



## Abbeyfield Estate

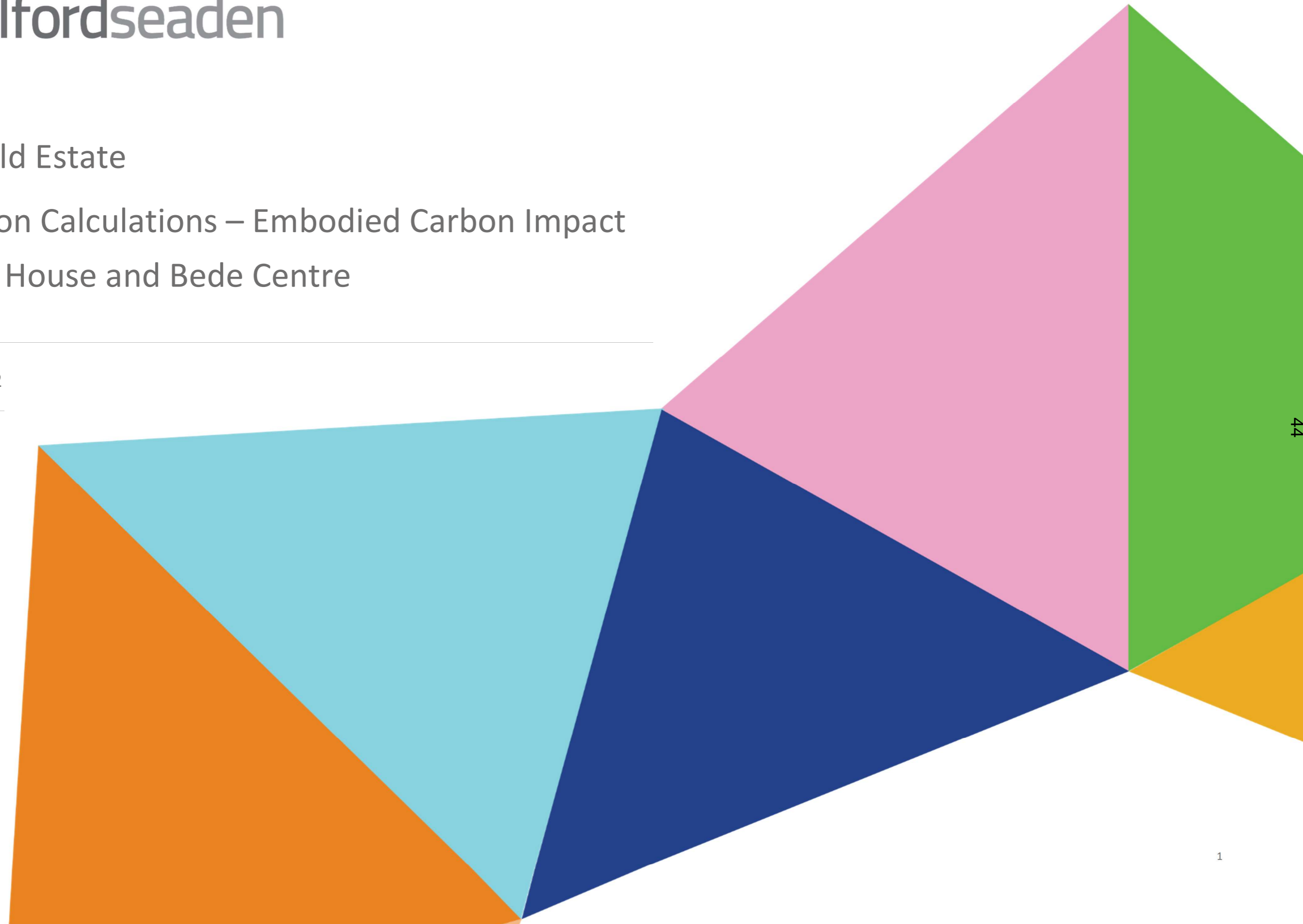
# Demolition Calculations – Embodied Carbon Impact Maydew House and Bede Centre

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## Foreword

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## INTRODUCTION

Calfordseaden LLP were commissioned to undertake an assessment of the demolition of existing buildings within the Abbeyfield Estate utilising the methodology as detailed within the Greater London Authority (GLA), Whole Life-cycle Carbon Guidance for calculating demolition impact. of Maydew House and the Bede Centre.

