East Anglia
Offshore Wind

VATTENFALL

SCOTTISHPOWER RENEWABLES

East Anglia THREE

Appendix 27.7

Construction material quantities and associated HGV demand (Substation Single Phase)

Environmental Statement
Volume 3
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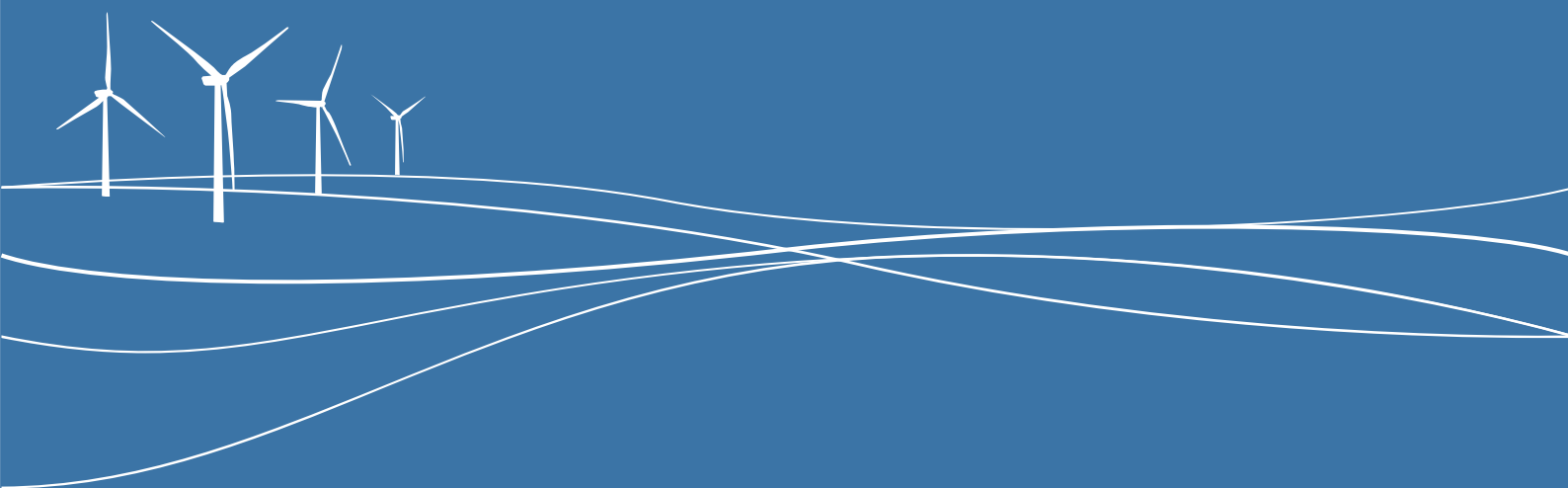

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Appendix 27.07 Construction material quantities and associated HGV demand Substation (Single Phase)

material quantities and HGV demand derived by construction consultants AECOM

Table 1

	Height to Ridge (m)	Length (m)	Width (m)	Area (m²)
Substation Building 1	25	85	58	4,930
Substation Building 2	25	85	56	4,760
Control room	10	25	25	625
Spares storage building and MV Interface building	5	10	10	100

Table 2

Building	Item	Description	Unit Weight (kg/m²)	Total Volume (m³)	Total Area (m²)	Density (kg/m³)	Total Weight (t)	Material	Delivery	HGVs
Main Substation Building (total for 2No.)	pad foundations	5x5x1m deep RC concrete on a 29x8.5m grid plus one on each gable		1,500		2,400	3,600	Concrete	6	250
	concrete slab within building	200mm thick concrete slab	480	1,938		2,400	4,651	Concrete	6	323
		on 150mm thick type 1 sub base	285	1,454		1,900	2,762	Stone	20	138
	extra concrete plinths for equipment in building									
	perimeter ground beam	600mm deep x 400mm wide, 568m long		136		2,400	327	Concrete	6	23
	steel frame	78 kg/m2 includes secondary steel (purlins and cladding rails and door framing, and a 10% allowance for connections. Based on max 29m span and 8m bay centres , 25m ridge height.	78				756	Steel	12.5	60
	cladding	composite cladding panels 150mm thick -	10		23,890		239	Cladding	12.5	19
								Total HGVs		**813**

