APPENDIX 14.2 GREENHOUSE GAS CALCULATION INPUTS

General project inputs

The assessment considers a 60-year reference study period (in line with the principles set out in BS EN 15978) covering all lifecycle stages (A, B, and C) to evaluate embodied and operational carbon impacts. Proposed Development information and programme assumptions that have informed the assessment are provided in Table 1 and Table 2.

The proposed development ('Plot H') comprises two primary assets: the Purpose Built Student Accommodation (PBSA) use and commercial use (assessed collectively as 'Building 1') in the Whole Life Carbon Assessment (WLCA) undertaken by Buro Happold (Appendix 14.5), with a floorspace of 34,618.60m^2 Gross Internal Area (GIA).

Table 1 Programme assumptions

Reference Study period (RSP)	60 years
Construction Start Date	02/08/2027
Construction End Date	23/08/2030
Construction Period	37 Months
Operation Start Date	01/09/2030
Operation End Date	01/09/2090

Table 2 Proposed Floorspace Quanta

Building	**Floorspace (m2 GIA)**
Building 1 ('Plot H')	34,618.60
Total	**34,618.60**

Whole Life Carbon Assessment Summary

Error! Reference source not found., provides a summary of the estimated total GHG emissions (tCO2e) for the Proposed Development as provided in the WLCA (Appendix 14.5) The WLCA has been conducted in accordance with BS EN 15978: 2011: (Sustainability of construction works - Assessment of environmental performance of buildings -Calculation method) using the RICS Professional Statement: Whole Life Carbon assessment for the built environment 2nd edition (September 2023), over a 60-year reference study period, covering the entirety of modules A, B and C:

- Module A1 – A5 (Product sourcing and construction stage);
- Module B1 – B7 (In use stage embodied carbon Use stage); and
- Module C1 – C4 (End of life stage)

The WLCA (Buro Happold, 2025) does not include operational stage transport-related emissions within its scope. Operational transport emissions have been assessed by Buro Happold separately using information provided by Civic Engineers, the project Transport Consultants, and benchmark assumptions derived from Department for Transport statistics (DESNZ, 2025). A detailed assessment of transport impacts is presented in the section below within Table 4.

The WLCA (Buro Happold, 2025) has been undertaken for two scenarios: non decarbonised and decarbonised. The non-decarbonised scenario assumes current carbon factors remain constant throughout the 60-year reference period, meaning operational energy and lifecycle emissions reflect today's grid intensity and material supply chains. In contrast, the decarbonised scenario incorporates anticipated reductions in carbon intensity aligned with UK Net Zero targets and sectoral decarbonisation pathways. This results in lower emissions for operational energy (module B6) and some lifecycle stages. The calculations for both the non-decarbonised and a decarbonised scenario do not currently account for the embedded mitigation for the Proposed Development, as set out within section 14.63 Chapter 16 Climate Change (ES Volume I), which would further reduce the overall GHG emissions.

The estimated total GHG emissions (tCO2e) per lifecycle stage of the Proposed Development have been calculated based on information provided in the WCLA undertaken by Buro Happold, 2025. The results are summarised within Table 3. For the Proposed Development, total whole-life emissions reduce from approximately 128,190.80 tCO_2e, under the non-decarbonised scenario, to 65,490.80 tCO_2e, under the decarbonised scenario, demonstrating the critical impact of future grid and material decarbonisation on long-term carbon performance.

Table 3 Estimated total GHG emissions (tCO_2e) for Building 1 ('Plot H')

Lifecycle Stage	**Total GHG emissions (tCO_2e)**	
	Non-Decarbonised Scenario	**Decarbonised Scenario**
Product stage (lifecycle stage A1-A3)	21,530.00	21,530.00
Construction process stage (lifecycle stage A4-A5)	4,958.00	4,958.00
In use stage embodied carbon (lifecycle stage B1-B5)	31,589.00	15,821.00
Use stage Operational energy (lifecycle stage B6)	57,877.00	12,751.00
Use stage operational water use (lifecycle stage B7)	1,189.00	238.00
End-of-life stage (lifecycle stage C1-C4)	2,605.00	1,753.00
Total	**127,638.80**	**64,941.80**

Details of the project-specific information and the technical methodology applied by Buro Happold within the WLCA, used to determine carbon emissions at each lifecycle stage for the Proposed Development, are provided in Appendix 14.5. This appendix should be read in conjunction with Appendix 14.5 (ES Volume II) and Chapter 16 Climate Change (ES Volume I) to ensure a comprehensive understanding of the assessment.

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Use Stage Operational Transport

Assumptions that have informed the assessment of use stage operational transport emission are provided in Table 4 below. Daily return trips (AADT) have been provided by Civic Engineers, the projects transport consultants. Heavy goods vehicles (HGVs), light goods vehicles (LGVs), and cars have been considered, with assumptions derived from Department for Transport statistics (DESNZ,2025) and industry averages. Carbon emission factors have been sourced from the latest Department for Energy Security and Net Zero (DESNZ) 2025 conversion factors to ensure alignment with UK reporting standards. These factors have been applied consistently across the 60 year reference period and do not incorporate future decarbonisation of the energy grid or other technological improvements. This approach provides a conservative estimate of lifecycle emissions and ensures comparability with current reporting requirement.

Table 4 Assumptions and conversion factors used for GHG emissions associated with operational transport for the proposed development

Assumed mode of transport	Daily return trips (AADT)	Assumed Distance travelled (km)	Source of assumed distance travelled	Annual trips	Number of trips over 60-year lifecycle	Carbon factor (total $kgCO_2e$ per km)*	Lifetime GHG emissions (tCO_2e)
HGV	2	107	Department for Transport Domestic road freight statistics. United Kingdom: 2023 - GOV.UK	730.00	43,800.00	0.891210 (All HGVs, average laden)	4,176.74
LGV	0	108	Department for Transport Domestic road freight statistics. United Kingdom: 2023 - GOV.UK	0.00	0.00	0.254300 (Van - Average (up to 3.5 tonnes) - unknown fuel type)	0.00
Car	78	234	Nimblefins Average Car Journeys in the UK | NimbleFins (based on Department for Transport data)	28,470.00	1,708,200.00	0.166910 (Average cars, unknown fuel)	3,714.05
Total							7,890.80
*Carbon factors have been sourced from the DESNZ 2025 conversion factors. Available at ghg-conversion-factors-2025-condensed-set.xlsx							

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