

RWE



Awel y Môr Offshore Wind Farm

Offshore Project Description Audit

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Glossary of terms

TERM	DEFINITION
The array	The area where the wind turbines will be located.
AyM	The Awel y Môr Offshore Wind Farm project.
Export Cable Corridor	The area(s) where the export cables will be located.
Design envelope/ Maximum Design Scenario (MDS)	The maximum design parameters of the combined project assets that result in the greatest potential for change in relation to the impacts assessed.
LiDAR	Light Detection and Ranging (remote sensing)
Marine Licence	A licence under the Marine and Coastal Access Act 2009 for marine works in Welsh waters which is administered by the

TERM	DEFINITION
	Natural Resources Wales (NRW) Marine Licensing Team (MLT) on behalf of the Welsh Ministers.

Abbreviations and acronyms

TERM	DEFINITION
AyM	Awel y Môr Offshore Wind Farm
AyMOWFL	Awel y Môr Offshore Wind Farm Limited (the Applicant)
CTV	Crew Transfer Vessel
ES	Environmental Statement
GBS	Gravity Based Structure
GyM	Gwynt y Môr Offshore Wind Farm
HVAC	High Voltage Alternative Current
HVDC	High Voltage Direct Current
JUV	Jack-Up Vessel
LAT	Lowest Astronomical Tide
MHWS	Mean High Water Springs
MAP	Main Access Platform
MDS	Maximum Design Scenario
ML	Marine License
NRW	Nation Resource Wales
O&M	Operation and Maintenance
OSP	Offshore Substation Platform
PVM	Permanent Vessel Mooring
SOV	Service Operation Vessel
TP	Transition Piece

TERM	DEFINITION
UXO	Unexploded Ordnance
WTG	Wind Turbine Generator

Units

UNIT	DEFINITION
cd	Candela
db	Decibel
hr	Hour
km	Kilometer
kJ	Kilojoule
kV	Kilovolt
m	Metre
m ²	Square metre
m ³	Cubic metre
mm	Millimetre
MW	Megawatt
nm	Nautical Mile
s	second

1 Maximum design parameters

- 1 Volume 2, Chapter 1: Project Description (Offshore) (application ref: 6.2.1) presented the proposed design envelope for the Awel y Môr Offshore Wind Farm (hereafter referred to as 'AyM'). This audit should be read in conjunction with Volume 2, Chapter 1: Project Description (Offshore) (application ref: 6.2.1).
- 2 Table 1 - Table 9 presents the maximum design parameters presented within the chapter and have been assessed by Awel y Môr Offshore Wind Farm Limited (AyMOWFL) ('the Applicant') within the Environmental Statement (ES). Where practical and appropriate the maximum parameters have been apportioned to the relevant Marine Licence; where the potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence this has been noted.
- 3 Table 1 - Table 9 presents the maximum design parameters in relation to the three separate Marine Licenses (ML):
 - ▲ ML 1 (Generation) – includes the array, associated cables and activities as well as the Met Mast;
 - ▲ ML2 (Transmission) – Offshore export cable installation, protection and maintenance)
 - ▲ ML3 (AyM/GyM Interlink) – Gwynt y Môr Offshore Wind Farm (GyM) interlink cable installation, protection and maintenance.

Commented [SL1]: Add sentence to cover the point on splitting parameter where practicable and where relevant for the purposes of marine licencing

Table 1: Maximum design parameters assessed for Marine Licenses

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
GENERAL SITE INFORMATION					
Table 3	Array Area (km ²)	78	78	N/A	N/A
Table 3	Total length of cable installed in seabed (km)	195	116	69.4	10
Table 3	Number of Wind Turbine Generators (WTGs)	50 (smaller)	50 (smaller)	N/A	N/A
		34 (larger)	34 (larger)	N/A	N/A
Table 3	Number of Offshore Substation Platforms (OSPs) (foundation)	2	N/A	2	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
	assumptions considered separately)				
Table 3	Number of met masts	1	1	N/A	N/A
Table 3	Number of floating LiDAR buoys	3	3	N/A	N/A
Table 3	Number of Permanent Vessel Moorings (PVMs)	3	3	N/A	N/A
Table 3	Number of offshore export cable circuits	2	N/A	2	N/A
UXO ASSUMPTIONS FOR THE PURPOSES OF ASSESSMENT, A LICENCE WILL BE SOUGHT SEPARATELY					

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 4	Expected total number of potential Unexploded Ordnance (UXO) targets	373	N/A	N/A	N/A
Table 4	Expected total number of potential UXO targets requiring inspection	52	N/A	N/A	N/A
Table 4	Expected number of UXO requiring clearance in the pre-construction phase	10	N/A	N/A	N/A
Table 4	Maximum number of clearances in one day	2	N/A	N/A	N/A
PEAK CONSTRUCTION VESSELS AT SITE					
Table 5	WTG foundation installation vessels (includes tugs and feeders)	16	16	N/A	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 5	OSP foundation installation vessels	8	N/A	8	N/A
Table 5	Transition Piece (TP) installation vessels	6	6	N/A	N/A
Table 5	Scour protection installation vessels (including filter layer and seabed preparation)	6	6	N/A	N/A
Table 5	Gravity Based Structure (GBS) ballast installation	2	2	N/A	N/A
WTGs and OSPs					
Table 5	WTG installation vessels (includes tugs and feeders)	15	15	N/A	N/A
Table 5	OSP topside installation vessels	4	N/A	4	N/A
Other installation vessels					

