrate, apply according to Method W202. For thick set with stud framing, use Method W222. For interior applications of thin set on stud framing, use Method W243.

Substrate and Surface Preparation

Where thin brick units are installed on site, proper construction and preparation of the substrate to receive them is critical. Surfaces receiving thin brick should be structurally sound and free of loose or deleterious debris or residue, including algae, mold, dust, laitance, paste, wallpaper or laminate. Remove all substances that could potentially impede the bonding of the veneer. Such substances include oils, greases, waxes, bond-release agents, sealers, solvents, paints or other coatings or surface preparations. If a substrate surface is wet, then the water source must be identified and eliminated. Surfaces on which thin brick are placed must not vary from plane by more than ¼ in. in 10 ft (6 mm in 3.05 m). Taping sheathing joints or fastening sheathing edges with plywood clips can sometimes

reduce unevenness. If a surface does not comply with surface tolerances, then a leveling coat must be applied before proceeding.

Walls of wood and steel stud framing should be designed to meet lateral deflection requirements. Exterior walls of wood or steel stud framing require a water-resistive barrier on sheathing. Fasten cement board through sheathing and water-resistive barrier into studs. Joints of cement board should be staggered and offset from sheathing joints. Treat cement board joints with alkali-resistant glass fiber mesh tape embedded in mortar or modified mortar in accordance with cement board manufacturer recommendations. Allow masonry and concrete substrates to cure for 28 days prior to installation of thin brick veneer.

Thick Set Method

Metal lath or wire mesh should be applied over the water-resistive barrier and attached with 11 gauge nails 1½ in. (38 mm) in length with a ⅞ in. (11 mm) head or 16 gauge staples ⅞ in. (22 mm) in length, spaced at a minimum of 6 in. (152 mm) o.c. Lap the lath or mesh a minimum of 2 in. (51 mm) at sides and ends where sheets are joined. Lap mesh one full mesh, wire to wire, where joined.

Attach lath or mesh to wood stud framing with corrosion-resistant fasteners that penetrate a minimum of 1 in. (25 mm) into the stud. For steel stud framing, use corrosion-resistant screws that extend through the steel stud connection a minimum of three exposed threads. For masonry or concrete, use hardened concrete nails or powder-actuated fasteners that penetrate a minimum of 1 in. (25 mm).

Scratch Coat. For thick set systems, a scratch coat of mortar with a nominal thickness of ½ to ¾ in. (12 to 19 mm) is applied to the lath or mesh until it is fully embedded in the mortar. The scratch coat can be applied in one layer or as two nominal ¼ to ⅜ in. (6 to 10 mm) layers, where the first layer fully embeds the lath or mesh. The surface of each layer should be scratched (scored) horizontally when thumbprint hard and allowed to cure before applying the next layer or coat. Installation in a single layer may be preferable during periods of hot or cold weather to avoid potential delamination between layers.

Bond Coat. Apply a bond coat of mortar or modified mortar over a damp scratch coat to a nominal thickness of ⅞ in. (3.2 mm) and groove with a square-notched trowel. For maximum adhesion, covering the entire back of the thin brick with bond coat mortar is recommended. While the coat remains wet and workable, embed the thin brick into the bond coat and fill mortar joints as described in the “Setting Thin Brick” and “Mortar Joints” sections below.

Thin Set Method

An adhesive or modified mortar may be used to bond thin brick to the substrate in thin set applications.

Adhesive. Thin brick may be adhered with a non-sagging adhesive compatible with the thin brick and substrate. These are typically available in tubes and are applied using a pressure gun. Apply the adhesive according to manufacturer’s instructions. The adhesive is usually applied in 1 in. diameter (quarter-sized) dabs on the back of the brick at each end. Adhesives should not be applied in a manner that will trap water, resulting in subsequent freezing and thawing. **Figure 10** shows an interior application of thin brick on wood stud framing using the thin set method.

