



East Anglia ONE North Offshore Windfarm

Appendix 26.13

Derivation of Construction Material Quantities and Associated HGV Demand

Environmental Statement Volume 3

Applicant: East Anglia ONE North Limited
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Pursuant to APFP Regulation: 5(2)(a)

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Material Vehicle Movements

Reference	General Data (Fixed Information)	Units	Value	Source/Comments
1.01	Number of Projects		1	OPEDA / Project Parameters
1.02	Number of circuits per project		2	OPEDA / Project Parameters
1.03	Tipper Truck Capacity	Tonnes	20	8x4 Rigid Tipper http://www.mop.co.uk/vehicle.htm
1.04	Ready Mix Concrete truck Capacity	m³	6	6m³ Truck mixer https://www.hanson.co.uk/en/technical-information/truck-information
1.05	Steel reinforcement per m³ of concrete	t/m³	0.065	Assumed
1.06	Type 1 Stone Density	t/m³	2.3	MOT Type 1 https://www.smithsbletcherington.co.uk/mot-type-1
1.07	Crusher Run Stone Density	t/m³	2.1	Crusher Run Stone https://www.smithsbletcherington.co.uk/limestone-crusher-run
1.08	Compound / Haul Road Type 1 Sub-base Thickness	m	0.15	Drawing ED11892-GE-2040 A
1.09	Compound / Haul Road Crushed Stone Thickness	m	0.1	Drawing ED11892-GE-2040 A
1.10	Geogrid mass/Area	kg/m²	0.22	Tensar SS20 https://www.drainagesuperstore.co.uk/userfiles/dp-tensar-geogrid.pdf
1.11	Mass of geogrid per delivery	Tonnes	2	Assumed
1.12	Concrete Block Length	m	0.215	https://www.travisperkins.co.uk/Solid-Dense-Concrete-Block-7-3N-100mm/p/700064
1.13	Concrete Block Width	m	0.215	https://www.travisperkins.co.uk/Solid-Dense-Concrete-Block-7-3N-100mm/p/700064
1.18	Concrete Block Height	m	0.1	https://www.travisperkins.co.uk/Solid-Dense-Concrete-Block-7-3N-100mm/p/700064
1.19	Number of concrete blocks per pallet	-	60	10 block on base of 1.2x1m pallet then 6 rows high
1.20	Number of pallets per delivery	-	5	Assumed
1.21	Native Soil Density	t/m³	2	Worst case for Glacial Clays
1.22	Mass of bentonite bag	kg	25	https://mistraini.co.uk/products/sodium-bentonite-grc
1.23	Number of bentonite bags per pallet	-	42	https://mistraini.co.uk/products/sodium-bentonite-grc
1.24	Density of bentonite	t/m³	0.9	https://mistraini.co.uk/products/sodium-bentonite-grc
1.25	Number of bentonite pallets per delivery	-	5	Assumed
1.26	Volume of fluid delivery vehicle	litres	30,000	Articulated Water Tanker https://www.water-direct.co.uk/what-we-do/water-tankers
1.27	Heras Fencing Panel Height	m	2	Heras HSG 151 Fencing https://www.heras-mobile.co.uk/fencing/151-system
1.28	Heras Fencing Panel Width	m	3.5	Heras HSG 151 Fencing https://www.heras-mobile.co.uk/fencing/151-system
1.29	Weight Per Panel	kg	16	Heras HSG 151 Fencing https://www.heras-mobile.co.uk/fencing/151-system
1.30	No of panels per delivery	-	125	Assumed 2T of panelling per delivery (includes all required feet and connectors)
1.31	Topsoil Depth	m	0.45	Assumed
1.32	Density of Topsoil	t/m³	0.67	https://www.rolawn.co.uk/calculating-topsoil-requirement
1.33	Length of stock fencing roll	m	500	1.15 Cattle Fence https://www.jacksons-fencing.co.uk/fencing/agricultural-fencing/wire-fencing-stoc
1.34	Frequency of Wooden Post	m	5	Assumed
1.35	Frequency of tension post (includes 2 stay posts)	m	50	Assumed
1.36	Length of fencing (including required posts) per HGV Deliver	m	4000	Assumed

Reference	Landfall Data (Fixed Information)	Units	Value	Source/Comments
2.01	Width of HDD Compound	m	100	Drawing ED11892-GE-2016 Rev D
2.02	Length of HDD Compound	m	70	Drawing ED11892-GE-2016 Rev D
2.03	Number of HDDs per compound	-	4	Drawing ED11892-GE-2016 Rev D
2.04	Number of marine export cables per project	-	2	OPEDA / Project Parameters
2.05	Marine Export cable diameter	m	0.285	EA1 Methodology
2.06	Marine export cable length per drum	m	500	Unknown
2.07	Number of marine export cable drums per delivery	-	0	Brought in from offshore
2.08	Number of marine fibre cables per project	-	2	OPEDA / Project Parameters
2.09	Marine fibre cable diameter	m	0	Unknown
2.10	Marine fibre cable length per drum	m	0	Unknown
2.11	Number of marine fibre cable drums per delivery	-	0	Brought in from offshore
2.12	HDD reamed diameter	m	1.1	Calculated (2.16 * 4/3)
2.13	Volume of drill fluid required per metre length of bore	m³	2.38	(2.5 times volume of soil removed based on advice from Tim Riggall, Riggall & Associates on 31/07/2018)
2.14	Percentage of drill fluid removed from site	%	40	Assumed
2.15	Bentonite required	kg/m³ of drill fluid	37	Assumed
2.16	HDD duct diameter	m	0.8	EA1 Methodology
2.17	HDD duct section length	m	0	Brought in from offshore
2.18	No of HDD duct lengths per delivery	-	0	Brought in from offshore
2.19	Number of transition bays to be constructed	-	4	OPEDA / Project Parameters
2.20	Transition bay width (construction footprint)	m	42	Project Parameters
2.21	Transition bay height (construction footprint)	m	3	Project Parameters
2.22	Transition bay length (construction footprint)	m	37	Project Parameters
2.23	Transition bay width (underground infrastructure only)	m	6	OPEDA / Project Parameters
2.24	Transition bay height (underground infrastructure only)	m	1.8	OPEDA / Project Parameters
2.25	Transition bay length (underground infrastructure only)	m	21	OPEDA / Project Parameters
2.26	Transition bay slab surface area	m²	126	Calculated (2.23 x 2.25)
2.27	Transition bay slab thickness	m	0.2	To be confirmed
2.28	Transition bay slab concrete volume	m³	25.2	Calculated (2.26 x 2.27)
2.29	Transition bay steel reinforcement	Tonnes	1.638	Calculated (1.05 x 2.28)
2.30	Number of blocks per transition bay	-	2196	IWA Calculation
2.31	Precast concrete slab length	m	5.26	Assumed (to be designed)
2.32	Precast concrete slab width	m	0.5	Assumed (to be designed)
2.33	Precast concrete slab height	m	0.25	Assumed (to be designed)
2.34	Number of precast concrete slabs per delivery	-	4	Each slab approx. 5T
2.35	Number of precast concrete slabs per transition bay	-	42	Calculated (2.25 x 2.32)
2.36	Depth to top of transition bay installed underground infrastructure	m	1.2	Project Parameters
2.37	Temporary HGV holding zone at Elm Tree farm	m²	1200	From plan minus 2 public road access areas
2.38	Additional Area required of HGV Turning Area	m²	250	Drawing ED11892-GE-20131

