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GROUP



42 Broad Street: High Rise Multi-Family Passive Design

October 18, 2021

42 Broad Street Mount Vernon, NY

CO-DEVELOPERS:

ALEXANDER / DEVELOPMENT / GROUP



The Bluestone
Organization

DEVELOPERS | BUILDERS | PROPERTY MANAGERS

Building on Generations of Experience

BUILDER:



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42 Broad Street Mount Vernon, NY

CONSULTANTS:

Structural: DeSimone Consulting Engineers – New Haven

MEP Engineers – MGE Engineering (SD-CD)

Sideris Kefalas Engineers (CA)

Energy and Passive House – Altanova

Envelope – Building Science Corp (BSC)

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42 Broad Street Mount Vernon, NY



Passive House Institute US

Program

- 249 Market-rate rental apartments
- 254,000 SF Gross building area
- 14,000 SF Street-front retail
- 580 Car garage
- Amenities – Swimming Pool, Fitness Center, Landscaped Courtyard and Roof Decks, Outdoor Movies, Library, Lounge, Conference Room, Party Room, Storage, Pet wash, High-speed Internet, 24-hour Concierge



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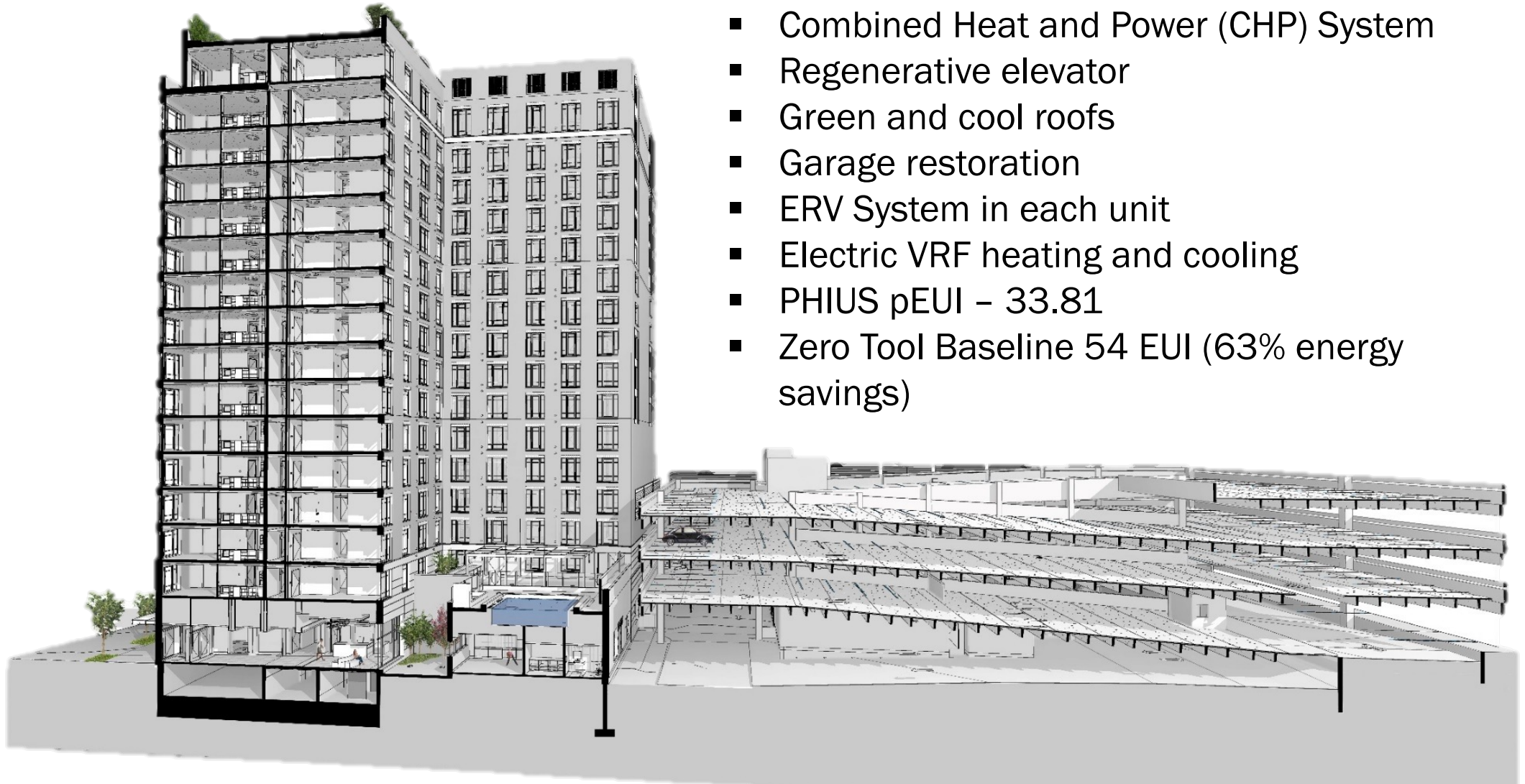
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Design



