Base Load Power Hub (BLPH)

OIM V3 - ROV Survey Deliverables

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HLV Rambiz Crosswind

ROV Work Procedure

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REVISION LOG SHEET	
Revision	**Description of updated/modified sections**
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1.0 DEFINITIONS AND ABBREVIATIONS

Definition or abbreviation	Meaning
BSO or Bluestream	Bluestream Offshore B.V.
BLPH	Baseload Power Hub
Client or Scaldis or SSMC HLV Rambiz	Scaldis Salvage and Marine Contractors N.V.
CM	Central Meridian
COSHH	Control Of Substances Hazardous to Health
ETRS89	Europees Terrestrisch Referentiesysteem 1989
GVI	General Visual Inspection
HIRA	Hazard Identification Risk Assessment
HLV	Heavy Lift Vessel
HPU	Hydraulic Power Unit
HSE	Health, Safety and Environment
IMCA	International Marine Contractors Association
LARS	Launch and Recovery System
o/b	On board
OOW	Officer on the Watch
PPE	Personal protective equipment
PTW	Permit to work
QHSE	Quality, Health, Safety and Environment
ROV	Remotely Operated Vehicle
SOW	Scope of Work
TBC	To Be Confirmed
TBT	Toolbox talk
USBL	Ultra-Short Base Line
UTM	Universal Transverse Mercator

2.0 REFERENCE DOCUMENTS

ROV operations shall be carried out in line with the following documents:

Document name	Document number
HSE Manual	A-QHSE-MAN-0001
Control of Substances Hazardous to Health	A-QHSE-PRC-3102
ROV Operations Manual	B-ROV-MAN-001
Emergency recovery procedure	B-ROV-PRC-016
Load test Procedure Hydraulic LAR Crane – Tiger FF	B-ROV-PRC-029
Project Document and Drawing Register	P24-157-PRJ-REG-001
Project HIRA	P24-157-QHSE-REG-001
Mobilisation plan HLV Rambiz	P24-157-PRJ-PLN-001
Infield Report	G-INS-RPT-001
Infield Anomaly Report	G-INS-RPT-002
As found As left report	G-INS-FRM-014
Seabed clearance survey report	B-PRJ-FRM-012
ROV Dive log	B-PRJ-FRM-010

Client provided reference documents:

Document name	Document number
Project Execution Plan	23-RE006-MST-001

3.0 INTRODUCTION

Scaldis will perform the installation of the transition piece and topside on an existing monopile, at Hollandse Kust Noord windfarm in August 2025. Bluestream will provide ROV assistance during the project.

This procedure describes the activities of a Seaeye Tiger Free Flying ROV system including two generators o/b the HLV Rambiz.

Location details	BLPH
Eastings	590718.95
Northings	5841602.42
Approx. water depth	20.5 - 22.2m
Coordinate projection is according to UTM zone 31, ETRS89.	

See ***Appendix 2*** for more location details.



Figure 3-1: HLV Rambiz.

4.0 SCOPE OF DOCUMENT

In assistance of the installation works, Bluestream has been requested by Scaldis to perform ROV operations.

The SOW at the monopile by the ROV will consist of the following but is not limited to:

ROV SOW	Chapter
As-Found survey	4.1
As-Left/Out survey	4.2

See ***Appendix 1*** for As-build drawings.

4.1 As-Found survey

not part of PeP and not included in Offshore program. RM considers ROV support during the buoy positioning part of the mooring operation (infield cable crossing)

The ROV shall con
sonar and video. T
footprint. All debris and/or anomalies found that may interfere with the operations must be reported to the client representative on board.

During the As-Found survey special care should be given to any potential hazards for the ROV or its tether. For more details, see the step-by-step procedure for the As-Found survey in ***section 11.1***.

4.2 As-Left survey

please explain better:
25m radius?
how the grid will be?

The ROV will finalize the As-Left survey after the HLV has installed the transition p
top side. The primary option is to inspect the seabed using a grid pattern. In case c
the inspection can be concluded making use of the multibeam imaging sonar by scanning the required seabed from overlapping scanning locations.

A perimeter of 25 m around the As-Left monopile structure footprint will be surveyed prior to the vessel leaving the area. Any anomalies found will be reported to the Scaldis client representative. Further details can be found in the step-by-step procedure for the As-Left survey in ***section 11.2***.

5.0 HEALTH, SAFETY AND ENVIRONMENT

All hazards identified in the HIRA have been addressed within the step-by-step procedures.

All operations will be executed taking into account following rules/procedures:

- All hoisting equipment and certification to be checked before start of operations;
- Use of correct PPE;
- Potential contact with hazardous substances, consult COSHH procedure;
- All concerned are to be aware of HLV subsea assets e.g. and beacons;
- Possible poor visibility;
- Tether management;
- Down-line/messenger-line and hose management.

For all safety considerations, reference is made to *the* HIRA document, *P24-157-QHSE-REG-001*.

6.0 RESPONSIBILITY AND AUTHORITY

The ROV supervisor is responsible to ensure that the requirements of this work instruction are implemented and maintained.

To perform the SOW all necessary permits and isolations are as follows:

Permit	Reasons required	Person responsible
Permit to Dive	ROV operations	ROV supervisor / HLV OOW
Permit to Work in 500m Zone	ROV operations	Delegate and client Rep

7.0 ROV EQUIPMENT

The Tiger Free Flying ROV system consists of (1) unit:

- Control container incl. LARS and ROV;

The spread will be mobilized with two generators, one acting as a spare.

7.1 Unit specifications

7.1.1 Tiger Free Flying ROV system c/w LARS

BSRU-009 ROV control unit (15ft)	
Dimensions (L x B x H)	4.57 x 2.44 x 2.74 m
Gross weight	8,000 kg
Power requirements	400/440VAC, 63A (minimum), 50/60 Hz

Generator set - (2x) generators	
Dimensions (L x B x H)	3.00m x 2.40m x 2.20m
Gross weight	5,270 kg

7.2 ROV details

7.2.1 Seaeye Tiger Free Fly configuration

The Tiger Free Flying ROV system is specifically designed for rig support operations. The system is gravity based, so no welding/securing required for deployment of the ROV, ensuring minimal mobilisation times, the system is plug and play.

With the control cabin, umbilical winch, ROV and Launch and Recovery system all integrated in a single 15ft. offshore container, the system requires a minimum deck space. This is advantageous especially on offshore installations with tight deck space conditions.

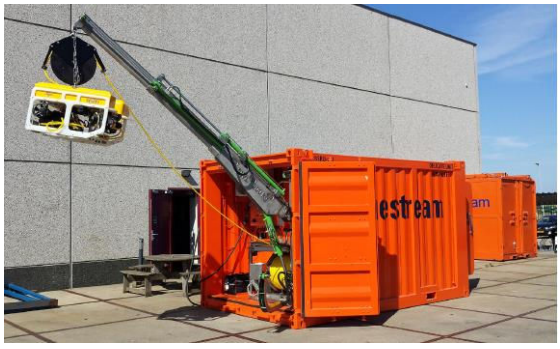


Figure 7-1 Tiger Free Fly ROV

The ROV deployment crane has a 3.5 meter outreach from the container. The Tiger ROV will come standard with Standard Definition Cameras and obstacle sonar for imaging in poor visibility.

7.2.2 ROV workability and tether lengths

The following operational information regarding workability and tether length is applicable to the ROV systems. Below limitations should be taken into account with planning of the offshore works in relation to operational windows of the ROV, limitations are for both launch and recovery of the ROV.

