

APPENDIX 7.3

CARBON ASSESSMENT DATA

Proposed Development plot areas and use classes

Table 7C.1: Proposed Development plot areas

Plot	Occupation	Area GIA (m ²)
S4	Retail	976
	Office	12,961
	Laboratory	0
S05	MSCP	20,584
S6	Retail	1393.6
	Office	6539.2
	Laboratory	2787.2
S7	Retail	1475
	Office	6920
	Laboratory	2950
S08	Commercial, Business and Service, Local Community and Learning	13,055
S09	Commercial, Business and Service, Local Community and Learning	24,080
S11	Residential (Build to rent)	5,159
S12	Residential (Build to rent)	4,176
S13	Residential (Private / Affordable / Shared Ownership)	5938
S14	Residential (Private / Affordable / Shared Ownership)	3,889
S15	Residential (Private / Affordable / Shared Ownership)	3,775
S16	Residential (Private / Affordable / Shared Ownership)	7,609
S17	Residential (Build to rent)	7,655
S18	Residential (Build to rent)	3,772
S19	Residential (Build to rent)	9,859
S20	Residential (Build to rent)	4,784
S21	Residential (Build to rent)	4,194

Energy assessment

Table 7C.2: Proposed Development energy use

Plot	Area m ² (GIA)	Energy Intensity (kWh/m ²)	KWh/year
Milton Avenue (S4) and 1-3 Swale Street (S6-7)	-	-	3,538,000
S8-9 Commercial, Business and Service, Local Community and Learning	37,135	129.06 ¹	4,792,643
S11-12-13-14-15-16-17-18-20-21 Residential	60,810	79 ²	4,803,990

Table 7C.3: Grid decarbonisation projections from BEIS Green Book

Year	KgCO ₂ e/kWh
2027	0.076
2028	0.071
2029	0.066
2030	0.053
2031	0.042
2032	0.036
2033	0.031
2034	0.028
2035	0.025
2036	0.021
2037	0.019
2038	0.018

¹ Based on the distribution of total energy intensity by sector for 2014-2015 from Building Energy Efficiency Survey (BEES), 2016 Overarching Tables.

² Based on the energy consumption benchmarks for existing buildings from Chartered Institution of Building Services Engineers (CIBSE), Guide F Energy efficiency in buildings (2012).

2039	0.017
2040	0.016
2041	0.013
2042	0.012
2043	0.012
2044	0.011
2045	0.010
2046	0.009
2047	0.008
2048	0.008
from 2049 to 2086	0.007

Transport assessment

Table 7C.4: Transport Assessment Assumptions

Transport Assessment Assumptions	
Average trip length car (km) ³	10.94
Average trip length HGV (km) ⁴	101.45
Number of days in a year for HGVs journeys ⁵	260
Number of days in a year for car journeys ⁶	365

³ Based on the average distance travelled from the BEIS national statistics average distance for 2010-2020 of 10.93km for cars.

⁴ Based on the average distance travelled from the BEIS national statistics average distance for 2010-2020 of 101.45km for HGV.

⁵ It has been assumed that HGV trips will occur for lab and office on weekdays only.

⁶ It has been assumed that car trips will occur on weekdays and weekends.

Table 7C.5: Proposed Development vehicle trip generation summary

Occupation	Total trips daily (weekdays) ⁷	Annual trips	km design life	tCO ₂ e design life
Office vehicle	175	47,211	65,584,194	45,254
Lab Vehicle	1,154	312,153	433,634,677	299,212
Residential Vehicle	89	32,305	21,204,535	2,885
Total				347,351

Table 7C.6: BEIS TAG Databook car modal shift projections

Year	Petrol	Diesel	Electric
2027	53%	38%	9%
2028	53%	36%	11%
2029	53%	34%	13%
2030	52%	32%	16%
2031	51%	31%	18%
2032	51%	29%	20%
2033	50%	28%	22%
2034	49%	27%	24%
2035	48%	26%	25%
2036	47%	26%	27%
2037	46%	25%	29%
2038	46%	24%	30%
2039	45%	24%	32%
2040	44%	23%	33%
2041	43%	23%	34%
2042	42%	22%	36%

⁷ Trip generation data was sourced from the Trip Generation data provided from PJA Transport Consultants.

Year	Petrol	Diesel	Electric
2043	41%	22%	37%
2044	41%	21%	38%
2045	40%	21%	39%
2046	39%	20%	40%
2047	39%	20%	41%
2048	38%	20%	42%
2049	37%	19%	43%
from 2050 to 2086	37%	19%	44%

Carbon sequestration data

Table 7C.7: Biodiversity Net Gain outputs for current land uses on site (baseline) and carbon sequestration and use category and carbon factor from (Natural England, 2021)

Feature from Biodiversity Net Gain Assessment		Area (hectares)	Carbon sequestration land use category from Natural England (2021)	Carbon factor (tCO ₂ e/ha/yr)
Broad Habitat	Habitat Type			
Grassland	Modified grassland	0.84	Improved grasslands	-0.36
Urban	Artificial unvegetated, unsealed surface	0.54	Urban	0
Woodland and forest	Other woodland; broadleaved	0.96	Mixed native broadleaved woodland (100 years)	-7
Urban	Developed land; sealed surface	2.26	Urban	0
Urban	Introduced shrub	0.05	Urban	0
Grassland	Other neutral grassland	0.01	Improved grasslands	-0.36
Urban	Open Mosaic Habitats on	0.77	Urban	0

