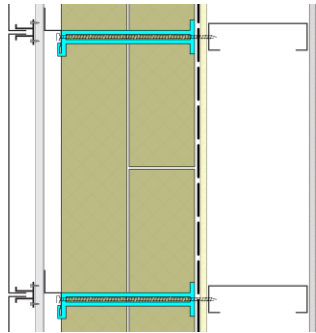
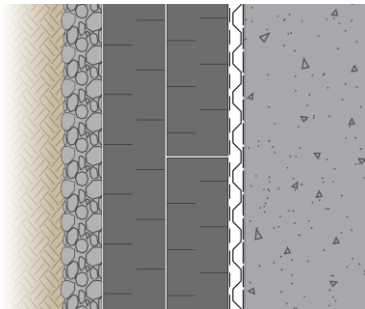
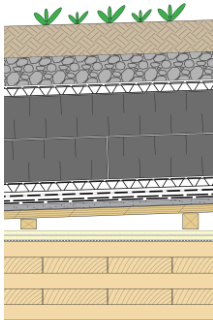
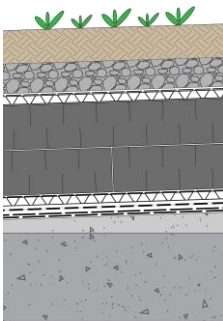
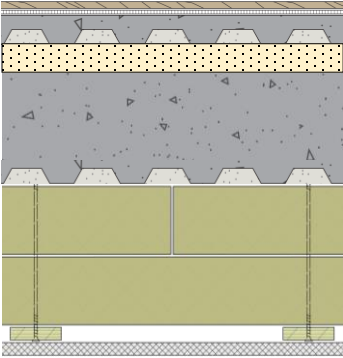
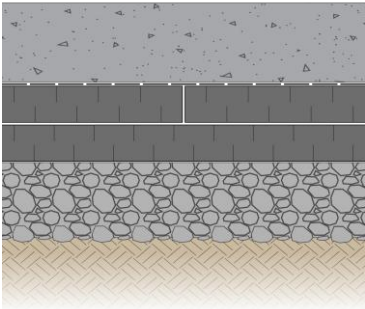
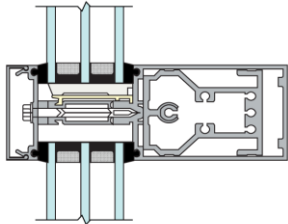
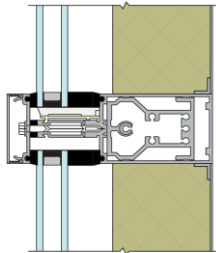
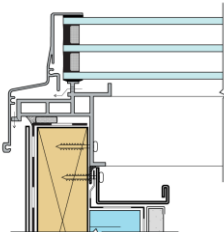


Assembly	Assembly Layers	Control Function	Comments/Product Recommendation	Approx. Clear-Field R-value
EW2, EW4, EW5 – Opaque Cladding Rainscreen Wall Assembly 	Exterior insulated steel-stud framed wall with exterior air barrier approach. Seal all joints and penetrations with neutral cure silicone sealant e.g., Dowsil 758. Assume cladding attachment method installed at 16" x 16" grid pattern.			R-23.7 (8-inch exterior insulation with stainless steel clips) R-25.4 (8-inch exterior insulation with fiberglass clips) R-29.0 (10-inch exterior insulation with stainless steel clips) R-31.1 (10-inch exterior insulation with fiberglass clips)
	Exterior			
	Opaque Metal/Zinc or BIPV Cladding	WATER SHEDDING	Light or medium-weight cladding such: <ul style="list-style-type: none">EW2: Zinc panelEW4: BIPV cladding.EW5: Terracotta panels	
	Airspace	DRYING & VENTILATION	Airspace for drainage and ventilation. Minimum 25mm thickness.	
	Semi-rigid Stone Wool Insulation w/ Thermally Broken Cladding Attachment	THERMAL	Thick semi-rigid stone wool insulation such as Cavityrock by Rockwool. Min. 200mm thickness. If a cladding product is selected with open panel joints, consider using a faced stone wool insulation board such as Cavityrock Black by Rockwool so that the insulation is not visible at the cladding joints. We recommend using thermally broken cladding attachment. The cladding attachment type and spacing will impact the clear wall R-value. We have included a clear wall R-value for: <ul style="list-style-type: none">Fiberglass clips (such as Cascadia Clips – max-inch-thick insulation) – 5 to 30 % reduction to insulation thermal performanceStainless steel clips (custom L brackets – can be manufactured for 8 or 10-inch-thick insulation) – 15 to 35 % reduction to insulation thermal performance At the sawtooth walls, the clips will be at closer spacing to support the cladding panels. We understand that you would also like to evaluate 10-inch exterior insulation. Most off the shelf clip options are for a maximum of 8-inches of exterior insulation. Custom stainless-steel clips can be manufactured for 10-inch exterior insulation. Mineral wool insulation installed in multiple layers with off-set joints and thermally efficiency cladding attachment clips.	