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PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 5	Commissioning vessels	3	3	N/A	N/A
Table 5	Accommodation Vessels	2	2	N/A	N/A
Table 5	Other (including Crew Transfer Vessels (CTVs), guard vessels and support vessels)	15	15	N/A	N/A
Cable installation vessels					
Table 5	Array cable installation vessels (includes support, cable protection and anchor handling vessels)	12	12	N/A	N/A
Table 5	Export cable installation vessels (including at landfall) (includes support, cable protection and anchor handling vessels)	12	N/A	12	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Total construction vessels					
Table 5	Maximum total construction vessels	101	71	30	N/A
ROUND TRIPS TO SITE					
Table 5	WTG foundation installation vessels (includes tugs and feeders)	Larger WTG 136	136	N/A	N/A
		Smaller WTG 133	136	N/A	N/A
Table 5	OSP foundation installation vessels	Larger WTG 16	N/A	16	N/A
		Smaller WTG 16	N/A	16	N/A
Table 5	TP installation vessels	Larger WTG 27	27	N/A	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
		Smaller WTG 24	24	N/A	N/A
Table 5	Scour protection installation vessels (including filter layer and seabed preparation)	Larger WTG 87	87	N/A	N/A
		Smaller WTG 170	170	N/A	N/A
Table 5	GBS ballast installation	Larger WTG 371	371	N/A	N/A
		Smaller WTG 315	315	N/A	N/A
WTGs and OSPs					
Table 5		Larger WTG 31	31	N/A	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
	WTG installation vessels (includes tugs and feeders)	Smaller WTG 45	45	N/A	N/A
Table 5	OSP topside installation vessels	Larger WTG 8	N/A	8	N/A
		Smaller WTG 8	N/A	8	N/A
Other Installation vessels					
Table 5	Commissioning vessels	Larger WTG 78	78	N/A	N/A
		Smaller WTG 78	78	N/A	N/A
Table 5	Accommodation Vessels	Larger WTG 52	52	N/A	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
		Smaller WTG 52	52	N/A	N/A
Table 5	Other (including Crew Transfer Vessels (CTVs), guard vessels and support vessels)	Larger WTG 2,300	2,300	N/A	N/A
		Smaller WTG 2,300	2,300	N/A	N/A
Cable Installation vessels					
Table 5	Array cable installation vessels (includes support, cable protection and anchor handling vessels)	Larger WTG 23 (plus 84 for cable protection vessels)	107	N/A	N/A
		Smaller WTG 23 (plus 84 for cable	107	N/A	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
		protection vessels)			
Table 5	Export cable installation vessels (including at landfall) (includes support, cable protection and anchor handling vessels)	Larger WTG 23 (plus 164 for cable protection vessels)	N/A	187	N/A
		Smaller WTG 23 (plus 164 for cable protection vessels)	NA	187	N/A
Total Round Trips					
Table 5	Maximum total round trips	Larger WTG 3,399	3,078	321	N/A
		Smaller WTG	3,119	317	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
		3,436			
DESIGN ENVELOPE FOR JACK-UP VESSELS (JUV) OPERATION					
Table 6	Individual Spud can footprint (m ²)	275	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		
Table 6	Maximum seabed area per vessel (m ²)	1,100 (note JUVs with greater numbers of legs have a smaller individual leg footprint)	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		
Table 6	Typical seabed penetration (m)	0-15	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		
Table 6	Total jack-up operations during construction	312	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		

Commented [SL3]: We have duplicated the max parameter in both ML1 and ML2, which isn't correct - the max parameter for the whole project should either be split or we should state that assessment is for the whole project cannot meaningfully be split

Commented [SL4R3]: Merge columns in some areas because assessment considers all operations across the project boundary and not possible to apportion according to project area

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 6	Maximum seabed area impacted (m ²)	343,200	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		

DESIGN ENVELOPE FOR ANCHOR FOOTPRINTS

WTG, OSP and met mast installation (foundations and topsides)

Table 7	Number of anchors per deployment	8	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		
Table 7	Anchor footprint (deployment and recovery per anchor) (m ²)	116	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		
Table 7	Typical anchor penetration depth (m)	4	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		
Table 7	Number of deployments per location	5 (4 for foundation installation, 1 for	5	1	N/A

Commented [SL5]: We have in some cases duplicated the max parameter in both ML1 and ML2, which isn't (always) correct - the max parameter for the whole project should either be split or we should state that assessment is for the whole project cannot meaningfully be split

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
		WTG/ OSP topside installation)			
Table 7	Total impact area (m ²)	242,112	236,022	6,090	N/A
Table 7	Total impact volume (m ³)	968,448	700,256	268,192	N/A
Array Cable Installation					
Table 7	Number of anchors per deployment	9	9	N/A	N/A
Table 7	Anchor footprint (deployment and recovery per anchor) (m ²)	61	61	N/A	N/A
Table 7	Typical anchor penetration depth (m)	1.5	1.5	N/A	N/A
Table 7	Number of deployments	264	264	N/A	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 7	Total impact area (m ²)	144,077	144,077	N/A	N/A
Table 7	Total impact volume (m ³)	216,115	216,115	N/A	N/A
Export cable installation					
Table 7	Number of anchors per deployment	9	N/A	9	N/A
Table 7	Anchor footprint (deployment and recovery per anchor) (m ²)	61	N/A	61	N/A
Table 7	Typical anchor penetration depth (m)	1.5	N/A	1.5	N/A
Table 7	Number of deployments	143	N/A	143	N/A
Table 7	Total impact area (m ²)	78,204	N/A	78,204	N/A
Table 7	Total impact volume (m ³)	117,306	N/A	117,306	N/A

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Table 2: Maximum parameters for foundation types

