

Rampion 2 Wind Farm

Category 6:

Environmental Statement

Volume 4, Appendix 9.4

Geophysical survey (Part 2 of 7)

Date: August 2023

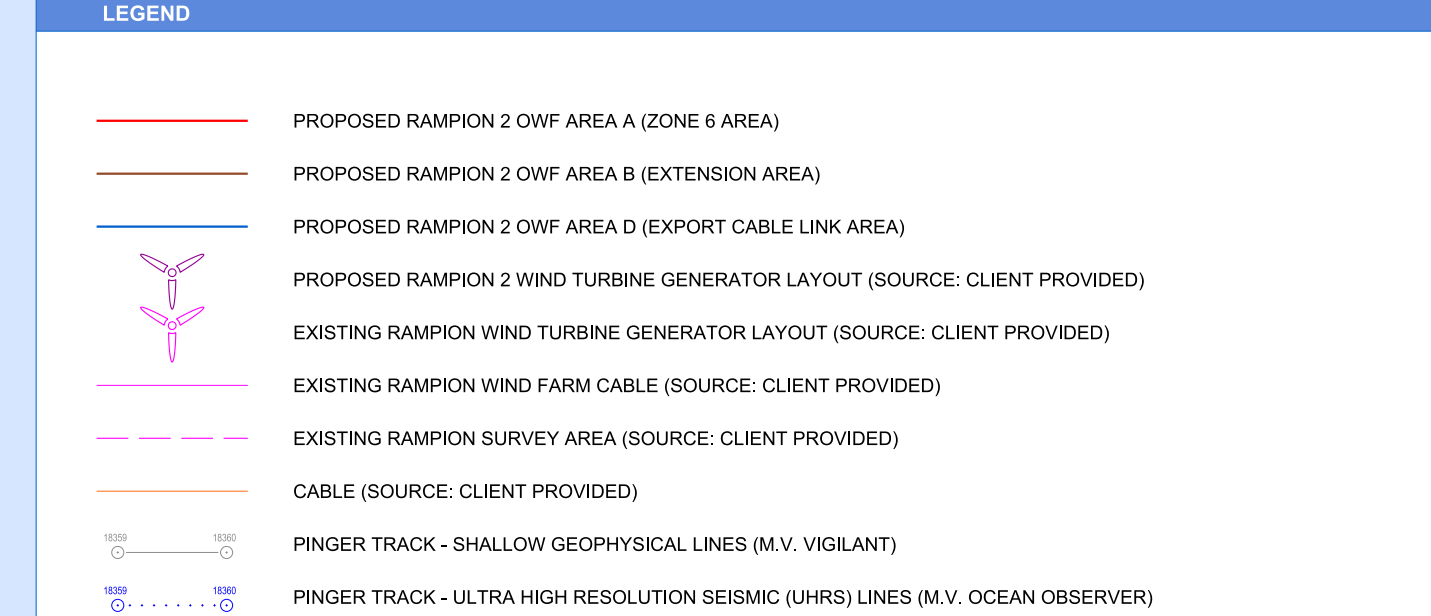
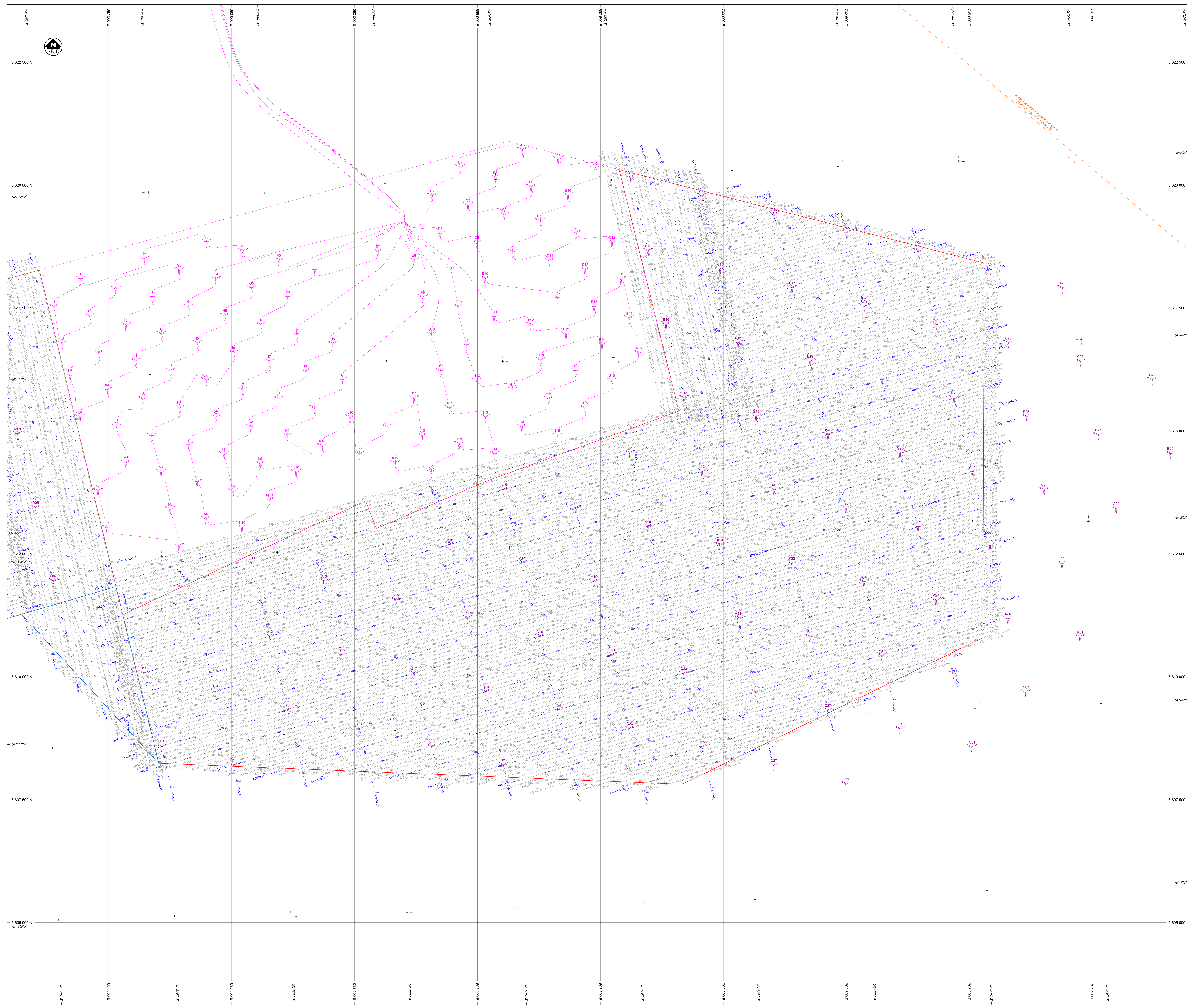
Revision A

Document Reference: 6.4.9.4
Pursuant to: APFP Regulation 5 (2) (a)
Ecodoc number: 004866474-01

