Appendix A.17.1 Embodied Carbon Emissions

Appendix A.17.1



Document Verification

Project title		N6 Gal	way City Ring	Road					
Document t	itle	Append	lix A.17.1 Eml	1 Embodied Carbon Emissions					
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Revision	Date		Filename	Appendix A.17.1 Embodied Carbon Emissions					
Issue 1	28 Mar	2025	Description	Issued for 2025 RFI Response					

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	Description			
		Prepared by	Checked by	Approved by
	Name			
	Signature			
Issue Document Verificatio	n with Documer	nt 🗸		

Embodied Carbon Constructio n - Emission Factor TC02e/Unit Maintenan Construction Naterial Maintenan Ce Percentage Comme Material Element TC02e/Unit Material Unit Percentage Tonnes C02e Comme Excavations Excavations Excavations Factor Comme Comme Excavations Excavation Material 0.0010 7.538 m3 N/A 7.71 General	nt/ Assumption						
Excavations Hazardous Excavation Material 0.0010 7.538 m3 N/A 7.71 General							
Excavations Hazardous Excavation Material 0.0010 7.538 m3 N/A 7.71 General							
Excavations Pear 0.0004 75,953 m3 N/A 32.96 Genera	Excavation - Peat						
Excavations lopsoil 0.0007 183,497 m3 132.02 General	Excavation - Topsoli						
Excavations U1 Soil 0.001 147,452 m3 150.8 General Excavations U1 N/A N/A Instant American Ameri	I Excavation						
Rock 0.0191 7,749 m3 148.4 Genera Drilling, N/A Drilling, Drilling, Drilling,	l Excavation - rock , blasting and ripping of						
Blasted U1 Rock 0.0289 36,044 m3 1,048 hard rock Excavations Acceptable N/A Incomparing the second	<u>ck</u>						
Earthworks 0.0010 1,343,027 m3 1,361.2 Genera Excavations N/A	I Excavation						
Acceptable Rock 0.0011 254,907 m3 275.2 General Blasting Acceptable N/A Drilling.	l Excavation , blasting and ripping of						
Rock 0.0289 1,016,914 m3 29,392 hard roc Excavation N/A N/A <td><u>ck</u></td>	<u>ck</u>						
Marginal Material 0.0010 168,480 m3 172.4 Genera	l Excavation						
Total 32,727							
Residential N/A Zot							
Commercial N/A N/A							
Demolition 0.43 2 ha 0.86 Industrial N/A N/A Industrial N/A Industrial							
Demolition 0.43 1.4 ha 0.60 N/A N/A 0.60 0							
Site Clearance 0.43 180.3 ha 77.94							
Total 86.46							
Disferend	9, Includes steel ement 100kg rebar per oncrete, ng steel rebar from an EAF recycled stock. ed from						
Reinforced ICE Cen Concrete 0.0002 298,967,400 kg N/A 57,084 model.	nent, Mortar, Concrete						
Concrete In-Situ Stables 0.1020 1,379.2 T 140.7 Cement	9, precast concrete 0 with 50% GGBS						
Concrete Slabs N/A ICE 2019 Stables 0.2825 7,308 m3 2.064 Cement	७, precast concrete slab 0 with 50% GGBS :						
Total 59,289							
Pavement							
Stone Mastic Til TOOl Asphalt 0.0068 693.840 m2 170% 12.689 size agg	L, Dense asphalt e 14mm nominal						

