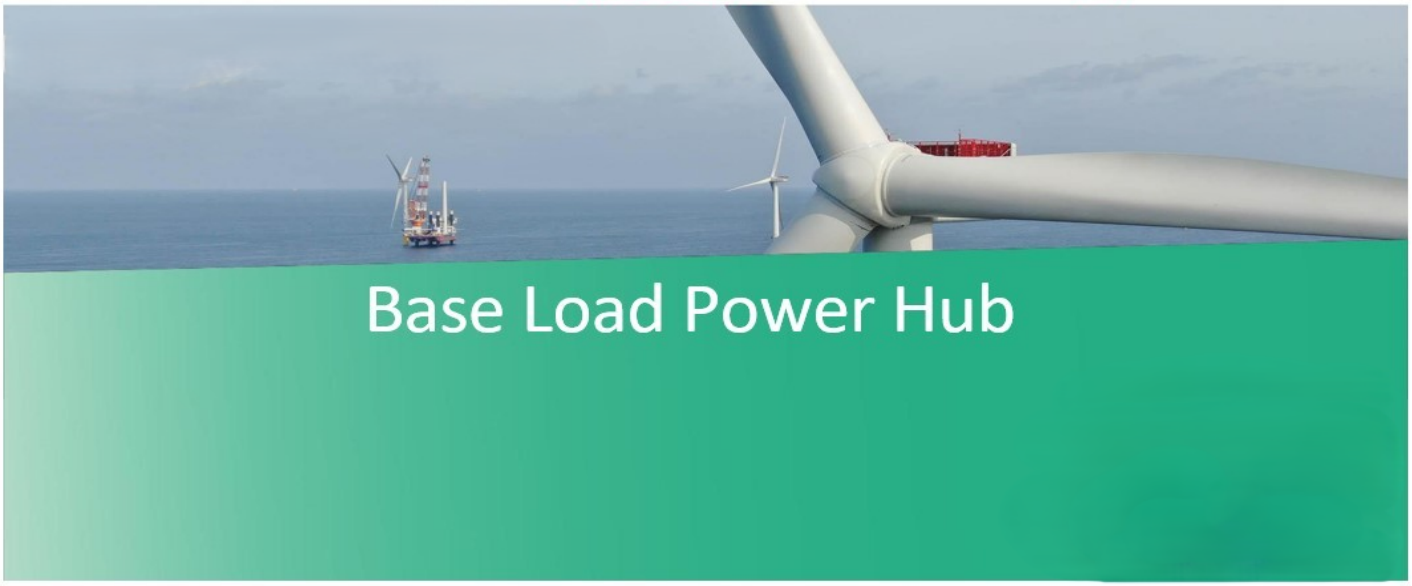
CROSSWIND

ROSETTI MARINO

PROVERLIS

**PROJECT** **123A90 - HOLLANDSE KUST NOORD WIND PARK**
**BLPH Project**




# MECHANICAL COMPLETION DOSSIER (ONSHORE)

| | |
|---|---|
| SYSTEM | 82<br>Main Power Distribution Medium Voltage 6.6 kV |
| SUBSYSTEM | 82-40<br>Power Transformer 1.6 MVA (TR-200DE1) |

CROSSWIND

**123A90 - HOLLANDSE KUST NOORD WIND PARK**
**BLPH Project**

# MECHANICAL COMPLETION DOSSIER INDEX

ROSETTI MARINO

| | | | | |
|---|---|---|---|---|
| **Sub System N°:** | 82-40 | **Tick as appropriate** | ONSHORE | O |
| **Description:** | Power Transformer 1.6 MVA (TR-200DE1) | | OFFSHORE | NA |

| | | |
|---|---|---|
| **1.** | ***READY FOR COMMISSIONING CERTIFICATE***<br>*Ready For Commissioning Certificate (RFC)* | O |
| **2.** | ***CONSOLIDATED PUNCH LISTS***<br>*Cleared and Residual Items* | O |
| **3.** | ***SYSTEM/SUB-SYSTEM LIMIT DRAWINGS***<br>*Mark-up drawings showing the limits of the relevant System/Sub-System* | O |
| **4.** | ***MECHANICAL COMPLETION STATUS INDEX – BUILDING DISCIPLINE***<br>*Building Sub-System Status Index (Print out) and Check/Test sheets* | NA |
| **5.** | ***MECHANICAL COMPLETION STATUS INDEX – ELECTRICAL DISCIPLINE***<br>*Electrical Sub-System Status Index (Print out) and Check/Test Sheets*<br>*Hazardous Area Equipment Detailed Inspection* | O |
| **6.** | ***MECHANICAL COMPLETION STATUS INDEX - INSTRUMENTAL DISCIPLINE***<br>*Instrumental Sub-System Status Index (Print out) and Check/Test Sheets* | NA |
| **7.** | ***MECHANICAL COMPLETION STATUS INDEX - MECHANICAL DISCIPLINE***<br>*Mechanical SubSystem Status Index (Print out) and Check/Test Sheets* | NA |
| **8.** | ***MECHANICAL COMPLETION STATUS INDEX - TELECOMMUNICATION DISCIPLINE***<br>*Telecommunication Sub-System Status Index (Print out) and Check/Test Sheets* | NA |
| **9.** | ***MECHANICAL COMPLETION STATUS INDEX - HVAC DISCIPLINE***<br>*HVAC Sub-System Status Index (Print out) and Check/Test Sheets* | NA |
| **10.** | ***MECHANICAL COMPLETION STATUS INDEX - PIPING DISCIPLINE***<br>*Piping Sub-System Status Index and Check/Test Sheets* | NA |
| **11.** | ***MECHANICAL COMPLETION INDEX - SAFETY DISCIPLINE***<br>*Safety Sub-System Status Index (Print out) and Check/Test Sheets* | NA |
| **12.** | ***FAT / VENDOR REPORTS***<br>*Fat reports issued by vendors and/or vendor reports* | OK |
| **13.** | ***MECHANICAL COMPLETION CHANGES / MARK-UPS***<br>*A copy of the changes initiated during the Mechanical Completion process pertaining to the relevant Sub-System will be incorporated in this section* | NA |

Note: Under the generic terminology “Building” are also covered the following disciplines: **Structural, Painting**

Under the generic terminology “Instrumental” is also covered the following discipline: **Fire & Gas**

ROSETTI MARINO

**123A90 - HOLLANDSE KUST NOORD WIND PARK**
**BLPH Project**

CROSSWIND

# Ready For Commissioning (RFC) Certificate

| COMPLETE | ● | PARTIAL | |
|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Revision: | 1 | | Issued on: | 2024-11-26 | |
| System: | 82 | / | Main Power Distribution Medium Voltage 6.6 kV | | |
| SubSystem: | 82-40 | / | Power Transformer 1.6 MVA (TR-200DE1) | | |

| | |
|---|---|
| 1 | COMPANY has, at its option and if required, reviewed the mechanical completion associated with the above-named system/sub-system of the SCOPE and observed that such functional sub-system has been brought into readiness for commencement of the associated pre-commissioning and commissioning activities, but for the outstanding punch list items, if any, attached and referred in this Certificate. |
| 2 | Issuance of this Certificate shall not release CONTRACTOR from any of his obligations, responsibilities or liabilities under the CONTRACT. |
| 3 | Mechanical Completion Status Index attached (per Discipline)<br>Punch List report attached (Outstanding and Cleared) |

| PUNCH LIST | PENDING POINTS | |
|---|---|---|
| **Note: All Category "A" Items must be cleared prior to issue a Ready For Commissioning (RFC) Certificate** | A | B |
| | '0 | 14 |

**REMARKS:**

| | **CONTRACTOR** Construction Manager | **CONTRACTOR** Commissioning Manager | **COMPANY** Construction Lead (if required) | **COMPANY** Commissioning Lead (if required) |
|---|---|---|---|---|
| Name | Wolmer Borghi | Anthony Iveson | CPY NOT PRESENT | CPY NOT PRESENT |
| Date | 2024-11-27 | 2024-11-27 | 2024-11-27 | 2024-11-27 |
| Signature | PROVERLIS Digitaly signed by Wolmer Borghi 2024-11-27T12:21:05.609Z | PROVERLIS Digitaly signed by Anthony Iveson 2024-11-27T13:05:42.823Z | PROVERLIS Digitaly signed by CPY NOT PRESEN 2024-11-27T16:44:32.710Z | PROVERLIS Digitaly signed by CPY NOT PRESEN 2024-11-27T16:44:47.140Z |

CROSSWIND

ROSETTI MARINO

# Project CROSSWIND

STATUS INDEX DETAIL

Filtered on system: 82 & subsystem: 82-40 & process: MC

| Electrical | 82-40 Power Transformer 1.6 MVA (TR-200DE1) | | | | | | |
|---|---|---|---|---|---|---|---|
| ITEM | | TASK | | | | | |
| Code | Description | Location | Code | Form | Progress | Date | Certificate |
| 82002-CEM-1-L1 | 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | ONSHORE | C10000476 | CPX08 | 100 | 2024-11-20 | RFC 1 |
| 82002-CEM-1-L2 | 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | ONSHORE | C10000477 | CPX08 | 100 | 2024-11-20 | RFC 1 |
| 82002-CEM-1-L3 | 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | ONSHORE | C10000478 | CPX08 | 100 | 2024-11-20 | RFC 1 |
| 82015-CEC | MV 6,6kV Switchgear / 6,6 / 0,42 kV 1,6 MVA Transformer Control Panel | ONSHORE | C10002340 | CPX10 | 100 | 2024-11-22 | RFC 1 |
| 83001-CEC | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear | ONSHORE | C10002134 | CPX10 | 100 | 2024-11-22 | RFC 1 |
| 83001-CEL-1-E | 6.6/0.4 KV, 1.6MVA Transformer-Neutral / Earth Point | ONSHORE | C10000509 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-1-L1 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000491 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-1-L2 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000496 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-1-L3 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000501 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-1-N | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000506 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-2-E | 6.6/0.4 KV, 1.6MVA Transformer-Neutral / Earth Point | ONSHORE | C10000510 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-2-L1 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000492 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-2-L2 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000497 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-2-L3 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000502 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-2-N | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000507 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-3-L1 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000493 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-3-L2 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000498 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-3-L3 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000503 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-3-N | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000508 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-4-L1 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000494 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-4-L2 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000499 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-4-L3 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000504 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-5-L1 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000495 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-5-L2 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000500 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-5-L3 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000505 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83002-CEC | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear | ONSHORE | C10002135 | CPX10 | 100 | 2024-11-22 | RFC 1 |
| 83003-CEC | Auxiliary Trafo 1,6 MVA / MV 6,6kV Switchgear | ONSHORE | C10003047 | CPX10 | 100 | 2024-11-22 | RFC 1 |
| 83004-CEC | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear | ONSHORE | C10004375 | CPX10 | 100 | 2024-11-22 | RFC 1 |
| 83116-CEL | Lighting & Small Power DB BoP / Auxiliary Trafo 1,6MVA | ONSHORE | C10000635 | CPX09 | 100 | 2024-11-22 | RFC 1 |

# Project CROSSWIND

STATUS INDEX DETAIL

Filtered on system: 82 & subsystem: 82-40 & process: MC

| Electrical | 82-40 Power Transformer 1.6 MVA (TR-200DE1) | | | | | | |
|---|---|---|---|---|---|---|---|
| ITEM | | TASK | | | | | |
| Code | Description | Location | Code | Form | Progress | Date | Certificate |
| TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | ONSHORE | C10000868 | CPX02 | 100 | 2024-09-13 | RFC 1 |

CROSSWIND

ROSETTI MARINO

# Project CROSSWIND

PUNCH LIST REPORT

| | | |
|---|---|---|
| SYSTEM | 82 | Main Power Distribution Medium Voltage 6.6 kV |
| SUBSYSTEM | 82-40 | Power Transformer 1.6 MVA (TR-200DE1) |

Electrical

| CODE | CAT | ITEM | DEFECT DESCRIPTION | CORRECTIVE ACTION | PERFORMED ACTION | ISSUED | CARRIED | CHECKED | APPROVED |
|---|---|---|---|---|---|---|---|---|---|
| C30000649 | A | 82002-CEM-1-L1 C10000476 | Cable to be connected by SG-100D1 side. Point valid also for 82002-CEM-1-L2 and 82002-CEM-1-L3 | . | | Pschintu 2024-11-20 | | Ecarotenuto | |
| C30000650 | B | 82002-CEM-1-L1 C10000476 | Trefoil formation is not as per drawing 123A90-DDL-EL-DD-20092 sh.009 | . | | Pschintu 2024-11-20 | | | |
| C30000651 | B | 82002-CEM-1-L1 C10000476 | Missing cable tags on external routing. Point valid also for 82002-CEM-1-L2 and 82002-CEM-1-L3 | . | | Pschintu 2024-11-20 | | | |
| C30000652 | B | 82002-CEM-1-L1 C10000476 | Missing cable cleats stainless steel with TPE cable protection. Point valid also for 82002-CEM-1-L2 and 82002-CEM-1-L3 | . | | Pschintu 2024-11-20 | | | |
| C30000752 | B | 83116-CEL C10000635 | Missing core identification tags on both terminations | . | | Pschintu 2024-11-22 | | | |
| C30000754 | B | 83001-CEC C10002134 | Missing SS cable tags on external routing | . | | Pschintu 2024-11-22 | | | |
| C30000755 | B | 83001-CEC C10002134 | Missing core identification tags on both terminations | . | | Pschintu 2024-11-22 | | | |
| C30000756 | B | 83002-CEC C10002135 | Missing core identification tags on both terminations | . | | Pschintu 2024-11-22 | | | |
| C30000757 | B | 83002-CEC C10002135 | Missing cable tags inside and outside B-200 | . | | Pschintu 2024-11-22 | | | |

CROSSWIND

ROSETTI MARINO

# Project CROSSWIND

PUNCH LIST REPORT

| | | |
|---|---|---|
| SYSTEM | 82 | Main Power Distribution Medium Voltage 6.6 kV |
| SUBSYSTEM | 82-40 | Power Transformer 1.6 MVA (TR-200DE1) |

Electrical

| CODE | CAT | ITEM | DEFECT DESCRIPTION | CORRECTIVE ACTION | PERFORMED ACTION | ISSUED | CARRIED | CHECKED | APPROVED |
|---|---|---|---|---|---|---|---|---|---|
| C30000758 | B | 83003-CEC C10003047 | Missing core identification tags on both terminations | . | | Pschintu 2024-11-22 | | | |
| C30000759 | B | 83003-CEC C10003047 | Missing cable tags on all internal and external routing | . | | Pschintu 2024-11-22 | | | |
| C30000760 | B | 83004-CEC C10004375 | Missing cable tags on internal and external routing | . | | Pschintu 2024-11-22 | | | |
| C30000761 | B | 83004-CEC C10004375 | Core identification tags are missing inside CP-200E1 | . | | Pschintu 2024-11-22 | | | |
| C30000766 | B | 82015-CEC C10002340 | Missing core identification tags inside CP-200E1 | . | | Pschintu 2024-11-22 | | | |
| C30000818 | B | 83001-CEL-1-L1 C10000491 | Missing SS cable tag of all the cables outside TR-200DE1 | . | | Pschintu 2024-11-23 | | | |

# Section 2 CONSOLIDATED PUNCH LISTS

CROSSWIND

ROSETTI MARINO

# Project CROSSWIND

PUNCH LIST REPORT

| | | |
|---|---|---|
| SYSTEM | 82 | Main Power Distribution Medium Voltage 6.6 kV |
| SUBSYSTEM | 82-40 | Power Transformer 1.6 MVA (TR-200DE1) |

