



# **ROBIN RIGG OFFSHORE WIND FARM**

## **INTER-ARRAY CABLE MONITORING SURVEY**

### **REPORT**

**C9023b**

October 2009

**REPORT AUTHORISATION AND DISTRIBUTION**

**ROBIN RIGG  
OFFSHORE WIND FARM  
INTER-ARRAY  
CABLE MONITORING SURVEY  
REPORT**

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## 1. INTRODUCTION

On the instructions of Offshore Design Engineering Ltd (ODE), acting on behalf of E.ON UK Solway Offshore Ltd and E.ON UK Offshore Energy Resources Ltd, Osiris Projects were commissioned to undertake a mid-construction geophysical survey covering the proposed Robin Rigg Offshore Wind Farm development site. The survey was undertaken using Osiris Projects own dedicated survey vessel, MV 'Freja' during the period 28<sup>th</sup> June to 6<sup>th</sup> July 2009.

High-resolution side scan sonar, swath multi-beam and single beam bathymetry and magnetometer data were acquired along all survey lines, in order to accurately map the seabed within the wind farm development area. Main survey lines were run at 100m centres, with cross lines at 200m centres. Additional lines were run 25m either side of individual turbine rows in both NNE-SSW and WNW-ESE orientations, giving four complete passes at each turbine location.

The primary objectives of the survey were to map bathymetry and seabed features, including the presence of any magnetic anomalies within the wind farm area and to assess the condition of any recently installed inter-array cables.

The survey included detailed bathymetric data collection around each of the recently installed turbine bases, to monitor the extents of seabed scouring. More detailed bathymetric data collection was also carried out around the location of the west and east sub-stations and their immediate surroundings, where inter-array cables will be more densely concentrated. It was also necessary to carry out a number of infill multi-beam bathymetry lines, to ensure total coverage within this area, due to the shallow water depths encountered. In addition, the export cable route was surveyed for the first 3km from the offshore substation, using a full survey spread. The cable route was surveyed at a 75m line spacing.

This report presents the results of the survey of the inter-array cables only. Report no C9023a presents the results of the mid-construction scour monitoring survey, including the development area charts and the operational aspects of the survey.

All positions are expressed as WGS84, UTM Zone 30, 3° W coordinates, throughout this report.

## 2. RESULTS

Drawing nos C9023b-01 to -36 are the Cable Profile charts, presenting shaded relief bathymetry of the relative sections of seabed at a scale of 1:2000, contoured at a vertical interval of 1.0m relative to Chart Datum (CD). They also present a seabed profile along the respective 'as-laid' inter-array cable route at a horizontal scale of 1:2000 and a vertical scale of 1:100. *N.B. These charts are **not** 'North-up'. The orientations of each of the charts are as shown – see Location Map below.*

### 2.1 Inter Array Cable Profiles

#### C9023b-01 Cable Profile B2 to B1

Seabed levels along the as-laid section of inter array cable between turbine locations B2 and B1 lay between -1.6mCD and -2.2mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -8.0mCD at B2 and to -6.0mCD at B1.

For the inter array cable between B2 and B1, a small length (~13m) of exposed cable can be seen to the N of turbine B2, with a second, small exposure indicated to the NE (5.5m) of turbine B1 (see Cable Exposure Listings in Appendix 2).

#### C9023b-02 Cable Profile B1 to C2

Seabed levels along the as-laid section of inter array cable between turbine locations B1 and C2 lay between -1.7mCD and -3.0mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -6.0mCD at B1 and to -7.0mCD at C2.

Approximately 186m of the inter array cable between turbines B1 and C2 is exposed (see Cable Exposure Listings in Appendix 2).

#### C9023b-03 Cable Profile E1 to D1

Seabed levels along the as-laid section of inter array cable between turbine locations E1 and D1 lay between -5.4mCD and -6.4mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -11.1mCD at E1 and to -9.9mCD at D1.

Three exposures of the inter array cable are noted, with two of these situated close to turbine E1 and the other close to turbine D1. Approximately 77m of the inter array cable between turbines E1 and D1 is exposed (see Cable Exposure Listings in Appendix 2).

#### C9023b-04 Cable Profile D1 to C1

Seabed levels along the as-laid section of inter array cable between turbine locations D1 and

C1 lay between -3.4mCD and -5.5mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.9mCD at D1 and to -8.0mCD at C1.

A single exposure of the inter array cable is noted close to turbine D1. Approximately 9m of the inter array cable between turbines D1 and C1 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-05 Cable Profile C1 to D2**

Seabed levels along the as-laid section of inter array cable between turbine locations C1 and D2 lay between -2.9mCD and -3.3mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -8.6mCD at C1 and to -8.4mCD at D2.

A single exposure of the inter array cable is noted close to turbine C1. Approximately 7m of the inter array cable between turbines C1 and D2 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-06 Cable Profile D2 to D3**

Seabed levels along the as-laid section of inter array cable between turbine locations D2 and D3 lay between -2.9mCD and -3.8mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.0mCD at D2 and to -8.7mCD at D3.

Three exposures of the inter array cable are noted, two of these are situated close to turbine D2 and the other close to turbine D3. Approximately 42m of the inter array cable between turbines D2 and D3 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-07 Cable Profile D3 to D4**

Seabed levels along the as-laid section of inter array cable between turbine locations D3 and D4 lay between -4.0mCD and -4.4mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.7mCD at D3 and to -9.6mCD at D4.

Two exposures of the inter array cable are noted, one close to turbine D3 and the other close to turbine D4. Approximately 24m of the inter array cable between turbines D3 and D4 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-08 Cable Profile D4 to D5**

Seabed levels along the as-laid section of inter array cable between turbine locations D4 and D5 lay between -2.8mCD and -4.2mCD, with deep scouring present close to each turbine

base. Within these deep scours, seabed levels fall to approximately -9.6mCD at D4 and to -8.5mCD at D5.

A single exposure of the inter array cable is noted close to turbine D4. Approximately 20m of the inter array cable between turbines D4 and D5 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-09 Cable Profile E2 to E3**

Seabed levels along the as-laid section of inter array cable between turbine locations E2 and E3 lay between -3.5mCD and -4.4mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -8.5mCD at E2 and to -9.0mCD at E3.

A large (~72m) exposure of the inter array cable is noted close to turbine E2, with three other exposures noted. Approximately 95m of the inter array cable between turbines E2 and E3 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-10 Cable Profile E3 to E4**

Seabed levels along the as-laid section of inter array cable between turbine locations E3 and E4 lay between -4.4mCD and -5.0mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.3mCD at E3 and to -9.8mCD at E4.

A single exposure of the inter array cable is noted close to turbine E4. Approximately 6.5m of the inter array cable between turbines E3 and E4 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-11 Cable Profile E4 to E5**

Seabed levels along the as-laid section of inter array cable between turbine locations E4 and E5 lay between -3.8mCD and -4.7mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -10.5mCD at E4 and to -7.7mCD at E5.

Two exposures of the inter array cable are noted close to turbine E4. Approximately 11m of the inter array cable between turbines E4 and E5 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-12 Cable Profile F1 to F2**

Seabed levels along the as-laid section of inter array cable between turbine locations F1 and F2 lay between -4.1mCD and -5.9mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -10.9mCD at F1 and to

-9.3mCD at F2.

Two exposures of the inter array cable are noted, one close to turbine F1 and the other close to turbine F2. Approximately 32m of the inter array cable between turbines F1 and F2 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-13 Cable Profile F2 to F3**

Seabed levels along the as-laid section of inter array cable between turbine locations F2 and F3 lay between -4.4mCD and -5.0mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -8.7mCD at F2 and to -10.0mCD at F3.

A single exposure of the inter array cable is noted close to turbine F3. Approximately 17m of the inter array cable between turbines F2 and F3 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-14 Cable Profile F3 to F4**

Seabed levels along the as-laid section of inter array cable between turbine locations F3 and F4 lay between -4.3mCD and -5.0mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -10.0mCD at F3 and to -9.2mCD at F4.

A single exposure of the inter array cable is noted close to turbine F3. Approximately 9.5m of the inter array cable between turbines F3 and F4 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-15 Cable Profile F4 to F5**

Seabed levels along the as-laid section of inter array cable between turbine locations F4 and F5 lay between -3.9mCD and -4.4mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.1mCD at F4 and to -9.8mCD at F5.

A single exposure of the inter array cable is noted close to turbine F5. Approximately 32m of the inter array cable between turbines F4 and F5 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-16a Cable Profile RRW to F6 (1)**

Seabed levels along the first part of the as-laid section of inter array cable, between the RRW Sub-Station and turbine F6 lay between -1.6mCD and -2.9mCD, with deep scouring present close to the RRW and RRE Sub-Station. Within this area of deep scour, seabed levels fall to approximately -7.5mCD.

A single exposure of the inter array cable is noted close to the RRW Sub-Station. Approximately 9m of the inter array cable is exposed along this section (see Cable Exposure Listings in Appendix 2).

#### **C9023b-16b Cable Profile RRW to F6 (2)**

Seabed levels along the second part of the as-laid section of inter array cable, between the RRW Sub-Station and turbine F6 lay between -2.0mCD and -2.8mCD, with deep scouring present close to turbine F6. Within this area of deep scour, seabed levels fall to approximately -9.5mCD.

A single exposure of the inter array cable is noted close to turbine F6. Approximately 30m of the inter array cable is exposed along this section (see Cable Exposure Listings in Appendix 2).

#### **C9023b-17 Cable Profile G1 to G2**

Seabed levels along the as-laid section of inter array cable between turbine locations G1 and G2 lay between -5.0mCD and -5.2mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.0mCD at G1 and to -8.5mCD at G2.

Two exposures of the inter array cable are noted, one close to turbine G1 and the other close to turbine G2. Approximately 35m of the inter array cable between turbines G1 and G2 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-18 Cable Profile G2 to H1**

Seabed levels along the as-laid section of inter array cable between turbine locations G2 and H1 lay between -4.8mCD and -5.1mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.5mCD at G2 and to -10.3mCD at H1.

Two exposures of the inter array cable are noted, one close to turbine G2 and the other close to turbine H1. Approximately 39m of the inter array cable between turbines G2 and H1 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-19 Cable Profile H1 to H2**

Seabed levels along the as-laid section of inter array cable between turbine locations H1 and H2 lay between -5.1mCD and -5.8mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -10.0mCD at H1 and to -9.8mCD at H2.

A single exposure of the inter array cable is noted close to turbine H1. Approximately 6m of

the inter array cable between turbines H1 and H2 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-20 Cable Profile H2 to G3**

Seabed levels along the as-laid section of inter array cable between turbine locations H2 and G3 lay between -4.9mCD and -5.4mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.9mCD at H2 and to -10.0mCD at G3.

No inter array cable exposures were noted.

#### **C9023b-21 Cable Profile G3 to G4**

Seabed levels along the as-laid section of inter array cable between turbine locations G3 and G4 lay between -4.8mCD and -5.1mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -10.0mCD at G3 and to -10.5mCD at G4.

Two exposures of the inter array cable are noted, one close to turbine G3 and the other close to turbine G4. Approximately 19m of the inter array cable between turbines G3 and G4 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-22 Cable Profile G4 to G5**

Seabed levels along the as-laid section of inter array cable between turbine locations G4 and G5 lay between -5.1mCD and -5.6mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -11.5mCD at G4 and to -9.5mCD at G5.

Two exposures of the inter array cable are noted, one close to turbine G4 and the other close to turbine G5. Approximately 13m of the inter array cable between turbines G4 and G5 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-23 Cable Profile G5 to G6**

Seabed levels along the as-laid section of inter array cable between turbine locations G5 and G6 lay between -5.2mCD and -5.6mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.7mCD at G5 and to -8.3mCD at G6.

A single exposure of the inter array cable is noted close to turbine G6. Approximately 14m of the inter array cable between turbines G5 and G6 is exposed (see Cable Exposure Listings in Appendix 2).



#### **C9023b-24 Cable Profile G6 to G7**

Seabed levels along the as-laid section of inter array cable between turbine locations G6 and G7 lay between -5.2mCD and -5.6mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.0mCD at G6 and to -9.0mCD at G7.

A single exposure of the inter array cable is noted close to turbine G7. Approximately 10m of the inter array cable between turbines G6 and G7 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-25 Cable Profile K1 to J1**

Seabed levels along the as-laid section of inter array cable between turbine locations K1 and J1 lay between -8.6mCD and -9.8mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -11.6mCD at K1 and to -11.8mCD at J1.

A single exposure of the inter array cable is noted close to turbine J1. Approximately 26m of the inter array cable between turbines K1 and J1 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-26a Cable Profile J1 to H3 (1)**

Seabed levels along the first part of the as-laid section of inter array cable between turbine locations J1 and H3 lay between -7.0mCD and -8.4mCD, with deep scouring present close to turbine J1. Within this deep scour, seabed levels fall to approximately -11.8mCD.

No inter array cable exposures were noted along this part of the inter array cable route.

#### **C9023b-26b Cable Profile J1 to H3 (2)**

Seabed levels along the second part of the as-laid section of inter array cable between turbine locations J1 and H3 lay between -6.8mCD and -8.0mCD, with deep scouring present close to turbine H3. Within this deep scour, seabed levels fall to approximately -12.8mCD.

A single exposure of the inter array cable is noted close to turbine H3. Approximately 8.5m of the inter array cable between turbines J1 and H3 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-27 Cable Profile H3 to H4**

Seabed levels along the as-laid section of inter array cable between turbine locations H3 and H4 lay between -7.0mCD and -7.2mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -12.6mCD at H3 and to -11.7mCD at H4.

Two exposures of the inter array cable are noted, one close to turbine H3 and the other close to turbine H4. Approximately 51m of the inter array cable between turbines H3 and H4 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-28 Cable Profile H4 to H5**

Seabed levels along the as-laid section of inter array cable between turbine locations H4 and H5 lay between -5.7mCD and -6.8mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -12.8mCD at H4 and to -9.9mCD at H5.

Three exposures of the inter array cable are noted, two of these are close to turbine H4, with the other close to turbine H5. Approximately 47m of the inter array cable between turbines H4 and H5 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-29 Cable Profile H5 to H6**

Seabed levels along the as-laid section of inter array cable between turbine locations H5 and H6 lay between -4.4mCD and -5.1mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.5mCD at H5 and to -9.0mCD at H6.

A single exposure of the inter array cable is noted close to turbine H5. Approximately 14m of the inter array cable between turbines H5 and H6 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-30 Cable Profile K1 to J2**

Seabed levels along the as-laid section of inter array cable between turbine locations K1 and J2 lay between -8.6mCD and -9.1mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -12.0mCD at K1 and to -11.4mCD at J2.

A single exposure of the inter array cable is noted close to turbine K1. Approximately 22m of the inter array cable between turbines K1 and J2 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-31 Cable Profile J2 to J3**

Seabed levels along the as-laid section of inter array cable between turbine locations J2 and J3 lay between -7.3mCD and -8.3mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -11.4mCD at J2 and to -11.0mCD at J3.

Two exposures of the inter array cable are noted, one close to turbine J2 and the other close

to turbine J3. Approximately 37m of the inter array cable between turbines J2 and J3 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-32 Cable Profile K2 to J3**

Seabed levels along the as-laid section of inter array cable between turbine locations K2 and J3 lay between -7.1mCD and -7.8mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -13.5mCD at K2 and to -11.1mCD at J3.

Two exposures of the inter array cable are noted close to turbine K2. Approximately 25m of the inter array cable between turbines K2 and J3 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-33 Cable Profile J4 to J5**

Seabed levels along the as-laid section of inter array cable between turbine locations J4 and J5 lay between -4.6mCD and -5.8mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -11.8mCD at J4 and to -9.0mCD at J5.

Two exposures of the inter array cable are noted close to turbine J4. Approximately 26m of the inter array cable between turbines J4 and J5 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-34 Cable Profile J6 to J5**

Seabed levels along the as-laid section of inter array cable between turbine locations J6 and J5 lay between -3.3mCD and -5.0mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -9.0mCD at J6 and to -8.5mCD at J5.

A single exposure of the inter array cable is noted close to turbine J5. Approximately 3m of the inter array cable between turbines J6 and J5 is exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-35 Cable Profile J6 to H7**

Seabed levels along the as-laid section of inter array cable between turbine locations J6 and H7 lay between -2.9mCD and -3.5mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -8.6mCD at J6 and to -8.7mCD at H7.

Two exposures of the inter array cable are noted, one close to turbine J6 and the other close to turbine H7. Approximately 21m of the inter array cable between turbines J6 and H7 is

exposed (see Cable Exposure Listings in Appendix 2).

#### **C9023b-36 Cable Profile H7 to G8**

Seabed levels along the as-laid section of inter array cable between turbine locations H7 and G8 lay between -2.3mCD and -3.2mCD, with deep scouring present close to each turbine base. Within these deep scours, seabed levels fall to approximately -8.5mCD at H7 and to -7.0mCD at G8.

A single exposure of the inter array cable is noted close to turbine H7. Approximately 9m of the inter array cable between turbines H7 and G8 is exposed (see Cable Exposure Listings in Appendix 2).

## APPENDICES

**APPENDIX 1 - CHARTING**

**APPENDIX 2 - EXPOSURE LISTINGS**

## APPENDIX 1

### CHARTING

#### INDIVIDUAL CABLE PROFILE CHARTS

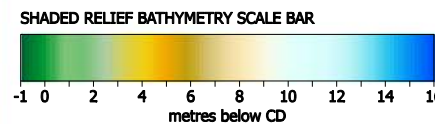
C9023b-01	-Cable Profile B1 to B2	C9023b-02	-Cable Profile B1 to C2
C9023b-03	-Cable Profile E1 to D1	C9023b-04	-Cable Profile D1 to C1
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C9023b-07	-Cable Profile D3 to D4	C9023b-08	-Cable Profile D4 to D5
C9023b-09	-Cable Profile E2 to E3	C9023b-10	-Cable Profile E3 to E4
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C9023b-16b	-Cable Profile RRW to F6 (2)	C9023b-17	-Cable Profile G1 to G2
C9023b-18	-Cable Profile G2 to H1	C9023b-19	-Cable Profile H1 to H2
C9023b-20	-Cable Profile H2 to G3	C9023b-21	-Cable Profile G3 to G4
C9023b-22	-Cable Profile G4 to G5	C9023b-23	-Cable Profile G5 to G6
C9023b-24	-Cable Profile G6 to G7	C9023b-25	-Cable Profile K1 to J1
C9023b-26a	-Cable Profile J1 to H3 (1)	C9023b-26b	-Cable Profile J1 to H3 (2)
C9023b-27	-Cable Profile H3 to H4	C9023b-28	-Cable Profile H4 to H5
C9023b-29	-Cable Profile H5 to H6	C9023b-30	-Cable Profile K1 to J2
C9023b-31	-Cable Profile J2 to J3	C9023b-32	-Cable Profile K2 to J3
C9023b-33	-Cable Profile J4 to J5	C9023b-34	-Cable Profile J6 to J5
C9023b-35	-Cable Profile J6 to H7	C9023b-36	-Cable Profile H7 to G8

PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

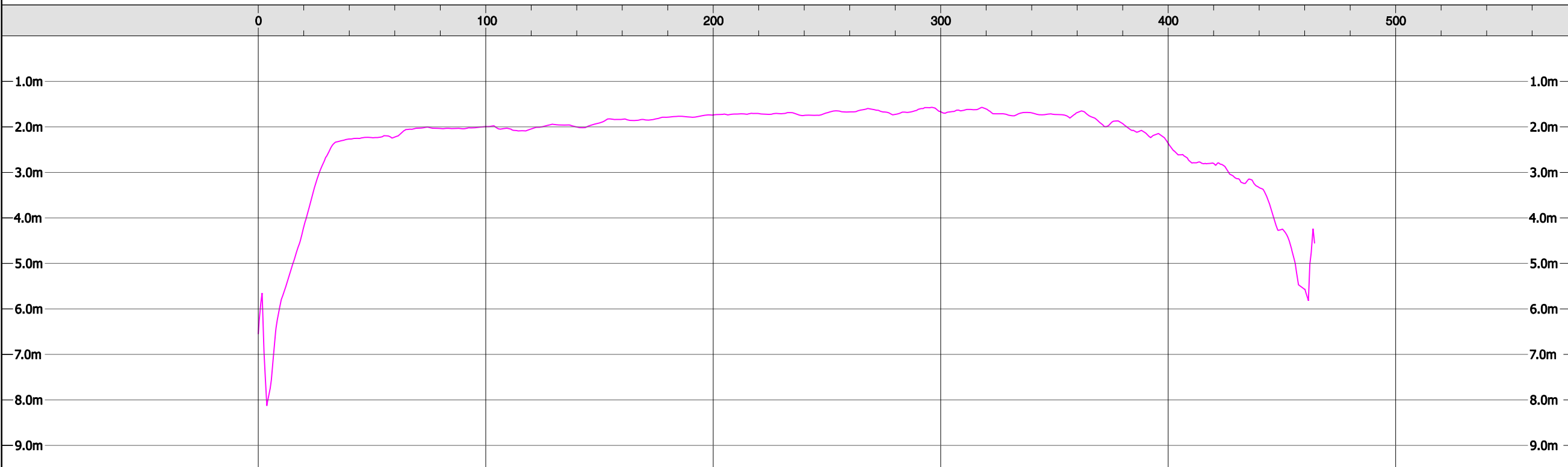
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



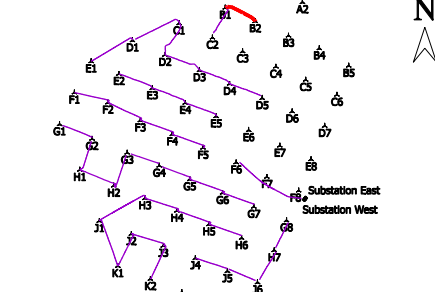
LEGEND PROFILE:

- 100 Chainage in metres
- 2009 seabed profile below CD

PROFILE

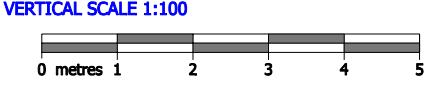
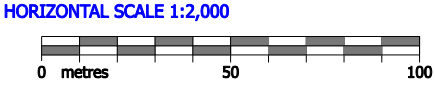


LOCATION MAP



GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



CLIENT:

ENGINEERING DETAIL

CONTRACTOR:

CONTRACT TITLE:  
ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

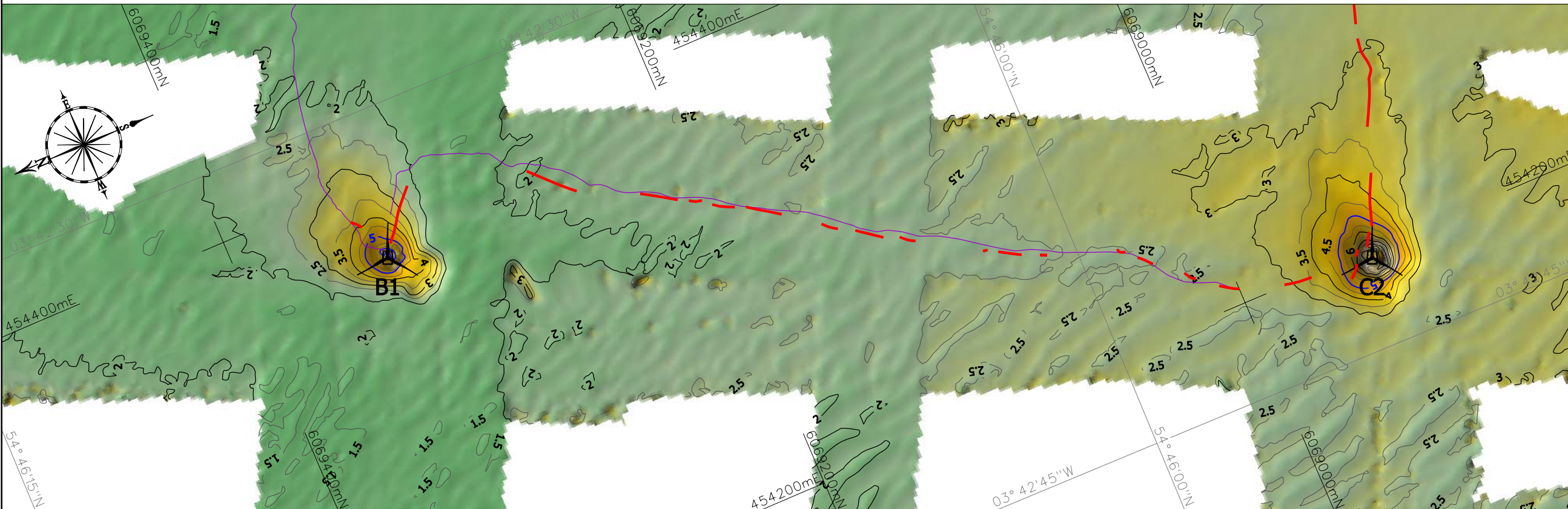
CHART TITLE:  
Cable Profile B2 to B1

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

CHART SCALE AT A3: 1:2,000    CHART NUMBER: C9023b-01    REVISION: 1

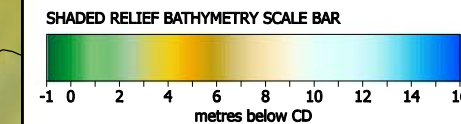


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

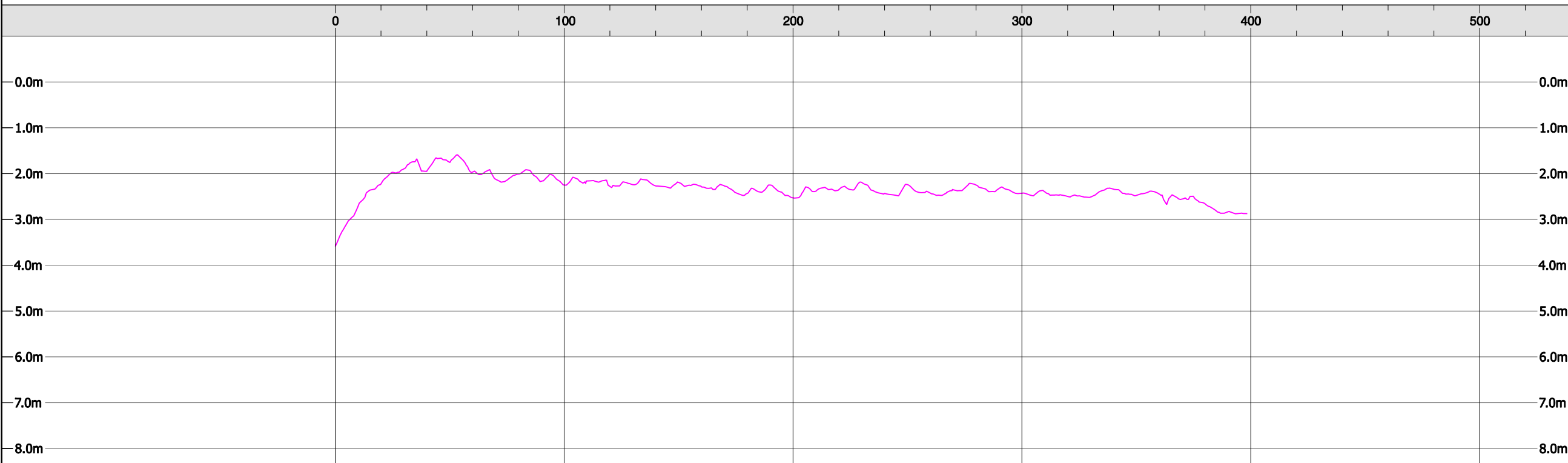
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