Reference	Onshore Data (Fixed Information)	Units	Value	Source/Comments
3.01	Large CCS compound length	m	165	Drawing ED11892-GE-2058
3.02	Large CCS compound width	m	100	Drawing ED11892-GE-2058
3.03	Large CCS compound tarmac area	m ²	3,000	Drawing ED11892-GE-2058
3.04	Large CCS compound hardstanding area	m ²	10,600	Drawing ED11892-GE-2058
3.05	Medium CCS compound length	m	88	Drawing ED11892-GE-2057
3.06	Medium CCS compound width	m	80	Drawing ED11892-GE-2057
3.07	Medium CCS compound hardstanding area	m ²	5,525	Drawing ED11892-GE-2057
3.08	Small CCS compound length	m	50	Drawing ED11892-GE-2056
3.09	Small CCS compound width	m	50	Drawing ED11892-GE-2056
3.10	Small CCS compound Hardstanding Area	m ²	1,975	Drawing ED11892-GE-2056
3.11	Number of terrestrial export cables per project	-	6	OPEDA / Project Parameters
3.12	Number of terrestrial fibre cables per project	-	2	OPEDA / Project Parameters
3.13	Number of trenches per project	-	2	OPEDA / Project Parameters
3.14	Number of export cable ducts per trench	-	3	OPEDA / Project Parameters
3.15	Number of fibre cable ducts per trench	-	1	OPEDA / Project Parameters
3.16	Number of Projects to have cables installed in ducts	-	1	OPEDA / Project Parameters
3.17	Number of Projects for empty ducts to be installed	-	0	OPEDA / Project Parameters
3.18	Normal Onshore Cable Route Width	m	31.9	OPEDA / Project Parameters
3.19	Reduced Onshore Cable Route Width	m	16.1	OPEDA / Project Parameters
3.20	Cable trench width	m	0.9	Project Parameters
3.21	Cable trench depth	m	1.615	Project Parameters
3.22	Cement Bound Sand (CBS) depth	m	1.1	ED11892-GE-2041 A
3.23	CBS Volume per m run of trench	m ³	0.31	ED11892-GE-2041 A
3.24	CBS density	t/m ³	1.6	Assumed
3.25	Tile length	m	1	https://www.powerandcables.com/product/product-category/stokbord-cable-protection-1000mm-x-450mm
3.26	Tile width	m	0.45	https://www.powerandcables.com/product/product-category/stokbord-cable-protection-1000mm-x-450mm
3.27	Tile Height	m	0.02	Assumed
3.28	Number of tiles per delivery	-	800	Assumed. Based on 40 per pack and 20 packs per delivery
3.29	Depth to top of tile	m	1.00	ED11892-GE-2041 A
3.30	Terrestrial export cable diameter	m	0.17	OPEDA / Project Parameters
3.31	Terrestrial export cable length per drum	m	500	Project Parameters
3.32	Number of terrestrial export cable drums per delivery	-	1	Weight of cable 34T
3.33	Terrestrial fibre cable diameter	m	0.025	Assumed
3.34	Terrestrial fibre cable length per drum	m	2000	TBC
3.35	Number of terrestrial fibre cable drums per delivery	-	1	TBC
3.36	Diameter of terrestrial export cable ducts	m	0.25	ED11892-GE-2041 A
3.37	Diameter of terrestrial fibre cable ducts	m	0.11	ED11892-GE-2041 A
3.38	Length of terrestrial export cable duct	m	6	Page 32 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
3.39	Length of terrestrial fibre cable duct	m	6	Page 30 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
3.40	Number of terrestrial export cable ducts per pack	-	16	Page 32 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
3.41	Number of terrestrial fibre cable ducts per pack	-	90	Page 30 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
3.42	Number of duct packs per delivery	-	4	Assumed
3.43	Bentonite required for cable installation in duct	kg/m ³ of fluid	60	Assumed
3.44	Maximum distance between jointing bays	m	500	Project Parameters
3.45	Number of export cables per jointing bay	-	3	Project Parameters
3.46	Number of jointing bays per location	-	2	Project Parameters
3.47	Jointing bay width (construction footprint)	m	18.6	Project Parameters
3.48	Jointing bay height (construction footprint)	m	2.9	Project Parameters
3.49	Jointing bay length (construction footprint)	m	30.6	Project Parameters
3.50	Jointing bay width (underground infrastructure only)	m	3	OPEDA / Project Parameters
3.51	Jointing bay height (underground infrastructure only)	m	1.7	OPEDA / Project Parameters
3.52	Jointing bay length (underground infrastructure only)	m	15	OPEDA / Project Parameters
3.53	Jointing bay slab surface area	m ²	45	Calculated (3.50 x 3.52)
3.54	Jointing bay slab thickness	m	0.2	To be confirmed
3.55	Jointing bay slab concrete volume	m ³	9	Calculated (3.53 x 3.54)
3.56	Jointing bay steel reinforcement	Tonnes	0.585	Calculated (1.05 x 3.55)
3.57	Number of blocks per jointing bay	-	1394	WA Calculation
3.58	Precast concrete slab length	m	3	Assumed (to be designed)
3.59	Precast concrete slab width	m	1	Assumed (to be designed)
3.60	Precast concrete slab height	m	0.3	Assumed (to be designed)
3.61	Number of precast concrete slabs per delivery	-	8	Each slab approx. 2.5T
3.62	Number of concrete slabs per jointing bay	-	15	Calculated (3.52 x 3.59)
3.63	Depth to top of jointing bay installed underground infrastructure	m	1.2	Project Parameters
3.64	Number of cable joint kits per jointing bay	-	3	Assumed
3.65	Number of cable joint kits per delivery	-	3	Assumed
3.66	Maximum distance between link boxes	m	500	Project Parameters
3.67	Number of link boxes per jointing bay	-	2	Project Parameters
3.68	Link box height	m	1.5	Project Parameters
3.69	Width of haul road / permanent access road	m	4.5	OPEDA / Project Parameters
3.70	Minimum distance between Passing Places	m	87	ED11892-GE-2006
3.71	Length of passing place	m	32	ED11892-GE-2006
3.72	Width of passing place	m	4	ED11892-GE-2006
3.73	Area of passing place	m ²	128	Calculated (3.71 x 3.72)
3.74	Volume of Type 1 Stone required per passing place	m ³	19.2	Calculated (1.08 x 3.73)
3.75	Volume of Crusher Run Stone Required per passing place	m ³	12.8	Calculated (1.09 x 3.73)
3.76	Width of Medium Length HDD Compound	m	90	Drawing ED11892-GE-2046 Rev B
3.77	Length of Medium Length HDD Entry Pit Compound	m	70	Drawing ED11892-GE-2046 Rev B
3.78	Width of Short Length HDD Entry Pit Compound	m	75	5m spacing between drills
3.79	Length of Short Length HDD Entry Pit Compound	m	50	5m spacing between drills
3.80	Width of Short Length HDD Exit Pit Compound	m	75	5m spacing between drills
3.81	Length of Medium / Short Length HDD Exit Pit Compound	m	30	-
3.82	Standard Length of Short HDD	m	112	WA Calculation
3.83	Number of HDDs per compound	-	9	Drawing ED11892-GE-2046 Rev B
3.84	HDD reamed diameter	-	0.4	Calculated (3.88 * 4/3)
3.85	Volume of drill fluid required per metre length of bore	m ³	0.19	(1.5 times volume of soil removed based on advice from Tim Riggall, Riggall & Associates on 02/08/2018, *1.5 x volume, that will be conservative
3.86	Volume of drill fluid removed from site per metre length of bore	m ³	0.11	(Based on advice from Tim Riggall, Riggall & Associates on 02/08/2018 *for waste fluid to be removed from site assume 0.5 x hole volume plus the volume displaced by the duct
3.87	Bentonite required	kg/m ³ of drill fluid	37	Assumed
3.88	Onshore HDD duct diameter	m	0.25	Assumed
3.89	Onshore HDD duct section length	m	10	Assumed
3.90	No of HDD duct lengths per delivery	-	25	Assumed
3.91	Number of welfare / HDD rigs / infrastructure per compound	-	100	Drawing ED11892-GE-2017 Rev C

Reference	Access and Permanent Haul Road Data (Fixed Information)	Units	Value	Source/Comments
4.01	Area of access tarmac surface	m ²	170	ED11892-GE-2038 A
4.02	Length of R2 8m external radi kerbing required per access	m	25	ED11892-GE-2038 A
4.03	Maximum Length of K2 straight kerbing required per access	m	394.5	ED11892-GE-2038 A
4.04	Length of one R2 8m external radi kerb	m	0.78	https://www.marshalls.co.uk/commercial/assets/documents/product-specifications/kerb07.pdf
4.05	Length of one K2 straight kerb	m	0.914	https://www.marshalls.co.uk/commercial/assets/documents/product-specifications/kerb07.pdf
4.06	Number of internal radi kerbs required per access	-	32	Calculated (4.02 / 4.04)
4.07	Maximum Number of straight kerbs required per access	-	432	Calculated (4.03 / 4.05)
4.08	Number of R2 8m external radi kerbs per pallet	-	10	Assumed
4.09	Number of R2 straight kerbs per pallet	-	18	Assumed
4.10	Number of kerb pallets per delivery	-	6	Assumed
4.12	Maximum volume of concrete required for kerbing at each access	m ³	33.2	Volume calculated from design drawing x length of kerbing required
4.13	Maximum Depth of Type 1 mortar required	m	0.04	Worst case Assumed
4.14	Maximum Volume of Type 1 mortar required per access	m ³	2.1	Calculated (125 x (4.02 + 4.02) x 4.13)
4.15	Maximum Volume of cement required per access	m ³	0.49	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sand
4.16	Density of cement	tonnes/m ³	3.15	Calculated (4.15 / 4.16)
4.17	Mass of cement required per access	tonnes	0.16	Calculated (4.15 / 4.16)
4.18	Mass of cement per bag	kg	25	https://www.condeil-ld.com/full-pallet-general-purpose-cement-opc-25kg-60-per-pallet?gclid=EAlaQobChMImPHW44702gIVB-MbCh2LUwy-EAQYBCABegIQAD_Ba
4.19	Number of cement bags per pallet	-	60	https://www.condeil-ld.com/full-pallet-general-purpose-cement-opc-25kg-60-per-pallet?gclid=EAlaQobChMImPHW44702gIVB-MbCh2LUwy-EAQYBCABegIQAD_Ba
4.20	Maximum Volume of lime required per access	m ³	0.12	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sand
4.21	Density of lime	tonnes/m ³	2.21	https://www.sfb.com/-/media/Files/miswaco/ps-drilling-fluids/lime.pdf?la=en&hash=2FD5F24971492980C016D52C63F7FFCC7B40F0A
4.22	Mass of lime required per access	tonnes	0.06	Calculated (4.20 / 4.21)
4.23	Mass of lime per bag	kg	25	https://www.condeil-ld.com/rugby-lime-25kg?gclid=EAlaQobChMI5suZyJDO2gIVQucbCh2r-wUAEAQYASABegJRHPD_Bw
4.24	Number of lime bags per pallet	-	60	Assumed
4.25	Maximum Volume of sand required per access	m ³	1.48	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sand
4.26	Density of sand	tonnes/m ³	1.70	https://www.smihsbletchington.co.uk/mixed-building-sand
4.27	Mass of sand required per access	tonnes	0.87	Calculated (4.20 / 4.21)
4.28	Mass of sand per bag	tonnes	0.9	https://www.condeil-ld.com/rugby-lime-25kg?gclid=EAlaQobChMI5suZyJDO2gIVQucbCh2r-wUAEAQYASABegJRHPD_Bw
4.29	Number of cement pallets / lime pallets / sand bags per deliver	-	4	Assumed (assumes all three items can be delivered in same deliver)
4.30	Depth of sub-base beneath kerb	m	0.150	Assumed
4.31	Maximum volume of sub-base beneath kerb	m ³	25.17	Calculated from design drawing and length of kerbing
4.32	Permanent access road sub-base depth	m	0.225	Suffolk County Council Estate Road Specifier
4.33	Permanent access road Asphalt Depth	m	0.25	Suffolk County Council Estate Road Specifier
4.34	Bulk Density of Asphalt	tonnes/m ³	2.36	https://www.engineeringtoolbox.com/density-solids-d_1265.htm
4.35	Width of Permanent Access Corridor	m	10.1	