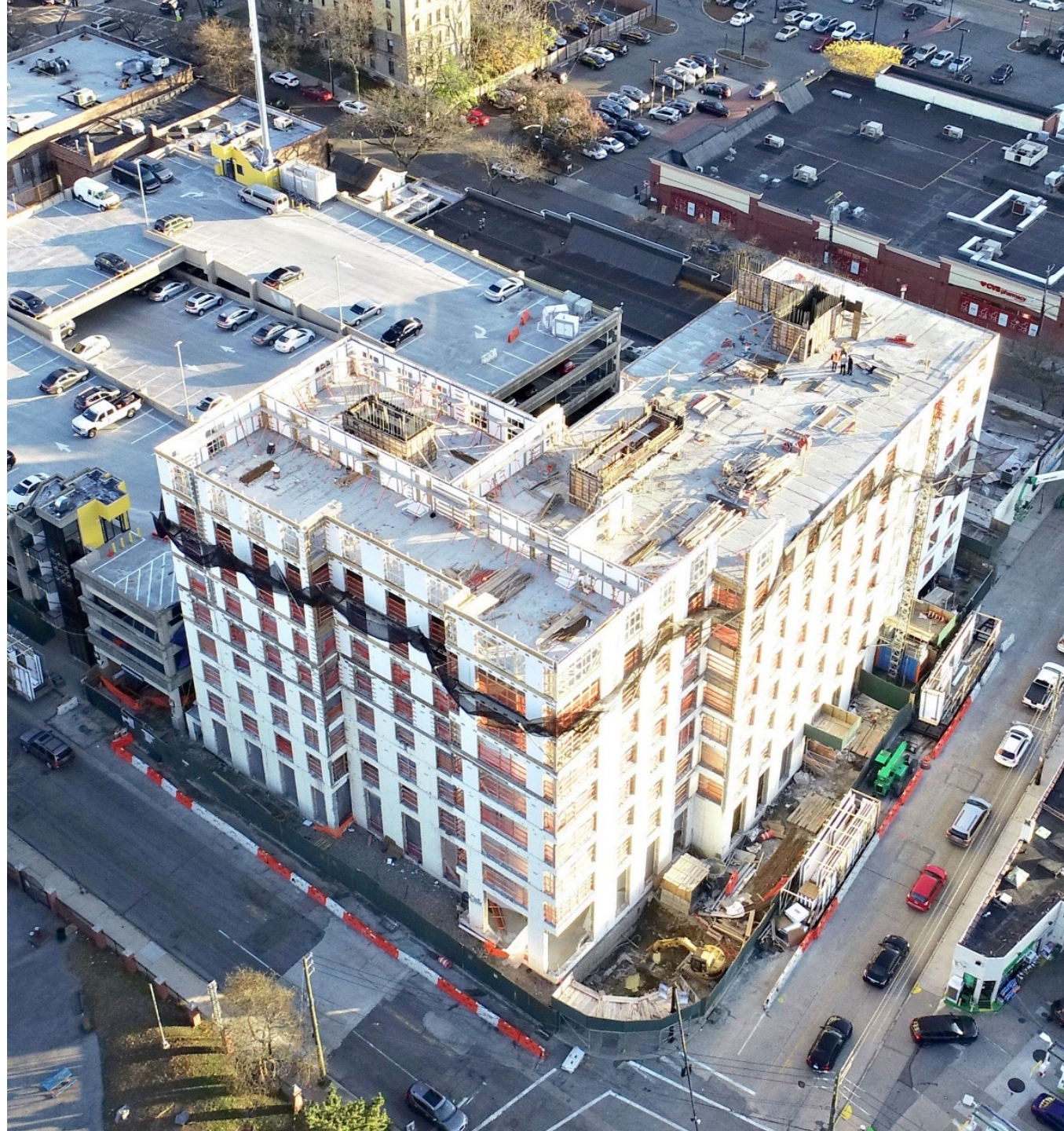
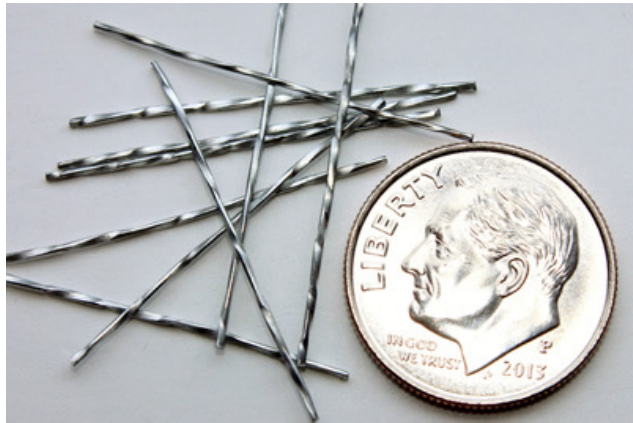
Sustainability features



- Resilient durable construction
- Convenient to mass transit
- Combined Heat and Power (CHP) System
- Regenerative elevator
- Green and cool roofs
- Garage restoration
- ERV System in each unit
- Electric VRF heating and cooling
- PHIUS pEUI - 33.81
- Zero Tool Baseline 54 EUI (63% energy savings)

Structure

- Matt footings - address buoyancy
- Reinforced concrete foundation walls
- Panelized ICF bearing walls – exterior and interior
- Twisted steel micro-rebar replaces horizontal rebar.
- Reinforced concrete core and shear walls
- Concrete plank floors and roof

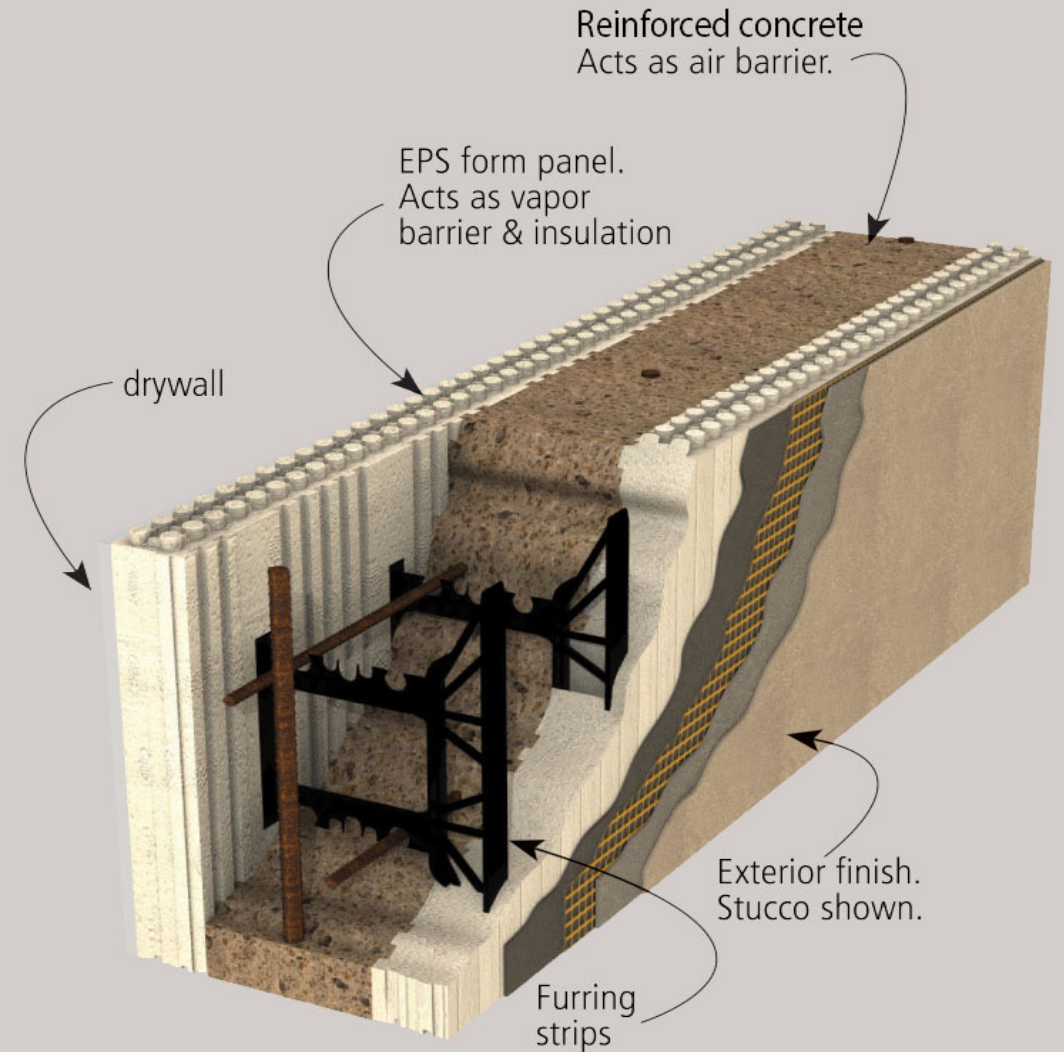
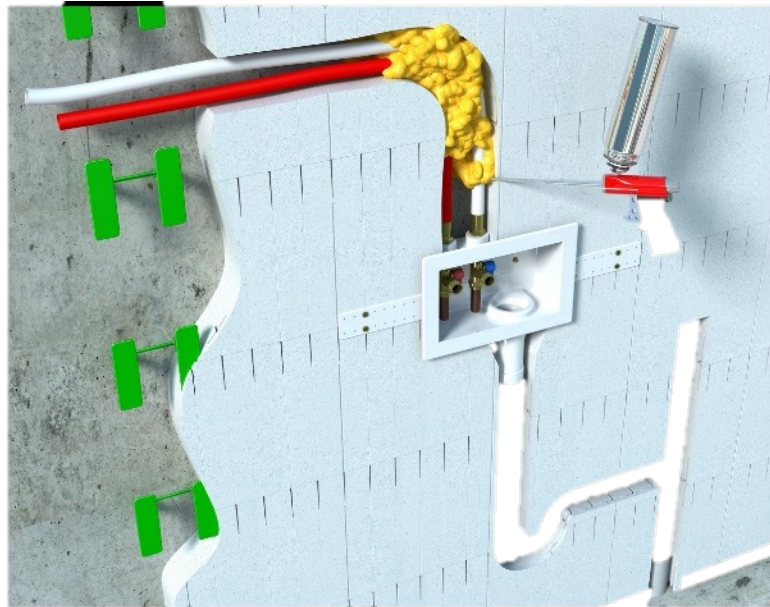