This report explores the carbon impact of the demolition of the existing Maydew House and the Bede Centre located within the Abbeyfield Estate, Abbeyfield Road, London SE16 [the site] on behalf of the London Borough of Southwark.

The resulting Whole Life Carbon impact of the demolition will be included within any subsequent application for redevelopment of the Abbeyfield Estate.

## SITE DESCRIPTION

The existing Abbeyfield Estate, build between 1965 and 1967 is located along Abbeyfield Road and consists of three residential blocks and a community centre. Maydew House lies within the centre of the development and consists of 26 floors and stands 78meters in height. Damory House is a 4-storey block consisting of 35 flats and is located to the northern end of the development and the 4-storey Thaxted Court, consisting of 24 flats lies to the southern end of the development. The Bede Community Centre lies between Maydew House and Thaxted Court. The development is also bounded by Southwark Park to the east and Bradley House to the west.



Figure 1: Location Plan – Source: Google Maps

## METHODOLOGY

The methodology for calculating the demolition impact of a project, utilises both the pre-demolition audit, which details the nature of the buildings to be demolished, alongside the methodology as detailed within the Greater London Authority (GLA), Whole Life-cycle Carbon Guidance for calculating demolition impact which applies a figure of 50kgCO<sub>2</sub>e/m<sup>2</sup> GIA (demolition).

Prior to refurbishment or demolition, it is useful to undertake a survey the site so that the volume, type and condition of the structure and internal fixtures and fittings can be determined. A pre-demolition audit provides a list of Key Demolition Products (KDPs) that will be removed during the demolition phase of the redevelopment that are suitable for reuse and recycling.

Currently, the demolition audits for both buildings being assessed have not yet been undertaken and therefore, a standard figure of 50kgCO<sub>2</sub>e/m<sup>2</sup> GIA has been applied to both buildings to calculate the carbon impact of the demolition at this stage, in accordance with the Greater London Authority (GLA), Whole Life-cycle Carbon Guidance for calculating demolition impact.

In lieu of the demolition audit however, estimated values for major materials expected to be produced as a result of demolition will be outlined for both buildings where it is possible to do so.

## MAYDEW HOUSE

Maydew House is a 26 storey residential tower block consisting of 144 dwellings and stands 78m in height. The block currently stands empty with residents decanted between 2011 and 2015 to allow for asbestos removal and other essential repairs to take place.

The external envelope and internal walls, fittings and fixtures have already been removed and the building currently consists of the reinforced concrete shell.



Figure 2: Maydew House

## BREAKDOWN OF EXISTING MATERIALS

Maydew House has already undergone significant removal of the external façade, and strip out of the majority of internal partitions, fittings and fixtures within the residential properties and common circulation space. The carbon impact of the removal of these elements was not required at the time of removal and therefore, this assessment will only consider remaining material elements and their estimated demolition impact.

The remaining structure is thought to consist primarily of reinforced concrete and rebar however, some further components have been identified as remaining. These include:

- 2no. passenger lifts
- aluminium entrance doors (approx. 20m<sup>2</sup>),
- steel security doors (approx. 10m<sup>2</sup>)
- steel roller shutters (approx. 10m<sup>2</sup>)
- Asphalt roof covering
- Cast iron rainwater downpipes
- Brickwork at lower ground level
- Steel railings
- Metal fencing
- Steel framed windows to staircase tower
- Timber window frames at roof level
- Wet riser (inc. pumps)
- Electrical switchgear
- UKPN substation at ground floor