Electrical

| CODE | CAT | ITEM | DEFECT DESCRIPTION | CORRECTIVE ACTION | PERFORMED ACTION | ISSUED | CARRIED | CHECKED | APPROVED |
|---|---|---|---|---|---|---|---|---|---|
| C30000649 | A | 82002-CEM-1-L1 C10000476 | Cable to be connected by SG-100D1 side. Point valid also for 82002-CEM-1-L2 and 82002-CEM-1-L3 | . | | Pschintu 2024-11-20 | 2024-11-26 | Ecarotenuto 2024-11-26 | 2024-11-26 |
| C30000650 | B | 82002-CEM-1-L1 C10000476 | Trefoil formation is not as per drawing 123A90-DDL-EL-DD-20092 sh.009 | . | | Pschintu 2024-11-20 | 2025-01-24 | Pschintu 2025-01-24 | 2025-01-24 |
| C30000651 | B | 82002-CEM-1-L1 C10000476 | Missing cable tags on external routing. Point valid also for 82002-CEM-1-L2 and 82002-CEM-1-L3 | . | | Pschintu 2024-11-20 | 2025-02-07 | Pschintu 2025-02-07 | 2025-02-07 |
| C30000652 | B | 82002-CEM-1-L1 C10000476 | Missing cable cleats stainless steel with TPE cable protection. Point valid also for 82002-CEM-1-L2 and 82002-CEM-1-L3 | . | | Pschintu 2024-11-20 | 2025-01-03 | Ecarotenuto 2025-01-03 | 2025-01-03 |
| C30000752 | B | 83116-CEL C10000635 | Missing core identification tags on both terminations | . | | Pschintu 2024-11-22 | 2025-02-04 | Pschintu 2025-02-04 | 2025-02-04 |
| C30000754 | B | 83001-CEC C10002134 | Missing SS cable tags on external routing | . | | Pschintu 2024-11-22 | 2025-02-04 | Pschintu 2025-02-04 | 2025-02-04 |
| C30000755 | B | 83001-CEC C10002134 | Missing core identification tags on both terminations | . | | Pschintu 2024-11-22 | 2025-02-04 | Pschintu 2025-02-04 | 2025-02-04 |
| C30000756 | B | 83002-CEC C10002135 | Missing core identification tags on both terminations | . | | Pschintu 2024-11-22 | 2025-02-15 | AAndreani 2025-02-15 | 2025-02-15 |
| C30000757 | B | 83002-CEC C10002135 | Missing cable tags inside and outside B-200 | . | | Pschintu 2024-11-22 | 2025-02-03 | APolo 2025-02-03 | 2025-02-03 |

CROSSWIND

ROSETTI MARINO

# Project CROSSWIND

PUNCH LIST REPORT

| | | |
|---|---|---|
| SYSTEM | 82 | Main Power Distribution Medium Voltage 6.6 kV |
| SUBSYSTEM | 82-40 | Power Transformer 1.6 MVA (TR-200DE1) |

Electrical

| CODE | CAT | ITEM | DEFECT DESCRIPTION | CORRECTIVE ACTION | PERFORMED ACTION | ISSUED | CARRIED | CHECKED | APPROVED |
|---|---|---|---|---|---|---|---|---|---|
| C30000758 | B | 83003-CEC C10003047 | Missing core identification tags on both terminations | . | | Pschintu 2024-11-22 | 2025-02-04 | Pschintu 2025-02-04 | 2025-02-04 |
| C30000759 | B | 83003-CEC C10003047 | Missing cable tags on all internal and external routing | . | | Pschintu 2024-11-22 | 2025-02-04 | Pschintu 2025-02-04 | 2025-02-04 |
| C30000760 | B | 83004-CEC C10004375 | Missing cable tags on internal and external routing | . | | Pschintu 2024-11-22 | 2025-02-04 | Pschintu 2025-02-04 | 2025-02-04 |
| C30000761 | B | 83004-CEC C10004375 | Core identification tags are missing inside CP-200E1 | . | | Pschintu 2024-11-22 | 2025-02-15 | AAndreani 2025-02-15 | 2025-02-15 |
| C30000766 | B | 82015-CEC C10002340 | Missing core identification tags inside CP-200E1 | . | | Pschintu 2024-11-22 | 2025-02-15 | AAndreani 2025-02-15 | 2025-02-15 |
| C30000818 | B | 83001-CEL-1-L1 C10000491 | Missing SS cable tag of all the cables outside TR-200DE1 | . | | Pschintu 2024-11-23 | 2025-02-07 | Pschintu 2025-02-07 | 2025-02-07 |

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000818

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10000491 | 1.4 Discipline | Electrical |
| 1.2 Item | 83001-CEL-1-L1 | | 6.6/0.415 kV Transformer / LV Switchgear |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing SS cable tag of all the cables outside TR-200DE1

Name: Paolo Schintu

Date: 2024-11-23

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-23 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

INSTALLED

Name: Paolo Schintu

Date: 2025-02-07

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000649

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10000476 | 1.4 Discipline | Electrical |
| 1.2 Item | 82002-CEM-1-L1 | | 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Cable to be connected by SG-100D1 side. Point valid also for 82002-CEM-1-L2 and 82002-CEM-1-L3

Name: Paolo Schintu

Date: 2024-11-20

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | A PL A | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-20 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

According to Commissioning request, the cables will be re-connected during Commissioning Activities

Name: Eleonora Carotenuto

Date: 2024-11-26

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000650

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10000476 | 1.4 Discipline | Electrical |
| 1.2 Item | 82002-CEM-1-L1 | | 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Trefoil formation is not as per drawing 123A90-DDL-EL-DD-20092 sh.009

Name: Paolo Schintu

Date: 2024-11-20

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-20 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-01-24

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000651

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10000476 | 1.4 Discipline | Electrical |
| 1.2 Item | 82002-CEM-1-L1 | | 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing cable tags on external routing. Point valid also for 82002-CEM-1-L2 and 82002-CEM-1-L3

Name: Paolo Schintu
Date: 2024-11-20
Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-20 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:
Date:
Signature:

## 5 - CLEARANCE CHECK

INSTALLED

Name: Paolo Schintu
Date: 2025-02-07
Signature:

## 6- CLEARANCE APPROVAL

Name:
Date:
Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000652

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10000476 | 1.4 Discipline | Electrical |
| 1.2 Item | 82002-CEM-1-L1 | | 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing cable cleats stainless steel with TPE cable protection.
Point valid also for 82002-CEM-1-L2 and 82002-CEM-1-L3

Name: Paolo Schintu
Date: 2024-11-20
Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-20 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:
Date:
Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Eleonora Carotenuto
Date: 2025-01-03
Signature:

## 6- CLEARANCE APPROVAL

Name:
Date:
Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000752

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10000635 | 1.4 Discipline | Electrical |
| 1.2 Item | 83116-CEL | | Lighting & Small Power DB BoP / Auxiliary Trafo 1,6MVA |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing core identification tags on both terminations

Name: Paolo Schintu

Date: 2024-11-22

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-22 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-04

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000754

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10002134 | 1.4 Discipline | Electrical |
| 1.2 Item | 83001-CEC | | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing SS cable tags on external routing

Name: Paolo Schintu

Date: 2024-11-22

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-22 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-04

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000755

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10002134 | 1.4 Discipline | Electrical |
| 1.2 Item | 83001-CEC | | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing core identification tags on both terminations

Name: Paolo Schintu

Date: 2024-11-22

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-22 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-04

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000756

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10002135 | 1.4 Discipline | Electrical |
| 1.2 Item | 83002-CEC | | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing core identification tags on both terminations

Name: Paolo Schintu

Date: 2024-11-22

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-22 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-15

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000757

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10002135 | 1.4 Discipline | Electrical |
| 1.2 Item | 83002-CEC | | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing cable tags inside and outside B-200

Name: Paolo Schintu

Date: 2024-11-22

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-22 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Alessio Polo

Date: 2025-02-03

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000758

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10003047 | 1.4 Discipline | Electrical |
| 1.2 Item | 83003-CEC | | Auxiliary Trafo 1,6 MVA / MV 6,6kV Switchgear |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing core identification tags on both terminations

Name: Paolo Schintu

Date: 2024-11-22

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-22 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-04

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000759

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10003047 | 1.4 Discipline | Electrical |
| 1.2 Item | 83003-CEC | | Auxiliary Trafo 1,6 MVA / MV 6,6kV Switchgear |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing cable tags on all internal and external routing

Name: Paolo Schintu

Date: 2024-11-22

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-22 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-04

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000760

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10004375 | 1.4 Discipline | Electrical |
| 1.2 Item | 83004-CEC | | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing cable tags on internal and external routing

Name: Paolo Schintu

Date: 2024-11-22

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-22 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Paolo Schintu

Date: 2025-02-04

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000761

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10004375 | 1.4 Discipline | Electrical |
| 1.2 Item | 83004-CEC | | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Core identification tags are missing inside CP-200E1

Name: Paolo Schintu

Date: 2024-11-22

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-22 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-15

Signature:

## 6- CLEARANCE APPROVAL

Name:

Date:

Signature:

ROSETTI MARINO
CROSSWIND

# PUNCH ITEM ENTRY / CLEARANCE FORM

C30000766

PROVERLIS

## 1 -ELEMENT IDENTIFICATION

| | | | |
|---|---|---|---|
| 1.1 Task | C10002340 | 1.4 Discipline | Electrical |
| 1.2 Item | 82015-CEC | | MV 6,6kV Switchgear / 6,6 / 0,42 kV 1,6 MVA Transformer Control Panel |
| 1.3 Subsystem | 82-40 | | Power Transformer 1.6 MVA (TR-200DE1) |

## 2 - OBSERVATION

Missing core identification tags inside CP-200E1

Name: Paolo Schintu

Date: 2024-11-22

Signature:

## 3 - DEFECT ASSESSMENT

.

3.1 Corrective action proposal

3.2 Material required

| | | | |
|---|---|---|---|
| 3.3 Priority | B PL B | Name | Paolo Schintu |
| 3.4 Activity code | MC Mechanical Completion | Date | 2024-11-22 |
| 3.5 Action by | RM_CONSTR RM | Signature | |

## 4 - PERFORMED ACTION

Name:

Date:

Signature:

## 5 - CLEARANCE CHECK

DONE

Name: Andrea Andreani

Date: 2025-02-15

Signature:

## 6- CLEARANCE APPROVAL

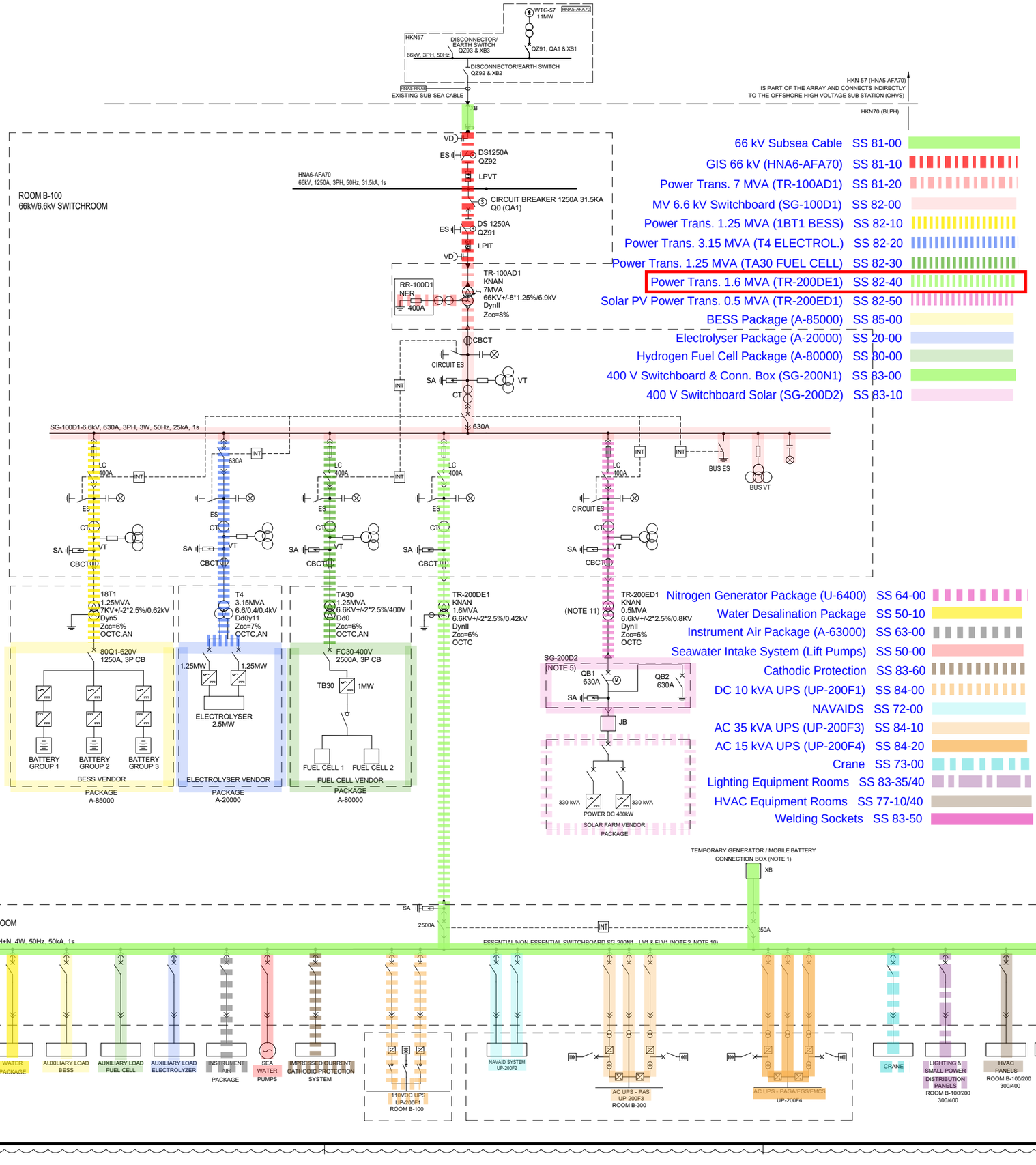
Name:

Date:

Signature:

# Section 3 SYSTEM,SUB-SYSTEM LIMIT DRAWINGS

DRAWING NO. 123A90-DDL-EL-DG-20158 REV. 01




## SYMBOL LEGEND:

- VOLTAGE DETECTOR
- EARTHING SWITCH DISCONNECTOR
- MOTORIZED EARTHING SWITCH
- CIRCUIT BREAKER
- FUSE
- CONTACTOR
- THREE-PHASE TRANSFORMER WITH TAP CHANGER
- THREE-PHASE TRANSFORMER
- CURRENT TRANSFORMER
- THREE-PHASE TRANSFORMER, WITH THREE WINDINGS
- NEUTRAL EARTHING RESISTOR
- SURGE ARRESTER
- CORE BALANCE CURRENT TRANSFORMER
- SURGE ARRESTOR FOR T-CONNECTOR (N.1 FOR EACH PHASE)
- VOLTAGE & CURRENT TRANSFORMER (3Ø X 2) (LPIT TYPE)
- VOLTAGE TRANSFORMER (3Ø X 2) (LPVT TYPE)
- VOLTAGE TRANSFORMER
- CABLE BOX
- T-CONNECTOR CABLE TERMINATION
- CABLE AIR TERMINATION

| | |
|---|---|
| OLTC | = ON LOAD TAP CHANGER |
| OCTC | = OPEN CIRCUIT TAP CHANGER |
| KNAN | = NON-MINERAL OIL NATURAL AIR COOLED |
| AN | = AIR NATURAL |
| XB | = CABLE BOX |
| QZ | = DISCONNECT SWITCH & EARTH SWITCH |
| QA | = CIRCUIT BREAKER |
| LC | = LATCHED FUSED CONTACTOR (400A) |
| INT | = INTERLOCK SYSTEM |
| SA | = SURGE ARRESTER |
| CBCT | = CORE BALANCE CURRENT TRANSFORMER |
| ES | =EARTHING SWITCH |
| VD | =VOLTAGE DETECTOR |
| LCP | =LOCAL CONTROL PANEL |
| LPVT | =LOW POWER VOLTAGE TRANSFORMER |
| LPCT | =LOW POWER CURRENT TRANSFORMER |
| LPIT | =LOW POWER INSTRUMENT TRANSFORMER |
| JB | =JUNCTION BOX |

## NOTES:

1. TEMPORARY POWER SUPPLY CONNECTION BOX LOCATED ON OUTSIDE WALL OF LV SWITCHROOM / CONTAINER.
2. LOAD DEFINITION 'ESSENTIAL' / 'NON-ESSENTIAL' IS SHOWN IN THE LOAD LIST. THE CCS, EMCS AND 'SMART' SWITCHGEAR WILL OPEN / CLOSE CIRCUIT BREAKERS AS REQUIRED.
3. A COMBINED CCS/EMCS SYSTEM COMPRISES A MICROPROCESSOR BASED SYSTEM, ASSOCIATED SOFTWARE AND REQUIRED PERIPHERALS FOR MONITORING AND CONTROLLING OF ELECTRICAL POWER NETWORK. ALL ELECTRICAL EQUIPMENT AND PACKAGE UNITS SHALL BE CONNECTED TO THE CENTRAL CONTROL SYSTEM .
4. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM SUPPLIED BY COMPANY.
5. THE SOLAR FARM IN-FEED POWER CIRCUIT BREAKERS PANEL IS LOCATED INSIDE THE LV SWITCHGEAR ROOM B-200.
6. DELETED.
7. DELETED.
8. DELETED.
9. CROSSWIND SHALL BE ABLE TO CONTROL THE BLPH 66KV MOTORISED CIRCUIT BREAKER Q0 (QA1) & MOTORISED ELECTRICAL DISCONNECTOR / EARTH SWITCH (QZ92, TYPE B) USING THEIR 'HV-SCADA' SYSTEM. THIS BACK-UP / REDUNDANT CONTROL SHALL BE ADDITIONAL TO THAT PROVIDED BY THE CCS AND BE OF HIGHER PRIORITY OVER A SEPARATE FIBRE OPTIC CABLE (FOC). THE CCS OPERATOR AND 'HV-SCADA' SHALL BOTH BE KEPT FULLY AWARE OF EQUIPMENT STATUS AT ALL TIMES. INTERTRIPPING, INHIBITS & INTERLOCKING FOR BLPH 66KV EQUIPMENT SHALL BE AS PER THE WIND FARM.
10. THE LOADS IN THE LOW VOLTAGE SWITCHGEAR AND THE CURRENT VALUES OF THE CIRCUIT BREAKERS ARE ONLY INDICATIVE.
11. NEUTRAL POINT OF TR-200ED1 SHALL NOT BE GROUNDED AS REQUIRED BY SOLAR FARM SUPPLIER IN 123A90-PML-PM-TQ-00040.

