

# **East Anglia ONE North Offshore Windfarm**

## **Appendix 26.19**

### **Derivation of Construction Material Quantities and Associated HGV Demand (Scenario 1)**

Preliminary Environmental Information  
Volume 3

EA1N-DEVWF-ENV-REP-IBR-000295\_019

**Material Vehicle Movements**

Reference	General Data (Fixed Information)	Units	Value	Source/Comments
1.01	Number of Projects		2	OPEDA / Project Parameters
1.02	Number of circuits per project		2	OPEDA / Project Parameters
1.03	Tipper Truck Capacity	Tonnes	20	8x4 Rigid Tipper <a href="http://www.mcp.co.uk/vehicle.htm">http://www.mcp.co.uk/vehicle.htm</a>
1.04	Ready Mix Concrete Truck Capacity	m³	6	6m³ Truck mixer <a href="https://www.hanson.co.uk/en/technical-information/truck-informatic">https://www.hanson.co.uk/en/technical-information/truck-informatic</a>
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 <a href="https://www.smithsbletchington.co.uk/mot-type-1">https://www.smithsbletchington.co.uk/mot-type-1</a>
1.07	Crusher Run Stone Density	t/m³	2.1	Crusher Run Stone <a href="https://www.smithsbletchington.co.uk/limestone-crusher-rn">https://www.smithsbletchington.co.uk/limestone-crusher-rn</a>
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 <a href="https://www.drainagesuperstore.co.uk/user/u/files/jdp-tensar-geogrid.px">https://www.drainagesuperstore.co.uk/user/u/files/jdp-tensar-geogrid.px</a>
1.11	Mass of geogrid per delivery	Tonnes	2	Assumed
1.12	Concrete Block Length	m	0.215	<a href="https://www.travisperkins.co.uk/Solid-Dense-Concrete-Block-7-3N-100mm/p/70006">https://www.travisperkins.co.uk/Solid-Dense-Concrete-Block-7-3N-100mm/p/70006</a>
1.13	Concrete Block Width	m	0.215	<a href="https://www.travisperkins.co.uk/Solid-Dense-Concrete-Block-7-3N-100mm/p/70006">https://www.travisperkins.co.uk/Solid-Dense-Concrete-Block-7-3N-100mm/p/70006</a>
1.18	Concrete Block Height	m	0.1	<a href="https://www.travisperkins.co.uk/Solid-Dense-Concrete-Block-7-3N-100mm/p/70006">https://www.travisperkins.co.uk/Solid-Dense-Concrete-Block-7-3N-100mm/p/70006</a>
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	<a href="https://mistraini.co.uk/products/sodium-bentonite-gr">https://mistraini.co.uk/products/sodium-bentonite-gr</a>
1.23	Number of bentonite bags per pallet	-	42	<a href="https://mistraini.co.uk/products/sodium-bentonite-gr">https://mistraini.co.uk/products/sodium-bentonite-gr</a>
1.24	Density of bentonite	t/m³	0.9	<a href="https://mistraini.co.uk/products/sodium-bentonite-gr">https://mistraini.co.uk/products/sodium-bentonite-gr</a>
1.25	Number of bentonite pallets per delivery	-	5	Assumed
1.26	Volume of fluid delivery vehicle	litres	30,000	Articulated Water Tanker <a href="https://www.water-direct.co.uk/what-we-do/water-tankers">https://www.water-direct.co.uk/what-we-do/water-tankers</a>
1.27	Heras Fencing Panel High	m	2	Heras HSG 151 Fencing <a href="https://www.heras-mobile.co.uk/fencing/151-syster">https://www.heras-mobile.co.uk/fencing/151-syster</a>
1.28	Heras Fencing Panel Width	m	3.5	Heras HSG 151 Fencing <a href="https://www.heras-mobile.co.uk/fencing/151-syster">https://www.heras-mobile.co.uk/fencing/151-syster</a>
1.29	Weight Per Panel	kg	16	Heras HSG 151 Fencing <a href="https://www.heras-mobile.co.uk/fencing/151-syster">https://www.heras-mobile.co.uk/fencing/151-syster</a>
1.30	No of panels per delivery	-	125	Assumed 2T of panelling per delivery (includes all required feet and connector)
1.31	Topsoil Depth	m	0.45	Assumed
1.32	Density of Topsoil	t/m³	0.67	<a href="https://www.tolawn.co.uk/calculating-topsoil-requirement">https://www.tolawn.co.uk/calculating-topsoil-requirement</a>
1.33	Length of stock fencing roll	m	500	1.15 Cattle Fence <a href="https://www.jacksons-fencing.co.uk/fencing/agricultural-fencing/wire-fencing-sto">https://www.jacksons-fencing.co.uk/fencing/agricultural-fencing/wire-fencing-sto</a>
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

Reference	Landfall Data (Fixed Information)	Units	Value	Source/Comments
2.01	Width of HDD Compound	m	190	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	-	8	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	EAT 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 31/07/2011)
2.14	Percentage of drill fluid removed from site	%	40	Assumed
2.15	Bentonite requirec	kg/m³ of drill fluid	37	Assumed 20kg/1000l for clay and 65kg/1000l for gravel:
2.16	HDD duct diameter	m	0.8	EAT 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 on)	m	6	OPEDA / Project Parameters
2.24	Transition bay height (underground infrastructure on)	m	1.8	OPEDA / Project Parameters
2.25	Transition bay length (underground infrastructure on)	m	21	OPEDA / Project Parameters
2.26	Transition bay slab surface area	m²	1.26	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	WA 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