Table 1: ESTIMATED EXISTING BUILDING MATERIALS for MAYDEW HOUSE

Material/assembly	Mass of raw materials (kg)	Total (kg)	Estimated recyclable materials %
<b>Foundations / Sub-surface / Basement</b>			
Ready mix concrete (low strength C12/15) 0% recycled binders	220,000		
Ready mix concrete (40/50 MPA)	484,025		
Reinforcement steel (rebar) generic 0 % recycled content	31,500		
Bricks (basement) including mortar	45,724	<b>781,249</b>	<b>100%</b>
<b>Floor slabs / ceilings / roofing decks / beams and roof</b>			
Ready mix concrete (normal strength C40/50) 0% recycled binders	240,000		
Ready-mix concrete 32/40 MPA	1,150,800		
Ready-mix concrete (normal strength C28/35) 0% recycled binders	3,561,600		
Concrete slab (generic)	1,152,000		
Reinforcement steel (rebar) generic, 0% recycled content	125,912		
Fiber-reinforced, self levelling floor rendering	1,800		
Self-leveling mortar	268,800		
Plastic vpc	74		
Asphalt waterproof coating for flat roofs (85kg/m <sup>2</sup> )	37,400	<b>6,538,386</b>	<b>99.5%</b>
<b>Columns / load bearing vertical structures</b>			
Ready-mix concrete 40/50 MPA	195,300		
Reinforcement steel (rebar) 0% recycled content	16,200	<b>211,500</b>	<b>100%</b>

Material/assembly	Mass of raw materials (kg)	Total (kg)	Estimated recyclable materials %
<b>Other structures / materials</b>			
Ready-mix concrete (normal strength C30/37) 0% recycled binders	417,600		
Ready-mix concrete (normal strength C30/37) 10% recycled binders	400		
Ready-mix concrete (normal strength C28/35) 0% recycled binders	480,000		
Reinforcement steel (rebar) 0% recycled content	41,427	<b>1,339,027</b>	<b>100%</b>
<b>Windows /doors</b>			
Steel security doors	566		
Aluminium entrance doors	788		
Steel framed windows	14,919		
Wooden framed windows	4,451		
Steel shutters	870	<b>21,594</b>	<b>100%</b>
<b>Materials and constructions for external use</b>			
Cast iron RWP (100mm)	2,037		
Steel guard railing / metal fencing	3,424	<b>5,461</b>	<b>100%</b>
<b>Building systems and Installations</b>			
Residential passenger lifts (2no.)	5,860		
Switchgear	1,688		
Dry-riser pipe (inc. pumps) 0% recycled content	100	<b>7,649</b>	<b>49.34%</b>
<b>Total</b>		<b>8,184,8010</b>	

Source: OneClick LCA

## BEDE COMMUNITY CENTRE

The Bede Community Centre is located next to Maydeu House and consists of a single storey building located at first floor level above garages off Abbeyfield Road and is accessed via a pedestrian ramp to the podium deck.



Figure 3: Bede Community Centre

### BREAKDOWN OF EXISTING MATERIALS

The Bede Centre has not yet undergone significant strip out or demolition. The carbon impact for the demolition of the Bede Centre has been based on estimated quantities of existing structural materials together with estimated internal finishing components and building services. Review of the condition report is recommended to confirm actual components present.

Table 2: ESTIMATED EXISTING BUILDING MATERIALS for BED CENTRE

Material/assembly	Mass of raw materials (kg)	Total (kg)	Estimated recyclable materials %
<b>Foundations / Sub-surface / Basement</b>			
Ready mix concrete (low strength C12/15) 0% recycled binders	65,120		
Ready mix concrete (normal strength C30/37)	57,309		
Reinforcement steel (rebar) generic 0 % recycled content	3,730		