	Vapour impermeable membrane	AIR/WATER/VAPOUR	Self-adhered air and vapour impermeable pour impermeable. Recommend Sopraseal Stick 1100 T by Soprema.	
	Steel stud		Steel-frame structure with exterior grade fiberglass mat gypsum sheathing (ex. DensGlass Gold by Georgia Pacific) and interior gypsum wall board. Sheathing not required for CMU back-up wall. 152mm depth metal studs.	
	Interior (conditioned space)			
FW1 – Insulated Below Grade Foundation Wall 	Waterproofed back-filled below-grade concrete foundation wall. Submit Geotech report for review.			R-39.9
	Exterior			
	Free drainage granular & native soil		Free draining compacted granular fill. TBC by Geotechnical. Native Fill or other material as per Geotechnical.	
	XPS 8"	THERMAL	200mm thick extruded polystyrene (XPS) insulation installed in multiple layers with off-set joints. Recommend SOPRA-XPS by Soprema or Styrofoam by Dupont	
	drainage mat with filter fabric		Polypropylene dimple board with integral filter fabric. Recommend Sopradrain 10-G by Soprema.	
	Polyethylene sheet waterproofing	WATER	HDPE sheet waterproofing, lapped and welded or taped at seams, foundation walls and columns depending on . Recommend Preprufe 200 by Grace for low to medium water pressures and Preprufe 300R by Grace for critical waterproofing.	
	Concrete	AIR /VAPOUR	Assumed 250mm thick cast-in-place concrete wall recommended. Vertical control joints every 10 feet (maximum) is recommended, TBC by structural. All control joints and construction joints to be detailed with crystalline slurry, grout, and swelling water stop. Recommend Kryton Krystol Water stop Treatment, Krystol Water stop Grout, and Krytonite Swelling Water stop.	
	Interior (conditioned space)			

Assembly	Assembly Layers	Control Function	Comments/Product Recommendation	Approx. Clear-field R-value
R3 - Low Slope Roof – Protected Membrane Assembly with Mass timber Roof Deck 	Green roof assembly. Overburden thickness may impact total roof thickness, parapet height, structural loading requirements, and door threshold height. Consider accessibility requirements at door thresholds. Liquid flashing required for challenging penetration details. Leakage detection system recommended for green roof assemblies.			R-49.9 (Does not include tapered insulation; assumes slab is sloped to drain)
	Exterior			
	Vegetative System - extensive		Free draining gravel and non-trafficable lightweight growing medium between 3-6" for low-maintenance ground-cover plants. TBC by landscape architect.	
	XPS 8"	THERMAL	200mm extruded polystyrene (XPS) insulation installed in multiple layers with off-set joints.	
	Drainage mat with filter fabric	DRAINAGE	Polypropylene drainage board of fused entangled filaments with integrated filter fabric above insulation. Recommend Sopra-XPS and Sopradrain Eco-Vent by Soprema. Recommend Sopradrain 10-G by Soprema.	
	Root barrier - Extensive		30 mil high density polyethylene (HDPE) root barrier, heat welded at seams. TBC by landscape architect. Recommend Soprabarrier 30 by Soprema.	
	2-ply SBS membrane	AIR / WATER / VAPOUR	Torch applied 2-ply Styrene Butadiene Styrene (SBS) membrane system installed per manufacturer specifications. PMMA liquid roofing membrane for penetration detailing. Recommend Sopraply Base 520 base sheet & cap sheet by Soprema.	
	OPTIONAL: Tapered rigid insulation with cover board	THERMAL / DRAINAGE	If the roof deck is not sloped, tapered polyisocyanurate insulation, sloped towards the area drains. Provide cover/protection board over insulation	
	Mass timber		CLT or NLT mass timber structure with vapour permeable self-adhered membrane, two layers of gypsum board, plywood on sleepers and semi-rigid asphaltic roofing board sloped min. 2% to drains. Assumed 8-in-thick. TBC by architect and structural. Recommend Sopraseal Stick VP by Soprema, DensDeck by Georgia-Pacific or Sopraboard by Soprema.	
	Interior (conditioned space)			
R4- Low Slope - Protected Membrane Assembly with Concrete Roof Deck 	Green roof assembly. Overburden thickness may impact total roof thickness, parapet height, structural loading requirements, and door threshold height. Consider accessibility requirements at door thresholds. Liquid flashing required for challenging penetration details. Leakage detection system recommended for green roof assemblies.			R-40.4
	Exterior			
	Vegetative System - extensive		Free draining gravel and non-trafficable lightweight growing medium between 3-6" for low-maintenance ground-cover plants. TBC by landscape architect.	
	XPS 8"	THERMAL	200mm extruded polystyrene (XPS) insulation installed in multiple layers with off-set joints.	