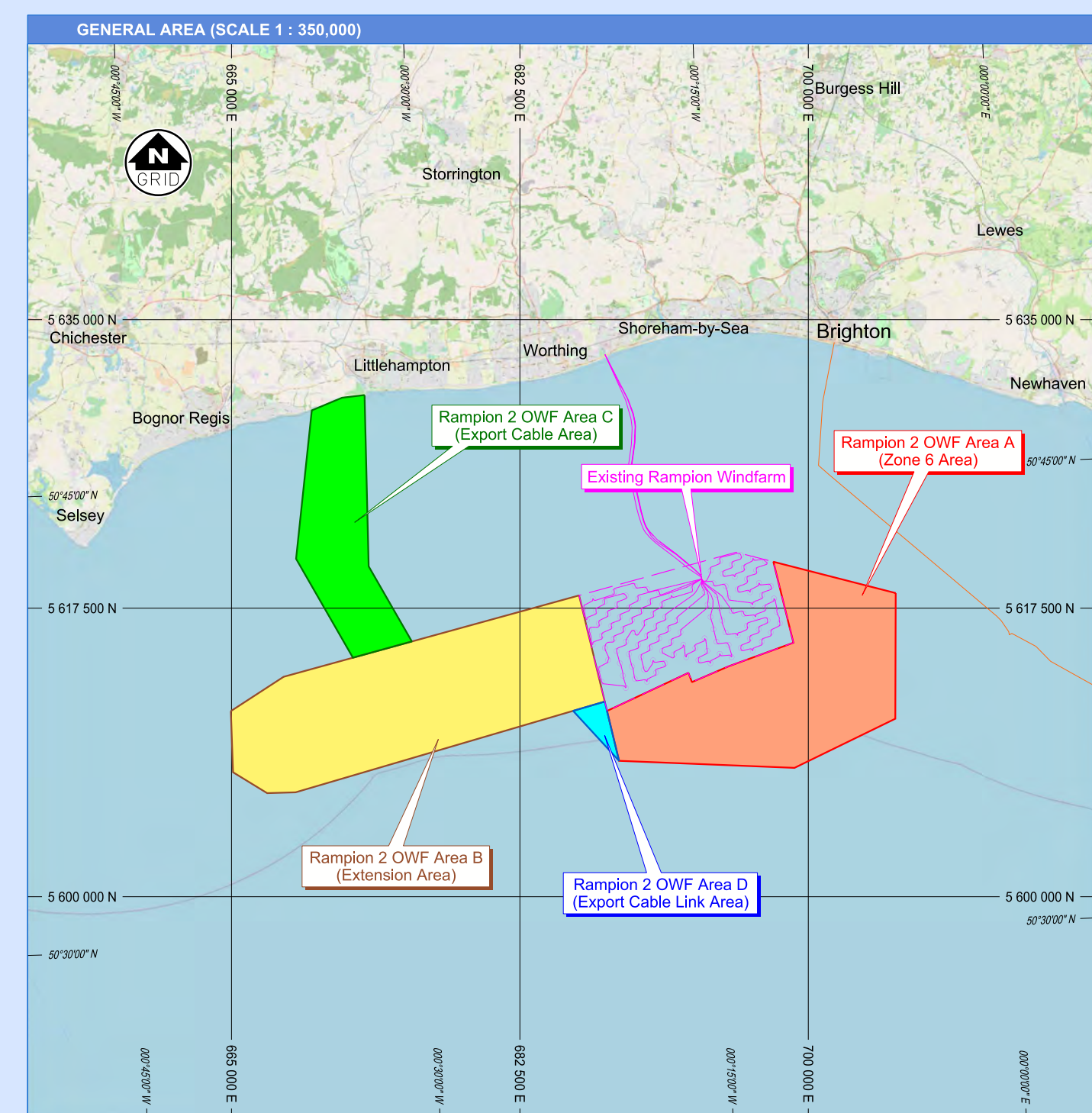


Document revisions

Revision	Date	Status/reason for issue	Author	Checked by	Approved by
A	04/08/2023	Final for DCO Application	GoBe	RED	RED



NOTES



GEODETIC REFERENCE SYSTEM

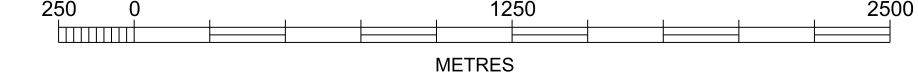
GEOCENTRIC DATUM: WGS84
 ELLIPSOID: WGS84
 PROJECTION: UTM ZONE 30 N (CENTRAL MERIDIAN 3° W)

SURVEY INFORMATION

SURVEY VESSEL:	M.V. VIGILANT	M.V. OCEAN CREATOR
DEPART DATE:	30-JUN-2010 TO 01-JUL-2010	16-SEP-2002 TO 13-OCT-2002
POSITIONING SYSTEM:	OCEANSTAR C-MAN NAVIONIS SONAR/DYNAPAGE RANGER USBL	FURUNO STAYAVE GONS SONAR/DYNAPAGE RANGER USBL
NAVIGATION SYSTEM:	EDGE ECHOGRAPH MULTIBEAM SYSTEM EDGE SOUNDER (SINGLE-BEAM SYSTEM)	VOYAGER 1 VOYAGER 1
SEI: SCAN SONAR	SIMRAD EK6000	SIMRAD EK6000
MAGNETOMETER	EDGE TECH 4200FS	EDGE TECH 4200FS
SUB-BOTTOM PROFILER	GEOTECHNICS GORG	GEOTECHNICS GORG
ULTRA HIGH RESOLUTION SEISMIC (UHRIS)	GEOTECHNICS PINGER	1 X G.O.U.T. 1.1. SLEEVE GUN 2 X TELEPHONE STRAINER

SCALE (A0 ORIGINAL)

1 : 25 000 (Horizontal)



TITLE

SURVEY CONTRACTOR



GARDLINE LIMITED
ENDEAVOUR HOUSE, ADMIRALTY ROAD, GREAT YARMOUTH, NORFOLK NR30 3NG, ENGLAND
TELEPHONE +44 (0) 1493 845600 FAX +44 (0) 1493 852106 WEBSITE WWW.GARDLINE.COM