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
DESIGN ENVELOPE FOR MONOPILES						
Table 9	Number of monopiles	Larger WTG 34	OSP Option A: 2	34 Met Mast: 1	2	N/A
		Smaller WTG 50	OSP Option B: 12	50 Met Mast: 1	12	N/A
Table 9	Diameter	Larger WTG 15	OSP Option A: 15	15 Met Mast: 5	15	N/A
		Smaller WTG 13	OSP Option B: 8	13 Met Mast: 5	8	N/A
Table 9	Footprint (excluding scour protection) per foundation (m ²)	Larger WTG 177	OSP Option A: 177	177 Met Mast: 20	177	N/A
		Smaller WTG 133	OSP Option B: 302	133 Met Mast: 20	302	N/A
Table 9	Total seabed footprint (excluding scour protection) (m ²)	Larger WTG 6,008	OSP Option A: 353	6,008 Met Mast: 20	353	N/A
		Smaller WTG 6,637	OSP Option B: 603	6,637 Met Mast: 20	603	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Table 9	Typical embedment depth (m)	Larger WTG 65	OSP: 60	65 Met Mast: 30	60	N/A
		Smaller WTG 55	OSP: 60	55 Met Mast: 30	60	N/A
Table 9	Hammer energy (kJ)	Larger WTG 5,000	OSP: 5,000	5,000 Met Mast: 3,000	5,000	N/A
		Smaller WTG 5,000	OSP: 5,000	5,000 Met Mast: 3,000	5,000	N/A
Drilling						
Table 9	Foundations requiring drilling (%)	Larger WTG 100	OSP: 100	100 Met Mast: 100	100	N/A
		Smaller WTG 100	OSP: 100	100 Met Mast: 100	100	N/A
Table 9	Drill diameter (m)	Larger WTG 16	OSP: 16	16 Met Mast: 5	16	N/A
		Smaller WTG 16	OSP: 16	14 Met Mast: 5	16	N/A
Table 9		Larger WTG 68	OSP: 60	68 Met Mast: 30	60	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
	Typical drill penetration depth (m)	Smaller WTG 59	OSP:60	59 Met Mast: 30	60	N/A
Table 9	Indicative volume of drill arisings per pile (m³)	Larger WTG 13,572	OSP: 12,064	13,572 Met Mast: 589	12,064	N/A
		Smaller WTG 9,005	OSP: 12,064	9,005 Met Mast: 589	12,064	N/A
Table 9	Total drill arisings (m³)	Larger WTG 276,862	OSP: 24,127	276,862 Met Mast: 589	24,127	N/A
		Smaller WTG 270,161	OSP: 24,127	270,161 Met Mast: 589	24,127	N/A
Seabed Preparation						
Seabed preparation for monopiles is expected to be minimal and typically limited to within the footprint of clearance for boulders, UXO and sandwaves. The total extent of seabed preparation will be significantly lower than for GBS foundations						
Scour Protection						
Table 9		Larger WTG 2	OSP: 2	2 Met Mast: 2	2	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
	Typical scour protection depth (m)	Smaller WTG 2	OSP: 2	2 Met Mast:2	2	N/A
Table 9	Diameter of scour protection at seabed level (including foundation footprint) (m)	Larger WTG 83	OSP Option A: 98	83 Met Mast: 33	98	N/A
		Smaller WTG 73	OSP Option B: 120 x 90 rectangle	73 Met Mast: 33	120 x 90 rectangle	N/A
Table 9	Area of scour protection (including foundation footprint) (m²)	Larger WTG 5,411	OSP Option A: 7,543	5,411 Met Mast: 855	7,543	N/A
		Smaller WTG 4,185	OSP Option B: 10,800	4,185 Met Mast: 855	10,800	N/A
Table 9	Volume of scour protection per foundation (m³)	Larger WTG 9,450	OSP Option A: 13,526	9,450 Met Mast: 1,282	13,526	N/A
		Smaller WTG 7,213	OSP Option B: 21,600	7,213 Met Mast: 1,282	21,600	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Table 9	Total area of scour protection (including foundation footprint (m²)	Larger WTG 183,961	OSP Option A: 15,086	183,961 Met Mast: 855	15,086	N/A
		Smaller WTG 209,269	OSP Option B: 21,600	209,269 Met Mast: 855	21,600	N/A
Table 9	Total volume of scour protection required (m³)	Larger WTG 321,250	OSP Option A: 27,050	321,250 Met Mast: 1,282	27,050	N/A
		Smaller WTG 360,650	OSP Option B: 43,200	360,650 Met Mast: 1,282	43,200	N/A
DESIGN ENVELOPE FOR MULTI-LEG PIN-PILED JACKETS						
Table 10	Number of jacket foundations	Larger WTG 34	OSP: 2	34	2	N/A
		Smaller WTG 50	OSP: 2	50	2	
Table 10	Separation of adjacent legs at seabed level (m)	Larger WTG 40	OSP: 50	40	50	N/A
		Smaller WTG 30	OSP: 50	30	50	

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 10	Separation of adjacent legs at sea level Lowest Astronomical Tide (LAT) (m)	Larger WTG 30	OSP: 40	30	40	N/A
		Smaller WTG 25	OSP: 40	25	40	
Table 10	Number of legs per foundation	Larger WTG 4	OSP: 6	4	6	N/A
		Smaller WTG 4	OSP: 6	4	6	
Table 10	Pin-piles per leg	Larger WTG 1	OSP: 2	1	2	N/A
		Smaller WTG 1	OSP: 2	1	2	
Table 10	Total pin-piles	Larger WTG 136	OSP: 24	136	24	N/A
		Smaller WTG 200	OSP: 24	200	24	
Table 10	Pin-pile diameter (m)	Larger WTG 3.5	OSP: 3.5	3.5	3.5	N/A
		Smaller WTG 3.5	OSP: 3.5	3.5	3.5	

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Table 10	Footprint of pin-piles (excluding scour protection) per pin-pile (m²)	Larger WTG 9.6	OSP 9.6	9.6	9.6	N/A
		Smaller WTG 9.6	OSP 9.6	9.6	9.6	
Table 10	Total seabed footprint (excluding scour protection) (m²)	Larger WTG 1,306	OSP: 231	1,306	231	N/A
		Smaller WTG 1,924	OSP: 231	1,924	231	
Table 10	Typical pin-pile embedment depth (m)	Larger WTG 60	OSP: 60	60	60	N/A
		Smaller WTG 60	OSP: 60	60	60	
Table 10	Hammer energy (kJ)	Larger WTG 3,000	3,000	3,000	3,000	N/A
		Smaller WTG 3,000	3,000	3,000	3,000	
Drilling						

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 10	Foundations requiring drilling (%)	Larger WTG 100%	OSP: 100%	100%	100%	N/A
		Smaller WTG 100%	OSP: 100%	100%	100%	
Table 10	Drill diameter (m)	Larger WTG 3.5	OSP: 3.5	3.5	3.5	N/A
		Smaller WTG 3.5	OSP: 3.5	3.5	3.5	
Table 10	Typical drill penetration depth (m)	Larger WTG 60	OSP: 60	60	60	N/A
		Smaller WTG 60	OSP: 60	60	60	
Table 10	Typical drilling rate (m/hr)	Larger WTG 0.25-2	OSP: 60	0.25-2	60	N/A
		Smaller WTG 0.25-2	OSP: 60	0.25-2	60	
Table 10	Volume of drill arisings per pile (m³)	Larger WTG 577	OSP: 577	577	577	N/A
		Smaller WTG 577	OSP: 577	577	577	