Reference	Onshore Data (Fixed Information)	Units	Value	Source/Comments
3.01	CCS Compound Maximum Length	m	210	DED11892-GE-2050
3.02	CCS compound Maximum Width	m	195	DED11892-GE-2050
3.03	Number of terrestrial export cables per project	-	6	OPEDA / Project Parameters
3.04	Number of terrestrial fibre cables per project	-	2	OPEDA / Project Parameters
3.05	Number of trenches per project	-	2	OPEDA / Project Parameters
3.06	Number of export cable ducts per trench	-	3	OPEDA / Project Parameters
3.07	Number of fibre cable ducts per trench	-	1	OPEDA / Project Parameters
3.08	Number of Projects to have cables installed in duct	-	2	OPEDA / Project Parameters
3.09	Number of Projects for empty ducts to be installed	-	0	OPEDA / Project Parameters
3.10	Normal Onshore Cable Route Width	m	50.1	OPEDA / Project Parameters
3.11	Reduced Onshore Cable Route Width	m	27.1	OPEDA / Project Parameters
3.12	Cable trench width	m	0.9	Project Parameters
3.13	Cable trench depth	m	1.615	Project Parameters
3.14	Cement Bound Sand (CBS) depth	m	1.1	ED11892-GE-2041 A
3.15	CBS Volume per m run of trench	m³	0.31	ED11892-GE-2041 A
3.16	CBS density	t/m³	1.6	Assumed
3.17	Tile length	m	1	<a href="https://www.powerandcables.com/product/product-category/stokbord-cable-protection-1000mm-x-450mm">https://www.powerandcables.com/product/product-category/stokbord-cable-protection-1000mm-x-450mm</a>
3.18	Tile width	m	0.45	<a href="https://www.powerandcables.com/product/product-category/stokbord-cable-protection-1000mm-x-450mm">https://www.powerandcables.com/product/product-category/stokbord-cable-protection-1000mm-x-450mm</a>
3.19	Tile Height	m	0.02	Assumed
3.20	Number of tiles per deliver	-	800	Assumed. Based on 40 per pack and 20 packs per deliver
3.21	Depth to top of tile	m	1.00	ED11892-GE-2041 A
3.22	Terrestrial export cable diameter	m	0.17	OPEDA / Project Parameters
3.23	Terrestrial export cable length per drum	m	500	Project Parameters
3.24	Number of terrestrial export cable drums per deliver	-	1	Weight of cable 34T
3.25	Terrestrial fibre cable diameter	m	0.025	Assumed
3.26	Terrestrial fibre cable length per drum	m	2000	TBC
3.27	Number of terrestrial fibre cable drums per deliver	-	1	TBC
3.28	Diameter of terrestrial export cable ducts	m	0.25	ED11892-GE-2041 A
3.29	Diameter of terrestrial fibre cable ducts	m	0.11	ED11892-GE-2041 A
3.30	Length of terrestrial export cable duct	m	6	Page 32 <a href="http://www.emtelle.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf">http://www.emtelle.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf</a>
3.31	Length of terrestrial fibre cable duct	m	6	Page 30 <a href="http://www.emtelle.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf">http://www.emtelle.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf</a>
3.32	Number of terrestrial export cable ducts per pack	-	16	Page 32 <a href="http://www.emtelle.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf">http://www.emtelle.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf</a>
3.33	Number of terrestrial fibre cable ducts per pack	-	90	Page 30 <a href="http://www.emtelle.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf">http://www.emtelle.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf</a>
3.34	Number of duct packs per deliver	-	4	Assumed
3.35	Bentonite required for cable installation in duct	kg/m³ of fluid	60	Assumed
3.36	Maximum distance between jointing bay	m	500	Project Parameters
3.37	Number of export cables per jointing bay	-	3	Project Parameters
3.38	Number of jointing bays per location	-	2	Project Parameters
3.39	Jointing bay width (construction footprint)	m	18.6	Project Parameters
3.40	Jointing bay height (construction footprint)	m	2.9	Project Parameters
3.41	Jointing bay length (construction footprint)	m	30.6	Project Parameters
3.42	Jointing bay width (underground infrastructure onh)	m	3	OPEDA / Project Parameters
3.43	Jointing bay height (underground infrastructure onh)	m	1.7	OPEDA / Project Parameters
3.44	Jointing bay length (underground infrastructure onh)	m	15	OPEDA / Project Parameters
3.45	Jointing bay slab surface area	m²	45	Calculated (3.42 x 3.44)
3.46	Jointing bay slab thickness	m	0.2	To be confirmed
3.47	Jointing bay slab concrete volume	m³	9	Calculated (3.45 x 3.46)
3.48	Jointing bay steel reinforcement	Tonnes	0.585	Calculated (1.05 x 3.47)
3.49	Number of blocks per jointing bay	-	1394	WA Calculation
3.50	Precast concrete slab length	m	3	Assumed (to be designed)
3.51	Precast concrete slab width	m	1	Assumed (to be designed)
3.52	Precast concrete slab height	m	0.3	Assumed (to be designed)
3.53	Number of precast concrete slabs per deliver	-	8	Each slab approx. 2.5T
3.54	Number of concrete slabs per jointing bay	-	15	Calculated (3.44 x 3.51)
3.55	Depth to top of jointing bay installed underground infrastructure	m	1.2	Project Parameters
3.56	Number of cable joint kits per jointing bay	-	3	Assumed
3.57	Number of cable joint kits per deliver	-	3	Assumed
3.58	Maximum distance between link boxes	m	500	Project Parameters
3.59	Number of link boxes per jointing bay	-	2	Project Parameters
3.60	Link box height	m	1.5	Project Parameters
3.61	Width of haul road / permanent access road	m	4.5	OPEDA / Project Parameters
3.62	Minimum distance between Passing Place	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	m²	128	Calculated (3.63 x 3.64)
3.66	Volume of Type 1 Stone required per passing place	m³	19.2	Calculated (1.08 x 3.65)
3.67	Volume of Crusher Run Stone Required per passing place	m³	12.8	Calculated (1.09 x 3.65)
3.68	Width of Medium Length HDD Compound	m	195	Drawing ED11892-GE-2017 Rev C
3.69	Length of Medium Length HDD Entry Pit Compound	m	70	Drawing ED11892-GE-2017 Rev C
3.70	Width of Short Length HDD Entry Pit Compound	m	145	5m spacing between drills
3.71	Length of Short Length HDD Entry Pit Compound	m	60	-
3.72	Width of Short Length HDD Exit Pit Compound	m	145	5m spacing between drills
3.73	Length of Medium / Short Length HDD Exit Pit Compound	m	30	-
3.74	Standard Length of Short HDD	m	112	WA Calculation
3.75	Number of HDDs per compound	-	18	Drawing ED11892-GE-2017 Rev C
3.76	HDD reamed diameter	-	0.4	Calculated (3.80 * 4/3)
3.77	Volume of drill fluid required per metre length of bore	m³	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 conservativ
3.78	Volume of drill fluid removed from site per metre length of bore	m³	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 du
3.79	Bentonite requirec	kg/m³ of drill fluid	37	Assumed
3.80	Onshore HDD duct diameter	m	0.25	Assumed
3.81	Onshore HDD duct section length	m	10	Assumed
3.82	No of HDD duct lengths per deliver	-	25	Assumed
3.83	Number of wellare / 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	m²	170	ED11892-GE-2038 A
4.02	Length of R2 8m external radi kerbing required per acces	m	25	ED11892-GE-2038 A
4.03	Maximum Length of K2 straight kerbing required per acces	m	394.5	ED11892-GE-2038 A
4.04	Length of one R2 8m external radi kert	m	0.78	https://www.marshalls.co.uk/commercial/assets/documents/product-specifications/kerb07.px
4.05	Length of one K2 straight kert	m	0.914	https://www.marshalls.co.uk/commercial/assets/documents/product-specifications/kerb07.px
4.06	Number of internal radi kerbs required per acces:	-	32	Calculated (4.02 / 4.04)
4.07	Maximum Number of straight kerbs required per acces	-	432	Calculated (4.03 / 4.05)
4.08	Number of R2 8m external radi kerbs per palle	-	10	Assumed
4.09	Number of R2 straight kerbs per palle	-	18	Assumed
4.10	Number of kerb pallets per deliver	-	6	Assumed
4.12	Maximum volume of concrete required for kerbing at each acces	m³	33.2	Volume calculated from design drawing x length of kerbing require
4.13	Maximum Depth of Type 1 mortar requirec	m	0.04	Worst case Assumed
4.14	Maximum Volume of Type 1 mortar required per acces:	m³	2.1	Calculated (125 x (4.02 + 4.02) x 4.13
4.15	Maximum Volume of cement required per acces:	m³	0.49	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sanc
4.16	Density of cement	tonnes/m³	3.15	
4.17	Mass of cement required per acces:	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=EAlaQobChMI5suZyJDO2gIVQuCh2r-wUAEAQYASABEGJRHPD_Bw
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=EAlaQobChMI5suZyJDO2gIVQuCh2r-wUAEAQYASABEGJRHPD_Bw
4.20	Maximum Volume of lime required per acces:	m³	0.12	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sanc
4.21	Density of lime	tonnes/m³	2.21	https://www.sib.com/-/media/Files/miswaco/ps-drilling-fluids/lime.pdf?la=en&hash=2FD5F24971492980C016D52C637FFCC7B40F0/
4.22	Mass of lime required per acces:	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=EAlaQobChMI5suZyJDO2gIVQuCh2r-wUAEAQYASABEGJRHPD_Bw
4.24	Number of lime bags per pallet	-	60	Assumed
4.25	Maximum Volume of sand required per acces:	m³	1.48	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sanc
4.26	Density of sanc	tonnes/m³	1.70	https://www.smithsbletchington.co.uk/mixed-building-san
4.27	Mass of sand required per acces:	tonnes	0.07	Calculated (4.20 / 4.21)
4.28	Mass of sand per bag	Tonnes	0.9	https://www.condell-ltd.com/rugby-lime-25kg?gclid=EAlaQobChMI5suZyJDO2gIVQuCh2r-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 kert	m	0.150	Assumed
4.31	Maximum volume of sub-base beneath kert	m³	25.17	Calculated from design drawing and length of kerbing
4.32	Permanent access road sub-base dept	m	0.225	Suffolk County Council Estate Road Specifcator
4.33	Permanal access road Asphalt Dept	m	0.25	Suffolk County Council Estate Road Specifcator
4.34	Bulk Density of Asphalt	tonnes/m³	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 Compounc	m	190	ED11892-GE-2037 A
5.02	Width of Substation Compounc	m	190	ED11892-GE-2037 A
5.03	Area of Substation Compounc	m²	36100	Calculated (5.01 x 5.03)
5.04	Depth of surface concrete slat	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 Documer
5.10	400kV cable length per drurr	-	500	Assumed
5.11	Number of 400kV cable drums per deliver)	-	1	Assumed
5.12	Diameter of fibre cable	m	0.025	TBC
5.13	Fibre cable length per drurr	m	2000	Assumed
5.14	Number of fibre cable drums per deliver)	-	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 deliver)	-	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.emtelle.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.emtelle.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.emtelle.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.emtelle.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 coi	m	50	Page 37 http://www.emtelle.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.emtelle.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.emtelle.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.emtelle.com/wp-content/uploads/2015/05/Duct-Catalogue-2015-1.pdf
5.34	Number of duct packs per deliver)	-	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	m³	0.43	ED11892-GE-2044 A
5.37	CBS density	t/m³	1.6	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 deliver)	-	800	Assumed. Based on 40 per pack and 20 packs per deliver
5.42	Depth to top of tile	m	1.14	ED11892-GE-2044 A
5.43	Bentonite required for cable installation in duct	kg/m³ of fluid	60	Assumed