				N/A		TII TOOL, Granular Material
AC20 50mm	0.0022	693,840	m2		1,549	Type 1 depth 100mm
				N/A		TII TOOL, Granular Material
AC32 200mm	0.0028	71,413	m2		201	Type 1 depth 150-200mm
AC22 200mm	0.0020	240 722		N/A	1 220	TII TOOL, Granular Material
AC32 260mm	0.0038	349,732	mz	NI/A	1,330	Type I depth 250-300mm
AC32 190mm	0.0028	222 381	m2	N/A	626.6	Tune 1 depth 150-200mm
AC32 130mm	0.0028	222,301	1112	Ν/Δ	020.0	TILTOOL Granular Material
AC32 250mm	0.0038	38.167	m2	,,,,	145.2	Type 1 depth 250-300mm
Crushed Rock						Surface dressing, coated
Chippings	0.0007	91,996	m2	354%	292.4	chippings, nominal size 10mm
				N/A		Unbound mixtures (type 1)
Sub-base 150mm	0.0010	679,012	m2		679.3	depth 150-200mm
						Average height, assumed to be
						one every 20m on each side of
Steel Columns	0.3077	2,164	Nr	38%	918.9	the road
	0.4000	1 710		2004	255.2	Assuming there is one every
LED Lights	0.1082	1,710	Nr	38%	255.3	20m, on each side of road
						Assuming speed every km on
Aluminium Signs	0.4508	151	Nr	38%	282 5	intersection
Reflecting Road	0.4508	434	INI	3876	202.5	Assumed to be 3 rows of
Studs (cat eves)	0.0035	51.300	Nr	125%	398.4	studs, placed every metre
Continuous Line		,		N/A		Assumed to be 2 continuous
Road Markings	0.0008	34,200	m		27.00	lines
Intermittent Line				N/A		
Road Markings	0.0009	68,400	m		59.40	Assumed to be 4 dashed lines
Letters and Shapes				N/A		Assumed one at each
- Directional Arrow	0.0235	210	Nr		4.92	interchange in each direction
Letters and Shapes				N/A		Assumed one at each
- Give Way Triangle	0.0141	210	Nr		2.97	interchange in each direction
Comoro i Staal nala	1 57	4	Nir	N/A	6.20	Drosumed value
Camera + Steer pole	1.57	4	INF	NI/A	0.30	Assuming miscellaneous cable
Miscellaneous				N/A		hoth directions for
Cable	0.001	34.200	m		35.68	length of scheme
				N/A		Length of perimeter of
Concrete Kerbing	0.025	129,609	m		3,249	pavement
Earthworks Fill				N/A		Granular material Type 2 depth
Stables	0.0059	22,132	m2		130.44	400-500mm
				N/A		Granular material Type 1-
Granular Fill Stables	0.0046	16,816	m2		76.83	Average
Rubberised	0.0004	16 270		N/A	C 49	Using gostoutile faster
Flooring Stables	0.0004	16,270	mz	NI/A	6.48	Osing geotextile factor
Retaining Wall				N/A		concrete volume, plain steel
Rebar	0.59	163.7	т		97.04	bar reinforcement
Total					23,066	
Landscaning and Veg	etation					
				N/A		
N6 Clearance	0.43	180	ha		77.84	
Vegetation				N/A		
Removed	1.3	16.98	ha		22.03	
Total					100	
Carbon Sink						
Vegetation Added	26.7	30.42	ha	N/A	812.46	Subtracted - carbon sink
Water and Energy						
Water used from				N/A		
			1			
concrete						
concrete production	1.47E-07	5,753,392	L		0.84	220L per m3 of concrete
production	1.47E-07	5,753,392	L	N/A	0.84	220L per m3 of concrete Using LED lights running for 10
concrete production Lighting Electricity	1.47E-07 2.96E-04	5,753,392 1,126	L kWh	N/A	0.84	220L per m3 of concrete Using LED lights running for 10 hours
concrete production Lighting Electricity Lighting	1.47E-07 2.96E-04	5,753,392 1,126	L kWh	N/A N/A	0.84	220L per m3 of concrete Using LED lights running for 10 hours Assuming portable lighting