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Table 10	Total drill arisings (m³)	Larger WTG 78,508	OSP: 13,854	78,508	13,854	N/A
		Smaller WTG 115,454	OSP: 13,854	115,454	13,854	
Seabed Preparation						
Seabed preparation for piled jacket foundations is expected to be minimal and typically limited to within the footprint of clearance for boulders, UXO and sandwaves. The total extent of seabed preparation will be significantly lower than for GBS foundations						
Scour Protection						
Table 10	Typical scour protection depth (m)	Larger WTG 2	2	2	2	N/A
		Smaller WTG 2	2	2	2	
Table 10	Diameter of scour protection at seabed level per	Larger WTG 22	OSP: Rectangular 120 x 90	22	Rectangular 120 x 90	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
	foundation (including foundation footprint) (m)	Smaller WTG 22	OSP: Rectangular 120 x 90	22	Rectangular 120 x 90	
Table 10	Area of scour protection per foundation (including foundation footprint) (m²)	Larger WTG 1,521	OSP: 10,800	1,521	10,800	N/A
		Smaller WTG 1,521	OSP: 10,800	1,521	10,800	
Table 10	Volume of scour protection per foundation (m³)	Larger WTG 1,959	OSP: 21,600	1,959	21,600	N/A
		Smaller WTG 1,959	OSP: 21,600	1,959	21,600	
Table 10	Total area of scour protection (including foundation footprint) (m²)	Larger WTG 51,698	OSP: 21,600	51,698	21,600	N/A
		Smaller WTG 76,027	OSP: 21,600	76,027	21,600	

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Table 10	Total volume of scour protection required (m³)	Larger WTG 66,550	OSP: 43,200	66,550	OSP: 43,200	N/A
		Smaller WTG 97,900	OSP: 43,200	97,900	43,200	
DESIGN ENVELOPE FOR MONO-SUCTION CASSION FOUNDATIONS						
Table 12	Number of foundations	Larger WTG 34	N/A	34	N/A	N/A
		Smaller WTG 50		50		
Table 12	Suction caisson diameter (m)	Larger WTG 35	N/A	35	N/A	N/A
		Smaller WTG 35		35		
Table 12		Larger WTG 15	N/A	15	N/A	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
	Monopile diameter at sea surface (LAT) (m)	Smaller WTG 15		15		
Table 12	Typical suction caisson penetration depth (m)	Larger WTG 25	N/A	25	N/A	N/A
		Smaller WTG 25		25		
Table 12	Height of suction caisson above seabed level (m)	Larger WTG 8	N/A	8	N/A	N/A
		Smaller WTG 8		8		
Table 12	Footprint of suction caissons (excluding scour protection) per foundation (m²)	Larger WTG 962	N/A	962	N/A	N/A
		Smaller WTG 962		962		
Table 12	Total seabed footprint (excluding scour protection) (m²)	Larger WTG 32,712	N/A	32,712	N/A	N/A
		Smaller WTG 48,106		48,106		

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Seabed preparation						
Table 12	Total area of seabed preparation required (including foundation footprint) (m²)	Larger WTG 32,712	N/A	32,712	N/A	N/A
		Smaller WTG 48,106		48,106		
Table 12	Typical depth of seabed preparation required (m)	Larger WTG 4	N/A	4	N/A	N/A
		Smaller WTG 4		4		
Table 12	Volume of sediment disturbed by seabed preparation (m³)	Larger WTG 130,847	N/A	130,847	N/A	N/A
		Smaller WTG 192,423		192,423		
Scour Protection						

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
It is assumed that for WTG mono suction caisson foundations, the scour protection envelope will not exceed the maximum parameters described for multileg GBS foundations						
DESIGN ENVELOPE FOR MULTI-LEG SUCTION CAISSON JACKET FOUNDATIONS						
Table 13	Design envelope for multi-leg suction caisson jacket foundations	Larger WTG 34	OSP: 2	34	2	N/A
		Smaller WTG 50		50		
Table 13	Separation of adjacent legs at seabed level (m)	Larger WTG 40	OSP: 50	40	50	N/A
		Smaller WTG 30		30		
Table 13	Separation of adjacent legs at sea level (LAT) (m)	Larger WTG 30	OSP: 40	30	40	N/A
		Smaller WTG 25		25		
Table 13	Number of legs per foundation	Larger WTG 4	OSP: 6	4	6	N/A
		Smaller WTG		4		

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
		4				
Table 13	Suction caisson diameter (m)	Larger WTG 20	OSP: 20	20	20	N/A
		Smaller WTG 15		15		
Table 13	Typical suction caisson penetration depth (m)	Larger WTG 25	OSP: 25	25	25	N/A
		Smaller WTG 25		25		
Table 13	Height of suction caisson above seabed level (m)	Larger WTG 5	OSP: 5	5	5	N/A
		Larger WTG 5		5		
Table 13	Footprint of suction caissons (excluding seabed preparation and scour protection) per suction caisson (m ²)	Larger WTG 314	OSP: 314	314	314	N/A
		Smaller WTG 177		177		

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Table 13	Total seabed footprint (excluding seabed preparation and scour protection) (m²)	Larger WTG 42,726	OSP: 3,770	42,726	3,770	N/A
		Smaller WTG 35,343		35,343		
Seabed Preparation						
Table 13	Total area of seabed preparation required (including foundation footprint) (m)	Larger WTG 66,759	OSP: 8,482	66,759	8,482	N/A
		Smaller WTG 62,832		62,832		
Scour Protection						
It is assumed that for multileg suction caisson foundations, the scour protection envelope will not exceed the maximum parameters described for multileg GBS foundations						

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
DESIGN ENVELOPE FOR MONO GBS FOUNDATIONS						
Table 14	Number of jacket foundations	Larger WTG 34	OSP: 2	34	2	N/A
		Smaller WTG 50		50		
Table 14	GBS diameter (m)	Larger WTG 55	OSP: 55 (round base)	55	55	N/A
		Smaller WTG 45		45		
Table 14	Shaft diameter at sea surface (LAT) (m)	Larger WTG 15	OSP: 15	15	15	N/A
		Smaller WTG 15		15		
Table 14	Footprint of foundation (including seabed)	Larger WTG 2,827	OSP: 7,000	2,827	7,000	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
	preparation but excluding scour protection) per foundation (m²)	Smaller WTG 1,963		1,963		
Table 14	Total seabed footprint (including seabed preparation but excluding scour protection) (m²)	Larger WTG 96,133	OSP: 14,000 (rectangular base)	96,133	14,000 (rectangular base)	N/A
		Smaller WTG 98,175		98,175		
Seabed Preparation						
Table 14	Seabed preparation diameter per foundation (m)	Larger WTG 60	OSP: 65 (or 100 x 70 rectangular base)	60	65 (or 100 x 70 rectangular base)	N/A
		Smaller WTG 50		50		
Table 14	Seabed preparation area per foundation (m²)	Larger WTG 2,827	7,000	2,827	7,000	N/A
		Smaller WTG 1,963		1,963		