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Insulated concrete forms

- Formwork provides an ideal condition for curing of concrete
- 6,000-8,000 PSI concrete forms air barrier
- EPS Foam provides interior vapor barrier
- EPS Foam with bead of sealant provides exterior weather resistive barrier
- Interior and exterior finishes can be applied directly to integral furring strips



Formwork Pre-fabrication



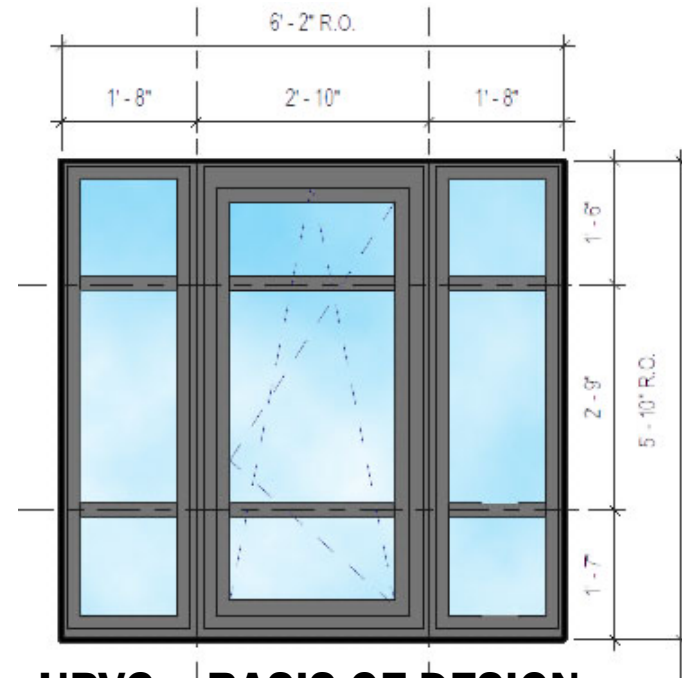
Micro rebar



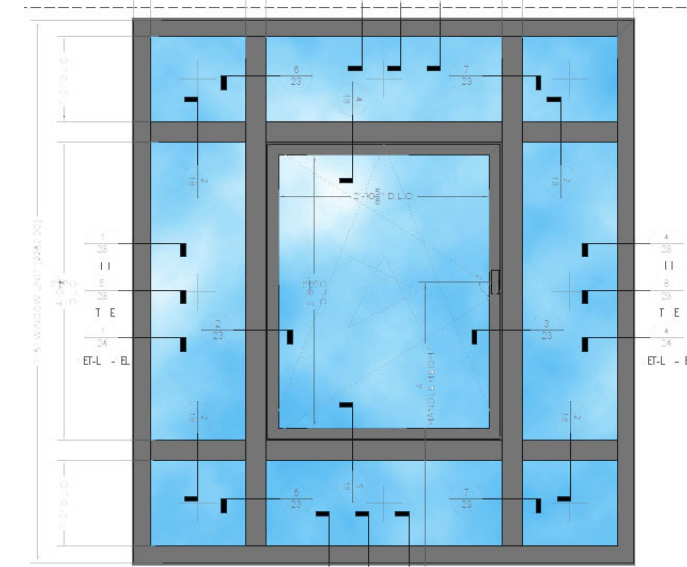
HELIX[®]
MICRO-REBAR



Window design



UPVC – BASIS OF DESIGN



ALUMINUM AND POLYAMIDE- BUILT

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Windows and Balcony Doors

- Window/Wall Ratio - 25%
- Performance Class - AW
- Frame U-Factor - 0.1
- Triple Pane U-Factor - 0.16
- Triple Pane SHGC - 0.39
- Tilt-Turn Operation