## REFERENCES:

1. 123A90-DDL-EL-DG-20014 ELECTRICAL CONTROL, PROTECTION AND METERING DIAGRAMS
2. 123A90-DDL-EL-DG-20015 ELECTRICAL SINGLE LINE DIAGRAM 6.6kV SYSTEMS
3. 123A90-DDL-EL-DG-20159 ELECTRICAL SINGLE LINE DIAGRAMS LV SYSTEM
4. 123A90-DDL-EL-DG-20160 ELECTRICAL SINGLE LINE DIAGRAMS AC UPS SYSTEMS
5. 123A90-DDL-EL-DG-20161 ELECTRICAL SINGLE LINE DIAGRAMS DC UPS SYSTEMS
6. 123A90-DDL-EL-DG-20185 ELECTRICAL SINGLE LINE DIAGRAM HV SYSTEMS
7. 123A90-DDL-EL-DL-20104 ELECTRICAL EQUIPMENT LAYOUT - HV SWITCHROOM
8. 123A90-DDL-EL-DL-20105 ELECTRICAL EQUIPMENT LAYOUT - LV SWITCHROOM
9. 123A90-DDL-EL-LIS-20016 ELECTRICAL LOAD LIST and BALANCE -CCS MODE CHARGING-
10. 123A90-DDL-EL-RE-20152 ELECTRICAL EQUIPMENT SIZING CCALCULATION REPORT
11. 123A90-DDL-EL-RE-20170 ELECTRICAL SYSTEM STUDY REPORT - LOAD FLOW
12. 123A90-DDL-EL-RE-20171 ELECTRICAL SYSTEM STUDY REPORT - SHORT CIRCUIT
13. 123A90-DDL-EL-RE-20172 ELECTRICAL SYSTEM STUDY REPORT - ARC FLASH ENERGY CALCULATION
14. 123A90-DDL-EL-RE-20173 ELECTRICAL SYSTEM STUDY REPORT - HARMONICS

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 02/11/2023 | DSF | CB/AMA | OYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

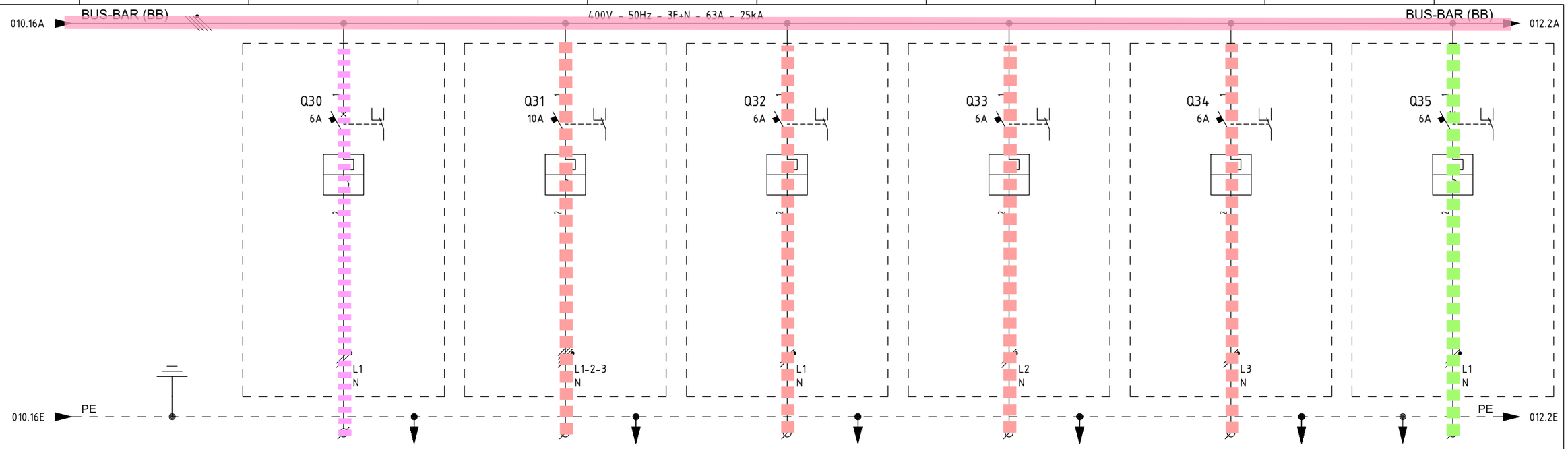
TITLE :

OVERALL/KEY SINGLE LINE DIAGRAM

| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE N/A |
| DRAWN GPA | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 26/03/2023 |
| A1 | DRAWING NO. 123A90-DDL-EL-DG-20158 | SHEET 001 | REV. 01 |

01

File Name : 123A90-DDL-EL-DG-20158_REV01.dwg




| ITEM | | | | 1 | CP-640F1 | CP-100E2 | CP-100E3 | CP-100E4 | RR-100D1 | CP-200E1 |
|---|---|---|---|---|---|---|---|---|---|---|
| UTILITY | | | | 2 | UCP - N2 PACKAGE - AUXILIARY | AUXILIARY TRAFO OLTC | AUXILIARY TRAFO AVR | AUXILIARY TRAFO 7MVA | AUXILIARY NER | AUXILIARY TRAFO 1.6MVA |
| CUBICLE | | | | 3 | +03 | +03 | +03 | +03 | +03 | +03 |
| RATED POWER \| RATED CURRENT | | | | 4/5 | 0.5 KW \| 2.72 A | 1 KW \| 1.81 A | 0.3 KW \| 1.63 A | 0.5 KW \| 2.72 A | 0.3 KW \| 1.63 A | 0.5 KW \| 2.72 A |
| TYPICAL FUNCTIONAL | | | | 6 | - | - | - | - | - | - |
| CIRCUIT BREAKER (ABB) | TYPE | | | 7 | S302P-C6 | S304P-C10 | S302P-C6 | S302P-C6 | S302P-C6 | S302P-C6 |
| | VERSION | | | 8 | 2P / MINIATURE | 4P / MINIATURE | 2P / MINIATURE | 2P / MINIATURE | 2P / MINIATURE | 2P / MINIATURE |
| | TRIP UNITS | | | 9 | In=6A - Curve C | In=10A - Curve C | In=6A - Curve C | In=6A - Curve C | In=6A - Curve C | In=6A - Curve C |
| | Icu | | KA | 10 | 25kA | 25kA | 25kA | 25kA | 25kA | 25kA |
| OVERLOAD | L | Range | A | 11 | - | - | - | - | - | - |
| | | Range | t | 12 | - | - | - | - | - | - |
| SEL. SHORT-CIRCUIT | S | Range | A | 13 | - | - | - | - | - | - |
| | | Range | t | 14 | - | - | - | - | - | - |
| INST. SHORT-CIRCUIT | I | Range | A | 15 | - | - | - | - | - | - |
| | | Range | t | 16 | - | - | - | - | - | - |
| EARTH FAULT PROTECTION | G | Range | A | 17 | - | - | - | - | - | - |
| | | Range | t | 18 | - | - | - | - | - | - |
| CONTACTOR (ABB) | | | | 19 | - | - | - | - | - | - |
| THERMAL OVERLOAD RELAY (ABB) | | | | 20 | - | - | - | - | - | - |
| SURGE ARRESTERS (DHENN) | | | | 21 | - | - | - | - | - | - |
| TOROIDAL CURRENT TRANSFORMER (FRER) | | | | 22 | - | - | - | - | - | - |
| FUSE HOLDER (ABB) | | | | 23 | - | - | - | - | - | - |
| TWILIGHT SWITCH (ABB) | | | | 24 | - | - | - | - | - | - |
| VOLTMETER (FRER) | | | | 25 | - | - | - | - | - | - |
| CURRENT TRANSFORMER FOR MEASURE (FRER) | TYPE | | | 26 | - | - | - | - | - | - |
| | PERFORMANCE/CLASS | | | 27 | - | - | - | - | - | - |
| VOLTAGE TRANSFORMER FOR MEASURE (FRER) | TYPE | | | 28 | - | - | - | - | - | - |
| | PERFORMANCE/CLASS | | | 29 | - | - | - | - | - | - |
| POWER TERM. BLOCK (CABUR) | | | Type/mm² | 30 | SCREW / 4 | SCREW / 4 | SCREW / 4 | SCREW / 4 | SCREW / 4 | SCREW / 4 |
| POWER CONDUCTOR | | | mm² | 31 | 3G2.5 | 5G4 | 3G2.5 | 3G2.5 | 3G2.5 | 3G2.5 |

SUBSYSTEM 64-00 | SUBSYSTEM 81-20 | SUBSYSTEM 81-20 | SUBSYSTEM 81-20 | SUBSYSTEM 81-20 | SUBSYSTEM 82-40

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| = | | | | | |
| + | | | | | |
| 3 | 05/07/2024 | Santinelli | Flamminio | Sigismondi | Accepted for construction (AFC) |
| 2 | 24/04/2024 | Santinelli | Flamminio | Sigismondi | Issued for review (IFR) |
| 1 | 15/03/2024 | Santinelli | Flamminio | Sigismondi | Issued for review (IFR) |
| 0 | 08/02/2024 | Santinelli | Flamminio | Sigismondi | Issued for review (IFR) |

DWG n° : 231298/SD/13
Item n° : PF1002888/101

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "DP-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00013

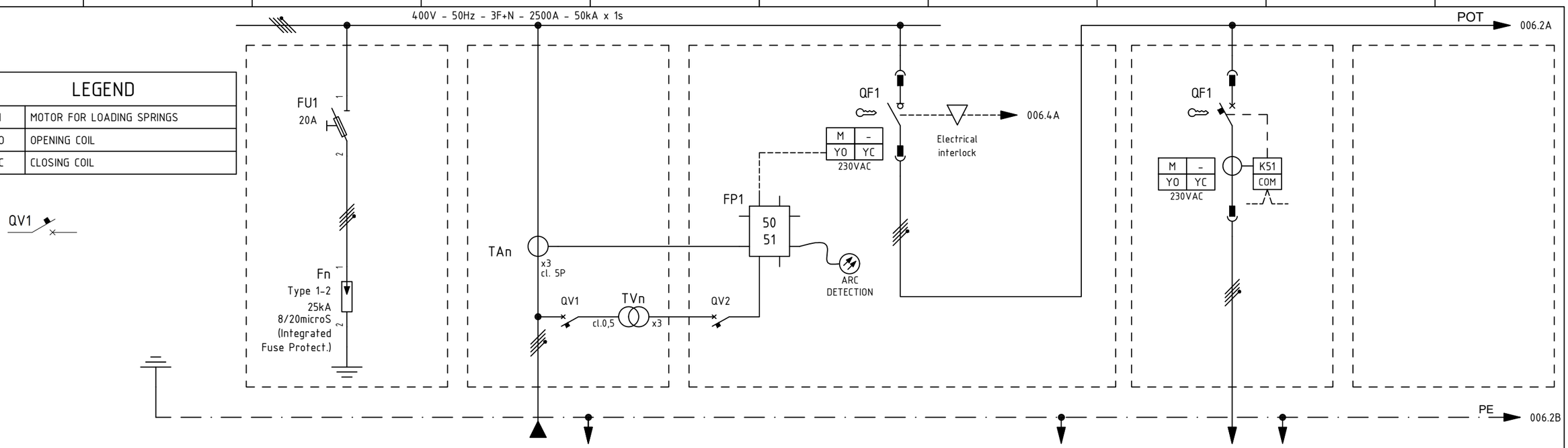
SHEET 011

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00013 Rev. 03

| LEGEND | |
|---|---|
| M | MOTOR FOR LOADING SPRINGS |
| YO | OPENING COIL |
| YC | CLOSING COIL |




| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ITEM | | | 1 | - | - | - | A-20000 | |
| UTILITY | | | 2 | SURGE ARRESTER | - | INCOMING TRASFORMER | ELECTROLYSER AUXILIARY LOAD | |
| COLUMN/CUBICLE | | | 3 | - | A1 / +02 | A1 / +05 | A1 / +08 | |
| RATED POWER \| RATED CURRENT | | | 4/5 | - \| - | - \| - | - \| - | 293 kW \| 497 A | |
| TYPICAL FUNCTIONAL | | | 6 | - | - | - | L3-630 | |
| CIRCUIT BREAKER (ABB) | TYPE | | 7 | - | - | E4.2N/MS-3200 4P | E1.2C-1250 4P | |
| | VERSION | | 8 | - | - | WITHDRAWABLE | WITHDRAWABLE | |
| | TRIP UNITS | | 9 | - | - | - | EKIP HI TOUCH LSIG = 630 | |
| | Icu | KA | 10 | - | - | 66 kA (1s) | 50 kA | |
| OVERLOAD | L | Range A | 11 | - | - | - | (0.4 ÷ 1) x In | |
| | | Range t | 12 | - | - | - | t=k/I^2 | |
| SEL. SHORT-CIRCUIT | S | Range A | 13 | - | - | - | (0.6 ÷ 10) x In [EXCLUDABLE] | |
| | | Range t | 14 | - | - | - | t=k / t=k/I² | |
| INST. SHORT-CIRCUIT | I | Range A | 15 | - | - | - | (1.5 ÷ 15) x In | |
| | | Range t | 16 | - | - | - | instantaneous | |
| EARTH FAULT PROTECTION | G | Range A | 17 | - | - | - | (0.1 ÷ 1) x In (EXCLUDABLE) | |
| | | Range t | 18 | - | - | - | t=k / t=k/I^2 | |
| CONTACTOR (ABB) | | | 19 | - | - | - | - | |
| THERMAL OVERLOAD RELAY (ABB) | | | 20 | - | - | - | - | |
| SURGE ARRESTER (DEHN) | | | 21 | DVCI 1 255 FM (961205) | - | - | - | |
| TOROIDAL CURRENT TRANSFORMER (FRER) | | | 22 | - | - | - | - | |
| FUSE HOLDER (ITALWEBER) | | | 23 | Fuses 20A gG | FROM SUBSISTEM 82.40 | - | SUBSISTEM 20.00 | |
| INDIRECT PROTECTION (ABB) | | | 24 | - | | REF615K-(version F) HBFFAEAGNDCABNA11G | | |
| VOLTMETER | | | 25 | - | | - | - | |
| CURRENT TRANSFORMER FOR MEASURE (FRER) | TYPE | | 26 | - | TAR1052K5N01V_18 - 2500/1A | - | - | |
| | PERFORMANCE/CLASS | | 27 | SUBSISTEM 82.40 | 5VA / 5P20 | SUBSISTEM 82.40 | - | |
| VOLTAGE TRANSFORMER FOR MEASURE (FRER) | TYPE | | 28 | | TTV020400VC1 - 400r3/110r3V | | - | |
| | PERFORMANCE/CLASS | | 29 | | 20VA / 0.5 | | - | |
| LOCK-OUT RELAY (-) | | | 30 | - | - | - | - | |
| POWER CONDUCTOR | | mmq | 31 | - | - | - | 1 x 150 + [4 x (1 x 300)] | |