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Table 14	Total area of seabed preparation required (including foundation footprint (m))	Larger WTG 96,133	OSP: 14,000	Larger WTG 96,133	14,000	N/A
		Smaller WTG 98,175		Smaller WTG 98,175		
Table 14	Indicative average depth of seabed preparation required (m)	Larger WTG 2	OSP: 4	2	4	N/A
		Smaller WTG 2		2		
Table 14	Volume of sediment disturbed by seabed preparation (m³)	Larger WTG 192,265	OSP: 56,000	192,265	56,000	N/A
		Smaller WTG 196,350		196,350		
Gravel bed requirements						
Table 14	Area of gravel bed (m²) per foundation	Larger WTG 2,827	OSP: 7,000	2,827	7,000	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
		Smaller WTG 1,963		1,963		
Table 14	Thickness of gravel bed (m)	Larger WTG 1	OSP: 1	1	1	N/A
		Smaller WTG 1		1		
Table 14	Volume of gravel bed per foundation (m³)	Larger WTG 2,827	OSP: 7,000	1	7,000	N/A
		Smaller WTG 1,963		1		
Table 14	Total area of gravel bed required (m²)	Larger WTG 96,133	OSP: 14,000	96,133	14,000	N/A
		Smaller WTG 98,175		98,175		
Table 14	Total volume of gravel bed required (m³)	Larger WTG 96,133	OSP: 14,000	96,133	14,000	N/A
		Smaller WTG 98,175		98,175		
Surface area						

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Table 14	Surface area of water facing structure per foundation (m²)	Larger WTG 4,250	OSP: 4,950	4,250	4,950	N/A
		Smaller WTG 3,650		3,650		
Table 14	Total surface area of water facing structure (m²)	Larger WTG 144,500	OSP: 9,900	144,500	9,900	N/A
		Smaller WTG 182,500		182,500		
Scour Protection						
Table 14	Scour protection depth (m)	Larger WTG 2	OSP: 2	2	2	N/A
		Smaller WTG 2		2		
Table 14	Diameter of scour protection at seabed level (including foundation footprint) (m)	Larger WTG 146	OSP: 120 x 90 (rectangular base)	146	120 x 90 (rectangular base)	N/A
		Smaller WTG 121		121		

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Table 14	Area of scour protection (including foundation footprint) (m)	Larger WTG 16,627	OSP: 10,800	16,627	10,800	N/A
		Smaller WTG 11,404		11,404		
Table 14	Volume of scour protection per foundation (m³)	Larger WTG 26,699	OSP: 13,600	26,699	13,600	N/A
		Smaller WTG 18,138		18,138		
Table 14	Total area of scour protection (including foundation footprint (m²)	Larger WTG 565,321	OSP: 21,600	565,321	21,600	N/A
		Smaller WTG 570,209		570,209		
Table 14	Total volume of scour protection required (m³)	Larger WTG 907,773	OSP: 27,200	907,773	27,200	N/A
		Smaller WTG 906,919		906,919		

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
DESIGN ENVELOPE FOR MULTI-LEG GBS FOUNDATIONS						
Table 15	Number of jacket foundations	Larger WTG 34	OSP: 2	34	2	N/A
		Smaller WTG 50		50		
Table 15	Separation of adjacent legs at seabed level (m)	Larger WTG 40	OSP:50	40	50	N/A
		Smaller WTG 30		30		
Table 15	Separation of adjacent legs at sea level (LAT) (m)	Larger WTG 30	OSP: 40	30	40	N/A
		Smaller WTG 25		25		
Table 15	Number of bases per foundation	Larger WTG 4	OSP: 6	4	6	N/A
		Smaller WTG 4		4		

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION		MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 15	GBS diameter (m)	One Base per leg	Larger WTG 20	OSP: 20	20	65 x 95	N/A
			Smaller WTG 20		20		
		Single Base	Larger WTG 50 x 50	OSP: 65 x 95	50 x 50		
			Smaller WTG 40 x 40		40 x 40		
Table 15	Height of GBS above seabed level (m)		Larger WTG 8	OSP: 8	8	8	N/A
			Smaller WTG 8		8		
Table 15	Footprint of foundation (including seabed preparation but excluding scour protection)	One base per leg	Larger WTG 490.9	OSP: 314	490.9	314	N/A
			Smaller WTG 490.9		490.9		
		Single base	Larger WTG 3,600	OSP: 10,800	3,600	10,800	

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION		MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
	per base (m²)		Smaller WTG 2,500		2,500		
Table 15	Total seabed footprint (including seabed preparation but excluding scour protection) (m²)	One leg per base	Larger WTG 66,759	3,770	66,759	3,770	N/A
			Smaller WTG 125,000		125,000		
		Singl e base	Larger WTG 122,400	21,600	122,400	21,600	
			Smaller WTG 125,000		125,000		
Seabed preparation							
Table 15	Seabed preparation diameter per leg (m)	One base per leg	Larger WTG 25	30	25	30	N/A
			Smaller WTG 25		25		
			Larger WTG 60		60	N/A (rectangular base)	

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION		MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
		Singl e base	Smaller WTG 50	N/A (rectangular base)	50		
Table 15	Seabed preparatio n area per base (m²)	One base per leg	Larger WTG 490.9	706.9	490.9	706.9	N/A
			Smaller WTG 490.9		490.9		
		Singl e base	Larger WTG 3,600	10,800	3,600	10,800	
			Smaller WTG 2,500		2,500		
Table 15	Total area of seabed preparatio n required (including foundation footprint (m²)	One leg per base	Larger WTG 66,759	OSP: 8,484	66,759	8,484	N/A
			Smaller WTG 98,175		98,175		
		Singl e base	Larger WTG 122,400	OSP: 21,600	122,400	21,600	
			Smaller WTG 125,000		125,000		