Table 3

Building	Item	Description	Unit Weight (kg/m²)	Total Volume (m³)	Total Area (m²)	Density (kg/m³)	Total Weight (t)	Material	Delivery	HGVs
Control Room Building	pad foundations	2.5x2.5x0.75m RC concrete on a 25x8m grid		56		2,400	135	Concrete	6	9
	concrete slab within building	200mm thick concrete slab	480	125		2,400	300	Concrete	6	21
		on 150mm thick type 1 sub base	285	94		1,900	178	Stone	20	9
	perimeter ground beam	600mm deep x 400mm wide, 100m long		24		2,400	58	Concrete	6	4
	steel frame	70 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 , 10m ridge height.	70				44	Steel	12.5	4
	cladding	composite cladding panels 150mm thick -	10		6,875		69	Cladding	12.5	6
								Total HGVs		**52**

Table 4

Building	Item	Description	Unit Weight (kg/m²)	Total Volume (m³)	Total Area (m²)	Density (kg/m³)	Total Weight (t)	Material	Delivery	HGVs
Spares storage building and MV Interface building	pad foundations	1.5x1.5x0.6m RC concrete on a 10x5m grid		16		2,400	39	Concrete	6	3
	concrete slab within building	200mm thick concrete slab	480	40		2,400	96	Concrete	6	7
		on 150mm thick type 1 sub base	285	30		1,900	57	Stone	20	3
	perimeter ground beam	600mm deep x 400mm wide, 100m long		10		2,400	46	Concrete	6	2
	steel frame	65 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 , 10m ridge height.	65				13	Steel	12.5	2
	cladding	composite cladding panels 150mm thick -	10		1,200		12	Cladding	12.5	1
								Total HGVs		**17**

Table 5

Building	Item	Description	Unit Weight (kg/m²)	Total Volume (m³)	Total Area (m²)	Density (kg/m³)	Total Weight (t)	Material	Delivery	HGVs
External blast walls	9No. Blast walls between transformers	9m high x 11m long x 300mm thick blast walls		30		2,400	71	Concrete	6	5
								Total HGVs		**5**

Table 6

Building	Item	Description	Unit Weight (kg/m²)	Total Volume (m³)	Total Area (m²)	Density (kg/m³)	Total Weight (t)	Material	Delivery	HGVs
plinths for external plant	cooler plinths x 2	2no. 28m x 14m x 300mm thick	720	235	784	2,400	564	Concrete	6	39
	AHU plinths	8No. 12m x 4m x 300mm thick	720	115	384	2,400	276	Concrete	6	19
	Generator plinth	6m x 12m	720	22	72	2,400	52	Concrete	6	4
	2No. Plinths either side of control room	2No. 14x6m	720	50	168	2,400	121	Concrete	6	8
	plinth for 3 transformers	45x11m x 300mm thick	720	149	495	2,400	356	Concrete	6	25
	plinth for 4 transformers	62x11m x 300mm thick	720	205	682	2,400	491	Concrete	6	34
	type 1 beneath all plinths	150mm thick	285	388	2,585	1,900	737	Stone	20	37
								Total HGVs		**166**

Table 7

Building	Item	Description	Unit Weight (kg/m²)	Total Volume (m³)	Total Area (m²)	Density (kg/m³)	Total Weight (t)	Material	Delivery	HGVs
concrete hardstanding access road	200mm thick concrete		480	1,000	5,000	2,400	2,400	Concrete	6	167
	on 200mm think type 1 sub base		285		5,000	1,900	1,425	Stone	20	71
								Total HGVs		**238**