QV1

QV1

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| = | | | | | |
| + | | | | | |
| 3 | 08/07/2024 | Santinelli | Flamminio | Sigismondi | Accepted for Construction (AFC) |
| 2 | 03/05/2024 | Santinelli | Flamminio | Sigismondi | Issued for review (IFR) |
| 1 | 28/03/2024 | Santinelli | Flamminio | Sigismondi | Issued for review (IFR) |
| 0 | 15/02/2024 | Santinelli | Flamminio | Sigismondi | Issued for review (IFR) |

DWG n° : 231298/SD/11

Item n° : PF1002983/26

IMESA ELECTRICAL ENGINEERING

CROSSWIND

ROSETTI MARINO

TITLE : "SG-200N1"

SINGLE LINE DIAGRAM

Single Line Drawing

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723002197-EL-DG-00011

SHEET 005

REV. 03

F.to UNI A3: 420mmx297mm

File Name : 1723002197-EL-DG-00011 Rev. 03

# Section 4 MECHANICAL COMPLETION STATUS INDEX - BUILDING DISCIPLINE

# NOT APPLICABLE

# Section 5 MECHANICAL COMPLETION STATUS INDEX - ELECTRICAL DISCIPLINE

CROSSWIND

ROSETTI MARINO

# Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 82-40 & process: MC & discipline : E

| Electrical | 82-40 Power Transformer 1.6 MVA (TR-200DE1) | | | | | | |
|---|---|---|---|---|---|---|---|
| ITEM | | TASK | | | | | |
| Code | Description | Location | Code | Form | Progress | Date | Certificate |
| 82002-CEM-1-L1 | 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | ONSHORE | C10000476 | CPX08 | 100 | 2025-04-15 | RFC 1 |
| 82002-CEM-1-L2 | 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | ONSHORE | C10000477 | CPX08 | 100 | 2025-04-15 | RFC 1 |
| 82002-CEM-1-L3 | 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | ONSHORE | C10000478 | CPX08 | 100 | 2025-04-15 | RFC 1 |
| 82015-CEC | MV 6,6kV Switchgear / 6,6 / 0,42 kV 1,6 MVA Transformer Control Panel | ONSHORE | C10002340 | CPX10 | 100 | 2024-11-22 | RFC 1 |
| 83001-CEC | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear | ONSHORE | C10002134 | CPX10 | 100 | 2024-11-22 | RFC 1 |
| 83001-CEL-1-E | 6.6/0.4 KV, 1.6MVA Transformer-Neutral / Earth Point | ONSHORE | C10000509 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-1-L1 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000491 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-1-L2 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000496 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-1-L3 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000501 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-1-N | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000506 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-2-E | 6.6/0.4 KV, 1.6MVA Transformer-Neutral / Earth Point | ONSHORE | C10000510 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-2-L1 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000492 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-2-L2 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000497 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-2-L3 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000502 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-2-N | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000507 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-3-L1 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000493 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-3-L2 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000498 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-3-L3 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000503 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-3-N | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000508 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-4-L1 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000494 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-4-L2 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000499 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-4-L3 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000504 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-5-L1 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000495 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-5-L2 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000500 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83001-CEL-5-L3 | 6.6/0.415 kV Transformer / LV Switchgear | ONSHORE | C10000505 | CPX09 | 100 | 2024-11-23 | RFC 1 |
| 83002-CEC | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear | ONSHORE | C10002135 | CPX10 | 100 | 2024-11-22 | RFC 1 |
| 83003-CEC | Auxiliary Trafo 1,6 MVA / MV 6,6kV Switchgear | ONSHORE | C10003047 | CPX10 | 100 | 2024-11-22 | RFC 1 |
| 83004-CEC | 6.6/0.415 kV Transformer / 6.6KV HV Switchgear | ONSHORE | C10004375 | CPX10 | 100 | 2024-11-22 | RFC 1 |
| 83116-CEL | Lighting & Small Power DB BoP / Auxiliary Trafo 1,6MVA | ONSHORE | C10000635 | CPX09 | 100 | 2024-11-22 | RFC 1 |

CROSSWIND

ROSETTI MARINO

# Project CROSSWIND

STATUS INDEX DETAIL

Filtered on subsystem: 82-40 & process: MC & discipline : E

| Electrical | 82-40 Power Transformer 1.6 MVA (TR-200DE1) | | | | | | |
|---|---|---|---|---|---|---|---|
| ITEM | | TASK | | | | | |
| Code | Description | Location | Code | Form | Progress | Date | Certificate |
| TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | ONSHORE | C10000868 | CPX02 | 100 | 2024-09-13 | RFC 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L1 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD_B-100/LD |
| **TASK** | code | C10000476 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX08 HV Power Cable |

## CABLE DATA

Type CU/EPR/CTS/LSZH/CWB/LSZH  Cores/Size mm² 1X70 mm2  Color RED

From SG-100D1  To TR-200DE1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | OK |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | OK |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | OK |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L1 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD_B-100/LD | |
| **TASK** | code | C10000476 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX08 | HV Power Cable |

| | | | | |
|---|---|---|---|---|
| | **CONTINUITY TESTS** | | | |
| 1 | CORE CONTINUITY | 300 | mΩ | OK |
| 2 | SCREEN CONTINUITY | 300 | mΩ | OK |
| 3 | ARMOUR CONTINUITY | 300 | mΩ | OK |
| | **1st INSULATION TEST** | | | |
| | Voltage applied: | 500 | kV | |
| 4 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 5 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 6 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |
| | **HV TEST 15 min** | | | |
| | Voltage applied: | 1,5 | kV | |
| 7 | Ph1 / Ph2-Ph3-screen-armour-Earth : | 92 | µA | OK |
| 8 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | µA | |
| 9 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | µA | |
| | **2nd INSULATION TEST** | | | |
| | Voltage applied: | 500 | kV | |
| 10 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 11 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 12 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |
| | **RE-CONNECT TERMINATIONS** | | | |
| 13 | Tightening torque | | N.m | Note |

**TESTING INSTRUMENTS USED**

| | | | |
|---|---|---|---|
| TYPE / SERIAL N° | VOLCRAFT 1000V - ET-200 S/N:H240103023 | TYPE / SERIAL N° | Mod:HVA45 S/N:GH5219.16C010 |
| Calibration certificate N° and date: | N°LAT 042 00768/24 _ 12/10/2024 | Calibration certificate N° and date: | LAT04200772/24 _ 02.2024 |
| TYPE / SERIAL N° | Mod:KEW3125A S/N: W8330207 | TYPE / SERIAL N° | |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | |

Comments: Note HV TEST: See attached certificate and Test Report.
Note : Tightening torque will be done by the commissioning activity.



| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM(ROSETTI MARINO) | |
| **Name** | Michele Tartaglia | Giovanni Tangianu | |
| **Date** | 2025-04-15 | 2025-04-15 | |
| **Signature** | PROVERLIS Digitaly signed by Michele Tartaglia 2025-04-15T09:48:38.143Z | PROVERLIS Digitaly signed by Giovanni Tangianu 2025-04-15T10:46:36.302Z | |

# Base Load Power Hub (BLPH)

## Work Instruction – VLF Testing of Installed 6/10 kV Cables

Document Number: 123A90-PML-QHSE-WI-0001

Document Class: 2

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 0 | 01/04/2025 | Issue for Review | R.Degli Esposti | G. Tassinari | A.Iveson |
| Rev. | Date | Description | Prepared | Reviewed | Approved |

*This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy*

Revision / Change Log

| Rev. | Description |
|---|---|
| 0 | Issue for Review (IFR) |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

HOLDS LIST

| No. | Description |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

# Table of contents


1 Scope ..... 4

2 Applicable Standards ..... 4

3 Equipment Required ..... 4

4 Safety Precautions ..... 4

5 Procedure ..... 4



*This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy*

# 1 SCOPE

This work instruction describes the procedure for Very Low Frequency (VLF) withstand testing on installed 6/10 (12) kV cables in accordance with IEC 60502-2:2014, clause 20.3.1(c).

# 2 APPLICABLE STANDARDS

- IEC 60502-2:2014 – Power cables with extruded insulation from 6 kV to 30 kV

# 3 EQUIPMENT REQUIRED

- VLF test set capable of generating 18 kV RMS at 0.1 Hz
- Voltage and current monitoring equipment
- Grounding and discharge rods
- Insulation resistance tester (Megger)
- Safety barriers and warning signs

# 4 SAFETY PRECAUTIONS

- All personnel must be trained and authorized
- Area must be barricaded with proper warning signs
- Only test personnel shall remain inside the zone during testing
- Confirm absence of voltage and ensure cable is grounded before and after testing
- Issue of work permit

# 5 PROCEDURE

## 5.1 TEST VOLTAGE

With reference to the IEC 60502-2:2014, clause 20.3.1(c), according to the Engineering department's instruction, the VLF test voltage is based on the system operational voltage of 6.6 kV.

Therefore, the value of $U_0$ is derived as:

$U_0 = 6.6\ kV / \sqrt{3} \approx 3.81\ kV$

Following this interpretation, the VLF withstand test shall be performed using:

- Test Voltage: $3 \times U_0 = 3 \times 3.81 \approx 11.43$ kV RMS
- Frequency: 0.1 Hz
- Duration: 15 minutes

## 5.2 VISUALLY INSPECT THE CABLE AND TERMINATIONS.

Inspect the entire length of the cable, joints, and terminations for visible damage, proper preparation, cleanliness, and conformance with installation standards. Check that no mechanical stress, sharp bends, or contamination is present.

## 5.3 VERIFY CABLE IS PROPERLY IDENTIFIED AND TAGGED.

Confirm that the cable is correctly labeled according to project documentation. Identification tags should match drawing references and be securely attached.

### 5.4 PERFORM INSULATION RESISTANCE MEASUREMENT.

Use a calibrated insulation resistance tester (Megger) at 500V for 1 minute to measure the resistance between conductor(s) and earth. Record values and ensure they meet project or manufacturer's criteria prior to proceeding with VLF test.

### 5.5 PREPARE TERMINATIONS, ENSURING CLEANLINESS AND DRYNESS.

Remove any temporary protection, clean the terminations with approved cleaning agents, and ensure the surfaces are dry and free of debris or moisture. Verify correct assembly of stress control components.

### 5.6 CONNECT VLF TEST SET BETWEEN CONDUCTOR AND METALLIC SCREEN (EARTH).

Connect the high-voltage output of the VLF generator to the conductor under test. Connect the return path to the metallic screen or grounding system. Ensure all connections are secure and that the test equipment is rated for the test voltage.

### 5.7 APPLY 11.43 KV RMSAT 0.1 HZ FOR 15 MINUTES.

Gradually ramp up the voltage 11.43 kV RMS. Maintain the voltage for the full duration of 15 minutes while monitoring the test equipment for current, voltage stability, and signs of insulation failure.

### 5.8 MONITOR FOR BREAKDOWNS, DISCHARGES OR CURRENT SPIKES.

Visually observe the test set and cable terminations. Monitor the current for any sharp increases or instability, which may indicate partial discharges or breakdowns.

### 5.9 DISCHARGE AND GROUND CABLE AFTER TEST COMPLETION.

After the test, slowly decrease the voltage to zero. Use a grounding rod to safely discharge any residual voltage from the conductor before handling.

### 5.10 REPEAT POINT 5.4

### 5.11 DOCUMENT ALL RESULTS IN THE ATTACHED TEST REPORT.

Complete the test report form, including all pre-checks, insulation readings, test parameters, observations, and results. Sign and submit the document for recordkeeping.

# TEST REPORT

Cable Tag/ID: _____

Cable Type: _____

Voltage Rating: 6/10 kV

## 5.12 PRE-TEST CHECKLIST

☐ Cable properly tagged and identified

☐ Visual inspection of terminations completed

☐ Insulation resistance test performed

☐ Clean and dry termination surfaces

☐ Metallic screen continuity verified

Client representative present during inspection: Yes ☐/ No ☐

## 5.13 TEST DETAILS

Megger before test: ☐

Test Method: VLF – 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☐

Equipment Used: _____

Serial Number: _____

Operator: _____

## 5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☐

Breakdown occurred: Yes ☐/ No ☐

Final Result: PASS ☐/ FAIL ☐

NOTES: _____

_____

## 5.15 SIGNATURES

Tested by: _____ Signature: _____ Date: _____

Witnessed by: _____ Signature: _____ Date: _____

**82002-CEM-1-L1**
VLF Withstand Report
82002-CEM-1-L1 - Maintenance Test
Auto Test
Test finished successfully

## Report Information

| | |
|---|---|
| Date | 4/14/2025 15:04 PM |
| Company Name | ICS |
| Region | --- |
| Station | --- |
| Operator Name | RECHICHI |
| Work Order | --- |

## Device Under Test (Cable XLPE)

| | |
|---|---|
| Voltage Rating | 11.5 kV |
| Insulation | XLPE |
| Line Length | 80 Meter |
| Size | 1X70 |
| Phase | A |
| Manufacturer Name | --- |

## Equipment:

| | |
|---|---|
| HVA45 | GH5219.16C010 |

## Test Setup

| | |
|---|---|
| Test Purpose | Maintenance |
| Arc Management Mode | Trip out on Arc |

| # | Test Voltage | Waveform | Frequency | Duration |
|---|---|---|---|---|
| 1 | 11.5 kV• | Sine | 0.1 Hz (A) | 15 min |

## Measurements:

Test finished successfully

| # | Voltage | Current | Cap. | Res. | Frequency |
|---|---|---|---|---|---|
| 1 | 11.5 kV• | 92 µA• | 14.6 nF | 16 GΩ | 0.1 Hz |

•RMS value

# TEST REPORT

Cable Tag/ID: 82002-CEM-1-L1

Cable Type: 1x70 mm²

Voltage Rating: 6/10 kV

## 5.12 PRE-TEST CHECKLIST

☑ Cable properly tagged and identified

☑ Visual inspection of terminations completed

☑ Insulation resistance test performed

☑ Clean and dry termination surfaces

☑ Metallic screen continuity verified

Client representative present during inspection: Yes ☑/ No ☐

## 5.13 TEST DETAILS

Megger before test: ☑

Test Method: VLF – 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☑

Equipment Used: HVA45

Serial Number: QH 5219.16C010

Operator: FAUSTO RECHICHI

## 5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☑

Breakdown occurred: Yes ☐/ No ☑

Final Result: PASS ☑/ FAIL ☐

NOTES: _____

## 5.15 SIGNATURES

Tested by: FAUSTO RECHICHI Signature: _____ Date: 14/04/2025

Witnessed by: GIOVANNI TAURIANO Signature: _____ Date: 14/04/2025
DAVE MUSGROVE 14/04/2025

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L1 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD |
| **TASK** | code | C10000476 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX08 HV Power Cable |

## CABLE DATA

| | | | | | |
|---|---|---|---|---|---|
| Type | CU/EPR/CTS/LSZH/CWB/LSZH | Cores/Size mm² | 1X70 mm2 | Color | RED |
| From | SG-100D1 | To | TR-200DE1 | | |

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | PL |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | PL |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | PL |
| 10 | Check cable earthing against lastest drawings. | OK |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | PL |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L1 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD | |
| **TASK** | code | C10000476 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX08 | HV Power Cable |

## CONTINUITY TESTS

| | | | | |
|---|---|---|---|---|
| 1 | CORE CONTINUITY | 300 | mΩ | OK |
| 2 | SCREEN CONTINUITY | 300 | mΩ | OK |
| 3 | ARMOUR CONTINUITY | 300 | mΩ | OK |

## 1st INSULATION TEST

| | | | | |
|---|---|---|---|---|
| | Voltage applied: | 2500 | kV | |
| 4 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 5 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 6 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |

## HV TEST 15 min

| | | | | |
|---|---|---|---|---|
| | Voltage applied: | | kV | |
| 7 | Ph1 / Ph2-Ph3-screen-armour-Earth : | | µA | Note |
| 8 | Ph2 / Ph1-Ph3-screen-armour-Earth: | | µA | Note |
| 9 | Ph3 / Ph2-Ph1-screen-armour-Earth: | | µA | Note |