Reference	Substation (Fixed Information)	Units	Value	Source/Comments
5.01	Length of Substation Compound	m	190	ED11892-GE-2037 A
5.02	Width of Substation Compound	m	190	ED11892-GE-2037 A
5.03	Area of Substation Compound	m ²	36100	Calculated (5.01 x 5.03)
5.04	Depth of surface concrete slab	m	0.15	Nominal for non trafficed yard slat
5.05	Depth of sub-base beneath concrete slat	m	0.15	Nominal for non trafficed yard slat
5.06	Number of interconnector trenches per substation	-	2	iberdrola Drawing EA1-GRD-DH-PRY-10893C
5.07	Depth of trench	m	1.615	ED11892-GE-2044 A
5.08	Width of trench	m	1.450	ED11892-GE-2044 A
5.09	Diameter of 400kV cable	m	0.120	SPR Document EA1-GRD-H-PRY-028854-Rev1-ONCA - 400kV Technical Components Documen
5.10	400kV cable length per drum	m	500	Assumed
5.11	Number of 400kV cable drums per delivery	-	1	Assumed
5.12	Diameter of fibre cable	m	0.025	TBC
5.13	Fibre cable length per drum	m	2000	Assumed
5.14	Number of fibre cable drums per delivery	-	1	Assumed
5.15	Diameter of ECC cable	m	0.05	TBC
5.16	ECC length per drum	m	2000	Assumed
5.17	Number of ECC cable drums per delivery	-	1	Assumed
5.18	Number of 400kV Cable Ducts per trench	-	3	ED11892-GE-2044 A
5.19	Diameter of 400kV cable ducts	m	0.20	ED11892-GE-2044 A
5.20	Length of 400kV cable duct	m	6	Page 32 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
5.21	Number of 400kV cable ducts per pack	-	25	Page 32 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
5.22	Number of fibre cable ducts per trench	-	1	ED11892-GE-2044 A
5.23	Diameter of fibre cable ducts	m	0.11	ED11892-GE-2044 A
5.24	Length of fibre cable ducts	m	6	Page 30 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
5.25	Number of fibre cable ducts per pack	-	90	Page 30 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
5.26	Number of sub ducts within fibre cable duc	-	4	ED11892-GE-2044 A
5.27	Diameter of sub ducts	m	0.032	ED11892-GE-2044 A
5.28	Length of sub duct coil	m	50	Page 37 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
5.29	Number of sub duct coils per pack	-	4	Page 37 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
5.30	Number of ECC cable ducts per trench	-	1	ED11892-GE-2044 A
5.31	Diameter of ECC Cable Ducts	m	0.11	ED11892-GE-2044 A
5.32	Length of fibre cable ducts	m	6	Page 30 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
5.33	Number of fibre cable ducts per pack	-	90	Page 30 http://www.emtelie.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
5.34	Number of duct packs per delivery	-	4	Assumed
5.35	Cement Bound Sand (CBS) depth	m	1.24	ED11892-GE-2044 A
5.36	CBS Volume per m run of trench	m ³	0.43	ED11892-GE-2044 A
5.37	CBS density	tm ³	1.8	Assumed
5.38	Tile length	m	1	https://www.powerandcables.com/product/product-category/stokbord-cable-protection-1000mm-x-450mm
5.39	Tile width	m	0.45	https://www.powerandcables.com/product/product-category/stokbord-cable-protection-1000mm-x-450mm
5.40	Tile Height	m	0.05	Assumed
5.41	Number of tiles per delivery	-	800	Assumed. Based on 40 per pack and 20 packs per delivery
5.42	Depth to top of tile	m	1.14	ED11892-GE-2044 A
5.43	Bentonite required for cable installation in duct	kg/m ² of fluid	60	Assumed
5.44	Substation CCS compound length	m	190	Drawing ED11892-GE-2057
5.45	Substation CCs compound width	m	90	Drawing ED11892-GE-2057
5.46	Substation CCS compound handstanding area	m ²	11050	Drawing ED11892-GE-2057

Measured Parameters	Units	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Number of accesses	m	0	1	1	0	1	2	1	1700
Permanent Haul road length	m	0	0	0	0	0	0	0	8
Permanent Haul road width	m	0	0	0	0	0	0	0	400
Temporary Hardstanding Haul road length	m	0	2428	2904	582	86	1728	1135	0
Temporary tarmac haul road length	m	0	0	0	0	0	0	453	0
Number of HGV Turning Areas	-	0	0	0	0	0	1	0	0
Number of Large CCS	-	0	0	0	0	0	1	0	0
Number of Medium CCS	-	1	1	1	0	0	0	0	0
Number of Small CCS	-	0.0	0	0	1	0	1	0	0
Number of substation CCS	-	0	0	0	0	0	0	0	1
Number of HGV Holding Areas	-	0	0	0	0	0	0	0	0
Number of joint bays required per project	-	0	10	10	4	0	6	8	0
Length of Trenching	m	0	2078	2296	582	86	1728	1588	326
Number of transition bays per project	-	2	0	0	0	0	0	0	0
Number of Landfall HDD locations	-	1	0	0	0	0	0	0	0
Length of Landfall HDD	m	1300	0	0	0	0	0	0	0
Number of Medium Length HDD Drilling Compound	-	0	1	0	0	0	0	0	0
Total length of medium length HDD	m	0	407	0	0	0	0	0	0
Number of Medium Length HDD Exit Pit Compounds	m	0	0	1	0	0	0	0	0
Number of Short Length HDD Drilling Compound	m	0	0	0	0	0	0	0	0
Total length of short length HDD	-	0	0	0	0	0	0	0	0
Number of Short Length HDD Exit Pit Compounds	-	0	0	0	0	0	0	0	0
Number of Substation Operational Compound	-	0	0	0	0	0	0	0	1
Volume of Topsoil to be removed from Substation Site and SUD	m³	0	0	0	0	0	0	0	10,731
Volume of Sub-soil to be imported/exported for Substation Site and SUD	m³	0	0	0	0	0	0	0	763
Distance between National Grid and Project Substation	m	0	0	0	0	0	0	0	20

Total Vehicle Movements (without miscellaneous allowances)		Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Access from Public Road HGV Movements		0	52	52	0	52	98	52	29
Permanent Haul Road HGV Movements		0	0	0	0	0	0	0	1,058
Total haul road construction HGV movements		0	816	976	200	34	596	1,030	206
Total CCS Construction HGV movements		316	316	316	118	0	118	932	624
Total HGV Holding Area at Elm Tree Farm HGV Movements		0	0	0	0	0	0	0	0
Total Marine Electrical Cable HGV Movement		0	0	0	0	0	0	0	0
Total Marine Fibre Cable HGV Movements		0	0	0	0	0	0	0	0
Total Terrestrial Electrical Cable HGV Movement		0	30	28	7	2	21	20	4
Total Terrestrial Fibre Cable HGV Movement		0	3	3	1	1	3	2	1
Total cable joint tile HGV movements		0	10	10	4	0	6	8	0
Total tile HGV movements		0	11	12	3	1	9	8	2
Total trench HGV movements		0	335	370	95	15	279	256	54
Total cable duct HGV movements		0	35	39	10	2	29	27	6
Bentonite cable installation (In Ducts) HGV Movement		0	0	0	0	0	0	0	0
Joining bay HGV movements		0	293	293	118	0	176	235	0
Transition bay HGV movements		92	0	0	0	0	0	0	0
Landfall HDD HGV movements		1,554	0	0	0	0	0	0	0
Medium Length Onshore HDD Drilling Compound HGV movement		0	461	0	0	0	0	0	0
Medium Length Onshore HDD Exit Pit Compound HGV movements		0	0	156	0	0	0	0	0
Short Length Onshore HDD Drilling Compound HGV movements		0	0	0	0	0	0	0	0
Short Length Onshore HDD Exit Pit Compound HGV movements		0	0	0	0	0	0	0	0
Substation Compound Earthworks and Surface HGV Movements		0	0	0	0	0	0	0	2,019
Project Substation - National Grid Connector		0	0	0	0	0	0	0	10
Grand total deliveries		1,962	2,362	2,255	566	107	1,334	2,570	4,013
Grand total (two way movements)		3,924	4,724	4,510	1,112	214	2,668	5,140	8,026

Access From Public Road Construction	Units	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Number of accesses	m	0	1	1	0	1	2	1	1700
Area of tarmac surface	m²	0	170	170	0	170	340	170	170
Volume of Sub-base stone (Type 1)	m³	0	63	63	0	63	127	63	63
Mass of Type 1 stone required	Tonnes	0	146	146	0	146	292	146	146
Number of Type 1 stone deliveries	-	0	8	8	0	8	15	8	8
Volume of Asphalt	m³	0	43	43	0	43	85	43	43
Mass of Asphalt	Tonnes	0	100	100	0	100	201	100	100
Number of Asphalt Deliveries	-	0	6	6	0	6	11	6	6
Number of R2 8m external radi kerbs	-	0	32	32	0	32	64	32	32
Number of K2 straight kerbs	-	0	432	432	0	432	864	432	432
Total number of pallets of kerbs	-	0	27	27	0	27	54	27	27
Number of kerb deliveries	-	0	5	5	0	5	10	5	5
Volume of concrete required	m³	0.0	33.2	33.2	0.0	33.2	66.4	33.2	33.2
Number of concrete deliveries	-	0	6	6	0	6	12	6	6
Volume of mortar required	m³	0	2	2	0	2	4	2	2
Mass of cement required	Tonnes	0.00	0.16	0.16	0.00	0.16	0.31	0.16	0.16
Mass of lime required	Tonnes	0.00	0.06	0.06	0.00	0.06	0.11	0.06	0.06
Mass of sand required	Tonnes	0.00	0.87	0.87	0.00	0.87	1.74	0.87	0.87
Number of Cement pallets required	-	0	1	1	0	1	1	1	1
Number of lime pallets required	-	0	1	1	0	1	1	1	1
Number of sand bags required	-	0	1	1	0	1	1	1	1
Number of cement pallet, lime pallet and sand bag deliveries	-	0	1	1	0	1	1	1	1
Volume of Topsoil to be removed from site (permanent access only)	m³	0	0	0	0	0	0	0	77
Mass of Topsoil to be removed from site (permanent access only)	Tonnes	0	0	0	0	0	0	0	51
Number of topsoil removal movements (permanent access only)	-	0	0	0	0	0	0	0	3
Removal of temporary access movements	-	0	26	26	0	26	49	26	0
Number of HGV movements	-	0	52	52	0	52	98	52	29

