APPENDIX 10-2

CARBON CALCULATIONS

The Hodson Bay Waterfront Park Project is co-funded by the Government of Ireland and the European Union through the EU Just Transition Fund

Assumptions

Traffic Assumptions

Traffic Assumptions		
Item	Description	Assumption
Material Delivery Distance	It has been assumed that all material will be imported locally from nearby towns/cities (Athlone, Roscommon Town, Moate, and Ballymahon). For modelling purposes, the average distance from four of the proximate city locations will be used for transport of all materials for the site.	22km
Truck Emissions Factor	Calculated from an HGV - All - Average emission factor as provided in the TII Carbon Tool Source: 2024 DESNZ emission factors - 'Delivery vehicles' tab, All HGVs and used Average laden weight. 2024 DESNZ emission factors - 'WTT - delivery vehs & freight' tab, all HGVs and used Average laden weight.	1.0845
Construction Phase HGV Movements	As identified in Section 5.2 of Traffic and Transport Report, a worst-case allowance of up to 15 Heavy Goods Vehicle (HGV) arrivals and 15 HGV departures per day has been assumed during peak construction activity periods.	30
Car Emission Factor	Calculated from LGV - Average emission factor as provided in the TII Carbon Tool. Source: 2024 DESNZ emission factors - 'Delivery vehicles' tab, Van - Average (up to 3.5 tonnes). 2024 DESNZ emission factors - 'WTT - delivery vehs & freight' tab, Van - Average (up to 3.5 tonnes).	0.31064
Construction Phase Worker Movements	As identified in Section 5.2 of Traffic and Transport Report, a peak construction workforce of approximately 25 personnel has been assumed for the purposes of the assessment based on the traffic chapter. Given the rural context and limited availability of public transport, it is assumed that the majority of construction staff will travel to the site by private car. 21 inbound vehicle trips during the morning peak construction period, and 21 outbound vehicle trips during the evening departure period.	42
Worker Movements	The average distance from four of the proximate city locations is used for modelling purposes for distance travelled for workers to go to site.	22km

Traffic Assumptions		
Construction Phase Working Days	Working days calculated as 30 months (2.5 years) × 302 working days/year (6-day Mon–Sat working week, 52 weeks/year, less 10 Irish public holidays) = 755 working days	755
Material Delivery Distance	It has been assumed that all material will be imported locally from nearby towns/cities (Athlone, Roscommon Town, Moate, and Ballymahon). For modelling purposes, the average distance from four of the proximate city locations will be used for transport of all materials for the site.	22km
Truck Emissions Factor	Calculated from an HGV - All - Average emission factor as provided in the TII Carbon Tool Source: 2024 DESNZ emission factors - 'Delivery vehicles' tab, All HGVs and used Average laden weight. 2024 DESNZ emission factors - 'WTT - delivery vehs & freight' tab, all HGVs and used Average laden weight.	1.0845
Construction Phase HGV Movements	As identified in Section 5.2 of Traffic and Transport Report, a worst-case allowance of up to 15 Heavy Goods Vehicle (HGV) arrivals and 15 HGV departures per day has been assumed during peak construction activity periods.	30
Car Emission Factor	Calculated from LGV - Average emission factor as provided in the TII Carbon Tool. Source: 2024 DESNZ emission factors - 'Delivery vehicles' tab, Van - Average (up to 3.5 tonnes). 2024 DESNZ emission factors - 'WTT - delivery vehs & freight' tab, Van - Average (up to 3.5 tonnes).	0.31064