ROV system	Max sea state Hs	Max current	Wind speed	Tether length
Free flying ROV	1.5m Hs	1.0 knots (depending SOW)	20 knots	120m
The above figures are just for indication and are not to be seen as firm/hard figures. The ROV supervisor will always assess environmental conditions onsite if it is safe to launch and operate the ROV. If manipulative tasks need to be performed the current handling of the vehicle will decrease.				

8.0 ROV PERSONNEL

The following personnel will be required on board the vessel for **12-hour** coverage with one operational ROV at the time:

- 1 x ROV supervisor;
- 1 x ROV pilot/technician.

9.0 PROCEDURE EQUIPMENT & CONSUMABLES LIST

9.1 Equipment and consumables required for this procedure, provided by Bluestream

Equipment list		
Item	Description	Quantity
1.	Seaeye Tiger Free Flying	1
2.	Multibeam imaging sonar	1
3.	4-function manipulator	1
4.	Depth sensor	1

9.2 Critical equipment

For some equipment and parts, the choice of suppliers is limited, or their delivery is critical for the performance level of the projects. These are therewith appointed as critical suppliers, based on their risk level (based on the corporate risk matrix) and its equipment as critical equipment.

As part of the project planning, during the HIRA the project team will draw up a list of critical equipment/suppliers (if applicable) which might bring forward the need to source new suppliers and/or have extra spares available.

Sufficient spares will be available at the worksite to solve most common problems. Equipment is designed, built, tested and maintained to legal requirements and current IMCA standards. Valid certification for the equipment package will be made available.

10.0 DELIVERABLES

Table below specifies deliverables produced per SOW. Further details should be agreed upon the SOW execution.

ROV SOW	Deliverables	Originator	Approver
As-Found survey	Video recording/clip; *Seabed clearance survey report, B-PRJ-FRM-012;* ***Appendix 2***; *Infield report, G-INS-RPT-001;* *Infield anomaly report, G-INS-RPT-002.*		
As-Left survey	Video recording/clip; *Seabed clearance survey report, B-PRJ-FRM-012;* ***Appendix 2***; *ROV Dive log, B-PRJ-FRM-010;* *Infield report, G-INS-RPT-001*; *Infield anomaly report, G-INS-RPT-002*; *Resource document, P24-157-PRJ-RPT-001-01*; Data sheets of equipment, used for visualisation and navigation.		

10.1 As-Left survey reporting requirements

The content of the As-Left survey deliverables will include a plan view showing the monopile footprint plus 25m area location with gridlines, water depth, the survey routes, location of remaining debris and/or abnormalities on the seabed, record of work performed, record of equipment used, and other relevant information to demonstrate the seabed cleaning & survey scope is completed and accepted by the client representative. Reference is made to **Appendix 2**, Report sheets.

The reporting documentation used for the As-Left survey deliverables can be found in **Appendix 2**.

11.0 STEP-BY-STEP PROCEDURE

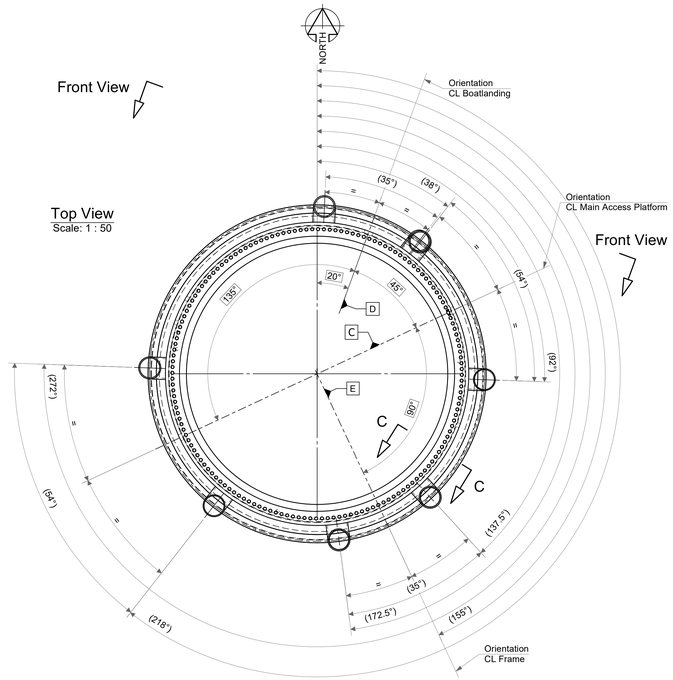
11.1 Task plan A: Vessel set-up and As-Found survey

Task no.	VESSEL SET-UP AND AS-FOUND SURVEY Task description		Date
A 1. HOLD POINT	Task plan(s) and HIRA reviewed and understood by offshore personnel? Task plans(s) and HIRA align with conditions on site? PTW in place? TBT completed? **Only when all above are answered with a 'Yes' operations are allowed to commence.**	Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐	
	Name and signature ROV supervisor:	Date:	
A 2. SAFETY FLASH	All communications during the operations between client, deck crew, HLV crew and ROV crew are through the ROV supervisor and will have been set-up and tested prior start of operations. **Work will be suspended and/or ROV will be recovered to surface if communications fail.**		
A 3. SAFETY FLASH	Ensure good tether management, preventing entanglement or entrapment.		
A 4.	HLV Rambiz to set up at the monopile as per Scaldis preferences/specifications. Eastings: 590718.95 Northings: 5841602.42 Coordinate projection is according to UTM zone 31, ETRS89. Water depth is approx.: 20.5 - 22.2m.		
A 5.	ROV to conduct an As-Found survey in a perimeter of 25m around the monopile structure, to identify any debris, hazards and other anomalies that may interfere the operations. Any debris hampering the ROV operations, will be removed or repositioned from the work area within the capabilities of the ROV. The reporting template used can be in accordance with **B-PRJ-FRM-012** Seabed Clearance Report **Survey will be recorded, logged and reported for future reference.**		
END OF TASK PLAN A			

11.2 Task plan B: As-Left survey

Task no.	VESSEL SET-UP AND AS-LEFT SURVEY Task description		Date
B.1. HOLD POINT	Task plan(s) and HIRA reviewed and understood by offshore personnel? Task plans(s) and HIRA align with conditions on site? PTW in place? TBT completed? **Only when all above are answered with a 'Yes' operations are allowed to commence.**	Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐	
	Name and signature ROV supervisor:	Date:	
B.2. SAFETY FLASH	All communications during the operations between client, deck crew, HLV crew and ROV crew are through the ROV supervisor and will have been set-up and tested prior start of operations. **Work will be suspended and/or ROV will be recovered to surface if communications fail.**		
B.3. SAFETY FLASH	Ensure good tether management, preventing entanglement or entrapment.		
B.4.	After the HLV Rambiz has installed the transition piece and topside, perform an As-Left survey over the installation footprint. Survey to project a suitable grid on the nav screen with a favourable heading towards the current.		
B.5.	A perimeter of 25m around the monopile structure footprint will be surveyed prior to the vessel leaving the area. Any debris dropped objects found during the As-Left survey are to be reported to the client representative and removed if possible.		
B.6.	The reporting template used can be in accordance with ***B-PRJ-FRM-012*** *Seabed Clearance Report*. Reference is made to **Appendix 2**. **Survey will be recorded, logged, and reported for future reference.**		
END OF TASK PLAN B			

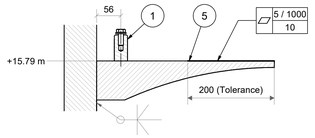
APPENDIX 1 AS BUILT SHEETS



NO	QTY	PART NUMBER	DESCRIPTION	MATERIAL	MASS
1	8	144671-VOOW-TF-ENG-DWG-1911	Earthing Stud M12		0 kg
2	1	144671-VOOW-TF-ENG-DWG-1110	MP Top Flange	Special Steel	8846 kg
3	6	144671-VOOW-TF-ENG-DWG-1113	Main Access Platform Supports	Primary Steel	228 kg
4	8	144671-VOOW-TF-ENG-DWG-1112	Boatlanding Supports	Primary Steel	258 kg
5	1	144671-VOOW-TF-ENG-DWG-1111	Hang-off Platform Support Ring	Primary Steel	3153 kg
6	1	144671-00891	Monopile Cans	Primary & Special Steel	894071 kg

Section C-C: Hang-off Platform Support Ring - (Typ.)