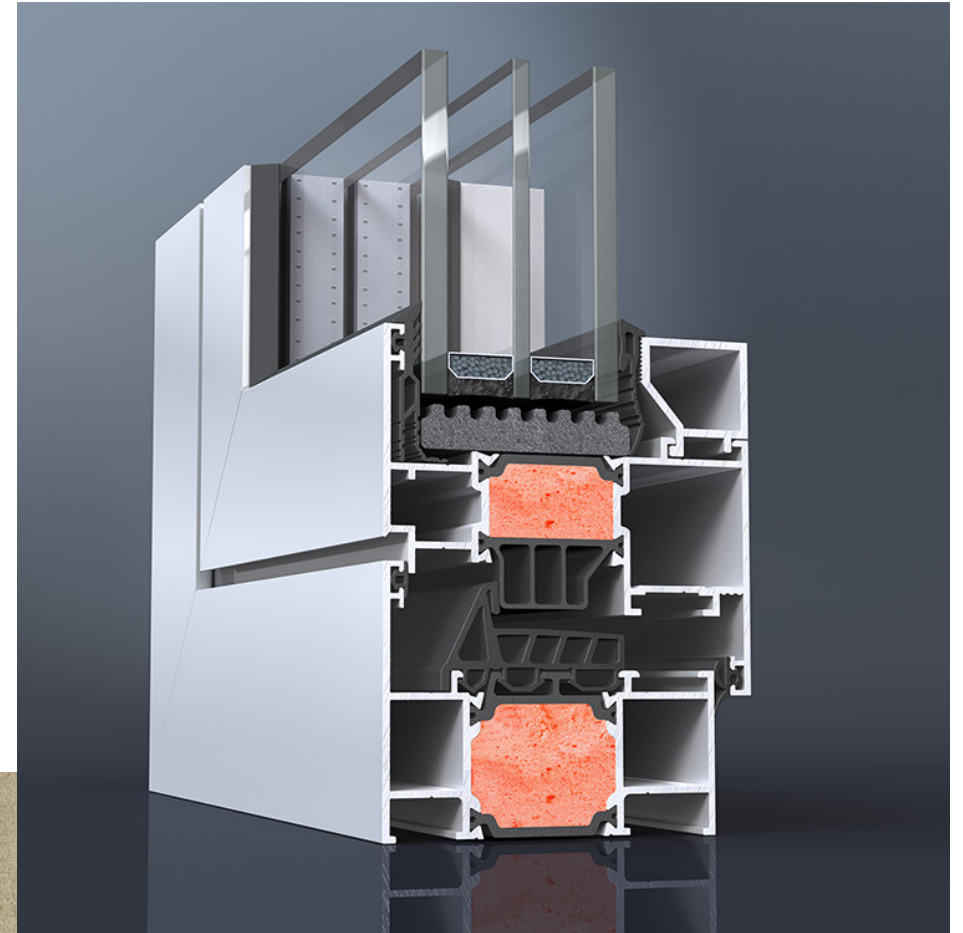


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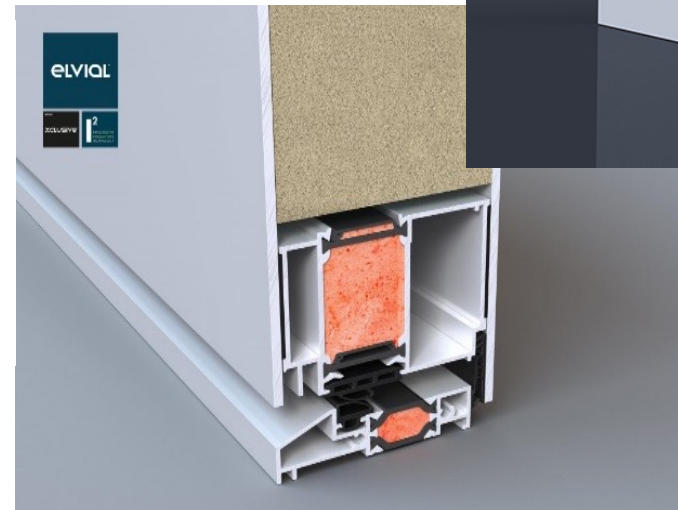
Aluminum windows

- Foam core- optimizes the isothermal curves in the frame section and neutralizes heat transfer by radiation.
- Multi-chamber polyamide thermal breaks - for excellent thermal insulation and improved rigidity
- Five chamber polyamide gaskets - at operable vents and doors
- Tilt/turn operable vents- for safety and window cleaning.
- Doors- Insulated frame, polyamide seals and thermally broken sills
- Triple glazed



| | | Outdoors | |
|---|---|------------------------------|------------------------------|
| GLASS 1 | Guardian ExtraClear (CE) Thickness = 5/32" = 4mm | #1 ---- | #2 ---- |
| INTERLAYER 1 | PVB Clear 0.38mm (CE) | | |
| GLASS 2 | Guardian ExtraClear (CE) Thickness = 5/32" = 4mm | #3 ---- | #4 ClimaGuard® Premium2 (CE) |
| GAP 1 | 10% Air, 90% Argon, 16mm | | |
| GLASS 3 | Guardian ExtraClear (CE) Thickness = 5/32" = 4mm | #5 ---- | #6 ---- |
| GAP 2 | 10% Air, 90% Argon, 16mm | | |
| GLASS 4 | Guardian ExtraClear (CE) Thickness = 5/32" = 4mm | #7 ClimaGuard® Premium2 (CE) | #8 ---- |
| Total Unit (Nominal) = 1 29/32 in | | Slope = 90° | |
| Estimated Nominal Glazing Weight: 7.94 lb/ft² | | | |