Feature from Biodiversity Net Gain Assessment		Area (hectares)	Carbon sequestration land use category from Natural England (2021)	Carbon factor (tCO ₂ e/ha/yr)
Broad Habitat	Habitat Type			
	Previously Developed Land			
Urban	Open Mosaic Habitats on Previously Developed Land	0.59	Urban	0
Urban	Open Mosaic Habitats on Previously Developed Land	0.48	Urban	0
Woodland and forest	Other woodland; broadleaved	0.15	Mixed native broadleaved woodland (100 years)	-7
Heathland and shrub	Mixed scrub	0.74	Lowland heathland & Upland heathlands	0.054
Urban	Introduced shrub	0.00	Urban	0
Woodland and forest	Other woodland; broadleaved		Mixed native broadleaved woodland (100 years)	-7
Heathland and shrub	Mixed scrub	0.04	Lowland heathland & Upland heathlands	0.054
Grassland	Other neutral grassland	1.04	Improved grasslands	-0.36
Urban	Developed land; sealed surface	0.01	Urban	0
Grassland	Modified grassland	0.26	Improved grasslands	-0.36
Urban	Open Mosaic Habitats on Previously Developed Land	0.02	Urban	0
Urban	Open Mosaic Habitats on	0.17	Urban	0

Feature from Biodiversity Net Gain Assessment		Area (hectares)	Carbon sequestration land use category from Natural England (2021)	Carbon factor (tCO ₂ e/ha/yr)
Broad Habitat	Habitat Type			
	Previously Developed Land			
Urban	Open Mosaic Habitats on Previously Developed Land	0.22	Urban	0
Woodland and forest	Other woodland; broadleaved	0.03	Mixed native broadleaved woodland (100 years)	-7
Heathland and shrub	Mixed scrub	0.20	Lowland heathland & Upland heathlands	0.054
Urban	Open Mosaic Habitats on Previously Developed Land	0.22	Urban	0
Urban	Artificial unvegetated, unsealed surface	0.02	Urban	0
Grassland	Modified grassland	0.14	Improved grasslands	-0.36
Urban	Developed land; sealed surface	0.00	Urban	0

Table 7C.8: Biodiversity Net Gain outputs for proposed landscape plans for the roof on site and carbon sequestration and use category and carbon factor from (Natural England, 2021) and IPCC Guidelines for (Natural Greenhouse Gas Inventories, 2006)

Feature from Biodiversity Net Gain Assessment	Area (hectares)	Carbon sequestration land use category from Natural England (2021) and (Natural Greenhouse Gas Inventories, 2006)	Carbon factor (tCO₂e/ha/yr)
Habitat Type			
Planting -Green/Brown roof	1.05	Green Roof - Spurium (tC/m ²) after 2 growing seasons	-0.001
Ornamental Planting in Amenity Areas	0.04	Improved grasslands	-0.360
Planting – Estimated Green/Brown roof to be confirmed at detailed submission	0.20	Green Roof - Spurium (tC/m ²) after 2 growing seasons	-0.001
Planting - Phase 1 retrofit paths Green/Brown roof	0.03	Green Roof - Spurium (tC/m ²) after 2 growing seasons	-0.001
Seeding- Phase 1 enhancements Green/Brown roof	0.12	Green Roof - Spurium (tC/m ²) after 2 growing seasons	-0.001
Community gardens	0.05	Improved grasslands	-0.360
Vines in planters tied to vertical stainless-steel cables to grow up façade	-	-	-
Proposed trees- Small	41.00	Urban Tree - Mixed Hardwood (tCO ₂ /Yr/Tree)	-0.012

Table 7C.9: Biodiversity Net Gain outputs for proposed landscape plans for the ground floor on site and carbon sequestration and use category and carbon factor from Natural England (2021) and

Feature from Biodiversity Net Gain Assessment	Area (hectares)	Carbon sequestration land use category from Natural England (2021) and Natural Greenhouse Gas Inventories (2006)	Carbon factor (tCO ₂ e/ha/yr)
Habitat Type			
Wettest inundation zone 20%(shown indicatively) & Residential swales	0.07	Improved grasslands	-0.360
Driest inundation zone 80%(shown indicatively)	0.19	Improved grasslands	-0.360
Permanently wet-swale	0.17	Improved grasslands	-0.360
Planting -OMHmimic in rain garden	0.61	Improved grasslands	-0.360
Seeding - Restored Open Mosaic Habitat Species	0.32	Improved grasslands	-0.360
Planting -meadow grassland verge	0.08	Heathlands // Lowland heathland & Upland heathlands	0.054
Flowering lawn	0.03	Improved grasslands	-0.360
Ivy Green screen (as green 'hoarding' and to service compound fencing)	0.03	-	-
Proposed trees- Large	0.01	Mixed native broadleaved woodland (100 year)	-7.000
Proposed trees-Medium	0.01	Mixed native broadleaved woodland (100 year)	-7.000
Proposed trees- Small	0.02	Urban Tree - Mixed Hardwood (tCO ₂ /Yr/Tree)	-0.012
Transplanted pollarded willow tree	0.00	Improved grasslands	-0.360
Mixed native hedgerow	0.03	Improved grasslands	-0.360
Ornamental hedgerow	0.04	Improved grasslands	-0.360

References

Natural England, 2021. [Online]

Available at: <https://naturalengland.blog.gov.uk/2021/04/20/natural-england-publishes-major-new-report-on-carbon-storage-and-sequestration-by-habitat/>

Natural Greenhouse Gas Inventories, 2006. [Online]

Available at: Available online at: <https://www.ipcc-nggip.iges.or.jp/public/2006gl/>