Table 8

Building	Item	Description	Unit Weight (kg/m²)	Total Volume (m³)	Total Area (m²)	Density (kg/m³)	Total Weight (t)	Material	Delivery	HGVs
car parking	2No. 15x4.8m	block pavers 75mm		11	144	2,000	22	`	12.5	2
		single size stone subbase 600mm		86		1,500	130	Stone	20	6
								Total HGVs		**8**

Table 9

Grand total deliveries	**1,300**
Grand total (two-way movements)	**2,599**

Exclusions

1. kerbing to road/slab edges
2. Surfacing to switchgear area or any other areas out with the concrete hardstanding access road. Could be either concrete slab, gravel over type1 sub base, or grass ?
3. Domestic electrical and mechanical services in the buildings (fire alarms, lighting, toilet and welfare facilities)
4. Roof drainage, surface water drainage should be SuDs scheme with soakaway or controlled discharge to river.
5. foul drainage from welfare/ cooling systems - either septic tank or mains sewer connection
6. No allowance has been made for soil excavation or removal of arisings from foundation excavations.

Table 10

Electrical Equipment								
QTY	Description	Dimensions / unit	Weight/unit (t)	total weight (t)	Units per HGV	HGV Gross Weight	HGV Deliveries	Abnormal Loads
7	transformers	12m x 5m x 10m	350	2,450	1	350	0	7
2	Auxiliary transformers	5m x 2m x 2m	10	20	1	10	2	
400	Pallets/Crates for shipping Converter valve Modules (assembled on site)	2.5m x 2.5m x 2m	2	800	6	12	67	
200	Valve coolers (condenser / fans) modules	1.5m x 1.5m x 2m	0.50	100	8	4	25	
8	Air handling units	2m x 2m x 1m	1	8	6	6	2	
20	AC Reactors	4m x 3m diam	1	20	6	6	4	
8	DC Smoothing Reactors (air cooled)	10m x 3m diam	1.50	12	4	6	2	
4	DC wall Bushings	8m x 0.4m diam	1	4	4	4	1	
60	DC Insulator assemblies	8m x 0.3m diam	0.50	30	15	7.50	4	
60	AC Insulator assemblies	3m x 0.3m diam	0.25	15	30	7.50	2	
60	steel columns (for insulator assemblies)	2m x 0.3m diam	0.25	15	30	7.50	2	
60	steel columns (for insulator assemblies)	8m x 0.3m diam	0.75	45	15	11.25	4	
10	Switch board assemblies	5m x 0.8m x 2m	2	20	2	4	5	
20	Control panel assemblies	1m x 0.6m x 2m	0.25	5	4	1	5	
24	HPL Compact Breaker + 2 disconnect switch	12m x 0.4m diam	0.75	18	12	9	2	
20	HV horizontal line disconnect switch	12m x 0.4m diam	0.25	5	12	3	2	
20	HV vertical break feeder disconnect switch	12m x 0.4m diam	0.25	5	12	3	2	
12	AC Filters	10m x 5m diam	1	12	2	2	6	
6	Capacitor Banks	10m x 5m diam	1	6	2	2	3	
1	Water Booster set	2m x 2m x 1m	1	1	1	1	1	
1	Emergency Diesel Generator 1MVA	5m x 2m x 2.5m	10	10	1	10	1	
2	Emergency Diesel Fire Pumps 300 hp	1.5m x 2m x 0.5m	16	32	1	16	2	
7	DC Smoothing Reactors (air cooled)	4m x 3m diam	8	56	2	16	4	
24	CT's	4.5m x 0.6m diam	0.50	12	12	6	2	
20	VT's	4.5m x 0.6m diam	0.50	10	10	5	2	
					Grand total deliveries		152	7

Appendix 27.7 ends here