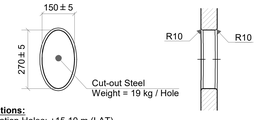
Scale: 1 : 5



Orientations:
Earthing Studs: 2°, 47°, 64°, 66°, 122°, 167°, 242°, 287° From North

Detail 1: Upper Ventilation Hole (4x) - (Typ.)

Scale: 1:10

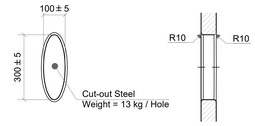


Elevations:
Ventilation Holes: +15.10 m (LAT)

Orientations:
Ventilation Holes: 65°±1.5°, 155°±1.5°, 245°±1.5°, 300°±1.5° From North

Detail 2: Lower Ventilation Hole (2x) - (Typ.)

Scale: 1:10

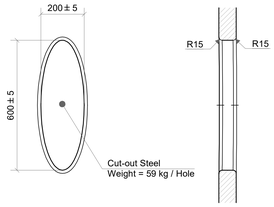


Elevations:
Ventilation Holes: +4.40 m (LAT)

Orientations:
Ventilation Holes: 110°±1.5°, 290°±1.5° From North

Detail 3: Replenishment Hole - (1x) (Typ.)

Scale: 1:10

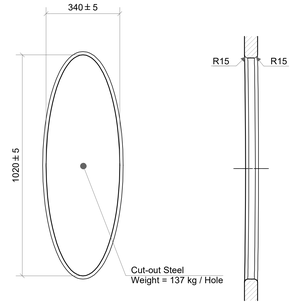


Elevations:
Replenishment Hole: -3.90 m (LAT)
(Tol.: ± 50 mm From Top of Flange, ± 5 mm From Circular Weld)

Orientations:
Replenishment Hole: 20°± 3° From North

Detail 4: Cable Entry Hole - (6x) (Typ.)

Scale: 1:10



Elevations:
Cable Entry Holes:
3x: Seabed HSBL2023 + 3.35 m
3x: Seabed HSBL2023 + 4.85 m
(Tol.: ± 50 mm From Top of Flange, ± 5 mm From Circular Weld)

Orientations:
Cable Entry Holes: 79°± 3°, 199°± 3°, 319°± 3° From North

NOTES

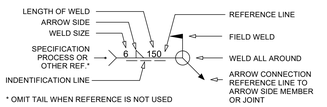
1. For general notes see 144671-VOOW-TF-ENG-DWG-1001
2. At the positions of welded attachments to a can section (e.g. platform supports) the can section material shall be ultrasonically tested for delaminations regardless of steel grade.
3. All attachments & holes shall be positioned at least 300 [mm] from longitudinal or circular welds, to be measured from weld toe to weld toe.
4. The location of longitudinal welds of the can sections shall be positioned at least 300 [mm] from the longitudinal welds of the adjacent can sections.
5. Thickness transitions between two cans shall be tapered 1:4 on the inside of the cans.
6. Holes shall be manufactured in accordance with DNVGL-RP-C203 category B2.
7. Circular can welds shall be manufactured in accordance with DNVGL-RP-C203 category D from Table A-5 (as welded) or C from Table A-5 (as grinded), as indicated on drawing (grinding is indicated with category C or with a welding grind symbol).
8. Longitudinal can welds shall be manufactured in accordance with DNVGL-RP-C203 category E from Table A-5 (as welded) or C from Table A-3 (as grinded), as indicated on drawing.
9. Flush grinding of welds shall be applied in the direction of stress = perpendicular to the weld.
10. All tolerances apply to the as welded as built structure in upright position. Dimensional verification in horizontal position is allowed. Effects of horizontal-to-vertical transfer shall be evaluated and incorporated in the production methodology by fabricator.
11. For attachments for Pile Driving Analysis equipment see: 144671-VOOW-TF-ENG-DWG-1116

5 Revision Mark

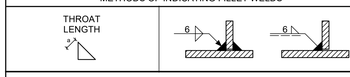
BASIC WELDING SYMBOLS ISO 2553

BASIC SYMBOLS			SUPPLEMENTARY SYMBOLS				
FILLET WELD	DOUBLE V	SINGLE V	BACKING WELD	BACKING STRIP	ALL AROUND	FIELD WELD	FLUSH
				M			

STANDARD LOCATION OF ELEMENTS OF A WELDING SYMBOL



METHODS OF INDICATING FILLET WELDS



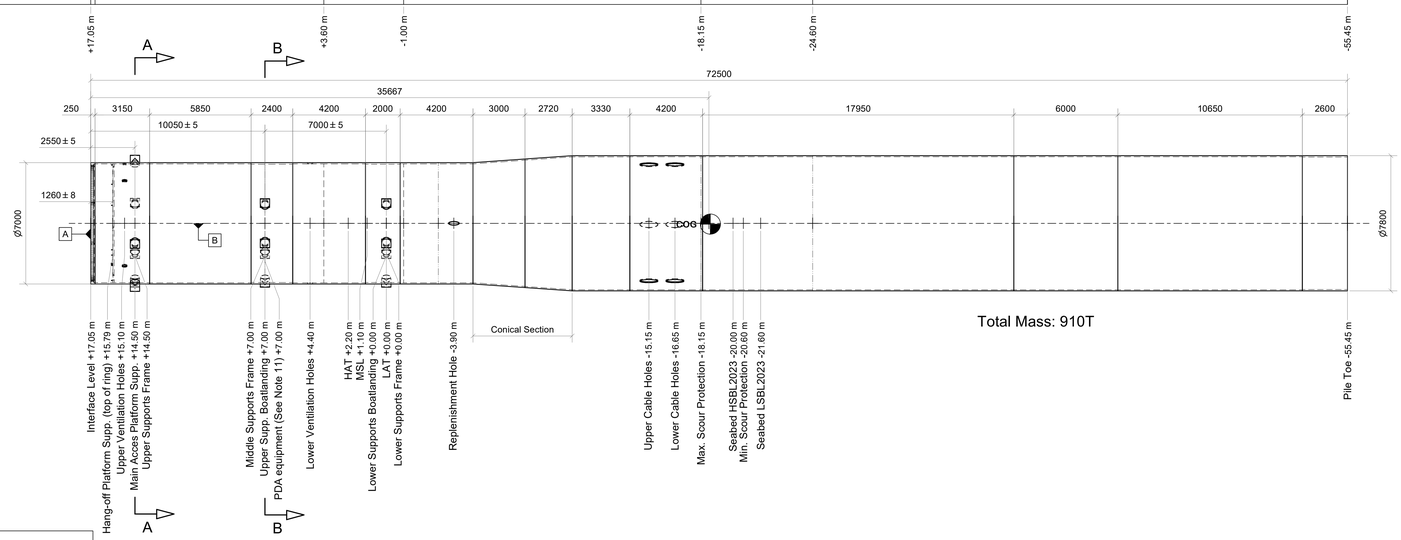
CIRCULAR WELD FLUSH GRINDING SYMBOLS

Flush Grinding Both Sides	Flush Grinding Inside	Flush Grinding Outside	No Flush Grinding
I/O	I/-	-/O	-/-