## 2nd INSULATION TEST

| | | | | |
|---|---|---|---|---|
| | Voltage applied: | 2500 | kV | |
| 10 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 11 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 12 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |

## RE-CONNECT TERMINATIONS

| | | | | |
|---|---|---|---|---|
| 13 | Tightening torque | | N.m | PL |

## TESTING INSTRUMENTS USED

| | | | |
|---|---|---|---|
| TYPE / SERIAL N° | Mod:KEW3125A S/N: W8330207 | TYPE / SERIAL N° | Mod:HVA45 S/N:GH5219.16C010 |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | LAT04200772/24 _ 02.2024 |
| TYPE / SERIAL N° | Mod:FLUKE 175 S/N:(AW1/018-17140769) | TYPE / SERIAL N° | |
| Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 | Calibration certificate N° and date: | |

Comments: Note: See attached certificate



| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-04 | 2024-11-20 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-04T17:03:48.084Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-20T13:58:24.124Z | |

**82002-CEM-1-L1**
VLF Diagnostic Report

Manual Test
Test finished successfully

## Report Information

| | |
|---|---|
| Date | 11/9/2024 3:01 PM |
| Company Name | ICS |
| Region | EMILIA ROMAGNA |
| Station | --- |
| Operator Name | RIELA |
| Work Order | MT-MISURE |

## Device Under Test (Cable XLPE)

| | |
|---|---|
| Voltage Rating | 10.0 kV |
| Insulation | XLPE |
| Line Length | 80 Meter |
| Size | 1X70 |
| Phase | C |
| Manufacturer Name | ICS |

## Equipment:

| | |
|---|---|
| HVA45TD | GH5219.16C010 |

## Test Setup

Arc Management Mode: Trip out on Arc

| # | first Voltage | Waveform | Frequency | Duration |
|---|---|---|---|---|
| 1 | 0.0 kV• | Sine | 0.1 Hz | 5 min |

Manual max. Voltage 10.1 kV

## Measurements:

Test finished successfully

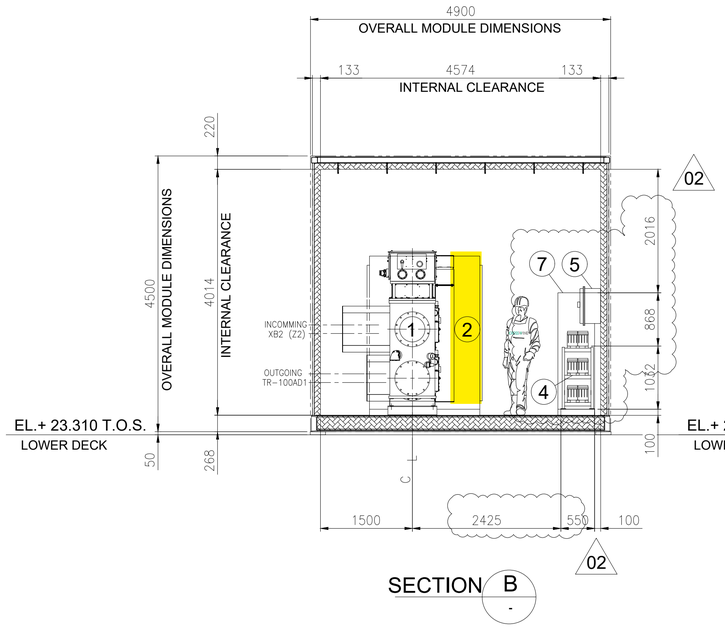
| # | Voltage | Current | Cap. | Res. | Frequency |
|---|---|---|---|---|---|
| 1 | 10.1 kV• | 70 µA• | 10.6 nF | 615 MΩ | 0.1 Hz |

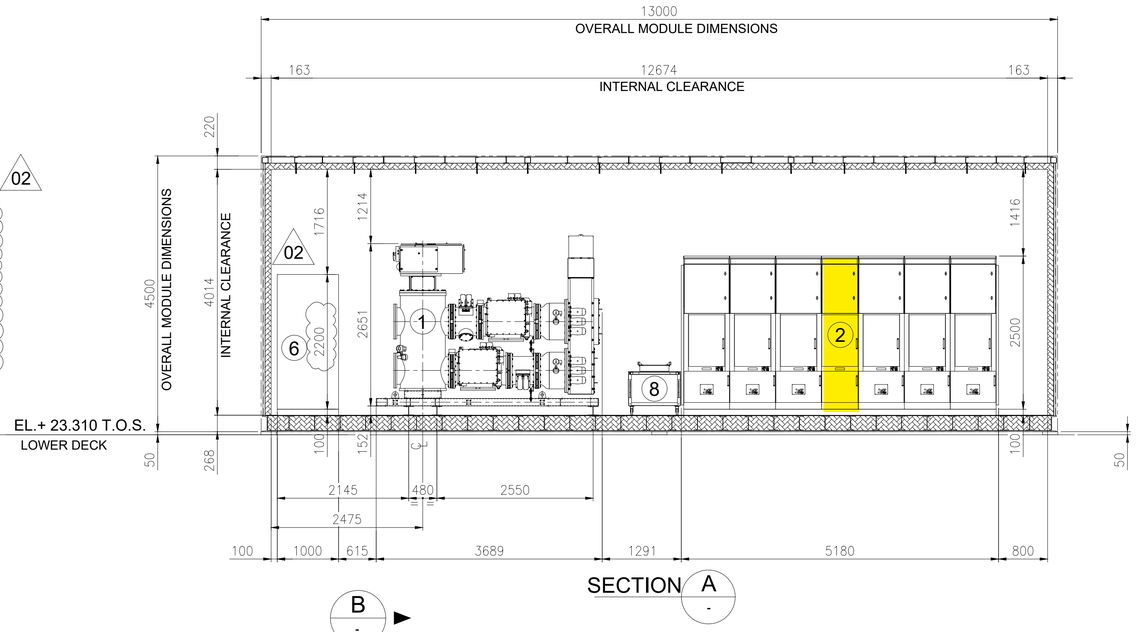
| # | Voltage | TD [E-3] | Std.Dev. [E-3] |
|---|---|---|---|
| 1 | 10.1 kV• | 250 | 0.47 |

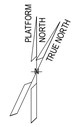
•RMS value

20/11/24
I.C.S. IMPIANTI
BONGIOVANNI CARMELO

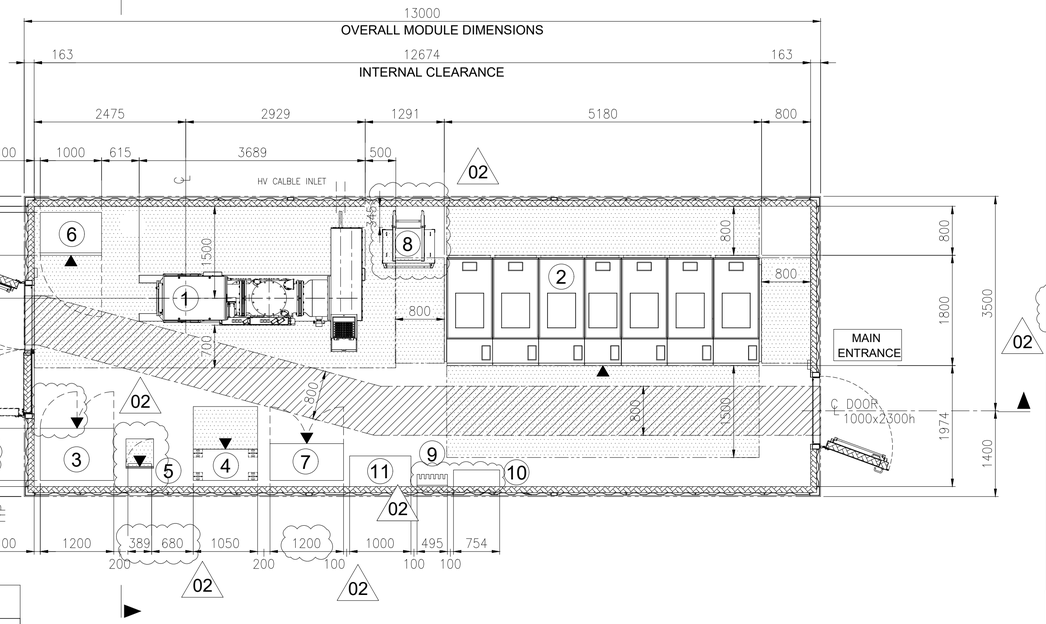
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02

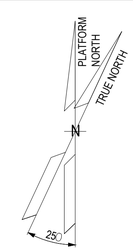


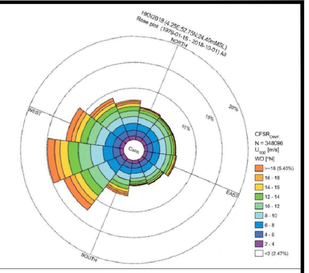




B -




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

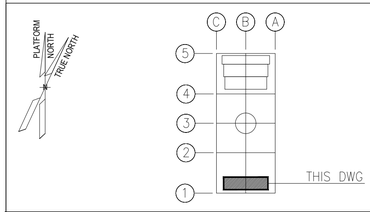
## LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| 66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING | 1723001595-EL-DA-00006 |
| CIRCUIT AND WIRING DIAGRAM | 1723001595-EL-DG-00015 |
| SG-100D1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00006 |
| DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00003 |
| DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00010 |
| B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00014 |

## KEY PLAN




## EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | HNA6-AFA70 | 66kV SWITCHGEAR (GIS) | 3689 | 2025 | 2651 | |
| 2 | SG-100D1 | 6.6kV SWITCHGEAR | 5180 | 1800 | 2500 | |
| 3 | UP-200F1 | DC UPS PANEL | 1200 | 850 | 2105 | |
| 4 | BA-200F1 | DC UPS BATTERY RACK | 1050 | 510 | 1272 | |
| 5 | CB-200F1 02 | ISOLATOR FOR DC UPS | 452 | 377 | 634 | |
| 6 | CP-100E1 | 66 kV SWITCHGEAR LOCAL CONTROL PANEL | 1000 | 700 | 2200 | 02 |
| 7 | B100-HSB-001 | DISTRIBUTION & HVAC PANEL - HV MV ROOM | 1200 | 600 | 1900 | |
| 8 | - | SERVICE TROLLEY FOR 6.6kV SWITCHGEAR | 943 | 862 | 874 | |
| 9 | - | TOOL BOX | 495 | 200 | 200 | |
| 10 | - | SUBSTATION LIFE SAVING & INTERVENTION KIT | 754 | 270 | 840 | |
| 11 | - | TABLE | 1000 | 500 | 750 | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20104**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 10/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

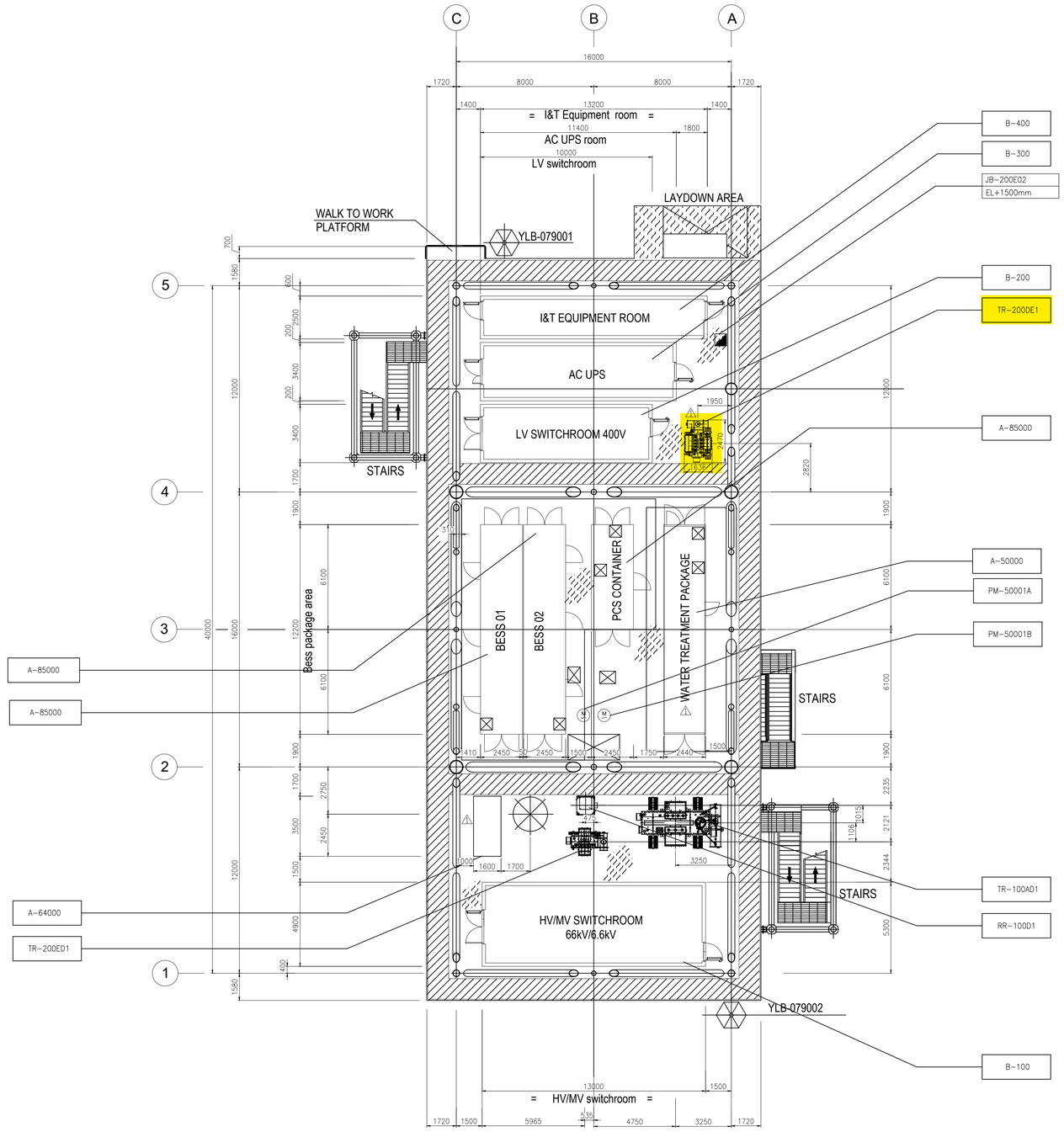
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN GPA | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20104 | SHEET 001 | REV. 02 |
|---|---|---|---|

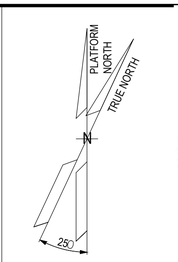
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

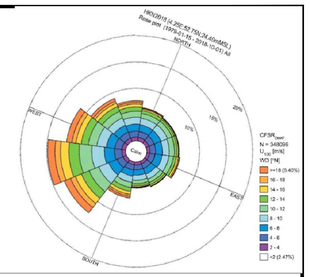
DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20101**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01 |

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

FROM

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

TAG COLUMN: A4

| | | | | |
|---|---|---|---|---|
| L1 | Arm. | BK | 82002-CEM-1-L1 1C X 70 mm² | 01 |
| L2 | | BK | 82002-CEM-1-L2 1C X 70 mm² | |
| L3 | | BK | 82002-CEM-1-L3 1C X 70 mm² | |

TAG COLUMN: A7

| | | | | |
|---|---|---|---|---|
| L1 | Arm. | BK | 82003-CEM-1-L1 1C X 70 mm² | 01 |
| L2 | | BK | 82003-CEM-1-L2 1C X 70 mm² | |
| L3 | | BK | 82003-CEM-1-L3 1C X 70 mm² | |

TAG COLUMN: A1

| | | | | |
|---|---|---|---|---|
| L1 | Arm. | BK | 82004-CEM-1-L1 1C X 150 mm² | 01 |
| L2 | | BK | 82004-CEM-1-L2 1C X 150 mm² | |
| L3 | | BK | 82004-CEM-1-L3 1C X 150 mm² | |