	Drainage mat with filter fabric	DRAINAGE	Polypropylene drainage board of fused entangled filaments with integrated filter fabric above insulation. Recommend Sopra-XPS and Sopradrain Eco-Vent by Soprema. Recommend Sopradrain 10-G by Soprema.	
	Root barrier - Extensive		30 mil high density polyethylene (HDPE) root barrier, heat welded at seams. TBC by landscape architect. Recommend Soprabarrier 30 by Soprema.	
	2-ply SBS membrane	AIR / WATER / VAPOUR	Torch applied 2-ply Styrene Butadiene Styrene (SBS) membrane system installed per manufacturer specifications. PMMA liquid roofing membrane for penetration detailing. Recommend Sopraply Base 520 base sheet & cap sheet by Soprema.	
	OPTIONAL: Tapered rigid insulation with cover board	THERMAL / DRAINAGE	If the roof deck is not sloped, tapered polyisocyanurate insulation, sloped towards the area drains. Provide cover/protection board over insulation	
	Concrete slab		200mm thick concrete slab. Top of slab sloped min 2% to drains. TBC by structural.	
	Interior (conditioned space)			

Assembly	Assembly Layers		Control Function	Comments/Product Recommendation	Approx. R-value
SF1 – Gymnasium Soffit 	Concrete floor separating conditioned space from exterior space. Exposed fasteners to be 300 series stainless steel and fasteners in rainscreen cavity to have minimum DT2000 coating. Seal all joints and penetrations with neutral cure silicone sealant e.g. Dowsil 795.				R-45.2
	<i>Interior</i>				
	Finished floor assembly			TBC by Architect. Includes 25mm airspace.	
	Concrete topping	THERMAL		Concrete topping and acoustic fiberglass batt insulated joist cavity. TBC by Structural.	
	Concrete slab	AIR		Concrete floor slab, TBC by structural. Assumed 250mm thick. All joints and penetrations sealed for continuity of the air barrier.	
	Metal deck			Composite steel deck. TBC by Structural.	
	Mineral wool	THERMAL		200mm thick mineral wool insulation installed in multiple layers with off-set joints, stainless steel screws and vertical 1.5" pressure treated plywood strapping (0.5" minimum depth to form rainscreen cavity). Spacing TBC.	
	Non-combustible soffit cladding	WATER SHEDDING		Non-combustible soffit panels w/ perforated metal vent screens. Soffit cladding TBC by Architect.	
	<i>Exterior</i>				
FL1 – Slab-on-Grade 	Slab-on-grade.				R-20.3
	<i>Interior</i>				
	Concrete - cast-in-place	AIR / VAPOUR		Assumed 250mm cast-in-place concrete slab. TBC by structural.	
	Polyethylene sheet waterproofing	AIR/WATER/VAPOUR		Drained below-grade structure: 15mil HDPE sheet vapour retarder and waterproofing, lapped and taped at seams, foundation walls and columns. STEGO INDUSTRIES STEGO WRAP and TAPE. Vapour retarder to exceed ASTM E1745 Class A Requirements.	
	XPS 4"	THERMAL		100mm extruded polystyrene (XPS) insulation installed in multiple layers with off-set joints. Recommend High load XPS insulation by Dow (compressive strength TBD by structural).	
	fill and native soil			Free draining compacted granular fill. TBC by Geotechnical. Native Fill or other material as per Geotechnical.	
	<i>Exterior</i>				

Assembly	Assembly Layers	Control Function	Comments/Product Recommendation	Approx. R-value
CW1 - Curtain Wall Fenestration 	Triple-glazed thermally broken aluminum curtain wall. Pressure equalized and drained frame system and associated installation detailing (i.e. rainscreen).			U_w-0.22 U_{COG} - 0.12 SHGC 0.36
	Exterior			
	triple-glazed aluminum curtain wall	All	Stick built aluminum curtain wall with triple glazed IGUs. Structural silicone glazed or captured. Recommend 1620 UT by Kawneer, or similar. Glass type per architectural.	
	Interior (conditioned space)			
CW# - Curtain Wall Fenestration 	Typical spandrel contained within curtain wall assemblies. No interior insulation. U-value to be confirmed by the manufacturer using 3D thermal model or hot box testing.			U-0.20 (6" backsection)
	Exterior			
	aluminum curtain wall spandrel	All	Stick built aluminum curtain wall typical insulated spandrel assembly. Structural silicone glazed or captured. Recommend 1600 UT by Kawneer, Therm+ 50 AV by Raico or FWS 50 S.I by Shuco. Spandrel type per architectural.	
	Interior (conditioned space)			
SL1 - Skylight Fenestration 	Fixed skylight at roof area installed on top of curbs.			U_w-0.29 U_{COG} - 0.12 SHGC 0.36
	Exterior			
	aluminum skylight	All	Triple glazed aluminum skylights. Structurally glazed to encourage water shedding. Locate skylight aluminum framing on a curb minimum 8" (203mm) above finished roof surface. PENDING	
	Interior (conditioned space)			