

Appendix 7.1 Greenhouse Gas Calculation inputs

General project inputs

Table 1 General information

LCA timeline	60	years
--------------	----	-------

Table 2 Calculation area schedule and timing of phases for construction of the Proposed Development

Plot	Unit	2023	2024	2025
North Stand	m ²	1,848	7,391	5,543
Hotel	m ²		7,851	7,851
Commercial Building	m ²		3,575	3,575

Table 3 Operational carbon based on benchmarks for the Proposed Development

Schedule typologies	Fossil	Electric	Unit	Source
North Stand	0	41.79	kWh/m²/y	M-E Engineers Limited, MCFC North Stand Expansion, Energy Strategy
Hotel	0	142.29	kWh/m²/y	M-E Engineers Limited, MCFC North Stand Expansion, Energy Strategy
Commercial Building	0	38.28	kWh/m²/y	M-E Engineers Limited, MCFC North Stand Expansion, Energy Strategy

Table 4 BEIS (2022) and SAP (2016) emissions factors

kgCO ₂ /kWh		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050+
BEIS	Grid Domestic- BEIS projections (BEIS Measuring and reporting environmental impacts: guidance for businesses, 2019)	0.146	0.151	0.131	0.098	0.073	0.063	0.054	0.049	0.042	0.033	0.026	0.021	0.020	0.020	0.018	0.018	0.017	0.016	0.015	0.015	0.009	0.008	0.008	0.008	0.005	0.005	0.003	0.003
BEIS	Grid Commercial/ Public sector- BEIS projections (BEIS Measuring and reporting environment	0.143	0.149	0.129	0.096	0.072	0.062	0.053	0.049	0.041	0.032	0.025	0.020	0.020	0.019	0.018	0.018	0.017	0.016	0.015	0.014	0.009	0.008	0.008	0.008	0.005	0.005	0.003	0.002

Project North Stand Manchester

kgCO ₂ /kWh		2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050+
	al impacts: guidance for businesses, 2019)																												
BEIS	Grid Industrial-BEIS projections (BEIS Measuring and reporting environmental impacts: guidance for businesses, 2019)	0.140	0.146	0.127	0.095	0.070	0.061	0.052	0.048	0.040	0.032	0.025	0.020	0.019	0.019	0.018	0.017	0.016	0.015	0.015	0.014	0.009	0.008	0.008	0.007	0.005	0.005	0.003	0.002
SAP	Grid SAP 2016 Consultation	0.229	0.229	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.183
SAP	Gas SAP 2016 Consultation	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208

Table 5 Benchmarks and conversion factors used for GHG emissions associated with operational water consumption for the Proposed Development

Building	Area use	Benchmark name	Benchmark	Source
North Stand		Restaurant water consumption	7 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
Hotel	Hotel (without GF retail elements)	Occupancy rate for Bedroom (Hotel)	0.5 people per metre square	SD5078: BREEAM UK New Construction 2018 3.0

Building	Area use	Benchmark name	Benchmark	Source
		5 star hotel water consumption	200 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
	North Stand Suites	Occupancy rate for Bedroom (Hotel)	0.5 people per metre square	SD5078: BREEAM UK New Construction 2018 3.0
		5 star hotel water consumption	200 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
	GF F&B	Food preparation area occupancy rate	0.108 people per metre square	SD5078: BREEAM UK New Construction 2018 3.0
		Restaurant water consumption	7 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
	All Day Dining F&B	Food preparation area occupancy rate	0.108 people per metre square	SD5078: BREEAM UK New Construction 2018 3.0
		Restaurant water consumption	7 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
Commercial Building	Club Shop	Sales area, general occupancy rate	0.102 people per metre square	SD5078: BREEAM UK New Construction 2018 3.0
		Museum water consumption	6 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
	Club level Tour Access	Public circulation areas occupancy rate	0.241 people per metre square	SD5078: BREEAM UK New Construction 2018 3.0

Building	Area use	Benchmark name	Benchmark	Source
		Museum water consumption	6 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
	Club Museum	Display and public areas occupancy rate	0.15 people per metre square	SD5078: BREEAM UK New Construction 2018 3.0
		Museum water consumption	6 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
	F&B Distribution	Display and public areas occupancy rate	0.15 people per metre square	SD5078: BREEAM UK New Construction 2018 3.0
		Restaurant water consumption	7 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
	Football Experience and Tour	Display and public areas occupancy rate	0.15 people per metre square	SD5078: BREEAM UK New Construction 2018 3.0
		Museum water consumption	6 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
	Office Levels	Generic office occupancy rate	0.166 people per metre square	SD5078: BREEAM UK New Construction 2018 3.0
		Office with/without canteen water consumption	45 litres per person per day	BSRIA Rules of Thumb Edition for Building Services (5 th Edition)
All building typologies		Carbon factor for water supply	0.149 kg CO ₂ per m ³ of water supplied	Department for Business, Energy & Industrial Strategy Greenhouse Gas Reporting: Conversion Factors 2021