Indoors



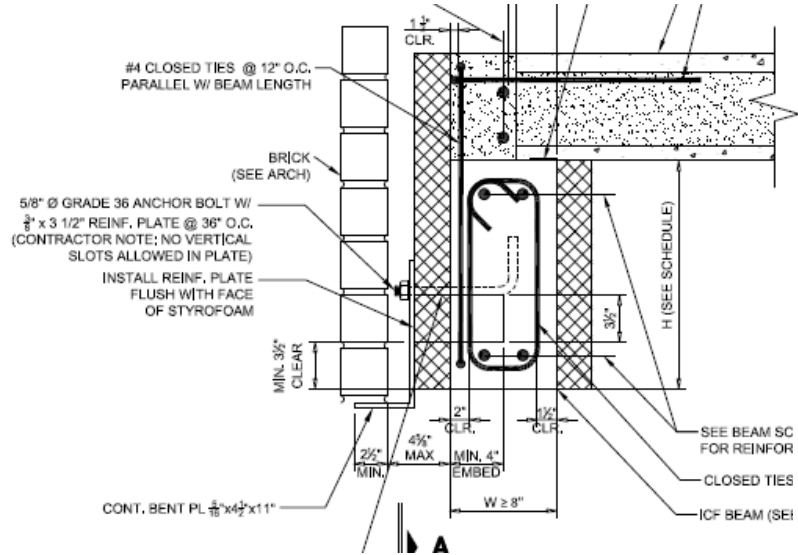
elvial®
ADVANCED ALUMINIUM SYSTEMS

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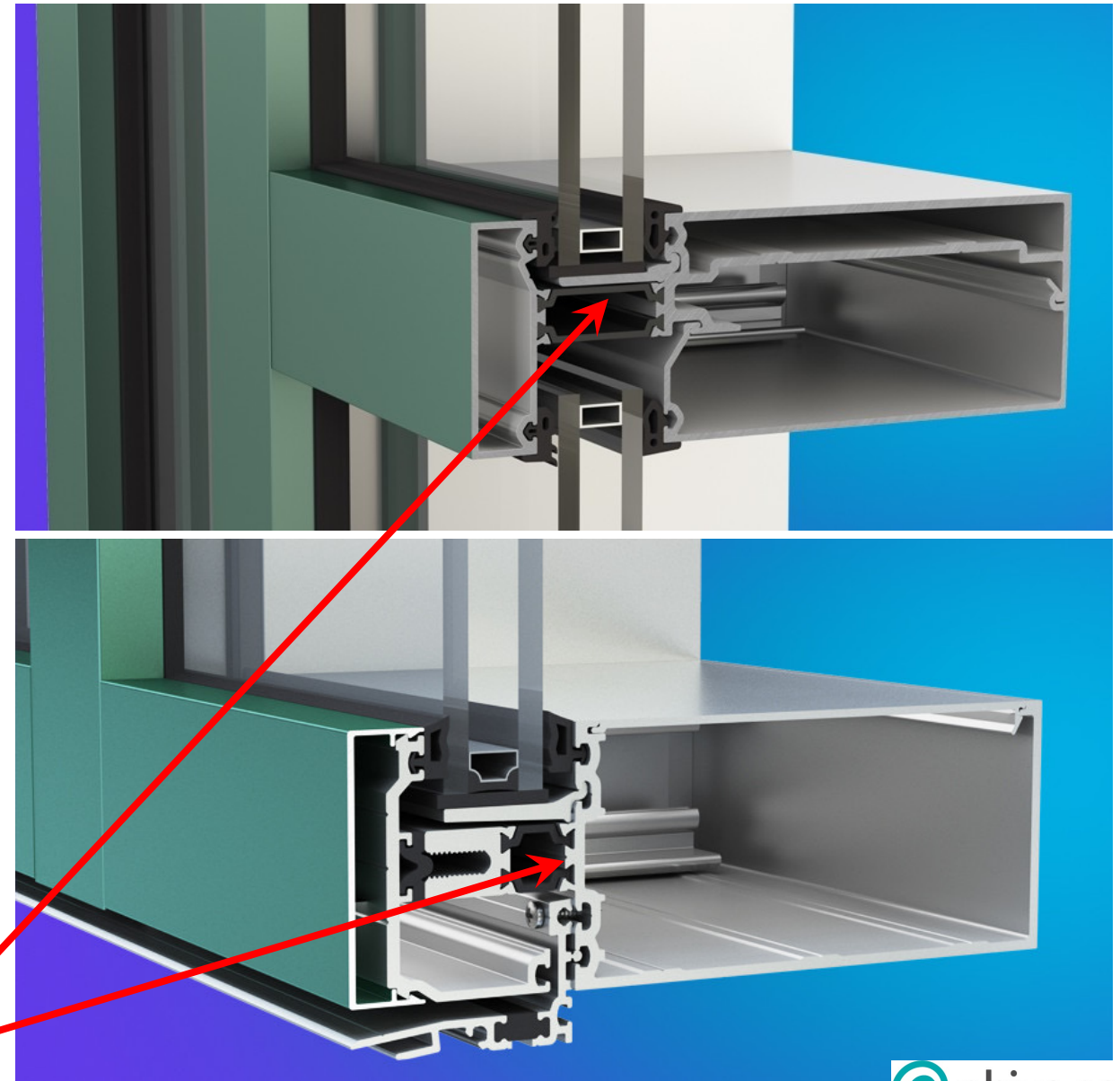
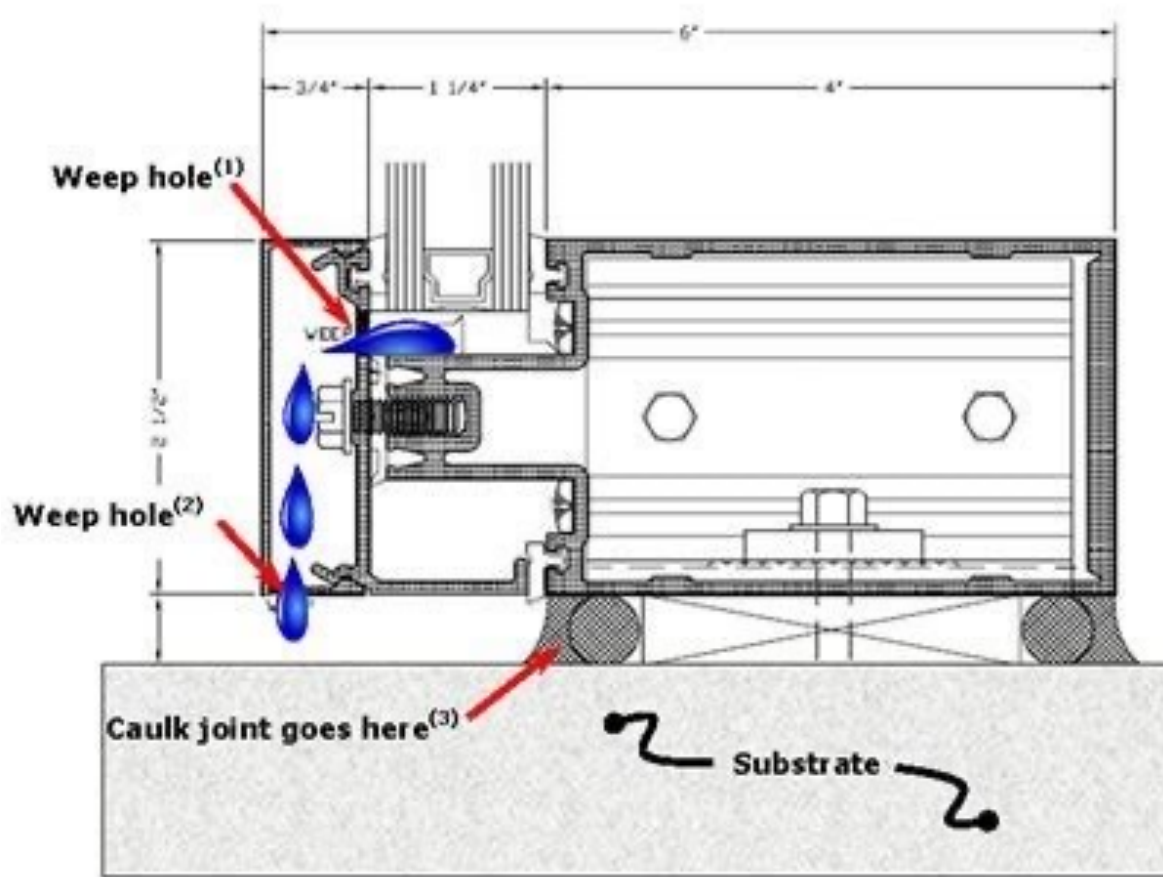
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Window flashing



Thermally Improved System



Improved Thermal Breaks

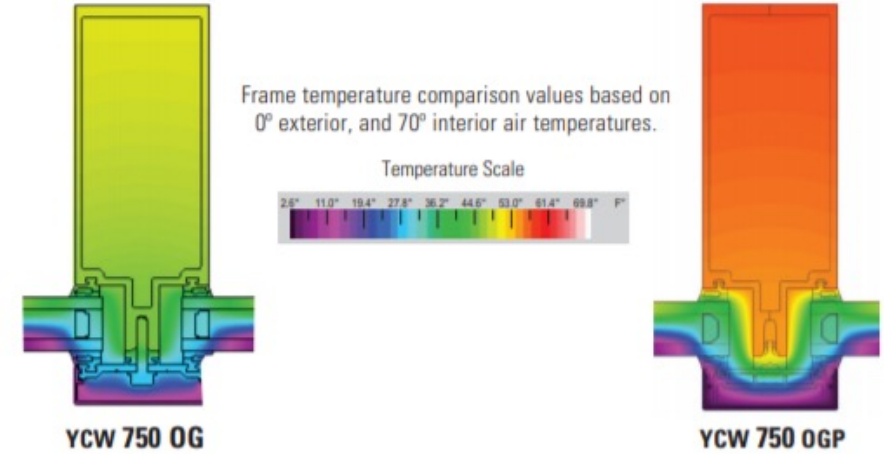
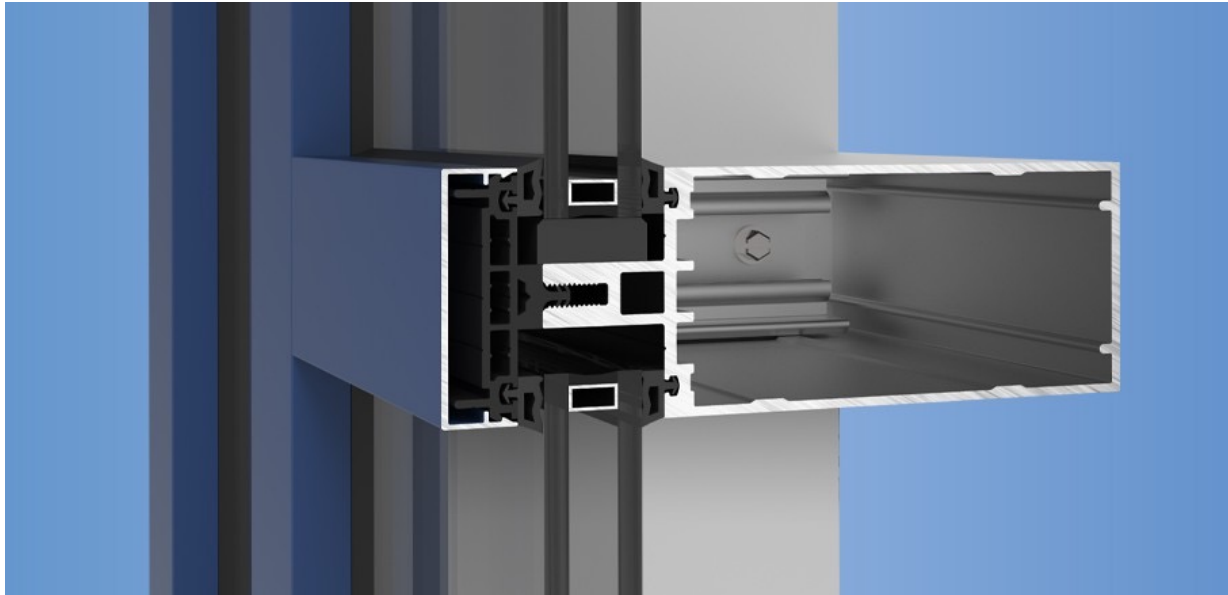
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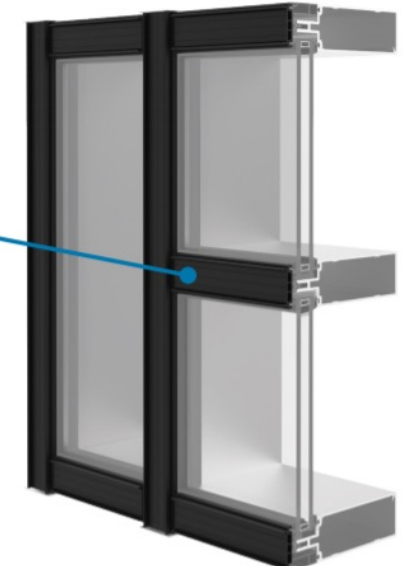
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Thermal performance