Measured Parameters	Units	Landfall HDD	Cable route section 1	Cable route section 2 (Sizewell Gap to B1353)	Cable route section 2 (B1353 to Hundred River)	Cable route section 3 (Hundred River to B1122)	Cable route section 3 (B1122 to B1069)	Cable route section 4 (B1069 to Grove Road)	Cable route section 4 (Grove Road to Substation Zone)
Number of accesses	-	4	1	1	0	0	1	1	1
Permanent Haul road length	m	0	0	0	0	0	0	0	1600.0
Permanent Haul road width	m	0	0	0	0	0	0	0	8.0
Temporary Haul road length	m	1600.0	3520	2450	750	100	1900	1625	900.0
Number of CCS	m	0.25	1	1	0	0	1	1	0.56
Number of HGV Holding Areas	-	1	0	0	0	0	1	0	0
Number of joint bays required per projec	-	0	10	8	4	0	6	8	0
Length of Trenchinc	m	0	2300	1850	625	100	1700	1625	450
Number of transition bays per projec	-	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	330	0	0	0	0	0	0
Number of Medium Length HDD Exit Pit Compound	m	0.0	0	1	0	0	0	0	0
Number of Short Length HDD Drilling Compound	-	0	0	0	0	0	0	0	0
Total length of short length HDD	m	0	0	0	0	0	0	0	0
Number of Short Length HDD Exit Pit Compound	-	0.0	0	0	0	0	0	0	0
Number of Substation Operational Compound	-	0	0	0	0	0	0	0	2
Volume of Topsoil to be removed from Substation Site and SUD	m³	0	0	0	0	0	0	0	19,396
Volume of Sub-soil to be imported/exported for Substation Site and SUD	m³	0	0	0	0	0	0	0	349
Distance between National Grid and Project Substation	m	0	0	0	0	0	0	0	20