Permanent Haul Road Construction	Units	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Haul road length	m	0	0	0	0	0	0	0	1700
Haul road width	m	0	0	0	0	0	0	0	8.0
Number of passing places required	-	0	0	0	0	0	0	0	0
Surface area	m ²	0	0	0	0	0	0	0	13,600
Volume of Sub-base stone For road and kerbing	m ³	0	0	0	0	0	0	0	3,264
Mass of stone	Tonnes	0	0	0	0	0	0	0	7,507
Number of stone deliveries	-	0	0	0	0	0	0	0	376
Volume of Asphalt	m ³	0	0	0	0	0	0	0	3,400
Mass of Asphalt	Tonnes	0	0	0	0	0	0	0	8,024
Number of Asphalt Deliveries	-	0	0	0	0	0	0	0	402
Number of K2 Straight Kerbs	-	0	0	0	0	0	0	0	1,880
Total number of pallets of kerbs	-	0	0	0	0	0	0	0	103
Number of kerb deliveries	-	0	0	0	0	0	0	0	18
Maximum volume of concrete required for kerbing	m ³	0	0	0	0	0	0	0	269.0
Number of concrete deliveries	-	0	0	0	0	0	0	0	45
Volume of mortar required	m ³	0	0	0	0	0	0	0	17.0
Volume of cement required	m ³	0	0	0	0	0	0	0	4.00
Mass of cement required	Tonnes	0	0	0	0	0	0	0	1.27
Volume of lime required	m ³	0	0	0	0	0	0	0	1.00
Mass of lime required	Tonnes	0	0	0	0	0	0	0	0.57
Volume of sand required	m ³	0	0	0	0	0	0	0	12.00
Mass of sand required	Tonnes	0	0	0	0	0	0	0	7.1
Number of Cement pallets required	-	0	0	0	0	0	0	0	1
Number of lime pallets required	-	0	0	0	0	0	0	0	1
Number of sand bags required	-	0	0	0	0	0	0	0	8
Number of cement pallet, lime pallet and sand bag deliveries	-	0	0	0	0	0	0	0	3
Length of permanent security fencing requirec	m	0	0	0	0	0	0	0	3,420.2
Number of fencing panels required	-	0	0	0	0	0	0	0	978
Number of fencing panel deliveries	-	0	0	0	0	0	0	0	8
Volume of Topsoil to be removed from site	m ³	0	0	0	0	0	0	0	6,120
Mass of Topsoil to be removed from site	Tonnes	0	0	0	0	0	0	0	4,100
Number of topsoil removal movements	-	0	0	0	0	0	0	0	206
Number of HGV movements	-	0	0	0	0	0	0	0	1,058

Haul Road Construction	Units	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Haul road length	m	0	2428	2904	582	86	1728	1135	400
Number of passing places required	-	0	28	34	7	1	20	0	1
Number of HGV Turning Areas	-	0	0	0	0	0	1	0	0
Volume of Sub-base stone required	m ³	0	2,177	2,813	527	77	1,588	1,332	540
Mass of sub-base stone required	Tonnes	0	5,096	6,010	1,213	178	3,652	3,524	1,242
Number of sub-base stone deliveries	-	0	251	301	61	9	163	177	63
Volume of Crusher Run stone requirec	m ³	0	1,451	1,742	352	52	1,059	1,022	360
Mass of Crusher Run stone required	Tonnes	0	3,047	3,658	738	108	2,223	2,145	796
Number of Crusher Run stone deliveries	-	0	153	183	37	6	112	108	38
Surface area	m ²	0	14,510	17,420	3,515	515	10,586	10,215	3,600
Mass of geogrid required	Tonnes	0.00	3.19	3.83	0.77	0.11	2.33	2.25	0.79
Number of geogrid deliveries	-	0	2	2	1	1	2	2	1
Length of stock proof fencing required	m	63.8	4,919.8	5,871.8	1,227.8	235.8	3,519.8	2,333.8	863.8
Number of Stockproof fencing deliveries	-	0	2	2	1	1	1	1	1
Length of tarmac haul road	m	0	0	0	0	0	0	0	453
Area of tarmac haul road	m ²	0	0	0	0	0	0	0	4,077
Volume of Sub-base stone	m ³	0	0	0	0	0	0	0	917,325
Mass of stone	Tonnes	0	0	0	0	0	0	0	2,110
Number of stone deliveries	-	0	0	0	0	0	0	0	106
Volume of Asphalt	m ³	0	0	0	0	0	0	0	1,019
Mass of Asphalt	Tonnes	0	0	0	0	0	0	0	2,405
Number of Asphalt Deliveries	-	0	0	0	0	0	0	0	121
Removal of haul road movements	-	0	408	488	100	17	298	515	103
Number of HGV movements	-	0	816	976	200	34	596	1,030	206

CCS Construction	Units	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Number of CCS	m	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0
Compound Hard Standing Surface Area	m ²	5525	5525	5525	1975	0	1975	10600	11050
Volume of Sub-base stone required	m ³	829	829	829	296	0	296	1,590	1,658
Mass of sub-base stone required	Tonnes	1,906	1,906	1,906	681	0	681	3,657	3,812
Number of sub-base stone deliveries	-	96	96	96	35	0	35	183	191
Volume of Crusher Run stone requirec	m ³	553	553	553	198	0	198	1,060	1,105
Mass of Crusher Run stone required	Tonnes	1,160	1,160	1,160	415	0	415	2,226	2,321
Number of Crusher Run stone deliveries	-	59	59	59	21	0	21	112	117
Mass of geogrid required	Tonnes	1.22	1.22	1.22	0.43	0.00	0.43	2.33	2.43
Number of geogrid deliveries	-	1	1	1	1	0	1	2	2
Compound Tarmac Surface Area	m ²	0	0	0	0	0	0	3000	0
Volume of Sub-base stone	m ³	0	0	0	0	0	0	675	0
Mass of stone	Tonnes	0	0	0	0	0	0	1,553	0
Number of stone deliveries	-	0	0	0	0	0	0	78	0
Volume of Asphalt	m ³	0	0	0	0	0	0	750	0
Mass of Asphalt	Tonnes	0	0	0	0	0	0	1,770	0
Number of Asphalt Deliveries	-	0	0	0	0	0	0	89	0
Length of security fencing required	m	530	530	530	530	0	530	530	530
Number of fencing panels required	-	152	152	152	152	0	152	152	152
Number of fencing panel deliveries	-	2	2	2	2	0	2	2	2
Removal of compound movements	-	158	158	158	59	0	59	466	312
Number of HGV movements	-	316	316	316	118	0	118	932	624

HGV Holding Area at Elm Tree Farm to be constructed as part of Landfall HDD Enabling Works	Units	1	2A	2B	3A	3B	4A	4B and Substation Zone
Number of Holding Areas	m	0	0	0	0	0	0	0
Holding Area Surface Area	m ²	0	0	0	0	0	0	0
Volume of Sub-base stone required	m ³	0	0	0	0	0	0	0
Mass of sub-base stone required	Tonnes	0	0	0	0	0	0	0
Number of sub-base stone deliveries	-	0	0	0	0	0	0	0
Volume of Crusher Run stone required	m ³	0	0	0	0	0	0	0
Mass of Crusher Run stone required	Tonnes	0	0	0	0	0	0	0
Number of Crusher Run stone deliveries	-	0	0	0	0	0	0	0
Mass of geogrid required	Tonnes	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of geogrid deliveries	-	0	0	0	0	0	0	0
Length of security fencing required	m	0	0	0	0	0	0	0
Number of fencing panels required	-	0	0	0	0	0	0	0
Number of fencing panel deliveries	-	0	0	0	0	0	0	0
Removal of compound movements	-	0	0	0	0	0	0	0
Number of HGV movements	-	0	0	0	0	0	0	0

Jointing Bays Construction	Units	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Number of jointing bays	-	0	10	10	4	0	6	8	0
Total Jointing bay concrete volume (m³)	m³	0	90	90	36	0	54	72	0
Number of concrete deliveries	-	0	15	15	6	0	9	12	0
Total Number of blocks	-	0	13,940	13,940	5,576	0	8,364	11,152	0
Number of block movements	-	0	47	47	19	0	28	38	0
Total number of slabs	-	0	0	0	0	0	0	0	0
Number of slab movements	-	0	0	0	0	0	0	0	0
Total Native soil to be disposed of	m³	0	765	765	306	0	459	612	0
Total Native Soil Tonnage	Tonnes	0	4,590	4,590	1,836	0	2,754	3,672	0
Number of native soil movements	-	0	230	230	92	0	138	184	0
Total Steel reinforcement (t)	Tonnes	0	5.85	5.85	2.34	0	3.51	4.68	0
Number of steel deliveries	-	0	1	1	1	0	1	1	0
Number of HGV movements	-	0	293	293	118	0	176	235	0