- Multi-chambered low conductivity polyamide pressure cap replaces aluminum or fiberglass pressure cap with thermal break washers at fasteners.
- Multi-chambered glazing gaskets

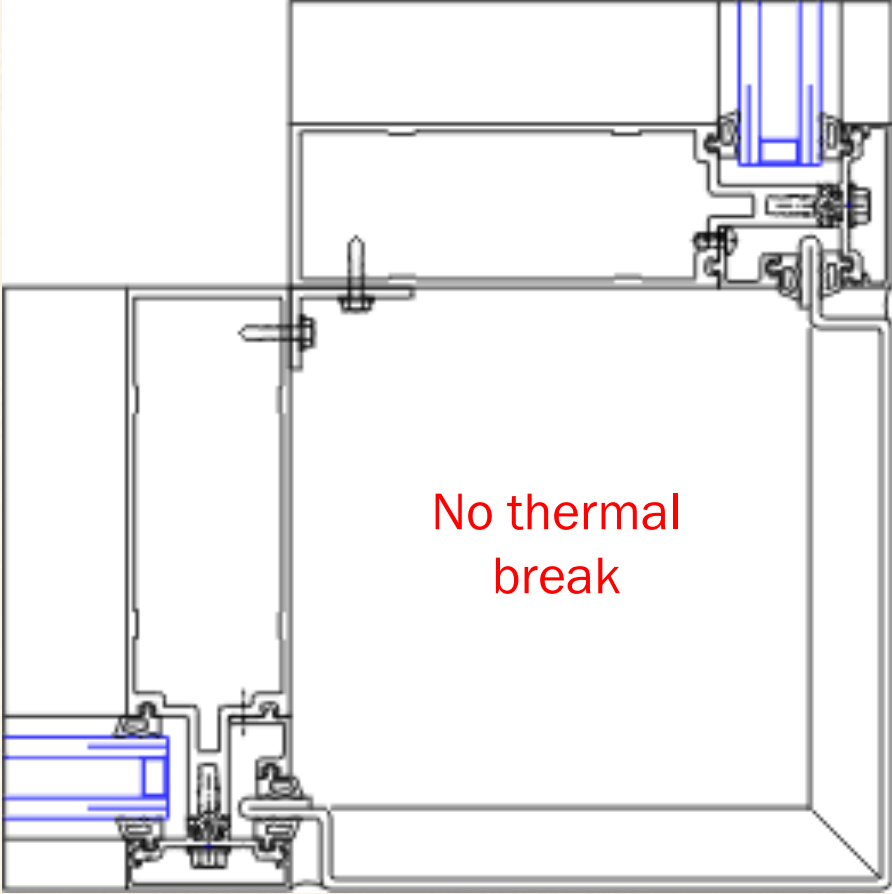


POLYAMIDE PLATES

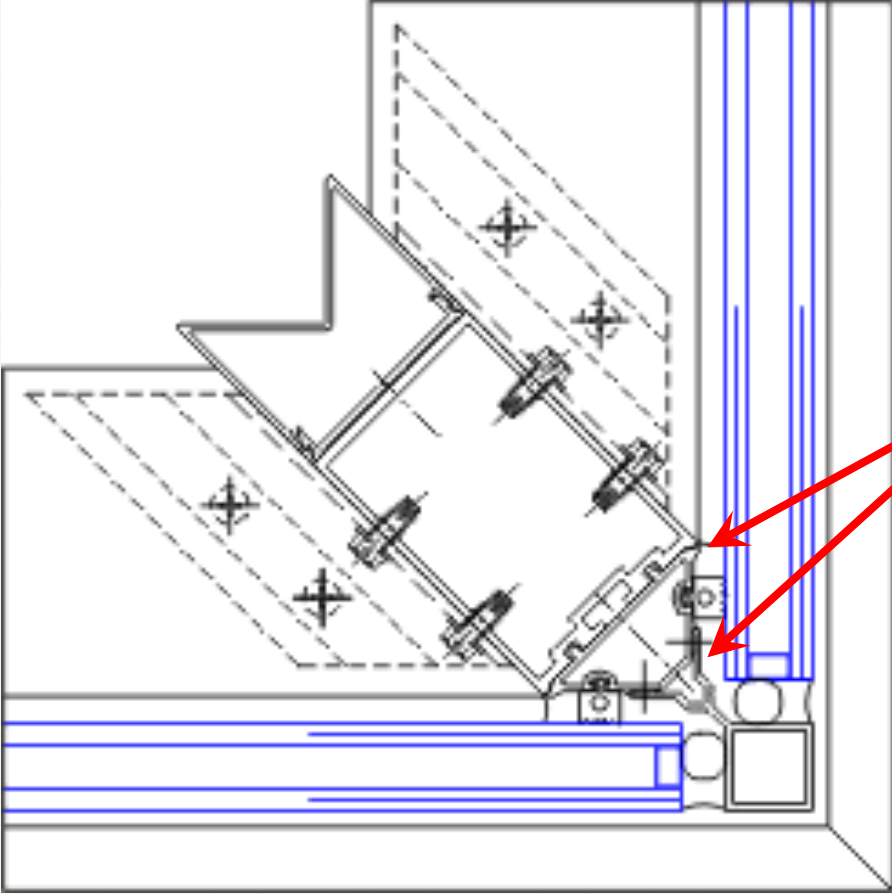


To help keep inside temperatures constant, YKK AP designed a low conductivity pressure plate to reduce heat transfer. These Polyamide 6/6 pressure plates are a superior option compared to handling alternative fiberglass products. Adding these pressure plates results in at least 20% better thermal performance versus the standard YCW 750 OG system.