Total Vehicle Movmenets (without miscellaneous allowances)	Landfall HDD	Cable route section 1	Cable route section 2 (Sizewell Gap to B1353)	Cable route section 2 (B1353 to Hundred River)	Cable route section 3 (Hundred River to B1122)	Cable route section 3 (B1122 to B1069)	Cable route section 4 (B1069 to Grove Road)	Cable route section 4 (Grove Road to Substation Zone)
Access from Public Road HGV Movements	190	52	52	0	0	52	52	29
Permanent Haul Road HGV Movement	0	0	0	0	0	0	0	996
Total haul road construction HGV movement	544	1,182	828	252	46	640	920	456
Total CCS Construction HGV movements	576	2,288	2,288	0	0	2,288	2,288	1,294
Total HGV Holding Area at Elm Tree Farm HGV Movement	72	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	64	45	15	3	41	39	11
Total Terrestrial Fibre Cable HGV Movement	0	6	4	2	1	4	4	1
Total cable joint kits HGV movements	0	20	16	8	0	12	16	0
Total tile HGV movements	0	23	19	7	1	17	17	5
Total trench HGV movements	0	740	595	202	33	547	523	145
Total cable duct HGV movements	0	77	62	21	4	57	55	16
Bentonite (cable installation in Ducts) HGV Movement	0	0	0	0	0	0	0	0
Jointing bay HGV movements	0	583	468	235	0	351	468	0
Transition bay HGV movements	161	0	0	0	0	0	0	0
Landfall HDD HGV movements	3,066	0	0	0	0	0	0	0
Medium Length Onshore HDD Drilling Compound HGV movement	0	936	0	0	0	0	0	0
Medium Length Onshore HDD Exit Pit Compound HGV movement	0	0	332	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 Movement	0	0	0	0	0	0	0	3,847
Project Substation - National Grid Connection	0	0	0	0	0	0	0	15
<b>Grand total deliveries</b>	<b>4,629</b>	<b>5,971</b>	<b>4,709</b>	<b>742</b>	<b>88</b>	<b>4,009</b>	<b>4,382</b>	<b>6,805</b>
<b>Grand total (two way movements)</b>	<b>9,258</b>	<b>11,942</b>	<b>9,418</b>	<b>1,484</b>	<b>176</b>	<b>8,018</b>	<b>8,764</b>	<b>13,610</b>

Access From Public Road Construction	Units	Landfall HDD	Cable route section 1	Cable route section 2 (Sizewell Gap to B1353)	Cable route section 2 (B1353 to Hundred River)	Cable route section 3 (Hundred River to B1122)	Cable route section 3 (B1122 to B1069)	Cable route section 4 (B1069 to Grove Road)	Cable route section 4 (Grove Road to Substation Zone)
Number of accesses	m	4	1	1	0	0	1	1	1
Area of tarmac surface	m²	680	170	170	0	0	170	170	170
Volume of Sub-base stone (Type 1)	m³	254	63	63	0	0	63	63	63
Mass of Type 1 stone requirec	Tonnes	583	146	146	0	0	146	146	146
Number of Type 1 stone deliveries	-	30	8	8	0	0	8	8	8
Volume of Asphalt	m³	170	43	43	0	0	43	43	43
Mass of Asphalt	Tonnes	401	100	100	0	0	100	100	100
Number of Asphalt Deliveries	-	21	6	6	0	0	6	6	6
Number of R2.8m external radi kerbs	-	128	32	32	0	0	32	32	32
Number of K2 straight kerbs	-	1,728	432	432	0	0	432	432	432
Total number of pallets of kerbs	-	109	27	27	0	0	27	27	27
Number of kerb deliveries	-	19	5	5	0	0	5	5	5
Volume of concrete required	m³	132.8	33.2	33.2	0.0	0.0	33.2	33.2	33.2
Number of concrete deliveries	-	23	6	6	0	0	6	6	6
Volume of mortar required	m³	8	2	2	0	0	2	2	2
Mass of cement required	Tonnes	0.63	0.16	0.16	0.00	0.00	0.16	0.16	0.16
Mass of lime requirec	Tonnes	0.22	0.06	0.06	0.00	0.00	0.06	0.06	0.06
Mass of sand requirec	Tonnes	3.48	0.87	0.87	0.00	0.00	0.87	0.87	0.87
Number of Cement pallets requirec	-	1	1	1	0	0	1	1	1
Number of lime pallets requirec	-	1	1	1	0	0	1	1	1
Number of sand bags requirec	-	4	1	1	0	0	1	1	1
Number of cement pallet, lime pallet and sand bag deliverie	-	2	1	1	0	0	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	-	95	26	26	0	0	26	26	0
<b>Number of HGV movements</b>	<b>-</b>	<b>190</b>	<b>52</b>	<b>52</b>	<b>0</b>	<b>0</b>	<b>52</b>	<b>52</b>	<b>29</b>



