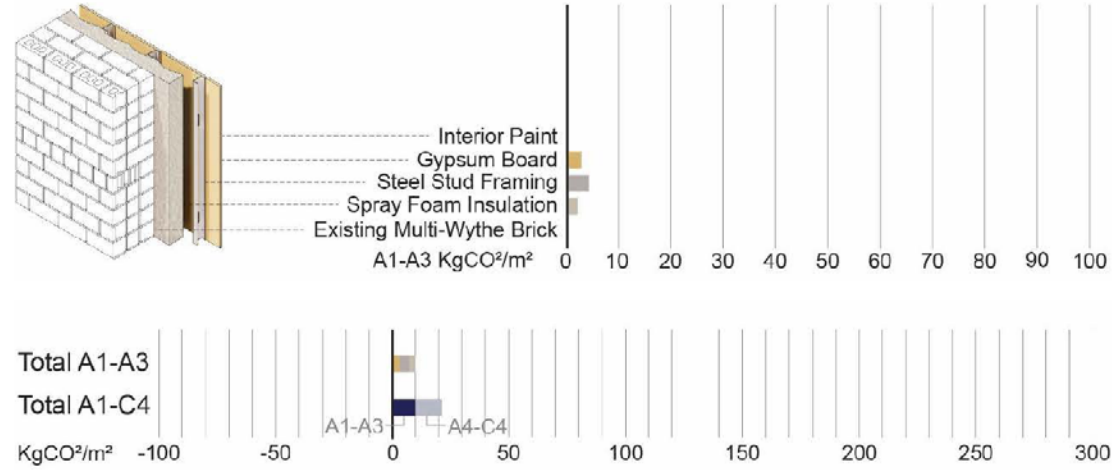


APPENDIX A WALL ASSEMBLY 15

W15: Results Summary

Metrics	Results
Description	Existing Masonry with Interior Spray Foam Insulation
Effective R-value	RSI-4.7 m ² K/W R-26.8 ft ² ·F·h/BTU
Embodied Carbon per m ² of Enclosure (A1-A3)	9.8 kgCO ₂ /m ²
Biogenic Carbon per m ² of Enclosure	0 kgCO ₂ /m ²



W15: Assembly Effective R-value Calculation

Description	t _{SI}	t _{IP}	k	C (USI)	RSI _{effective}	Reffective	R _{nominal}
Units	mm	in	W/mK	W/m ² K	m ² K/W	ft ² ·F·h/BTU	ft ² ·F·h/BTU
Interior air film					0.12	0.68	
Interior gypsum board	12.7	0.50	0.16	27.0	0.04	0.21	
Steel stud-framed wall	63.5	2.50	0.49	7.75	0.13	0.73	
Closed-cell spray foam insulation	102	4.00	-	-	4.26	24.2	24.2
Existing multi-wythe brick masonry	203	8.00	1.31	6.45	0.16	0.88	
Exterior air film					0.03	0.17	
TOTALS	281	15.0			4.70	26.8	24.2

W15: Embodied Carbon Emissions (A1 to A3 Life Stages) for 9m² Assembly Area

Category	Material	Description (from EPD)	Thickness	Material Volume	Carbon Emissions (A1-A3)	% of total
Units			mm	m ³	kgCO ₂ e	%
Finish	Interior Paint	Eggshell acrylic paint, 1294.29 kg/m ³ (Generic)	0.16 (0.0063")	0.0014	0.56	0.6%
Finish	gypsum board	Gypsum plaster board, regular, (Generic)	12.7 (0.5")	0.1143	26.00	29.30%
Back-up structure	Steel stud framing, no insulation	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m ³), C-profile: 63.5 x 30.48 mm, gauge 25, 3 m height x 406.4 mm (400 mm) spacing (Generic)	-	*	39	43.70%
Exterior Insulation	SPRAY FOAM	Spray polyurethane foam insulation for closed cell, with HFO blowing agent	101.6 (4")	0.9144	23	26.40%
Existing structure	Existing Multi-wythe brick	Existing - Not Included				
TOTAL					88.56	100.0%

*Software auto-calculates the impact based on the area provided.

W15: Environmental Emissions (A1 to C4 Life Stages) for 9m² Assembly Area

Lifecycle Stage	A1 to C4	A1-A3	A4-A5	B1-B5	C1-C4	A1-A3 Contribution to total	
Category	Units	Total	Construction Materials	Transport to Site & Construction	Material Replacement & Refurbishment	Deconstruction	
Global Warming	kg CO ₂ e	189.12	89.01	1.72	3.83	94.56	47.07%
Acidification	kg SO ₂	4.59E-06	1.58E-06	4.55E-07	2.60E-07	2.30E-06	34.42%
Eutrophication	kg Ne	0.9018	0.4202	9.70E-03	0.021	0.4509	46.60%
Ozone Depletion	kg CFC11e	0.194588	0.094944	0.00135	0.001	0.097294	48.79%
Formation of Tropospheric Ozone	kg O ₃ e	13.624	6.049	0.273	0.49	6.812	44.40%
Fossil Fuel Primary Energy	MJ	1541.3	689.85	48.66	32.14	770.65	44.76%
Biogenic Carbon Storage	kg CO ₂ e	0	0				