CLIENT



PROJECT TITLE

RAMPTON 2 OFFSHORE WINDFARM DEVELOPMENT
GEOPHYSICAL SITE SURVEY FOR AREA A

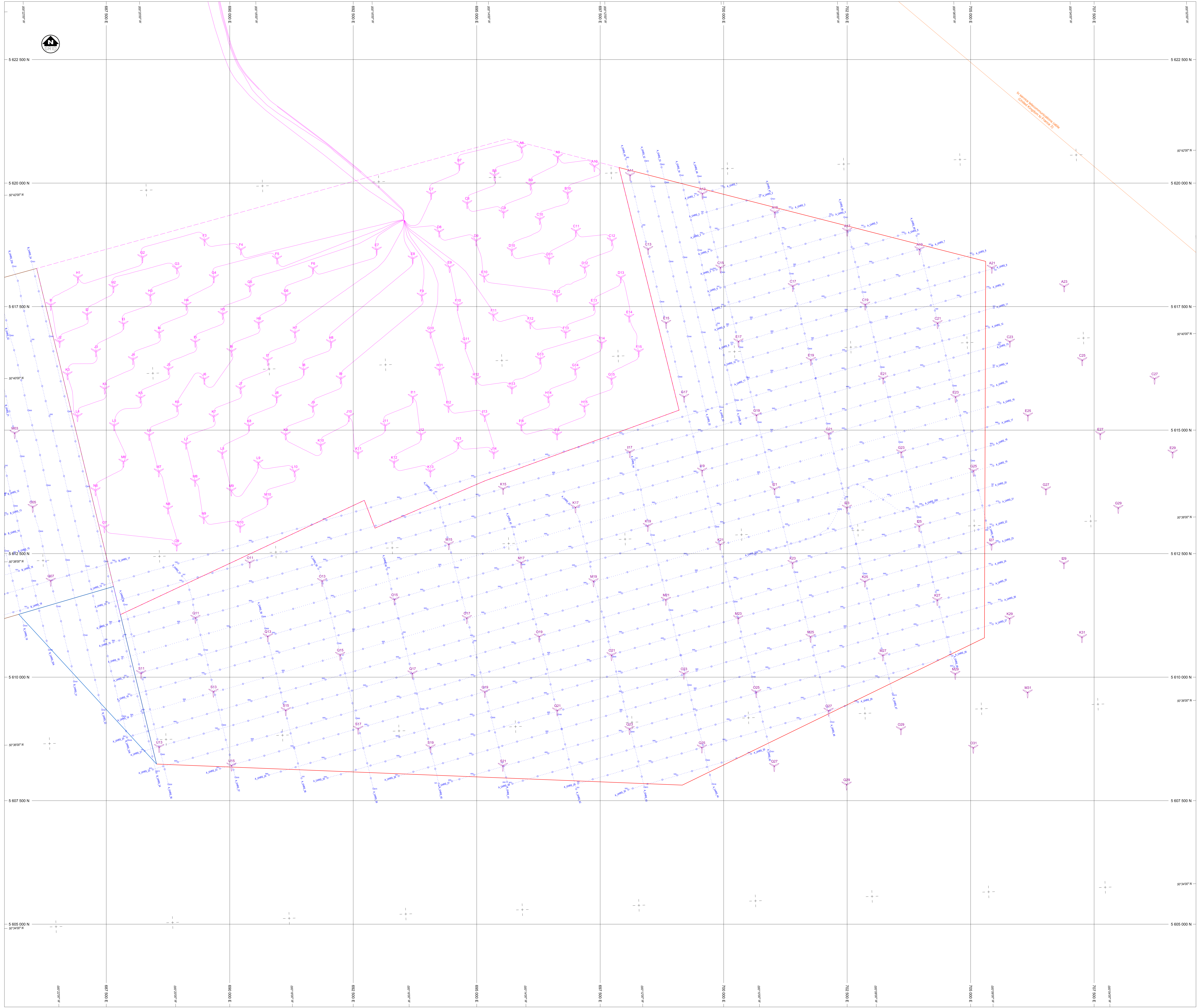
DRAWING TITLE

SUB-BOTTOM PROFILER TRACK

CHART 3

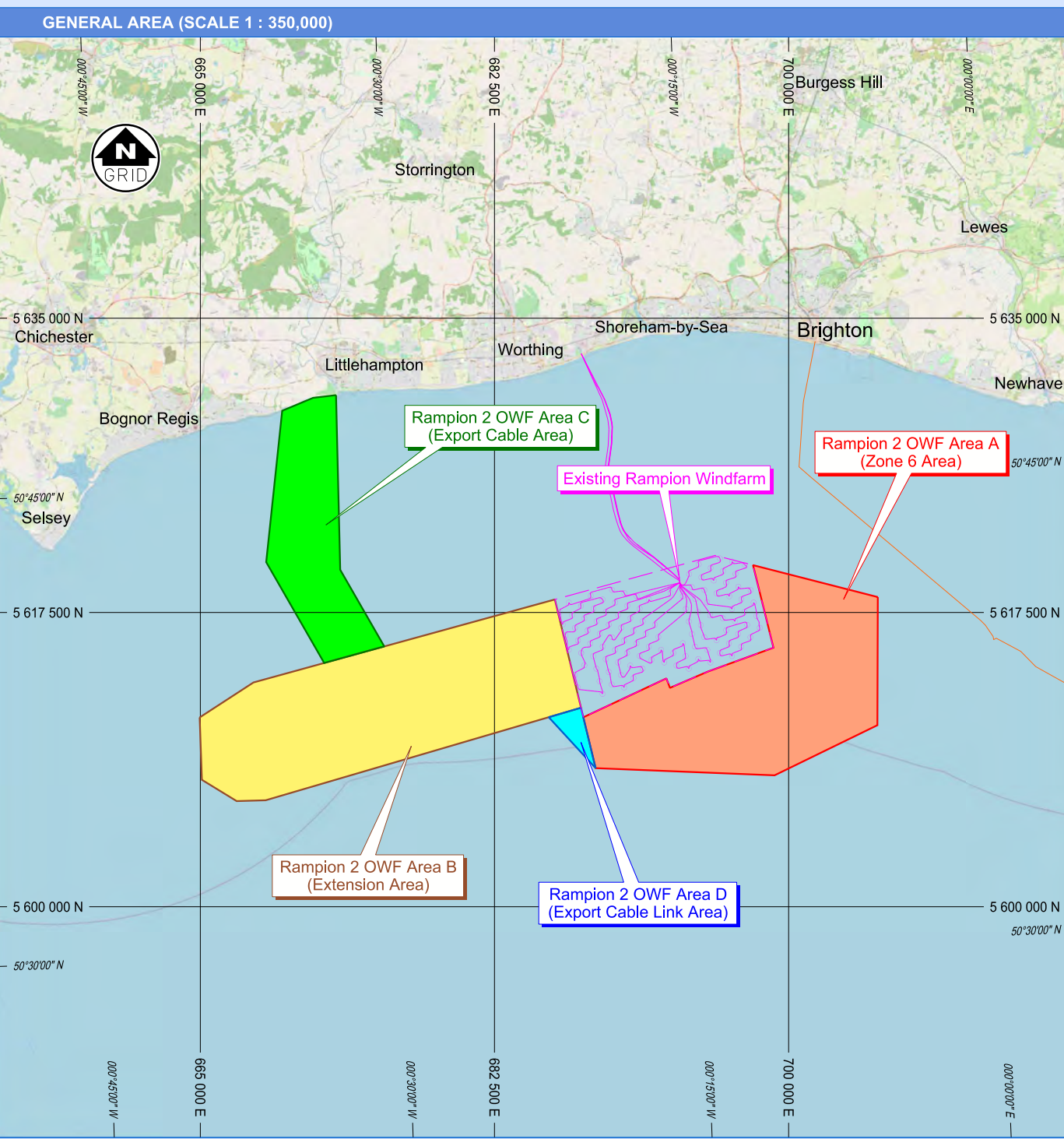
REVISION							
REV.	DATE	TITLE	DESCRIPTION	AUTHOR	DRAWN	CHECKED	APPROVED
0	16 DEC 2020	DRAFT	FIRST ISSUE FOR CLIENT REVIEW. RFS ONLY	MC	IS	MK	DVG

V	R006E18G	B047	FIRST ISSUE FOR CLIENT REVIEW, F&E ONLY	NO	99	NR	DIG	
CLIENT REFERENCE			REPORT REFERENCE	11521.2	DRAWING NUMBER			11521.2-03



