

Appendix 7.1 – Carbon Assessment Results Summary

Table 7.1 – Summary of Embodied Carbon Assessment

Material	Quantity*	Carbon Factor Type	Emissions (tonnes CO ₂ e)
Structural			11,830
Cement	6,530	Cement - 21% GGBS (CEM II/B-S)	5,020
Fine Aggregate	15,580	Aggregates and Sand - Typical UK Mix	120
Coarse Aggregate	19,120	Aggregates and Sand - Typical UK Mix	140
Reinforcement	3,230	Steel - Rebar	6,420
Steel frames total			
Building	95	Steel - Engineering	120
Metal decking to form roof slab	10	Steel - Engineering	10
Landscape			80
Softscape-soil	340	Soil – General (Rammed Soil)	10
Hardscape paving	2,000m ²	Concrete paving	60
Tarmac	150m ²	Roads-Asphalt – Hot construction method	10
Architecture			3,700
Glazing	5,000m ²	Glass – Double Glazed Unit, 16mm	320
Façade – External Walls	38,000m ²	Multiple layers of materials	3,380
MEP			1,940
Ventilation components	170	Plastic, Aluminium, Galvanised Steel	620
H&C Water	78	Copper tube, Brass, Phenilox Foam, Stainless Steel, Plastic, Fibreglass	320
Drainage	61	HDPE - Pipe	150
Sprinkler	36	PVC pipe, Bronze, Steel, Fibreglass	160
Stair Pressurisation	3	Galvanised Steel, Aluminium	40
Ventilation	2	Aluminium	20
Power	130	Steel, Polyethylene, PVC, Copper tube, Plastic, Aluminium	400
Lighting	7	Plastic	20
Fire Alarm	41	PVC, Copper tube, Steel, Plastic	130
Communications	21	PVC, Copper tube, Steel, Plastic	80
Total			17,550

Notes: * All quantities are in tonnes unless stated otherwise, cover both Buildings A and B, and are initial estimates.

Source: Project Team; Atkins analysis.

Table 7.2 – Summary of Operational Carbon Assessment

Energy Hierarchy	Total Regulated CO ₂ e Emissions (tonnes CO ₂ e/Yr)		
	Domestic	Non-domestic	Site Wide
A - Baseline Emissions of Development (pre-improvement)	637	30	667
B - Be Lean (<i>building performance</i>)	642	28	670
C - Be Clean (<i>no use of District Heating</i>)	642	28	670
D - Be Green (<i>renewable energy technology</i>)	377	25	402
E - Total Reduction in Carbon Emissions from Baseline	260	5	265
F - Percentage Improvement in Carbon Emissions (above Building Regulations ADL1A 2013)	40.83%	17.10%	39.77%
C-D - Percentage Contribution from Renewables (PV) [#]	41.29%	13.00%	40.10%

Notes: Figures have been calculated using SAP 2012 and SBEM.

Domestic contribution from low and zero carbon technologies (LZCT) includes the improvement from the heat pump on the Domestic Hot Water side. With this factored in, the renewables and LZCT contribution will significantly exceed Manchester policy of 10%.

Source: Project Energy Statement.