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
Table 15	Depth of seabed preparation required	Larger WTG 4	OSP: 4	4	4	N/A
		Smaller WTG 4		4		
Table 15	Volume of sediment disturbed by seabed preparation (m³)	Larger WTG 489,600	OSP: 86,400	489,600	86,400	N/A
		Smaller WTG 500,000		500,000		
Gravel bed requirements						
Table 15	Area of gravel bed (m²) per foundation	Larger WTG 3,600	OSP: 10,800	3,600	10,800	N/A
		Smaller WTG 2,500		2,500		
Table 15	Thickness of gravel bed (m)	Larger WTG 1	OSP: 1	Larger WTG 1	1	N/A
		Smaller WTG 1		Smaller WTG 1		
Table 15		Larger WTG 3,600	OSP: 10,800	3,600	10,800	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATIO N ASSETS)	ML2 (TRANSMISSIO N ASSETS)	ML3 (AYM/GY M INTERLINK)
	Volume of gravel bed per foundation (m³)	Smaller WTG 2,500		2,500		
Table 15	Total area of gravel bed required (m²)	Larger WTG 122,400	OSP: 21,600	122,400	21,600	N/A
		Smaller WTG 125,000		125,000		
Table 15	Total volume of gravel bed required (m³)	Larger WTG 122,400	OSP: 21,600	122,400	21,600	N/A
		Smaller WTG 125,000		125,000		
Scour Protection						
Table 15	Scour protection depth (m)	Larger WTG 2	OSP: 2	2	2	N/A
		Smaller WTG 2		2		
Table 15	Diameter of scour protection at seabed level	Larger WTG 78	OSP: 120 x 90	78	120 x 90	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
	(including foundation footprint) (m)	Smaller WTG 68		68		
Table 15	Area of scour protection per foundation (including foundation footprint) (m)	Larger WTG 6,084	OSP: 10,800	6,084	10,800	N/A
		Smaller WTG 4,624		4,624		
Table 15	Volume of scour protection per foundation (m³)	Larger WTG 10,952	OSP: 21,600	10,952	21,600	N/A
		Smaller WTG 8,192		8,192		
Table 15	Total area of scour protection (including foundation footprint) (m²)	Larger WTG 206,856	OSP: 21,600	206,856	OSP: 21,600	N/A
		Smaller WTG 231,200		231,200		
Table 15		Larger WTG 372,350	OSP: 43,200	372,350	43,200	N/A

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER S (WTG SCENARIO)	MAXIMUM PARAMETER S (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
	Total volume of scour protection required (m³)	Smaller WTG 409,600		409,600		

Table 3: Max parameters for piling scenarios

PROJECT DESCRIPTION N CHAPTER REF	PARAMETER DESCRIPTION	SOFT START	RAMP UP					MAX	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
MONOPILE											
Table 11	Hammer energy (kJ)	750	1,000	2,000	3,000	4,000	5,000	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.			
Table 11	Strikes	100	100	340	680	1,020	6,528	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.			

Table 11	Duration (s)	600	600	600	1,200	1,800	11,520	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.
Table 11	Strike rate (strikes per minute)	10	10	34	34	34	34	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.
Pin-Pile								
Table 11	Hammer energy (kJ)	450	600	1,200	1,800	2,400	3,000	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.
Table 11	Strikes	100	100	340	680	1,020	5,100	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.
Table 11	Duration (s)	600	600	600	1,200	1,800	9,000	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.
Table 11	Strike rate (strikes per minute)	10	10	34	34	34	34	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.

Table 4: Design envelope for WTGs

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (GYM CONNECTION WORKS)
Table 16	Number of WTGs	Larger WTG 34	34	N/A	N/A
		Smaller WTG 50	50		
Table 16	Minimum lower blade tip height above Mean High Water Springs (MHWS) (m)	Larger WTG 22	22	N/A	N/A
		Smaller WTG 22	22		
Table 16	Maximum upper blade tip height above MHWS (m)	Larger WTG 332	332	N/A	N/A
		Smaller WTG 282	282		
Table 16	Rotor diameter (m)	Larger WTG 306	306	N/A	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (GYM CONNECTION WORKS)
		Smaller WTG 250	250		

Table 5: Design envelope for oils and fluids

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETERS (WTG SCENARIO)	MAXIMUM PARAMETERS (OSP SCENARIO)	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 17	Grease (I)	Larger WTG 1,317	OSP: Minimal	1,317	Minimal	N/A
		Smaller WTG 838		838		
Table 17	Hydraulic oil (I)	Larger WTG 2,487	OSP: Minimal	2,487	Minimal	N/A
		Smaller WTG 1,583		1,583		
Table 17	Gear oil (I)	Larger WTG 4,883	OSP: N/A	4,883	N/A	N/A
		Smaller WTG 3,108		3,108		

Table 17	Nitrogen (l)	Larger WTG 159,467	OSP: Minimal	159,467	Minimal	N/A
		Smaller WTG 101,479		101,479		
Table 17	Transformer silicon/ ester oil (l)	Larger WTG 17,849	OSP: 340,000	17,849	340,000	N/A
		Smaller WTG 11,358		11,358		
Table 17	Diesel fuel (l)	Larger WTG 1,000	OSP:20,000	1,000	20,000	N/A
		Smaller WTG 1,000		1,000		
Table 17	Sulphur hexafluoride (SF6) kg)	Larger WTG 180	OSP: 5,000	180	5,000	N/A
		Smaller WTG 180		180		
Table 17	Glycol/ coolant (l)	Larger WTG 34,527	OSP: Minimal	34,527	Minimal	N/A
		Smaller WTG 21,972		21,972		
Table 17	Batteries (kg)	Larger WTG 4,000	OSP: 350,000	4,000	350,000	N/A
		Smaller WTG 3,000		3,000		
Table 17	Grey water (l)	Larger WTG N/A	OSP: 5,000	N/A	5,000	N/A
		Smaller WTG		N/A		

		N/A				
Table 17	Black water (l)	Larger WTG N/A	OSP: 3,000	N/A	3,000	N/A
		Smaller WTG N/A		N/A		

Table 6: Design envelope for OSPs

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 18	Number of OSPs	2	N/A	2	N/A
Table 18	Topside dimension	Plan area: 4,000 m ² Maximum length: 80 m	N/A	Plan area: 4,000 m ² Maximum length: 80 m	N/A
Table 18	Topside height above LAT (excluding stowed crane, helideck and mast) (m)	65	N/A	65	N/A
Table 18	Topside height above LAT (including stowed crane, helideck and mast)	85	N/A	85	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 18	Maximum unstowed crane height above LAT (m)	115	N/A	115	N/A
Table 18	Maximum High Voltage Alternative Current (HVAC) system voltage (primary) (kV)	400	N/A	400	N/A
Table 18	Maximum HVAC system voltage (secondary) (kV)	132	N/A	132	N/A
DESIGN ENVELOPE FOR FLOATING LIDAR					
Table 19	Maximum number of LiDAR buoys	3	3	N/A	N/A
Table 19	Total seabed area affected (m²)	18	18	N/A	N/A
DESIGN ENVELOPE FOR PERMANENT VESSEL MOORINGS (PVMS)					
Table 20	Number of PVMS	3	3	N/A	N/A
Table 20	Buoy diameter (m)	6	6	N/A	N/A
Table 20	Total area of seabed disturbed by anchor installation (m²)	10,080	10,080	N/A	N/A