Transition Bays Construction	Units	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Number of transition bays	-	2	0	0	0	0	0	0	0
Total Transition bay concrete volume	m³	50.4	0	0	0	0	0	0	0
Number of concrete deliveries	-	9	0	0	0	0	0	0	0
Total Number of blocks	-	4,392	0	0	0	0	0	0	0
Number of block movements	-	15	0	0	0	0	0	0	0
Total number of slabs	-	84	0	0	0	0	0	0	0
Number of slab movements	-	21	0	0	0	0	0	0	0
Total Native soil to be disposed of	m³	453.6	0	0	0	0	0	0	0
Total Native Soil Tonnage	Tonnes	907.2	0	0	0	0	0	0	0
Number of native soil movements	-	46	0	0	0	0	0	0	0
Total Steel reinforcement (t)	Tonnes	3,276	0	0	0	0	0	0	0
Number of steel deliveries	-	1	0	0	0	0	0	0	0
Number of HGV movements	-	92	0	0	0	0	0	0	0

Landfall HDDs	Units	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Number of Landfall HDD locations	-	1	0	0	0	0	0	0	0
Compound Surface Area	m²	7000	0	0	0	0	0	0	0
Volume of Sub-base stone required	m³	1,050	0	0	0	0	0	0	0
Mass of sub-base stone required	Tonnes	2,415	0	0	0	0	0	0	0
Number of sub-base stone deliveries	-	121	0	0	0	0	0	0	0
Volume of Crusher Run stone required	m³	700	0	0	0	0	0	0	0
Mass of Crusher Run stone required	Tonnes	1,470	0	0	0	0	0	0	0
Number of Crusher Run Stone deliveries	-	74	0	0	0	0	0	0	0
Mass of geogrid required	Tonnes	1.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of geogrid deliveries	-	1	0	0	0	0	0	0	0
Length of security fencing required	m	340	0	0	0	0	0	0	0
Number of fencing panels required	-	98	0	0	0	0	0	0	0
Number of fencing panel deliveries	-	1	0	0	0	0	0	0	0
Removal of compound movements	-	197	0	0	0	0	0	0	0
Length of Landfall HDD	m	1300	0	0	0	0	0	0	0
Total Number of HDDs	-	4	0	0	0	0	0	0	0
Total length of HDD	m	5200	0	0	0	0	0	0	0
Number of HDPE ducting required	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Number of HDPE duct deliveries	-	0	0	0	0	0	0	0	0
Volume of excavated material	m³	4941.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Native Soil Tonnage	Tonnes	9853.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of excavated material deliveries (off site)	-	455	0	0	0	0	0	0	0
Drill fluid required	m³	12354.3	0.0	0	0	0	0	0	0
Number of water deliveries	-	412	0	0	0	0	0	0	0
Volume of drill fluid removed from site	m³	4941.7	0.0	0	0	0	0	0	0
Number of waste drill fluid deliveries	-	165	0	0	0	0	0	0	0
Total mass of bentonite required for drilling	kg	457109.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Volume of fluid required for export cable duc	m³	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total mass of bentonite required to infill cable duc	kg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total mass of bentonite required	kg	457109.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of bags required	-	18284.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of bentonite deliveries	-	88	0	0	0	0	0	0	0
Number of HGV movements	-	1,554	0	0	0	0	0	0	0

Miscellaneous allowances and total HGV estimates

Activity	Units	Value	Comment
Access from Public Road HGV Movements	%	25	If unfavourable ground is found thicker sub-base may be required
Permanent Haul Road HGV Movements	%	25	If unfavourable ground is found thicker sub-base may be required
Total haul road construction HGV movements	%	20	If unfavourable ground is found geogrid / geotextiles can be introduced which will reduce stone depth therefore low risk of significant increase in vehicle movements
Total CCS Construction HGV movements	%	20	If unfavourable ground is found geogrid / geotextiles can be introduced which will reduce stone depth therefore low risk of significant increase in vehicle movements
Total HGV Holding Area at Elm Tree Farm HGV Movements	%	20	If unfavourable ground is found geogrid / geotextiles can be introduced which will reduce stone depth therefore low risk of significant increase in vehicle movements
Total Marine Electrical Cable HGV Movement	%	0	Worst case already assumed - 1300m of cable required
Total Marine Fibre Cable HGV Movement	%	0	Worst case already assumed - separate fibre cable required
Total Terrestrial Electrical Cable HGV Movement	%	0	Worst case already assumed - 1 cable per delivery
Total Terrestrial Fibre Cable HGV Movement	%	0	Worst case already assumed - 1 cable per delivery
Total cable joint kits HGV movements	%	0	Worst case already assumed - 1 delivery per JB.
Total tile HGV movements	%	0	Tile Specs TBC
Total trench HGV movements	%	50	If unfavourable ground is encountered trench sides can be battered back to 1/3 therefore increased CBS required and more natural soils to be removed
Total cable duct HGV movements	%	15	Nominal percentage for damage to ducts
Bentonite (cable installation in Ducts) HGV Movement	%	10	Nominal percentage for spillages and waste
Joining bay HGV movements	%	0	Worst case already assumed
Transition bay HGV movements	%	0	Worst case already assumed
Landfill HDD HGV movements	%	25	Possible occurrence of poor ground conditions at HDD locations.
Medium Length Onshore HDD Drilling Compound HGV movement	%	25	Possible occurrence of poor ground conditions at HDD locations.
Medium Length Onshore HDD Exit Pit Compound HGV movement	%	25	Possible occurrence of poor ground conditions at HDD locations.
Short Length Onshore HDD Drilling Compound HGV movement	%	25	Possible occurrence of poor ground conditions at HDD locations.
Short Length Onshore HDD Exit Pit Compound HGV movement	%	25	Possible occurrence of poor ground conditions at HDD locations.
Substation Compound Earthworks and Surface HGV Movements	%	25	Possible occurrence of poor ground conditions at HDD locations.
Project Substation - National Grid Connector	%	50	If unfavourable ground is encountered trench sides can be battered back to 1/3 therefore increased CBS required and more natural soils to be removed

Total Vehicle Movements (with miscellaneous allowances)	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Access from Public Road HGV Movements	0	65	65	0	65	123	65	37
Permanent Haul Road HGV Movements	0	0	0	0	0	0	0	1,323
Total haul road construction HGV movements	0	980	1,172	240	41	716	1,236	248
Total CCS Construction HGV movements	380	380	380	142	0	142	1,119	749
Total HGV Holding Area at Elm Tree Farm HGV Movements	0	0	0	0	0	0	0	0
Total Marine Electrical Cable HGV Movement	0	0	0	0	0	0	0	0
Total Marine Fibre Cable HGV Movement	0	0	0	0	0	0	0	0
Total Terrestrial Electrical Cable HGV Movement	0	30	28	7	2	21	20	4
Total Terrestrial Fibre Cable HGV Movement	0	3	3	1	1	2	2	1
Total cable joint kits HGV movements	0	10	10	4	0	6	8	0
Total tile HGV movements	0	11	12	3	1	8	8	2
Total trench HGV movements	0	503	555	143	23	419	384	81
Total cable duct HGV movements	0	41	45	12	3	34	32	7
Bentonite (cable installation in Ducts) HGV Movement	0	0	0	0	0	0	0	0
Joining bay HGV movements	0	293	293	118	0	176	235	0
Transition bay HGV movements	92	0	0	0	0	0	0	0
Landfall HDD HGV movements	1,943	0	0	0	0	0	0	0
Medium Length Onshore HDD Drilling Compound HGV movement	0	577	0	0	0	0	0	0
Medium Length Onshore HDD Exit Pit Compound HGV movement	0	0	195	0	0	0	0	0
Short Length Onshore HDD Drilling Compound HGV movement	0	0	0	0	0	0	0	0
Short Length Onshore HDD Exit Pit Compound HGV movement	0	0	0	0	0	0	0	0
Substation Compound Earthworks and Surface HGV Movements	0	0	0	0	0	0	0	2,524
Project Substation - National Grid Connector	0	0	0	0	0	0	0	15
Grand total deliveries	2,415	2,893	2,758	670	136	1,648	3,109	4,991
Grand total (two way movements)	4,830	5,786	5,516	1,340	272	3,296	6,218	9,982
Percentage increase in Two Way Vehicle Movements	%	23.1	22.5	20.5	27.1	23.5	21.0	24.4

Substation Parameters

Building	Height (m)	Length (m)	Width (m)	Area (m ²)	Number of
Control Building	6.00	40.00	25.00	1000.00	1.00
Statcom/SVC Building	15.00	30.00	22.00	660.00	2.00
GIS Building	15.00	40.00	20.00	800.00	1.00
Shunt Reactor	8.00	18.00	12.00	216.00	2.00

Other Structures	Height (m)	Length (m)	Width (m)	Area (m ²)	Number of	Loading Weight (t)
External Blast Walls	16.00	26.00	0.30	N/A	0.00	N/A
Main Transformer	10.00	23.00	17.00	391.00	2.00	575.00
Auxiliary Transformer	5.00	6.00	3.00	18.00	2.00	15.00
Reactors + STATCOM equipment	15.00	25.00	20.00	500.00	2.00	100.00
Switch Board Assemblies	3.00	75.00	1.50	112.50	10.00	3.00
Control Panel assemblies	3.00	1.50	1.00	1.50	20.00	0.30
HPL Compact Breaker	3.00	14.00	0.60	8.40	12.00	1.50
HV Horizontal Line Disconnect Switch	12.00	0.50	0.50	0.25	10.00	0.30
HV Vertical break feeder disconnect switch	12.00	0.50	0.50	0.25	10.00	0.30
Emergency Diesel Generator	4.00	10.00	5.00	50.00	1.00	15.00
Emergency Diesel Fire Pump	1.00	2.50	2.00	5.00	2.00	20.00
Filter/Capacitor Bank	18.00	10.00	10.00	100.00	2.00	10.00

