East Anglia
Offshore Wind

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East Anglia THREE

Appendix 27.8

Construction material quantities and associated HGV demand (Substation Two Phased)

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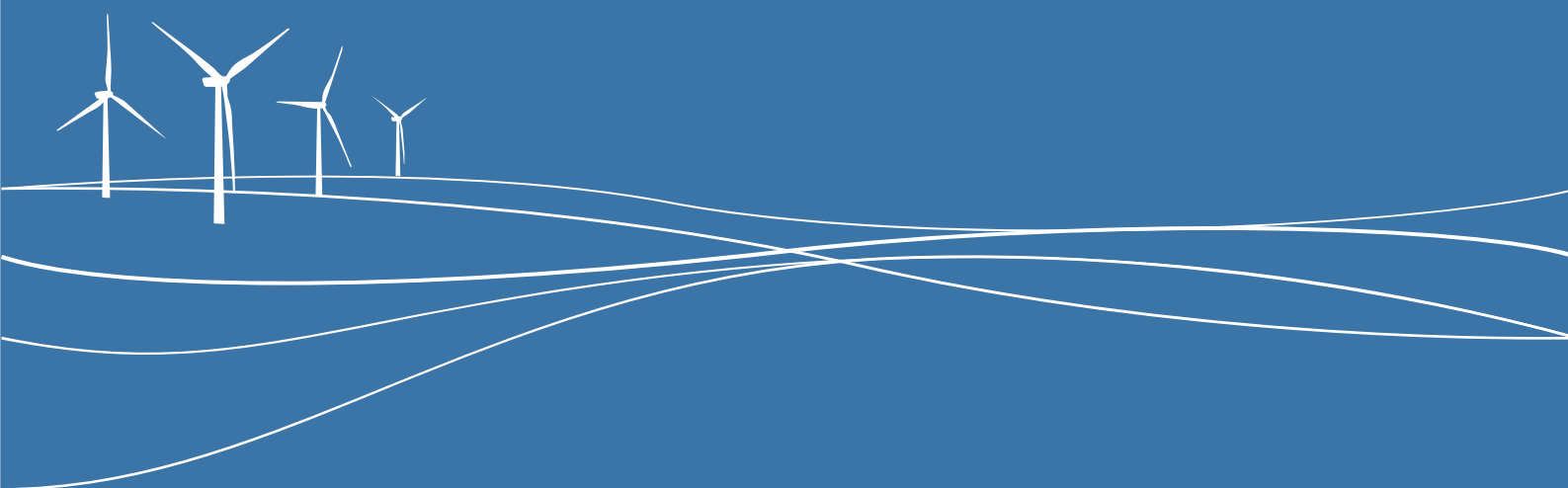

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Appendix 27.08 Construction material quantities and associated HGV demand Substation (Two Phased)

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
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 1No.)	pad foundations	5x5x1m deep RC concrete on a 29x8.5m grid plus one on each gable		375		2,400	900	Concrete	6	63
	concrete slab within building	200mm thick concrete slab	480	1,014		2,400	2,366	Concrete	6	170
		on 150mm thick type 1 sub base	285	740		1,900	1,405	Stone	20	71
	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				385	Steel	12.5	31
	cladding	composite cladding panels 150mm thick -	10		12,080		121	Cladding	12.5	10
								Total HGVs		368

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		HGV Deliveries

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	5 No. Blast walls between transformers	9m high x 11m long x 300mm thick blast walls		17		2,400	40	Concrete	6	3
								Total HGVs		3

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 1	1no. 28m x 14m x 300mm thick	720	118	392	2,400	282	Concrete	6	20
	AHU plinths	4No. 12m x 4m x 300mm thick	720	58	192	2,400	138	Concrete	6	10
	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 4 transformers	62x11m x 300mm thick	720	205	682	2,400	491	Concrete	6	34
	type 1 beneath all plinths	150mm thick	285	226	1,506	1,900	429	Stone	20	21
								Total HGVs		97

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	600	3,000	2,400	1,440	Concrete	6	100
	on 200mm think type 1 sub base		285		3,000	1,900	855	Stone	20	43
								Total HGVs		143

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	1No. 15x4.8m	block pavers 75mm		5	72	2,000	11		12.5	1
		single size stone subbase 600mm		43		1,500	65	Stone	20	3
								Total HGVs		4

Table 9

Grand total deliveries	722
Grand total (two-way movements)	1,444

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 Movements

QTY	Description	Dimensions / unit	Weight/unit (t)	total weight (t)	Units per HGV	HGV Gross Weight	HGV Deliveries	Abnormal Loads
4	Main Converter transformers	12m x 5m x 10m	350	1,400	1	350	0	4
2	Auxiliary transformers	5m x 2m x 2m	10	20	1	10	2	
50	Pallets/Crates for shipping Converter valve Modules (assembled on site)	2.5m x 2.5m x 2m	2	100	6	12	9	
80	Valve coolers (condenser / fans) modules	1.5m x 1.5m x 2m	0.50	40	8	4	10	
4	Air handling units	2m x 2m x 1m	1	4	6	6	1	
6	AC Reactors	4m x 3m diam	1	6	6	6	1	
2	DC Smoothing Reactors (air cooled)	10m x 3m diam	1.50	3	4	6	1	
2	DC wall Bushings	8m x 0.4m diam	1	2	4	4	1	
30	DC Insulator assemblies	8m x 0.3m diam	0.50	15	15	7.50	2	
30	AC Insulator assemblies	3m x 0.3m diam	0.25	8	30	7.50	1	
30	steel columns (for insulator assemblies)	2m x 0.3m diam	0.25	8	30	7.50	1	
30	steel columns (for insulator assemblies)	8m x 0.3m diam	0.75	23	15	11.25	2	
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	
6	HPL Compact Breaker + 2 disconnect switch	12m x 0.4m diam	0.75	5	12	9	1	
5	HV horizontal line disconnect switch	12m x 0.4m diam	0.25	1	12	3	1	
5	HV vertical break feeder disconnect switch	12m x 0.4m diam	0.25	1	12	3	1	
3	AC Filters	10m x 5m diam	1	3	2	2	2	
3	Capacitor Banks	10m x 5m diam	1	3	2	2	2	
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	
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	
					Total Movements		**56**	**4**

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