Office Facilities				N/A		Using LED lights running for 10
Stables	2.96E-04	1,616	kWh		0.48	hours
				N/A		
Total					1.97	
Waste & Material Mo	vement					
Recycled				N/A		
Construction Waste	0.0010	17.710	т	,,,	17.4	70% can be recycled
Landfill		, -		N/A		
Construction Waste	0.2805	7,590	т		2,129	30% is sent to landfill
Recycled	0.2000	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		N/A		
Demolition of				14/7		
Waste	0.0010	13 899	т		13 7	70% can be recycled
Landfill Demolition	0.0010	13,055		N/A	13.7	70% can be recycled
of Waste	0 2805	5 957	т	N/A	1 671	30% is sent to landfill
of Waste	0.2005	5,557		N/A	1,071	Taken to Dublin port to be
Hazardous Waste	0 1988	16 599	т	17/7	3 299	brought overseas
Post Material	0.1500	10,555		N/A	5,235	brought overseus
Movement	0.0100	86 460	т	N/A	969	Deposited in MDA
Tomporany Stables	0.0100	80,409	1	NI/A	808	Deposited in MDA
				N/A		
Wasto	0 0020	E 040	т		0.04	
Waste Tanananan Chables	0.0020	5,049		N1/A	9.94	
Crean Deafing				N/A		
Green Rooting	0.0172	100 7	-		2.04	
waste	0.0173	169.7	1		2.94	
Temporary Stables				N/A		
Rubberised Surface		101.15	-			
Waste	0.0088	131.15	1		1.16	
Maintenance			_	N/A		Taken every 20 years (i.e. 6
Aggregate Waste	0.0010	312,062	T		307.1	times over life of road)
Total					8.320	
			TRANSPORT	EMISSIONS		
		Carbon				
		Carbon Emissions	Number	Assumed		
		Carbon Emissions Factor	Number of	Assumed Average		
Transport Element	Vehicle	Carbon Emissions Factor (TCO2e/km)	Number of Journeys	Assumed Average Distance	Tonnes CO2e	Comment/ Assumptions
Transport Element	Vehicle	Carbon Emissions Factor (TCO2e/km)	Number of Journeys	Assumed Average Distance	Tonnes CO2e	Comment/ Assumptions
Transport Element Material	Vehicle	Carbon Emissions Factor (TCO2e/km)	Number of Journeys	Assumed Average Distance	Tonnes CO2e	Comment/ Assumptions
Transport Element Material	Vehicle HGV - All-	Carbon Emissions Factor (TCO2e/km)	Number of Journeys	Assumed Average Distance	Tonnes CO2e	Comment/ Assumptions Distance from Bearna to
Transport Element Material Concrete	Vehicle HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085	Number of Journeys 17,326	Assumed Average Distance 25	Tonnes CO2e 369.41	Comment/ Assumptions Distance from Bearna to Coshla Quarry
Transport Element Material Concrete Stone Mastic	Vehicle HGV - All- Average HGV - All-	Carbon Emissions Factor (TCO2e/km) 0.00085	Number of Journeys 17,326	Assumed Average Distance 25	Tonnes CO2e 369.41	Comment/ Assumptions Distance from Bearna to Coshla Quarry Distance from Bearna to
Transport Element Material Concrete Stone Mastic Asphalt	Vehicle HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085	Number of Journeys 17,326 1,554	Assumed Average Distance 25 25	Tonnes CO2e 369.41 33.13	Comment/ Assumptions Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry
Transport Element Material Concrete Stone Mastic Asphalt	Vehicle HGV - All- Average HGV - All- Average HGV - All-	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085	Number of Journeys 17,326 1,554	Assumed Average Distance 25 25	Tonnes CO2e 369.41 33.13	Comment/ Assumptions Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Distance from Bearna to
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179	Assumed Average Distance 25 25 25	Tonnes CO2e 369.41 33.13 110.42	Comment/ Assumptions Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock China and	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All-	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179	Assumed Average Distance 25 25 25 25	Tonnes CO2e 369.41 33.13 110.42	Comment/ Assumptions Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554	Assumed Average Distance 25 25 25 25 25	Tonnes CO2e 369.41 33.13 110.42 33.13	Comment/ Assumptions Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554	Assumed Average Distance 25 25 25 25 25	Tonnes CO2e 369.41 33.13 110.42 33.13	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Text the description
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554	Assumed Average Distance 25 25 25 25 25	Tonnes CO2e 369.41 33.13 110.42 33.13	Comment/ Assumptions Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538	Assumed Average Distance 25 25 25 25 25 25 10	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538	Assumed Average Distance 25 25 25 25 25 25 10	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538	Assumed Average Distance 25 25 25 25 25 10	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Cosh
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256	Assumed Average Distance 25 25 25 25 25 10	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256	Assumed Average Distance 25 25 25 25 25 10 10	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256	Assumed Average Distance 25 25 25 25 25 10 10	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Cosheme Assumed movement of Earthworks within Cosheme Assumed movement of Earthworks within Cosheme Coshe