Waste Assumptions

Waste Assumptions		
Item	Description	Assumption
Construction Phase Waste Quantities	As set out in the CEMP and Chapter 4: Description of this EIAR, construction/demolition waste type has been identified (concrete, metals, etc.), with an intention to reuse/recycle material where suitable (e.g. for backfill), subject to site engineer approval, with residual waste disposed of via a licensed contractor. Quantitative waste estimations for the Proposed Development were derived using the TII Carbon Tool. The estimated cost was informed by the Cost Estimate Report prepared by TC Estimating Services Ltd. Due to commercial sensitivity the Cost Estimate Report has not been appended to the EIAR. The cost-based proxy calculation, including all of the construction/demolition works is 15062.45tCO_2e. This is considered likely to overestimate actual waste arisings, as the underlying industry-average ratio may not reflect the specific mix of civil/infrastructure works (marina, parking, active travel) comprising a significant proportion of the total construction cost, which are generally less waste-intensive than general building construction. Cost-based proxy calculation for construction/demolition waste was applied using the construction cost of the building/demolition-related works only (excluding civil/infrastructure works (marina, parking, active travel) which are not expected to generate a significant quantity of waste and would otherwise over estimate disproportionately. The cost-based proxy calculation for construction waste emissions is 7,975.92tCO_2e. However, this is considered to be an overestimation and is used as a precautionary figure based on the cost-based proxy calculation provided by the TII Carbon Tool.	7,975.92tCO_2e
Operational Phase Waste Transportation Distances	It has been assumed that all waste material will be exported to local appropriately authorised waste licensed facilities. Have used the average distance from Athlone, Roscommon town, Moate, and Ballymahon to the site for this assumption. Furthermore, it is assumed that waste will be exported once per week.	22km
Mixed Residual Waste (MRW)Volume Per Year	There will be approximately 387.32 L of MRW produced per day during the operational phase of the Proposed Development. The TII Carbon Tool requires quantity of waste to be input in tonnes. The assumed density of MRW to be used at the Proposed Development is approximately 0.164 kg/litre, which was derived from the EPA's official guidance for estimating on-site waste quantities, published as part of the National Waste Statistics reporting framework. This guidance provides typical full-bin weights for standard bin sizes across three waste categories: general residual waste, recyclables, and organic waste. Since the EPA guidance provides multiple bin-size reference points within each waste category, an average density was calculated within each category. Tonnes per year was calculated with the formula: (Litres per day × Density × 365) ÷ 1,000. So, (387.32 L x 0.164 kg/L x 365) ÷ 1,000 = 23.18	23.18 tonnes per year

Waste Assumptions		
	tonnes per year.The daily value would be (387.32 L x 0.164 kg/L) ÷ 1,000 == 0.06 tonnes.Therefore, there will be approximately 0.06 tonnes of MRW produced per day for this project, or 23.18 tonnes per year.	
Volume of Dry Mixed Recycling Per year	There will be approximately 95.89 L of dry mixed recycling produced per day during the operational phase of the Proposed Development. The TII Carbon Tool requires quantity of waste to be input in tonnes. The assumed density of dry mixed recycling to be used at the Proposed Development is approximately 0.06 kg/litre, which was derived from the EPA's official guidance for estimating on-site waste quantities, published as part of the National Waste Statistics reporting framework. This guidance provides typical full-bin weights for standard bin sizes across three waste categories: general residual waste, recyclables, and organic waste. Since the EPA guidance provides multiple bin-size reference points within each waste category, an average density was calculated within each category. Tonnes per year was calculated with the formula: (Litres per day × Density × 365) ÷ 1,000. So, (95.89 L x 0.06 kg/L x 365) ÷ 1,000 = 2.09 tonnes per year. The daily value would be (95.89 L x 0.06 kg/L) ÷ 1,000 == 0.0057. Therefore, there will be approximately 0.0057 tonnes of dry mixed recycling per day for this project, or 2.09 tonnes per year.	2.09 tonnes per year
Glass Volume Per Year	There will be approximately 4.82 L of glass produced per day during the operational phase of the Proposed Development. The TII Carbon Tool requires quantity of waste to be input in tonnes. The assumed density of glass waste to be used at the Proposed Development is approximately 0.694 kg/litre, which was informed by the UK Waste & Resources Action Programme bulk density research on mixed glass. Tonnes per year was calculated with the formula: (Litres per day × Density × 365) ÷ 1,000. So, (4.82 L x 0.694 kg/L x 365) ÷ 1,000 = 1.22 tonnes per year. The daily value would be (4.82 L x 0.694 kg/L) ÷ 1,000 == 0.0033 tonnes. Therefore, there will be approximately 0.0033 tonnes of glass per day for this project, or 1.22 tonnes per year.	1.22 tonnes per year

