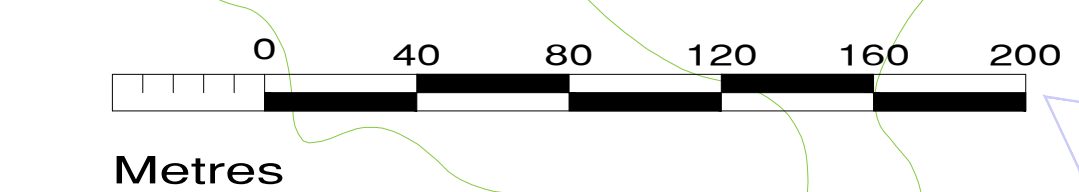
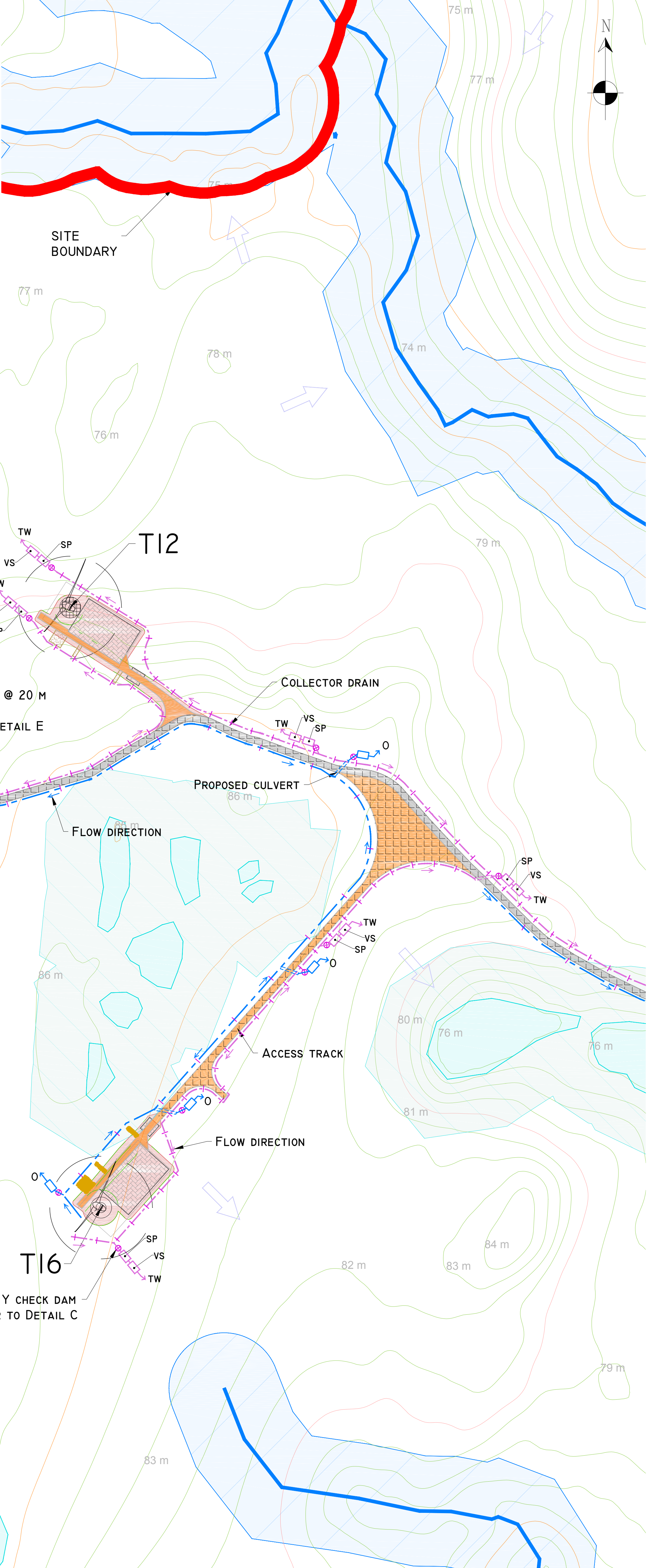
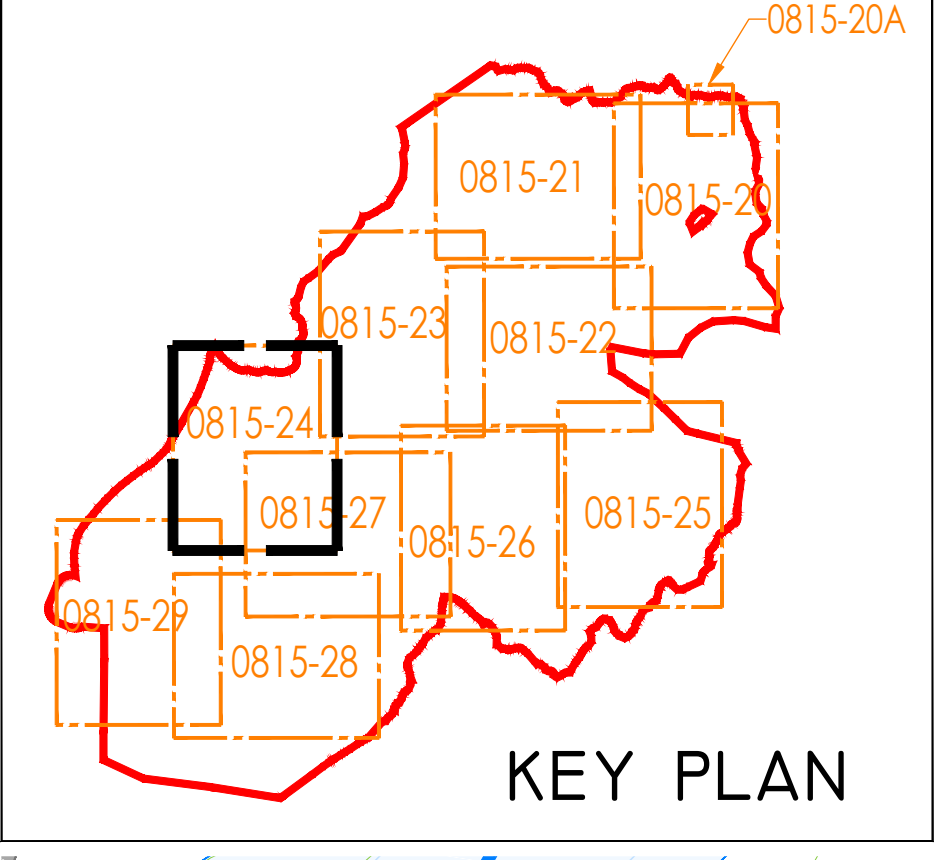


