

GreenGirt CMH Delta™

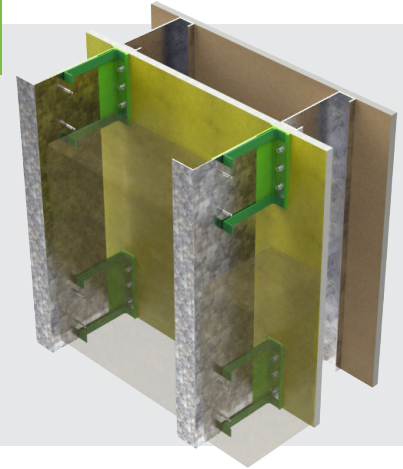
by **aap**™ ADVANCED ARCHITECTURAL PRODUCTS

Thermal Performance Summary

GreenGirt CMH Delta combines easy adjustability and fast installation with industry-leading thermal efficiency.

GreenGirt CMH Delta™ is an adjustable continuous insulation system created by Advanced Architectural Products, designed to enhance structural integrity and improve building energy efficiency. With thermal efficiencies of up to 96%, GreenGirt CMH Delta utilizes composite metal hybrid Z-profile base brackets with a continuous L-rail (made of GreenGirt CMH, galvanized steel, or aluminum), fastened to the backup wall.

This complete thermal performance analysis was conducted by Morrison Hershfield/Stantec at the request of Advanced Architectural Products. A summary of results is provided here; further details are available upon request.



Analysis Results

Steel-frame wall assembly includes:

5/8-inch gypsum, 6-inch steel stud at 16 inches o.c., with uninsulated stud cavity, 5/8-inch gypsum sheathing, vertical GreenGirt CMH Delta system at 16 inches o.c., and exterior mineral wool insulation (R-4.2/in) at various thicknesses with a 2-inch cavity standoff.

Continuous GreenGirt CMH Delta System on Steel-Frame Wall Assembly; with Aluminum L-Rail

Clip Spacing	Bracket and L-Rail Size	GreenGirt/ Exterior Insulation Thickness	Exterior Insulation R-Value* h.ft2·°F/Btu	Assembly Effective R-Value with Alum. L-Rail h.ft2·°F/Btu	Overall Assembly Efficiency with Alum. L-Rail**
16" horiz. x 24" vert.	3" bracket + 2 3/4" L-rail	3	12.6	15.1	93%
	4" bracket + 3" L-rail	4	16.8	19.2	94%
	5" bracket + 3" L-rail	5	21.0	23.4	95%
	6" bracket + 4" L-rail	6	25.2	26.8	93%

Continuous GreenGirt CMH Delta System on Steel-Frame Wall Assembly; with CMH L-Rail

Clip Spacing	Bracket and L-Rail Size	GreenGirt/ Exterior Insulation Thickness	Exterior Insulation R-Value* h.ft2·°F/Btu	Assembly Effective R-Value with CMH L-Rail h.ft2·°F/Btu	Overall Assembly Efficiency with CMH L-Rail**
16" horiz. x 24" vert.	3" bracket + 2 3/4" L-rail	3	12.6	15.4	95%
	4" bracket + 3" L-rail	4	16.8	19.6	96%
	5" bracket + 3" L-rail	5	21.0	23.7	96%
	6" bracket + 4" L-rail	6	25.2	27.8	96%

Continuous GreenGirt CMH Delta System on Steel-Frame Wall Assembly; with Galvanized Steel L-Rail

Clip Spacing	Bracket and L-Rail Size	GreenGirt/ Exterior Insulation Thickness	Exterior Insulation R-Value* h.ft2·°F/Btu	Assembly Effective R-Value with Galv. Steel L-Rail h.ft2·°F/Btu	Overall Assembly Efficiency with Galv. Steel L-Rail**
16" horiz. x 24" vert.	3" bracket + 2 3/4" L-rail	3	12.6	15.1	93%
	4" bracket + 3" L-rail	4	16.8	19.3	94%
	5" bracket + 3" L-rail	5	21.0	23.3	95%
	6" bracket + 4" L-rail	6	25.2	26.7	93%

Concrete wall assembly includes:

8-inch concrete wall, vertical GreenGirt CMH Delta system at 16 inches o.c., and exterior mineral wool insulation (R-4.2/in) at various thicknesses.

Continuous GreenGirt CMH Delta System on Concrete Wall Assembly

Clip Spacing	Cavity Standoff	Bracket and L-Rail Size	GreenGirt/Exterior Insulation Thickness	Exterior Insulation R-Value* h.ft2·°F/Btu	Assembly Effective R-Value with CMH L-Rail h.ft2·°F/Btu	Overall Assembly Efficiency with CMH L-Rail**
16" horiz. x 24" vert.	2"	3" bracket + 2 3/4" L-rail	3"	12.6	14.3	95%
	2"	4" bracket + 3" L-rail	4"	16.8	18.5	96%
	2"	5" bracket + 3" L-rail	5"	21.0	22.6	96%
	2"	6" bracket + 4" L-rail	6"	25.2	26.7	96%
	0"	3" bracket + 3" L-rail	3"	12.6	13.7	93%

* This value is the nominal R-value of the exterior insulation ONLY. Additional components, such as the gypsum, stud cavity, exterior sheathing, and air films all contribute an additional R-3.2 towards the nominal R-value of the entire assembly.

** Thermal bypass reduces assembly efficiency and increases energy loss. GreenGirt CMH and SMARTci eliminate thermal bypass — delivering maximum thermal performance. Discover how at GreenGirt.com.

The effective R-values and overall assembly efficiency of exterior insulated steel-frame and concrete wall assemblies featuring the GreenGirt CMH Delta adjustable system were evaluated using both 3D thermal simulations and approximations derived from those simulations. These 3D simulations were conducted using Siemens' NX and SimCenter 3D software package. The thermal solver and modeling procedures employed were calibrated/validated to within +/-5% of hotbox testing, as referenced in ASHRAE Research Project 1365-RP Thermal Performance of Building Envelope Details for Mid- and High-Rise Construction and the Building Envelope Thermal Bridging Guide 1.