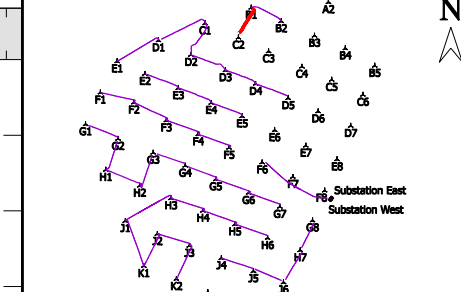
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**

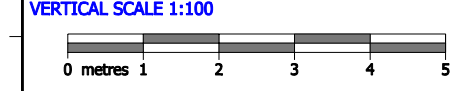
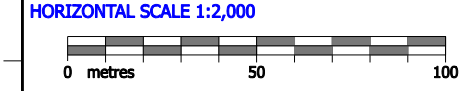


**LOCATION MAP**



**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



**CLIENT:**

**ENGINEERING DETAIL**

**CONTRACTOR:**

**CONTRACT TITLE:**  
 ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

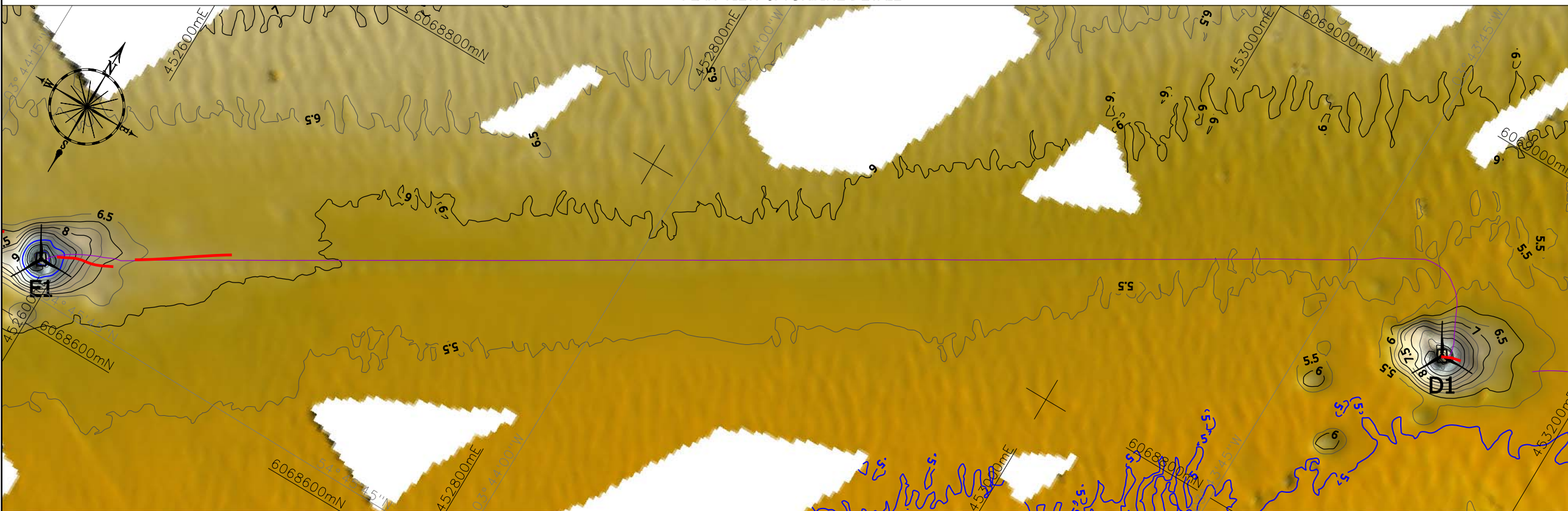
**CHART TITLE:**  
 Cable Profile B1 to C2

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-02  
**REVISION:** 1

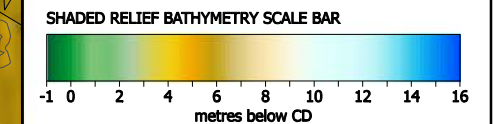


PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

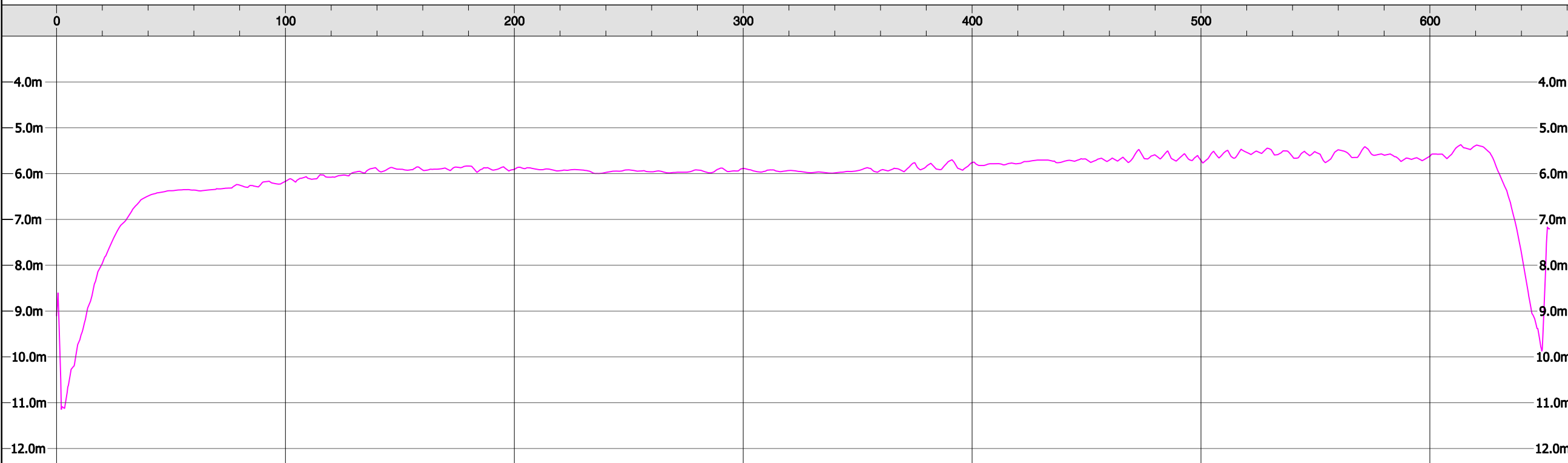
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



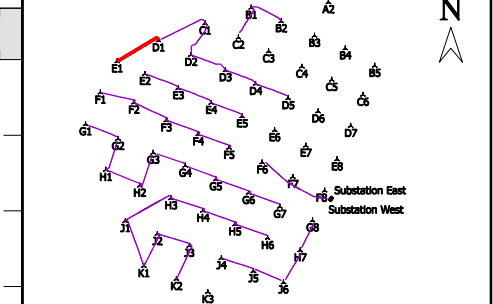
LEGEND PROFILE:

- Chainage in metres
- 2009 seabed profile below CD

PROFILE



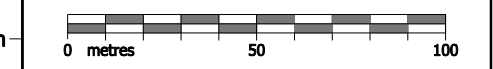
LOCATION MAP



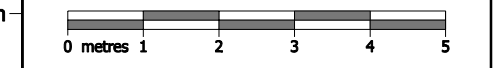
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

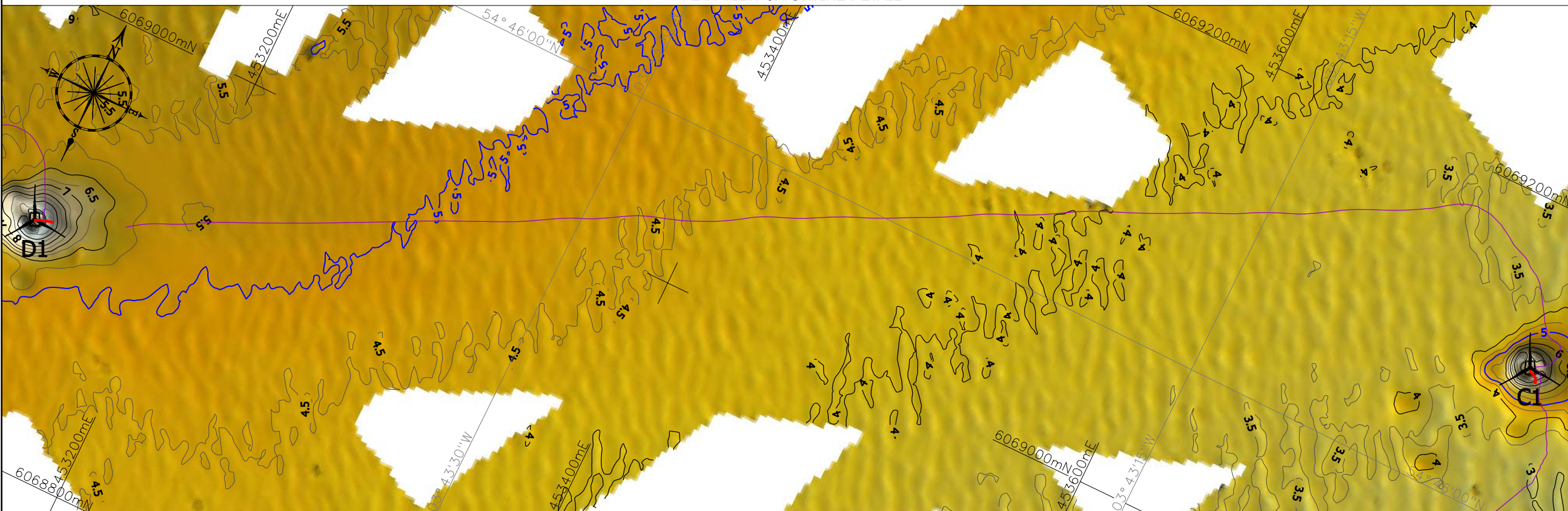
CHART TITLE:

Cable Profile E1 to D1

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

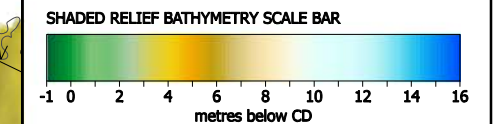
CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-03  
 REVISION: 1

PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

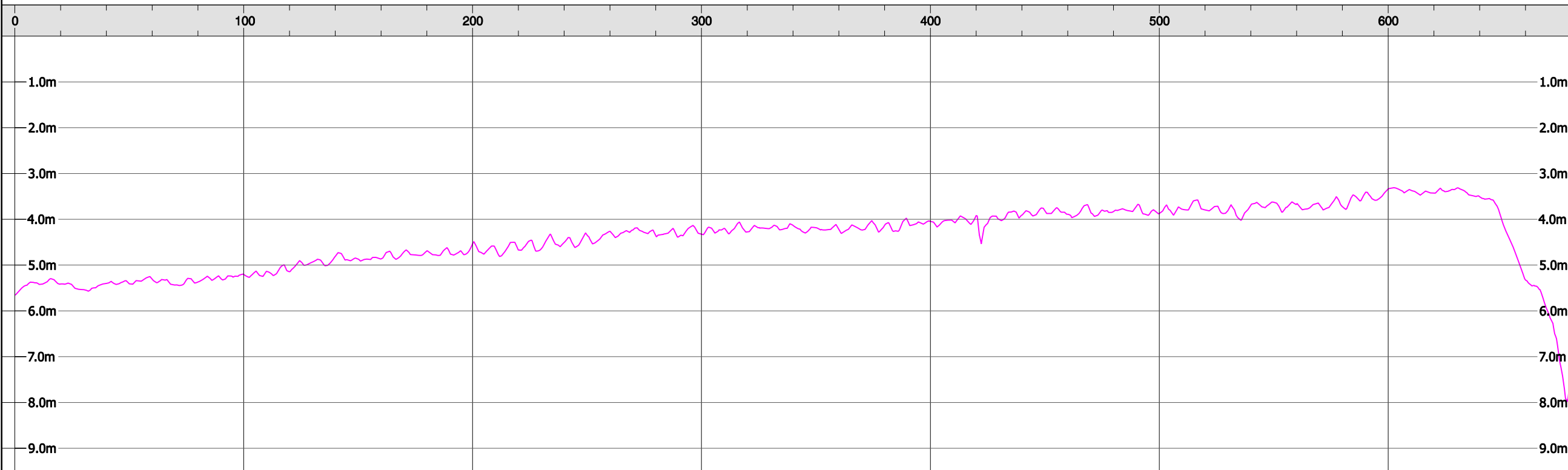
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



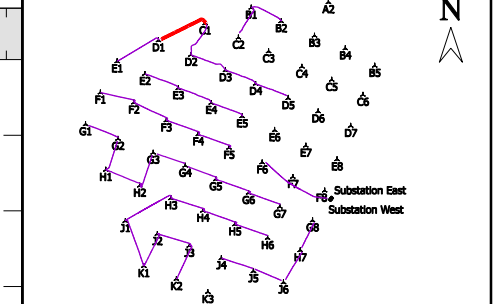
LEGEND PROFILE:

- 100 Chainage in metres
- 2009 seabed profile below CD

PROFILE



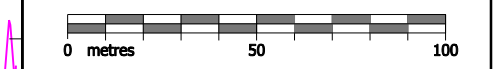
LOCATION MAP



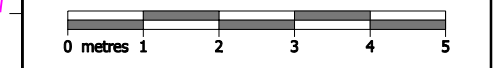
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

CHART TITLE:

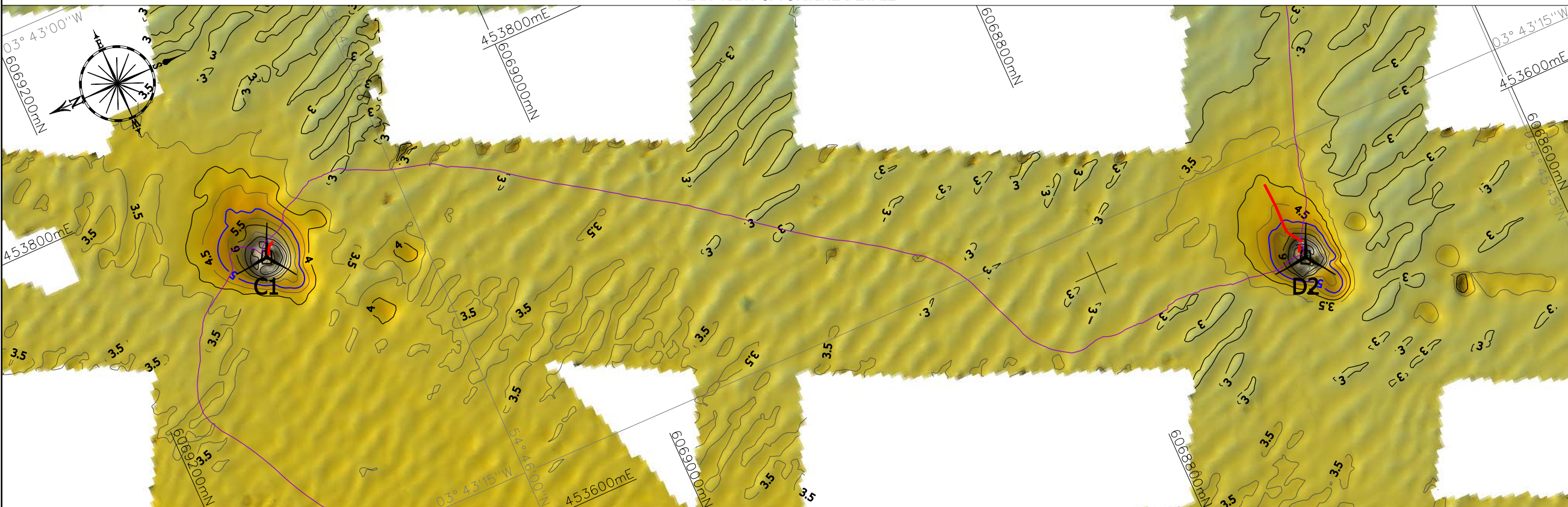
Cable Profile D1 to C1

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-04  
 REVISION: 1

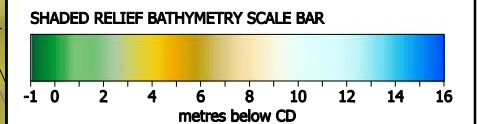


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

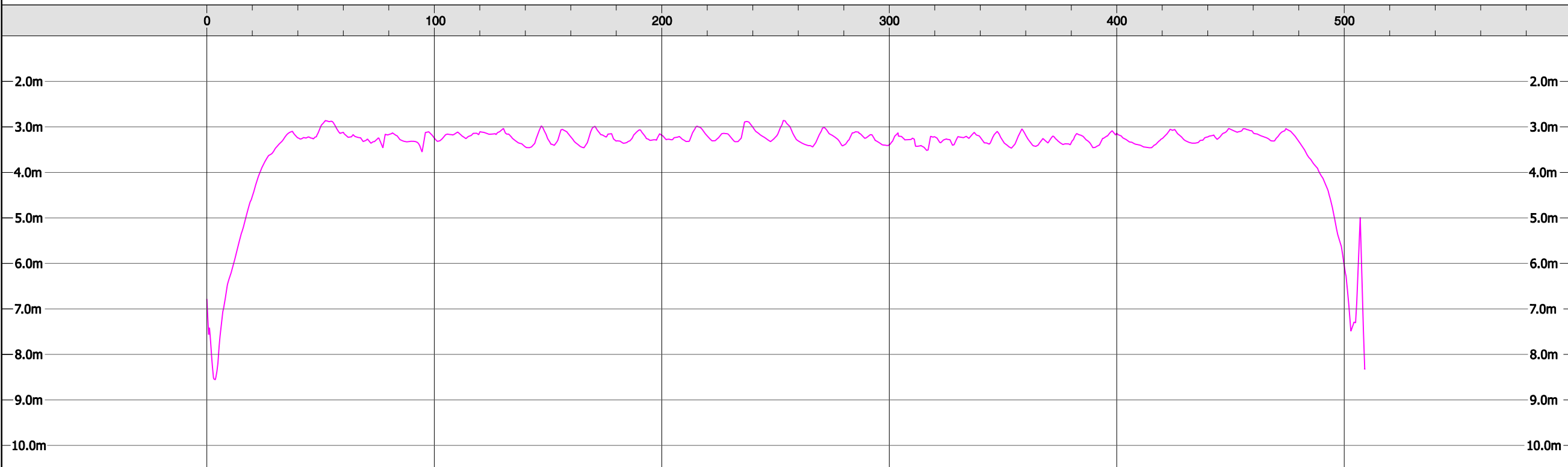
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



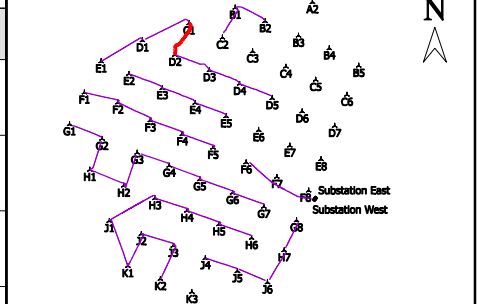
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



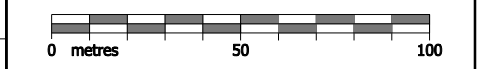
**LOCATION MAP**



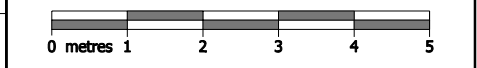
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**

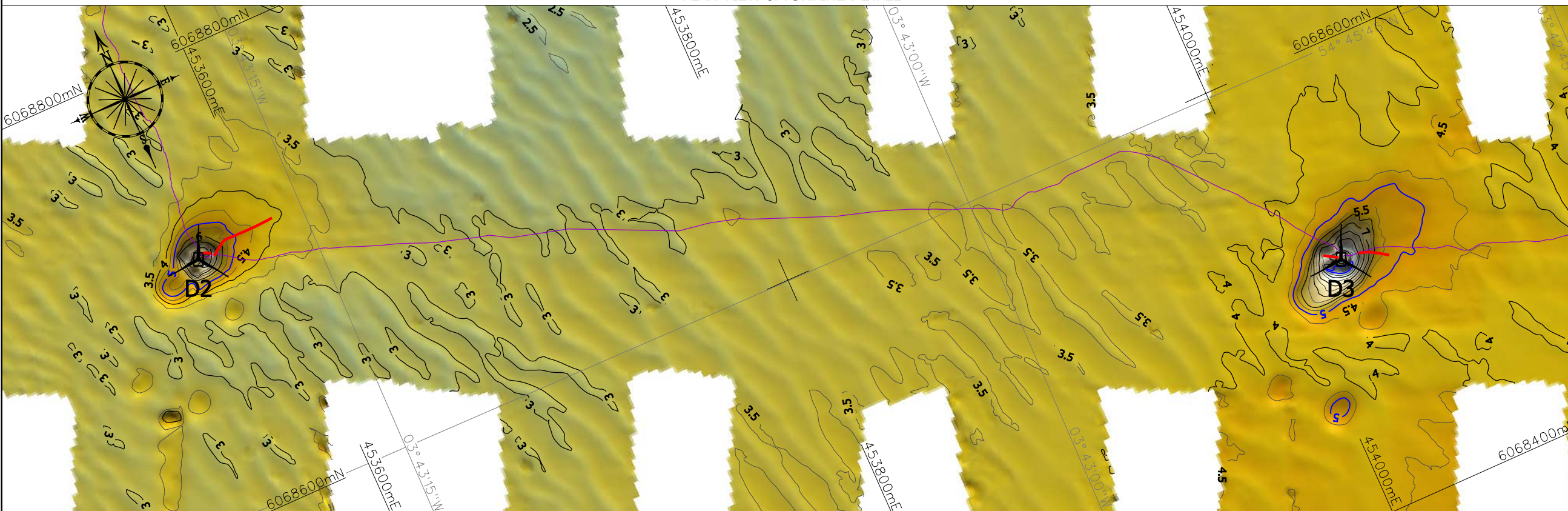
Cable Profile C1 to D2

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-05  
**REVISION:** 1

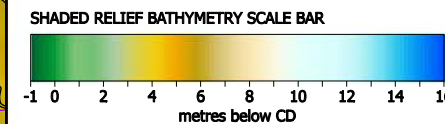


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

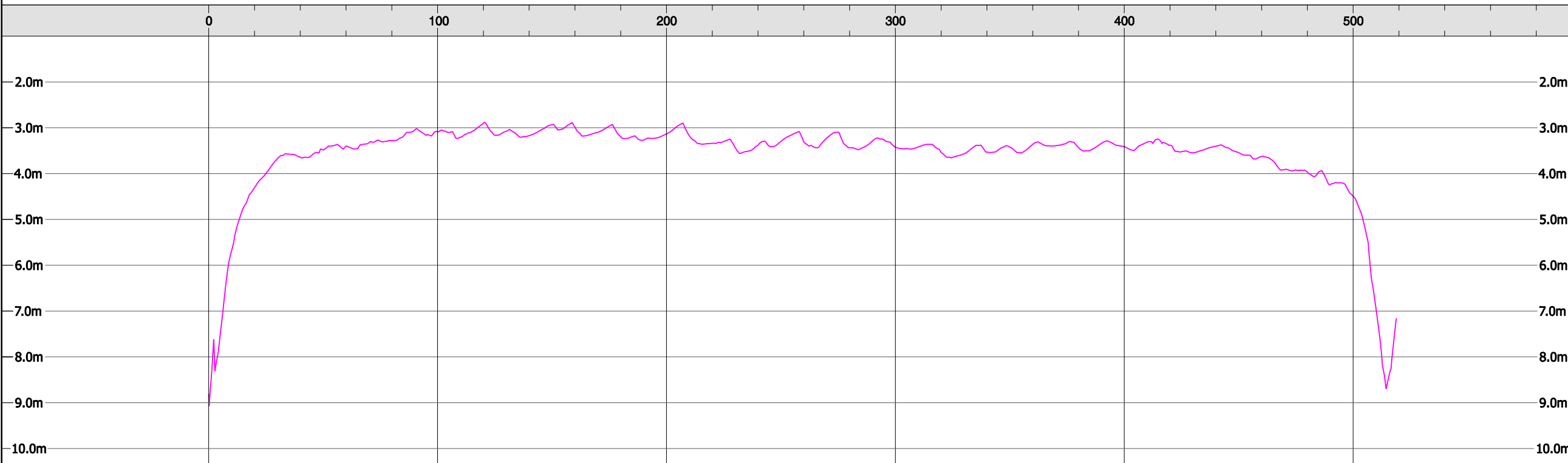
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



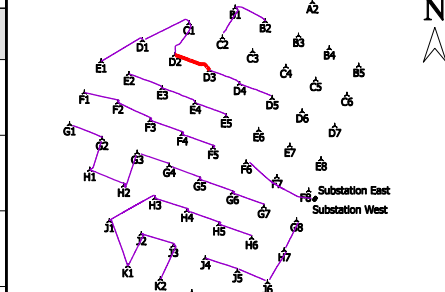
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**

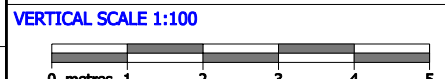
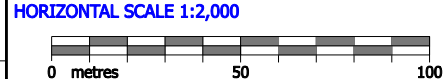


**LOCATION MAP**



**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



**CLIENT:**

**CONTRACTOR:**

**CONTRACT TITLE:**  
 ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**  
 Cable Profile D2 to D3

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-06  
**REVISION:** 1

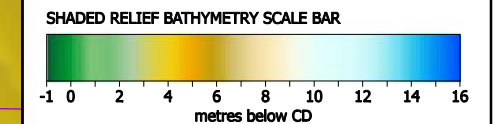
**ENGINEERING DETAIL**

PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

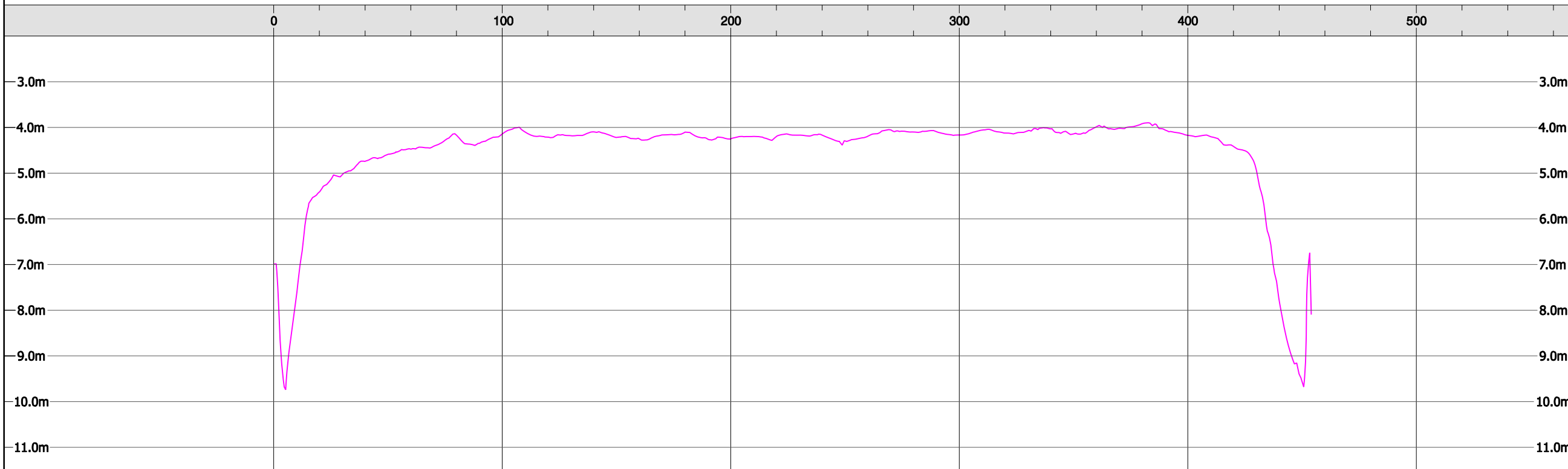
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