Terrestrial Electrical Cables	Units	Landfall HDD	Cable route section 1	Cable route section 2 (Sizewell Gap to B1353)	Cable route section 2 (B1353 to Hundred River)	Cable route section 3 (Hundred River to B1122)	Cable route section 3 (B1122 to B1069)	Cable route section 4 (B1069 to Grove Road)	Cable route section 4 (Grove Road to Substation Zone)
Length of cable route	m	0	2630	1850	625	100	1700	1625	450
Total Length of Terrestrial Cable Required	m	0.0	31560.0	22200.0	7500	1200.0	20400.0	19500.0	5400.0
Total number of drums	-	0	63.12	44.4	15	2.4	40.8	39	10.8
<b>Number of HGV movements</b>	-	<b>0</b>	<b>64</b>	<b>45</b>	<b>15</b>	<b>3</b>	<b>41</b>	<b>39</b>	<b>11</b>

Terrestrial Fibre Cables	Units	Landfall HDD	Cable route section 1	Cable route section 2 (Sizewell Gap to B1353)	Cable route section 2 (B1353 to Hundred River)	Cable route section 3 (Hundred River to B1122)	Cable route section 3 (B1122 to B1069)	Cable route section 4 (B1069 to Grove Road)	Cable route section 4 (Grove Road to Substation Zone)
Length of cable route	m	0	2630	1850	625	100	1700	1625	450
Total Length of Terrestrial Cable Required	m	0	10520	7400	2500	400	6800	6500	1800
Total number of drums	-	0	5.26	3.7	1.25	0.2	3.4	3.25	0.9
<b>Number of HGV movements</b>	-	<b>0</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>4</b>	<b>1</b>

Cable Joint Kits	Units	Landfall HDD	Cable route section 1	Cable route section 2 (Sizewell Gap to B1353)	Cable route section 2 (B1353 to Hundred River)	Cable route section 3 (Hundred River to B1122)	Cable route section 3 (B1122 to B1069)	Cable route section 4 (B1069 to Grove Road)	Cable route section 4 (Grove Road to Substation Zone)
Number of joint bays required	-	0	20	16	8	0	12	16	0
Total number of kits required	-	0	60	48	24	0	36	48	0
<b>Number of HGV movements</b>	-	<b>0</b>	<b>20</b>	<b>16</b>	<b>8</b>	<b>0</b>	<b>12</b>	<b>16</b>	<b>0</b>

Protective Covers	Units	Landfall HDD	Cable route section 1	Cable route section 2 (Sizewell Gap to B1353)	Cable route section 2 (B1353 to Hundred River)	Cable route section 3 (Hundred River to B1122)	Cable route section 3 (B1122 to B1069)	Cable route section 4 (B1069 to Grove Road)	Cable route section 4 (Grove Road to Substation Zone)
Total length of protective cover	m	0	18400	14800	5000	800	13600	13000	3600
Total number of protective covers	-	0	18400	14800	5000	800	13600	13000	3600
<b>Number of HGV movements</b>	-	<b>0</b>	<b>23</b>	<b>19</b>	<b>7</b>	<b>1</b>	<b>17</b>	<b>17</b>	<b>5</b>

Trench (Cable Ducts)	Units	Landfall HDD	Cable route section 1	Cable route section 2 (Sizewell Gap to B1353)	Cable route section 2 (B1353 to Hundred River)	Cable route section 3 (Hundred River to B1122)	Cable route section 3 (B1122 to B1069)	Cable route section 4 (B1069 to Grove Road)	Cable route section 4 (Grove Road to Substation Zone)
Length of Trenching	m	0	2300	1850	625	100	1700	1625	450
Total length of trenching	m	0	9200	7400	2500	400	6800	6500	1800
Total CBS volume	m³	0	2,869	2,308	780	125	2,121	2,027	561
CBS mass	Tonnes	0	4591	3693	1248	200	3393	3244	898
CBS number of deliveries	-	0	230	185	63	10	170	163	45
Total exported native soil volume	m³	0	5092.2	4095.9	1383.75	221.4	3763.8	3597.75	996.3
Total exported native soil mass	Tonnes	0	10184.4	8191.8	2767.5	442.8	7527.6	7195.5	1992.6
Total exported native soil number of deliveries	-	0	510	410	139	23	377	360	100
<b>Number of HGV movements</b>	-	<b>0</b>	<b>740</b>	<b>595</b>	<b>202</b>	<b>33</b>	<b>547</b>	<b>523</b>	<b>145</b>

Cable Ducts To Install In Trench	Units	Landfall HDD	Cable route section 1	Cable route section 2 (Sizewell Gap to B1353)	Cable route section 2 (B1353 to Hundred River)	Cable route section 3 (Hundred River to B1122)	Cable route section 3 (B1122 to B1069)	Cable route section 4 (B1069 to Grove Road)	Cable route section 4 (Grove Road to Substation Zone)
Total length of 250mm ducting	m	0	27600	22200	7500	1200	20400	19500	5400
Total length of 110mm ducting	m	0	9200	7400	2500	400	6800	6500	1800
Number of 250mm cable duct packs required	-	0	288	232	79	13	213	204	57
Number of 110mm cable duct packs	-	0	18	14	5	1	13	13	4
<b>Number of HGV movements</b>	-	<b>0</b>	<b>77</b>	<b>62</b>	<b>21</b>	<b>4</b>	<b>57</b>	<b>55</b>	<b>16</b>









**Compound Welfare and Plant Requirements**

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

CCS Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit	12	ED11892-GE-2050
Canteen Unit	4	ED11892-GE-2050
Tool Storage Unit	6	ED11892-GE-2050
Workshop Unit	2	ED11892-GE-2050
Mobile Toilet Unit	4	ED11892-GE-2050
Washing / Changing Unit	2	ED11892-GE-2050
First Aid Unit	2	ED11892-GE-2050
Drying Room Unit	2	ED11892-GE-2050
Freshwater Storage Container (2 per delivery)	4	ED11892-GE-2050
Foul Water Storage Container (2 per delivery)	4	ED11892-GE-2050
Bunded Fuel Tank (1 per delivery)	2	ED11892-GE-2050
Generator (2 per delivery)	4	ED11892-GE-2050
General Waste Skip (1 per delivery)	4	ED11892-GE-2050
Wheel Wash (assume 3 deliveries to mobilise)	1	ED11892-GE-2050
Weigh bridge (assume 3 deliveries to mobilise)	1	ED11892-GE-2050
Telehandler	2	
Road Sweeper	1	
<b>Number of HGV Movements</b>	<b>55</b>	