- LEGEND**
- PROPOSED RAMPON 2 OWF AREA A (ZONE 6 AREA)
 - PROPOSED RAMPON 2 OWF AREA B (EXTENSION AREA)
 - PROPOSED RAMPON 2 OWF AREA C (EXPORT CABLE LINK AREA)
 - PROPOSED RAMPON 2 WIND TURBINE GENERATOR LAYOUT (SOURCE: CLIENT PROVIDED)
 - EXISTING RAMPON WIND TURBINE GENERATOR LAYOUT (SOURCE: CLIENT PROVIDED)
 - EXISTING RAMPON WIND FARM CABLE (SOURCE: CLIENT PROVIDED)
 - EXISTING RAMPON SURVEY AREA (SOURCE: CLIENT PROVIDED)
 - CABLE (SOURCE: CLIENT PROVIDED)
 - ULTRA HIGH RESOLUTION SEISMIC TRACK - FIRST CMP POSITION (M.V. OCEAN OBSERVER)

NOTES

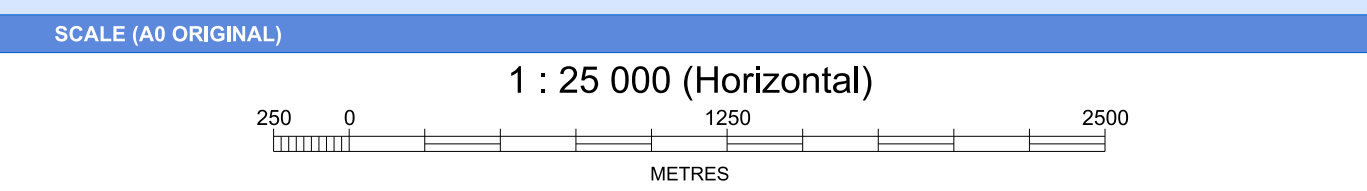


GEODETIC REFERENCE SYSTEM

GEODETIC DATUM:	WGS84
ELLIPSOID:	WGS84
PROJECTION:	UTM ZONE 30 N (CENTRAL MERIDIAN 3° W)

SURVEY INFORMATION

SURVEY VESSEL:	M.V. VIGILANT	M.V. OCEAN OBSERVER
SURVEY DATE:	16-SEP-2020 TO 19-AUG-2020	16-SEP-2020 TO 19-AUG-2020
POSITIONING SYSTEM:	OCEANERRING CANAV DGNSS	FURIO STAFFX DGNSS
NAVIGATION SYSTEM:	SCHNAPPE RANGER USBL	SCHNAPPE RANGER USBL
ECHO SOUNDER (MULTI-BEAM SYSTEM):	VOYAGER 5	VOYAGER 5
ECHO SOUNDER (SINGLE-BEAM SYSTEM):	SMIRAD E6400	SMIRAD E6400
SIDE SCAN SONAR:	EDGETECH 400PS	EDGETECH 400PS
MAGNETOMETER:	GEOMETRICS G82	GEOMETRICS G82
SUB-BOTTOM PROFILER:	GEOTECH 400PS	GEOTECH 400PS
ULTRA-HIGH RESOLUTION SEISMIC (UHR):	GEOTECH 400PS	GEOTECH 400PS



TITLE

SURVEY CONTRACTOR

Gardline

GARDLINE LIMITED
ENDEAVOUR HOUSE, ADMIRALTY ROAD, GREAT YARMOUTH, NORFOLK, ENGLAND
TELEPHONE: 44 (0) 1493 84500 FAX: 44 (0) 1493 82156 WEBSITE: WWW.GARDLINE.COM

CLIENT

RWE
The energy to lead

PROJECT TITLE

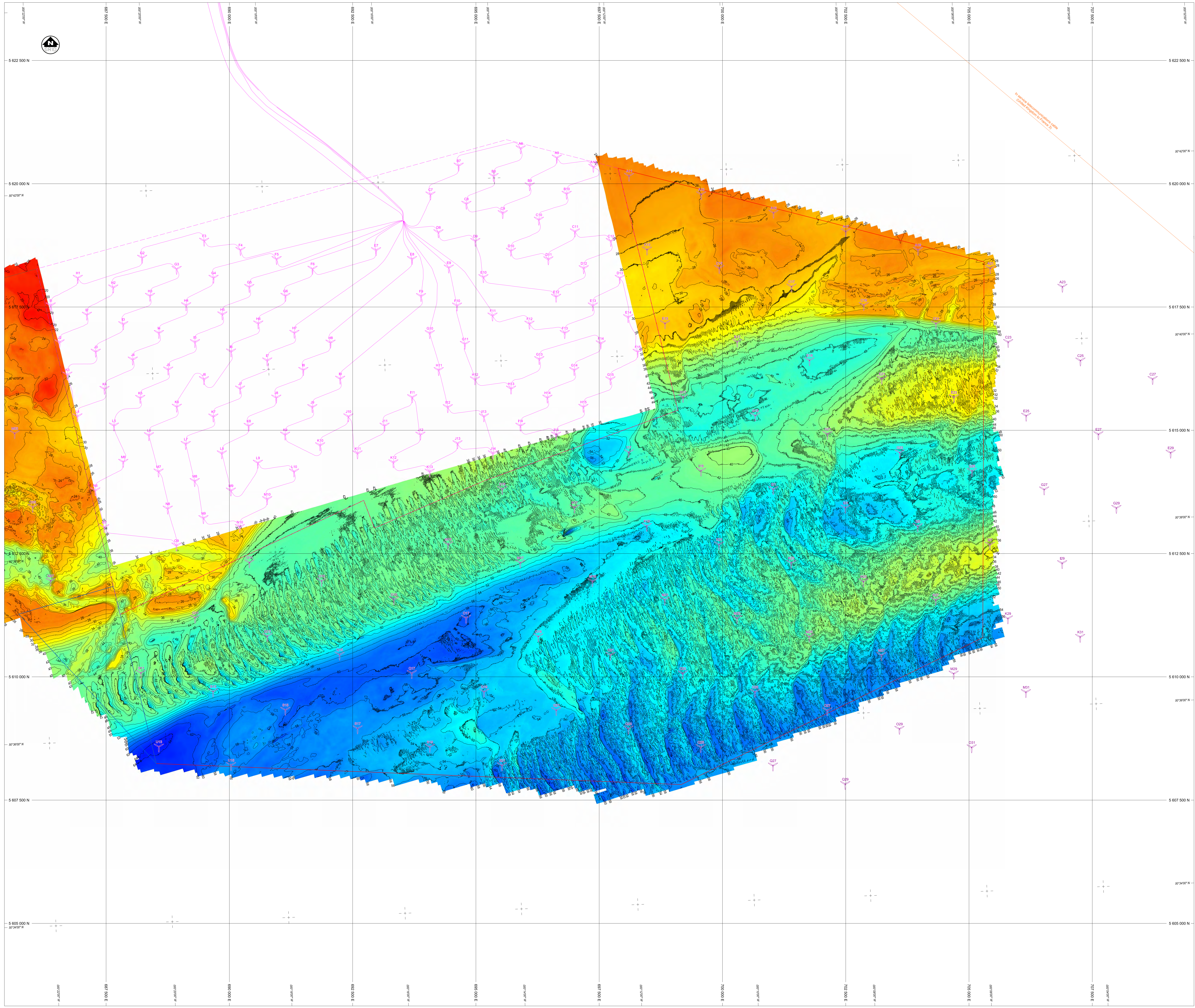
**RAMPON 2 OFFSHORE WINDFARM DEVELOPMENT
GEOPHYSICAL SITE SURVEY FOR AREA A**

DRAWING TITLE

**ULTRA HIGH RESOLUTION SEISMIC TRACK
(FIRST CMP POSITION)**

CHART 4

REVISION		TITLE		DESCRIPTION		AUTHOR	DRAWN	CHECKED	APPROVED
0	16-DEC-2020	DRAFT		FIRST ISSUE FOR CLIENT REVIEW. PDF ONLY		MC	JS	MC	DIG
CLIENT REFERENCE		REPORT REFERENCE		11021.2		DRAWING NUMBER		11021.2.04	