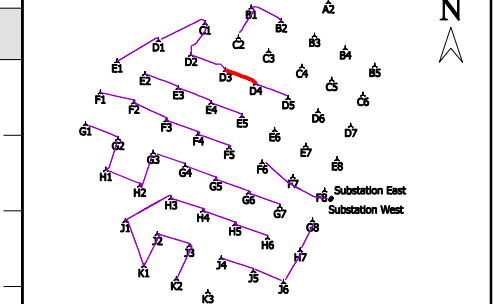
LEGEND PROFILE:

- 100 Chainage in metres
- 2009 seabed profile below CD

PROFILE



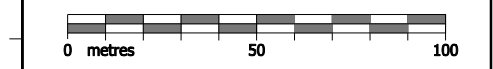
LOCATION MAP



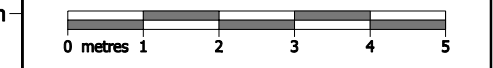
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

CHART TITLE:

Cable Profile D3 to D4

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-07  
 REVISION: 1

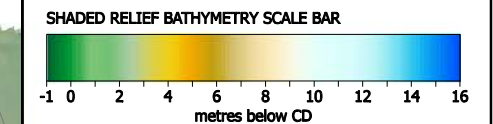


PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

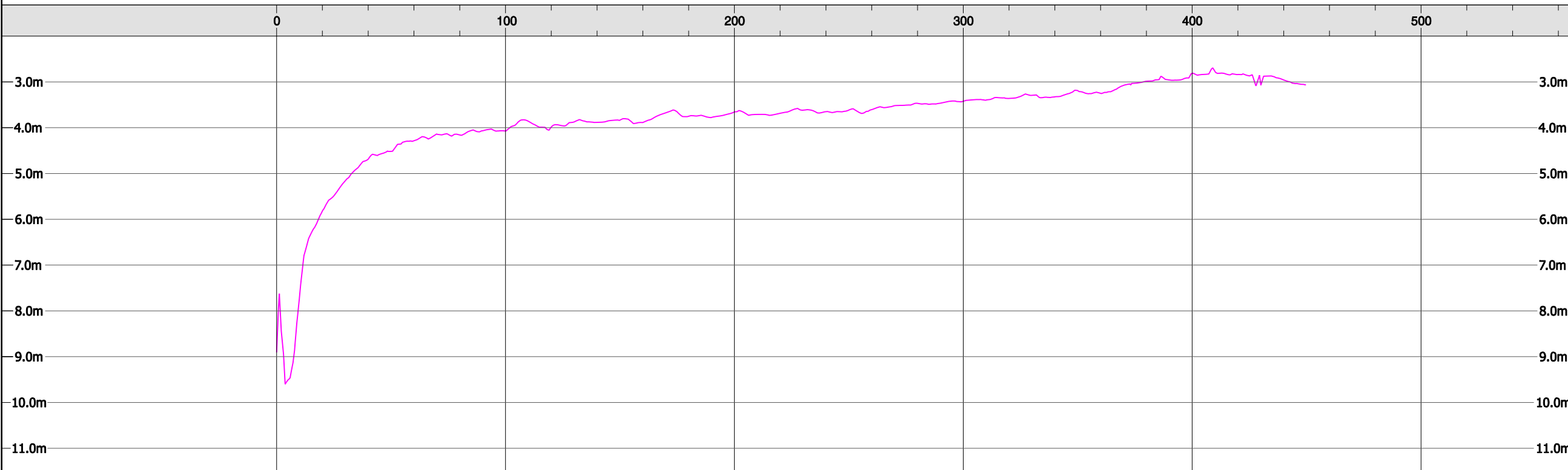
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



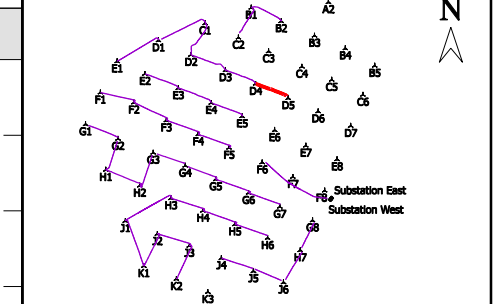
LEGEND PROFILE:

- 100 Chainage in metres
- 2009 seabed profile below CD

PROFILE



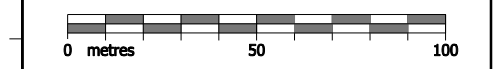
LOCATION MAP



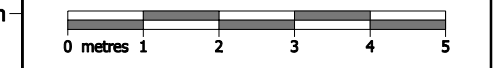
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

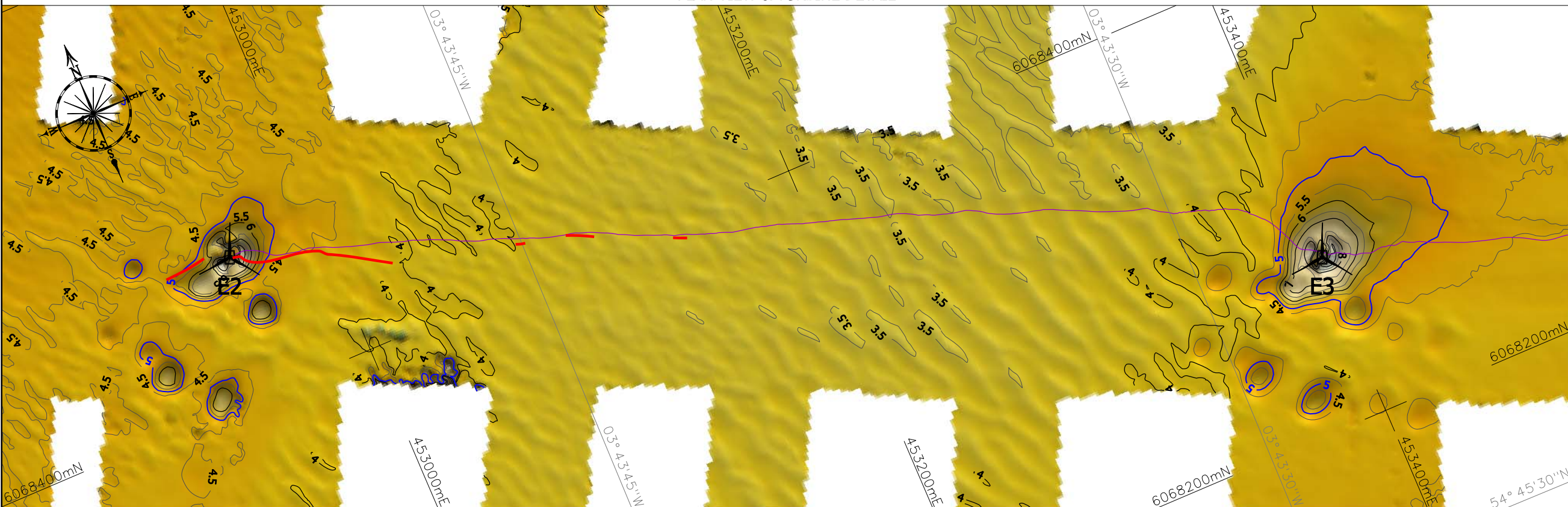
CHART TITLE:

Cable Profile D4 to D5

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

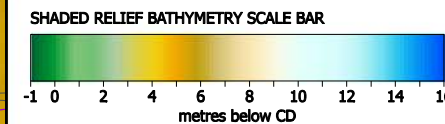
CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-08  
 REVISION: 1

**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

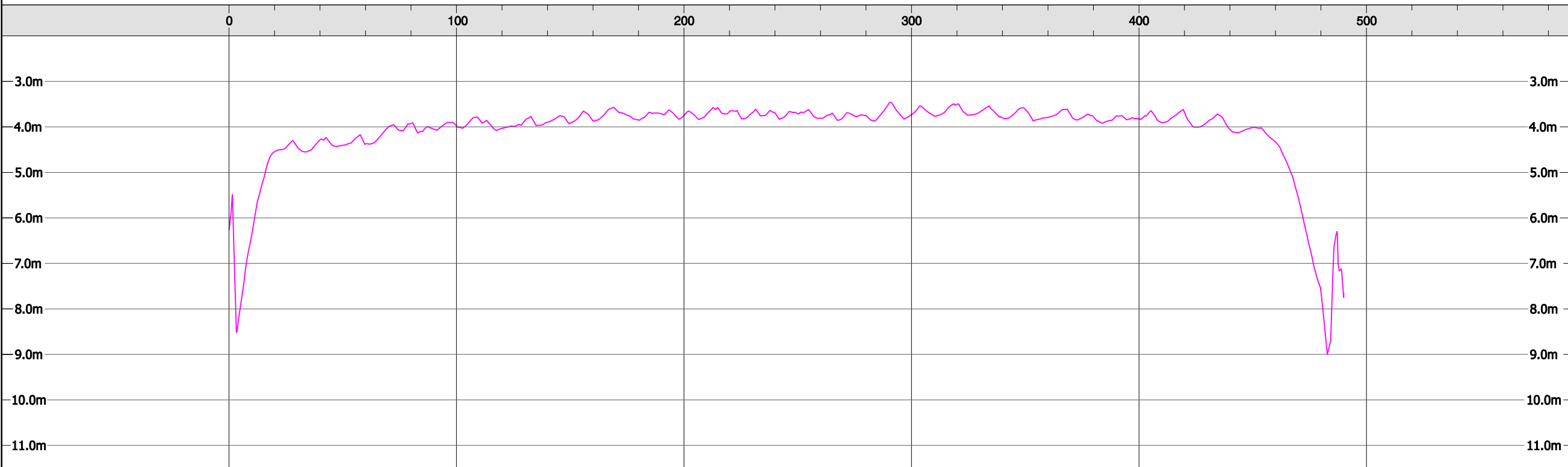
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



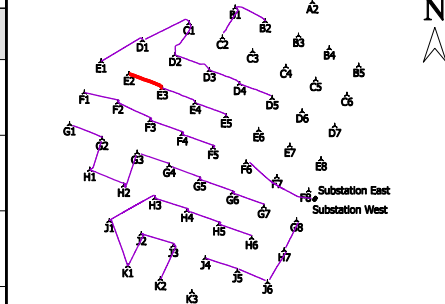
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**

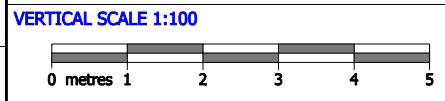
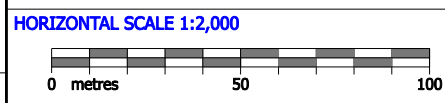


**LOCATION MAP**



**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**

Cable Profile E2 to E3

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-09  
 REVISION: 1

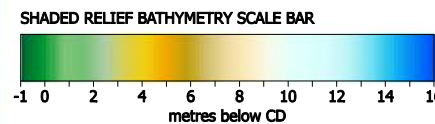


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

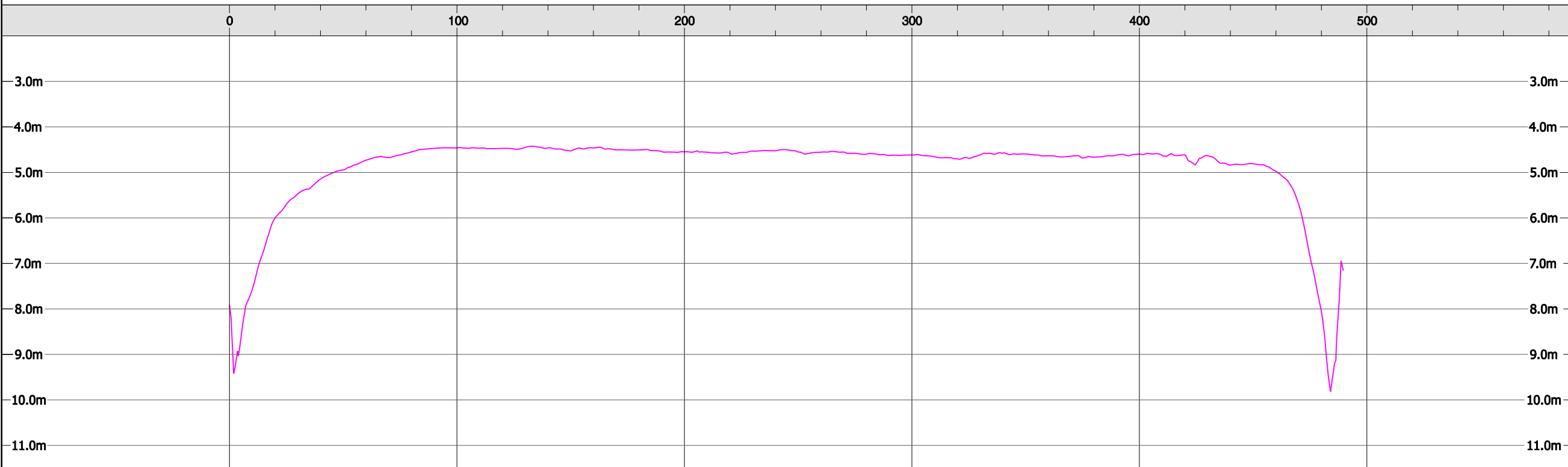
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



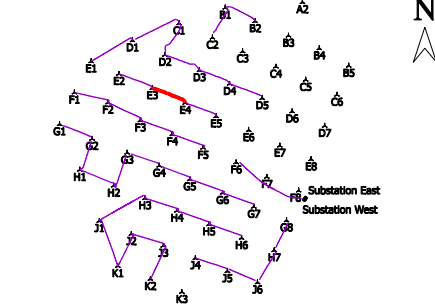
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**

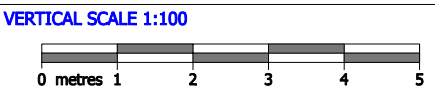
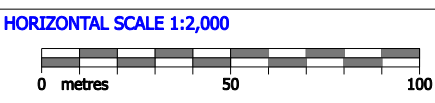


**LOCATION MAP**



**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



**CLIENT:**

**ENGINEERING DETAIL**

**CONTRACTOR:**

**CONTRACT TITLE:**  
 ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**  
 Cable Profile E3 to E4

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW

**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-10  
**REVISION:** 1

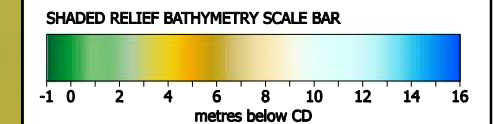


PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

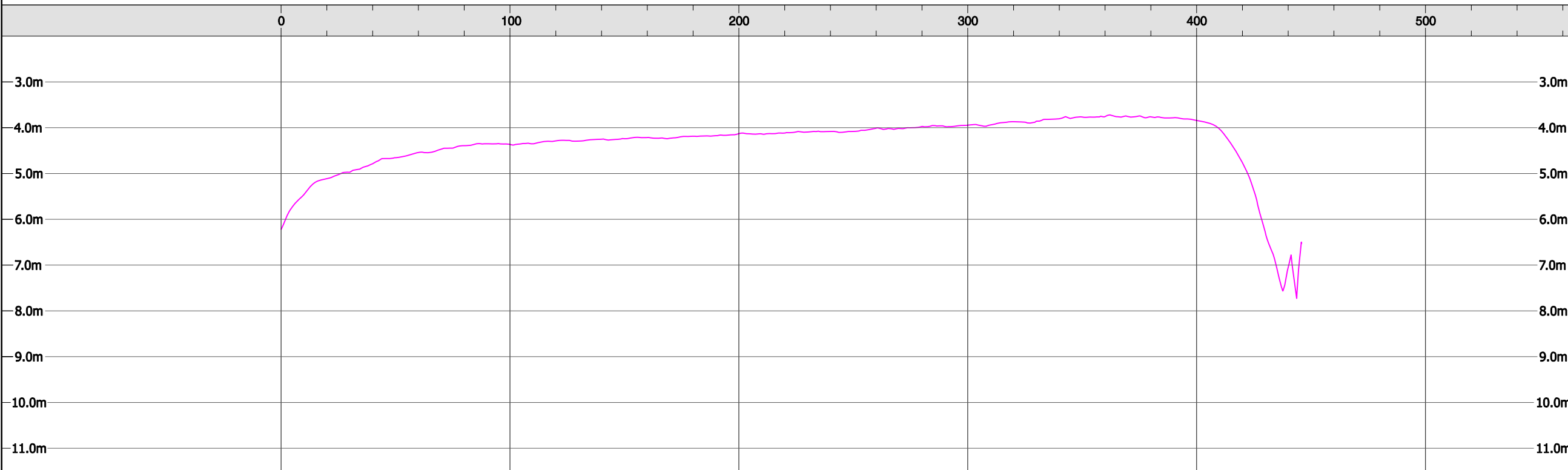
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



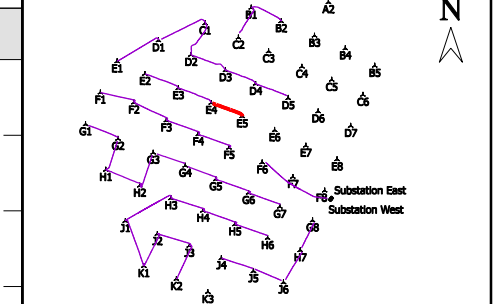
LEGEND PROFILE:

- Chainage in metres
- 2009 seabed profile below CD

PROFILE



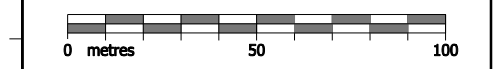
LOCATION MAP



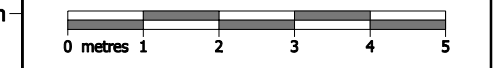
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

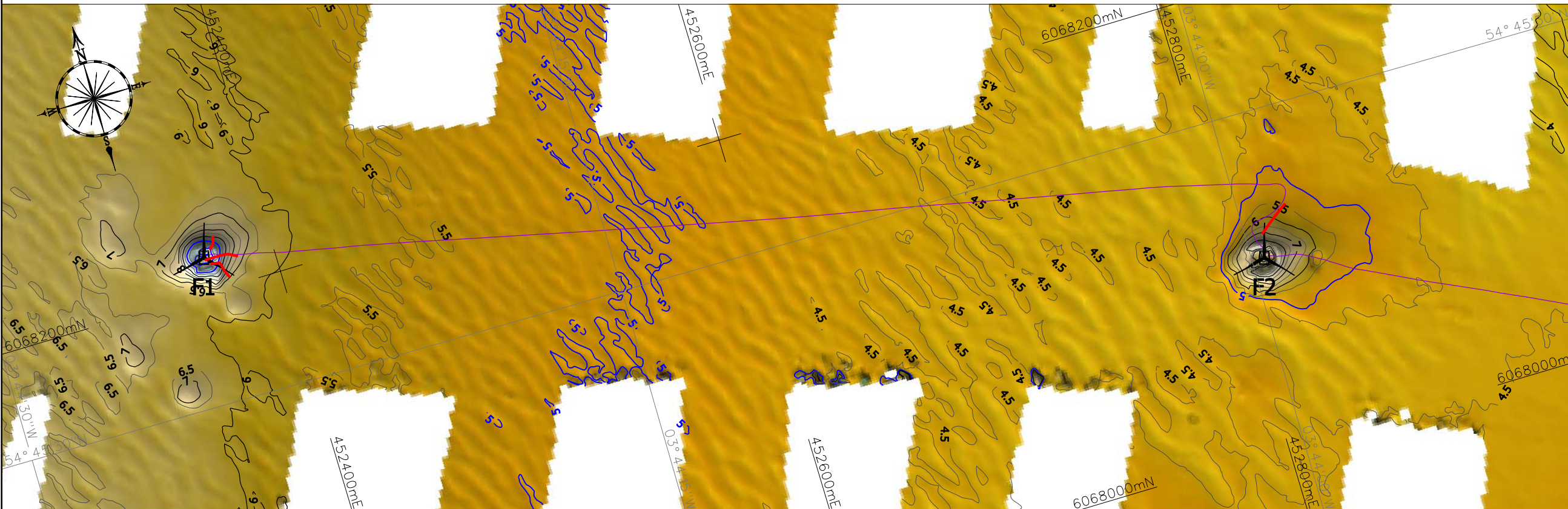
CHART TITLE:

Cable Profile E4 to E5

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

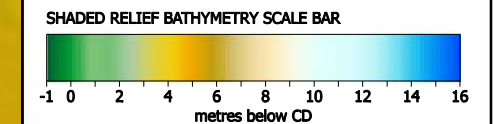
CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-11  
 REVISION: 1

**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

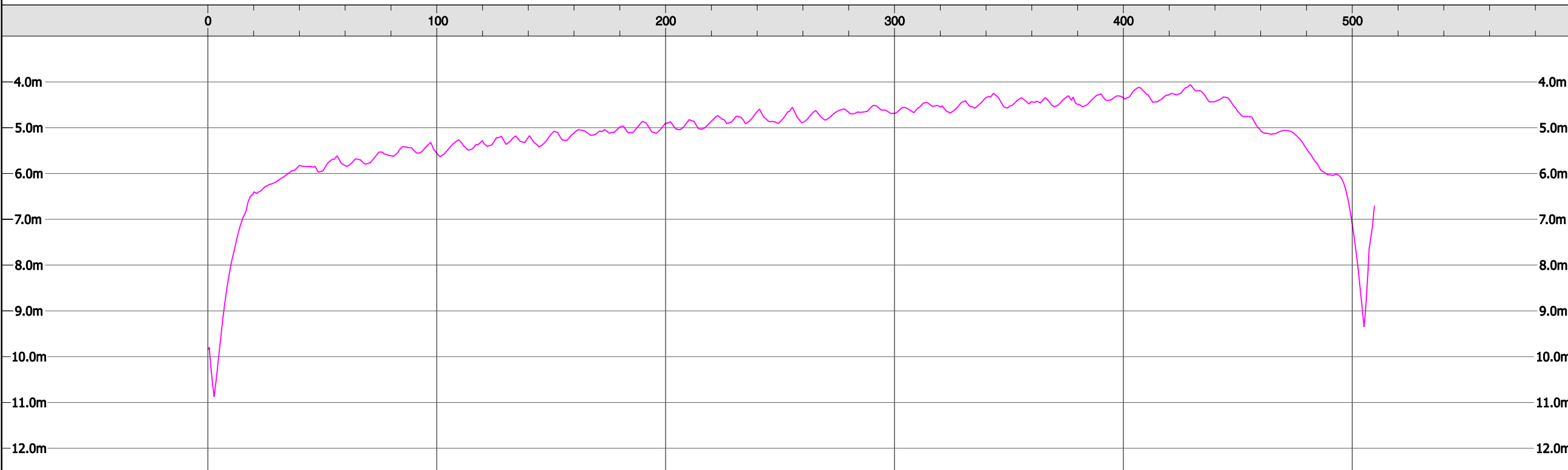
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



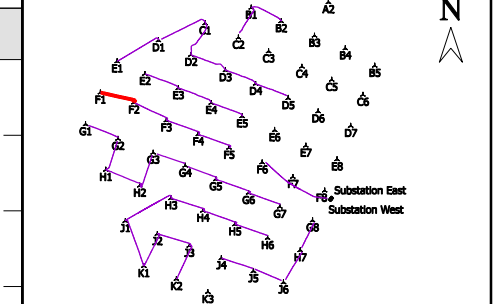
**LEGEND PROFILE:**

- Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



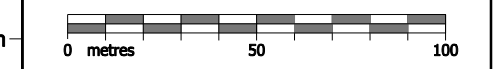
**LOCATION MAP**



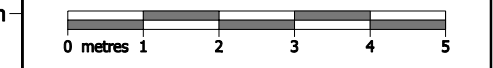
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

**ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY**

**CHART TITLE:**

**Cable Profile F1 to F2**

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:







**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-12  
**REVISION:** 1



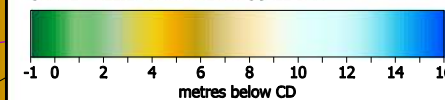
PLAN VIEW & TURBINE DETAIL





LEGEND PLAN VIEW:

-  Wind turbine location, with identifier
-  As-laid cable routes, supplied by client
-  Cable exposed - Osiris 2009 survey
-  5 Major contours at 5m intervals below CD
-  1 Minor contours at 1m intervals below CD
-  0.5 Minor contours at 0.5m intervals below CD

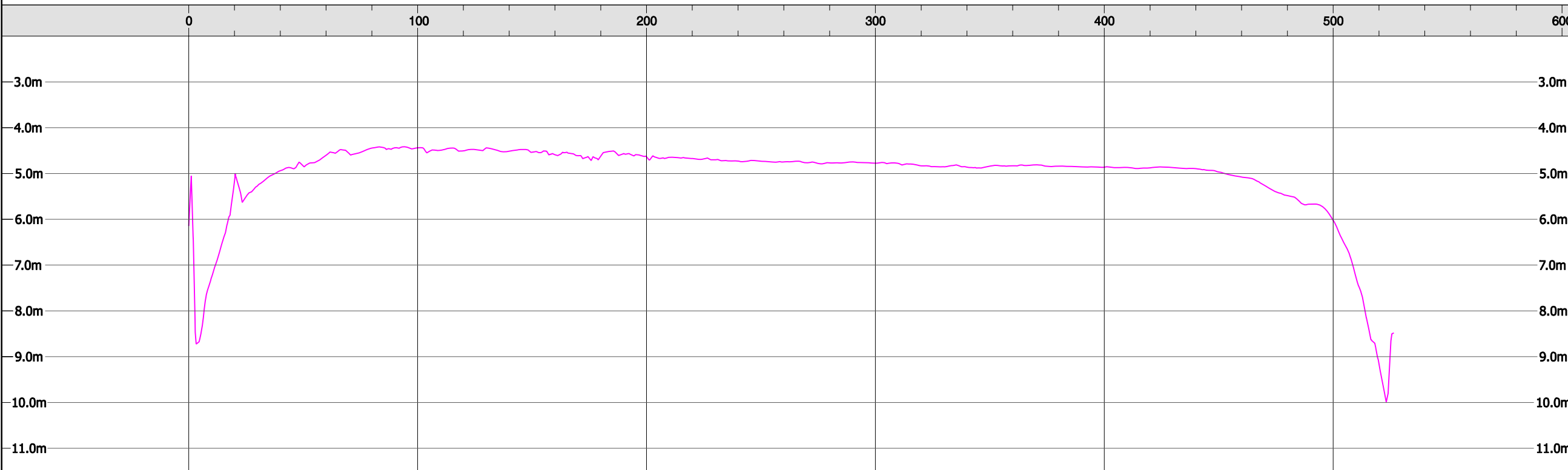
SHADED RELIEF BATHYMETRY SCALE BAR



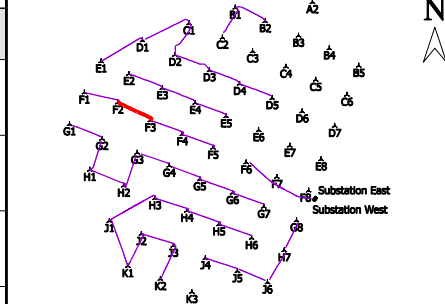
LEGEND PROFILE:

-  100 Chainage in metres
-  2009 seabed profile below CD

PROFILE



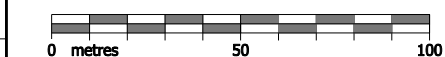
LOCATION MAP



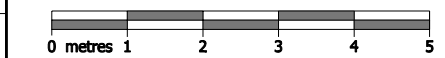
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

CHART TITLE:

Cable Profile F2 to F3

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

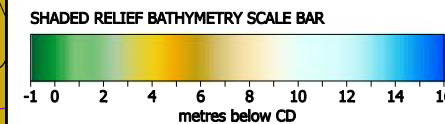
CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-13  
 REVISION: 1

PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



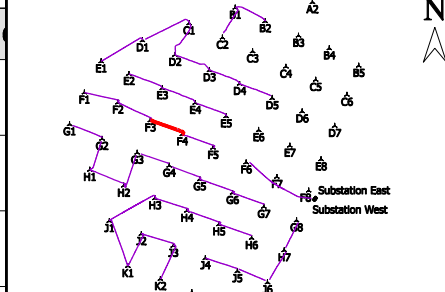
LEGEND PROFILE:

- Chainage in metres
- 2009 seabed profile below CD

PROFILE

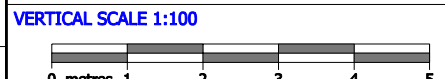
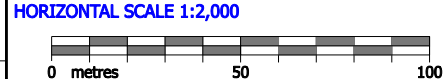


LOCATION MAP



GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



ENGINEERING DETAIL

CLIENT:

CONTRACTOR:

CONTRACT TITLE: ROBIN RIGG OFFSHORE WIND FARM MID-CONSTRUCTION GEOPHYSICAL SURVEY

CHART TITLE: Cable Profile F3 to F4

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

CHART SCALE AT A3: 1:2,000 | CHART NUMBER: C9023b-14 | REVISION: 1

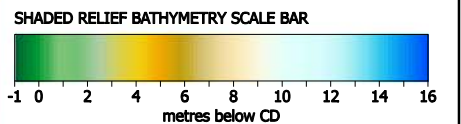


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

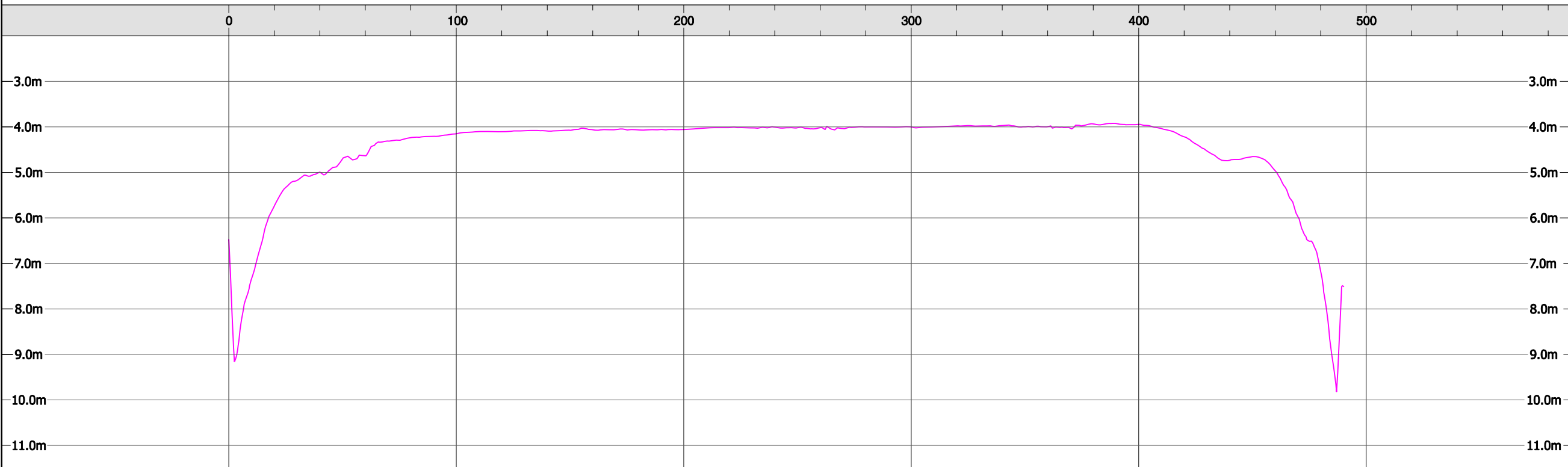
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



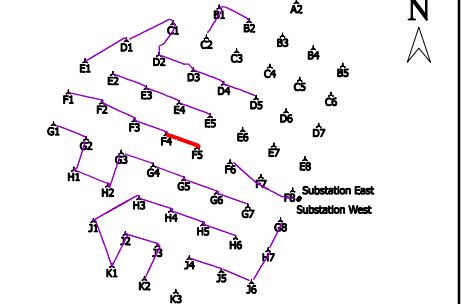
**LEGEND PROFILE:**

- Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



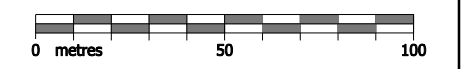
**LOCATION MAP**



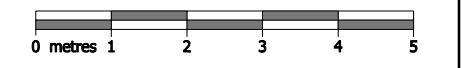
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**

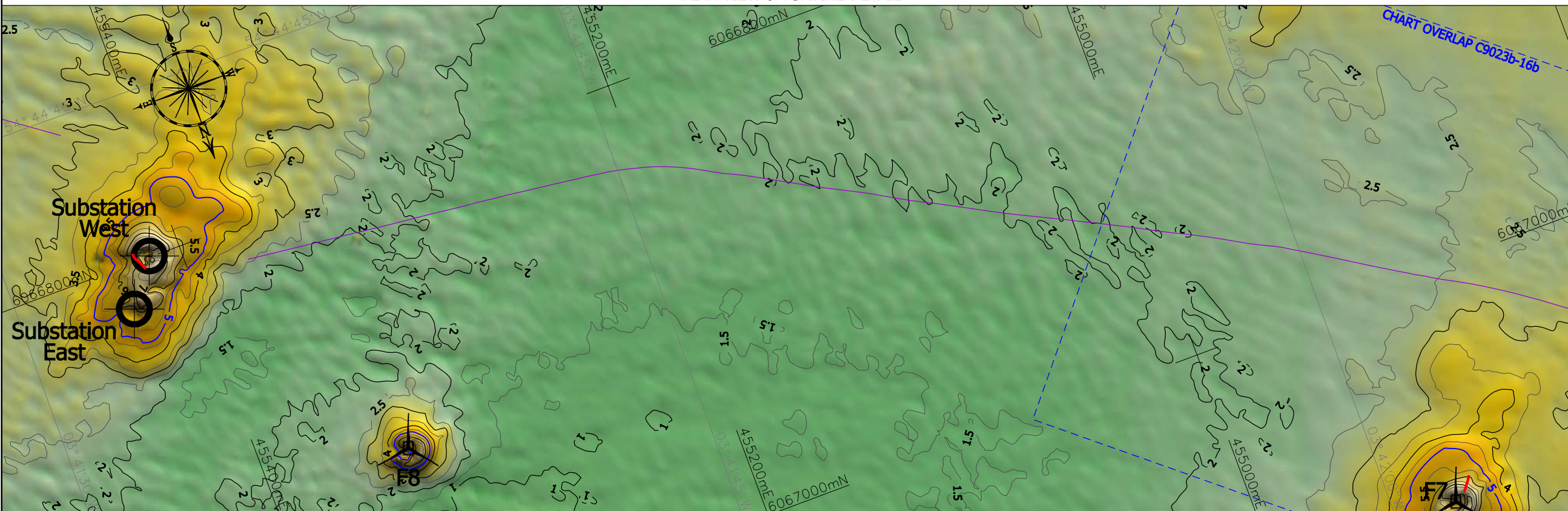
Cable Profile F4 to F5

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW

REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

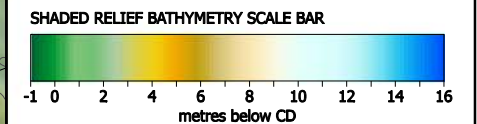
CHART SCALE AT A3:	CHART NUMBER:	REVISION:
1:2,000	C9023b-15	1

PLAN VIEW & TURBINE DETAIL



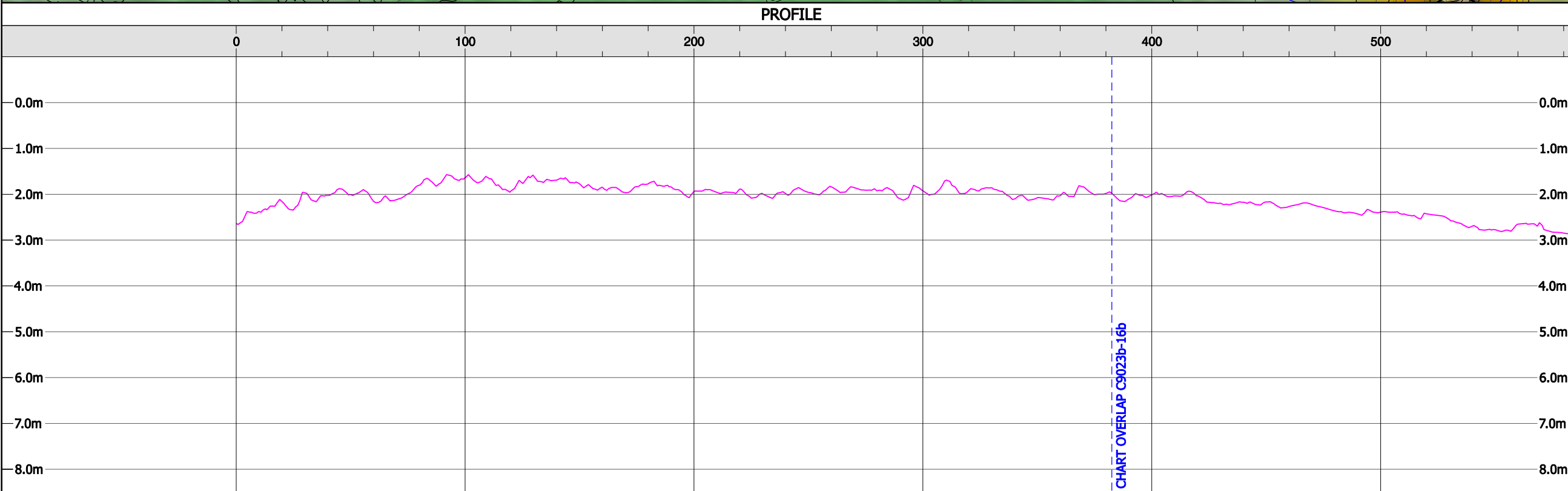
LEGEND PLAN VIEW:

- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD

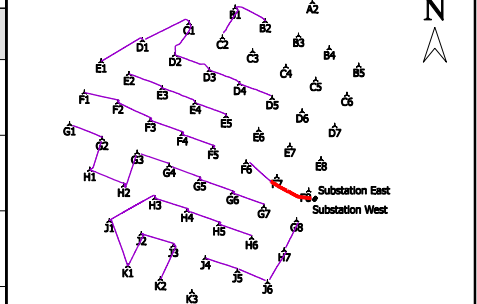


LEGEND PROFILE:

- Chainage in metres
- 2009 seabed profile below CD
- Chart overlap



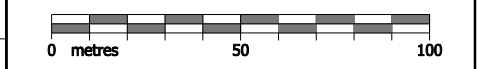
LOCATION MAP



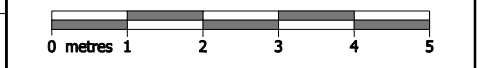
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

CHART TITLE:

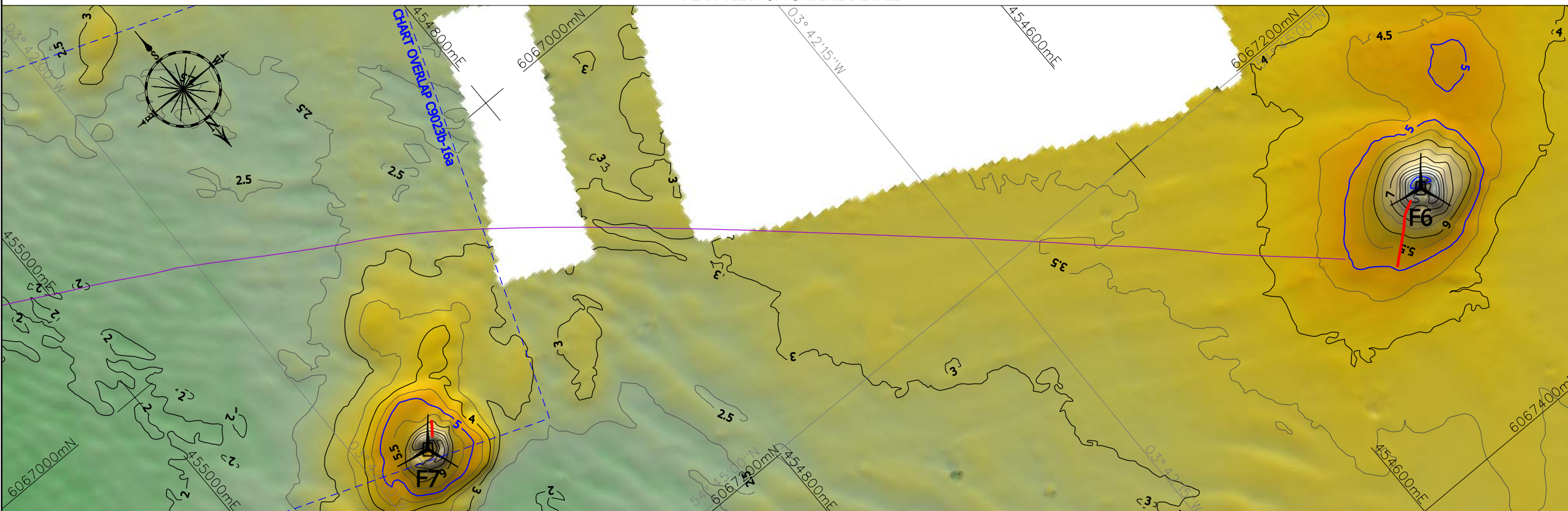
Cable Profile RRW to F6 (1)

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-16a  
 REVISION: 1

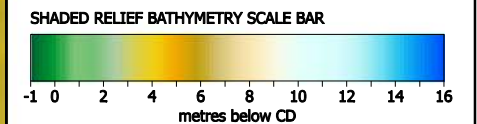


PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

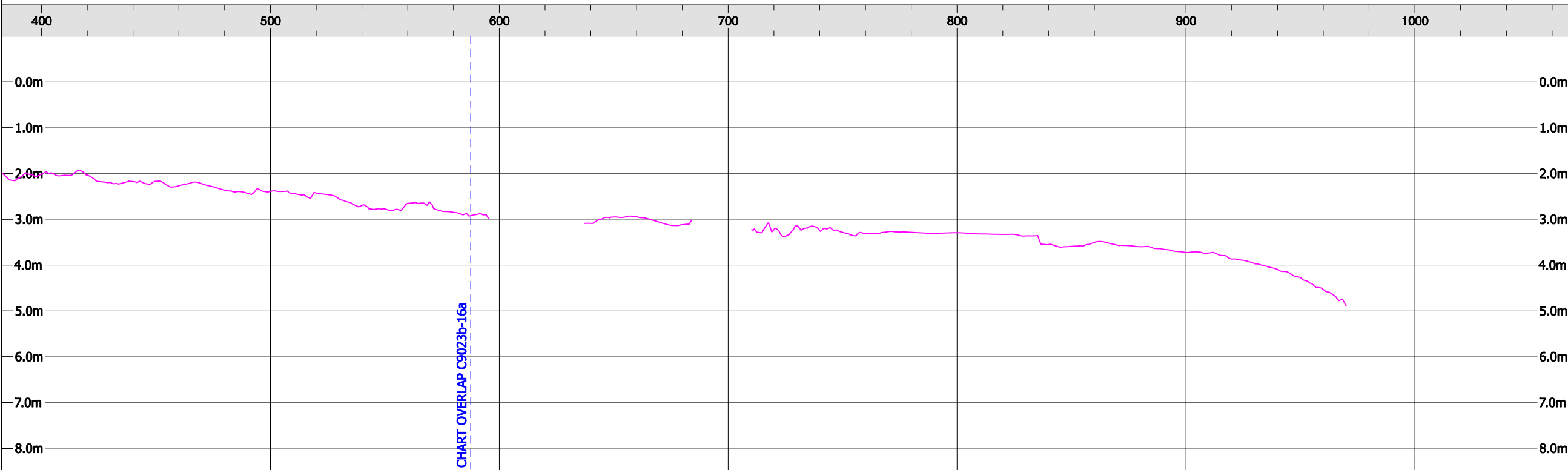
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



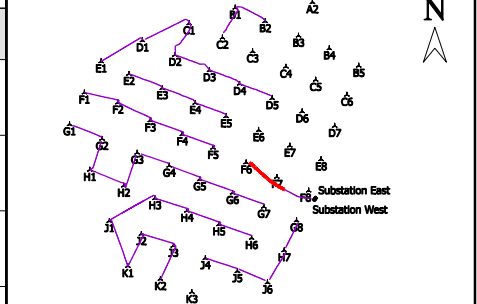
LEGEND PROFILE:

- 100 Chainage in metres
- 2009 seabed profile below CD
- Chart overlap

PROFILE



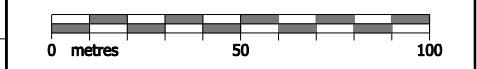
LOCATION MAP



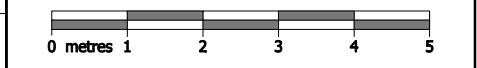
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

CHART TITLE:

Cable Profile RRW to F6 (2)

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

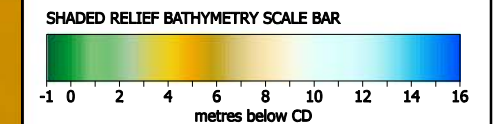
CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-16b  
 REVISION: 1

**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

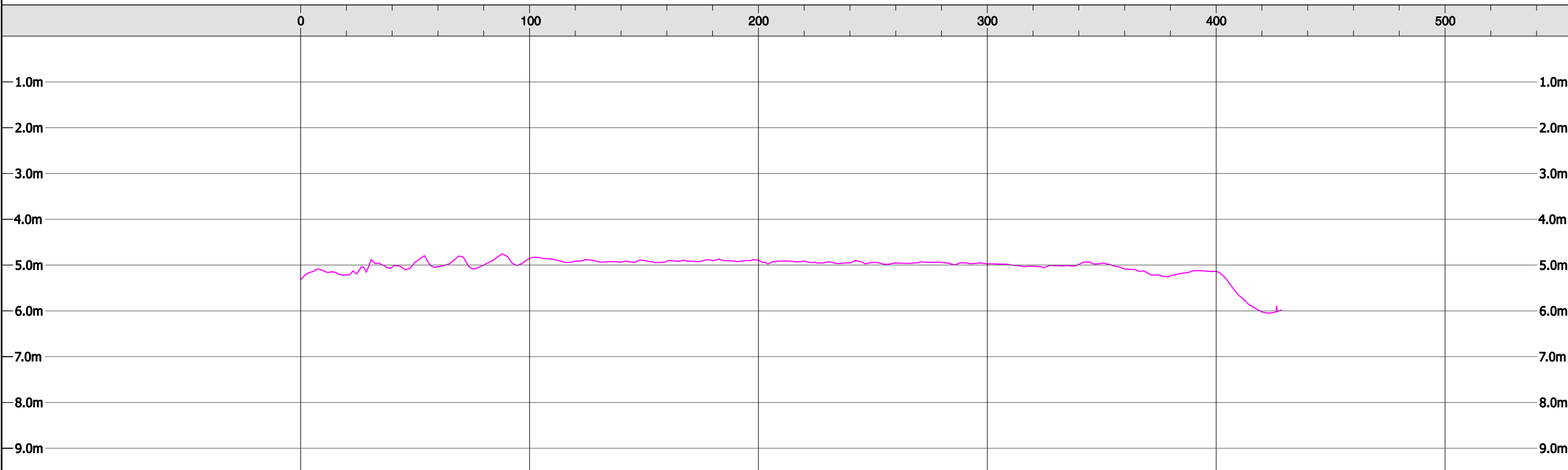
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



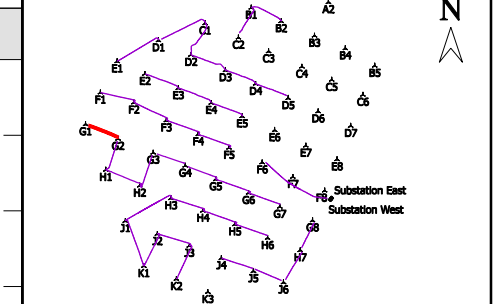
**LEGEND PROFILE:**

- Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



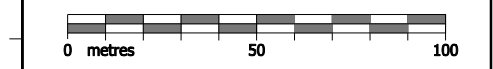
**LOCATION MAP**



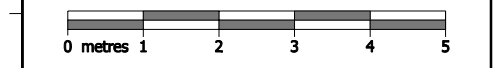
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**

Cable Profile G1 to G2

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-17  
**REVISION:** 1

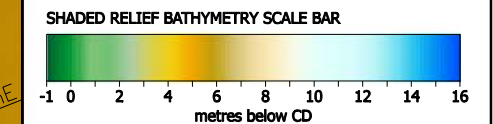


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

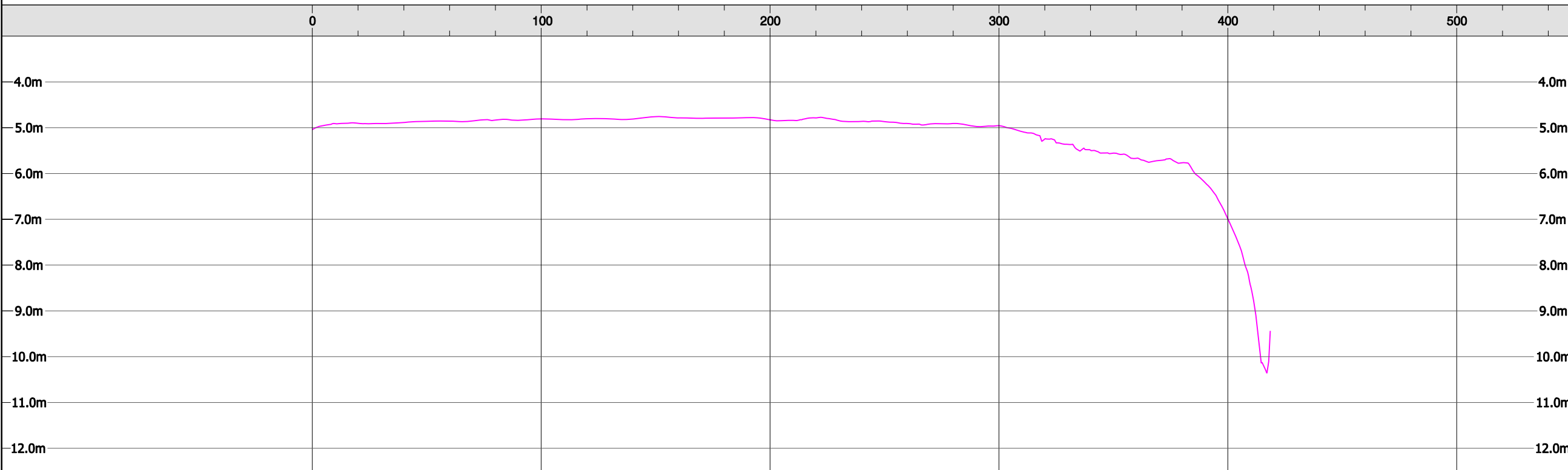
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



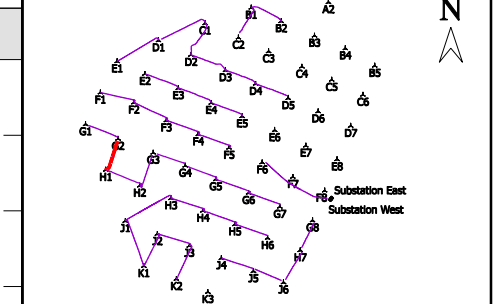
**LEGEND PROFILE:**

- Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



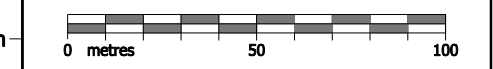
**LOCATION MAP**



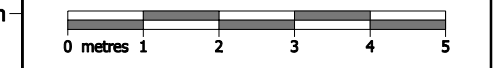
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**

Cable Profile G2 to H1

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-18  
**REVISION:** 1

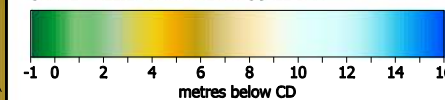
PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD

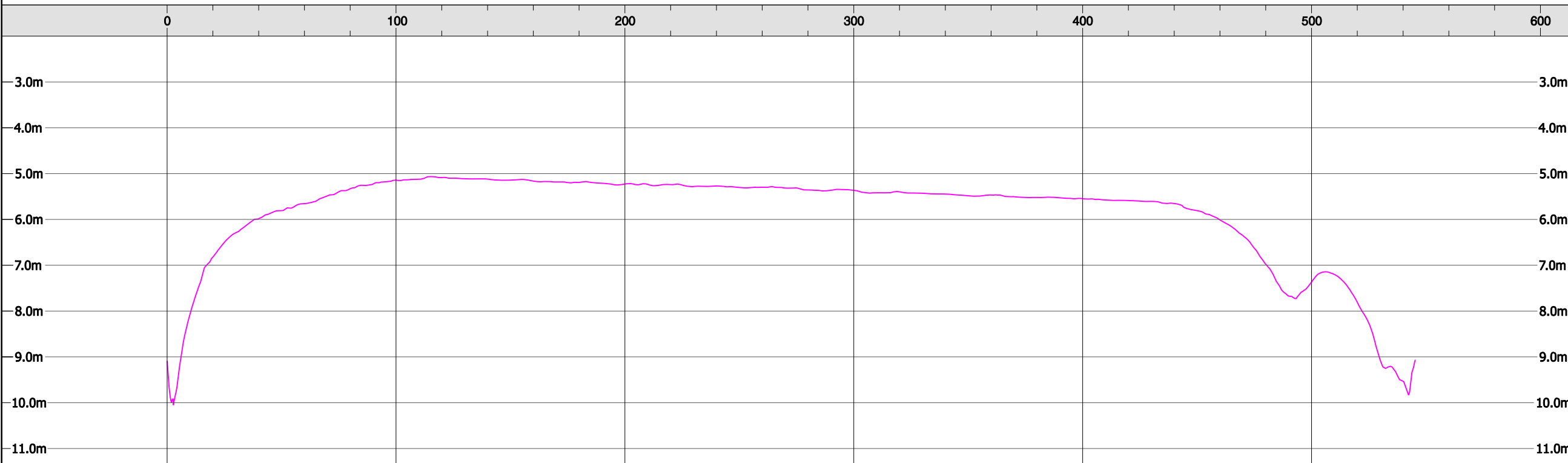
SHADED RELIEF BATHYMETRY SCALE BAR



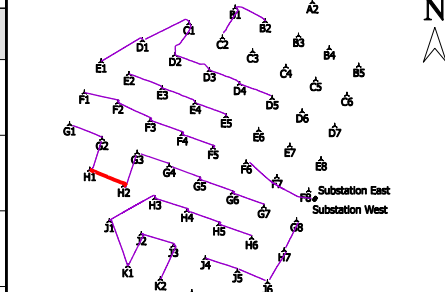
LEGEND PROFILE:

- 100 Chainage in metres
- 2009 seabed profile below CD

PROFILE



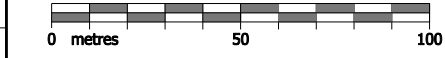
LOCATION MAP



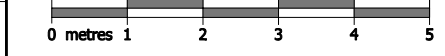
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

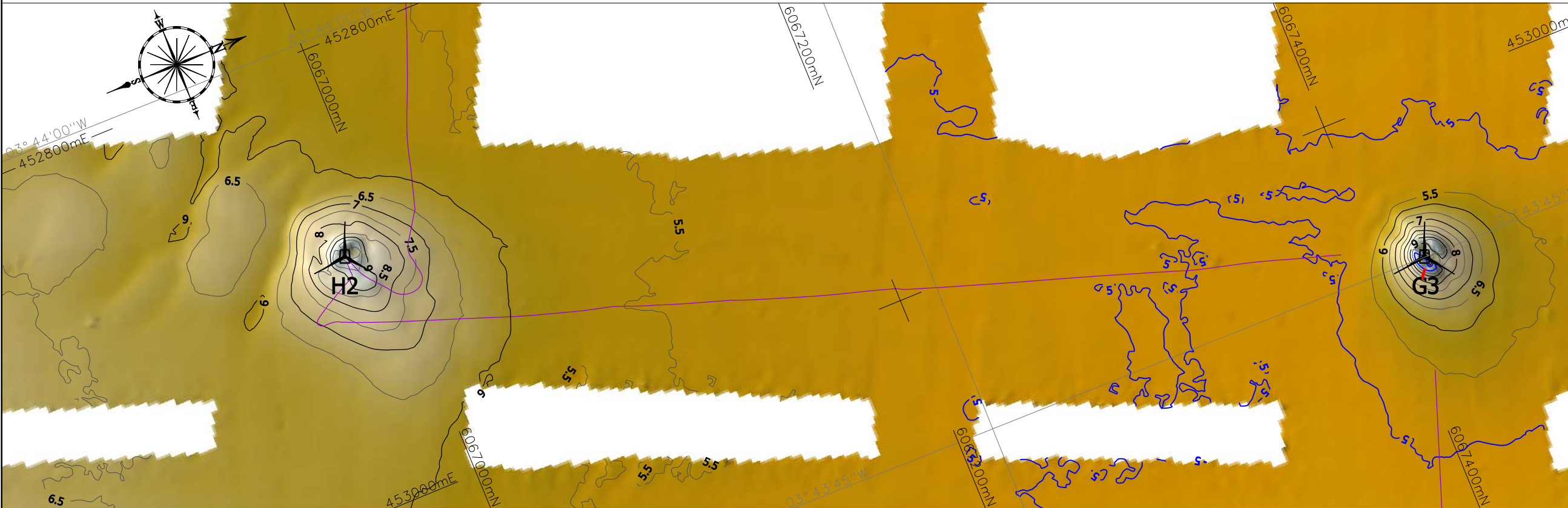
CHART TITLE:

Cable Profile H1 to H2

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

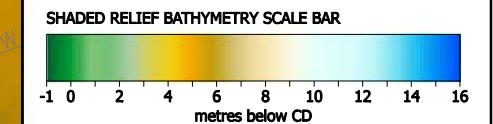
CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-19  
 REVISION: 1

PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

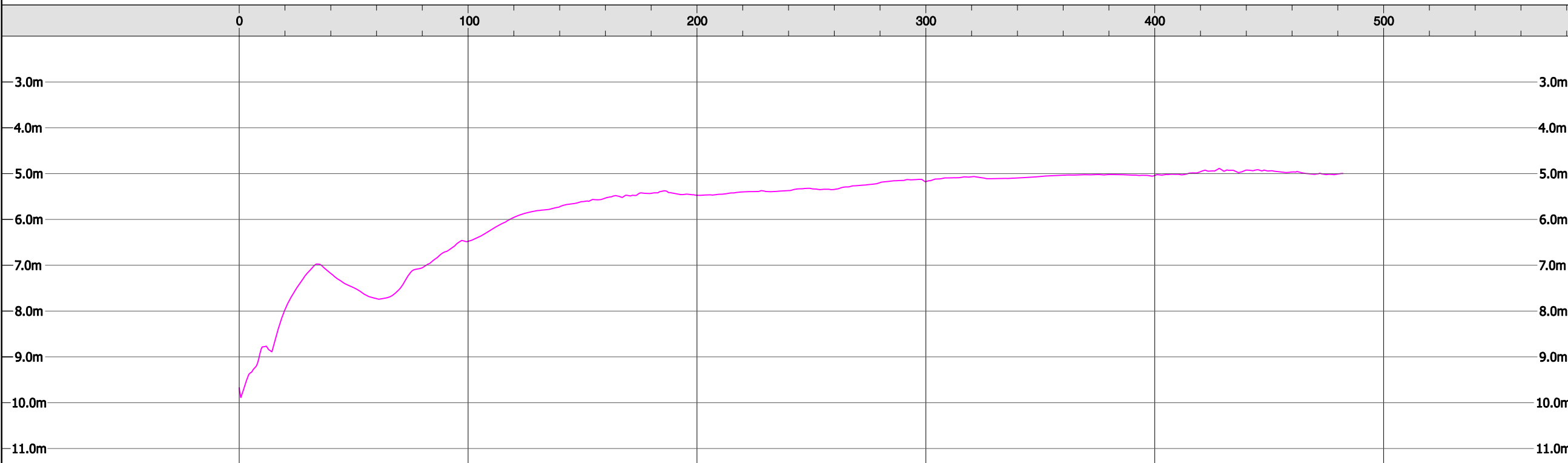
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



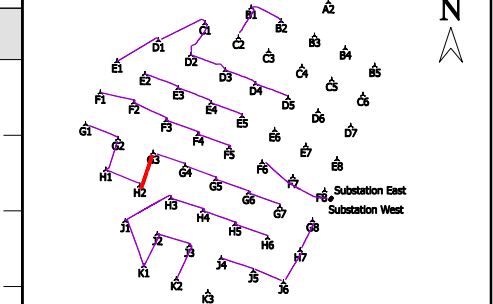
LEGEND PROFILE:

- Chainage in metres
- 2009 seabed profile below CD

PROFILE



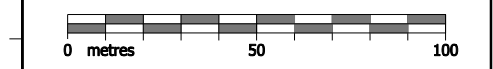
LOCATION MAP



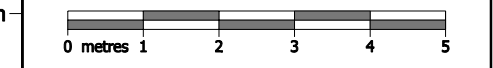
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

CHART TITLE:

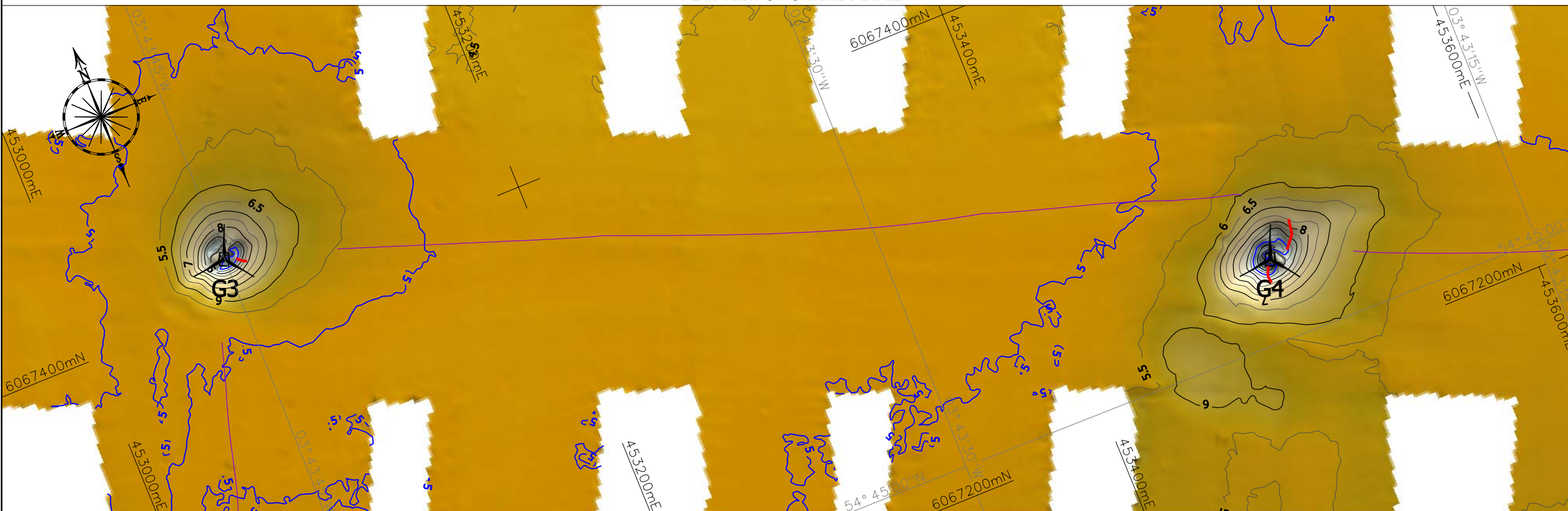
Cable Profile H2 to G3

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

CHART SCALE AT A3:	CHART NUMBER:	REVISION:
1:2,000	C9023b-20	1

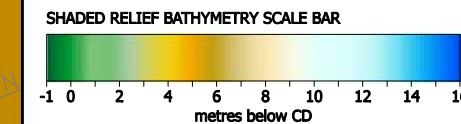


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

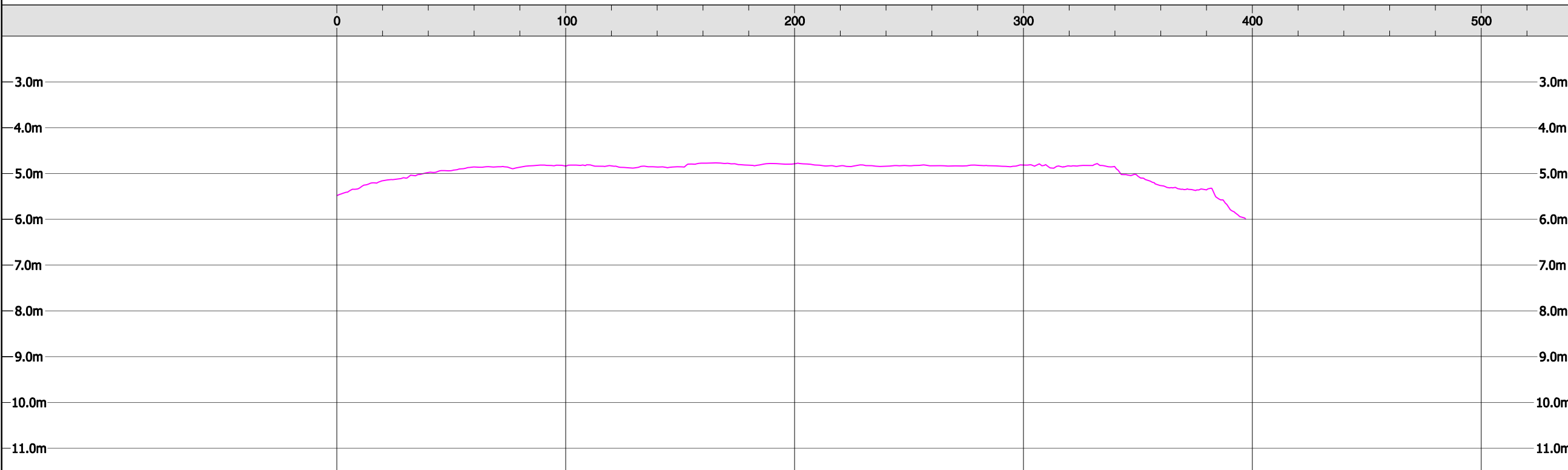
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



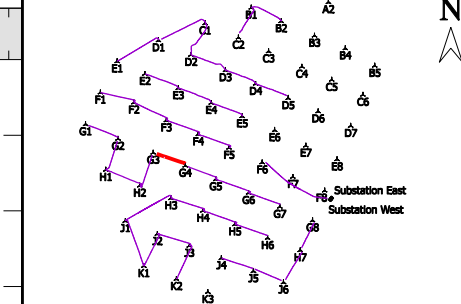
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**

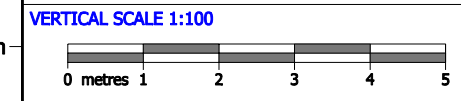
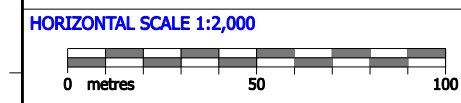


**LOCATION MAP**



**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



**CLIENT:**

**ENGINEERING DETAIL**

**CONTRACTOR:**

**CONTRACT TITLE:**  
 ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**  
 Cable Profile G3 to G4

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-21  
**REVISION:** 1

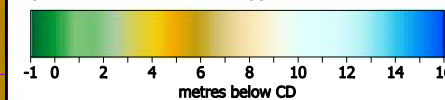
**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD

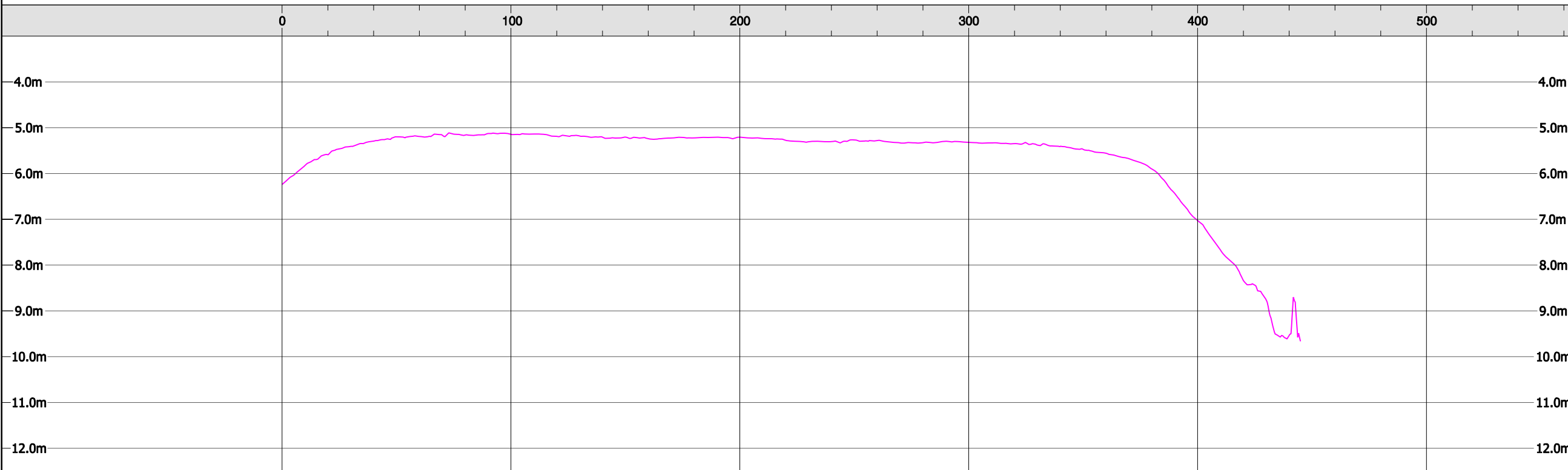
**SHADED RELIEF BATHYMETRY SCALE BAR**



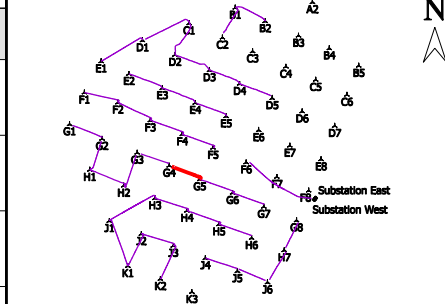
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



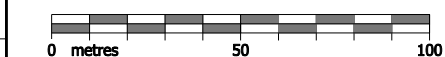
**LOCATION MAP**



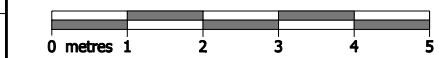
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

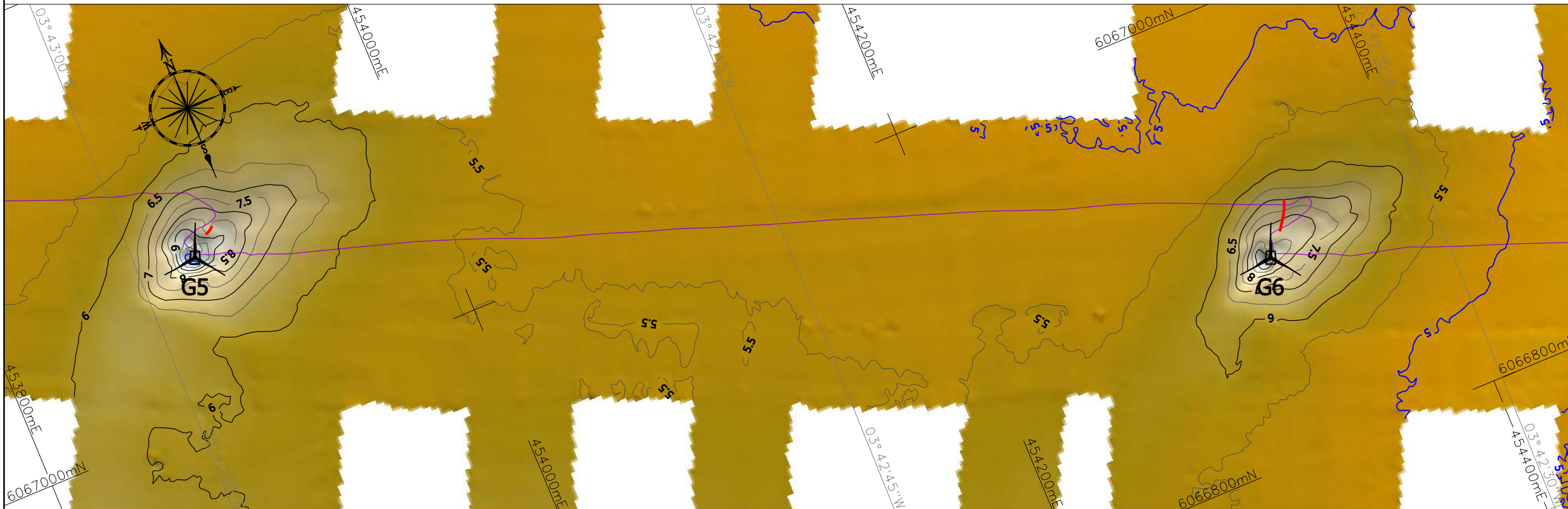
**CHART TITLE:**

Cable Profile G4 to G5

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

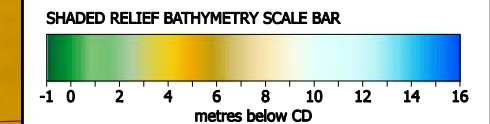
**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-22  
**REVISION:** 1

**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

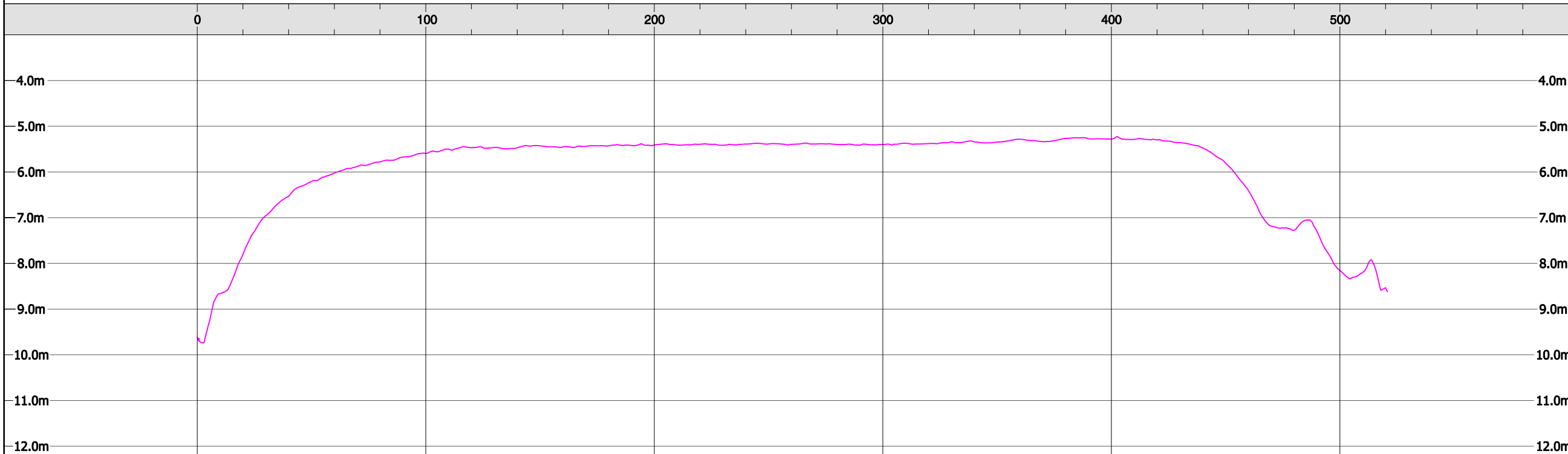
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



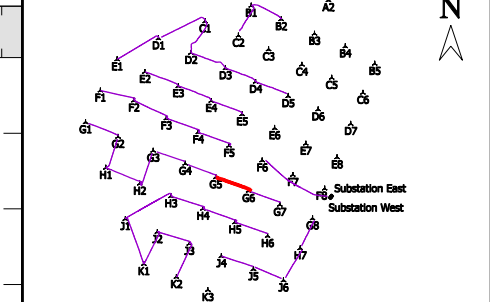
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



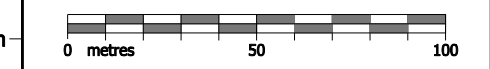
**LOCATION MAP**



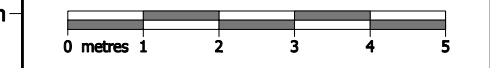
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**

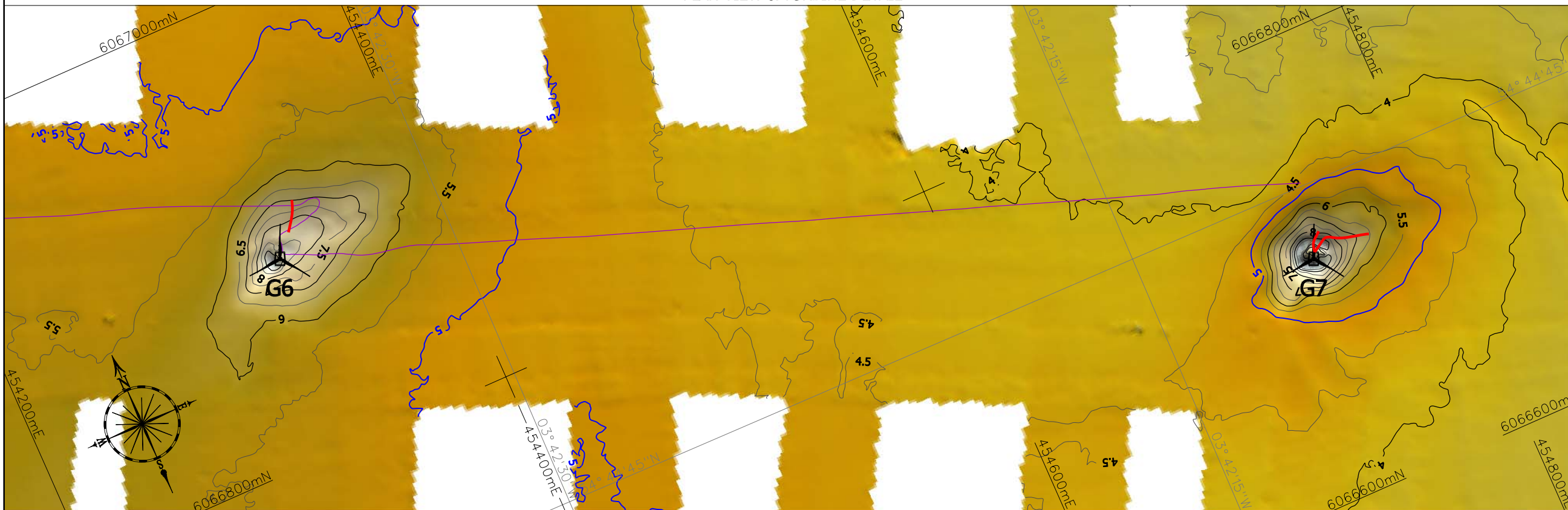
Cable Profile G5 to G6

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-23  
 REVISION: 1

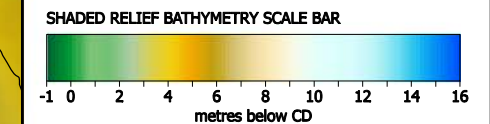


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

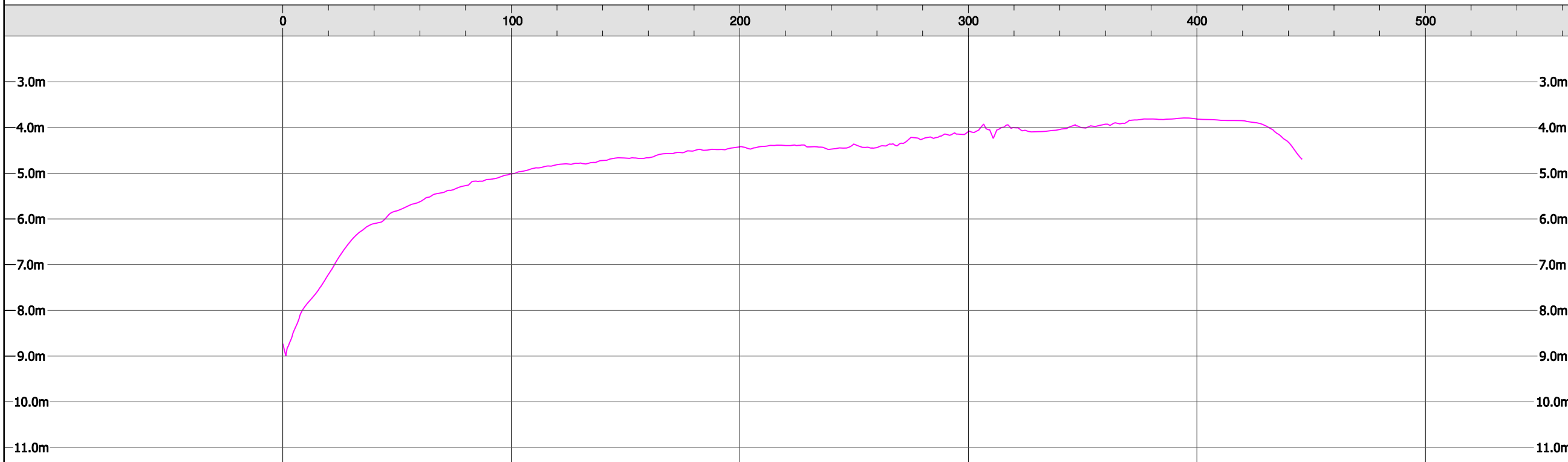
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