Corner detail

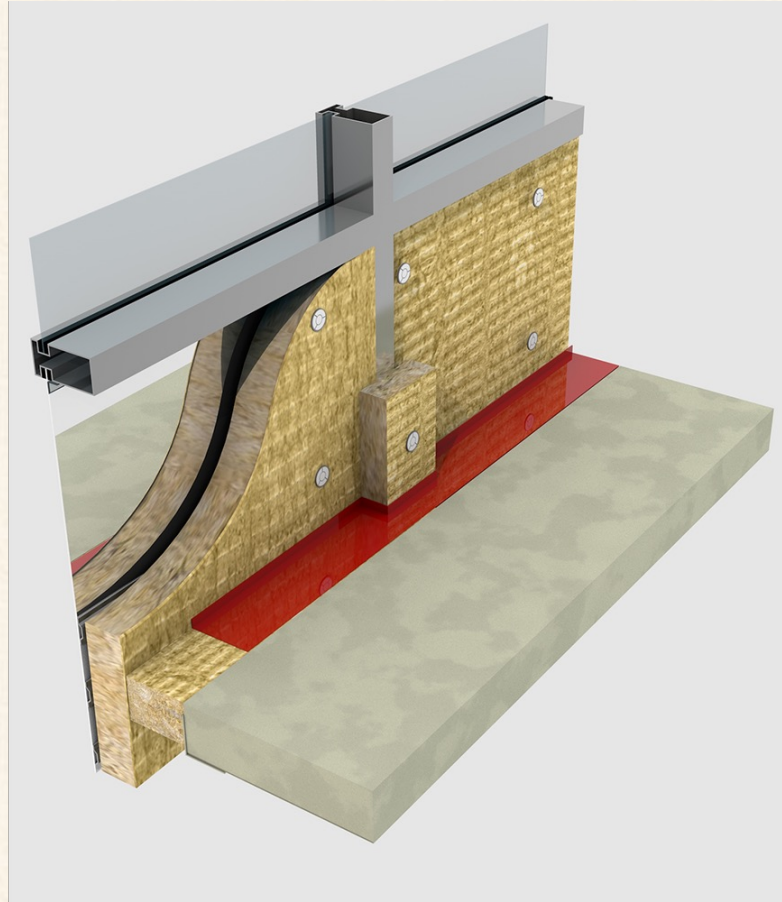


Traditional box-corner detail



Thermal-break Outside Corner Detail

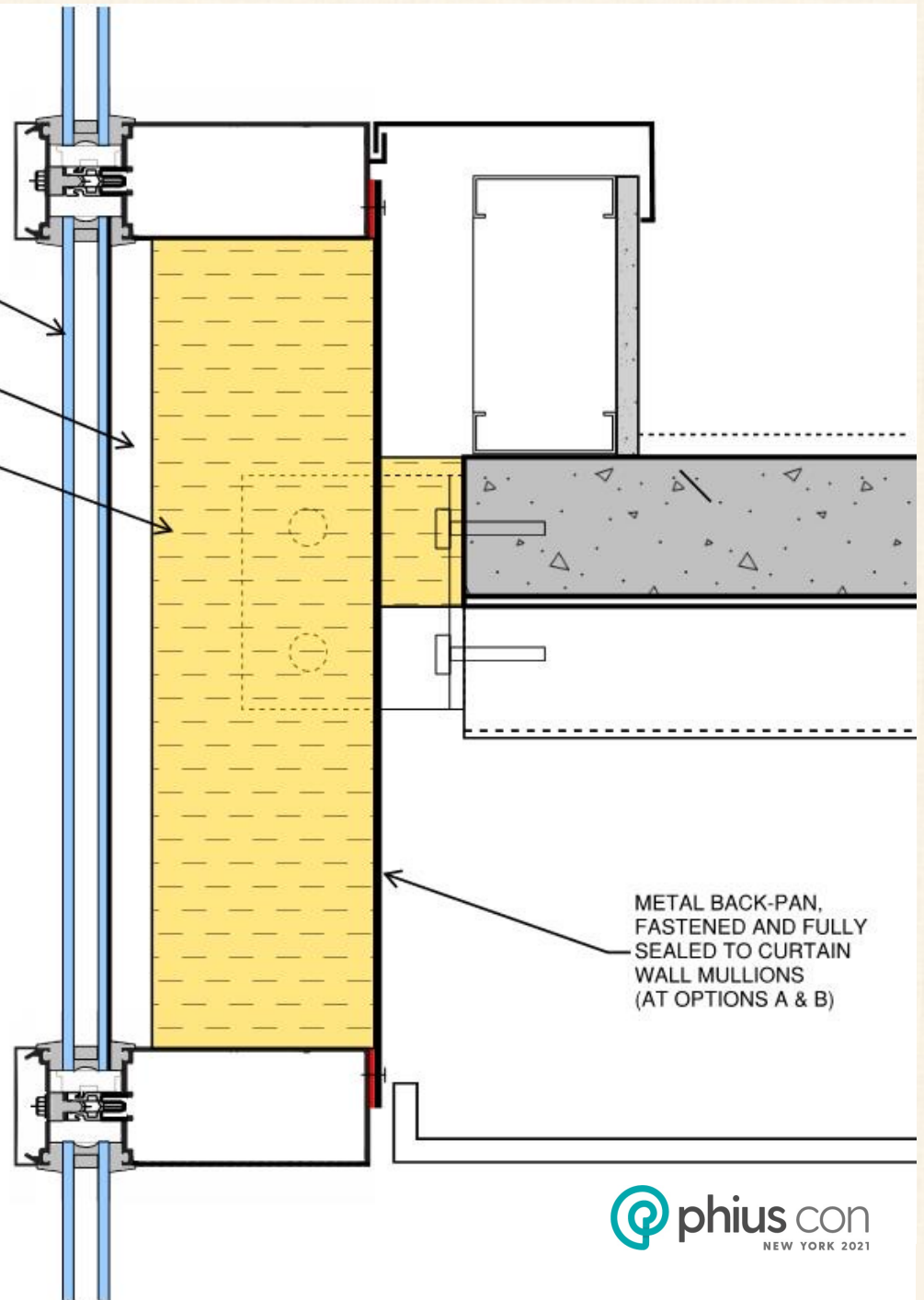
Slab edge detail



LOW-E COATED INSULATING
SPANDREL GLASS UNIT
(SOLID FRIT ON SURFACE #4)

AIR CAVITY, 1" MIN.
VENTED TO EXTERIOR

MINERAL WOOL
INSULATION



METAL BACK-PAN,
FASTENED AND FULLY
SEALED TO CURTAIN
WALL MULLIONS
(AT OPTIONS A & B)