Building	Item	Description	Unit Weight (kg/m ²)	Total Volume (m ³)	Total Area (m ²)	Density (kg/m ³)	Total Weight (t)	Material	Delivery	HGV Movements	Number of unit	Total HGV Movements
Control Building (total for 1No.)	pad foundations	5x5x1m deep RC concrete on a 25x8m grid plus ridge column at both gables		350		2,400	840	Concrete	6	59	1	59
	concrete slab within building	200mm thick concrete slab on 150mm thick type 1 sub base	480	200	1,000	2,400	480	Concrete	6	34	1	34
			345	180	1,200	2,300	414	Stone	20	21	1	21
	extra concrete plinths for equipment in building	TBC									1	0
	perimeter ground beam	450mm deep x 600mm wide, 130m long		35		2,400	84	Concrete	6	6	1	6
	steel frame	80 kg/m2 includes secondary steel (purlins and cladding rails and door framing, and a 10% allowance for connections. Based on max 25m span and 8m bay centres , 6m ridge height.	80		1,000		80	Steel	12.5	7	1	7
	cladding	composite cladding panels 150mm thick -	10		1,780		18	Cladding	12.5	2	1	2
Total (1no)										129	Total	129

Building	Item	Description	Unit Weight (kg/m ²)	Total Volume (m ³)	Total Area (m ²)	Density (kg/m ³)	Total Weight (t)	Material	Delivery	HGV Movements	Number of unit	Total HGV Movements
Statcom/SVC Building (total for 1No.)	RC Pad foundations	4.5x4.5x1m deep RC concrete on a 22x6m grid plus ridge column at both gables		284		2,400	680	Concrete	6	48	2	96
	Concrete ground bearing slab within building	200mm thick concrete slab on 150mm thick type 1 sub base	480	132	660	2,400	317	Concrete	6	22	2	44
			345	119	792	2,300	273	Stone	20	14	2	28
	extra concrete plinths for equipment in building	TBC									2	0
	Perimeter ground beam	450mm deep x 600mm wide, 104m long		28		2,400	67	Concrete	6	5	2	10
	Steel frame	134 kg/m2 includes secondary steel (purlins and cladding rails and door framing, and a 10% allowance for connections. Based on max 22m span and 6m bay centres , 8m ridge height.	134		660		88	Steel	12.5	8	2	16
	Cladding	composite cladding panels 150mm thick -	10		2,220		22	Cladding	12.5	2	2	4
Total (1no)										99	Total	198

Building	Item	Description	Unit Weight (kg/m ²)	Total Volume (m ³)	Total Area (m ²)	Density (kg/m ³)	Total Weight (t)	Material	Delivery	HGV Movements	Number of unit	Total HGV Movements
GIS Building	RC Pad foundations	5x5x1m deep RC concrete on a 20x8m grid plus ridge column at both gables		433		2,400	1,040	Concrete	6	73	1	73
	Concrete ground bearing slab within building	200mm thick concrete slab on 150mm thick type 1 sub base	480	160	800	2,400	384	Concrete	6	27	1	27
			345	144	960	2,300	331	Stone	20	17	1	17
	extra concrete plinths for equipment in building	TBC									1	0
	Perimeter ground beam	450mm deep x 600mm wide, 120m long		32		2,400	78	Concrete	6	6	1	6
	Steel frame	80 kg/m2 includes secondary steel (purlins and cladding rails and door framing, and a 10% allowance for connections. Based on max 20m span and 8m bay centres , 15m ridge height.	80		800		64	Steel	12.5	6	1	6
	Cladding	composite cladding panels 150mm thick -	10		2,600		26	Cladding	12.5	3	1	3
Total (1no)										132	Total	132

Building	Item	Description	Unit Weight (kg/m ²)	Total Volume (m ³)	Total Area (m ²)	Density (kg/m ³)	Total Weight (t)	Material	Delivery	HGV Movements	Number of unit	Total HGV Movements
Shunt Reactor	RC Pad foundations	3x3x0.75m deep RC concrete on a 12x6m grid plus ridge column at both gables		68		2,400	162	Concrete	6	12	2	24
	Concrete ground bearing slab within building	200mm thick concrete slab on 150mm thick type 1 sub base	480	43	216	2,400	104	Concrete	6	8	2	16
			345	39	259	2,300	89	Stone	20	5	2	10
	extra concrete plinths for equipment in building	TBC									2	0
	Perimeter ground beam	450mm deep x 600mm wide, 60m long		16		2,400	39	Concrete	6	3	2	6
	Steel frame	80 kg/m2 includes secondary steel (purlins and cladding rails and door framing, and a 10% allowance for connections. Based on max 12m span and 6m bay centres, 8m ridge height.	80		216		17	Steel	12.5	2	2	4
	Cladding	composite cladding panels 150mm thick -	10		696		7	Cladding	12.5	1	2	2
Total (1no)										31	Total	62

Structure	Item	Description	Unit Weight (kg/m ²)	Total Volume (m ³)	Total Area (m ²)	Density (kg/m ³)	Total Weight (t)	Material	Delivery	HGV Movements	Number of unit	Total HGV Movements
External blast walls	10 No. Blast walls between transformers	16m high x 26m long x 450mm thick blast walls		187		2,400	449	Concrete	6	31	0.00	0
Total (1no)										31	Total	0

Structure/Bases	Item	Description	Unit Weight (kg/m ²)	Total Volume (m ³)	Total Area (m ²)	Density (kg/m ³)	Total Weight (t)	Material	Delivery	HGV Movements	Number of unit	Total HGV Movements
Main Transformer	RC Base/Foundation	1no. 23m x 17m x 450mm thick	1,080	175.95	391.00	2,400	422.28	Concrete	6	30	2	60
	Sub base	150mm thick type 1 sub base	345	70.38	469.20	2,300	161.87	Stone	20	9	2	18
Auxiliary Transformer	RC Base/Foundation	1no. 6m x 3m x 300mm thick	720	5.40	18.00	2,400	12.96	Concrete	6	1	2	2
	Sub base	150mm thick type 1 sub base	345	3.24	21.60	2,300	7.45	Stone	20	1	2	2
Reactors + STATCOM equipment	RC Base/Foundation	1no. 25m x 20m x 450mm thick	1,080	225.00	500.00	2,400	540.00	Concrete	6	38	2	76
	Sub base	150mm thick type 1 sub base	345	90.00	600.00	2,300	207.00	Stone	20	11	2	22
Switch Board Assemblies	RC Base/Foundation	1no. 75m x 1.5m x 300mm thick	720	33.75	112.50	2,400	81.00	Concrete	6	6	10	60
	Sub base	150mm thick type 1 sub base	345	20.25	135.00	2,300	46.58	Stone	20	3	10	30
Control Panel assemblies	RC Base/Foundation	1no. 1.5m x 1.5m x 300mm thick	720	0.45	1.50	2,400	1.08	Concrete	6	1	20	20
	Sub base	150mm thick type 1 sub base	345	0.27	1.80	2,300	0.62	Stone	20	1	20	20
HPL Compact Breaker	RC Base/Foundation	1no. 14m x 0.6m x 300mm thick	720	2.52	8.40	2,400	6.05	Concrete	6	1	12	12
	Sub base	150mm thick type 1 sub base	345	1.51	10.08	2,300	3.48	Stone	20	1	12	12
HV Horizontal Line Disconnect Switch	RC Base/Foundation	1no. 0.5m x 0.5m x 300mm thick	720	0.08	0.25	2,400	0.18	Concrete	6	1	10	10
	Sub base	150mm thick type 1 sub base	345	0.05	0.30	2,300	0.10	Stone	20	1	10	10
HV Vertical break feeder disconnect switch	RC Base/Foundation	1no. 0.5m x 0.5m x 300mm thick	720	0.08	0.25	2,400	0.18	Concrete	6	1	10	10
	Sub base	150mm thick type 1 sub base	345	0.05	0.30	2,300	0.10	Stone	20	1	10	10
Emergency Diesel Generator	RC Base/Foundation	1no. 10m x 5m x 450mm thick	720	15.00	50.00	2,400	36.00	Concrete	6	3	1	3
	Sub base	150mm thick type 1 sub base	345	9.00	60.00	2,300	20.70	Stone	20	2	1	2
Emergency Diesel Fire Pump	RC Base/Foundation	1no. 2.5m x 2m x 300mm thick	720	1.50	5.00	2,400	3.60	Concrete	6	1	2	2
	Sub base	150mm thick type 1 sub base	345	0.90	6.00	2,300	2.07	Stone	20	1	2	2
Filter/Capacitor Bank	RC Base/Foundation	1no. 10m x 10m x 300mm thick	720	30.00	100.00	2,400	72.00	Concrete	6	5	2	10
	Sub base	150mm thick type 1 sub base	345	18.00	120.00	2,300	41.40	Stone	20	3	2	6
Total (1no)										122	Total	399

Total	920
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Compound Welfare and Plant

General Data	Value	Source/Comments
Number of Welfare / Container Units Per Delivery	1	Worst Case
Number of plant per delivery	1	Worst Case
Frequency of Skip Emptying (weeks)	2	Assumed

