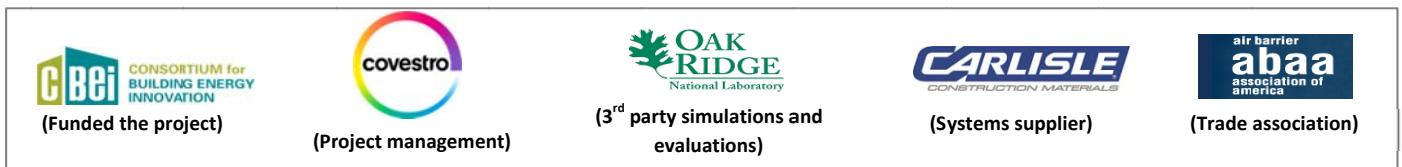


Best Practice Recommendations for Wall Retrofit on the Two-Story Flexible Research Platform (FRP) at Oak Ridge National Laboratory (ORNL)

Executive Summary

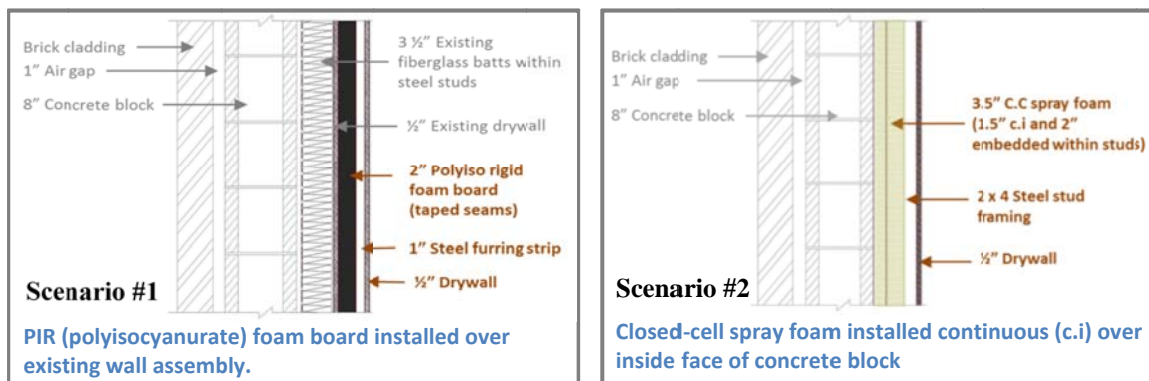
Energy efficient retrofits of existing commercial buildings are essential to achieve the U.S. Department of Energy (DOE) Building Technologies Office's (BTO's) goal of 50% reduction in overall building energy use by 2030. Masonry buildings constitute a significant portion of the existing building stock built prior to the 1980s in the north-east region of U.S. These buildings often have uninsulated or under-insulated walls (not up to code) which offer a good potential to achieve energy efficiency through improved wall retrofit strategies. Factors such as historic preservation, space requirements, zoning issues, etc. often require these existing buildings to be retrofitted on the inside of the wall assembly.

Project Partners



Recommendations

Nine wall retrofit scenarios were vetted through an industry expert panel and evaluated via simulation and laboratory testing. The two down-selected scenarios were demonstrated on the 2-story Flexible Research Platform at ORNL to analyze field performance. The two down-selected scenarios were:



The results of the field testing were:

Retrofit #	Scenario	Thermal performance (based on field data)		Knoxville				Philadelphia			
				Performance measured against baseline without existing insulation (R-5)		Performance measured against baseline with existing insulation (R-10)		Performance measured against baseline without existing insulation (R-5)		Performance measured against baseline with existing insulation (R-10)	
				R-value (IP units)	U-value (IP units)	Yearly HVAC energy savings	Payback Period, Years	Yearly HVAC energy savings	Payback Period	Yearly HVAC energy savings	Payback Period, Years
1	PIR over existing assembly	20.7	0.048	NA	NA	24%	16	NA	NA	33%	12
2	CC SPF	21.6	0.046	31%	22	25%	32	41%	17	29%	27