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill	Vehicle HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356	Assumed Average Distance 25 25 25 25 25 10 10	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18 28.62	Comment/ Assumptions Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill Rubberised	Vehicle HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356	Assumed Average Distance 25 25 25 25 25 10 10	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18 28.62	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill Rubberised Flooring	Vehicle HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356 23	Assumed Average Distance 25 25 25 25 25 10 10 10 10 10	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18 28.62 0.12	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed distance to supplier
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill Rubberised Flooring	Vehicle HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356 23	Assumed Average Distance 25 25 25 25 25 10 10 10 10 6.3	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18 28.62 0.12	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill Rubberised Flooring	Vehicle HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356 23	Assumed Average Distance 25 25 25 25 25 10 10 10 10 6.3	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18 28.62 0.12	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill Rubberised Flooring Precast slabs	Vehicle HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356 23 661	Assumed Average Distance 25 25 25 25 25 10 10 10 10 6.3	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18 28.62 0.12 14.09	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed distance to supplier Assumed distance to supplier
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill Rubberised Flooring Precast slabs Retaining Wall	Vehicle HGV - All- Average HGV - All-	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356 23 661	Assumed Average Distance 25 25 25 25 10 10 10 10 6.3	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18 28.62 0.12 14.09	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed distance to supplier Assumed distance to supplier
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill Rubberised Flooring Precast slabs Retaining Wall Rebar	Vehicle HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356 23 661 41	Assumed Average Distance 25 25 25 25 10 10 10 10 6.3 25 25 25	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18 28.62 0.12 14.09 0.87	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed distance to supplier Assumed distance to supplier Assumed distance to supplier
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill Rubberised Flooring Precast slabs Retaining Wall Retaining Wall	Vehicle HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356 23 661 41	Assumed Average Distance 25 25 25 25 10 10 10 10 6.3 25 25 25	Tonnes CO2e 369.41 33.13 110.42 33.13 132.52 2.18 28.62 0.12 14.09 0.87	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed distance to supplier Assumed distance to supplier Assumed distance to supplier
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill Rubberised Flooring Precast slabs Retaining Wall Rebar Retaining Wall Concrete	Vehicle HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356 23 661 41	Assumed Average Distance 25 25 25 25 10 10 10 6.3 25 25 25 25	Tonnes CO2e 369.41 3313 110.42 33.13 132.52 2.18 28.62 0.12 14.09 0.87 0.87	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed distance to supplier Assumed distance to supplier Assumed distance to supplier Assumed distance to supplier
Transport Element Material Concrete Stone Mastic Asphalt Asphalt Concrete Crushed Rock Chippings Sub-base 150mm Earthworks Fill Granular Fill Rubberised Flooring Precast slabs Retaining Wall Rebar Retaining Wall Concrete Loading Bays	Vehicle HGV - All- Average HGV - All- Average	Carbon Emissions Factor (TCO2e/km) 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085 0.00085	Number of Journeys 17,326 1,554 5,179 1,554 15,538 256 3,356 23 661 41	Assumed Average Distance 25 25 25 25 10 10 10 6.3 25 25 25 25	Tonnes CO2e 369.41 3313 110.42 33.13 1132.52 2.18 28.62 0.12 14.09 0.87 0.87	Comment/ Assumptions Distance from Bearna to Coshla Quarry Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed movement of Earthworks within Scheme Assumed distance to supplier Assumed distance to supplier Assumed distance to supplier Assumed distance to supplier