LEGEND

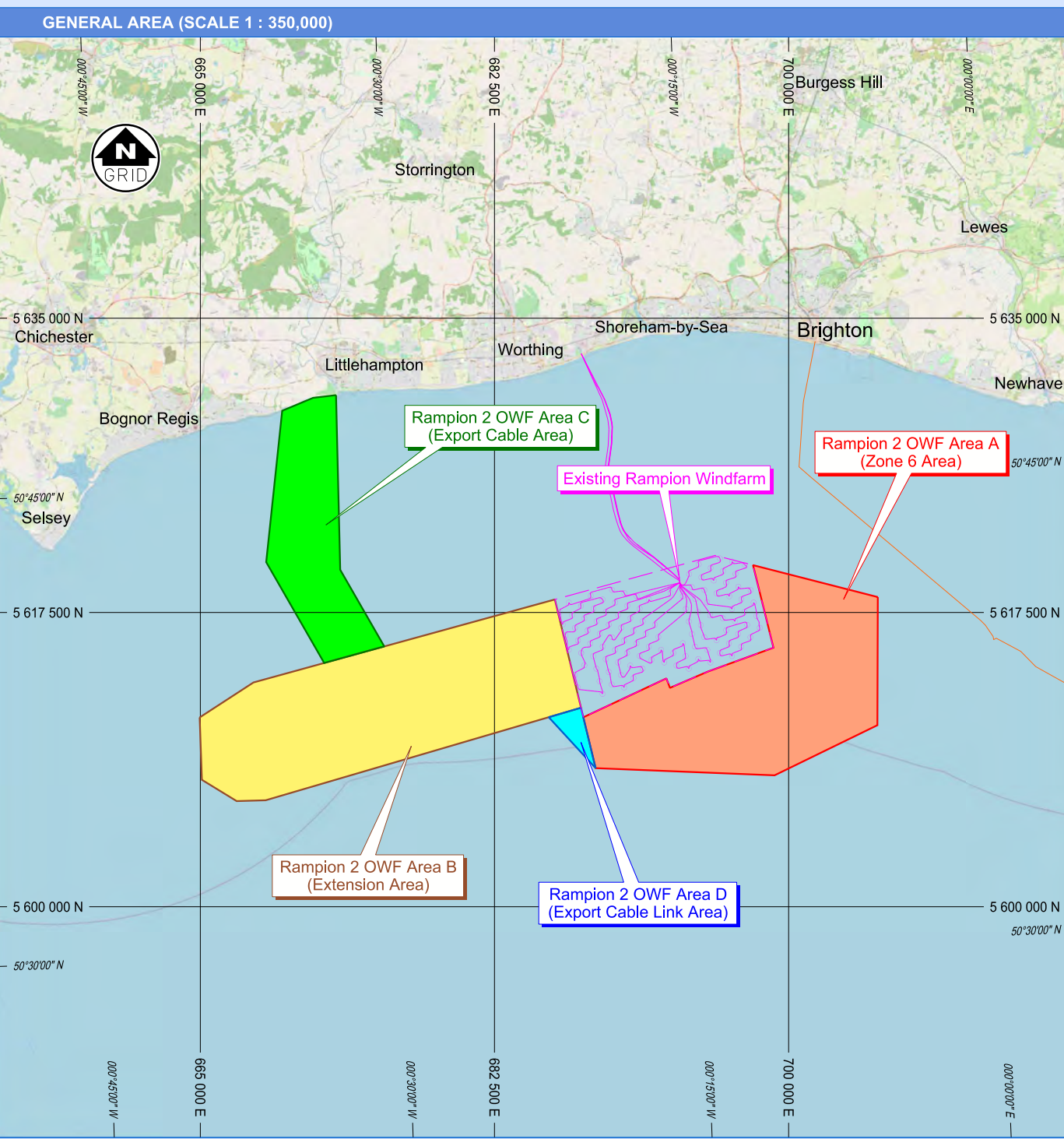
- PROPOSED RAMPION 2 OWF AREA A (ZONE 6 AREA)
- PROPOSED RAMPION 2 OWF AREA B (EXTENSION AREA)
- PROPOSED RAMPION 2 OWF AREA C (EXPORT CABLE LINK AREA)
- PROPOSED RAMPION 2 WIND TURBINE GENERATOR LAYOUT (SOURCE: CLIENT PROVIDED)
- EXISTING RAMPION WIND TURBINE GENERATOR LAYOUT (SOURCE: CLIENT PROVIDED)
- EXISTING RAMPION SURVEY AREA (SOURCE: CLIENT PROVIDED)
- CABLE (SOURCE: CLIENT PROVIDED)
- BATHYMETRIC CONTOURS SHOWN AT 10 METRE INTERVALS LAT
- BATHYMETRIC CONTOURS SHOWN AT 2 METRE INTERVALS LAT

DEPTH METRES (SEAWAY)

20
25
30
35
40
45
50
55
60
65

NOTES

- OBSERVED SOUNDINGS HAVE BEEN REDUCED TO LAT TIDAL DATUM USING GNSS HEIGHT DATA. PROCESSED USING RPT PRECISION POINT POSITIONING TECHNIQUES AND THE UNDO VORF MODEL.
- THE DIFFERENCE BETWEEN LAT TO MSL IS 3.3m
- DATA GRIDDED AT 1m x 1m

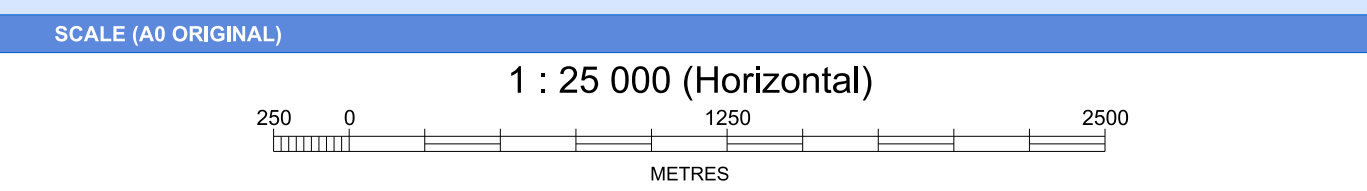


GEODETIC REFERENCE SYSTEM

GEODETIC DATUM: ELLIPSOID: PROJECTION:	WGS84 WGS84 UTM ZONE 30 N (CENTRAL MERIDIAN 3° W)
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SURVEY INFORMATION