Waste Assumptions		
Organic Waste Volume Per Year	There will be approximately 47.68 L of organic waste produced per day during the operational phase of the Proposed Development. The TII Carbon Tool requires quantity of waste to be input in tonnes. The assumed density of organic waste to be used at the Proposed Development is approximately 0.344 kg/litre, which was derived from the EPA's official guidance for estimating on-site waste quantities, published as part of the National Waste Statistics reporting framework. This guidance provides typical full-bin weights for standard bin sizes across three waste categories: general residual waste, recyclables, and organic waste. Since the EPA guidance provides multiple bin-size reference points within each waste category, an average density was calculated within each category. Tonnes per year was calculated with the formula: (Litres per day × Density × 365) ÷ 1,000. So, (47.68 L x 0.344 kg/L x 365) ÷ 1,000 = 5.98 tonnes per year.The daily value would be (47.68 L x 0.344 kg/L) ÷ 1,000 == 0.016 tonnes.Therefore, there will be approximately 0.016 tonnes of organic waste per day for this project, or 5.98 tonnes per year.	5.98 tonnes per year

Carbon Vegetation Assumptions

Carbon Vegetation Assumptions		
Item	Description	Assumption
Replanting Area	A 2m buffer radius was applied to all planting points in QGIS, representing a blended average establishment-stage canopy footprint across the mixed plant sizes specified (multi-stem 300/350 through WR 30-35), based on an assumed size distribution. Based on this, the area of replanting is approximately 0.27 ha.	0.27 ha

Embodied Carbon Assumptions (Water Sports Building)

Embodied Carbon Assumptions (Water Sports Building)		
Item	Description	Assumption
Mass of Concrete Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 1920 tonnes of concrete required for the construction of the Water Sports building. The TII Carbon tool requires these units to be in kg. Given the formula, kg=tonnes×1000, approximately 1,920,000kg of concrete will be used for the Water Sports building.	1,920,000kg
Mass of Steel Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 226 tonnes of steel required for the construction of the Water Sports building. The TII Carbon tool requires these units to be in kg. Given the formula, kg=tonnes×1000, approximately 226,000kg of steel will be used for the Water Sports building.	226,000kg
Mass of Timber Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 55 tonnes of timber required for the construction of the Water Sports building. The TII Carbon Tool requires mass of timber to be input in kg. Given the formula, kg=tonnes×1000, approximately 55,000kg of timber will be used for the Water Sports building.	55,000kg
Mass of Plastic	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 10 tonnes of plastic required for the construction of the Water Sports building. The TII Carbon Tool requires mass of plastic to be input in kg. Given the formula, kg=tonnes×1000, approximately 10,000kg of plastic will be used for the Water Sports building.	10,000kg

Embodied Carbon Assumptions (Public Realm Works)

Embodied Carbon Assumptions (Public Realm Works)		
Item	Description	Assumption
Volume of Concrete Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 3,344m³ of concrete required for the public realm works. The TII Carbon tool requires these units to be in kg. The assumed density of concrete to be used at the Proposed Development is approximately 2,400 kg/m³ which applies to slab, foundations, kerbs, and precast steps. This is a standard concrete reference value. Based on an assumed 3,344m³ of concrete being required this would result in approximately 8,025,600kg being used for the public realm works.	8,025,600kg
Volume of Steel Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 0.5m³ of steel required for the public realm works. The TII Carbon tool requires these units to be in kg. The assumed density of steel to be used at the Proposed Development is approximately 7,850kg/m³. This is a standard reinforced steel reference value. Based on an assumed 0.5m³ of steel being required this would result in approximately 3,925kg being used for the public realm works.	3,925kg
Volume of Timber Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 18m³ of timber required for the public realm works. The TII Carbon Tool requires mass of timber to be input in kg. The assumed density of timber to be used at the Proposed Development is approximately 500 kg/m³, representing standard softwood timber. Therefore, there will be approximately 9,000 kg of timber required for the public realm works.	9,000 kg
Density of Permeable Paving (ethylene propylene diene monomer)	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), will be approximately 45m³ of permeable paving (ethylene propylene diene monomer) required for the playground for the public realm works. The TII Carbon tool requires these units to be in kg. The assumed density of permeable paving (ethylene propylene diene monomer) to be used at the Proposed Development is approximately 750kg/m³. Based on an assumed 45m³ of permeable paving being required this would result in approximately 33,750kg being used for the Proposed Development.	33,750kg
Permeable Paving (Resin bound 6 to	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 58m³ of permeable paving (resin bound 6 to 10mm aggregate) required the public realm works. The TII Carbon tool requires these units to be in kg. The assumed density of permeable paving (resin bound 6 to 10mm aggregate) to be used at the Proposed Development is approximately	116,000kg