Flange Coating: TSZA-85/15
Min. 100µm Max. 200µm
Area: 21 [m²]

External Coating Zone	Atmospheric zone	Splash zone	Submerged zone	Top buried zone	Buried zone
Coating System	Norsok System 7a Rev6: 2x 300 µm Epoxy + 100 µm PU Topcoat RAL 1023	5 Norsok System 7a Rev6: 2x 375 µm Epoxy + 100 µm PU Topcoat RAL 1023	DNVGL-RP-B401 CAT II coating RAL 7035	Norsok System 7a Rev6: 2x 300 µm Epoxy RAL 7035	No Coating
Coating Area	220 [m²]	220 [m²]	357 [m²]	158 [m²]	756 [m²]

Internal Coating Zone	Atmospheric zone	Splash zone	Submerged zone	Top buried zone	Buried zone
Coating System	Norsok System 7a Rev6: 2x 300 µm Epoxy RAL 7035	Norsok System 7a Rev6: 2x 300 µm Epoxy RAL 7035	5 Norsok System 7b Rev6: 2x 250 µm Epoxy RAL 7035	Norsok System 7a Rev6: 2x 300 µm Epoxy RAL 7035	No Coating
Coating Area	295 [m²]	99 [m²]	394 [m²]	156 [m²]	744 [m²]

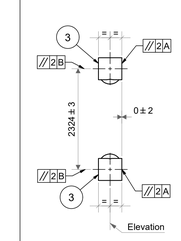


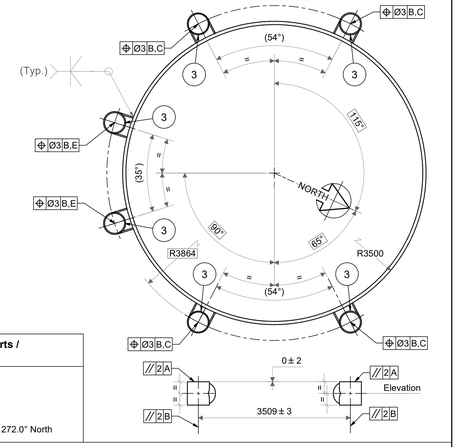
FLANGE: 250
S460 (Z35)

WALL THICKNESS	75	70	85	70	87	70	70	68	68	63	63	63	63	78
STEEL QUALITY	S420 (Z35)	S355	S355 (Z35)	S355	S355 (Z35)	S460							S355	
LONGITUDINAL WELDS (IN & OUT)	C	E												
CIRCULAR WELDS (IN & OUT)	D	D	D	D	D	D	D	D	D	D	C	D	D	D
WELDS TO BE GROUND FLUSH (IN/OUT)	I/O	-/-	-/-	-/-	-/-	-/-	-/-	-/-	5 -/-	-/-	5 I/-	I/O	-/-	-/-

A-A

Scale: 1:50





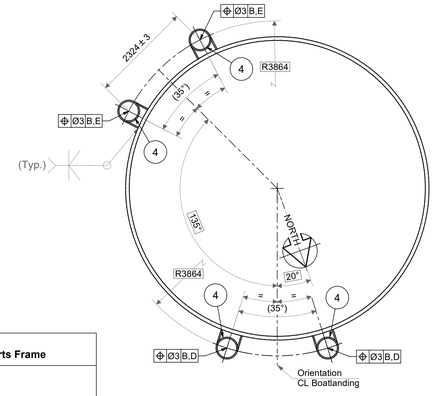
Main Access Platform Supports / Upper Supports Frame

Elevations:
6x: +14.50 m (LAT)

Orientations:
38.0°, 92.0°, 137.5°, 172.5°, 218.0°, 272.0° North

B-B

Scale: 1:50

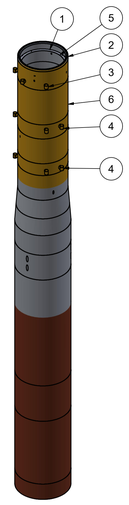


Boatlanding Supports / Middle and Lower Supports Frame

Elevations:
4x: +7.00m (LAT),
4x: +0.00 m (LAT)

Orientations:
2x: 2.5° North
2x: 37.5° North
2x: 137.5° North
2x: 172.5° North

Part Number: 144671-VOOW-TF-ENG-DWG-1190
Description: PRIMARY & SPECIAL STEEL, MONOPILE CW70 (BLPH)
Mass: 909507 kg



CLIENT: CROSSWIND

CONTRACTOR: Van Oord — Marine ingenuity

PROJECT: 144671 - HKNWFZ

Rev.	Date	Reason for Issue	Prepared	Checked	Approved	Client
5	19-05-2022	For Approval	D9D	YZP	FPN	
4	15-03-2022	For Approval	D9D	YZP	FPN	
3	11-02-2022	For Approval	D9D	YZP	FPN	
2	10-01-2022	For Approval	D9D	YZP	FPN	

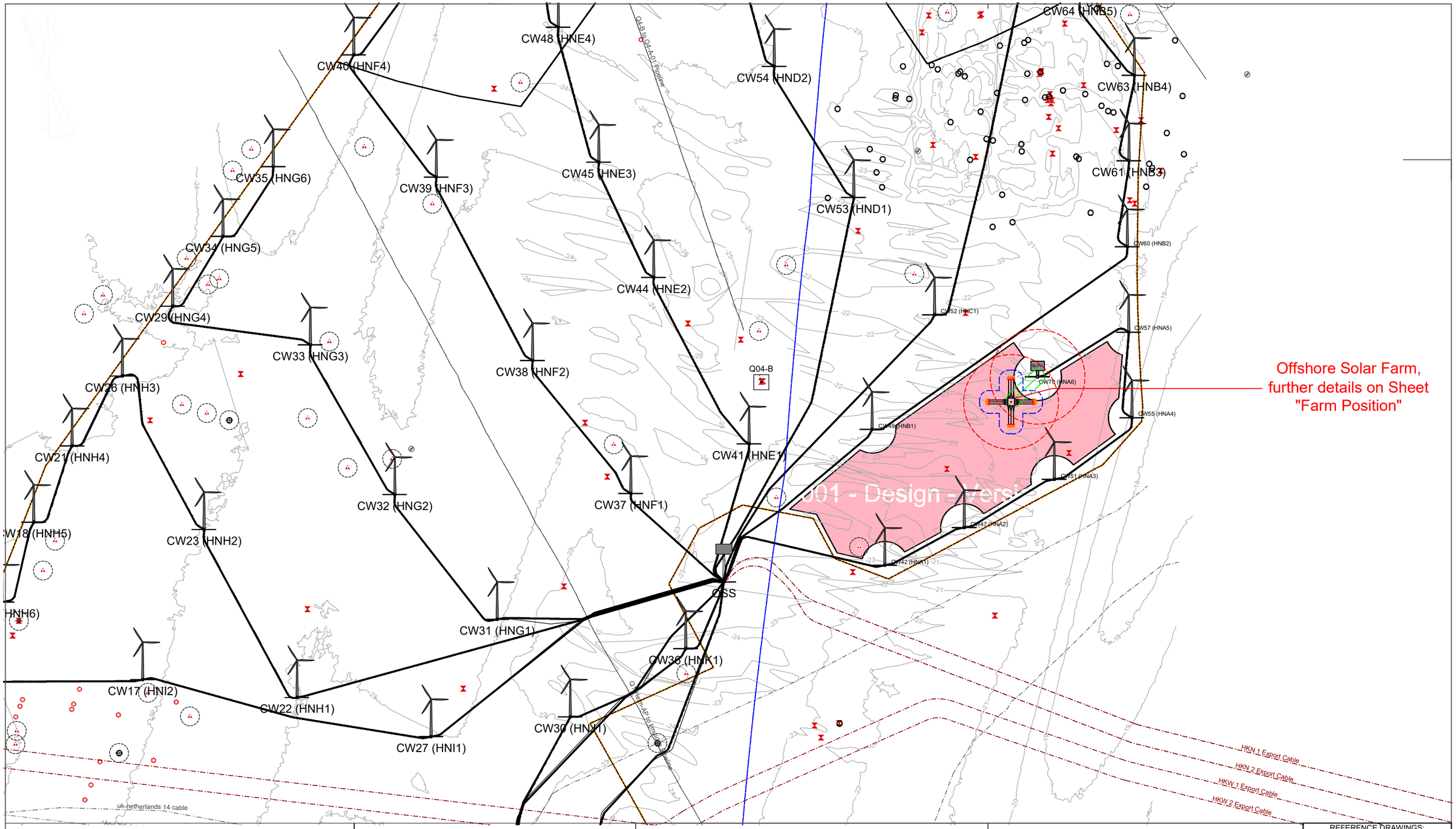
DRAWING TITLE: PRIMARY & SPECIAL STEEL, MONOPILE CW70 (BLPH)