TAG COLUMN: A3

| | | | | |
|---|---|---|---|---|
| L1 | Arm. | BK | 82005-CEM-1-L1 1C X 70 mm² | 01 |
| L2 | | BK | 82005-CEM-1-L2 1C X 70 mm² | |
| L3 | | BK | 82005-CEM-1-L3 1C X 70 mm² | |

TAG COLUMN: A2

| | | | | |
|---|---|---|---|---|
| L1 | Arm. | BK | 82006-CEM-1-L1 1C X 70 mm² | 01 |
| L2 | | BK | 82006-CEM-1-L2 1C X 70 mm² | |
| L3 | | BK | 82006-CEM-1-L3 1C X 70 mm² | |

TO

DESCRIPTION: 6.6/0.42 KV, 1.6MVA TRANSFORMER
TAG NUMBER: TR-200DE1

| | | | | |
|---|---|---|---|---|
| BK | Arm. | 1U | | 01 |
| BK | | 1V | HV TERMINAL BOX OF TR-200DE1 | |
| BK | | 1W | | |

DESCRIPTION: 6.6/0.4 KV, 1.25MVA TRANSFORMER
TAG NUMBER: TA30

| | | | |
|---|---|---|---|
| BK | Arm. | 1U | |
| BK | | 1V | HV TERMINAL BOX OF TA30 |
| BK | | 1W | |

DESCRIPTION: 6.6/0.4/0.4 KV, 3.15MVA TRANSFORMER
TAG NUMBER: T4

| | | | |
|---|---|---|---|
| BK | Arm. | 1U | |
| BK | | 1V | HV TERMINAL BOX OF T4 |
| BK | | 1W | |

DESCRIPTION: 6.6/0.62 KV, 1.25MVA TRANSFORMER
TAG NUMBER: 18T1

| | | | |
|---|---|---|---|
| BK | Arm. | 1U | |
| BK | | 1V | HV TERMINAL BOX OF 18T1 |
| BK | | 1W | |

DESCRIPTION: 6.6/0.8 KV, 0.5MVA TRANSFORMER
TAG NUMBER: TR-200ED1

| | | | |
|---|---|---|---|
| BK | Arm. | 1U | |
| BK | | 1V | HV TERMINAL BOX OF TR-200ED1 |
| BK | | 1W | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

**ROSETTI MARINO SpA**

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6KV HV SWITCHGEAR

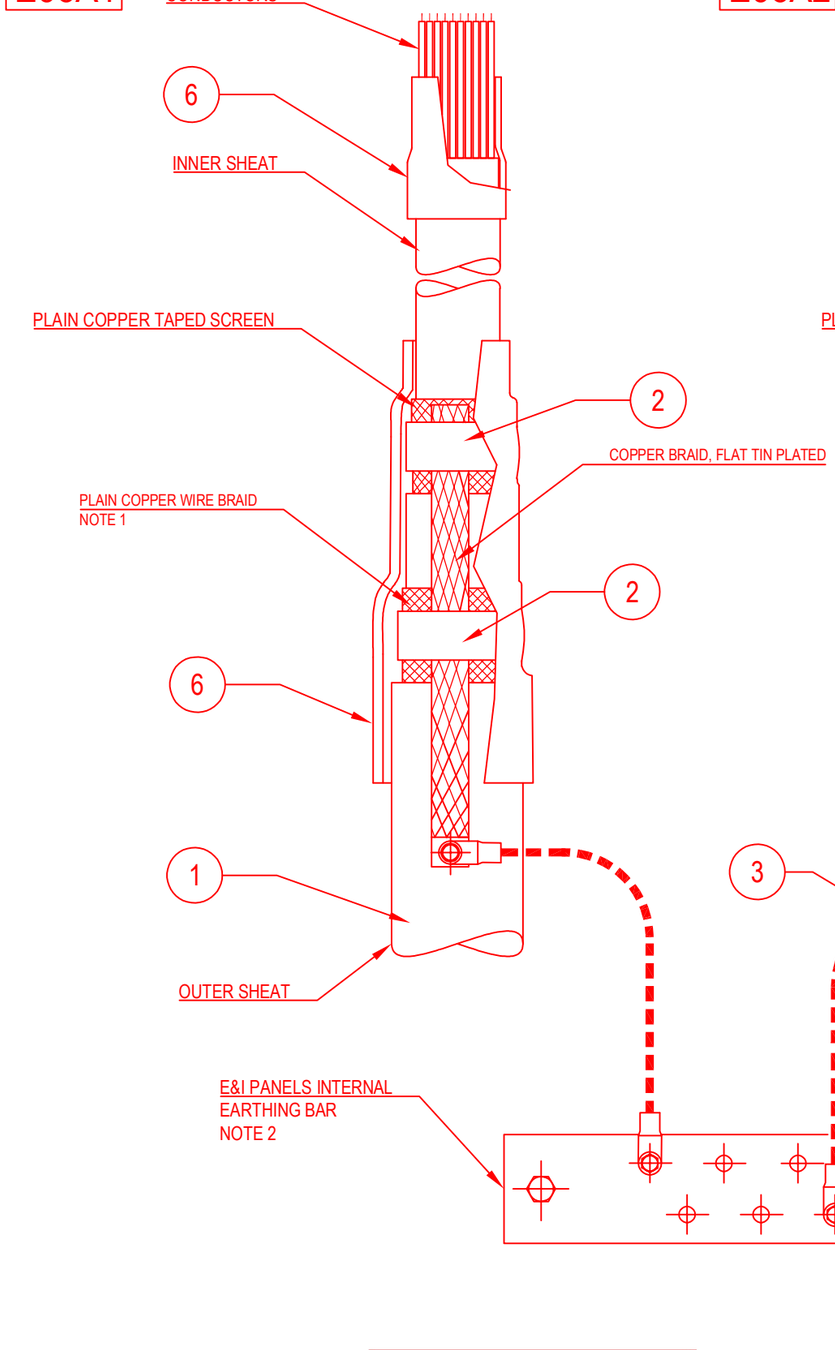
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 016 | REV. 01

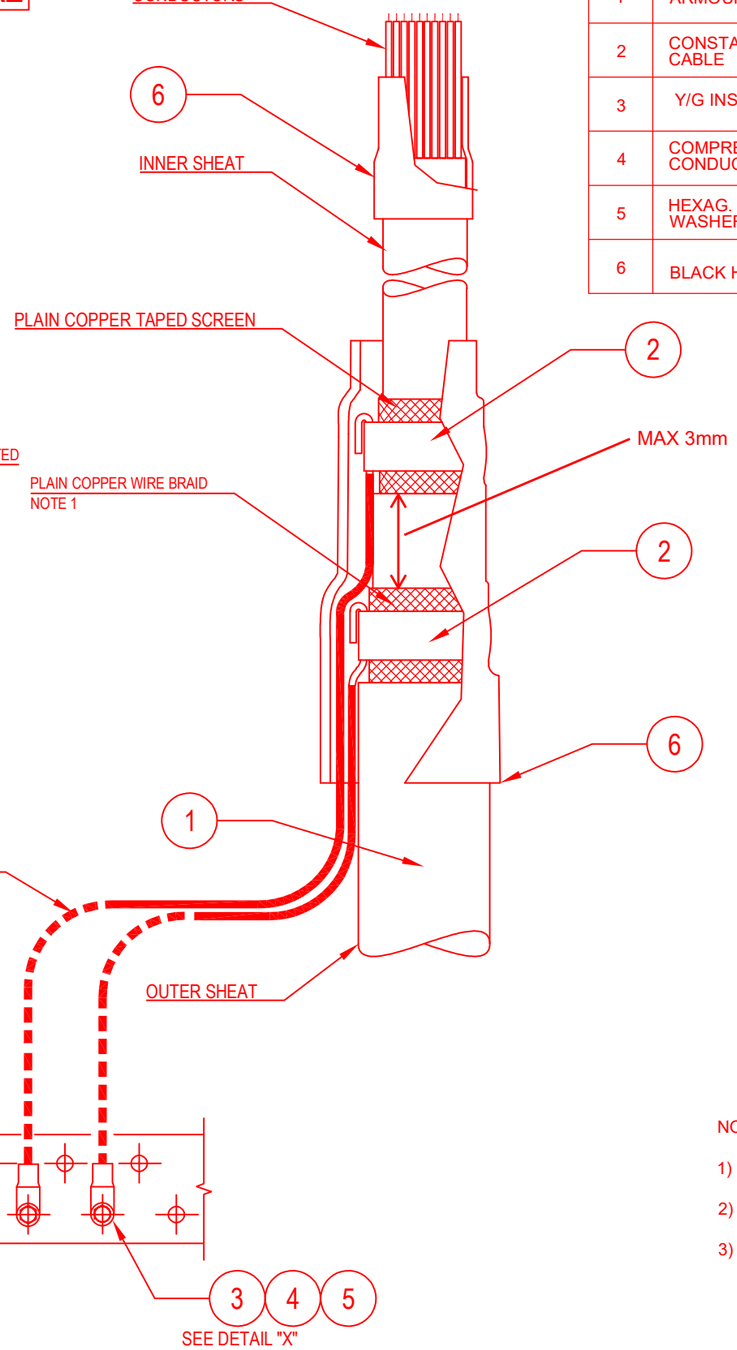
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

## E06A1

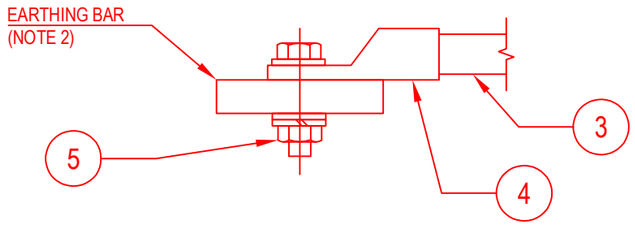



## E06A2




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | ARMOURED CABLE | | | | |
| 2 | CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE | AISI 316L | | | |
| 3 | Y/G INSULATING COPPER CONDUCTOR | COPPER | $16mm^2$ | | |
| 4 | COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR | TINNED COPPER | $16mm^2$ | | |
| 5 | HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT | AISI 316L | M8X30 | | |
| 6 | BLACK HEAT SHRINKABLE SLEEVE | | | | |

## DETAIL "X"




NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DD-20090**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_G | 25/10/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 26/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 10/06/24 | SPS | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

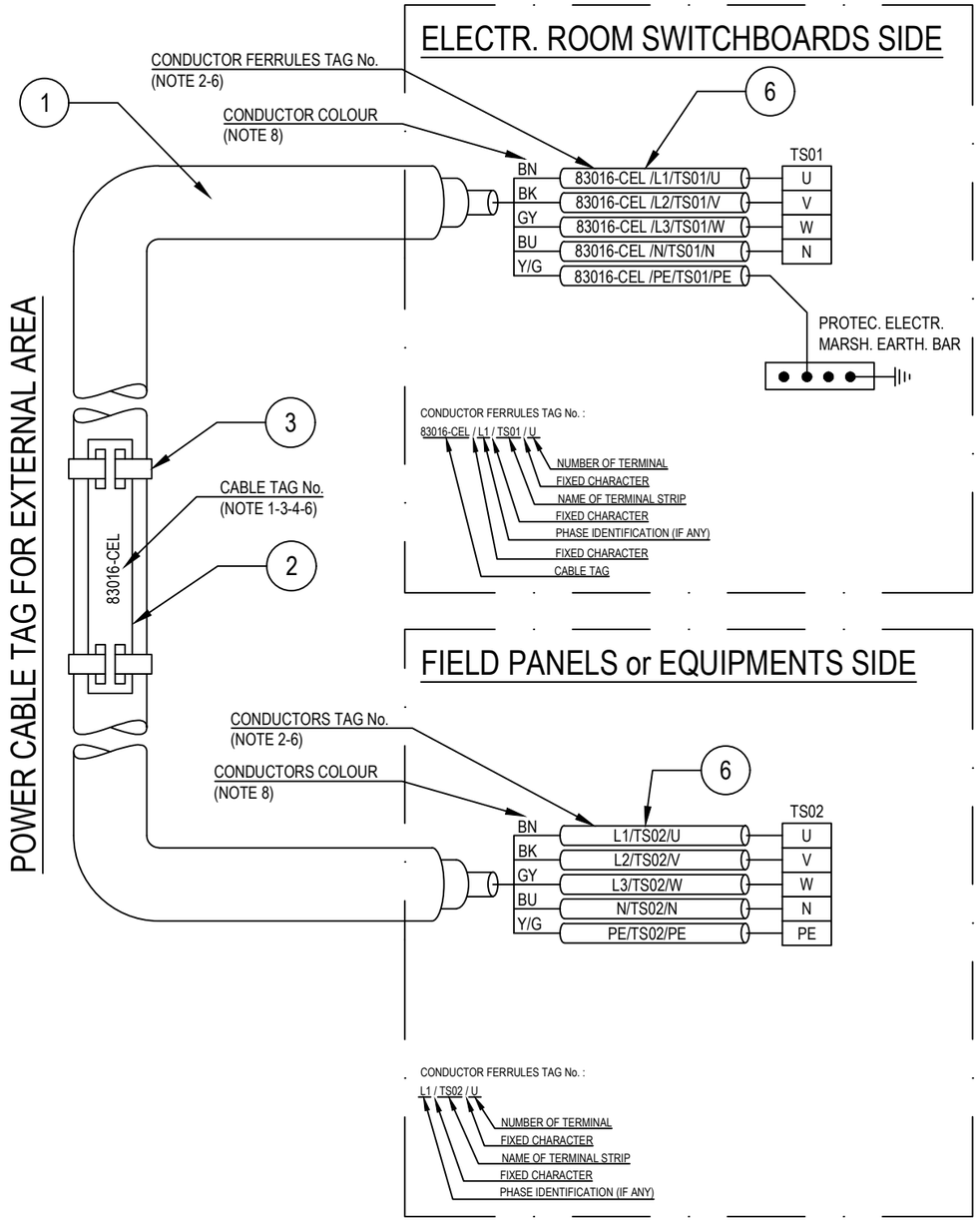
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20090 RLMU MV CABLES.DWG

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

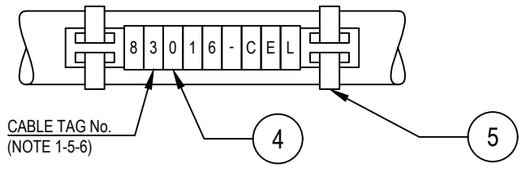
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 82002-CEM-1-L1 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | SG-100D1 | MV 6,6kV Switchgear | Lower Deck (B-100) | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | ELECV36-1X70 | Cable CU/EPR/CTS/LSZH/CWB/LSZH 6/10kV 1x70mm²- Red | M40 | n.a. | | | T2_M40_Double | | | | L-150-101-MVT-013 / L-600-101-MVT-008 / L-600-101-MVT-009 / E-MCT-103 / L-450-101-MVT-004 / L-300-101-MVT-002 |

| CROSSWIND | HOLLANDSE KUST NOORD WIND PARK Project<br>Contract No. CW-I-WP4-2023-05 | ROSETTI MARINO |
|---|---|---|
| | | Sh: 9 of 35 |
| Document Title: | Technical Data Sheet (TDS) for Electrical Power and Control Cables | Date: 31/07/2024 |
| | | Rev.: 01 |

TITLE

**DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)**

## ELECTRICAL SYSTEM CHARACTERISTIC

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| OPERATING VOLTAGE | 6,6 | kVac | ± | 5 | % | | |
| FREQUENCE | 50 | Hz | ± | 2 | % | | |
| NEUTRAL SYSTEM | ☐ | EARTHED | | | | ☐ | INSULATED |
| | ☑ | EARTHED BY RESISTANCE | | | | ☐ | |
| EXPOSITION OF LIGHTNING OVER VOLTAGE | | | | | | ☐ NO | ☑ YES |

PROJECT SPECIFICATION: 123A90-DDL-EL-SP-20057

## CABLE CHARACTERISTIC

| | | | |
|---|---|---|---|
| GENERAL CHARACT | REFERENCE STD | FOR CONSTRUCTION AND TEST | IEC 60092-350 |
| | | FOR SPECIAL CHARACTERISTIC | **IEC-60754-1, IEC-60332-1-2** |
| | | | **IEC-61034-2** |