Embodied Carbon Assumptions (Public Realm Works)		
10mm aggregate)	2,000kg/m³. Based on an assumed 58m³ of permeable paving being required this would result in approximately 116,000kg being used for the public realm works.	
Permeable Paving Carbon Factor	Resin-bound paving (6-10mm aggregate) carbon factor calculated using the Tool's Polymer Modified Bitumen (PMB) material as a proxy, given the structural similarity (aggregate + enhanced polymer binder system) and absence of a dedicated resin-bound paving factor in the Tool.	0.326 $kgCO_2e/kg$
Permeable Paving (Self-bound gravel)	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), will be approximately 5m³ of permeable paving (Resin bound 6 to 10mm aggregate) required for the public realm works. The TII Carbon tool requires these units to be in kg. The assumed density of permeable paving (Resin bound 6 to 10mm aggregate) to be used at the Proposed Development is approximately 1,900kg/m³ Based on an assumed 5m³ of permeable paving being required this would result in approximately 9,500kg being used for the Proposed Development.	9,500kg
Volume of Imported Fill	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), approximately 4,800m³ of imported fill are required for the public realm works. The TII Carbon Tool requires imported fill to be input in kg. The assumed density of fill to be used at the Proposed Development is approximately 1900 kg/m³. Density assumed at 1,900 kg/m³ for general mixed aggregate (bulk, loose descriptor), as a reasonable mid-range assumption between true loose bulk density and compacted in-situ density. This assumption leans toward a conservative estimate of embodied carbon. Based on an assumed 4,800m³ of fill being required this would result in approximately 9,120,000kg being used for the Proposed Development.	9,120,000kg
Volume of Granular Subbase	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), approximately 1,709m³ of granular subbase is required for the public realm works. The TII Carbon Tool requires granular subbase to be input in kg. The assumed density of fill to be used at the Proposed Development is approximately 1900 kg/m³. Density assumed at 1,900 kg/m³ for general mixed aggregate (bulk, loose descriptor), as a reasonable mid-range assumption between true loose bulk density and compacted in-situ density. This assumption leans toward a conservative estimate of embodied carbon. Based on an assumed 1,709m³ of granular subbase being required this would result in approximately 3,247,100kg being used for the Proposed Development.	3,247,100kg

Embodied Carbon Assumptions (Transport Elements, which include active travel works, marina extension, parking extension works)

Embodied Carbon Assumptions (Transport Elements, which include active travel works, marina extension, parking extension works)		
Item	Description	Assumption
Volume of In-Situ Concrete Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 441.7m³ of concrete required for the transport elements of this project. The TII Carbon tool requires these units to be in kg. The assumed density of concrete to be used at the Proposed Development is approximately 2,400 kg/m³ which applies to slab, foundations, kerbs, and precast steps. This is a standard concrete reference value. Based on an assumed 441.7m³ of concrete being required this would result in approximately 1,060,080kg being used for the transport elements of the Proposed Development.	1,060,080kg
Volume of Pre-Cast Concrete Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 138m³ concrete (kerbs) required for the transport elements of this project. The TII Carbon tool requires these units to be in kg. The assumed density of concrete to be used at the Proposed Development is approximately 2,400 kg/m³ which applies to slab, foundations, kerbs, and precast steps. This is a standard concrete reference value. Based on an assumed 138m³ of concrete being required this would result in approximately 331,200kg being used for the transport elements of the Proposed Development.	331,200kg
Volume of Steel Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 89.88 tonnes of steel required for the transport elements of this project. The TII Carbon tool requires these units to be in kg. The assumed density of steel to be used at the Proposed Development is approximately 7,850kg/m³. This is a standard reinforced steel reference value. Based on an assumed 89.88 tonnes of steel being required this would result in approximately 89,880kg being used for the transport elements of the Proposed Development.	89,880kg
Volume of Asphalt Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 2,027m³ of asphalt required for the traffic elements of this project. The TII Carbon Tool requires mass of asphalt to be input in tonnes. The assumed density of asphalt to be used at the Proposed Development is approximately 2,400 kg/m³, which is standard asphalt/bituminous mix reference. Based on an assumed 2,027m³ of asphalt being required this would result in approximately 4,864.8 tonnes being used for the transport elements of the Proposed Development.	4,864.8 tonnes
Volume of Timber Material	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), there will be approximately 8.041m³ of timber required for transport elements of this project. The TII Carbon Tool requires mass of timber to be input in kg.	4020.5 kg