Van Oord Project/Dwg. No.	144671-VOOW-TF-ENG-DWG-1190	Scale: 1:125	Size: A0
Client Dwg. No.		Sheet No.: 1 of 1	Cur. Rev.: 5

© Van Oord bv, 20-10-2020

D:\Working Folder\OW EEE\144501-145000\144671 - HKNWFZ\Drawings\1100 - Primary Structure Monopile\144671-VOOW-TF-ENG-DWG-1190.idw

APPENDIX 2 FIELD DETAILS



001 - Design - Versi

General Notes:

- Field layout with respect to wind farm and BLPH location
- For safety zones refer to Sheet 2
- For offshore floating solar farm position with respect to BLPH refer to Sheet 3
- For the anchor coordinates during installation refer to Sheet 4
- For the specific offshore solar farm layout refer to HKN1-01-DWG-310 Farm General Arrangement
- For the specific mooring layour refer to HKN1-03-DWG-311 Mooring Layout Drawing

Geodetic information:

Spheroid:	ETRS 1989
Projection:	Universal Transverse Mercator (UTM)
Zone:	31 North
Central Meridian (CM):	3° East
Latitude of origin:	0.0°
False Easting:	500000m
False Northing:	0m
Scale factor:	0.9996cm
Vertical datum :	Lowest Astronomical Tide (LAT)

Oceans of Energy

	DATE	NAME
DRAWN	25-03-2024	ADG
CHK'D	02-04-2024	MAA
APPV'D	02-04-2024	QVC

SCALE BAR: 0.0 500m 2000m

DRAWING NUMBER: HKN1-01-DWG-311

TITLE: Overview Location HKN1

SHEET: 1

REV. D

SIZE: A3

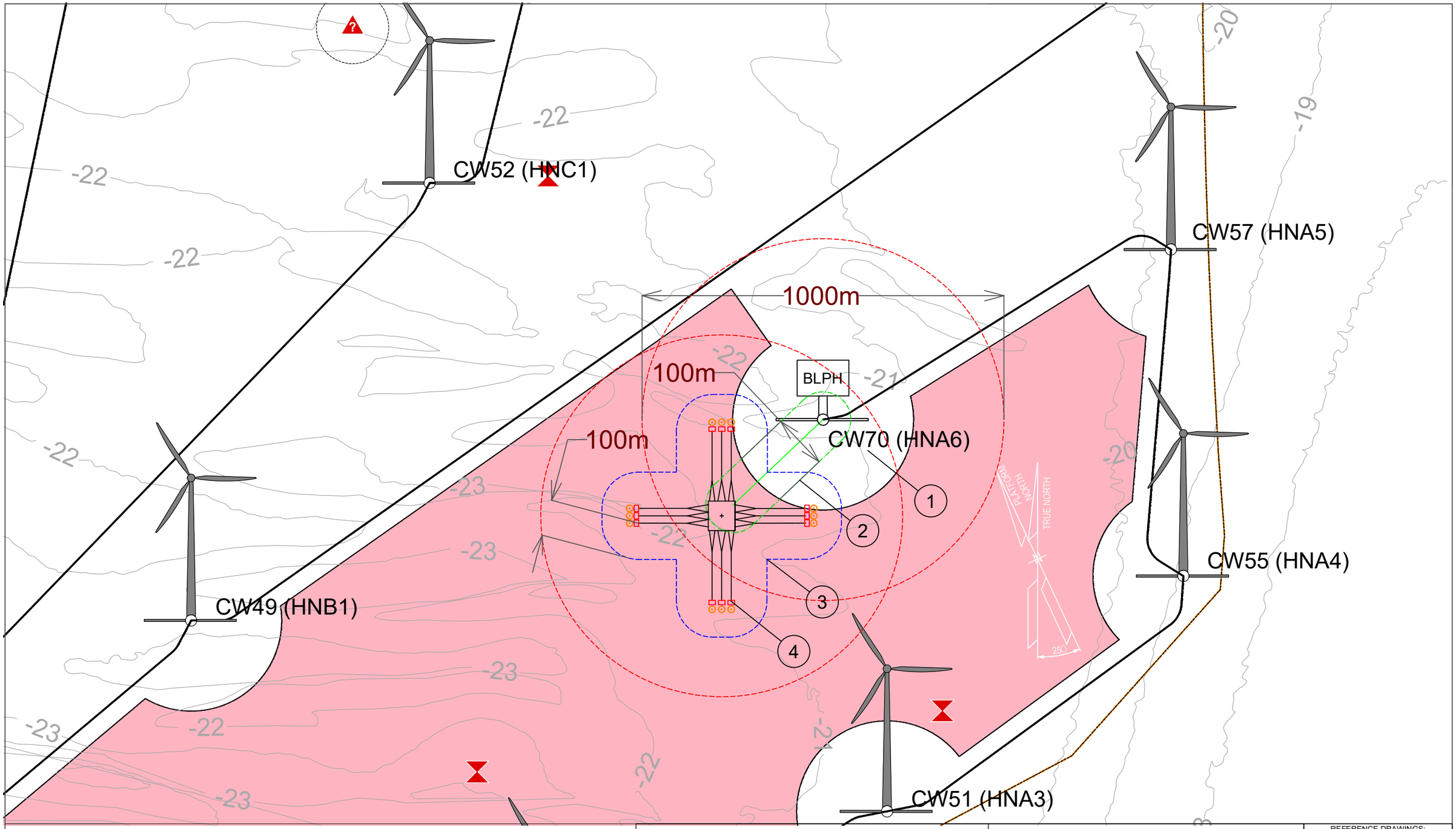
This drawing is our property; it can't be reproduced or communicated without our written agreement.