CCS Requirements for Landfall HDD Enabling Works (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit	1	ED11892-GE-2050
Canteen Unit	1	ED11892-GE-2050
Tool Storage Unit	1	ED11892-GE-2050
Workshop Unit	1	ED11892-GE-2050
Mobile Toilet Unit	1	ED11892-GE-2050
Washing / Changing Unit	1	ED11892-GE-2050
First Aid Unit	1	ED11892-GE-2050
Drying Room Unit	1	ED11892-GE-2050
Freshwater Storage Container (2 per delivery)	1	ED11892-GE-2050
Foul Water Storage Container (2 per delivery)	1	ED11892-GE-2050
Bunded Fuel Tank (1 per delivery)	1	ED11892-GE-2050
Generator (2 per delivery)	1	ED11892-GE-2050
General Waste Skip (1 per delivery)	1	ED11892-GE-2050
Wheel Wash (assume 3 deliveries to mobilise)	1	ED11892-GE-2050
Weigh bridge (assume 3 deliveries to mobilise)	1	ED11892-GE-2050
Telehandler	1	
Road Sweeper	1	
<b>Number of HGV Movements</b>	<b>20</b>	

Landfall HDD Compound Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit	4	ED11892-GE-2016 Rev D
Canteen Unit / Lunch Room	4	ED11892-GE-2016 Rev D
Welfare Unit	4	ED11892-GE-2016 Rev D
Tool Storage Unit	4	ED11892-GE-2016 Rev D
Workshop Unit	4	ED11892-GE-2016 Rev D
Generator (2 per delivery)	4	
Freshwater Storage Container (2 per delivery)	4	
Foul Water Storage Container (2 per delivery)	4	
General Waste Skip (1 per delivery)	4	
Bunded Fuel Tank	4	ED11892-GE-2016 Rev D
Bentonite Storage Container	4	ED11892-GE-2016 Rev D
Mixing Tank	4	ED11892-GE-2016 Rev D
Cuttings Container	4	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	4	ED11892-GE-2016 Rev D
Telehandler	1	
<b>Number of HGV Movements</b>	<b>71</b>	

Onshore HDD Entry Pit Compound Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit	2	ED11892-GE-2017 Rev C
Canteen Unit / Lunch Room	2	ED11892-GE-2017 Rev C
Welfare Unit	2	ED11892-GE-2017 Rev C
Tool Storage Unit	2	ED11892-GE-2017 Rev C
Workshop Unit	2	ED11892-GE-2017 Rev C
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-2017 Rev C
Bentonite Storage Container	2	ED11892-GE-2017 Rev C
Mixing Tank	2	ED11892-GE-2017 Rev C
Cuttings Container	2	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	9	ED11892-GE-2017 Rev C + 2 Fibre drills per project
Telehandler	2	
<b>Number of HGV Movements</b>	<b>70</b>	

Onshore HDD Exit Pit Compound Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office / Welfare Unit	4	
General Waste Skip (1 per delivery)	2	
Generator (2 per delivery)	4	
Tool Storage Unit	4	
Drill Pipe Rack	4	
<b>Number of HGV Movements</b>	<b>15</b>	

Substation Construction Compound Requirements (Welfare and Operation Plant)	Value	Source/Comments
Site Office Unit	6	ED11892-GE-2037
Canteen Unit	2	ED11892-GE-2037
Tool Storage Unit	3	ED11892-GE-2037
Workshop Unit	1	ED11892-GE-2037
Mobile Toilet Unit	2	ED11892-GE-2037
Washing / Changing Unit	1	ED11892-GE-2037
First Aid Unit	1	ED11892-GE-2037
Drying Room Unit	1	ED11892-GE-2037
Freshwater Storage Container (2 per delivery)	2	ED11892-GE-2037
Foul Water Storage Container (2 per delivery)	2	ED11892-GE-2037
Bunded Fuel Tank (1 per delivery)	1	ED11892-GE-2037
Generator (2 per delivery)	2	ED11892-GE-2037
General Waste Skip (1 per delivery)	2	ED11892-GE-2037
Telehandler	1	
Road Sweeper	1	
<b>Number of HGV Movements</b>	<b>25</b>	

Section	Landfall HDD	Cable route section 1	Cable route section 2 (Sizewell Gap to B1353)	Cable route section 2 (B1353 to Hundred River)	Cable route section 3 (Hundred River to B1122)	Cable route section 3 (B1122 to B1069)	Cable route section 4 (B1069 to Grove Road)	(Grove Road to Substation Zone)
Compound Welfare and Operation Plant Requirements	365	504	394	0	0	338	338	50
<b>Grand total deliveries</b>	<b>365</b>	<b>504</b>	<b>394</b>	<b>0</b>	<b>0</b>	<b>338</b>	<b>338</b>	<b>50</b>
<b>Grand total (two way movements)</b>	<b>730</b>	<b>1,008</b>	<b>788</b>	<b>0</b>	<b>0</b>	<b>676</b>	<b>676</b>	<b>100</b>

<b>Compound Welfare and Operation Plant Requirements</b>	<b>Units</b>	<b>Landfall HDD</b>	<b>Cable route section 1</b>	<b>Cable route section 2 (Sizewell Gap to B1353)</b>	<b>Cable route section 2 (B1353 to Hundred River)</b>	<b>Cable route section 3 (Hundred River to B1122)</b>	<b>Cable route section 3 (B1122 to B1069)</b>	<b>Cable route section 4 (B1069 to Grove Road)</b>	<b>(Grove Road to Substation Zone)</b>
Number of Construction Consolidation Sites	-	1.00	1	1	0	0	1	1	0
Duration of Construction Consolidation Site	Weeks	65	113	113	0	0.0	113.0	113.0	0
Number of Skip Movements	-	33	228	228	0	0	228	228	0
Number of Landfall Compounds	-	1	0	0	0	0	0	0	0
Duration of Landfall Compound Usage	Weeks	39	0	0	0	0	0	0	0
Number of Skip Movements	-	80	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	26	0	0	0	0	0	0
Number of Skip Movements	-	0	26	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	0	26	0	0	0	0	0
Number of Skip Movements	-	0	0	26	0	0	0	0	0
Number of Substation Constuction Compounds	-	0	0	0	0	0	0	0	2
Duration of Substation Construction Compound Usage	Weeks	0	0	0	0	0	0	0	136
Number of Skip Movements	-	0	0	0	0	0	0	0	544
<b>Number of HGV movements to Establish Compounds</b>	-	<b>126</b>	<b>125</b>	<b>70</b>	<b>0</b>	<b>0</b>	<b>55</b>	<b>55</b>	<b>50</b>
<b>Number of HGV movements to Demobilise Compounds</b>	-	<b>126</b>	<b>125</b>	<b>70</b>	<b>0</b>	<b>0</b>	<b>55</b>	<b>55</b>	<b>50</b>
<b>Total Number of Skip Movements</b>	-	<b>113</b>	<b>254</b>	<b>254</b>	<b>0</b>	<b>0</b>	<b>228</b>	<b>228</b>	<b>544</b>
<b>Total Number of Compound HGV Movements</b>	-	<b>365</b>	<b>504</b>	<b>394</b>	<b>0</b>	<b>0</b>	<b>338</b>	<b>338</b>	<b>644</b>