Embodied Carbon Assumptions (Transport Elements, which include active travel works, marina extension, parking extension works)		
	The assumed density of timber to be used at the Proposed Development is approximately 500 kg/m^3, representing standard softwood timber. Therefore, there will be approximately 4020.5 kg of timber required for the transport elements of the Proposed Development.	
Polystyrene (Marina Extension) Material	Polystyrene was included in the Construction Materials Estimates (Appendix 10-3 of this EIAR). For the purposes of this assessment, a generic emissions factor was applied which is 2.98kg CO_2e per kilogram of material.	2.98kg CO_2e per kilogram of material
Volume of Polystyrene	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), will be approximately 1800.25m^3 of Polystyrene required for the transport elements of this project. The TII Carbon Tool requires Polystyrene to be input in kg. The assumed density of Polystyrene to be used at the Proposed Development is approximately 1,049 kg/m^3. Based on an assumed 1800.25m^3 of Polystyrene being required this would result in approximately 1,888,462.25kg being used for the transport elements of the Proposed Development.	1,888,462.25kg
Volume of Imported Fill	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), will be approximately 2,912m^3 of imported fill required for the transport elements of this project. The TII Carbon Tool requires imported fill to be input in kg. The assumed density of fill to be used at the Proposed Development is approximately 1900 kg/m^3. Density assumed at 1,900 kg/m^3 for general mixed aggregate (bulk, loose descriptor), as a reasonable mid-range assumption between true loose bulk density and compacted in-situ density. This assumption leans toward a conservative estimate of embodied carbon. Based on an assumed 2,912m^3 of fill being required this would result in approximately 5,532,800kg being used for the transport elements of the Proposed Development.	5,532,800kg
Volume ofGranular Subbase	As set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), will be approximately 350m^3 of granular subbase required for the transport elements of this project. The TII Carbon Tool requires granular subbase to be input in kg. The assumed density of granular subbase to be used at the Proposed Development is approximately 1900 kg/m^3. Density assumed at 1,900 kg/m^3 for general mixed aggregate (bulk, loose descriptor), as a reasonable mid-range assumption between true loose bulk density and compacted in-situ density. This assumption leans toward a conservative estimate of embodied carbon. Based on an assumed 350m^3 of fill being required this would result in approximately 665,000kg being used for the transport elements of the Proposed Development.	665,000kg
Area of Topsoil	The area (m^2) of topsoil was calculated by dividing the total volume of topsoil (752m^3), as set out in the Construction Materials Estimates (Appendix 10-3 of this EIAR), by the depth of 0.45 m (also as set out in Appendix 10-3), in accordance with the formula: Area (m^2)= Volume (m^3) / Depth (m) Therefore, the total area of topsoil is 1,671.1 m^2.	1,671.1 m^2

Carbon Losses

Transport Embodied Carbon (Transport Elements, which include active travel works, marina extension, parking extension works)

Transport Embodied Carbon (Transport Elements, which include active travel works, marina extension, parking extension works)				Assumptions			
Material Breakdown	**Category**	**Sub-Category**	**Material**	**Quantity**	**Unit**	**Density (kg/m^3), if relevant**	**Embodied tCO_2e**
Concrete	Series number: 1700 - Structural Concrete	In Situ Concrete - General	In-Situ Concrete, General	1059996	kg	2,400.00	197.47
		Concrete - Pre-Cast	Precast concrete paving (blocks, slabs, channels, and kerbs)	331200	kg	2,400	40.70
Asphalt (Paving)	Series number: 700 - Pavements	Pavement Surface	Asphalt, 5.5% binder content	4,864.80	tonne	2,400	269.023
Imported Fill	Series number: 600 - Earthworks	Backfill/Fill	Aggregates and sand, general UK, mixture of land won, marine, secondary, and recycled, bulk, loose	665000	kg	1900	4.968
Granular Subbase	Series number: 600 - Earthworks	Pavement Base and Sub base	Aggregates and sand, general UK, mixture of land won, marine, secondary, and recycled, bulk, loose	5552800	kg	1900	41.479
Topsoil / Landscaping	Series number: 600 - Earthworks	Topsoiling and Storage of Topsoil	Topsoil	1671	m^2		0.705
Steel	Other	Structural steelwork	Steel, engineering steel	89880	kg	7,850	147.40
Timber	Series number: 300 - Fencing and Environmental Noise Barriers	Fencing (timber)	Timber - Average of all data - No Carbon Storage	4020.5	kg	500	1.981