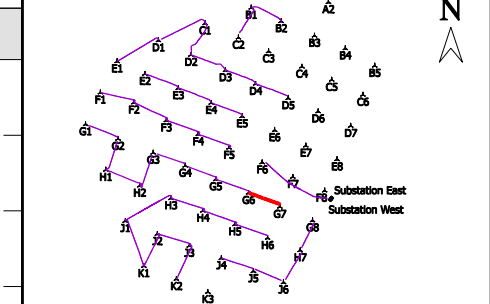
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



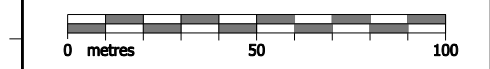
**LOCATION MAP**



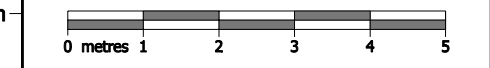
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

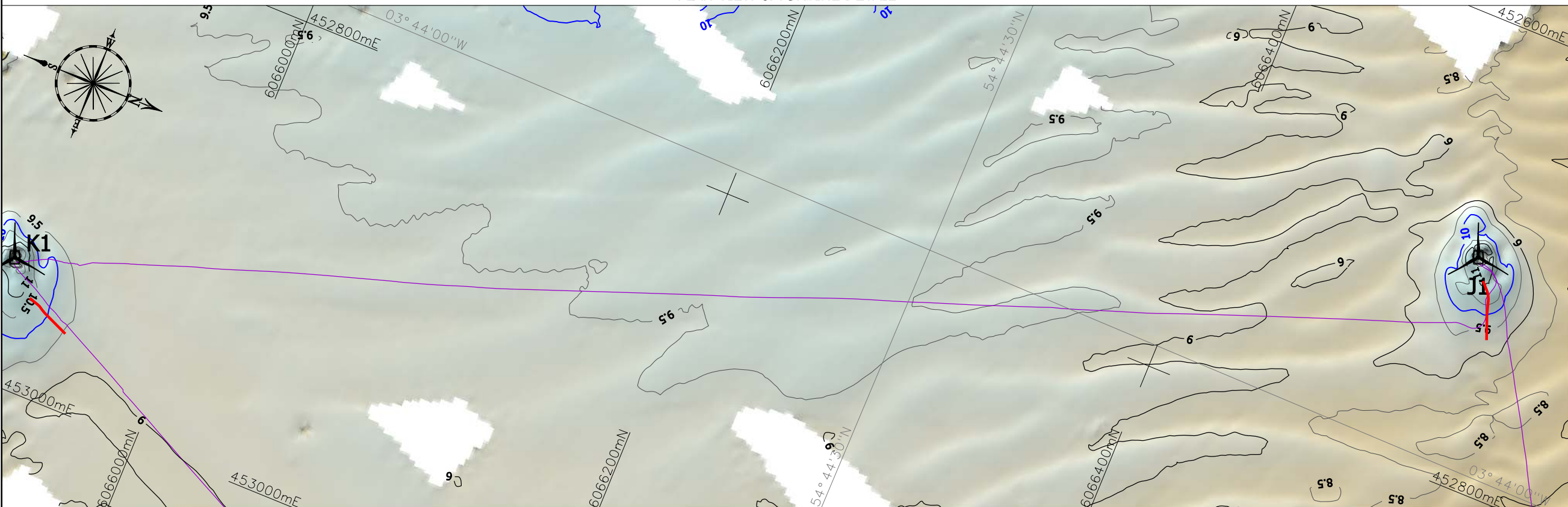
**CHART TITLE:**

Cable Profile G6 to G7

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

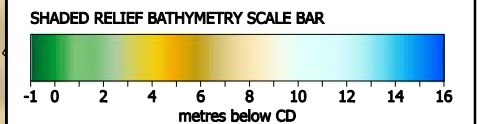
CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-24  
 REVISION: 1

**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

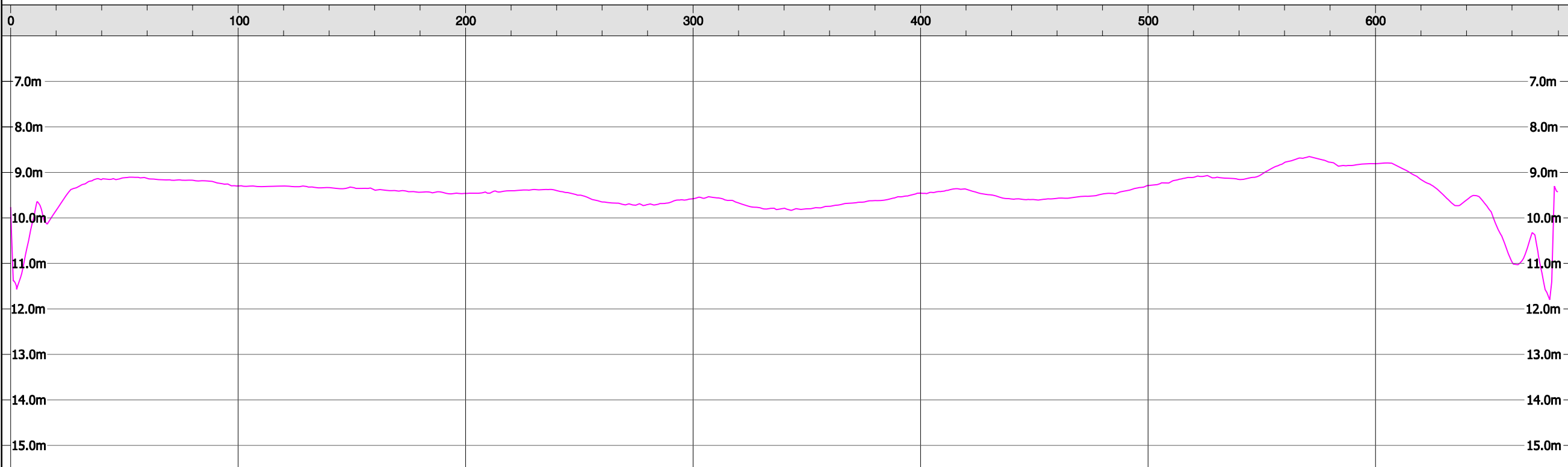
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



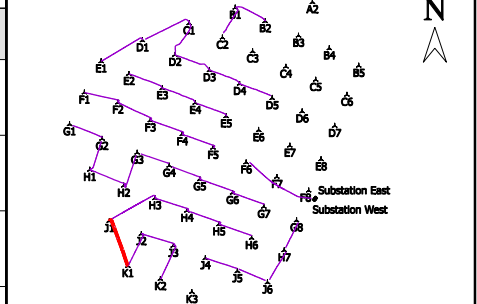
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



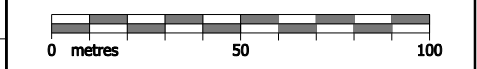
**LOCATION MAP**



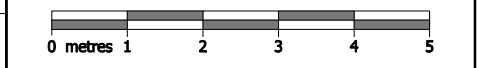
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**

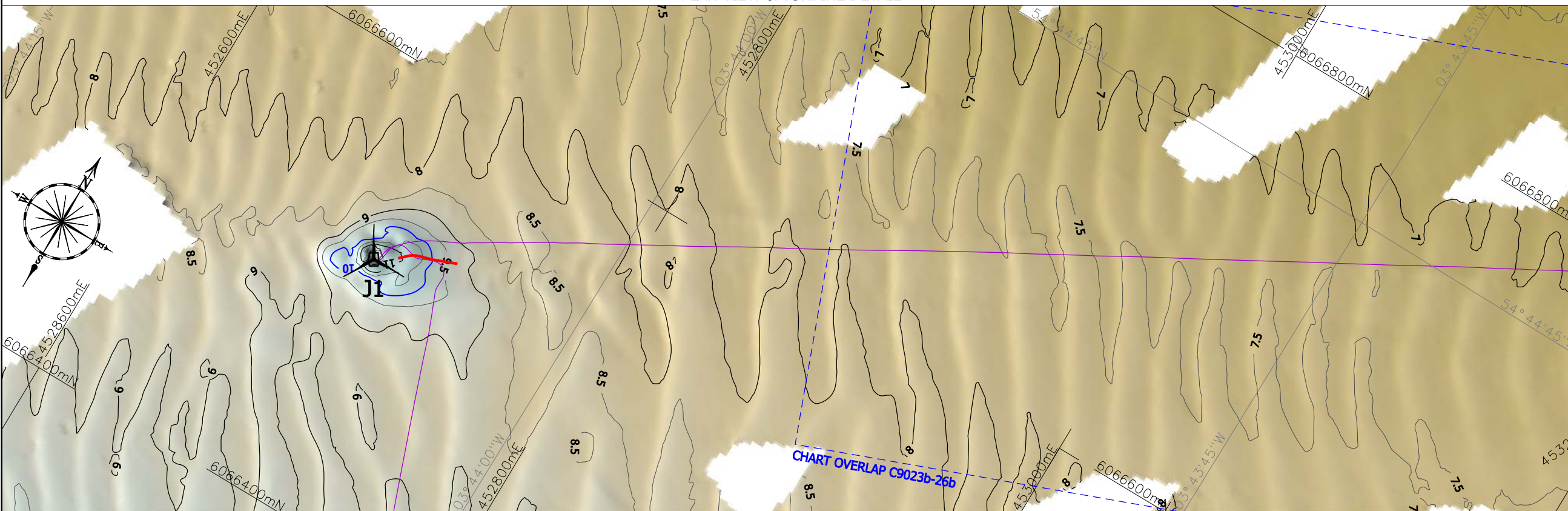
Cable Profile K1 to J1

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-25  
**REVISION:** 1

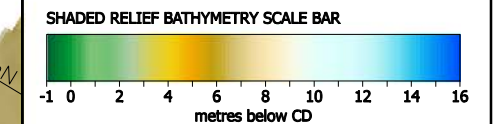


PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

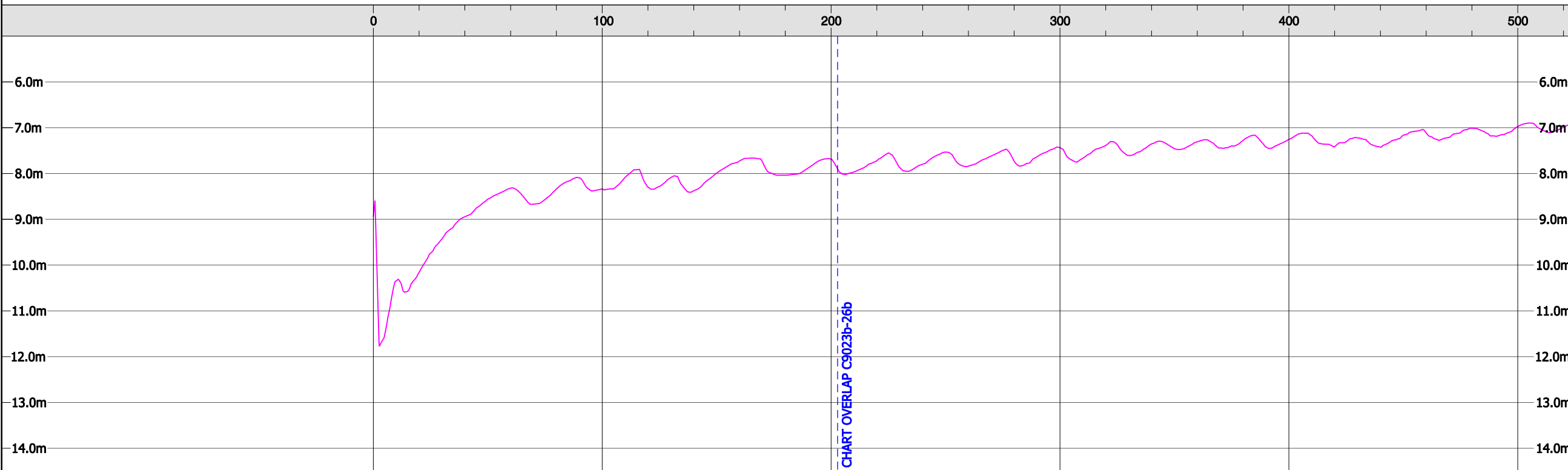
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



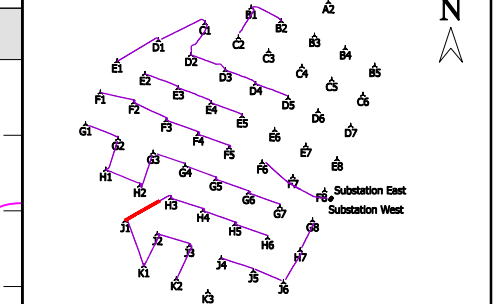
LEGEND PROFILE:

- 100 Chainage in metres
- 2009 seabed profile below CD
- Chart overlap

PROFILE



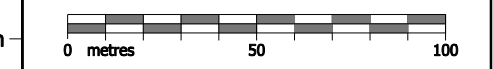
LOCATION MAP



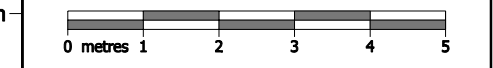
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

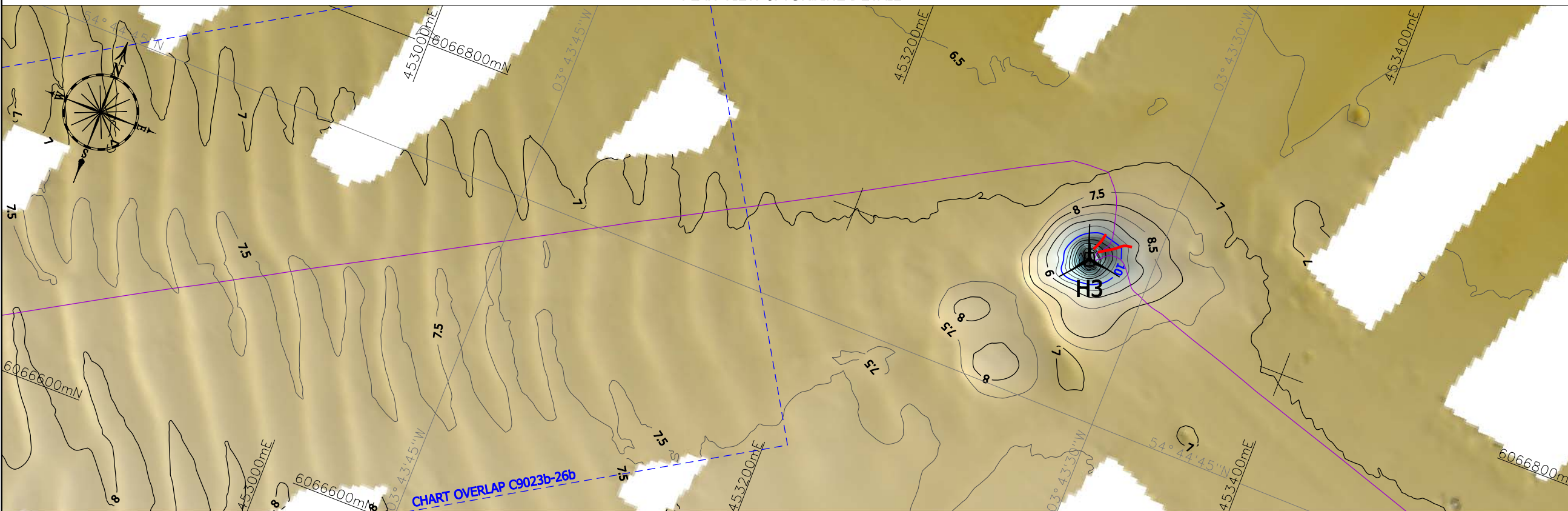
CHART TITLE:

Cable Profile J1 to H3 (1)

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

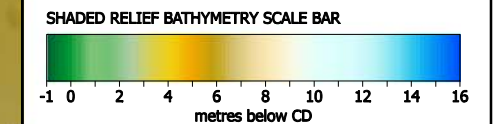
CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-26a  
 REVISION: 1

PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

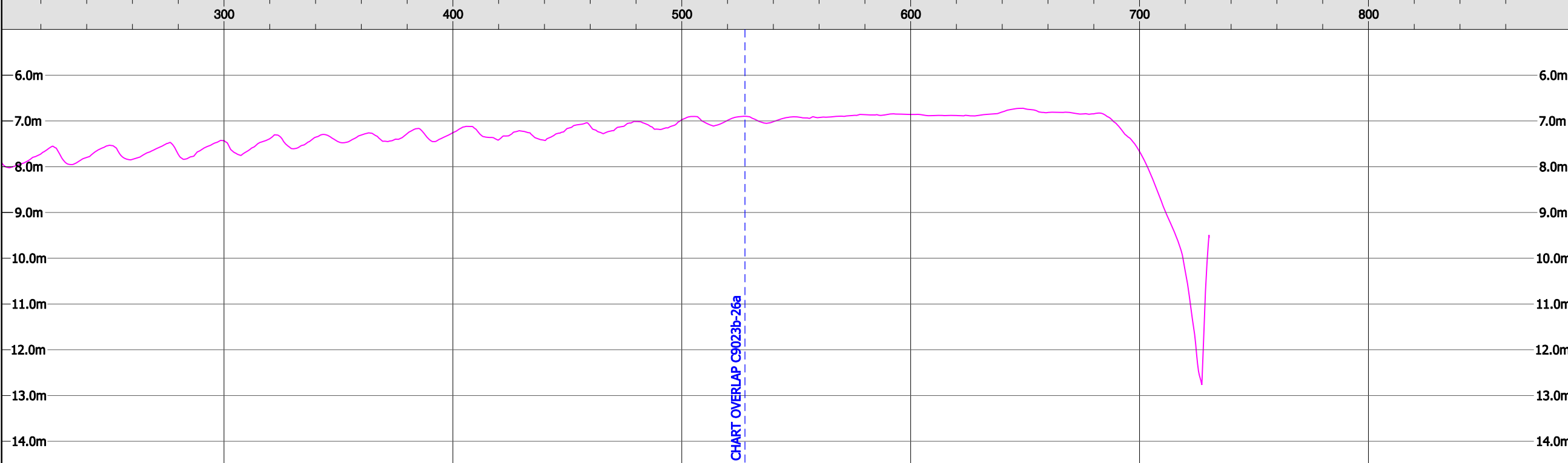
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



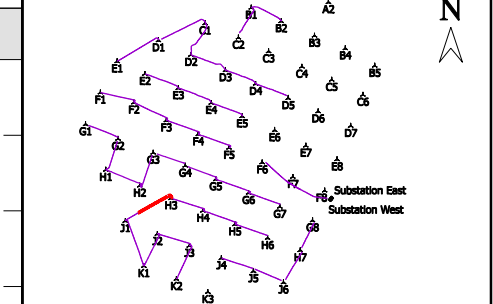
LEGEND PROFILE:

- Chainage in metres
- 2009 seabed profile below CD
- Chart overlap

PROFILE



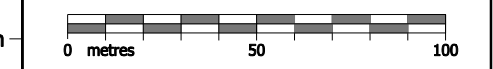
LOCATION MAP



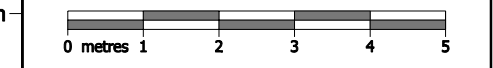
GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

HORIZONTAL SCALE 1:2,000



VERTICAL SCALE 1:100



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

CHART TITLE:

Cable Profile J1 to H3 (2)

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

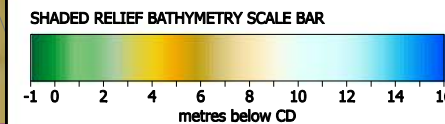
CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-26b  
 REVISION: 1

**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

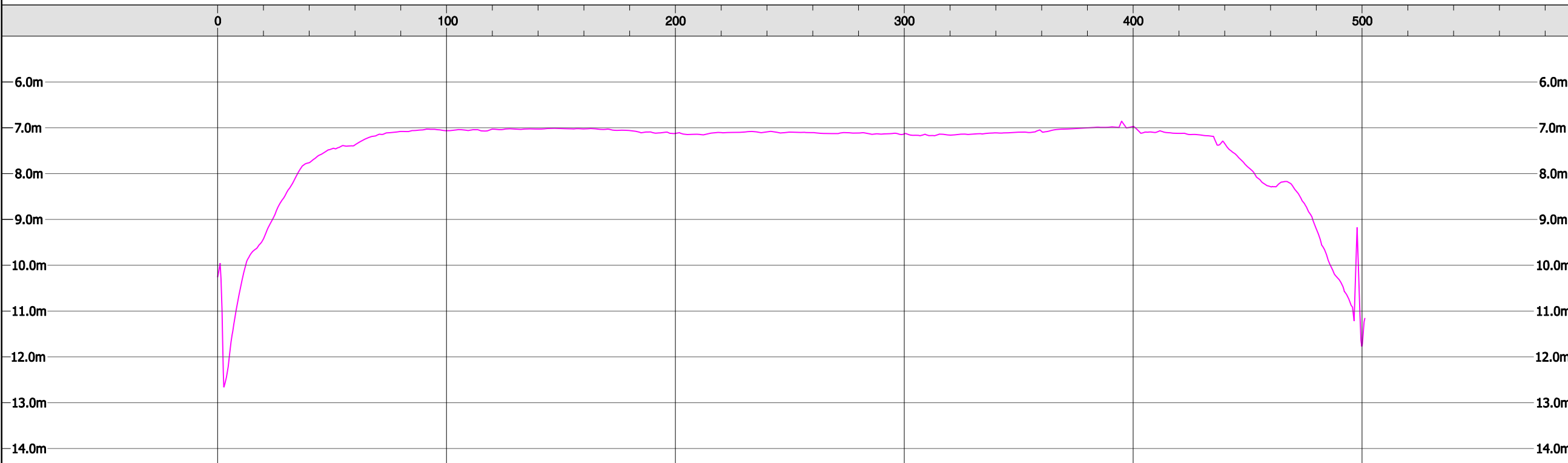
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



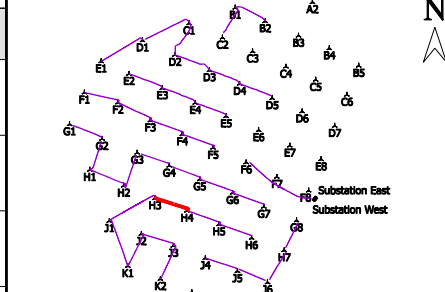
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**

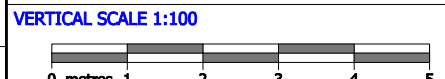
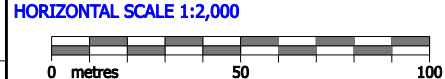


**LOCATION MAP**



**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



**ENGINEERING DETAIL**



**CONTRACT TITLE:**  
ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

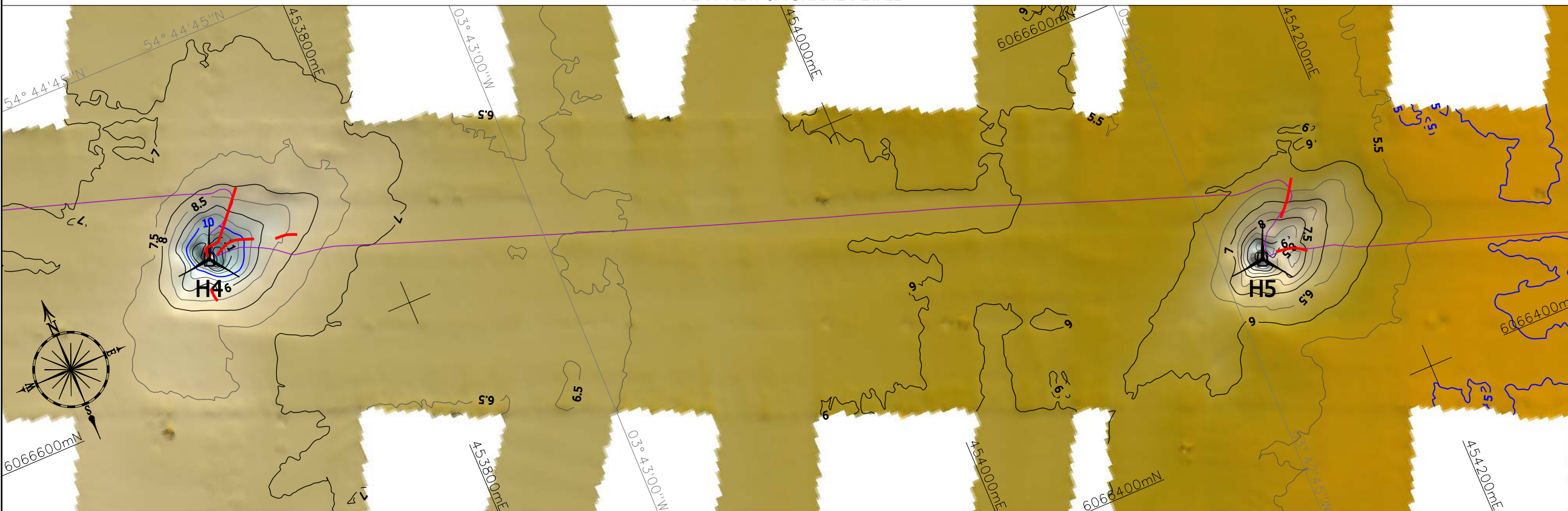
**CHART TITLE:**  
Cable Profile H3 to H4