National Grid Enabling Works

Reference	General Data (Fixed Information)	Units	Value	Source/Comments
1.03	Tipper Truck Capacity	Tonnes	20	8x4 Rigid Tipper <a href="http://www.mqp.co.uk/vehicle.htm">http://www.mqp.co.uk/vehicle.htm</a>
1.04	Ready Mix Concrete truck Capacity	m³	6	6m3 Truck mixer <a href="https://www.hanson.co.uk/en/technical-information/truck-information">https://www.hanson.co.uk/en/technical-information/truck-information</a>
1.06	Type 1 Stone Density	t/m³	2.3	MOT Type 1 <a href="https://www.smithsbletchington.co.uk/mot-type-1">https://www.smithsbletchington.co.uk/mot-type-1</a>
1.07	Crusher Run Stone Density	t/m³	2.1	Crusher Run Stone <a href="https://www.smithsbletchington.co.uk/limestone-crusher-run">https://www.smithsbletchington.co.uk/limestone-crusher-run</a>
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	Tensor SS20 <a href="https://www.drainagesuperstore.co.uk/user/u/files/jdp-tensar-geogrid.pdf">https://www.drainagesuperstore.co.uk/user/u/files/jdp-tensar-geogrid.pdf</a>
1.11	Mass of geogrid per delivery	Tonnes	2	Assumed
1.27	Heras Fencing Panel Hight	m	2	Heras HSG 151 Fencing <a href="https://www.heras-mobile.co.uk/fencing/151-system">https://www.heras-mobile.co.uk/fencing/151-system</a>
1.28	Heras Fencing Panel Width	m	3.5	Heras HSG 151 Fencing <a href="https://www.heras-mobile.co.uk/fencing/151-system">https://www.heras-mobile.co.uk/fencing/151-system</a>
1.29	Weight Per Panel	kg	16	Heras HSG 151 Fencing <a href="https://www.heras-mobile.co.uk/fencing/151-system">https://www.heras-mobile.co.uk/fencing/151-system</a>
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 <a href="https://www.jacksons-fencing.co.uk/fencing/agricultural-fencing/wire-fencing-stock">https://www.jacksons-fencing.co.uk/fencing/agricultural-fencing/wire-fencing-stock</a>
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	m²	128	Calculated (3.63 x 3.64)
3.66	Volume of Type 1 Stone required per passing place	m³	19.2	Calculated (1.08 x 3.65)
3.67	Volume of Crusher Run Stone Required per passing place	m³	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	m²	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	<a href="https://www.marshalls.co.uk/commercial/assets/documents/product-specifications/kerb07.pdf">https://www.marshalls.co.uk/commercial/assets/documents/product-specifications/kerb07.pdf</a>
4.05	Length of one K2 straight kerb	m	0.914	<a href="https://www.marshalls.co.uk/commercial/assets/documents/product-specifications/kerb07.pdf">https://www.marshalls.co.uk/commercial/assets/documents/product-specifications/kerb07.pdf</a>
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	m³	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	m³	2.1	Calculated (125 x (4.02 + 4.02) x 4.13)
4.15	Maximum Volume of cement required per access	m³	0.49	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sand
4.16	Density of cement	tonnes/m³	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	<a href="https://www.condell-ltd.com/full-pallet-general-purpose-cement-opc-25kg-60-per-pallet?gclid=EAlaIqObChMImPHW44702glVB-MbCh2LUwy-EAQYBCABEgIQa_D_BwE">https://www.condell-ltd.com/full-pallet-general-purpose-cement-opc-25kg-60-per-pallet?gclid=EAlaIqObChMImPHW44702glVB-MbCh2LUwy-EAQYBCABEgIQa_D_BwE</a>
4.19	Number of cement bags per pallet	-	60	<a href="https://www.condell-ltd.com/full-pallet-general-purpose-cement-opc-25kg-60-per-pallet?gclid=EAlaIqObChMImPHW44702glVB-MbCh2LUwy-EAQYBCABEgIQa_D_BwE">https://www.condell-ltd.com/full-pallet-general-purpose-cement-opc-25kg-60-per-pallet?gclid=EAlaIqObChMImPHW44702glVB-MbCh2LUwy-EAQYBCABEgIQa_D_BwE</a>
4.20	Maximum Volume of lime required per access	m³	0.12	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sand
4.21	Density of lime	tonnes/m³	2.21	<a href="https://www.slb.com/-/media/Files/miswaco/ps-drilling-fluids/lime.pdf?la=en&amp;hash=2FD5F24971492980C016D52C63F7FFCC7B40F0A7">https://www.slb.com/-/media/Files/miswaco/ps-drilling-fluids/lime.pdf?la=en&amp;hash=2FD5F24971492980C016D52C63F7FFCC7B40F0A7</a>
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	<a href="https://www.condell-ltd.com/rugby-lime-25kg?gclid=EAlaIqObChMl5suZyJDO2glVQuCbCh2r-wUAEAQYASABEgJRHPD_BwE">https://www.condell-ltd.com/rugby-lime-25kg?gclid=EAlaIqObChMl5suZyJDO2glVQuCbCh2r-wUAEAQYASABEgJRHPD_BwE</a>
4.24	Number of lime bags per pallet	-	60	Assumed
4.25	Maximum Volume of lime required per access	m³	1.48	Type 1 mortar 1 part cement, 1/4 parts lime and 3 parts sand
4.26	Density of sand	tonnes/m³	1.70	<a href="https://www.smithsbletchington.co.uk/mixed-building-sand">https://www.smithsbletchington.co.uk/mixed-building-sand</a>
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	<a href="https://www.condell-ltd.com/rugby-lime-25kg?gclid=EAlaIqObChMl5suZyJDO2glVQuCbCh2r-wUAEAQYASABEgJRHPD_BwE">https://www.condell-ltd.com/rugby-lime-25kg?gclid=EAlaIqObChMl5suZyJDO2glVQuCbCh2r-wUAEAQYASABEgJRHPD_BwE</a>
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	m³	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/m³	2.36	<a href="https://www.engineeringtoolbox.com/density-solids-d_1265.html">https://www.engineeringtoolbox.com/density-solids-d_1265.html</a>
4.35	Width of Permanent Access Corridor	m	10.1	