REFERENCE DRAWINGS:

DOCUMENT NUMBER	DOCUMENT DESCRIPTION
HKN1-03-DWG-311	MOORING LAYOUT DRAWING
HKN1-01-DWG-310	FARM GENERAL ARRANGEMENT
CWHKN-INN-BPH-DWG-00022	BLPH SAFETY ZONES INC. INSTALLATION AND SOLAR FARM

REVISION:

REV.	DATE	DESCRIPTION	DRWD	CHKD	APPR'D
D		Anchor points included with drop down positions for installation as of HKN1-03-DWG-311 Mooring Layout Drawing	ADG		
C	5/12/2023	CRS feedback, safety zones and cable routing updated	ADG	QVC	JBR
B	7/7/2023	Safety zones included	ASC	HLU / FJK	MVI
A	4/7/2023	Initial document	ASC	HLU / FJK	MVI



General Notes:

- WTG safety zone including inputs from CWHKN-INN-BPH-DWG-00022 (pink)
- BLPH & Offshore Solar Farm Safety zones of 500m in radius for AIS Systems included (dashed red)
- Exclusion zone for offshore solar farm including mooring with 100m offset from mooring lines positions (dashed blue)
- Site navigational marking not shown in this drawing, to be established based on Company and permit requirements
- Contractor to have access to all safety zones at all time, during offshore solar farm operational period

(1) Wind turbine safety zone (as provided by HKN wind farm)

(2) Power export cable safety zone (50m per side)

(3) Offshore solar farm safety zone (100m from anchors)

(4) Offshore solar farm anchors locations

Oceans of Energy

SCALE BAR: 0.0 100m 400m

	DATE	NAME
DRAWN	25-03-2024	ADG
CHK'D	02-04-2024	MAA
APPV'D	02-04-2024	QVC

DRAWING NUMBER: HKN1-01-DWG-311

TITLE: Safety Zones

SHEET: 2 REV. D

SIZE: A3

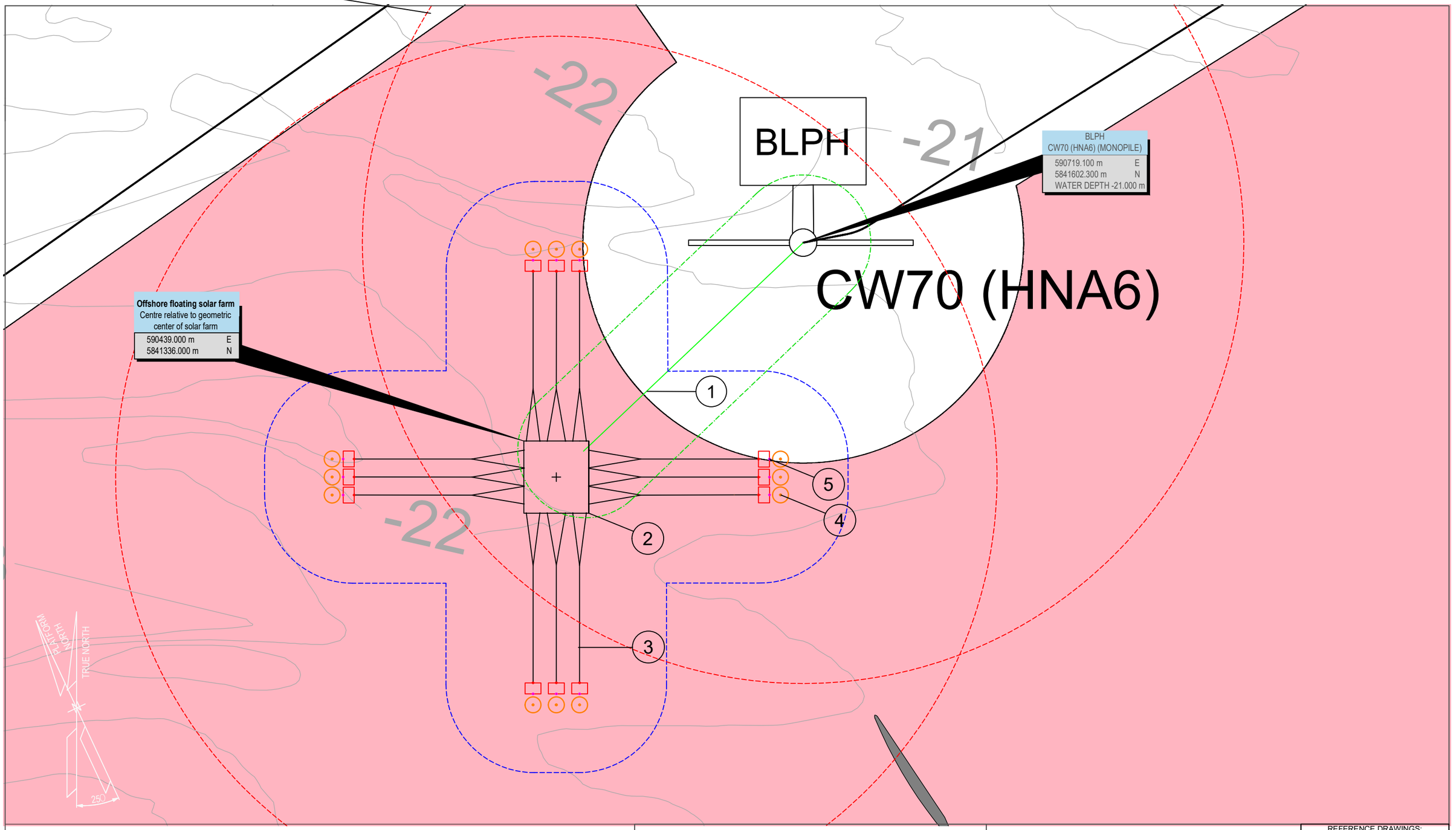
This drawing is our property; it can't be reproduced or communicated without our written agreement.

REFERENCE DRAWINGS:

DOCUMENT NUMBER	DOCUMENT DESCRIPTION
HKN1-03-DWG-311	MOORING LAYOUT DRAWING
HKN1-01-DWG-310	FARM GENERAL ARRANGEMENT
CWHKN-INN-BPH-DWG-00022	BLPH SAFETY ZONES INC. INSTALLATION AND SOLAR FARM

REVISION:

REV.	DATE	DESCRIPTION	DRW'D	CHK'D	APPR'D
D		Anchor points included with drop down positions for installation as of HKN1-03-DWG-311 Mooring Layout Drawing	ADG		
C	5/12/2023	CRS feedback, safety zones and cable routing updated	ADG	QVC	JBR
B	7/7/2023	Safety zones included	ASC	HLU / FJK	MVI
A	4/7/2023	Initial document	ASC	HLU / FJK	MVI



General Notes:

- Relative distance to BLPH: 385m
- Dashed lines refering to safety zones of solar farm (including mooring), power export cable and BLPH
- Anchor locations included in red including anchor tolerance

(1) Power export cable routing layout. For specifics on cable layout, bouyancy elements and touch down zones to refer to HKN1-04-DWG-354

(2) Farm layout as per HKN1-01-DWG-311 Farm General Arangement

(3) Mooring layout as per HKN1-03-DWG-311 Mooring Layout Drawing

(4) Anchor locations nominal drop-down position during installation

(5) Drag distance (minimum to maximum)