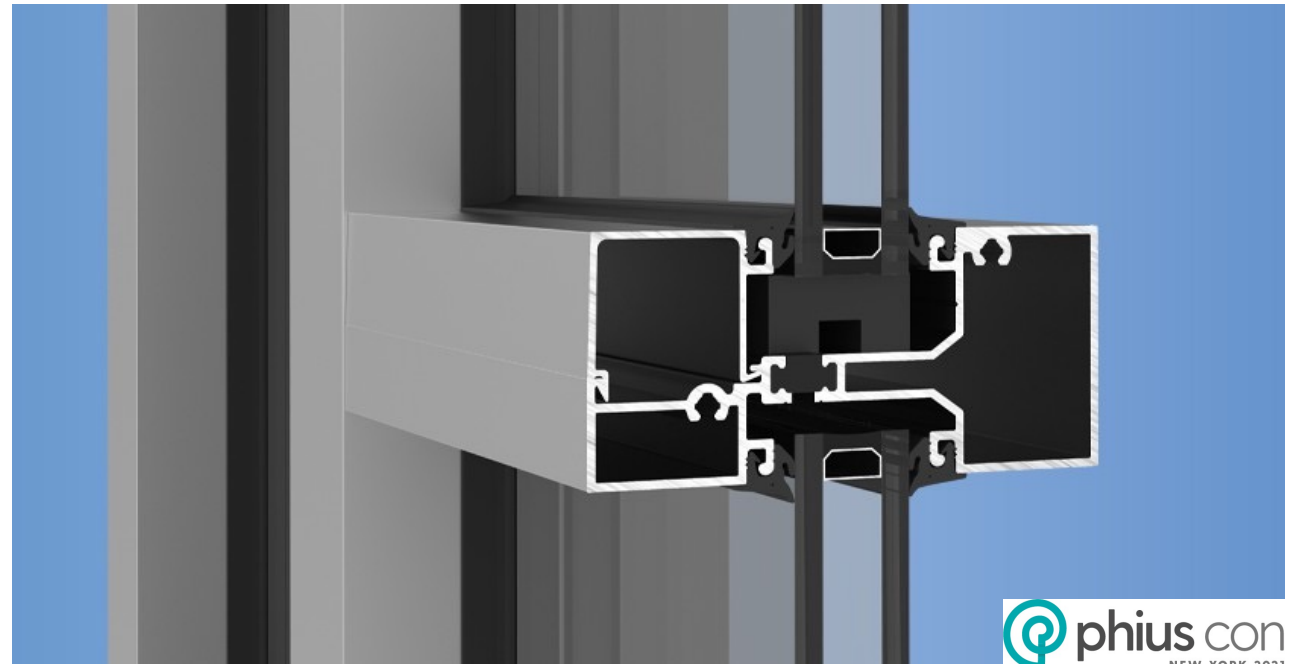
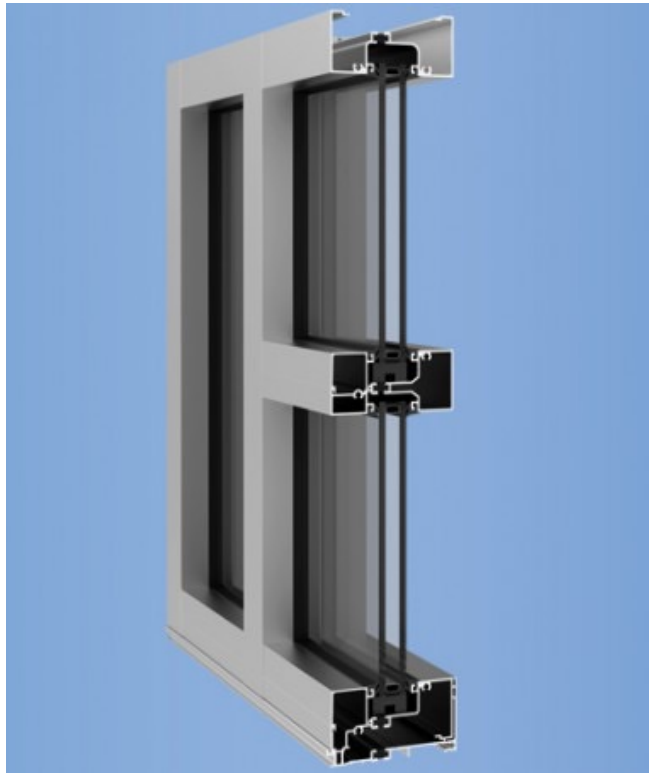
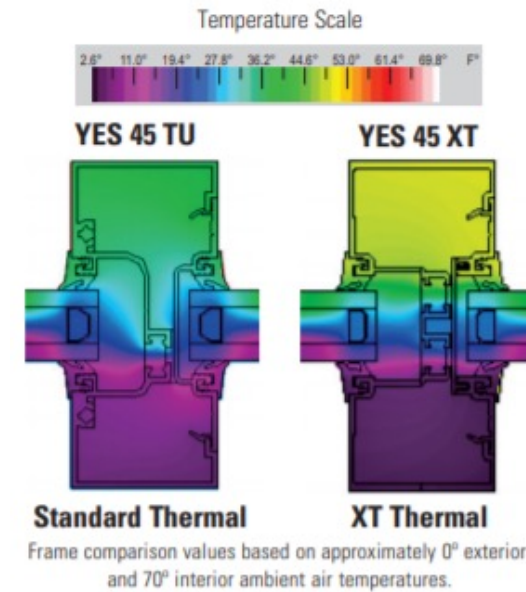
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Thermal performance

- Pour and de-bridged polyurethane thermal breaks aligned with glass surfaces.
- Multi-chambered glazing gaskets

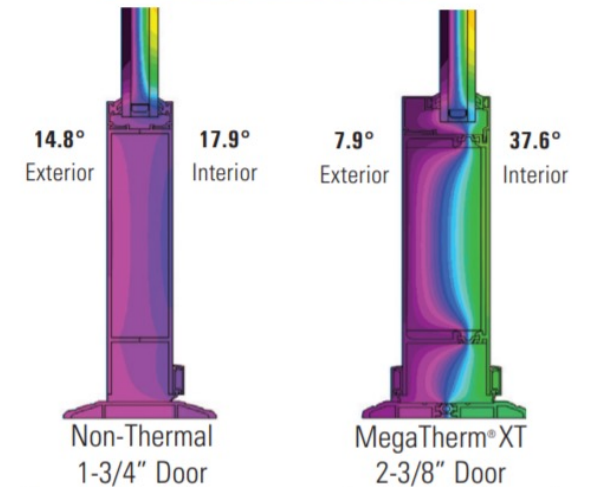


Thermally Broken Entrances



- Thermally broken panel faces
- Thermally broken jambs and sill profiles
- Double sweep
- Self rising pivot hinges
- Pressurized vestibules

Temperature Scale



Frame temperature comparison values based on 0° exterior, and 70° interior.

Variable Refrigerant Flow (VRF)

- All electric heating and cooling - one per unit
- Loads are minimized through improved envelope.
- In ceiling ducted to Living Room and Bedrooms
- Refrigerant pumps in corridor ceiling allow condensers on roof
- Improved comfort.



Energy Recovery Ventilation (ERV)

- Unitized Approach– one per unit
- Operates 24/7
- Exhaust from Kitchen and Bathrooms
- Supply to Living Room and Bedrooms
- Supply and Return alternate per floor - NYS Code variance required
- MERV 13 filtration
- No chance of air mixing between units –COVID consideration
- Balanced to Control Humidity



Hot water/ Co-Generation

- Hot Water becomes the largest heat load in building
- 2 Natural Gas - fired micro-turbines provide continuous electrical power
- Waste heat from the turbines is used to provide hot water for building.
- Four season pool heating
- Excess of hot water considering tenant car wash



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AEGIS
ENERGY SERVICES, INC.

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