Large CCS Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit	12	ED11892-GE-2058
Canteen Unit	4	ED11892-GE-2058
Tool Storage Unit	6	ED11892-GE-2058
Workshop Unit	2	ED11892-GE-2058
Mobile Toilet Unit	4	ED11892-GE-2058
Washing / Changing Unit	2	ED11892-GE-2058
First Aid Unit	1	ED11892-GE-2058
Drying Room Unit	2	ED11892-GE-2058
Freshwater Storage Container (2 per delivery)	4	ED11892-GE-2058
Foul Water Storage Container (2 per delivery)	4	ED11892-GE-2058
Bunded Fuel Tank (1 per delivery)	2	ED11892-GE-2058
Generator (2 per delivery)	4	ED11892-GE-2058
General Waste Skip (1 per delivery)	4	ED11892-GE-2058
Wheel Wash (assume 3 deliveries to mobilise)	1	ED11892-GE-2058
Weigh bridge (assume 3 deliveries to mobilise)	0	ED11892-GE-2058
Telehandler	2	
Road Sweeper	1	
Number of HGV Movements	51	

Medium CCS Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit	4	ED11892-GE-2057
Canteen Unit	2	ED11892-GE-2057
Tool Storage Unit	4	ED11892-GE-2057
Workshop Unit	1	ED11892-GE-2057
Mobile Toilet Unit	2	ED11892-GE-2057
Washing / Changing Unit	1	ED11892-GE-2057
First Aid Unit	0	ED11892-GE-2057
Drying Room Unit	1	ED11892-GE-2057
Freshwater Storage Container (2 per delivery)	2	ED11892-GE-2057
Foul Water Storage Container (2 per delivery)	2	ED11892-GE-2057
Bunded Fuel Tank (1 per delivery)	1	ED11892-GE-2057
Generator (2 per delivery)	2	ED11892-GE-2057
General Waste Skip (1 per delivery)	2	ED11892-GE-2057
Wheel Wash (assume 3 deliveries to mobilise)	1	ED11892-GE-2057
Weigh bridge (assume 3 deliveries to mobilise)	0	ED11892-GE-2057
Telehandler	1	
Road Sweeper	1	
Number of HGV Movements	26	

Small CCS Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit		
Canteen Unit	1	ED11892-GE-2056
Tool Storage Unit	2	ED11892-GE-2056
Workshop Unit		
Mobile Toilet Unit	1	ED11892-GE-2056
Washing / Changing Unit	1	ED11892-GE-2056
First Aid Unit		
Drying Room Unit	1	ED11892-GE-2056
Freshwater Storage Container (2 per delivery)	1	ED11892-GE-2056
Foul Water Storage Container (2 per delivery)	1	ED11892-GE-2056
Bunded Fuel Tank (1 per delivery)	1	ED11892-GE-2056
Generator (2 per delivery)	1	ED11892-GE-2056
General Waste Skip (1 per delivery)	1	ED11892-GE-2056
Wheel Wash (assume 3 deliveries to mobilise)		
Weigh bridge (assume 3 deliveries to mobilise)		
Telehandler	1	
Road Sweeper		
Number of HGV Movements	10.5	

Landfall HDD Compound Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit	2	ED11892-GE-2016 Rev D
Canteen Unit / Lunch Room	2	ED11892-GE-2016 Rev D
Welfare Unit	2	ED11892-GE-2016 Rev D
Tool Storage Unit	2	ED11892-GE-2016 Rev D
Workshop Unit	2	ED11892-GE-2016 Rev D
Generator (2 per delivery)	2	
Freshwater Storage Container (2 per delivery)	2	
Foul Water Storage Container (2 per delivery)	2	
General Waste Skip (1 per delivery)	2	
Bunded Fuel Tank	2	ED11892-GE-2016 Rev D
Bentonite Storage Container	2	ED11892-GE-2016 Rev D
Mixing Tank	2	ED11892-GE-2016 Rev D
Cuttings Container	2	ED11892-GE-2016 Rev D
Drill Pipe Rack	8	ED11892-GE-2016 Rev D
Mud Pump	4	ED11892-GE-2016 Rev D
Power Pack	4	ED11892-GE-2016 Rev D
Driller's Cabin	4	ED11892-GE-2016 Rev D
HDD Rig	1	ED11892-GE-2016 Rev D
Telehandler	1	
Number of HGV Movements	45	

Onshore HDD Entry Pit Compound Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit	1	ED11892-GE-2017 Rev C
Canteen Unit / Lunch Room	1	ED11892-GE-2017 Rev C
Welfare Unit	1	ED11892-GE-2017 Rev C
Tool Storage Unit	1	ED11892-GE-2017 Rev C
Workshop Unit	1	ED11892-GE-2017 Rev C
Generator (2 per delivery)	1	
Freshwater Storage Container (2 per delivery)	1	
Foul Water Storage Container (2 per delivery)	1	
General Waste Skip (1 per delivery)	1	
Bunded Fuel Tank	1	ED11892-GE-2017 Rev C
Bentonite Storage Container	1	ED11892-GE-2017 Rev C
Mixing Tank	1	ED11892-GE-2017 Rev C
Cuttings Container	1	ED11892-GE-2017 Rev C
Drill Pipe Rack	9	ED11892-GE-2017 Rev C
Mud Pump	9	ED11892-GE-2017 Rev C + 2 Fibre drills per project
Power Pack	9	ED11892-GE-2017 Rev C + 2 Fibre drills per project
Driller's Cabin	9	ED11892-GE-2017 Rev C + 2 Fibre drills per project
HDD Rig	1	ED11892-GE-2017 Rev C + 2 Fibre drills per project
Telehandler	1	
Number of HGV Movements	50	

Onshore HDD Exit Pit Compound Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office / Welfare Unit	2	
General Waste Skip (1 per delivery)	1	
Generator (2 per delivery)	2	
Tool Storage Unit	2	
Drill Pipe Rack	4	
Number of HGV Movements	10	

Substation Construction Compound Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit	6	ED11892-GE-2059 + 2061
Canteen Unit	2	ED11892-GE-2059 + 2061
Tool Storage Unit	6	ED11892-GE-2059 + 2061
Workshop Unit	1	ED11892-GE-2059 + 2061
Mobile Toilet Unit	2	ED11892-GE-2059 + 2061
Washing / Changing Unit	1	ED11892-GE-2059 + 2061
First Aid Unit	0	ED11892-GE-2059 + 2061
Drying Room Unit	1	ED11892-GE-2059 + 2061
Freshwater Storage Container (2 per delivery)	2	ED11892-GE-2059 + 2061
Foul Water Storage Container (2 per delivery)	2	ED11892-GE-2059 + 2061
Bunded Fuel Tank (1 per delivery)	1	ED11892-GE-2059 + 2061
Generator (2 per delivery)	2	ED11892-GE-2059 + 2061
General Waste Skip (1 per delivery)	2	ED11892-GE-2059 + 2061
Telehandler	1	
Road Sweeper	1	
Number of HGV Movements	27	

Section	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Compound Welfare and Operation Plant Requirements	226	267	195	75	0	67	390	27
Grand total deliveries	226	267	195	75	0	67	390	27
Grand total (two way movements)	452	534	390	150	0	134	780	54

Compound Welfare and Operation Plant Requirements	Units	Landfall HDD	1	2A	2B	3A	3B	4A	4B and Substation Zone
Number of Large CCS	-	0	0	0	0	0	0	1	0
Number of Medium CCS	-	1	1	1	0	0	0	0	0
Number of small CCS	-	0.0	0	0	1	0	1	0	0
Duration of Construction Consolidation Site	Weeks	52	100	108	108	0.0	92.0	144.0	0
Number of Skip Movements	-	52	100	108	54	0	46	288	0
Number of Landfall Compounds	-	1	0	0	0	0	0	0	0
Duration of Landfall Compound Usage	Weeks	32	0	0	0	0	0	0	0
Number of Skip Movements	-	32	0	0	0	0	0	0	0
Number of Onshore HDD Drilling Compounds (medium and short length)	-	0	1	0	0	0	0	0	0
Combined Duration of Onshore HDD Drilling Compound Usage	Weeks	0	30	0	0	0	0	0	0
Number of Skip Movements	-	0	15	0	0	0	0	0	0
Number of HDD Exit Pit Compounds (medium and short length)	-	0	0	1	0	0	0	0	0
Combined Duration of Landfall Compound Usage	Weeks	0	30	0	0	0	0	0	0
Number of Skip Movements	-	0	0	15	0	0	0	0	0
Number of Substation Constuction Compounds	-	0	0	0	0	0	0	0	1
Duration of Substation Construction Compound Usage	Weeks	0	0	0	0	0	0	0	132
Number of Skip Movements	-	0	0	0	0	0	0	0	264
Number of HGV movements to Establish Compounds	-	71	76	36	11	0	11	51	27
Number of HGV movements to Demobilise Compounds	-	71	76	36	11	0	11	51	27
Total Number of Skip Movements	-	84	115	123	54	0	46	288	264
Total Number of Compound HGV Movements	-	226	267	195	75	0	67	390	318