RATED VOLTAGE (Uo/U): 3.6/6(7.2) kV

MAX. OPERATING TEMPERATURE 90 °C TEMP.SHORT CIRCUIT TEMPERATURE 250 °C

POWER FREQUENCY TEST VOLTAGE/IMPULSE WITHSTAND VOLTAGE (Up): (AS PER IEC) 21 kV

COEFFICIEN. K: - FOR CONDUCTOR 143 A $\sqrt{s}$ /mm$^2$

- FOR SCREEN OR METAL SHEATS 115 A $\sqrt{s}$ /mm$^2$

| | | | | |
|---|---|---|---|---|
| SPECIAL CHARACT. | ☐ HYDROCARBON RESISTANCE | ☐ NON PROPAGATING FIRE | ☐ FIRE RESISTANCE | |
| | ☐ BUNCHED CABLES NON PROPAGATING FIRE : TOT. Q.TY OF COMBUSTIBLE MATERIAL | | | kg/m |
| | ☐ LOW CORROSIVE GAS EMISSION | ☐ % HCl ≤ 0,3 | ☐ % HCl = | |
| | ☐ LOW TOXIC GAS EMISSION (T INDEX) | ☐ T ≤ 2 | ☐ T= | |
| | ☑ LOW SMOKE EMISION (OPTICAL DENSITY) | ☐ D ≤ 1,5 | ☐ D= | |
| | ☐ U.V. RESISTANT | ☑ HALOGEN FREE COMPOUND | ☑ FLAME RETARDANT | |

| | |
|---|---|
| INSTALL. SPECIAL CONDITION | CABLE LADDER, TREFOIL FORMATION |
| ACCESS. | |

NOTES:

| CROSSWIND | HOLLANDSE KUST NOORD WIND PARK Project<br>Contract No. CW-I-WP4-2023-05 | ROSETTI MARINO<br>Sh: 10 of 35 |
|---|---|---|
| Document Title: | Technical Data Sheet (TDS) for Electrical Power and Control Cables | Date: 31/07/2024<br>Rev.: 01 |

TITLE

**DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)**

## MATERIALS

| | |
|---|---|
| GENERAL DATA | REF.STD N.: IEC 60092-350 |
| CONDUCTOR | MATERIAL: ☑ Cu ☐ Al ☐ Tinned Cu<br>CLASS (1): ☑ CLASS 2 ☐ CLASS 5 (F) ☐ CLASS 6 (H) |
| INSULATION | MATERIAL: EPR |
| SEMI-CONDUCTOR LAYER | ☑ FORESEEN AS PER IEC 60092-350<br>MATERIAL: HF EXTRUDED COMPOUND |
| SCREENS | ☑ FORESEEN AS PER IEC 60092-350<br>MATERIAL: Plain Copper Taped Screen |
| ARMOUR | ☑ REQUIRED TYPE:<br>MATERIAL: Plain Copper Wire Braid |
| OUTER SHEATING | MATERIAL: SHF1 to IEC 60093.360 |
| COMPONENTS AND SPECIAL CONSTR. | |

NOTE: (1) CLASS 1 : SOLID CONDUCOR - (U).
CLASS 2 : STRANDARD CONDUCTOR: CIRCULAR -R-, SHAPED -S-
CLASS 5 : FLEXIBLE CONDUCTOR - (F).
CLASS 6 : HIGHLY FLEXIBLE CONDUCTOR - (H) o (FF).

| CROSSWIND | HOLLANDSE KUST NOORD WIND PARK Project<br>Contract No. CW-I-WP4-2023-05 | ROSETTI MARINO<br>Sh: 11 of 35 |
|---|---|---|
| Document Title: | Technical Data Sheet (TDS) for Electrical Power and Control Cables | Date: 31/07/2024<br>Rev.: 01 |

TITLE

**DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | **CONSTRUCTIVE DATA** | | | | | | |
| 2 | | | | | | | |
| 3 | MR TAG / PART NUMBER | | | Note-3 | Note-3 | | |
| 4 | n° x NOMINAL AREA OF CONDUCTORS | | N.xmm$^2$ | 1Cx70 | 1Cx150 | | |
| 5 | n° AND DIAMETER OF WIRES IN EACH CONDUCTOR | | N.xmm | 352x0,52 | 776X0,51 | | |
| 6 | CONDUCTOR CLASS (2) | | | 2 | 2 | | |
| 7 | RATED CURRENT IN AIR AT 30° | | A | 285 | 460 | | |
| 8 | RATED CURRENT IN GROUND AT 20° | | A | 272 | 416 | | |
| 9 | | | | | | | |
| 10 | A.C. PHASES RESISTANCE AT THE MAX OP. TEMP. | | Ω/km | 0,345 | 0,163 | | |
| 11 | PHASE REACTANCE AT 50 Hz | | Ω/km | 0,110 | 0,097 | | |
| 12 | MINIMUM INSULATION RESISTANCE AT 20° | | MΩ/km | 745 | 567 | | |
| 13 | PHASE CAPACITY | | µF/km | 0,301 | 0,396 | | |
| 14 | | | | | | | |
| 15 | MINIMUM ORDER Q.TY | | m | TBD | TBD | | |
| 16 | MAX LENGHT OF DRUMS | | m | TBD | TBD | | |
| 17 | DIAMETERS | BARE CONDUCTOR | mm | 10 | 14,3 | | |
| 18 | | CORE (INSULATED CORE) | mm | 19,6 | 24 | | |
| 19 | | UNDER ARMOUR | mm | 23,6 | 28,3 | | |
| 20 | | ARMOUR OR CONCENTRIC CONDUCTOR | mm | 24,8 | 29,5 | | |
| 21 | | | | | | | |
| 22 | | | | | | | |
| 23 | | OVERALL | mm | 29 | 34 | | |
| 24 | MASSES | CONDUCTORS | kg/km | 640 | 1350 | | |
| 25 | | INSULATION | kg/km | 290 | 410 | | |
| 26 | | INNER COVERING | kg/km | 180 | 220 | | |
| 27 | | ARMOUR OR CONCENTRIC CONDUCTOR | kg/km | 220 | 250 | | |
| 28 | | OUTER SHEATING | kg/km | 280 | 350 | | |
| 29 | | | | | | | |
| 30 | | TOTAL | kg/km | 1610 | 2580 | | |
| 31 | EXTERNAL COLOUR | | | RED | RED | | |
| 32 | CORE IDENTIFICATION (1) | | | NATURAL | NATURAL | | |
| 33 | | | | | | | |
| 34 | | | | | | | |
| 35 | | | | | | | |
| 36 | | | | | | | |
| 37 | | | | | | | |
| 38 | | | | | | | |

39

40 NOTE: (1) BK=BLACK, BN=BROWN, GY=GRAY, BU=BLUE, RD=RED, Y/G=YELLOW/GREEN

41 (*) TO BE FILLED BY VENDOR

42 NA NOT APPLICABLE

43

44

45

46

47

48

49

50

51

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L2 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD_B-100/LD |
| **TASK** | code | C10000477 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX08 HV Power Cable |

## CABLE DATA

Type CU/EPR/CTS/LSZH/CWB/LSZH  Cores/Size mm² 1X70 mm2  Color RED

From SG-100D1  To TR-200DE1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | OK |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | OK |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | OK |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L2 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | Dwg | 123A90-DDL-EL-LIS-20148 | | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | Module | LD_B-100/LD | | |
| **TASK** | code | C10000477 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form CPX08 | HV Power Cable |

| | | | | |
|---|---|---|---|---|
| | **CONTINUITY TESTS** | | | |
| 1 | CORE CONTINUITY | 300 | mΩ | OK |
| 2 | SCREEN CONTINUITY | 300 | mΩ | OK |
| 3 | ARMOUR CONTINUITY | 300 | mΩ | OK |
| | **1st INSULATION TEST** | | | |
| | Voltage applied: | 500 | kV | |
| 4 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 5 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 6 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |
| | **HV TEST 15 min** | | | |
| | Voltage applied: | 1,5 | kV | |
| 7 | Ph1 / Ph2-Ph3-screen-armour-Earth : | 106 | µA | OK |
| 8 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | µA | |
| 9 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | µA | |
| | **2nd INSULATION TEST** | | | |
| | Voltage applied: | 500 | kV | |
| 10 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 11 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 12 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |
| | **RE-CONNECT TERMINATIONS** | | | |
| 13 | Tightening torque | | N.m | Note |

**TESTING INSTRUMENTS USED**

| | | | |
|---|---|---|---|
| TYPE / SERIAL N° | VOLCRAFT 1000V - ET-200 S/N:H240103023 | TYPE / SERIAL N° | N°7722/24 _ 10/07/2024 |
| Calibration certificate N° and date: | N°LAT 042 00768/24 _ 12/10/2024 | Calibration certificate N° and date: | LAT04200772/24 _ 02.2024 |
| TYPE / SERIAL N° | Mod:KEW3125A S/N: W8330207 | TYPE / SERIAL N° | |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | |

Comments: Note HV TEST: See attached certificate and Test Report.
Note : Tightening torque will be done by the commissioning activity.



| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM(ROSETTI MARINO) | |
| **Name** | Michele Tartaglia | Giovanni Tangianu | |
| **Date** | 2025-04-15 | 2025-04-15 | |
| **Signature** | PROVERLIS Digitaly signed by Michele Tartaglia 2025-04-15T09:48:52.730Z | PROVERLIS Digitaly signed by Giovanni Tangianu 2025-04-15T10:47:54.451Z | |

# Base Load Power Hub (BLPH)

## Work Instruction – VLF Testing of Installed 6/10 kV Cables

Document Number: 123A90-PML-QHSE-WI-0001

Document Class: 2

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 0 | 01/04/2025 | Issue for Review | R.Degli Esposti | G. Tassinari | A.Iveson |
| Rev. | Date | Description | Prepared | Reviewed | Approved |

*This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy*

Revision / Change Log

| Rev. | Description |
|---|---|
| 0 | Issue for Review (IFR) |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

HOLDS LIST

| No. | Description |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

# Table of contents


1 Scope ..... 4

2 Applicable Standards ..... 4

3 Equipment Required ..... 4

4 Safety Precautions ..... 4

5 Procedure ..... 4



*This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy*

# 1 SCOPE

This work instruction describes the procedure for Very Low Frequency (VLF) withstand testing on installed 6/10 (12) kV cables in accordance with IEC 60502-2:2014, clause 20.3.1(c).

# 2 APPLICABLE STANDARDS

- IEC 60502-2:2014 – Power cables with extruded insulation from 6 kV to 30 kV

# 3 EQUIPMENT REQUIRED

- VLF test set capable of generating 18 kV RMS at 0.1 Hz
- Voltage and current monitoring equipment
- Grounding and discharge rods
- Insulation resistance tester (Megger)
- Safety barriers and warning signs

# 4 SAFETY PRECAUTIONS

- All personnel must be trained and authorized
- Area must be barricaded with proper warning signs
- Only test personnel shall remain inside the zone during testing
- Confirm absence of voltage and ensure cable is grounded before and after testing
- Issue of work permit

# 5 PROCEDURE

## 5.1 TEST VOLTAGE

With reference to the IEC 60502-2:2014, clause 20.3.1(c), according to the Engineering department's instruction, the VLF test voltage is based on the system operational voltage of 6.6 kV.

Therefore, the value of $U_0$ is derived as:

$U_0 = 6.6\ kV / \sqrt{3} \approx 3.81\ kV$

Following this interpretation, the VLF withstand test shall be performed using:

- Test Voltage: $3 \times U_0 = 3 \times 3.81 \approx 11.43$ kV RMS
- Frequency: 0.1 Hz
- Duration: 15 minutes

## 5.2 VISUALLY INSPECT THE CABLE AND TERMINATIONS.

Inspect the entire length of the cable, joints, and terminations for visible damage, proper preparation, cleanliness, and conformance with installation standards. Check that no mechanical stress, sharp bends, or contamination is present.

## 5.3 VERIFY CABLE IS PROPERLY IDENTIFIED AND TAGGED.

Confirm that the cable is correctly labeled according to project documentation. Identification tags should match drawing references and be securely attached.

### 5.4 PERFORM INSULATION RESISTANCE MEASUREMENT.

Use a calibrated insulation resistance tester (Megger) at 500V for 1 minute to measure the resistance between conductor(s) and earth. Record values and ensure they meet project or manufacturer's criteria prior to proceeding with VLF test.

### 5.5 PREPARE TERMINATIONS, ENSURING CLEANLINESS AND DRYNESS.

Remove any temporary protection, clean the terminations with approved cleaning agents, and ensure the surfaces are dry and free of debris or moisture. Verify correct assembly of stress control components.

### 5.6 CONNECT VLF TEST SET BETWEEN CONDUCTOR AND METALLIC SCREEN (EARTH).

Connect the high-voltage output of the VLF generator to the conductor under test. Connect the return path to the metallic screen or grounding system. Ensure all connections are secure and that the test equipment is rated for the test voltage.

### 5.7 APPLY 11.43 KV RMSAT 0.1 HZ FOR 15 MINUTES.

Gradually ramp up the voltage 11.43 kV RMS. Maintain the voltage for the full duration of 15 minutes while monitoring the test equipment for current, voltage stability, and signs of insulation failure.

### 5.8 MONITOR FOR BREAKDOWNS, DISCHARGES OR CURRENT SPIKES.

Visually observe the test set and cable terminations. Monitor the current for any sharp increases or instability, which may indicate partial discharges or breakdowns.

### 5.9 DISCHARGE AND GROUND CABLE AFTER TEST COMPLETION.

After the test, slowly decrease the voltage to zero. Use a grounding rod to safely discharge any residual voltage from the conductor before handling.

### 5.10 REPEAT POINT 5.4

### 5.11 DOCUMENT ALL RESULTS IN THE ATTACHED TEST REPORT.

Complete the test report form, including all pre-checks, insulation readings, test parameters, observations, and results. Sign and submit the document for recordkeeping.

# TEST REPORT

Cable Tag/ID: _____

Cable Type: _____

Voltage Rating: 6/10 kV

## 5.12 PRE-TEST CHECKLIST

☐ Cable properly tagged and identified

☐ Visual inspection of terminations completed

☐ Insulation resistance test performed

☐ Clean and dry termination surfaces

☐ Metallic screen continuity verified

Client representative present during inspection: Yes ☐/ No ☐

## 5.13 TEST DETAILS

Megger before test: ☐

Test Method: VLF – 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☐

Equipment Used: _____

Serial Number: _____

Operator: _____

## 5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☐

Breakdown occurred: Yes ☐/ No ☐

Final Result: PASS ☐/ FAIL ☐

NOTES: _____

_____

## 5.15 SIGNATURES

Tested by: _____ Signature: _____ Date: _____

Witnessed by: _____ Signature: _____ Date: _____

# 82002-CEM-1-L2

VLF Withstand Report

82002-CEM-1-L2 - Maintenance Test

Auto Test

Test finished successfully

## Report Information

| | |
|---|---|
| Date | 4/14/2025 15:30 PM |
| Company Name | ICS |
| Region | --- |
| Station | --- |
| Operator Name | RECHICHI |
| Work Order | --- |

## Device Under Test (Cable XLPE)

| | |
|---|---|
| Voltage Rating | 11.5 kV |
| Insulation | XLPE |
| Line Length | 80 Meter |
| Size | 1X70 |
| Phase | B |
| Manufacturer Name | --- |

## Equipment:

| | |
|---|---|
| HVA45 | GH5219.16C010 |

## Test Setup

| | |
|---|---|
| Test Purpose | Maintenance |
| Arc Management Mode | Trip out on Arc |

| # | Test Voltage | Waveform | Frequency | Duration |
|---|---|---|---|---|
| 1 | 11.5 kV• | Sine | 0.1 Hz (A) | 15 min |

## Measurements:

Test finished successfully

| # | Voltage | Current | Cap. | Res. | Frequency |
|---|---|---|---|---|---|
| 1 | 11.5 kV• | 106 µA• | 14.7 nF | 12 GΩ | 0.1 Hz |

•RMS value

## TEST REPORT

Cable Tag/ID: 82002-CEM-1-L2

Cable Type: 1x70 mm²

Voltage Rating: 6/10 kV

### 5.12 PRE-TEST CHECKLIST

☑ Cable properly tagged and identified

☑ Visual inspection of terminations completed

☑ Insulation resistance test performed

☑ Clean and dry termination surfaces

☑ Metallic screen continuity verified

Client representative present during inspection: Yes ☑/ No ☐

### 5.13 TEST DETAILS

Megger before test: ☑

Test Method: VLF – 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☑

Equipment Used: HVA 45

Serial Number: GH. 5219, 16 C 010

Operator: FAUSTO RECHICHI

### 5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☑

Breakdown occurred: Yes ☐/ No ☑

Final Result: PASS ☑/ FAIL ☐

NOTES: _____

### 5.15 SIGNATURES

Tested by: FAUSTO RECHICHI Signature: _____ Date: 14-04/2025

Witnessed by: GIOVANNI TANRIAN Signature: _____ Date: 14/04/2025
DAVE MUSGROVE 14/04/2025