Oceans of Energy

	DATE	NAME
DRAWN	25-03-2024	ADG
CHK'D	02-04-2024	MAA
APPV'D	02-04-2024	QVC

SCALE BAR: 0.0 50m 200m

DRAWING NUMBER: HKN1-01-DWG-311

TITLE: Farm Position

SHEET: 3

REV. D

SIZE: A3

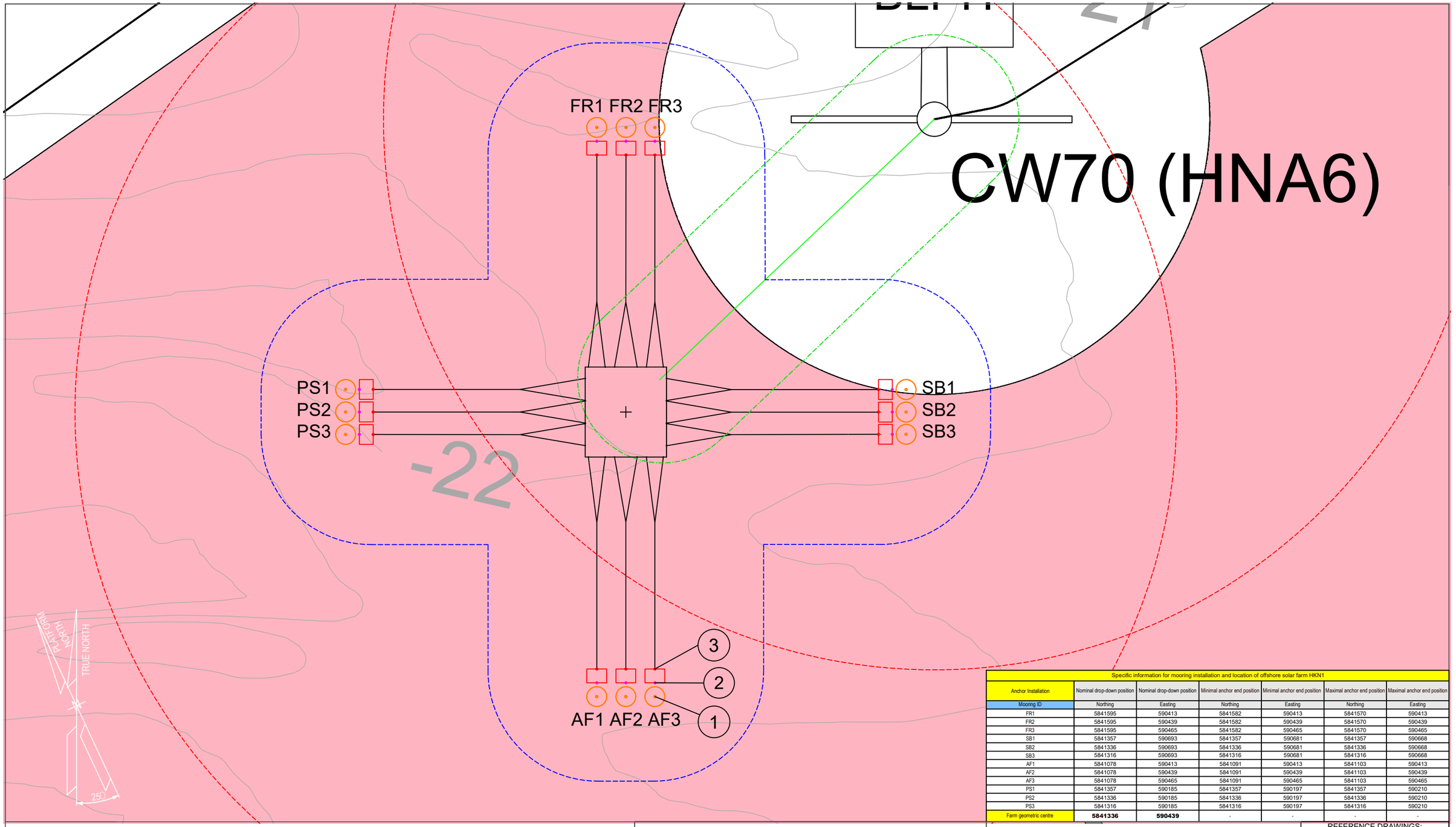
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REFERENCE DRAWINGS:

DOCUMENT NUMBER	DOCUMENT DESCRIPTION
HKN1-03-DWG-311	MOORING LAYOUT DRAWING
HKN1-01-DWG-310	FARM GENERAL ARRANGEMENT
CWHKN-INN-BPH-DWG-00022	BLPH SAFETY ZONES INC. INSTALLATION AND SOLAR FARM

REVISION:

REV.	DATE	DESCRIPTION	DRW'D	CHK'D	APPR'D
K					
J					
I					
H					
G					
F					
E					
D		Anchor points included with drop down positions for installation as of HKN1-03-DWG-311 Mooring Layout Drawing	ADG		
C	5/12/2023	CRS feedback, safety zones and cable routing updated	ADG	QVC	JBR
B	7/7/2023	Safety zones included	ASC	HLU / FJK	MVI
A	4/7/2023	Initial document	ASC	HLU / FJK	MVI



Specific information for mooring installation and location of offshore solar farm HKN1

Anchor Installation	Nominal drop-down position	Nominal drop-down position	Minimal anchor end position	Minimal anchor end position	Maximal anchor end position	Maximal anchor end position
Mooring ID	Northing	Easting	Northing	Easting	Northing	Easting
FR1	5841595	590413	5841582	590413	5841570	590413
FR2	5841595	590439	5841582	590439	5841570	590439
FR3	5841595	590465	5841582	590465	5841570	590465
SB1	5841357	590693	5841357	590681	5841357	590668
SB2	5841336	590693	5841336	590681	5841336	590668
SB3	5841316	590693	5841316	590681	5841316	590668
AF1	5841078	590413	5841091	590413	5841103	590413
AF2	5841078	590439	5841091	590439	5841103	590439
AF3	5841078	590465	5841091	590465	5841103	590465
PS1	5841357	590185	5841357	590197	5841357	590210
PS2	5841336	590185	5841336	590197	5841336	590210
PS3	5841316	590185	5841316	590197	5841316	590210
Farm geometric centre	**5841336**	**590439**	-	-	-	-

General Notes:

- Anchor positions, naming and coordinates included with reference to their nominal drop-down position during installation, maximal anchor end position and minimal anchor end position (coordinates rounded to the meter)
- For information on mooring system refer to HKN1-03-DWG-311 Mooring Layout Drawing

(1) Anchor nominal drop-down position

(2) Minimal anchor end position

(3) Maximal anchor end position

Oceans of Energy

	DATE	NAME
DRAWN	25-03-2024	ADG
CHK'D	02-04-2024	MAA
APPV'D	02-04-2024	QVC

SCALE BAR: 0.0 100m 300m

DRAWING NUMBER: HKN1-01-DWG-311

TITLE: Anchor positions

SHEET: 4

REV.: D

SIZE: A3

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REFERENCE DRAWINGS:

DOCUMENT NUMBER	DOCUMENT DESCRIPTION
HKN1-03-DWG-311	MOORING LAYOUT DRAWING
HKN1-01-DWG-310	FARM GENERAL ARRANGEMENT
CWHKN-INN-BPH-DWG-00022	BLPH SAFETY ZONES INC. INSTALLATION AND SOLAR FARM

REVISION:

REV.	DATE	DESCRIPTION	DRW'D	CHK'D	APPR'D
K					
J					
I					
H					
G					
F					
E					
D		Anchor points included with drop-down positions for installation as of HKN1-03-DWG-311 Mooring Layout Drawing	ADG		
C	5/12/2023	CRS feedback, safety zones and cable routing updated	ADG	QVC	JBR
B	7/7/2023	Safety zones included	ASC	HLU / FJK	MVI
A	4/7/2023	Initial document	ASC	HLU / FJK	MVI

APPENDIX 3 REPORT SHEETS

bluestream

ROV DIVE LOG

B-PRJ-FRM-010-02

Client:		**Date:**	
Project No.:		**Supervisor:**	
Location:		**Pilot:**	
Vessel/Installation:		**Technician:**	
ROV Type & No.:		**Data Recorder:**	
Client Rep.:		**Dive No.:**	