Modified Mortar. Dry components of modified mortar should be pre-blended prior to adding the latex additive. Apply according to manufacturer’s instructions. Most manufacturers recommend a nominal ⅞ in. (3.2 mm) thickness. For maximum adhesion, complete coverage of the back of thin brick with bond coat mortar is advised. Apply modified mortar over an area no greater than can be covered by thin brick while the mortar remains workable. Use a notched trowel as recommended by the mortar manufacturer to evenly spread the modified mortar to a nominal ⅞ in. (3.2 mm) thickness. Within 10 minutes of applying the latex-modified mortar on the substrate, completely cover the back of thin brick with modified mortar and embed in substrate mortar coat as indicated in the “Setting Thin Brick” section below.

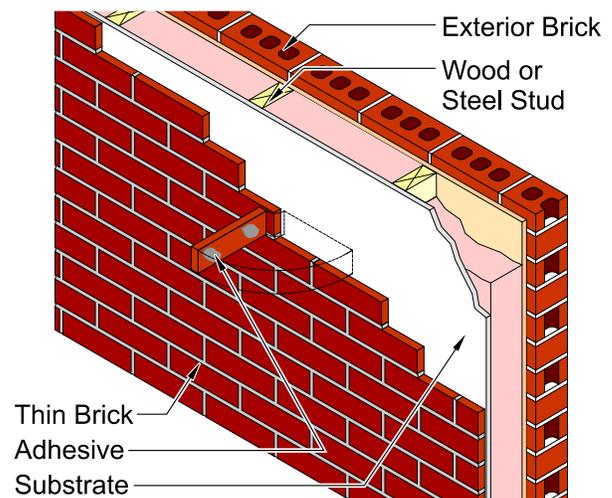


Figure 10
Interior Thin Set Application on Studs

Setting Thin Brick

Each thin brick should be firmly pressed or tapped into place, taking care to maintain proper spacing and alignment of the joints and bond pattern. Setting each brick with a rubber mallet or a beating block can help to ensure flatness and secure bedding. If mortar or modified mortar is used, a slight excess should squeeze out of the joints between brick during the setting process. Once the thin brick is set, it should not be moved or the bond may be compromised. If a thin brick is inadvertently moved after initial set has begun, it should be removed, along with any bond coat behind it, and a new thin brick unit installed with fresh mortar, modified mortar or adhesive. Proper setting of each thin brick is critical to ensuring a durable thin brick system. Improper setting of the thin brick is the most frequent cause of poor performance.

Mortar Joints

The mortar joints between thin brick must be filled. One method involves filling the joints as the brick are placed, using a striking tool or a trowel to remove the excess. Placing the brick under firm pressure, while sliding them slightly away from and back into desired position, squeezes excess mortar into the joint between units. A second and more common method is to keep the head and bed joint essentially free of mortar during thin brick placement and to fill the joints separately using a mortar gun, grout bag or other mortar delivery device. Allow the bond coat to cure 24 hours or until joints can be filled without displacement of the brick. Tool joints to a concave, vee or grapevine profile once they have achieved sufficient stiffness (thumbprint hard). [Photo 2](#) shows mortar installation with a grout bag after the brick have been placed.

Modular Panels

Modular panels should be installed according to the instructions provided by the modular panel manufacturer or the manufacturer of the proprietary modular panel system. Installing thin brick on most modular panel systems is similar to the thin set method.

Proprietary modular panel systems may provide all the materials needed to assemble the system, including the modular panel, thin brick, adhesive and mortar. Panels should be fastened in accordance with manufacturer's instructions. The components of such a proprietary system are designed to perform together as a whole; therefore, only the materials and instructions provided by the manufacturer should be used with a proprietary modular panel system.

Most modular panel systems require fastening the panel to the wall before thin brick are installed individually, as shown in [Photo 3](#). Some modular panel systems are designed to be transported to the construction site with the thin brick already installed on most of the panel.