Waste & Material Movement							
Movement							
HGV - All- Assumed distance to I Hazadous Waste Average 0.00085 754 226 145.30 Port	Dublin						
HGV - All- Average Distance to lo C&D Waste Average 0.00085 1387 186.25 220.25 landfills	ocal						
HGV - All- Average distance betw	veen						
Peat deposition Average 0.00085 11010 2.51 23.54 start and end of scher	ne zones						
Concrete Roofing HGV - All-							
Waste Average 0.00085 2 167.46 0.29 Average distance to la	ndfill						
Temporary Stables Green Roofing HGV - All- Wath							
Waste Average 0.00085 17 167.46 2.43 Average distance to la Temporary Stables	nafili						
Rubberised Surface HGV - All-							
Waste Average 0.00085 25 167.46 3.57 Average distance to la	ndfill						
Total 395.37							
Carbon Emissions Factor Fuel Use							
Transport Element Fuel Type (TC02e/L) per hour Total Days Tonnes CO2e Comment/ Assumption	ons						
Vehicles during construction							
Assumed 10 hours per days N6, 248	⁻ day, 780						
Tractor with low Gasoil/Dies days on Phase 1 + 3 of	:						
loader el 0.00264 4.06 1276 136.65 racecourse each	. day 780						
days N6, 248	uu <i>y, 700</i>						
Gasoil/Dies days on Phase 1 + 3 of	:						
Wheel loader el 0.00264 18.90 1276 636.92 racecourse each	. day . 700						
davs N6, 124	day, 780						
Gasoil/Dies days on Phase 1 + 3 of	:						
Mobile crane el 0.00264 10.00 1028 271.50 racecourse each	1 700						
Assumed 10 hours per days N6, 124	⁻ day, 780						
Gasoil/Dies days on Phase 1 + 3 of	:						
Teleporter el 0.00264 7.00 1028 190.05 racecourse each	day 790						
Road Sweeper el 0.00264 6.00 780 123.60 days N6	uay, 780						
Total 1,359							
Vehicles during demolition							
Assumed 10 hours per	⁻ day, 30						
Gasoil/Dies days N6,	4						
Excavator ei 0.00264 9.1 40 9.61 10 days racecourse pr	ase 4 r day, 30						
Gasoil/Dies days N6,	uu,, 00						
Bulldozer el 0.00264 18.927 40 19.99 10 days racecourse ph	ase 5						
Assumed 10 hours per Gasoil/Dies	^r day, 30						
Dumptruck el 0.00264 3.5 40 3.70 10 days racecourse ph	ase 6						
Total 33.31							
Maintenance of Materials							
Stone Mastic Gasoil/Dies Assumed 10 hours per Asphalt el 0.00264 3 7 0.028 7 days, every 20 years	day for						
Crushed Rock Gasoil/Dies Assumed 10 hours per company. Chippings el 0.00264 3 7 0.028 7 days, every 20 years	day for						
Gasoil/Dies Assumed 10 hours per Steel Columns el 0.00264 3 7 0.028 7 days every 20 years	day for						
Gasoil/Dies Assumed 10 hours per	^r day for						
Lights el 0.00264 3 7 0.028 7 days, every 20 years	alay fo						
Aluminium Signs el 0.00264 3 7 0.028 7 days, every 20 years	uay tor						

Reflecting Road Studs (cat eyes)	Gasoil/Dies	0.00264	3	7	0.028	Assumed 10 hours per day for 7 days, every 20 years		
Total		0.00201			0.166			
Mode of Transport	Carbon Emissions Factor (TC02e/km)	No. of Employees	Man- days	Assumed Average Distance	Tonnes C02e	Comment/ Assumptions		
Employees to Site N6								
Car	0.000248	100	780	25	483	Across 3 year period of scheme 5 days a week		
Van	0.000178	150	780	25	520.2	Across 3 year period of scheme 5 days a week		
Employees to Site N6 Racecourse								
Car	0.000248	4	526	25	13	248 days phases 1+3, 30 days phase 4		
Van	0.000178	5	526	25	11.7	248 days phases 1+3, 30 days phase 4		