SURVEY VESSEL: SURVEY DATE: POSITIONING SYSTEM: NAVIGATION SYSTEM: ECHO SOUNDER (MULTI-BEAM SYSTEM): ECHO SOUNDER (SINGLE-BEAM SYSTEM): SIDE SCAN SONAR: MAGNETOMETER: SUB-BOTTOM PROFILER: ULTRA-HIGH RESOLUTION SEISMIC (UHR):	M.V. VIGILANT 30-JUN-2020 TO 01-AUG-2020 OCENERRING CANAV DONGS SONARLINE RANGER USBL VOYAGER S SMBRAD E6400 SMBRAD E6400 EDGETECH 400PS GEOMETRICS Q82 GEACUSTICS PRINGER	M.V. OCEAN OBSERVER 16-SEP-2020 TO 14-OCT-2020 FURO STAFFX DONGS SONARLINE RANGER USBL VOYAGER S SMBRAD E6400 EDGETECH 400PS GEOMETRICS Q82 GEACUSTICS PRINGER 1 x F1000 T.I. SLEWING GUN 75m TELEDYNE STREAMER
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TITLE

SURVEY CONTRACTOR

Gardline

GARDLINE LIMITED
ENDAVOUR HOUSE, ADMIRALTY ROAD, GREAT YARMOUTH, NORFOLK NR3 2NG, ENGLAND
TELEPHONE: 44 (0) 1493 84600 FAX: 44 (0) 1493 84760 WEBSITE: WWW.GARDLINE.COM

CLIENT

RWE
The energy to lead

PROJECT TITLE

**RAMPION 2 OFFSHORE WINDFARM DEVELOPMENT
GEOPHYSICAL SITE SURVEY FOR AREA A**

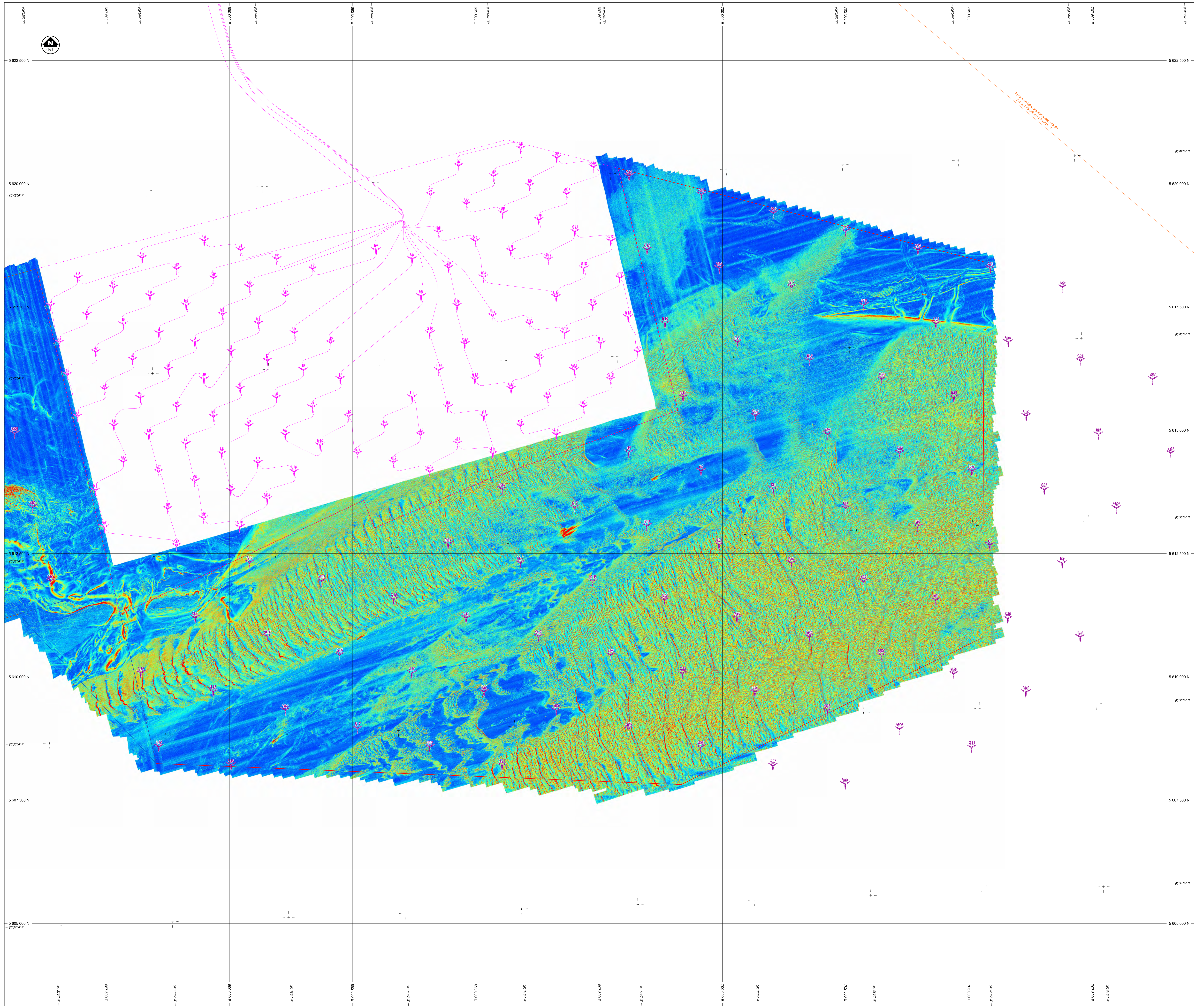
DRAWING TITLE

**BATHYMETRY
CHART 5**

REVISION

REV.	DATE	TITLE	DESCRIPTION	AUTHOR	DRAWN	CHECKED	APPROVED
0	16-DEC-2020	DRAFT	FIRST ISSUE FOR CLIENT REVIEW. PDF ONLY	MC	JS	MC	DIG

CLIENT REFERENCE **REPORT REFERENCE** 11021.2 **DRAWING NUMBER** 11021.2.05



LEGEND

- PROPOSED RAMPION 2 OWF AREA A (ZONE 6 AREA)
- PROPOSED RAMPION 2 OWF AREA B (EXTENSION AREA)
- PROPOSED RAMPION 2 OWF AREA C (EXPORT CABLE LINK AREA)
- PROPOSED RAMPION 2 WIND TURBINE GENERATOR LAYOUT (SOURCE: CLIENT PROVIDED)
- EXISTING RAMPION WIND TURBINE GENERATOR LAYOUT (SOURCE: CLIENT PROVIDED)
- EXISTING RAMPION WIND FARM CABLE (SOURCE: CLIENT PROVIDED)
- EXISTING RAMPION SURVEY AREA (SOURCE: CLIENT PROVIDED)
- CABLE (SOURCE: CLIENT PROVIDED)

SEABED GRADIENT

0.0 2.5 5.0 7.5 >10

NOTES

GENERAL AREA (SCALE 1 : 350,000)

GEODETIC REFERENCE SYSTEM

GEODETIC DATUM: WGS84
ELLIPSOID: WGS84
PROJECTION: UTM ZONE 30 N (CENTRAL MERIDIAN 3° W)

SURVEY INFORMATION

SURVEY VESSEL: M.V. VIGILANT	M.V. OCEAN OBSERVER
SURVEY DATE: 16-SEP-2020 TO 19-AUG-2020	16-SEP-2020 TO 19-AUG-2020
POSITIONING SYSTEM: OCEANERRING CANAV DGNSS	FURIO STAFFX DGNSS
NAVIGATION SYSTEM: SCHNEIDER RANGER USBL	SCHNEIDER RANGER USBL
ECHO SOUNDER MULTIBEAM SYSTEM: VOYAGER 5	VOYAGER 5
ECHO SOUNDER SINGLE-BEAM SYSTEM: SIMRAD EK600	SIMRAD EK600
SIDE SCAN SONAR: EDGETECH 400PS	EDGETECH 400PS
MAGNETOMETER: GEOMETRICS G82	GEOMETRICS G82
SUB-BOTTOM PROFILER: GEACOUSTICS PRINGER	GEACOUSTICS PRINGER
ULTRA-HIGH RESOLUTION SEISMIC (UHRIS):	1 x F1000, T1, SLEWING GUN
	75m TELEDYNE STREAMER