DRAINAGE DESIGN NOTES

1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, STILLING PONDS AND LEVEL SPREADERS ARE SHOWN AS INDICATIVE, AND MAY BE CHANGED TO SUIT THE REQUIREMENTS OF THE LOCAL TOPOGRAPHY.
3. SUPERVISING HYDROLOGIST OR ENVIRONMENTAL CLERK OF WORKS (ENVIRONMENTAL SCIENTIST) TO OVERSEE INSTALLATION OF DRAINAGE FEATURES FOLLOWING DETAILED DRAINAGE DESIGN.
4. DRAINAGE MEASURES TO BE INSTALLED PRIOR TO, OR AT THE SAME TIME AS THE WORKS AREAS THEY ARE INTENDED TO DRAIN.
5. DESIGN ELEVATION OF THE WATER SURFACE ALONG THE ROUTE OF THE INTERCEPTOR DRAINS OR SWALES WILL NOT BE LOWER THEN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR STILLING POND.
6. THE SPACING AND FREQUENCY OF THE CHECK DAMS WILL BE DEPENDANT ON THE GRADIENT OF THE INTERCEPTOR DRAIN OR SWALE IN WHICH THEY ARE BEING INSTALLED.
7. CHECK DAM DESIGNS TO BE SELECTED BEST TO SUIT PARTICULAR TOPOGRAPHY AND HYDROLOGICAL ENVIRONMENT.
8. DOWN GRADIENT SLOPE BELOW LEVEL SPREADER ONTO WHICH THE WATER WILL DISAPATE TO HAVE A GRADE LESS THE 6%.
9. NO DIRECT DISCHARGE OR PUMPING TO WATERCOURSES WILL BE PERMITTED. ALL DISCHARGES FROM LEVEL SPREADERS OR STILLING PONDS TO BE VIA VEGETATED FILTERS. SELECTION OR SUITABLE AREAS TO USE AS VEGETATION FILTERS WILL BE DETERMINED BY THE SIZE OF THE CONTRIBUTING CATCHMENT, SLOPE AND GROUND CONDITIONS.
10. STILLING PONDS TO BE SIZED ACCORDING TO THE AREA THEY WILL BE RECEIVING WATER FROM.
11. DIVERSION OF DRAINAGE DITCHES WILL ONLY TAKE PLACE WHEN ALTERNATIVE DRAINAGE DITCH HAS BEEN INSTALLED TO HANDLE THE SAME WATER.
12. EXISTING DRAINS/DITCHES TO BE INCORPORATED OR REMOVED DURING WIND FARM CONSTRUCTION.
13. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
14. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WOULD BE INSTALLED AS CLOSE TO THE ROAD AS POSSIBLE.
15. DRAINAGE ASSIGNED TO FLOATING ROAD SECTIONS OF THE LAYOUT WILL BE SUBJECT TO FURTHER OPTIMISATION IN PARALLEL WITH DETAILED GEOTECHNICAL DESIGN.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE

Management Type	Description of SUDS Drainage Control Methods
Avoidance Controls	<ol style="list-style-type: none"> 1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE 2) APPLICATION OF 25M BUFFER ZONES TO ARTIFICIAL DRAINAGE SYSTEMS WHERE POSSIBLE 3) USING SPILL WORKING AREAS 4) WORKING IN APPROPRIATE WEATHER AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
Source Controls	<ol style="list-style-type: none"> 1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE DRAINS, DIVERSION DRAINS, FLUMES AND COLLECTOR PIPES 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> a) SAND BAGS b) OYSTER BAGS FILLED WITH GRAVEL c) FILTER FABRICS d) OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS 3) USING SPILL WORKING AREAS 4) COVERING STOCKPILES 5) WEATHERING OFF / SEALING PEAT STOCKPILES
In-line Controls	<ol style="list-style-type: none"> 1) INTERCEPTOR DRAINING, VEE-DRAINING, OVERSIZED SWALES/COLLECTOR DRAINS 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> a) SAND BAGS b) OYSTER BAGS FILLED WITH GRAVEL c) FILTER FABRICS d) OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS 3) SILT FENCES, FILTER FABRICS 4) IN-TRENCH SOLES 5) COLLECTION Sumps, TEMPORARY Sumps, PUMPING SYSTEMS 6) ATTENUATION LASSINGS 7) SEGMENT TRAPS, STILLING / SETTLEMENT PONDS
Water Treatment Controls	<ol style="list-style-type: none"> 1) TEMPORARY Sumps 2) ATTENUATION PONDS 3) TEMPORARY STRAW LASSINGS 4) SEGMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PRIMARY SETTLEMENT SYSTEMS SUCH AS SILT COLLECTOR, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS 6) Silt DRAINING BASINS
Outfall Controls	<ol style="list-style-type: none"> 1) LEVEL SPREADERS 2) BUFFERS OFFFALLS 3) VEGETATION FILTERS 4) Silt DRAINING BASINS 5) FLOW LIMITERS AND WEIRS



DRAWING LEGEND :

	RIVERS/STREAMS		PROPOSED CULVERTS/BRIDGES
	LAKES		INTERCEPTOR DITCH CULVERT
	RIVERS/STREAMS 50M BUFFER		COLLECTOR DITCH CULVERT
	LAKES 50M BUFFER		OVERLAND FLOW DISCHARGE
	EXISTING CULVERTS/BRIDGES		TREATED WATER DISCHARGE
	UPSTREAM INTERCEPTOR DRAIN		SETTLEMENT POND
	SWALES/DOWNSTREAM COLLECTOR DRAIN		SEMI-NATURAL VEGETATION SWALE / FILTER BED / SECONDARY SP
	DIRECTION OF FLOW		PUMPING SUMP
	SILT FENCES		SITE BOUNDARY
	DOUBLE/TRIPLE SILT FENCES		EXISTING GROUND SURFACE MAJOR CONTOUR (10 M INTERVAL)
	SETTLEMENT POND - LEVEL SPREADER		EXISTING GROUND SURFACE INTERMEDIATE CONTOUR (5 M INTERVAL)
	SETTLEMENT POND - VEGETATION FILTER - LEVEL SPREADER		EXISTING GROUND SURFACE MINOR CONTOUR (1 M INTERVAL)
	CHECK DAM 'TYPE A'		TURBINE AND SWEEP AREA
	CHECK DAM 'TYPE B'		TURBINE FOUNDATION

PROJECT DESIGN DRAWING NOTES

1. DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
2. DRAWINGS NOT TO BE USED FOR CONSTRUCTION / CONTRACT CONDITIONS.
3. COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
4. DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
5. ALL CONTRACTORS, WEATHER MAIN OR SUB-CONTRACTORS, MUST VISIT THE SITE AND ARE RESPONSIBLE FOR TAKING AND CHECKING ANY AND ALL DIMENSIONS AND LEVELS THAT RELATE TO THE WORKS.
6. THE USE OF OR RELIANCE UPON THIS DRAWING SHALL BE DEEMED TO BE ACCEPTANCE OF THESE CONDITIONS OF USE UNLESS OTHERWISE AGREED IN WRITING. SUCH WRITTEN AGREEMENT TO BE SOUGHT FROM AND ISSUED BY THE COPYRIGHT HOLDER TO THE USE OR RELIANCE UPON THIS DRAWING.
7. LAYOUT PLANS SHOW TYPICAL TURBINE ROTOR DIAMETER AS PER TURBINE DRAWING.

Ordnance Survey Ireland Licence No. EN 0044718
© Ordnance Survey Ireland/Government of Ireland

Date	Description	Chkd	Signed

HYDRO ENVIRONMENTAL SERVICES

22 Lower Main St
Dungarvan
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

Client:	MCCARTHY KEVILLE O'SULLIVAN
Job:	ARDDERROO WF, Co. GALWAY
Title:	Drainage Layout Sheet 5 of 10
Figure No:	0815-24
Drawing No:	P1227-8-1118-A1-0815-24-00A
Sheet Size:	A1
Scale:	1:2,000 (A1)
Date:	21/11/2018
Project No.:	P1227-8
Drawn By:	GD
Checked By:	MG