National Grid Enabling Works

Reference	General Data (Fixed Information)	Units	Value	Source/Comments
1.03	Tipper Truck Capacity	Tonnes	20	8x4 Rigid Tipper http://www.mqp.co.uk/vehicle.htm
1.04	Ready Mix Concrete truck Capacity	m ³	6	6m3 Truck mixer https://www.hanson.co.uk/en/technical-information/truck-information
1.06	Type 1 Stone Density	t/m ³	2.3	MOT Type 1 https://www.smithsbletchington.co.uk/mot-type-1
1.07	Crusher Run Stone Density	t/m ³	2.1	Crusher Run Stone https://www.smithsbletchington.co.uk/limestone-crusher-run
1.08	Compound / Haul Road Type 1 Sub-base Thickness	m	0.15	Drawing ED11892-GE-2040 A
1.09	Compound / Haul Road Crushed Stone Thickness	m	0.1	Drawing ED11892-GE-2040 A
1.10	Geogrid mass/Area	kg/m ²	0.22	Tensar SS20 https://www.drainagesuperstore.co.uk/user/u/files/jdp-tensar-geogrid.pdf
1.11	Mass of geogrid per delivery	Tonnes	2	Assumed
1.27	Heras Fencing Panel Hight	m	2	Heras HSG 151 Fencing https://www.heras-mobile.co.uk/fencing/151-system
1.28	Heras Fencing Panel Width	m	3.5	Heras HSG 151 Fencing https://www.heras-mobile.co.uk/fencing/151-system
1.29	Weight Per Panel	kg	16	Heras HSG 151 Fencing https://www.heras-mobile.co.uk/fencing/151-system
1.30	No of panels per delivery	-	125	Assumed 2T of panelling per delivery (includes all required feet and connectors)
1.33	Length of stock fencing roll	m	500	1.15 Cattle Fence https://www.jacksons-fencing.co.uk/fencing/agricultural-fencing/wire-fencing-stock
1.34	Frequency of Wooden Post	m	5	Assumed
1.35	Frequency of tension post (includes 2 stay posts)	m	50	Assumed
1.36	Length of fencing (including required posts) per HGV Delivery	m	4000	Assumed
3.61	Width of haul road / permanent access road	m	4.5	OPEDA / Project Parameters
3.62	Minimum distance between Passing Places	m	87	ED11892-GE-2006
3.63	Length of passing place	m	32	ED11892-GE-2006
3.64	Width of passing place	m	4	ED11892-GE-2006
3.65	Area of passing place	m ²	128	Calculated (3.63 x 3.64)
3.66	Volume of Type 1 Stone required per passing place	m ³	19.2	Calculated (1.08 x 3.65)
3.67	Volume of Crusher Run Stone Required per passing place	m ³	12.8	Calculated (1.09 x 3.65)

Reference	Access and Permanent Haul Road Data (Fixed Information)	Units	Value	Source/Comments
4.01	Area of access tarmac surface	m ²	170	ED11892-GE-2038 A
4.02	Length of R2 8m external radi kerbing required per access	m	25	ED11892-GE-2038 A
4.03	Maximum Length of K2 straight kerbing required per access	m	394.5	ED11892-GE-2038 A
4.04	Length of one R2 8m external radi kerb	m	0.78	https://www.marshalls.co.uk/commercial/assets/documents/product-specifications/kerb07.pdf
4.05	Length of one K2 straight kerb	m	0.914	https://www.marshalls.co.uk/commercial/assets/documents/product-specifications/kerb07.pdf
4.06	Number of internal radi kerbs required per access	-	32	Calculated (4.02 / 4.04)
4.07	Maximum Number of straight kerbs required per access	-	432	Calculated (4.03 / 4.05)
4.08	Number of R2 8m external radi kerbs per pallet	-	10	Assumed
4.09	Number of R2 straight kerbs per pallet	-	18	Assumed
4.10	Number of kerb pallets per delivery	-	6	Assumed
4.12	Maximum volume of concrete required for kerbing at each access	m ³	33.2	Volume calculated from design drawing x length of kerbing required.
4.13	Maximum Depth of Type 1 mortar required	m	0.04	Worst case Assumed
4.14	Maximum Volume of Type 1 mortar required per access	m ³	2.1	Calculated (125 x (4.02 + 4.02) x 4.13)
4.15	Maximum Volume of cement required per access	m ³	0.49	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sand
4.16	Density of cement	tonnes/m ³	3.15	
4.17	Mass of cement required per access	tonnes	0.16	Calculated (4.15 / 4.16)
4.18	Mass of cement per bag	kg	25	https://www.condell-ltd.com/full-pallet-general-purpose-cement-opc-25kg-60-per-pallet?gclid=EAlaIqobChMIpPHW447O2glVB-MbCh2LUwy-EAQYBCABEgIQa_D_BwE
4.19	Number of cement bags per pallet	-	60	https://www.condell-ltd.com/full-pallet-general-purpose-cement-opc-25kg-60-per-pallet?gclid=EAlaIqobChMIpPHW447O2glVB-MbCh2LUwy-EAQYBCABEgIQa_D_BwE
4.20	Maximum Volume of lime required per access	m ³	0.12	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sand
4.21	Density of lime	tonnes/m ³	2.21	https://www.slb.com/-/media/Files/miswaco/ps-drilling-fluids/lime.pdf?la=en&hash=2FD5F24971492980C016D52C63F7FFCC7B40F0A7
4.22	Mass of lime required per access	tonnes	0.06	Calculated (4.20 / 4.21)
4.23	Mass of lime per bag	kg	25	https://www.condell-ltd.com/rugby-lime-25kg?gclid=EAlaIqobChMI5suZyJDO2glVQucbCh2r-wUAEAQYASABEgJRHPD_BwE
4.24	Number of lime bags per pallet	-	60	Assumed
4.25	Maximum Volume of sand required per access	m ³	1.48	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sand
4.26	Density of sand	tonnes/m ³	1.70	https://www.smithsbletchington.co.uk/mixed-building-sand
4.27	Mass of sand required per access	tonnes	0.87	Calculated (4.25 / 4.26)
4.28	Mass of sand per bag	Tonnes	0.9	https://www.condell-ltd.com/rugby-lime-25kg?gclid=EAlaIqobChMI5suZyJDO2glVQucbCh2r-wUAEAQYASABEgJRHPD_BwE
4.29	Number of cement pallets / lime pallets / sand bags per delivery	-	4	Assumed (assumes all three items can be delivered in same delivery)
4.30	Depth of sub-base beneath kerb	m	0.150	Assumed
4.31	Maximum volume of sub-base beneath kerb	m ³	25.17	Calculated from design drawing and length of kerbing.
4.32	Permanent access road sub-base depth	m	0.225	Suffolk County Council Estate Road Specification
4.33	Permanat access road Asphalt Depth	m	0.25	Suffolk County Council Estate Road Specification
4.34	Bulk Density of Asphalt	tonnes/m ³	2.36	https://www.engineeringtoolbox.com/density-solids-d_1265.html
4.35	Width of Permanent Access Corridor	m	10.1	
4.36	Width of Access Road to Sealing End Compounds	m	3.7	Instruction from PRW email 25/04/2019

Access From Public Road Construction	Units	Access to Pylons 16, 17 and 18	Access to Pylons 19 and 20	Access to Pylons 21, 22 and 23	
Number of accesses	m	0	0	0	
Area of tarmac surface	m ²	0	0	0	
Volume of Sub-base stone (Type 1)	m ³	0	0	0	
Mass of Type 1 stone required	Tonnes	0	0	0	
Number of Type 1 stone deliveries	-	0	0	0	
Volume of Asphalt	m ³	0	0	0	
Mass of Asphalt	Tonnes	0	0	0	
Number of Asphalt Deliveries	-	0	0	0	
Number of R2 8m external radi kerbs	-	0	0	0	
Number of K2 straight kerbs	-	0	0	0	
Total number of pallets of kerbs	-	0	0	0	
Number of kerb deliveries	-	0	0	0	
Volume of concrete required	m ³	0.0	0.0	0.0	
Number of concrete deliveries	-	0	0	0	
Volume of mortor required	m ³	0	0	0	
Mass of cement required	Tonnes	0.00	0.00	0.00	
Mass of lime required	Tonnes	0.00	0.00	0.00	
Mass of sand required	Tonnes	0.00	0.00	0.00	
Number of Cement pallets required	-	0	0	0	
Number of lime pallets required		0	0	0	
Number of sand bags required		0	0	0	
Number of cement pallet, lime pallet and sand bag deliveries		0	0	0	
Volume of Topsoil to be removed from site (permanent access only)	m ³	0	0	0	
Mass of Topsoil to be removed from site (permanent access only)	Tonnes	0	0	0	
Number of topsoil removal movements (permanent access only)	-	0	0	0	
Removal of tempoary access movements	-	0	0	0	Total
Number of HGV movements	-	0	0	0	0
Total Number of Two-way HGV movements	-	0	0	0	0

Haul Road Construction	Units	Access to Pylons 16, 17 and 18	Access to Pylons 19 and 20	Access to Pylons 21, 22 and 23	
Haul road length	m	1100			
Number of passing places required	-	13	0	0	
Volume of Sub-base stone required	m ³	992	0	0	
Mass of sub-base stone required	Tonnes	2,282	0	0	
Number of sub-base stone deliveries	-	115	0	0	
Volume of Crusher Run stone required	m ³	661	0	0	
Mass of Crusher Run stone required	Tonnes	1,389	0	0	
Number of Crusher Run stone deliveries	-	70	0	0	
Surface area	m ²	6,614	0	0	
Mass of geogrid required	Tonnes	1.46	0.00	0.00	
Number of geogrid deliveries	-	1	0	0	
Length of stock proof fencing required	m	2,209.0	9.0	9.0	
Number of Stockproof fencing deliveries	-	1	1	1	
Removal of haul road movements	-	187	1	1	Total
Number of HGV movements	-	374	2	2	378
Total Number of Two-way HGV movements	-	748	4	4	756

Tarmac Haul Road Construction to Sealing End Compounds	Units	Location TBC
Haul road length	m	500
Surface area	m ²	1,850
Volume of Sub-base stone for road	m ³	417
Mass of stone	Tonnes	959
Number of stone deliveries	-	48
Volume of Asphalt	m ³	463
Mass of Asphalt	Tonnes	1,092
Number of Asphalt Deliveries	-	55
Length of stock proof fencing required	m	1,000
Number of stock proof fencing deliveries	-	1
Volume of Topsoil to be removed from site	m ³	833
Mass of Topsoil to be removed from site	Tonnes	558
Number of topsoil removal movements	-	28
Number of HGV movements	-	132
Total Number of Two-way HGV movements	-	264

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