SCALE (AS ORIGINAL)

1 : 25 000 (Horizontal)

250 0 1250 2500 METRES

TITLE

SURVEY CONTRACTOR

Gardline

GARDLINE LIMITED
ENDAVOUR HOUSE, ADMIRALTY ROAD, GREAT YARMOUTH, NORFOLK NR3 2NG, ENGLAND
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CLIENT

RWE
The energy to lead

PROJECT TITLE

**RAMPION 2 OFFSHORE WINDFARM DEVELOPMENT
GEOPHYSICAL SITE SURVEY FOR AREA A**

DRAWING TITLE

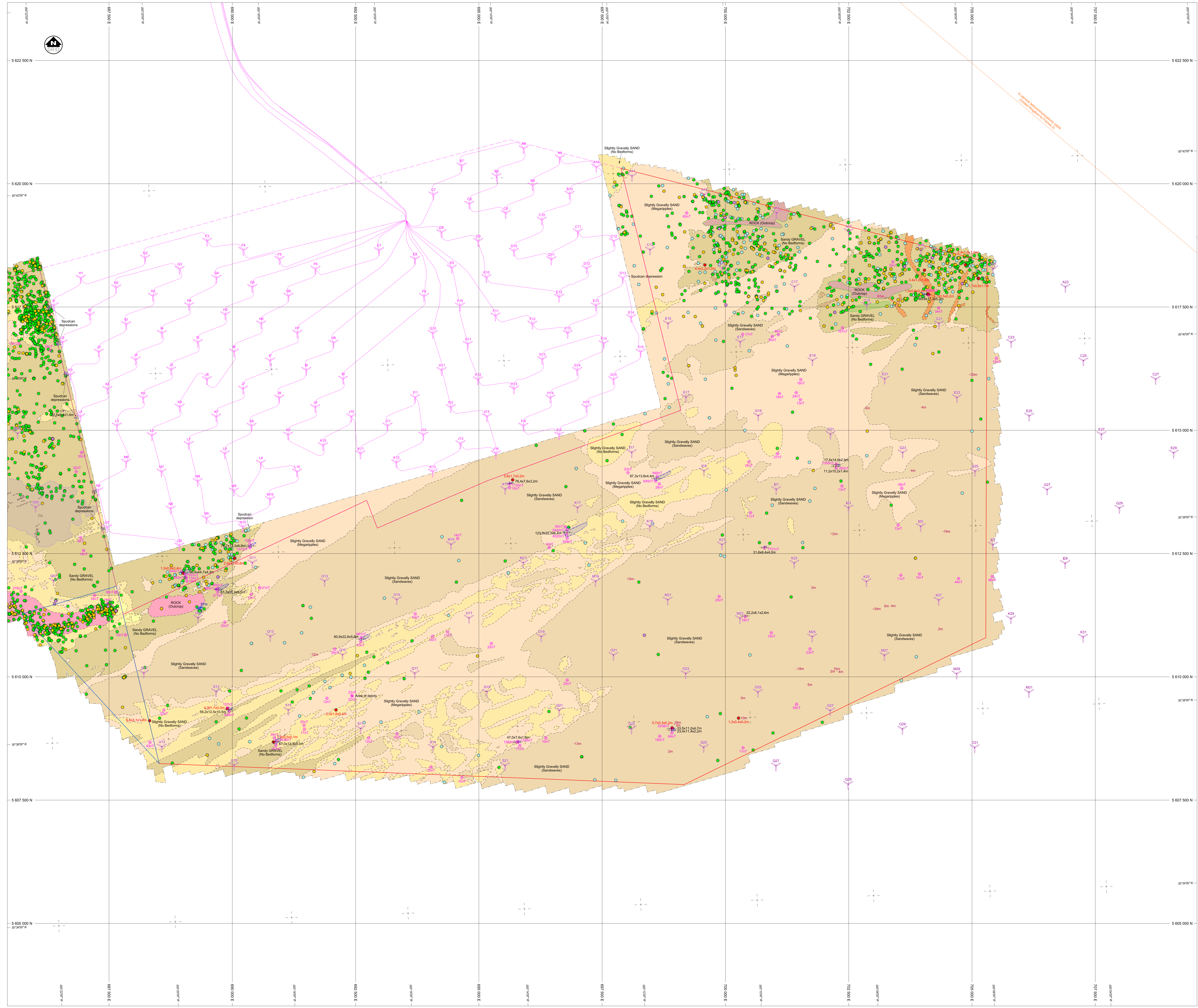
SEABED GRADIENT

CHART 7

REVISION

REV.	DATE	TITLE	DESCRIPTION	AUTHOR	DRAWN	CHECKED	APPROVED
0	16-DEC-2020	DRAFT	FIRST ISSUE FOR CLIENT REVIEW. PDF ONLY	MC	JS	MK	DIG

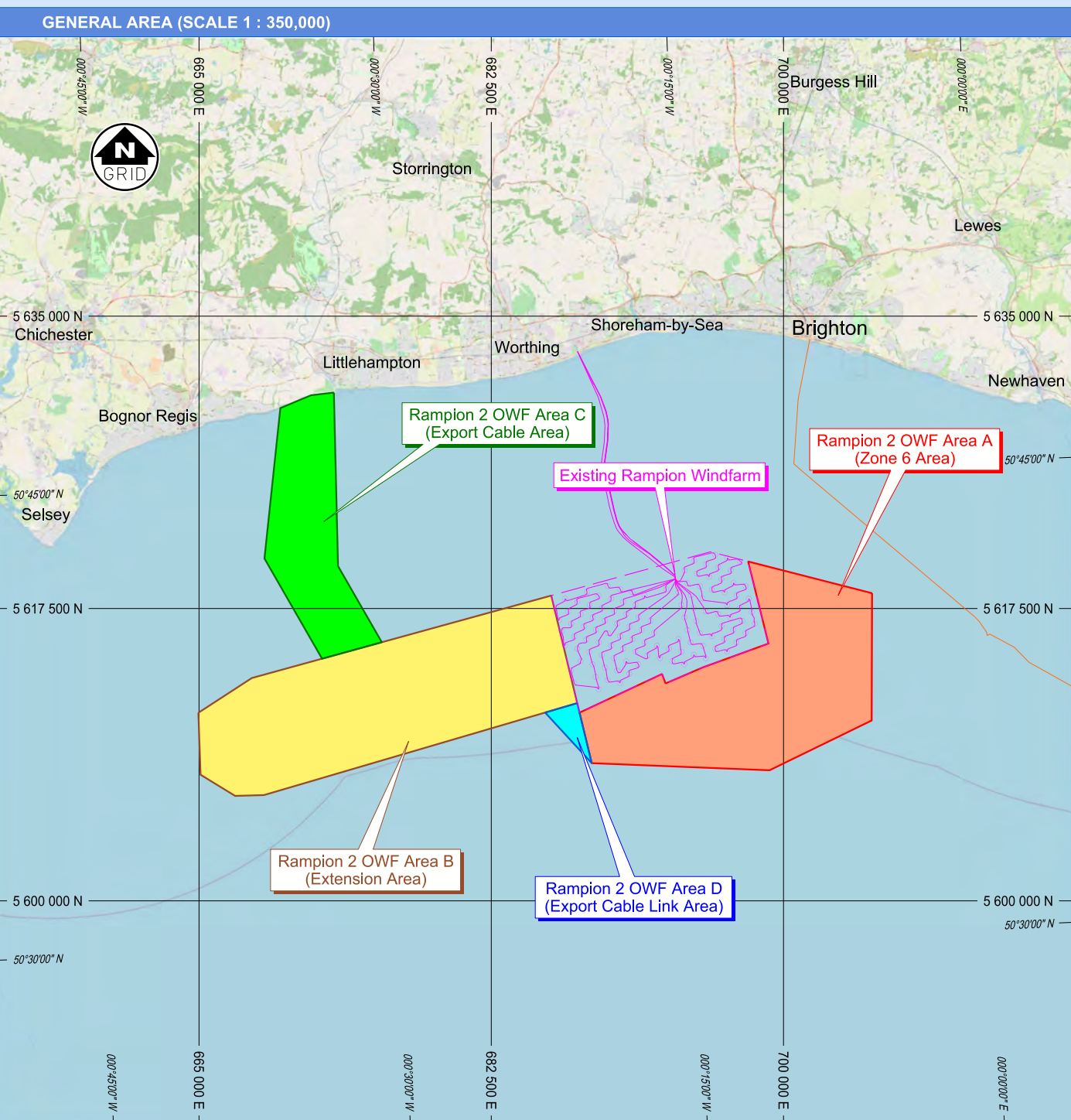
CLIENT REFERENCE **REPORT REFERENCE** 11021.2 **DRAWING NUMBER** 11021.2.07