Photo 2
Mortar Placement Using a Grout Bag



Photo 3
Installation of Modular Panel

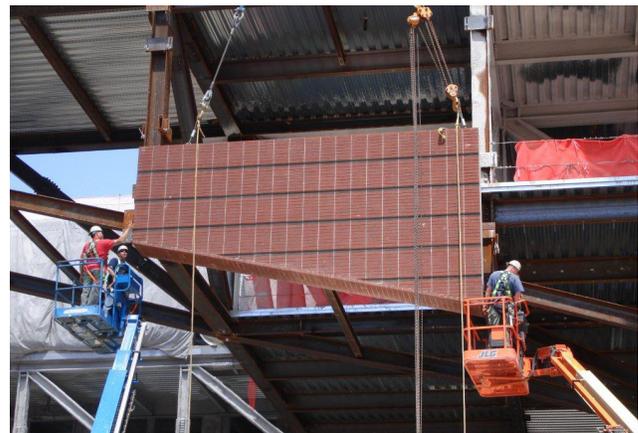


Photo 4
Installation of Prefabricated Panel

Prefabricated Panels

Brick-faced precast concrete panels and prefabricated wood and steel wall panels are typically attached using anchorage devices embedded in the concrete to the building structural frame or foundation. The panels are typically delivered to the job site by truck and lifted into place using a crane or a hoist, as shown in [Photo 4](#). Panels are adjusted to be level, plumb and in alignment with adjacent façade elements before they are bolted or welded in place.

MAINTENANCE

If properly designed, detailed and constructed, minimal maintenance is required for thin brick applications. Brick veneer should be inspected periodically to ascertain performance and to identify any potential problems. Inspections are recommended on an annual basis at a minimum. Such inspections should address sealant joints, any loose units, plumbness of the wall, cracking, etc., to identify repairs and corrections before severe issues develop. For additional information regarding maintenance, refer to *Technical Note 46*.

SUMMARY

Thin brick can be installed over a variety of substrates in both exterior and interior applications using thick set, thin set, modular panels or prefabricated panels. This *Technical Note* describes thin brick systems currently in use and includes recommendations on the selection, design, materials and installation of each system.

The information and suggestions contained in this Technical Note are based on the available data and the experience of the engineering staff and members of the Brick Industry Association. The information contained herein must be used in conjunction with good technical judgment and a basic understanding of the properties of brick masonry. Final decisions on the use of the information discussed in this Technical Note are not within the purview of the Brick Industry Association and must rest with the project architect, engineer and owner.

REFERENCES

1. *2012 International Building Code*, International Code Council, Inc., Country Club Hills, IL, 2012.
2. *2012 International Residential Code and Commentary*, International Code Council, Inc., Country Club Hills, IL, 2012.
3. *2013 TCNA Handbook for Ceramic Tile Installation, 50th Anniversary Edition*, Tile Council of North America, Inc., Anderson, SC, 2013.
4. ASTM International, *Annual Book of ASTM Standards*, West Conshohocken, PA, 2013.
Vol 4.01
ASTM C847, Standard Specification for Metal Lath
ASTM C1032, Standard Specification for Woven Wire Plaster Base
Vol. 4.05
ASTM C270, Standard Specification for Mortar for Unit Masonry
ASTM C1088, Standard Specification for Thin Veneer Brick Units Made From Clay or Shale
ASTM C1325, Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units
5. *Building Code Requirements for Masonry Structures* (TMS 402-13/ACI 530-13/ASCE 5-13), The Masonry Society, Boulder, CO, 2013.
6. FSC Tech Matters, "Guide to Attaching Exterior Wall Coverings through Foam Sheathing to Wood or Steel Wall Framing," Foam Sheathing Coalition (of the American Chemistry Council), Washington, DC, December 4, 2012, <http://fsc.americanchemistry.com/Building-Code/Installation-of-Cladding/Guide-to-Attaching-Exterior-Wall-Coverings.pdf>
7. Leslie, Neil P., "Residential Stucco Wall Assembly Moisture Performance Evaluation," *ASHRAE Transactions*, Vol. 114, Part 1, New York, NY 2008.
8. PCI Standard for Embedded Clay Thin Brick, Precast/Prestressed Concrete Institute, Chicago, IL, 2013.