Table 7: Design envelope for cables

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Cable parameters					
Table 21	Maximum system voltage (kV)	132	132	132	132
Table 21	External cable diameter (mm)	280	280	280	280
Table 21	Total length of array cables (km)	124 (of which 116 will be installed on the seabed)	116	N/A	N/A
Seabed preparation					
Table 21	Indicative length of cable route requiring sandwave clearance (km)	80	80	63	N/A
Table 21	Indicative width of sandwave clearance disturbance corridor (m)	70	70	70	N/A
Table 21	Indicative depth of sandwave clearance dredging (m)	5	5	5	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 21	Total area of seabed disturbed by sandwave clearance (m ²)	5,600,000	10,040,000	4,440,000	N/A
Table 21	Total volume of sediment disturbed by sandwave clearance (m ³)	28,000,000	21,719,000	6,281,000	N/A
Table 21	Maximum volume of material cleared from sandwaves requiring disposal (m ³)	7,600,000	1,319,000	6,281,000	N/A
Table 21	Length of array cable route requiring boulder clearance (%)	100	100	100	N/A
Table 21	Width of boulder clearance tool (m)	24	24	24	N/A
Table 21	Total area of seabed disturbed by boulder clearance (m ²)	2,786,000	880,000	1,906,000	N/A
Cable Installation					
Table 21	Maximum burial depth (m)	4	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 21	Minimum burial depth (m)	0 (see cable protection requirements in Volume 2 Chapter 1: Offshore Project Description (application ref: 6.2.1) paragraph 123 et seq.)	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		
Table 21	Maximum trench width (m)	6	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		
Table 21	Maximum installation tool seabed disturbance width (jetting) (m)	18	Potential impacts associated with the parameter have been assessed, but it is not feasible to meaningfully apportion or divide by Marine Licence.		
Table 21	Total area of seabed disturbed by cable installation (m²)	2,089,854	659,854	1,430,000	N/A
Table 21	Total volume of sediment disturbed by cable installation	2,089,854	660,294	1,429,560	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
	(assuming a V-shaped trench in which 50% of sediment is fluidized and the remaining 50% re-suspended in the water column) (m ³)				
DESIGN ENVELOPE FOR OFFSHORE EXPORT CABLES					
Cable parameters					
Table 22	Maximum system voltage (kV)	400	N/A	400	400
Table 22	External cable diameter (mm)	310	N/A	310	310
Table 22	Number of export cable circuits	2	N/A	2	N/A
Table 22	Total length of export cables (km)	79.4 (including up to 10 km for the AyM/GyM interlink cable)	N/A	89.4	10
Seabed preparation					
Table 22	Indicative length of export cable route	63	N/A	63	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
	requiring sandwave clearance (km)				
Table 22	Indicative width of sandwave clearance disturbance corridor (m)	70	N/A	70	N/A
Table 22	Indicative depth of sandwave clearance dredging (m)	5	N/A	5	N/A
Table 22	Total area of seabed disturbed by sandwave clearance (m ²)	4,440,000	N/A	4,440,000	N/a
Table 22	Total volume of sediment disturbed by sandwave clearance (m ³)	22,000,000	N/A	22,000,000	N/A
Table 22	Maximum volume of material cleared from sandwaves requiring disposal (m ³)	6,281,000	N/A	6,281,000	N/A
Table 22	Length of export cable route requiring boulder clearance (%)	100	N/A	100	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Paragraph 122	Manipulating existing rock protection around the GyM OSP (m³)	100	N/A	N/A	100
Table 22	Width of boulder clearance tool (m)	24	N/A	24	N/A
Table 22	Total area of seabed disturbed by boulder clearance (m²)	1,906,000	N/A	1,906,000	N/A
Table 22	Maximum area of seabed disturbed by export cable installation vessel laydown areas (m²)	57,600	N/A	57,600	N/A
Table 22	Maximum volume of sediment disturbed by export cable installation vessel laydown areas (m³)	57,600	N/A	57,600	N/A
Cable installation					
Table 22	Indicative maximum burial depth (m)	4	N/A	4	4
Table 22	Minimum burial depth (m)	0 (see cable protection requirements in	N/A	0	0

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
		Volume 2 Chapter 1 Section 123 et seq.)			
Table 22	Maximum trench width (m)	6	N/A	6	6
Table 22	Maximum installation tool seabed disturbance width (jetting) (m)	18	N/A	18	N/A
Table 22	Total area of seabed disturbed by cable installation (m ²)	1,430,000	N/A	1,430,000	N/A
Table 22	Total volume of sediment disturbed by cable installation (assuming a V- shaped trench in which 50% of sediment is fluidized and the remaining 50% re-suspended in the water column) (m ³)	1,429,560	N/A	1,429,560	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER ARRAY CABLES	MAXIMUM PARAMETER EXPORT CABLES	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (GYM CONNECTION WORKS)
DESIGN ENVELOPE FOR CABLE PROTECTION						
Table 23	Length of cable requiring cable protection (including cable ends protection) (km)	48	N/A	32	16	N/A
Table 23	Width of cable protection on seabed (m)	6	15.2	6	15.2	N/A
Table 23	Height of cable protection berm (m)	1	1.4	1	1.4	N/A
Table 23	Total area of seabed covered by cable protection (m ²)	192,124	242,853	192,124	242,853	N/A
Table 23	Total volume of cable protection required (m ³)	112,072	218,741	112,072	218,741	N/A