LEGEND

- PROPOSED RAMPON 2 OWF AREA A (ZONE 6 AREA)
- PROPOSED RAMPON 2 OWF AREA B (EXTENSION AREA)
- PROPOSED RAMPON 2 OWF AREA C (EXPORT CABLE LINK AREA)
- PROPOSED RAMPON 2 WIND TURBINE GENERATOR LAYOUT (SOURCE: CLIENT PROVIDED)
- EXISTING RAMPON WIND TURBINE GENERATOR LAYOUT (SOURCE: CLIENT PROVIDED)
- EXISTING RAMPON SURVEY AREA (SOURCE: CLIENT PROVIDED)
- CABLE (SOURCE: CLIENT PROVIDED)
- SAND (MEGARIPPLED)
- SLIGHTLY GRAVELLY SAND (NO BEDFORMS)
- SLIGHTLY GRAVELLY SAND (MEGARIPPLED)
- SLIGHTLY GRAVELLY SAND (SAND WAVES)
- SANDY GRAVEL (NO BEDFORMS)
- SANDY GRAVEL (MEGARIPPLED)
- SANDY GRAVEL (CHANNELLING)
- ROCK (OUTCROP)
- AREA OF NUMEROUS BOULDERS
- AREA OF DEBRIS
- AREA OF SCOUR
- AREA OF POSSIBLE HEAVILY SCARRED DREDGING EXTRACTION
- BOULDER WITH HEIGHT 0.1-0.2 METRES
- BOULDER WITH HEIGHT 0.3-0.5 METRES
- BOULDER WITH HEIGHT GREATER THAN 1.0 METRES
- DEBRIS WITH DIMENSIONS IN METRES (LxWxH)
- MAGNETOMETER ANOMALY WITH FIELD STRENGTH IN nT
- WRECK WITH DIMENSIONS IN METRES (LxWxH)
- LINEAR DEBRIS WITH LENGTH IN METRES
- FISHING POT
- LINEAR FISHING GEAR WITH LENGTH IN METRES
- LIMIT OF SIDE SCAN SONAR COVERAGE

NOTES

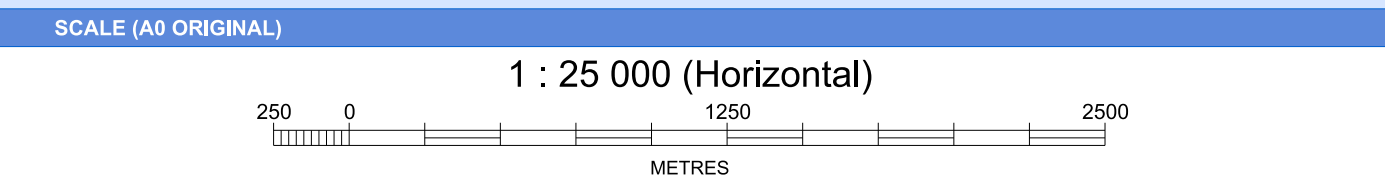


GEODETIC REFERENCE SYSTEM

GEODETIC DATUM: ELLIPSOID: PROJECTION:	WGS84 WGS84 UTM ZONE 30 N (CENTRAL MERIDIAN 3° W)
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SURVEY INFORMATION

SURVEY VESSEL: SURVEY DATE: POSITIONING SYSTEM: NAVIGATION SYSTEM: ECHO SOUNDER MULTIBEAM SYSTEM: ECHO SOUNDER SINGLE-BEAM SYSTEM: SIDE SCAN SONAR: MAGNETOMETER: SUB-BOTTOM PROFILER: ULTRA-HIGH RESOLUTION SEISMIC (UHR):	M.V. VILANT 30-JAN-2020 TO 19-AUG-2020 OCEANERRING CANAV DGNSS SONARONE RANGER USBL VOYAGER S SIMRAD EK600 SIMRAD EK600 EDGE TECH 400PS GEOMETRICS GR2 GEOMETRICS PRIMER	M.V. OCEAN OBSERVER 16-SEP-2020 TO 19-OCT-2020 FURO STAFFX DGNSS SONARONE RANGER USBL VOYAGER S SIMRAD EK600 SIMRAD EK600 EDGE TECH 400PS GEOMETRICS GR2 GEOMETRICS PRIMER 1 x FURU, T.I. SURVEY GUN 75m TELEDRYNE STREAMER
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TITLE

SURVEY CONTRACTOR

Gardline

GARDLINE LIMITED
ENDSAYOUR HOUSE, ADMIRALTY ROAD, GREAT YARMOUTH, NORFOLK NR3 2NG, ENGLAND
TELEPHONE: 44 (0) 1493 846600 FAX: 44 (0) 1493 847650 WEBSITE: WWW.GARDLINE.COM

CLIENT

RWE
The energy to lead

PROJECT TITLE

**RAMPON 2 OFFSHORE WINDFARM DEVELOPMENT
GEOPHYSICAL SITE SURVEY FOR AREA A**

DRAWING TITLE

SEABED FEATURES

CHART 8

REVISION

REV.	DATE	TITLE	DESCRIPTION	AUTHOR	DRAWN	CHECKED	APPROVED
0	16-DEC-2020	DRAFT	FIRST ISSUE FOR CLIENT REVIEW. PDF ONLY	CT	JS	MC	DIG

CLIENT REFERENCE

REPORT REFERENCE 11021.2

DRAWING NUMBER 11021.2.08