STRONGWELL

CASE STUDY

COMPOSITE WALL SUPPORT SYSTEM CREATES THERMAL BREAK ADVANTAGES

From highs in the summer pushing 90° F to winter lows in the range of -40° F, the Alaskan climate, with its dynamic annual temperature swings, creates a unique challenge for engineers and architects.

One concern with permanent building design and construction in challenging climate conditions is thermal conductivity through metal-to-metal fastenings and components of exterior walls. When too much thermal transference occurs, interior condensation often results, which can lead to mold growth. Steel offers reasonable thermal performance compared to other materials such as copper (10 times the thermal conductivity of steel) and aluminum (6 times steel). However, fiber reinforced polymer (more commonly known as FRP, 0.01 times steel) can yield significant energy savings and help avoid other problematic conditions related to condensation when utilized as a thermal break. FRP maintains both the temperature and the energy efficiency within a building.

Alaska's Bassett Army Community Hospital was completed by the architectural joint venture HKS, Inc./Wingler & Sharp. The project's chief structural engineer, Larry A. Johnson, P.E., designed a structural solution that minimized thermal conductivity through the exterior components of the exterior walls. The solution resided in an FRP design using composite structural members which bolted to the spandrel beams of the project's structural steel framing system. The FRP design was made of EXTREN® 12" x ½" FRP wide flanges, EXTREN® 8" x 2-3⁄16" x ⅜" FRP channels, FIBREBOLT® ¾" FRP threaded rods and hex nuts to support the exterior masonry façade/cladding. This system was designed to bridge the gap as a thermal break between the warm and cold sides of the exterior wall.

In situations and climates where drastic temperature variations occur, the materials chosen are critical to efficient building and structural designs. EXTREN® FRP Structural Shapes were chosen as the best material for this job due to EXTREN®'s advantages in its thermal properties in conjunction with its density, tensile/flexural strength and modulus of elasticity. ●

TECHNICAL DATA

Product:	Structural Wall Support as Thermal Break
Process:	Pultrusion
Materials & Sizes:	EXTREN® Wide Flange Beam: 12" x ½" EXTREN® Channel: 8" x 2-3⁄16" x ⅜" FIBREBOLT® Studs & Nuts: ¾"
For:	HKS, Inc./Wingler & Sharp
User:	Bassett Army Community Hospital

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