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-27  
**REVISION:** 1

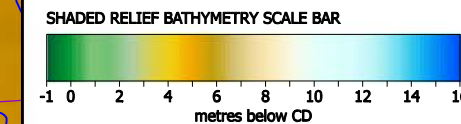


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

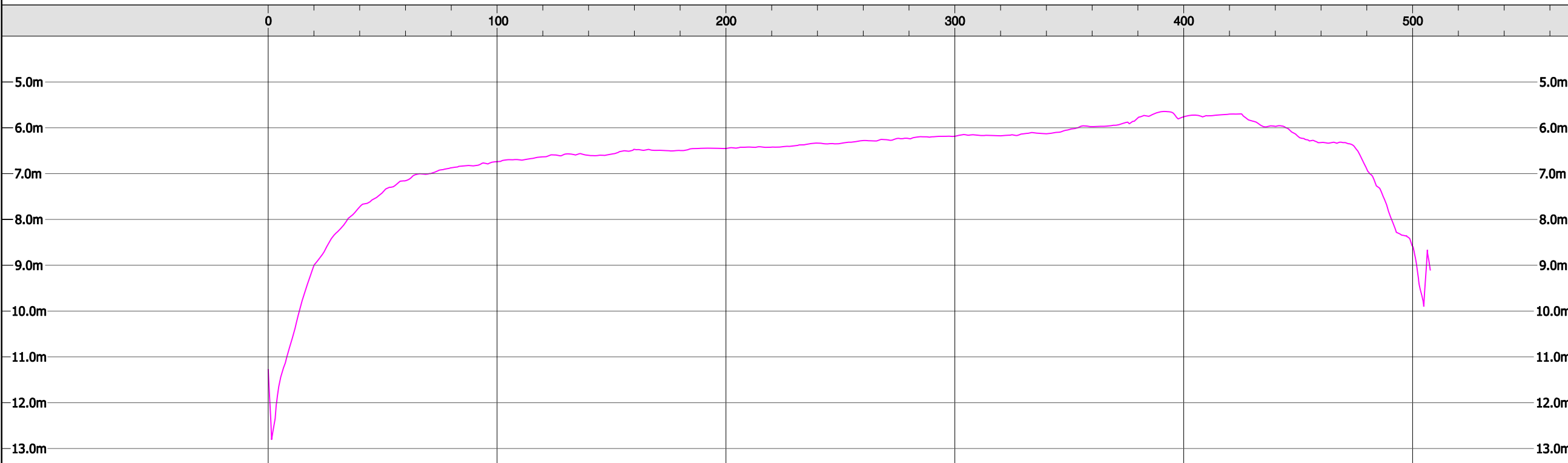
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



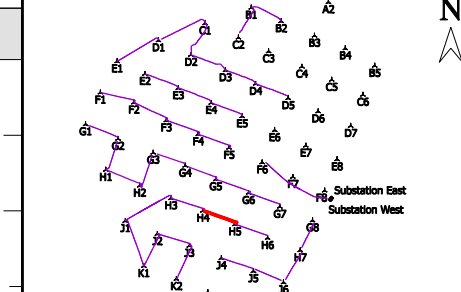
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**

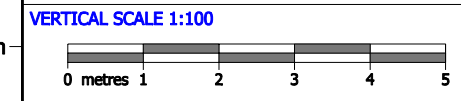
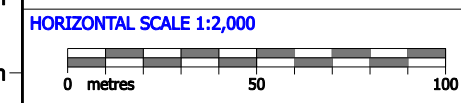


**LOCATION MAP**



**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**

Cable Profile H4 to H5

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

CHART SCALE AT A3: 1:2,000  
 CHART NUMBER: C9023b-28  
 REVISION: 1

PLAN VIEW & TURBINE DETAIL



**LEGEND PLAN VIEW:**

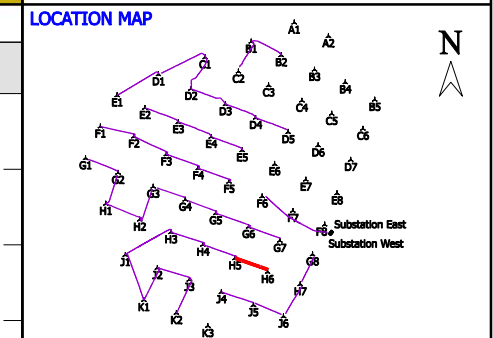
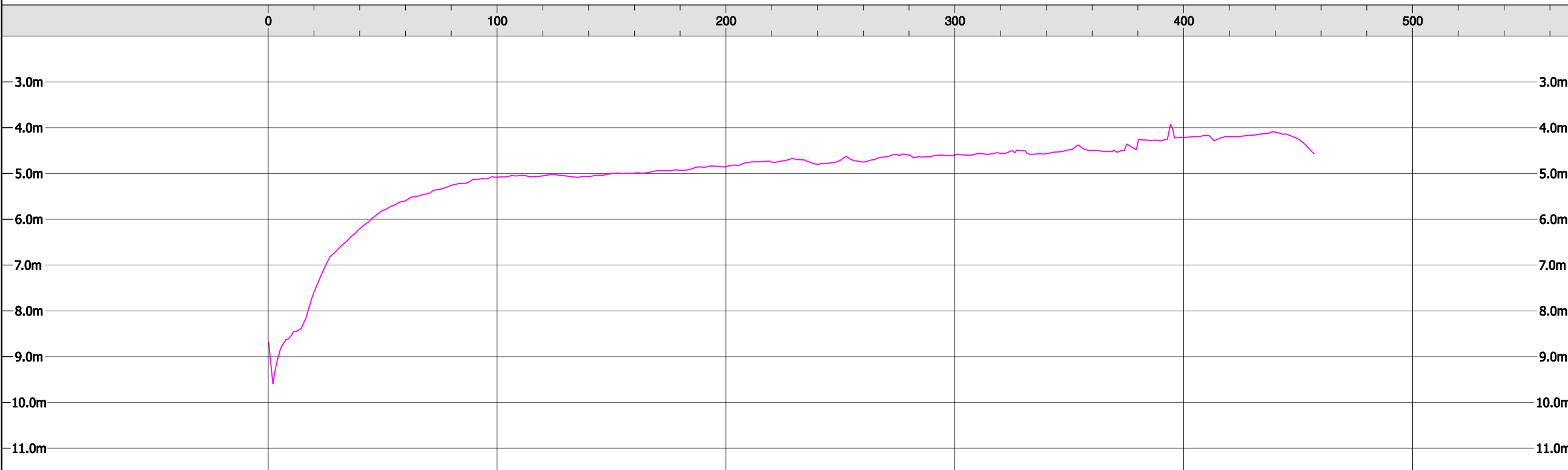
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD

**SHADED RELIEF BATHYMETRY SCALE BAR**

**LEGEND PROFILE:**

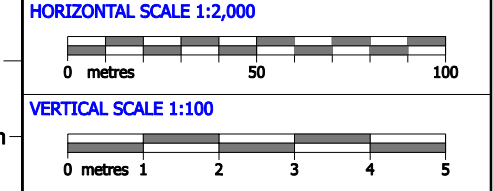
- 100 Chainage in metres
- 2009 seabed profile below CD

PROFILE



**GEODETTIC NOTES:**

- Projection : UTM, Zone 30
- Ellipsoid : WGS '84
- Geodetic Datum : WGS '84
- Latitude of Origin : 0° North
- Longitude of Origin : 3° West
- False Easting : 500000 metres
- False Northing : 0 metres
- Scale Factor : 0.9996



ENGINEERING DETAIL

**CLIENT:**

**CONTRACTOR:** Osiris Projects  
Seabed Mapping & Coastal Survey

**CONTRACT TITLE:**  
ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**  
Cable Profile H5 to H6

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

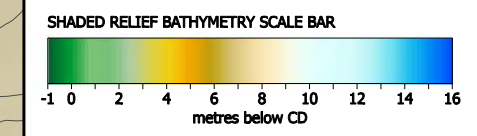
**CHART SCALE AT A3:** 1:2,000    **CHART NUMBER:** C9023b-29    **REVISION:** 1

**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

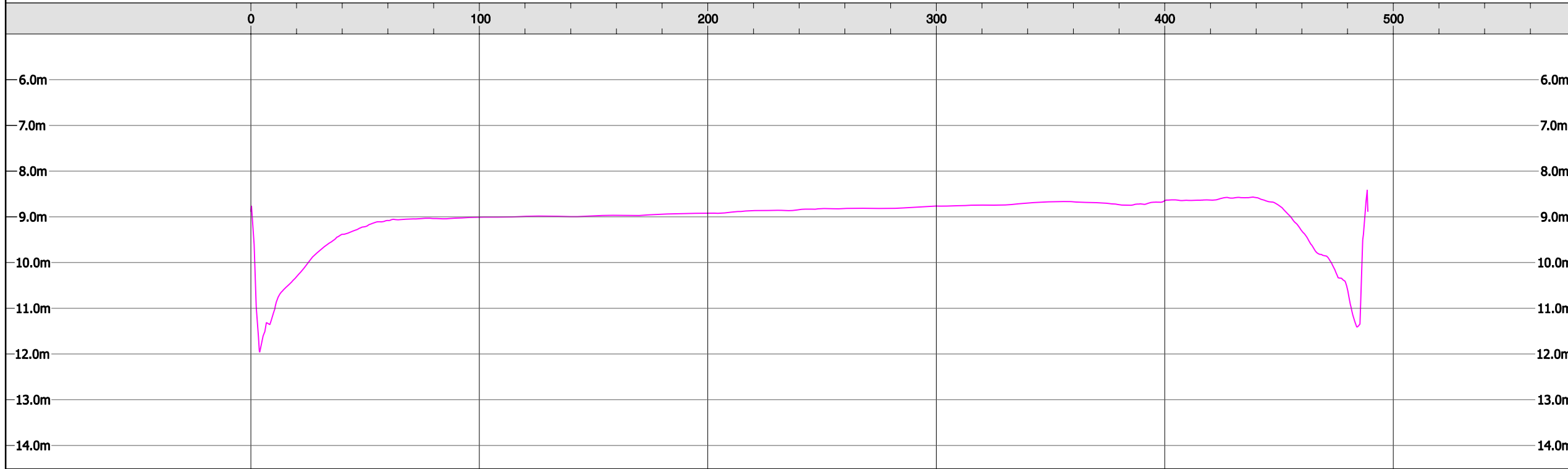
- D1 Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



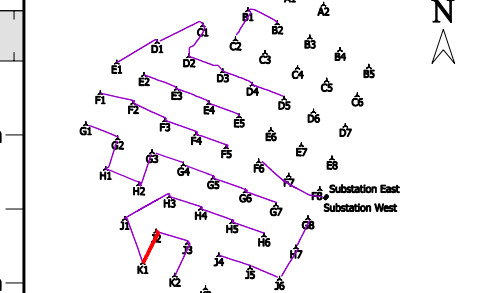
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



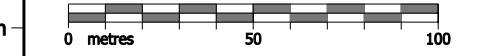
**LOCATION MAP**



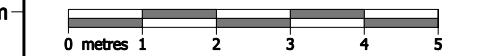
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**

Cable Profile K1 to J2

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:**

1:2,000

**CHART NUMBER:**

C9023b-30

**REVISION:**

1

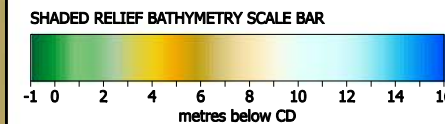


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

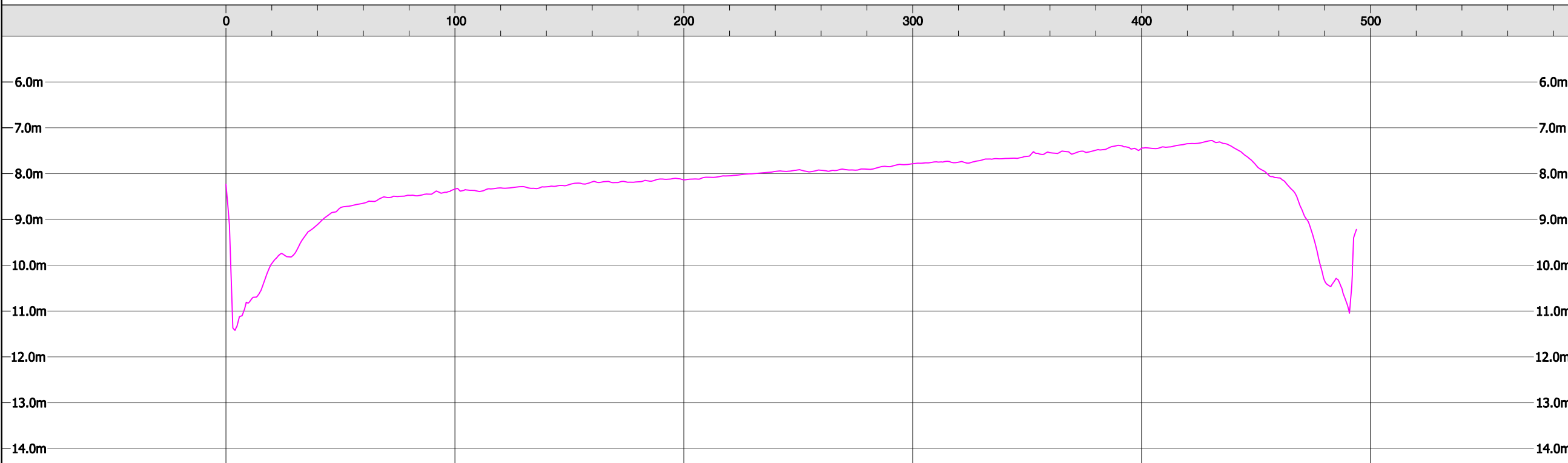
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



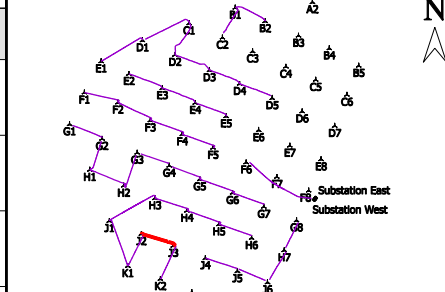
**LEGEND PROFILE:**

- Chainage in metres
- 2009 seabed profile below CD

**PROFILE**

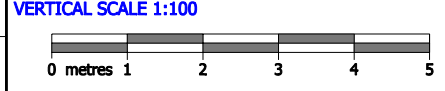
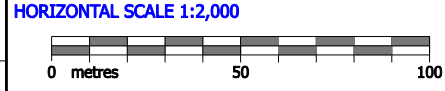


**LOCATION MAP**



**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



**CLIENT:**

**ENGINEERING DETAIL**

**CONTRACTOR:**

Seabed Mapping & Coastal Survey

**CONTRACT TITLE:**

ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:**

Cable Profile J2 to J3

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:** 1:2,000

**CHART NUMBER:** C9023b-31

**REVISION:** 1

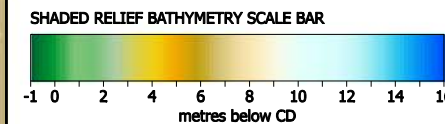


**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

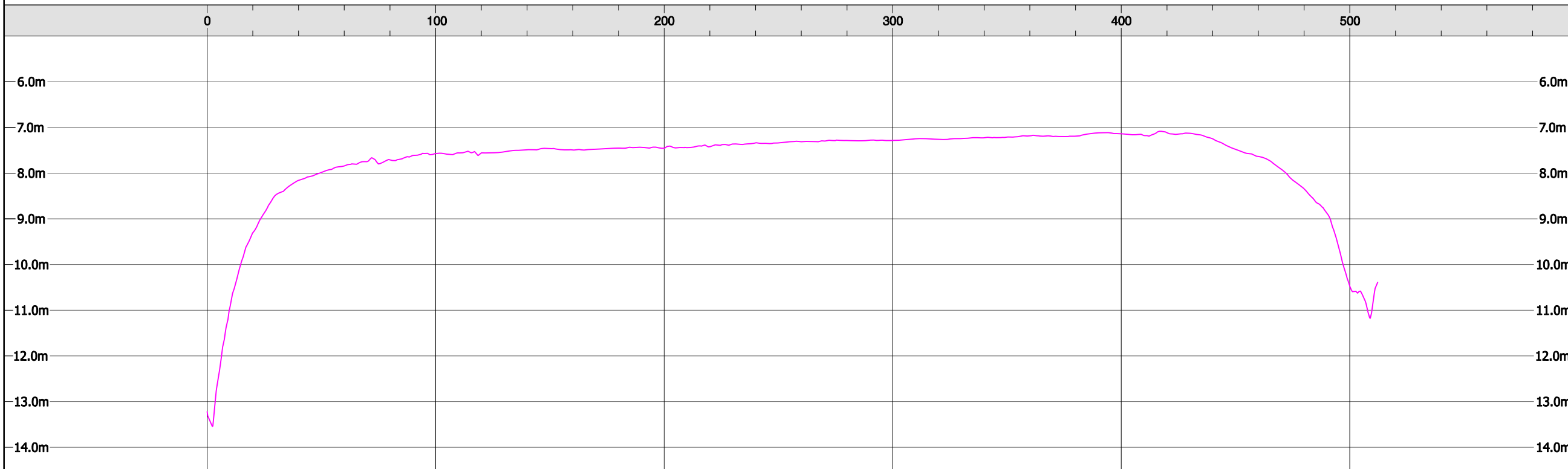
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



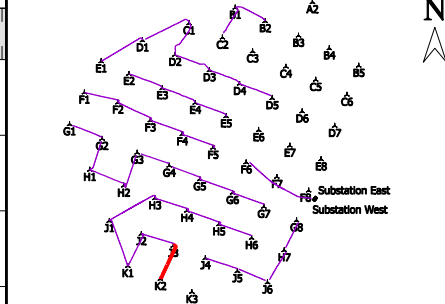
**LEGEND PROFILE:**

- Chainage in metres
- 2009 seabed profile below CD

**PROFILE**

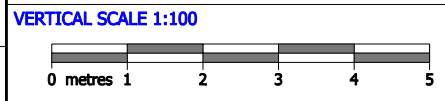
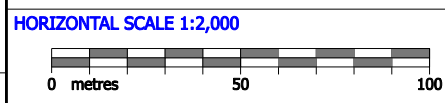


**LOCATION MAP**



**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



**ENGINEERING DETAIL**

**CLIENT:**

**CONTRACTOR:**

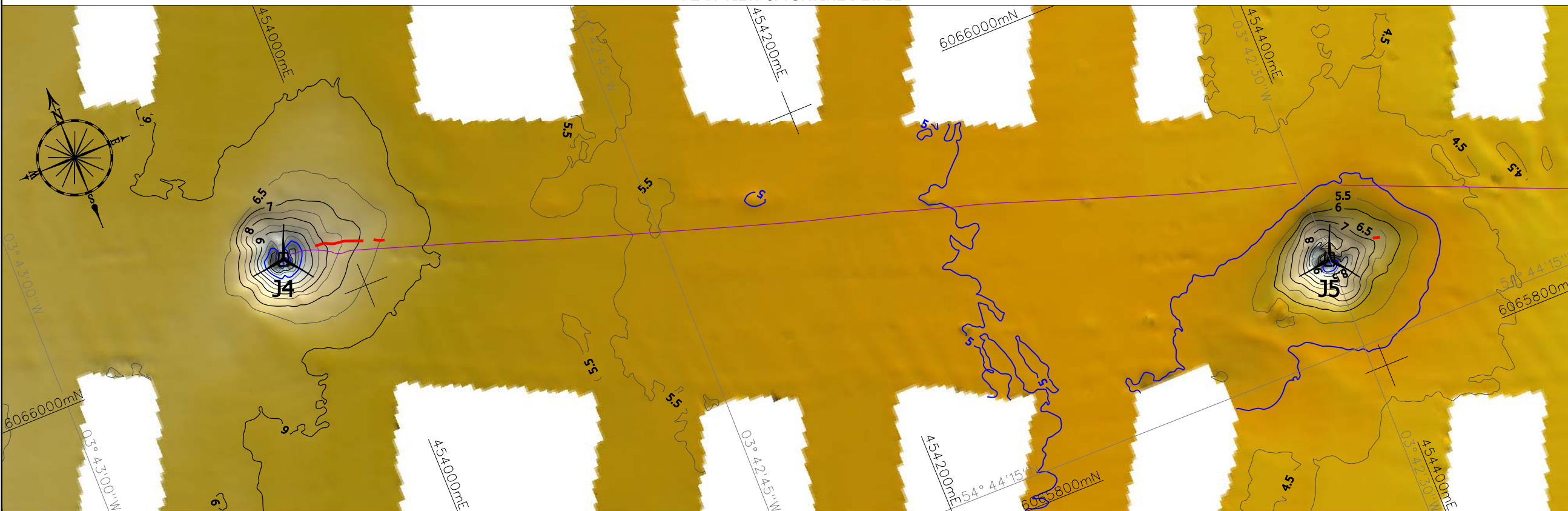
**CONTRACT TITLE:**  
ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:** Cable Profile K2 to J3

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

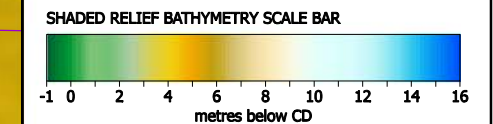
**CHART SCALE AT A3:** 1:2,000    **CHART NUMBER:** C9023b-32    **REVISION:** 1

**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

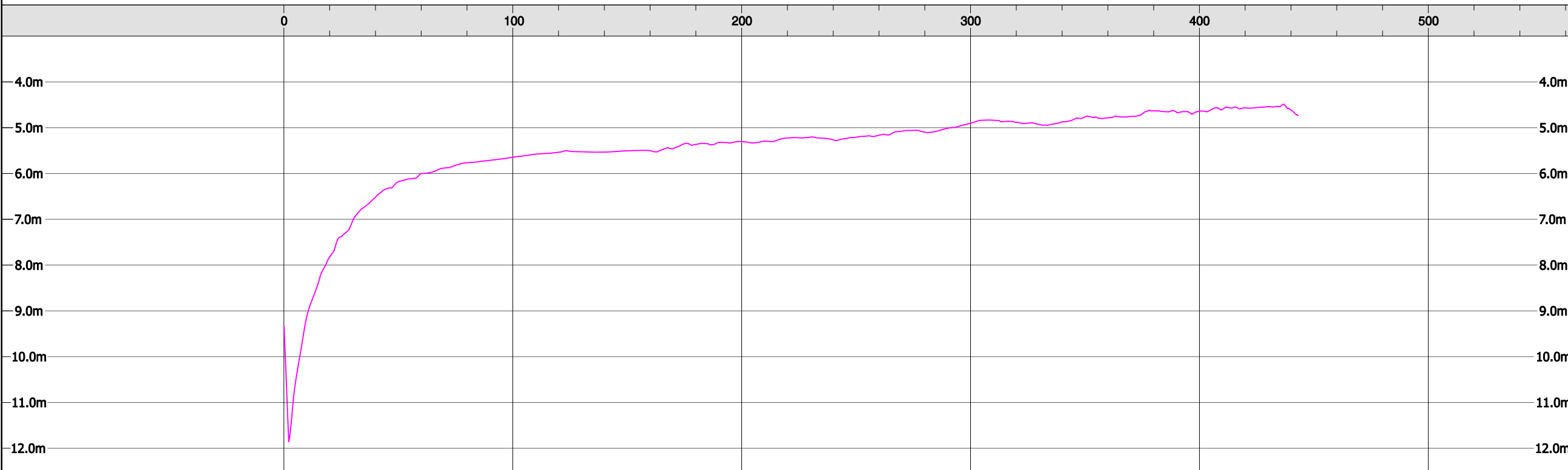
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



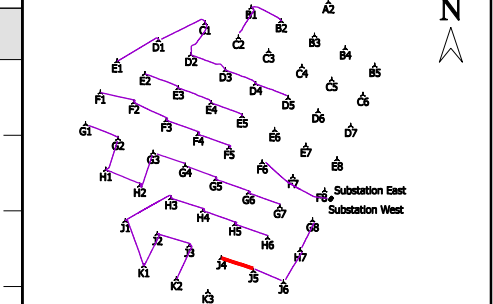
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



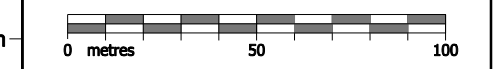
**LOCATION MAP**



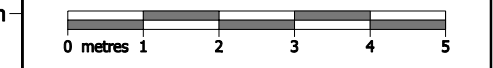
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

**ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY**

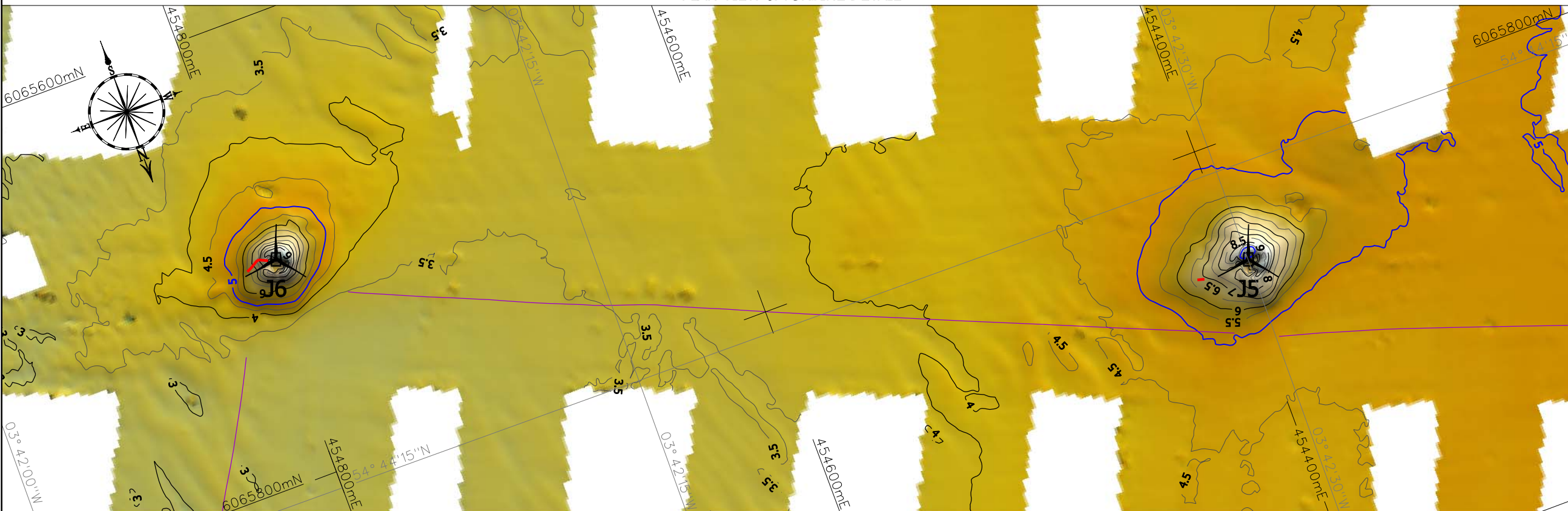
**CHART TITLE:**

**Cable Profile J4 to J5**

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

**CHART SCALE AT A3:** 1:2,000  
**CHART NUMBER:** C9023b-33  
**REVISION:** 1

PLAN VIEW & TURBINE DETAIL



**LEGEND PLAN VIEW:**

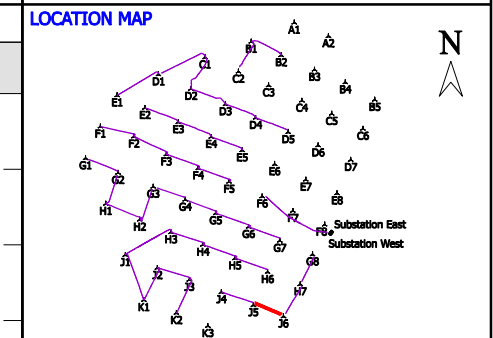
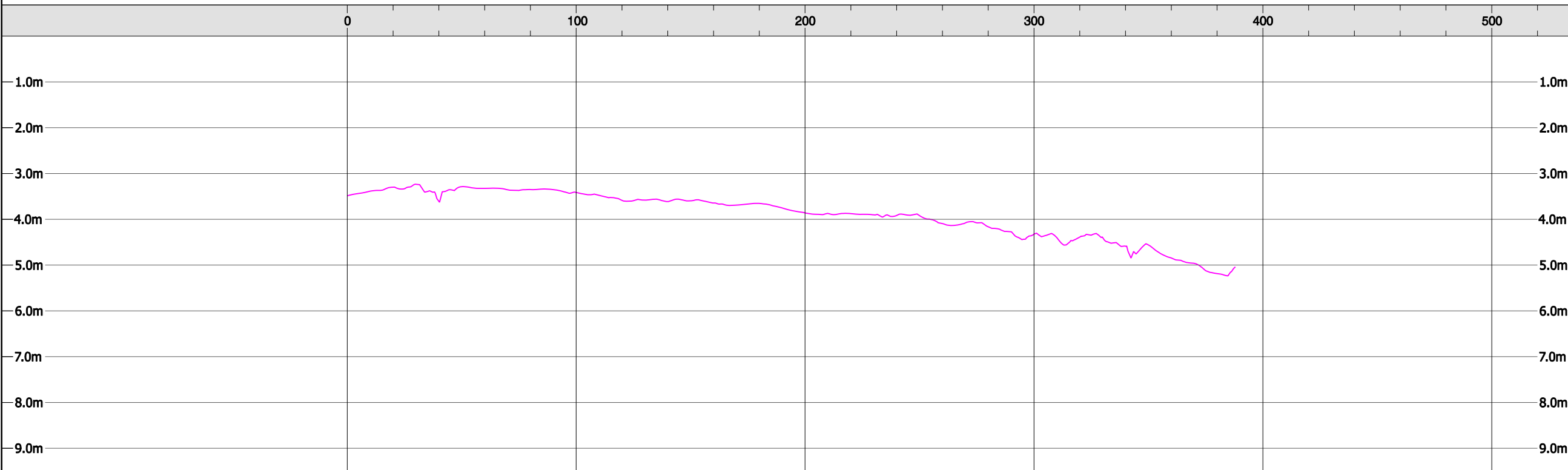
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD

**SHADED RELIEF BATHYMETRY SCALE BAR**

**LEGEND PROFILE:**

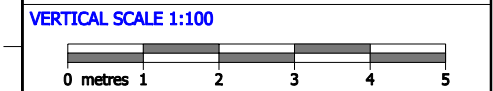
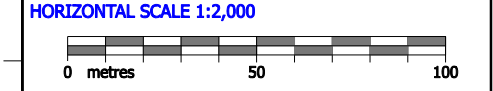
- 100 Chainage in metres
- 2009 seabed profile below CD

PROFILE



**GEODETTIC NOTES:**

- Projection : UTM, Zone 30
- Ellipsoid : WGS '84
- Geodetic Datum : WGS '84
- Latitude of Origin : 0° North
- Longitude of Origin : 3° West
- False Easting : 500000 metres
- False Northing : 0 metres
- Scale Factor : 0.9996



ENGINEERING DETAIL

**CLIENT:**

**CONTRACTOR:**

**CONTRACT TITLE:** ROBIN RIGG OFFSHORE WIND FARM MID-CONSTRUCTION GEOPHYSICAL SURVEY

**CHART TITLE:** Cable Profile J6 to J5

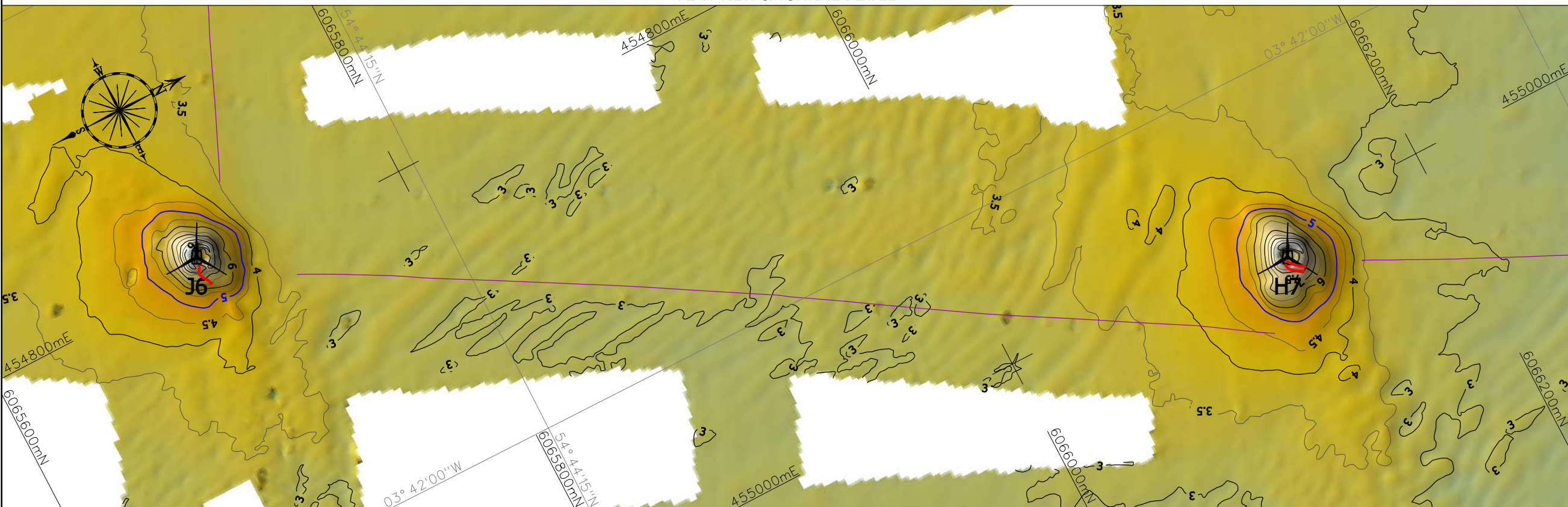
2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW

REV.: DATE: DESCRIPTION: DRAWN: CHECKED: APPROVED:

**CHART SCALE AT A3:** 1:2,000    **CHART NUMBER:** C9023b-34    **REVISION:** 1

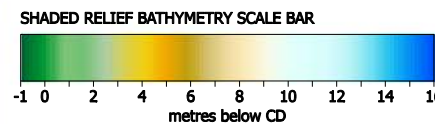


PLAN VIEW & TURBINE DETAIL



LEGEND PLAN VIEW:

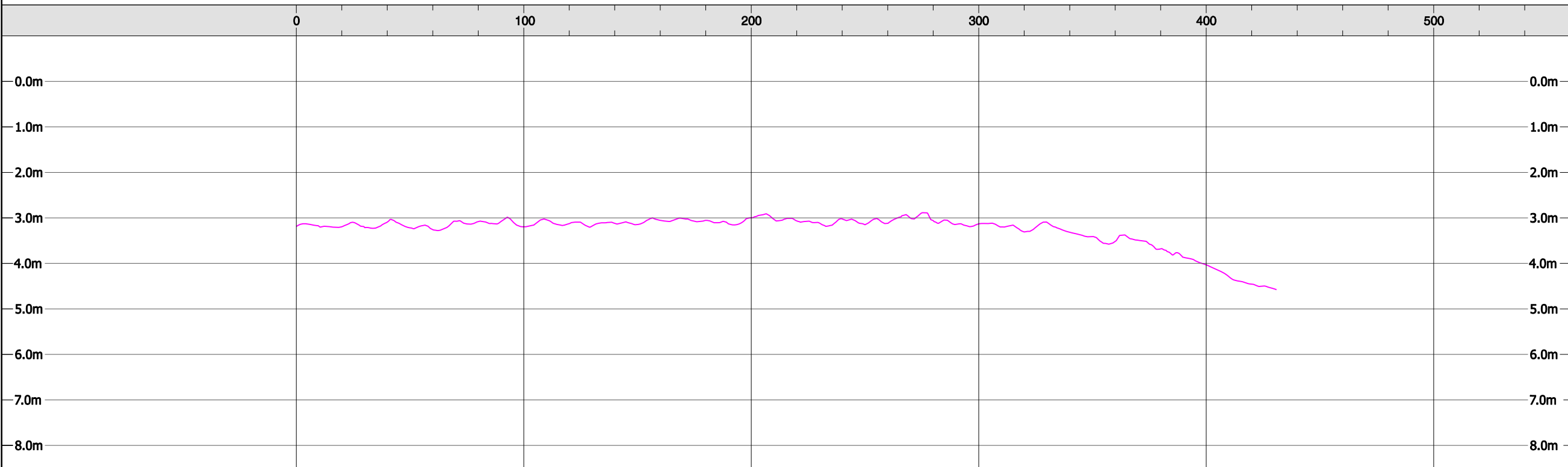
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



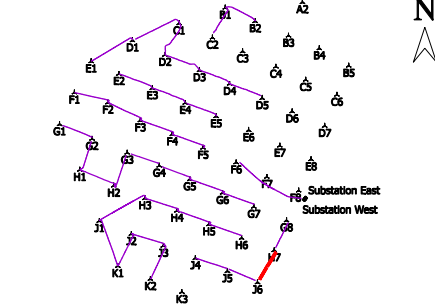
LEGEND PROFILE:

- 100 Chainage in metres
- 2009 seabed profile below CD

PROFILE

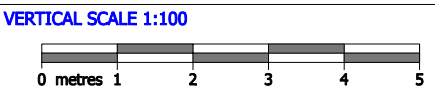
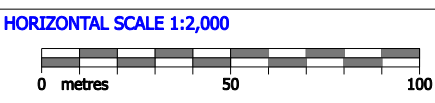


LOCATION MAP



GEODETTIC NOTES:

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996



CLIENT:



ENGINEERING DETAIL

CONTRACTOR:



CONTRACT TITLE:

ROBIN RIGG OFFSHORE WIND FARM  
 MID-CONSTRUCTION GEOPHYSICAL SURVEY

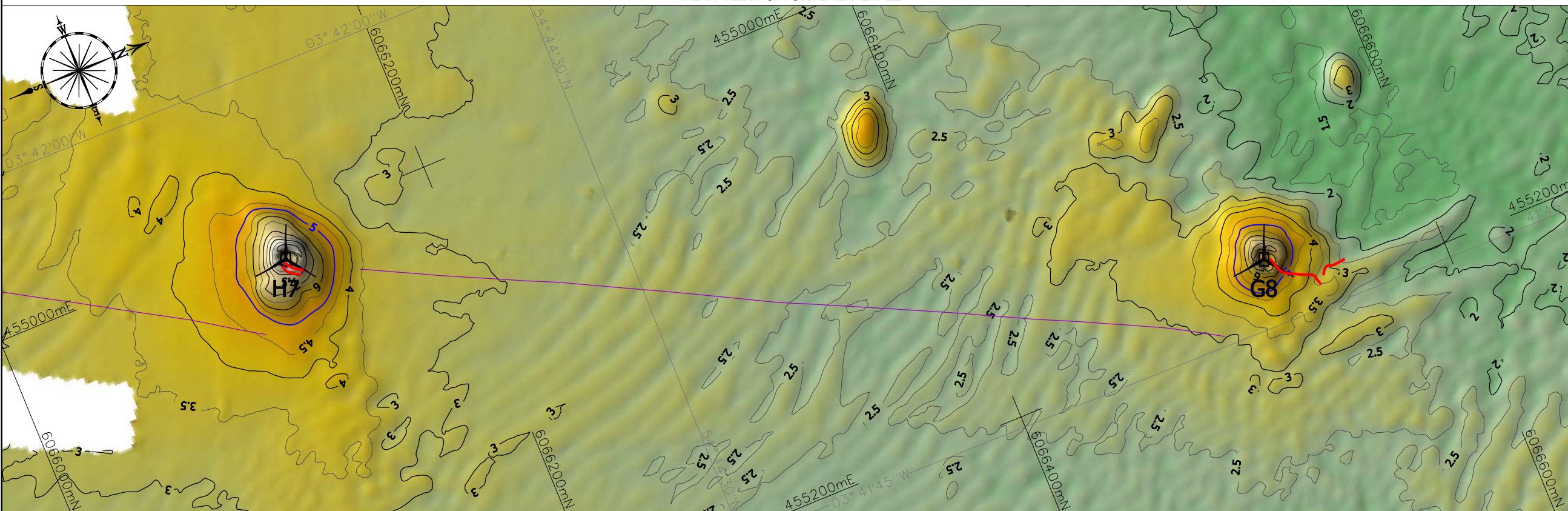
CHART TITLE:

Cable Profile J6 to H7

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

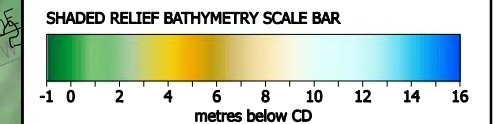
CHART SCALE AT A3:	CHART NUMBER:	REVISION:
1:2,000	C9023b-35	1

**PLAN VIEW & TURBINE DETAIL**



**LEGEND PLAN VIEW:**

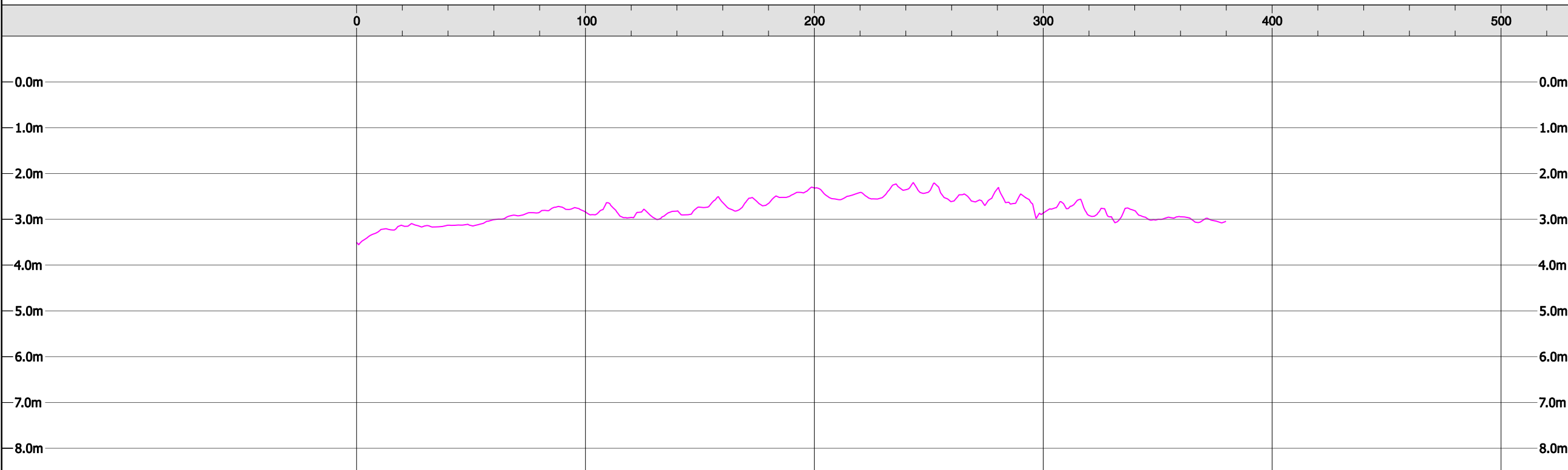
- Wind turbine location, with identifier
- As-laid cable routes, supplied by client
- Cable exposed - Osiris 2009 survey
- Major contours at 5m intervals below CD
- Minor contours at 1m intervals below CD
- Minor contours at 0.5m intervals below CD



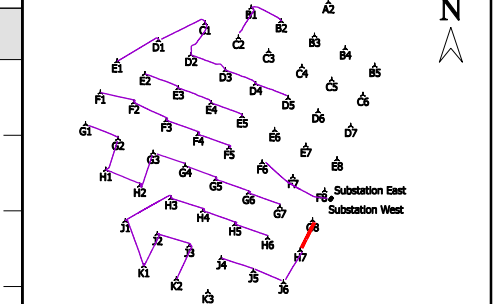
**LEGEND PROFILE:**

- 100 Chainage in metres
- 2009 seabed profile below CD

**PROFILE**



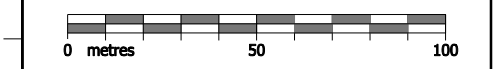
**LOCATION MAP**



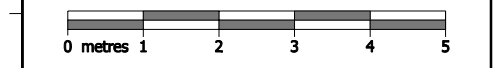
**GEODETTIC NOTES:**

Projection : UTM, Zone 30  
 Ellipsoid : WGS '84  
 Geodetic Datum : WGS '84  
 Latitude of Origin : 0° North  
 Longitude of Origin : 3° West  
 False Easting : 500000 metres  
 False Northing : 0 metres  
 Scale Factor : 0.9996

**HORIZONTAL SCALE 1:2,000**



**VERTICAL SCALE 1:100**



**CLIENT:**



**ENGINEERING DETAIL**

**CONTRACTOR:**



**CONTRACT TITLE:**

**ROBIN RIGG OFFSHORE WIND FARM  
MID-CONSTRUCTION GEOPHYSICAL SURVEY**

**CHART TITLE:**

**Cable Profile H7 to G8**

2					
1	22/10/09	Final	HS	CB	JW
0	23/09/09	Draft	HS	HF	JW
REV.:	DATE:	DESCRIPTION:	DRAWN:	CHECKED:	APPROVED:

<b>CHART SCALE AT A3:</b>	<b>CHART NUMBER:</b>	<b>REVISION:</b>
1:2,000	C9023b-36	1

## **APPENDIX 2**

### **EXPOSURE LISTINGS**



## EXPOSURE LISTINGS

Inter-Array Cable	Event	Eastings	Northings
B1 - C2	Start	454202.1	6068945.7
B1 - C2	End	454199.6	6068947.6
B1 - C2	Start	454196.3	6068948.5
B1 - C2	End	454191.2	6068953.1
B1 - C2	Start	454198.8	6068968.9
B1 - C2	End	454200.4	6068981.2
B1 - C2	Start	454206.5	6068999.9
B1 - C2	End	454211.2	6069007.6
B1 - C2	Start	454222.4	6069019.3
B1 - C2	End	454218.1	6069015.6
B1 - C2	Start	454236.7	6069035.5
B1 - C2	End	454231.4	6069030.5
B1 - C2	Start	454243.5	6069042.2
B1 - C2	End	454240.9	6069039.4
B1 - C2	Start	454253.2	6069071.4
B1 - C2	End	454254.5	6069074.1
B1 - C2	Start	454257.7	6069081.5
B1 - C2	End	454263.0	6069090.4
B1 - C2	Start	454265.4	6069094.4
B1 - C2	End	454265.8	6069096.5
B1 - C2	Start	454281.5	6069121.8
B1 - C2	End	454285.9	6069127.5
B1 - C2	Start	454288.5	6069134.1
B1 - C2	End	454296.1	6069144.1
B1 - C2	Start	454299.7	6069150.9
B1 - C2	End	454304.5	6069156.6
B1 - C2	Start	454315.2	6069171.0
B1 - C2	End	454324.4	6069184.0
B1 - C2	Start	454326.2	6069188.5
B1 - C2	End	454331.2	6069197.1
B1 - C2	Start	454336.7	6069205.9
B1 - C2	End	454334.5	6069200.6
B1 - C2	Start	454339.0	6069210.2
B1 - C2	End	454347.8	6069224.2
B1 - C2	Start	454359.8	6069249.3
B1 - C2	End	454376.5	6069266.0
B1 - C2	Start	454391.1	6069316.4
B1 - C2	End	454370.9	6069333.1
B2 - B1	Start	454386.1	6069345.4
B2 - B1	End	454382.2	6069341.7
B2 - B1	Start	454762.2	6069169.3
B2 - B1	End	454759.8	6069182.1
C1 - D1	Start	453146.9	6068907.5
C1 - D1	End	453138.6	6068904.7
C1 - D2	Start	453760.7	6069124.5
C1 - D2	End	453756.0	6069128.8
D2 - D3	Start	453605.2	6068716.7
D2 - D3	End	453575.5	6068711.8
D2 - D3	Start	453574.5	6068713.1

Inter-Array Cable	Event	Eastings	Northings
D2 - D3	End	453571.6	6068715.0
D2 - D3	Start	454023.7	6068511.0
D2 - D3	End	454017.8	6068514.5
D3 - D4	Start	454044.4	6068502.9
D3 - D4	End	454032.5	6068509.1
D3 - D4	Start	454427.6	6068354.3
D3 - D4	End	454425.0	6068345.2
D4 - D5	Start	454454.6	6068326.2
D4 - D5	End	454434.8	6068329.2
E1 - D1	Start	452662.3	6068671.8
E1 - D1	End	452627.0	6068648.2
E1 - D1	Start	452620.5	6068640.8
E1 - D1	End	452597.2	6068631.7
E1 - E2	Start	452948.5	6068465.5
E1 - E2	End	452929.6	6068463.4
E2 - E3	Start	453147.4	6068390.4
E2 - E3	End	453141.7	6068392.9
E2 - E3	Start	453110.0	6068406.9
E2 - E3	End	453098.7	6068412.4
E2 - E3	Start	453081.0	6068416.3
E2 - E3	End	453076.9	6068417.4
E2 - E3	Start	453024.0	6068431.1
E2 - E3	End	452960.2	6068460.8
E3 - E4	Start	453839.3	6068083.4
E3 - E4	End	453835.4	6068088.4
E4 - E5	Start	453857.5	6068069.9
E4 - E5	End	453853.6	6068071.7
E4 - E5	Start	453850.3	6068072.5
E4 - E5	End	453844.5	6068076.1
F1 - F2	Start	452384.1	6068211.6
F1 - F2	End	452369.7	6068214.1
F1 - F2	Start	452829.1	6068102.6
F1 - F2	End	452815.5	6068092.7
F2 - F3	Start	453261.6	6067869.5
F2 - F3	End	453254.8	6067854.9
F3 - F4	Start	453250.9	6067846.9
F3 - F4	End	453259.5	6067842.7
F4 - F5	Start	454091.9	6067504.1
F4 - F5	End	454070.2	6067483.4
F6 - SSW	Start	454540.7	6067310.6
F6 - SSW	End	454517.3	6067292.1
G2 - G1	Start	452603.9	6067602.3
G2 - G1	End	452624.0	6067613.9
G2 - G1	Start	452183.2	6067793.0
G2 - G1	End	452176.4	6067794.0
G3 - G4	Start	453506.5	6067260.5
G3 - G4	End	453500.8	6067248.3
G3 - G4	Start	453077.9	6067414.7
G3 - G4	End	453074.0	6067417.5
G5 - G4	Start	453908.2	6067077.8
G5 - G4	End	453904.2	6067075.6

Inter-Array Cable	Event	Eastings	Northings
G5 - G4	Start	453489.3	6067237.5
G5 - G4	End	453490.6	6067244.8
G6 - G5	Start	454345.6	6066908.6
G6 - G5	End	454338.6	6066896.3
G7 - G6	Start	454744.0	6066708.3
G7 - G6	End	454751.0	6066714.2
H1 - G2	Start	452600.4	6067584.4
H1 - G2	End	452603.1	6067598.2
H1 - G2	Start	452442.4	6067193.6
H1 - G2	End	452461.1	6067205.9
H1 - H2	Start	452448.1	6067189.8
H1 - H2	End	452442.6	6067191.3
H3 - H4	Start	453319.0	6066828.2
H3 - H4	End	453306.0	6066820.8
H3 - H4	Start	453750.0	6066676.1
H3 - H4	End	453726.8	6066652.7
H4 - H5	Start	453766.5	6066646.5
H4 - H5	End	453757.0	6066648.6
H4 - H5	Start	453748.4	6066652.1
H4 - H5	End	453730.7	6066651.9
H4 - H5	Start	454175.9	6066499.6
H4 - H5	End	454164.8	6066485.2
H5 - H6	Start	454170.1	6066467.5
H5 - H6	End	454157.2	6066472.3
H5 - H6	Start	454619.6	6066295.1
H5 - H6	End	454615.1	6066295.7
H5 - H6	Start	454610.4	6066296.3
H5 - H6	End	454580.6	6066288.9
H7 - G8	Start	455021.7	6066134.4
H7 - G8	End	455015.5	6066127.8
H3 - J1	Start	453306.3	6066829.4
H3 - J1	End	453303.6	6066821.4
J1 - K1	Start	452733.2	6066533.2
J1 - K1	End	452709.8	6066521.9
J3 - J2	Start	453562.4	6066200.1
J3 - J2	End	453567.5	6066211.6
J3 - J2	Start	453164.3	6066333.4
J3 - J2	End	453144.1	6066346.7
J4 - J5	Start	454015.0	6066015.3
J4 - J5	End	454010.5	6066017.2
J4 - J5	Start	454006.2	6066018.4
J4 - J5	End	453985.8	6066024.2
J5 - J6	Start	454418.3	6065852.8
J5 - J6	End	454415.3	6065853.6
J6 - H7	Start	454795.8	6065703.2
J6 - H7	End	454806.0	6065704.5
J6 - H7	Start	455023.2	6066132.7
J6 - H7	End	455016.4	6066126.5
K1 - J2	Start	452958.5	6065933.4
K1 - J2	End	452967.1	6065953.8
K2 - J3	Start	453382.0	6065753.7



<b>Inter-Array Cable</b>	<b>Event</b>	<b>Eastings</b>	<b>Northings</b>
K2 - J3	End	453386.5	6065760.4
K2 - J3	Start	453388.5	6065764.5
K2 - J3	End	453398.2	6065778.6