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 <sup>2</sup>	0	0	0	
Volume of Sub-base stone (Type 1)	m <sup>3</sup>	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 <sup>3</sup>	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 <sup>3</sup>	0.0	0.0	0.0	
Number of concrete deliveries	-	0	0	0	
Volume of mortar required	m <sup>3</sup>	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 <sup>3</sup>	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 temporary access movements	-	0	0	0	<b>Total</b>
<b>Number of HGV movements</b>	-	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Number of Two-way HGV movements</b>	-	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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	1903	795	848	
Number of passing places required	-	22	10	10	
Volume of Sub-base stone required	m <sup>3</sup>	1,707	729	764	
Mass of sub-base stone required	Tonnes	3,926	1,676	1,758	
Number of sub-base stone deliveries	-	197	84	88	
Volume of Crusher Run stone required	m <sup>3</sup>	1,138	486	510	
Mass of Crusher Run stone required	Tonnes	2,390	1,020	1,070	
Number of Crusher Run stone deliveries	-	120	52	54	
Surface area	m <sup>2</sup>	11,380	4,858	5,096	
Mass of geogrid required	Tonnes	2.50	1.07	1.12	
Number of geogrid deliveries	-	2	1	1	
Length of stock proof fencing required	m	3,815.0	1,599.0	1,705.0	
Number of Stockproof fencing deliveries	-	1	1	1	
Removal of haul road movements	-	320	138	144	<b>Total</b>
<b>Number of HGV movements</b>	-	<b>640</b>	<b>276</b>	<b>288</b>	<b>1,204</b>
<b>Total Number of Two-way HGV movements</b>	-	<b>1,280</b>	<b>552</b>	<b>576</b>	<b>2,408</b>

**Substation Vehicle Movements**

Building	Height (m)	Length (m)	Width (m)	Area (m <sup>2</sup> )	Number of
Control Building	6.00	40.00	25.00	1000.00	1.00
Statcom/SVC Building	8.00	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 <sup>2</sup> )	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	2.00	6.00	3.00	18.00	2.00	15.00
Reactors + STATCOM equipment	8.00	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	15.00	10.00	10.00	100.00	2.00	10.00

Building	Item	Description	Unit Weight (kg/m <sup>2</sup> )	Total Volume (m <sup>3</sup> )	Total Area (m <sup>2</sup> )	Density (kg/m <sup>3</sup> )	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	480	200	1,000	2,400	480	Concrete	6	34	1	34
		on 150mm thick type 1 sub base	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/m <sup>2</sup> 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
<b>Total (1no)</b>										<b>129</b>	<b>Total</b>	<b>129</b>

Building	Item	Description	Unit Weight (kg/m <sup>2</sup> )	Total Volume (m <sup>3</sup> )	Total Area (m <sup>2</sup> )	Density (kg/m <sup>3</sup> )	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	480	132	660	2,400	317	Concrete	6	22	2	44
		on 150mm thick type 1 sub base	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	80 kg/m <sup>2</sup> 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.	80		660		53	Steel	12.5	5	2	10
	Cladding	composite cladding panels 150mm thick -	10		1,492		15	Cladding	12.5	2	2	4
<b>Total (1no)</b>										<b>96</b>	<b>Total</b>	<b>192</b>

Building	Item	Description	Unit Weight (kg/m <sup>2</sup> )	Total Volume (m <sup>3</sup> )	Total Area (m <sup>2</sup> )	Density (kg/m <sup>3</sup> )	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	480	160	800	2,400	384	Concrete	6	27	1	27
		on 150mm thick type 1 sub base	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/m <sup>2</sup> 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
<b>Total (1no)</b>										<b>132</b>	<b>Total</b>	<b>132</b>

Building	Item	Description	Unit Weight (kg/m <sup>2</sup> )	Total Volume (m <sup>3</sup> )	Total Area (m <sup>2</sup> )	Density (kg/m <sup>3</sup> )	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
	extra concrete plinths for equipment in building	TBC	345	39	259	2,300	89	Stone	20	5	2	10
	Perimeter ground beam	450mm deep x 600mm wide, 60m long		16		2,400	39	Concrete	6	3	2	6
	Steel frame	80 kg/m <sup>2</sup> 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
<b>Total (1no)</b>										<b>31</b>	<b>Total</b>	<b>62</b>

Structure	Item	Description	Unit Weight (kg/m <sup>2</sup> )	Total Volume (m <sup>3</sup> )	Total Area (m <sup>2</sup> )	Density (kg/m <sup>3</sup> )	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
<b>Total (1no)</b>										<b>31</b>	<b>Total</b>	<b>0</b>

Structure/Bases	Item	Description	Unit Weight (kg/m <sup>2</sup> )	Total Volume (m <sup>3</sup> )	Total Area (m <sup>2</sup> )	Density (kg/m <sup>3</sup> )	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
<b>Total (1no)</b>										<b>122</b>	<b>Total</b>	<b>399</b>

<b>Total</b>	<b>914</b>
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