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 24	Number of offshore export cables	3	N/A	2	1
Table 24	Number of crossings per export cable circuit	7	N/A	7	N/A
Table 24	Cables to be crossed	Eirgrid (1 x High Voltage Direct Current (HVDC pair) GyM (4 x HVAC) North Hoyle (2 x HVAC) GyM array cable (in the AyM/GyM interlink zone)	N/A	Eirgrid (1 x HVDC pair) GyM (4 x HVAC) North Hoyle (2 x HVAC)	GyM array cable (in the AyM/GyM interlink zone)
Table 24	Total number of crossings required	15 (up to 19 including contingency)	N/A	14	1
Table 24	Total length of cable crossings (m)	2,550	N/A	2,250	300

Table 24	Width of crossing (m)	15.2	N/A	15.2	15.2
Table 24	Height of rock berm (m)	1.4	N/A	1.4	1.4
Table 24	Cross sectional area of trapezoid (m ²)	13.7	N/A	13.7	13.7
Table 24	Total area of seabed covered by cable crossings (m ²)	39,500	N/A	39,500	N/A
Table 24	Total volume of cable protection required (m ³)	35,700	N/A	35,700	N/A

Table 8: Design envelope for lighting requirements

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Table 25	Aviation lighting intensity (cd)	WTG: 2000 (Dimmable to 200 when visibility is >5 km at night)	2000	2000	n/a
		OSP: N/A			

		Met Mast: 2000 (Dimmable to 200 when visibility is >5 km at night)			
Table 25	Navigation lighting (nominal range (nm))	WTG: Significant Peripheral Structure (SPS): 5 Intermediate Peripheral Structure (IPS): 2	Significant Peripheral Structure (SPS): 5 Intermediate Peripheral Structure (IPS): 2	N/A	10
		OSP: N/A			
		Met Mast: 10			
Table 25	Heli-hoist lighting	WTG: Low intensity green light (200 cd) at the heli-hoist platform. Lighting will only be activated when a structure is being prepared for helicopter approach.	Low intensity green light (200 cd) at the heli-hoist platform. Lighting will only be activated when a structure is being prepared for helicopter approach.	N/A	Low intensity green light (200 cd) at the heli-hoist platform. Lighting will only be activated when a structure is being prepared for helicopter approach.
		OSP: N/A			
		Met Mast: Low intensity green light			

		(200 cd) at the heli-hoist platform. Lighting will only be activated when a structure is being prepared for helicopter approach.			
Table 25	ID marker board lighting	Typically low level baffled (5 – 10 cd/m ²) lighting directed towards the ID marker board. Located on the foundation body or Main Access Platform (MAP).	Typically low level baffled (5 – 10 cd/m ²) lighting directed towards the ID marker board. Located on the foundation body or Main Access Platform (MAP).	Typically low level baffled (5 – 10 cd/m ²) lighting directed towards the ID marker board. Located on the foundation body or Main Access Platform (MAP).	Typically low level baffled (5 – 10 cd/m ²) lighting directed towards the ID marker board. Located on the foundation body or Main Access Platform (MAP).
Table 25	Workplace lighting	Illumination levels for external areas will typically be 50 lux located at the foundation level of structures, providing illumination for the access ladder, resting platforms and MAP. Workplace	Illumination levels for external areas will typically be 50 lux located at the foundation level of structures, providing illumination for the access ladder, resting platforms and MAP. Workplace	Illumination levels for external areas will typically be 50 lux located at the foundation level of structures, providing illumination for the access ladder, resting platforms and MAP. Workplace	Illumination levels for external areas will typically be 50 lux located at the foundation level of structures, providing illumination for the access ladder, resting platforms and MAP. Workplace

		lighting will only be infrequently activated during the O&M phase when a structure is manned for maintenance activities.	lighting will only be infrequently activated during the O&M phase when a structure is manned for maintenance activities.	lighting will only be infrequently activated during the O&M phase when a structure is manned for maintenance activities.	lighting will only be infrequently activated during the O&M phase when a structure is manned for maintenance activities.
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Table 9: Design envelope for O&M activities

PROJECT DESCRIPTION CHAPTER REF	PARAMETER DESCRIPTION	MAXIMUM PARAMETER	ML1 (GENERATION ASSETS)	ML2 (TRANSMISSION ASSETS)	ML3 (AYM/GYM INTERLINK)
Operation and Maintenance (O&M) strategy					
Table 28	Project Lifetime (years)	Larger WTG 25	25	N/A	N/A
		Smaller WTG 25			
Surface infrastructure (WTGs, OSPs and met mast)					
Table 28	Number of major component	Larger WTG 135	135	135	N/A

	replacements requiring JUVs over project lifetime	Smaller WTG 180	180	135	N/A
Table 28	Maximum seabed disturbance from JUV footprints (m²) per year	Larger WTG 5,940	5,940	5,940	
		Smaller WTG 7,920	7,920	7,920	N/A
Array cables					
Table 28	Length of cable requiring remedial works (km)	Larger WTG 5	5	N/A	N/A
		Smaller WTG 5	5		
Table 28	Number of array cable repairs over project lifetime	Larger WTG 5	5	N/A	N/A
		Smaller WTG 5	5		
Table 28		Larger WTG 6,000	6,000	N/A	N/A

	Seabed disturbance per array cable repair event (m²)	Smaller WTG 6,000	6,000		
Table 28	Total seabed disturbance for array cables over project lifetime (m²)	Larger WTG 30,000	30,000	N/A	N/A
		Smaller WTG 30,000	30,000		
Offshore export cables					
Table 28	Length of cable requiring remedial works (km)	5	N/A	5	N/A
Table 28	Number of offshore export cable repairs over project lifetime	4	N/A	4	N/A
Table 28	Seabed disturbance per offshore export cable repair event (m²)	6,000	N/A	6,000	N/A
Table 28	Total seabed disturbance for offshore export	24,000	N/A	24,000	N/A

	cables over project lifetime (m ²)				
O&M VESSEL REQUIREMENTS					
Table 29	JUVs	Peak Vessels 2	2	N/A	N/A
		Annual Round Trips 6	6		
Table 29	Service Operation Vessel (SOV)	Peak Vessels 2	2	N/A	N/A
		Annual Round Trips 52	52		
Table 29	CTV	Peak Vessels 6	6	N/A	N/A
		Annual Round Trips 1095	1095		
Table 29	Lift vessels	Peak Vessels 2	2	N/A	N/A
		Annual Round Trips	6		

		6			
Table 29	Cable maintenance	Peak Vessels 2	2	2	2
		Annual Round Trips 1	1	1	1
Table 29	Auxiliary vessels	Peak Vessels 2	2	N/A	N/A
		Annual Round Trips 6	6		



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