EPS Insulation	73	126,393	99.8%
<b>Floor slabs / ceilings / roofing decks / beams and roof</b>			
Ready mix concrete (normal strength C30/37) 0% recycled binders	497,280		
Ready mix concrete (normal strength C30/40) 0% recycled binders	159,600		
Concrete slab (generic)	439,264		
Reinforcement steel (rebar) generic, 0% recycled content	37,248		
Self-leveling mortar	33,142		
Plastic vpc	219		
Concrete roof tiles	27,874		
Asphalt waterproof coating for flat roofs (85kg/m2)	50,320		
EPS Insulation	5,209		
Glass wool insulation	2,368	1,252,508	95%
<b>Columns / load bearing vertical structures</b>			
Ready-mix concrete (normal strength C32/40) 0% recycled binders	70,794		
Reinforcement steel (rebar) 0% recycled content	6,726	77,520	100%
<b>External walls / façade</b>			
Brick	132,272		
Concrete block (lightweight)	136,955		
Mortar	25,756		
Plasterboard	11,111		
Plaster	3,418		
Rock wool insulation	23,310	332,824	94.5%
<b>Internal walls / non-bearing structures</b>			
Plasterboard	9,712		
Steel studs	436		
Glass wool insulation	2,224		
Interior paints	549		
<b>Windows / doors</b>			
Aluminium entrance doors	467		
Aluminium framed windows	15,168		
Wooden internal doors	1,040	16,675	94%
<b>Materials and constructions for external use</b>			

## CONCLUSION AND NEXT STEPS

It is considered that refurbishment of the current buildings may not be able to deliver the number of high quality homes meeting current regulations and space standards as previously envisioned therefore, an embodied carbon assessment has been undertaken to assess the impact from the potential demolition of both Maydew House and the Bede Centre.

The assessment has however, been undertaken based on estimated material quantities and it is therefore, recommended that a full Pre-Demolition audit is undertaken to support the above assessment and identify any gaps in the assessment.

In addition to the Pre-demolition Audit, a further Pre-redevelopment Audit should also be undertaken to identify the most appropriate material re-use and recycling opportunities to comply with the greater London Authority (GLA) Circular Economy principles to maximise recovery and reuse of demolition materials at the highest possible value, and to reduce the requirement for virgin materials, where it is possible to do so.

Tables 1 and 2 provide a breakdown of the estimated existing materials within both Maydew House and The Bede Centre including the calculated mass of material components in kg together with the potential recycling percentage available.

To comply with Circular Economy principles, any redevelopment proposals will be required to achieve policy targets of reusing, recycling and/or recovery of 95% of construction and demolition waste and putting 95% of excavation waste to beneficial use. In addition, a commitment should be made to achieve an overall target of 20% reused or recycled content by value (£'s), calculated both on the estimated quantities of materials and the capital cost of that material.

Early adoption of both Whole Life Carbon principles and Circular Economy principles of the redevelopment proposals are highly recommended to maximise opportunities to reduce overall embodied carbon emissions and to maximise recovery at the highest value, and overall capital cost savings.

Precast concrete pavers	26,320		
Steel guard railing / metal fencing	904	<b>27,234</b>	<b>100%</b>
<b>Finishes / coverings / FFE</b>			
Stainless steel sink	5		
Ceramic WC	283		
Ceramic basin	117		
Taps	20	<b>427</b>	<b>5%</b>
Ceramic wall tiles	1,344		
Tile adhesive	78		
Vinyl floor covering	1,713		
Waterproof flexible coating	84	<b>3,646</b>	<b>40%</b>
<b>Building systems and Installations</b>			
Heat distribution center	354		
Heat distribution pipework	219	<b>7,649</b>	<b>49.34%</b>
AHU	389		
Ventilation ducting	331		
Electricity distribution system	4,689		
Drinking water supply pipework	309		
Radiator	6,168		
Sewage water drainage pipework	218	<b>12,678</b>	<b>100%</b>
<b>Total</b>		<b>1,862,095</b>	

Source: OneClick LCA

## Table 3: RESULTS

Table 3 shows the demolition impact of both Maydew House and the Bede Community Centre.

In the absence of a Pre-demolition Audit, a figure of 50kgCO<sub>2</sub>e/m<sup>2</sup> GIA (demolition) has been applied to calculate the demolition impact. Based on the Greater London Authority (GLA), Whole Life-cycle Carbon Guidance for calculating demolition impact.

	<b>Maydew House</b>	<b>The Bede Centre</b>
	A1-A5 emissions – (kgCO <sub>2</sub> e)	A1-A5 emissions – (kgCO <sub>2</sub> e)
0.1 – 0.2 Demolition	791,800	59,200