Transport Embodied Carbon (Transport Elements, which include active travel works, marina extension, parking extension works)				Assumptions			
Polystyrene	Series number: 2000 - Waterproofing for structures	Waterproofing and coatings	Polystyrene	1888462	kg		10953.0796
TOTAL							11656.8066

Built Environment Commercial Embodied Carbon (Water Sports Building and Public Realm Works)

Built Environment Commercial Embodied Carbon (Water Sports Building and Public Realm Works)				Assumptions			
Material Breakdown	**Category**	**Sub-Category**	**Material**	**Quantity**	**Unit**	**Density (kg/m^3), if relevant**	**Embodied tCO_2e**
Concrete	Series number: 1700 - Structural Concrete	In Situ Concrete - General	In-Situ Concrete, General	9945600	kg	2,400.00	8,075.83
Imported Fill	Series number: 600 - Earthworks	Backfill/Fill	Aggregates and sand, general UK, mixture of land won, marine, secondary, and recycled, bulk, loose	14652800	kg	1900	109.456
Granular Subbase	Series number: 600 - Earthworks	Pavement Base and Sub base	Aggregates and sand, general UK, mixture of land won, marine, secondary, and recycled, bulk, loose	3912100	kg	1900	29.223
Steel	Other	Structural steelwork	Steel, engineering steel	229925	kg	7,850	377.08

Built Environment Commercial Embodied Carbon (Water Sports Building and Public Realm Works)				Assumptions			
Timber	Series number: 300 - Fencing and Environmental Noise Barriers	Fencing (timber)	Timber - Average of all data - No Carbon Storage	64000	kg	500	31.541
Plastic	Series number: 2700 - Watermains, Utilities and Accommodation Works	Watermains	Plastic - Average	10,000	kg		58
Permeable Paving	Series number: 700 - Pavements	Pavement surface	Ethylene propylene diene monomer	33,750	kg	750	101.25
			Resin bound 6 to 10mm aggregate	116,000	kg	2000	41.076
		Pavement Base and Sub base	Self-bound gravel	9,500	kg	1900	0.071
Stone	Series number: 2400 - Brickwork, Blockwork and Stonework	Blockwork and Stonework	General Stone	2160	tonne		170.64
TOTAL							8994.161

TII Transport Inputs

TII Transport Inputs			Assumptions			
Phase	**Transport Type**	**Total no. Truck Loads (per day)**	**Working Days**	**Distance (km)**	**Distance (km) phase duration**	**Transport TCO_2e**
Construction Worker Travel to the Site	Car	42	755	22	1,395,240.00	294.256
Construction - Raw Material Transport	HGV-All-Average	30	755	22	996,600	1,080.813
TOTAL						294.256

Activities Emissions

Activities Emissions					
Category	**Sub Category**	**Activity**	**Quantity**	**Unit**	**Activity tCO_2e**
Earthworks - Excavation	General Excavation	General Excavation - Other	2150	m^3	2.235
Demolition and Site Clearance	General Clearance	General clearance - transitional woodland scrub	0.006	ha	0.003
Demolition and Site Clearance	General Clearance	General clearance - general site clearance	0.054	ha	0.024
TOTAL					2.262

Land Use Change and Vegetation Loss Emissions (tCO_2e)

Land Use Change and Vegetation Loss Emissions (tCO_2e)			
Vegetation Type	**Quantity**	**Unit**	**Carbon Sink tCO_2e (removed)**
Transitional woodland scrub	0.006	ha	0.163

Waste Stream Emissions (Operational Phase)