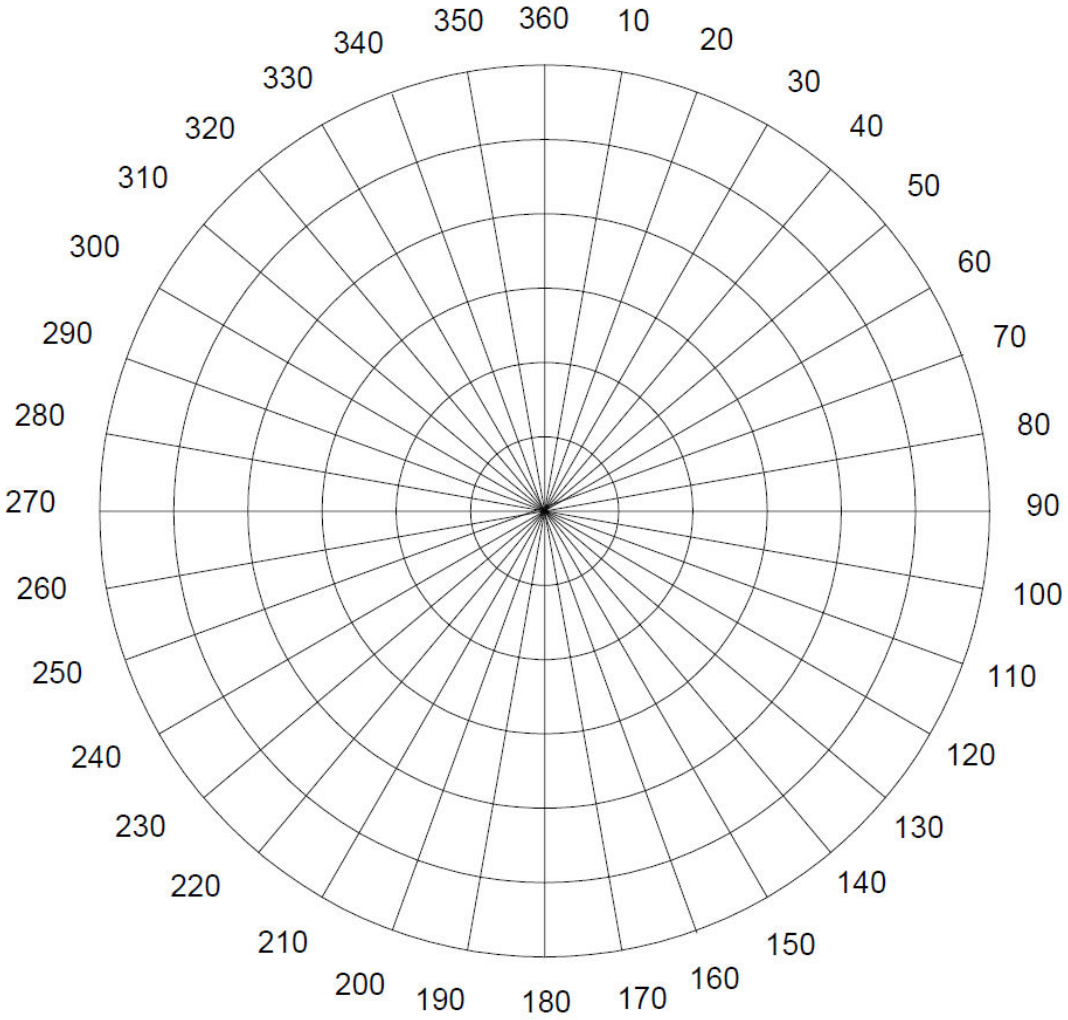
				CP Calibration	
Pre dive checks done:		Time:		CP pre-dive:	
Post dive checks done:		Time:		CP post:	
				Earth:	
				Ohm:	

From:		To:	Sub-Total:		Work Description:	Drawing No.	Video File:
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
	-						
Total Flying Hours:				Hrs.			
				Min.			
Remarks:							

Client Representative:	Project Supervisor:
Name:	Name:
Date:	Date:
Sign:	Sign:

Project no.:		Date:	
Client:		Supervisor:	
Rig:			
Location:			
Co-ordinates:			

Method of Survey:			
Type of Equipment:			
Range of Coverage:			
Rig Heading:			
Height of Scanning Unit During Scan:			
Nature of Seabed:		Type of Wellhead:	
Type of Records Made:			



LEGEND: (copy symbols for use in plot)	
Rig Heading:	
Rig Leg:	
Target Reference:	1 2 3

Note: Reference drawing not to scale

LIST OF TARGETS					
No	Position (Dist & Brg)	Approx. Dimensions (M)	Description	Means of Identification	Re-covered
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Means of Identification:		Reasons for not removing remaining debris:
A	Sonar Scan	
B	Visual	
C	Rig Records	

Comments:

Client Representative:	Project Supervisor:
Name:	Name:
Date:	Date:
Sign:	Sign:

Infield Report			
Client:		**Report Originator:**	
Location:		**Project No.:**	
Section:		**Item Of Interest No.:**	
Component:		**Infield Report No.:**	Year-R/D-IR-Location-XXX
Date:			

Description

Photographs

1

2

3	*4*
5	*6*
7	*8*

Reference Drawing

Client		Contractor	
Name:		Name:	
Function:		Function:	
Date:		Date:	
Signature:		Signature:	

Infield Anomaly Report			
Client:		**Report Originator:**	
Location:		**Project No.:**	
Section:		**Anomaly No.:**	
Component:		**Infield Anomaly Report:**	Year-D/R-IAR-Location-XXX
Date:			

Description

Photographs

1

2

3	*4*
5	*6*
7	*8*

Reference Drawing

Client		Contractor	
Name:		Name:	
Function:		Function:	
Date:		Date:	
Signature:		Signature:	

APPENDIX 4 ROV TECHNICAL DATASHEETS



Seaeye Tiger Free Flying

Technical data sheet

bluestream



Seaeye Tiger Free Flying

Housed in a single 15 feet container, the Bluestream Seaeye Tiger Free Fly unit is the most compact offshore inspection class system of its kind. The container houses the ROV control room with all relevant ROV control and inspection & reporting equipment, as well as the deployment system and umbilical winch. The limited deck space requirements and ultrafast mobilisation time make this system the best choice for platforms, rigs and small (anchor) vessels.

- Minimal deck space requirements;
- Ultrafast mobilisation time;
- Control room with full inspection suite.

The Seaeye Tiger ROV is a compact observation class vehicle which is ideal for inspection tasks. Due to its small size the ROV is nimble and capable of performing inspections at difficult to reach and narrow places.

The Tiger can be equipped with a range of survey and/or inspection equipment to perform specific task, such as CP or FMD inspections. The optional 4 function manipulator makes the ROV capable of performing simple intervention tasks or cutting operations.

- Inspections and surveys;
- CP and FMD measurements;
- Simple intervention tasks.



Saab Seaeye Tiger, Free Flying	
Depth rating	1.000 m
Length	1.030 mm
Width	700 mm
Height	590 mm
Launch weight	150 kg
Forward speed	3 knots
Thrust forward	62 kgf
Thrust lateral	43 kgf
Thrust vertical	22 kgf
Payload	32 kgf

Standard equipment
B/W and colour camera
Compass
Depth sensor
Dimmable lights
Obstacle avoidance sonar

Optional equipment
4-Function manipulator
CP measurement system
FMD
Multibeam imaging sonar
Multiple interfacing options
Survey equipment
Wire rope cutter



Control container & Launch And Recovery

Dimensions	L 4,57 m x W 2,44 m x H 2,59 m (15 ft container)
Gross weight	8.000 kg
Facilities	Video wall, air conditioned, recording suite and reporting equipment
Power requirements	400/440 VAC, 50/60 Hz, minimum 63 A
Power lead	20 m (standard)
Umbilical winch max.	400 m capacity (built in)
Launch and recovery	Foldable crane, deploys to 3,5 m from container

