Precast Concrete Wall Panel System and CONROCK® 60

Case Study

Project Description

ROCKWOOL's customer's precast concrete sandwich panels have a 2.5" concrete front plate (outside of building) followed by 6" of ROCKWOOL™ CONROCK 60 insulation in the middle of the wall , plus the back plate/inside wall is 5.5" structural concrete. The main part of the wall design is that the outside concrete panel does not touch the inside concrete panel to minimize thermal bridging in the walls

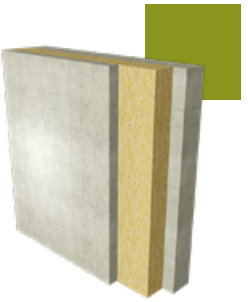
ROCKWOOL Products Installed

ROCKWOOL's CONROCK 60 is rigid stone wool (mineral wool) insulation board designed specifically for sandwich panel systems (SWP). CONROCK 60 used in a wall system can aid in providing superior protection and comfort by providing dimensional stability, consistent thermal performance, and acoustical benefits along with excellent fire resistant and moisture management properties.

Impact of CONROCK 60 in the Precast Concrete Wall Panel System

Thermal bridging has a similar 15% impact on the wall as a typical wood framed wall.1 In Southern Arizona (Climate Zone 2), the wall system is expected to perform similar to an R52 light wall.1 The combined impact of Thermal Mass resulted in an effective R-value of the wall being R44. A comparable wood framed wall assembly would need to be 2x6 construction with R20 batt and 4" of polyiso, 5" of XPS, 6" of ROCKWOOL IS, or 7" of EPS2 exterior sheathing.1 Total nominal R value is 26.0. Inclusive of the 15% impact of thermal bridging a nominal R value of 22.1 is achieved.1 The Concrete Sandwich Panels in this system have minimal thermal bridging and a large thermal mass that acts more like an R40+ building.

CASE STUDY



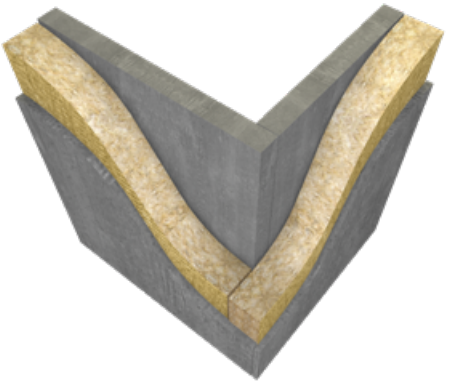
Benefits of using ROCKWOOL CONROCK 60 in Insulated Building Panels

ROCKWOOL CONROCK 60 used in a system can assist in providing excellent fire resistance properties allowing the panels to meet the necessary fire ratings.

CONROCK 60 is non-combustible with a melting point of 2150°F and does not develop smoke or promote flame spread when exposed to fire which will better protect the personnel and equipment located in the facility. In addition, CONROCK 60 has a dense, rigid structure allowing for easy handling and assembly. Other features and benefits include water repellency and strong acoustical properties.

Precast Concrete Wall Panel Systems

The main part of the wall design is that the outside concrete panel does not touch the inside concrete panels to minimize thermal bridging in the walls. The outside / front plate of concrete is connected to back plate/ inside plate with stainless steel single lattice diagonal ties, which is made of stainless steel. The PDM ties are 7 feet long and are spaced every 4' in the panel.



Location:
Southern Arizona

Project Timeline:
2013 – 2014

1 R. Van Straaten - Building Science Consulting Inc.
2 Smegal, J., Straube, J., High-R Walls for the Pacific Northwest-A Hygrothermal Analysis of Various Exterior Wall Systems Research Report – 1014, 2010.

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Another part of the wall design is that the corners of the panels overlap, to minimize thermal bridging on corners of the building.