Waste Stream Emissions (Operational Phase)									
Waste Type	**Quantity Per Day (tonnes)**	**Reused/Recovery %age**	**Reused/Recovery Tonnes**	**Recycle %age**	**Recycle Tonnes**	**Disposal %age**	**Disposal tonnes**	**Compost %age**	**Compost tonnes**
Mixed Residual Waste (MRW)	23.18	75%	17.32	0.00%		25.30%	5.86	0.00%	-
Dry Mixed Recycling	2.09	0%	-	100.00%	2.09	0.00%	-	0.00%	-
Glass	0.12	0%	-	100.00%	0.12	0.00%	-	0.00%	-
Organic Waste	5.98	0%	-	0.00%	-	0.00%	-	100.00%	5.98
Total	**31.37**		**17.32**		**2.21**		**5.86**		**5.98**

Transport Waste Stream Emissions (Operational Phase)

Waste Stream Emissions (Operational Phase)							
Waste Type	**Waste Route**	**Quantity Per Year**	**Unit**	**Transport Mode**	**Distance per year**	**Waste processing CarbontCO$_2$e**	**Transport tCO$_2$e**
Mixed Residual Waste (MRW)	Landfill	5.86	tonnes	HGV - All - Average	1,144.00	3.042	1.241
Mixed Residual Waste (MRW)	Reuse	17.32	tonnes	N/A	N/A	0.369	
Dry Mixed Recycling	Recycle	2.09	tonnes	HGV - All - Average	1,144.00	0.013	1.241
Glass	Recycle	0.12	tonnes	HGV - All - Average	1,144.00	0.008	1.241
Organic Waste	Compost	5.98	tonnes	HGV - All - Average	1,144.00	0.053	1.241

Waste Stream Emissions (Operational Phase)							
Total		31.37				3.49	4.96

Results

Total Losses

Total Losses		
Origin of Losses	**Expected**	**%age Breakdown of total**
Losses associated with embodied carbon in construction materials	20,650.90	71.38%
Losses associated with traffic and transport movements	294.26	1.02%
Losses associated with excavation, site clearance, and demolition	2.26	0.01%
Losses associated with waste generated from construction/demolition for the Proposed Development	7,975.92	27.57%
Losses associated with waste generated from operational phase of the Proposed Development	8.45	0.03%
Losses associated with vegetation loss	0.016	0.00%
Total	**28,932**	**100.00%**

Transport Carbon Losses (Transport Elements, which include active travel works, marina extension, parking extension works)

Transport Carbon Losses (Transport Elements, which include active travel works, marina extension, parking extension works)		
Origin of Losses	**Expected**	**%age Breakdown of total**
Losses associated with embodied carbon in construction materials.	11,656.80	97.54%
Losses associated with traffic and transport movements	294.26	2.46%
Total	**11,951**	**100.00%**

Commercial Built Environment Losses

Built Environment		
Origin of Losses	**Expected**	**%age Breakdown of total**
Losses associated with embodied carbon in construction materials	8,994.16	52.97%
Losses associated with excavation, site clearance, and demolition	2.26	0.01%
Losses associated with waste generated from construction/demolition for the Proposed Development	7,975.92	46.97%
Losses associated with waste generated from operational phase of the Proposed Development	8.45	0.05%
Losses associated with vegetation loss	0.016	0.00%
Total	**16,981**	**100.00%**

Carbon Savings

Carbon Savings				
Vegetation Type	**Quantity**	**Unit**	**Carbon Sink tCO2e (added)**	**Offset Calculations**
Transitional woodland scrub	0.27	Ha	7.326	0.03%

Carbon Budget Calculations

Carbon Budget Calculations	Transport carbon Budget 2 (MtCO2eq)	Transport Carbon Budget 3 (MtCO2eq)	Built Environment-Commercial Budget 2 (MtCO2eq)	Built Environment-Commercial Budget 3 (MtCO2eq)
Total emissions over a 5-Year carbon budget period	37	Carbon Budget 3 (2031-2035, provisional at 151 MtCO2eq economy-wide) has not yet been disaggregated into sectoral ceilings, as this budget remains subject to review and public consultation. Therefore, consideration of the Proposed Development within the context of the identified Sectoral Emission Ceiling cannot be completed at the time of writing	5	Carbon Budget 3 (2031-2035, provisional at 151 MtCO2eq economy-wide) has not yet been disaggregated into sectoral ceilings, as this budget remains subject to review and public consultation. Therefore, consideration of the Proposed Development within the context of the identified Sectoral Emission Ceiling cannot be completed at the time of writing
Total emissions over a 5-Year carbon budget period in MtCO2eq	0.011951056		0.017	
%age of Carbon Budget	**0.032%**		**0.34%**	