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L2 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD |
| **TASK** | code | C10000477 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX08 HV Power Cable |

## CABLE DATA

Type CU/EPR/CTS/LSZH/CWB/LSZH  Cores/Size mm² 1X70 mm2  Color RED

From SG-100D1  To TR-200DE1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | Note |
| 10 | Check cable earthing against lastest drawings. | OK |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | Note |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L2 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD | |
| **TASK** | code | C10000477 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX08 | HV Power Cable |

## CONTINUITY TESTS

| | | | | |
|---|---|---|---|---|
| 1 | CORE CONTINUITY | 300 | mΩ | OK |
| 2 | SCREEN CONTINUITY | 300 | mΩ | OK |
| 3 | ARMOUR CONTINUITY | 300 | mΩ | OK |

## 1st INSULATION TEST

| | | | | |
|---|---|---|---|---|
| | Voltage applied: | 2500 | kV | |
| 4 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 5 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 6 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |

## HV TEST 15 min

| | | | | |
|---|---|---|---|---|
| | Voltage applied: | | kV | |
| 7 | Ph1 / Ph2-Ph3-screen-armour-Earth : | | µA | Note |
| 8 | Ph2 / Ph1-Ph3-screen-armour-Earth: | | µA | Note |
| 9 | Ph3 / Ph2-Ph1-screen-armour-Earth: | | µA | Note |

## 2nd INSULATION TEST

| | | | | |
|---|---|---|---|---|
| | Voltage applied: | 2500 | kV | |
| 10 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 11 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 12 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |

## RE-CONNECT TERMINATIONS

| | | | | |
|---|---|---|---|---|
| 13 | Tightening torque | | N.m | PL |

## TESTING INSTRUMENTS USED

| | | | |
|---|---|---|---|
| TYPE / SERIAL N° | Mod:KEW3125A S/N: W8330207 | TYPE / SERIAL N° | Mod:HVA45 S/N:GH5219.16C010 |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | LAT04200772/24 _ 02.2024 |
| TYPE / SERIAL N° | Mod:FLUKE 175 S/N:(AW1/018-17140769) | TYPE / SERIAL N° | |
| Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 | Calibration certificate N° and date: | |

Comments:

Note 4: refer to PL n° C30000652
Note 8: refer to PL n° C30000651
Note 9: refer to PL n° C30000650
Note 12: refer to PL n° C30000649
Note 13: refer to PL n° C30000649

Note HV TEST: See attached certificate



| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-04 | 2024-11-20 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-04T17:04:00.348Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-20T14:28:06.467Z | |

**82002-CEM-1-L2**
VLF Withstand Report
82002-CEM-1-L3 - Maintenance Test
Auto Test
Test finished successfully

## Report Information

| | |
|---|---|
| Date | 11/9/2024 2:49 PM |
| Company Name | ICS |
| Region | EMILIA ROMAGNA |
| Station | --- |
| Operator Name | RIELA |
| Work Order | MT-MISURE |

## Device Under Test (Cable XLPE)

| | |
|---|---|
| Voltage Rating | 10.0 kV |
| Insulation | XLPE |
| Line Length | 80 Meter |
| Size | 1X70 |
| Phase | B |
| Manufacturer Name | ICS |

## Equipment:

| | |
|---|---|
| HVA45 | GH5219.16C010 |

## Test Setup

| | |
|---|---|
| Test Purpose | Maintenance |
| Arc Management Mode | Trip out on Arc |

| # | Test Voltage | Waveform | Frequency | Duration |
|---|---|---|---|---|
| 1 | 10.0 kV• | Sine | 0.1 Hz (A) | 5 min |

## Measurements:

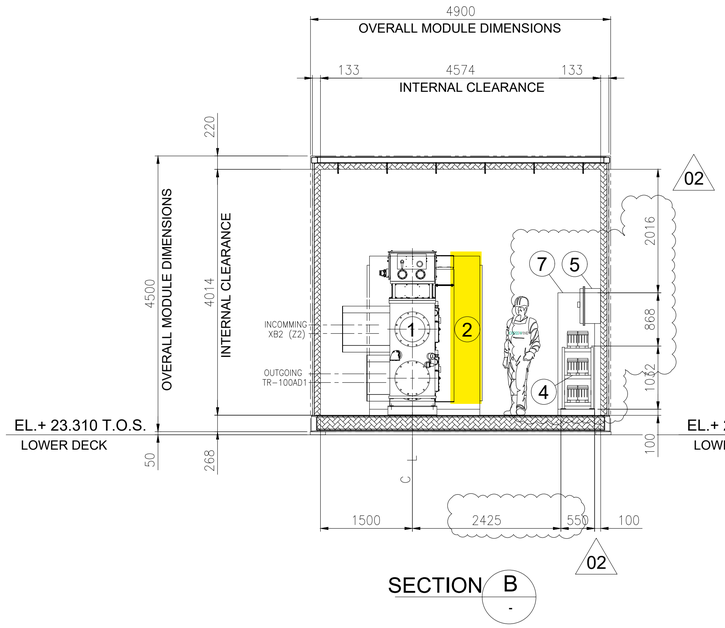
Test finished successfully

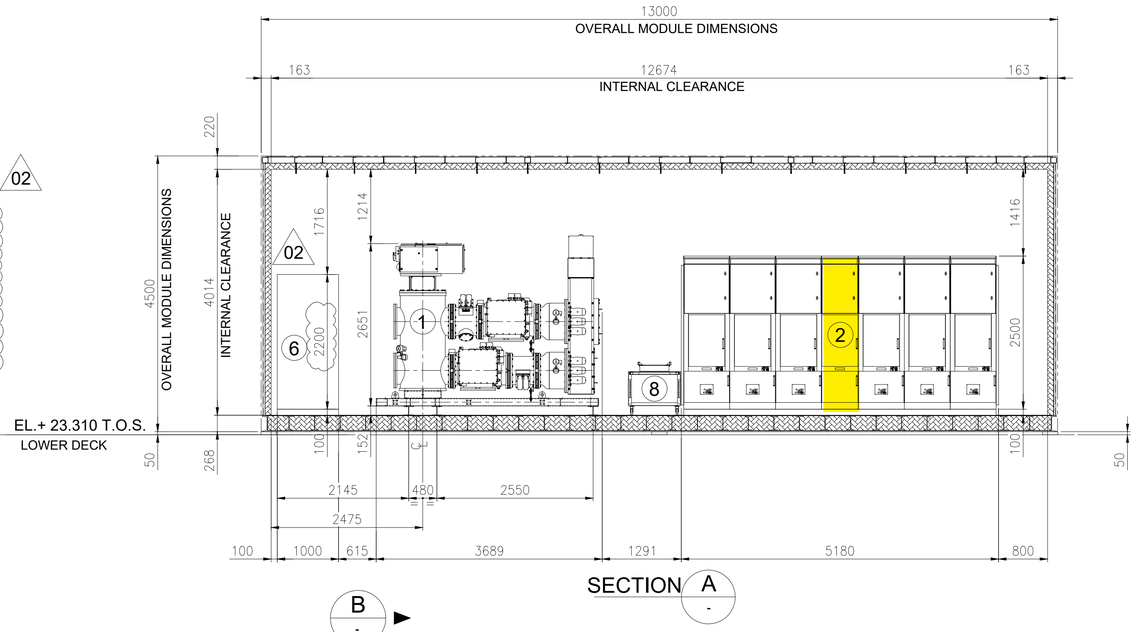
| # | Voltage | Current | Cap. | Res. | Frequency |
|---|---|---|---|---|---|
| 1 | 10.0 kV• | 66 µA• | 10.0 nF | 565 MΩ | 0.1 Hz |

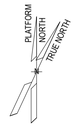
•RMS value

20/11/24
I.C.S. IMPIANTI
BONGIOVANNI CARMELO

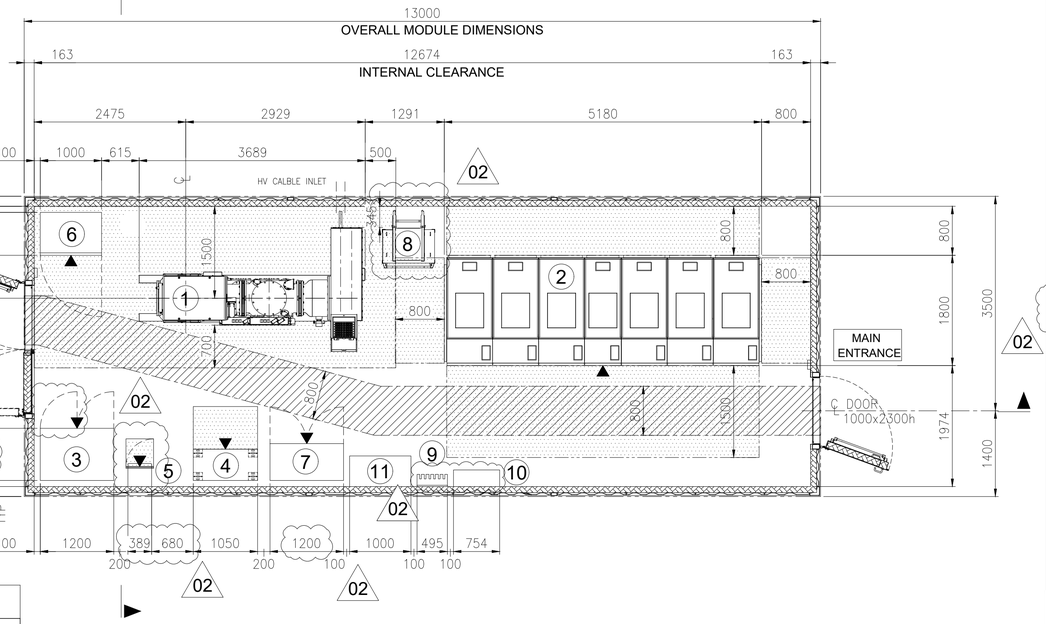
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02

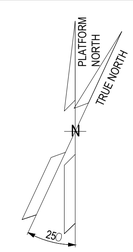


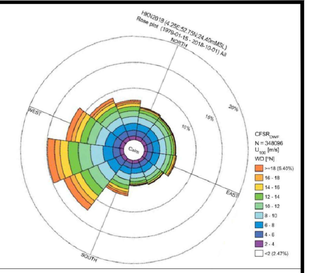




B -




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

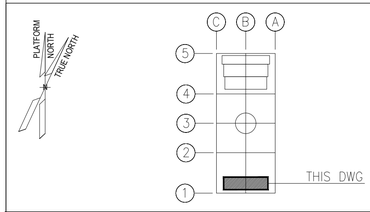
## LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| 66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING | 1723001595-EL-DA-00006 |
| CIRCUIT AND WIRING DIAGRAM | 1723001595-EL-DG-00015 |
| SG-100D1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00006 |
| DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00003 |
| DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00010 |
| B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00014 |

## KEY PLAN




## EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | HNA6-AFA70 | 66kV SWITCHGEAR (GIS) | 3689 | 2025 | 2651 | |
| 2 | SG-100D1 | 6.6kV SWITCHGEAR | 5180 | 1800 | 2500 | |
| 3 | UP-200F1 | DC UPS PANEL | 1200 | 850 | 2105 | |
| 4 | BA-200F1 | DC UPS BATTERY RACK | 1050 | 510 | 1272 | |
| 5 | CB-200F1 02 | ISOLATOR FOR DC UPS | 452 | 377 | 634 | |
| 6 | CP-100E1 | 66 kV SWITCHGEAR LOCAL CONTROL PANEL | 1000 | 700 | 2200 | 02 |
| 7 | B100-HSB-001 | DISTRIBUTION & HVAC PANEL - HV MV ROOM | 1200 | 600 | 1900 | |
| 8 | - | SERVICE TROLLEY FOR 6.6kV SWITCHGEAR | 943 | 862 | 874 | |
| 9 | - | TOOL BOX | 495 | 200 | 200 | |
| 10 | - | SUBSTATION LIFE SAVING & INTERVENTION KIT | 754 | 270 | 840 | |
| 11 | - | TABLE | 1000 | 500 | 750 | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20104**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 10/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

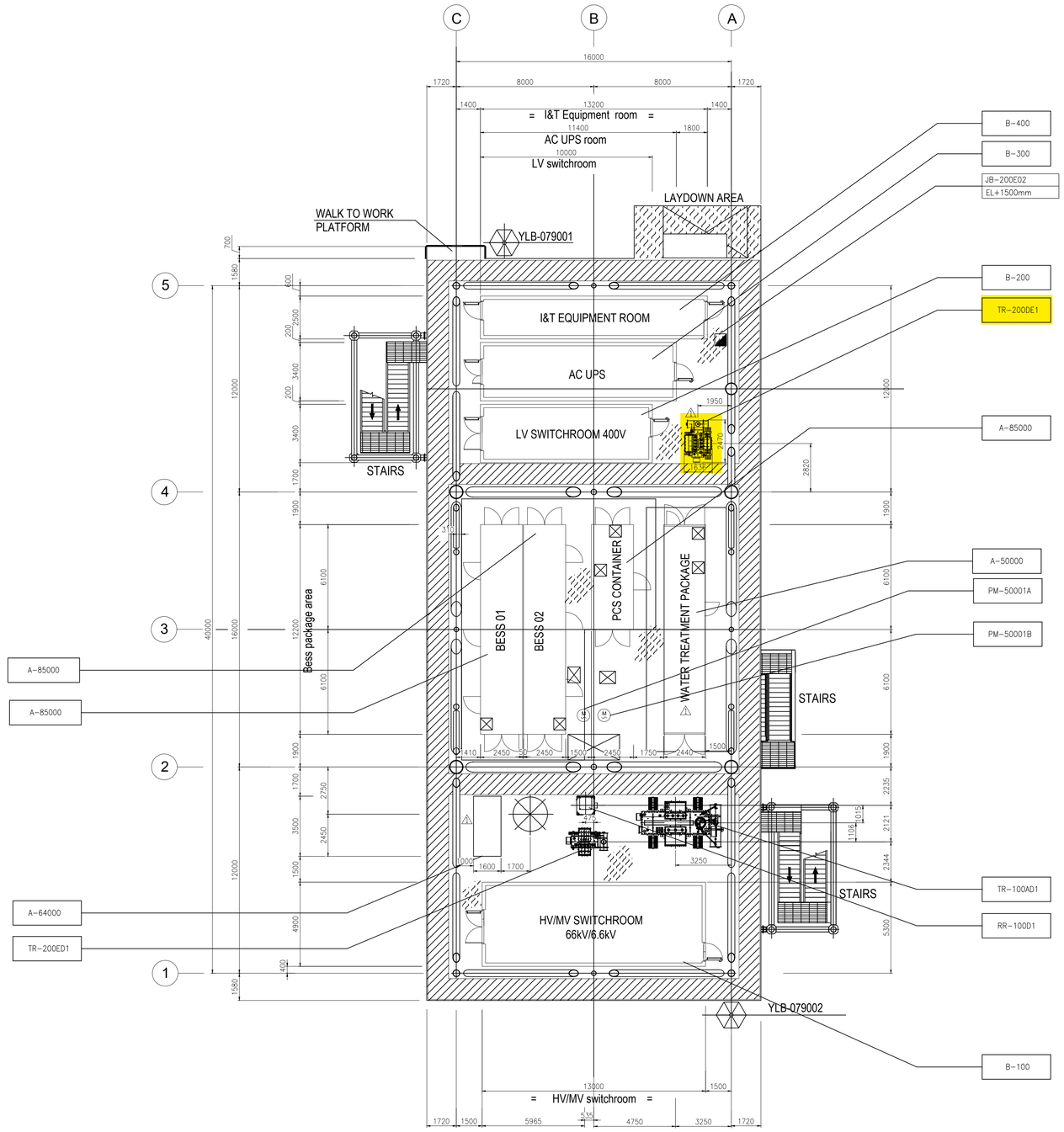
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN GPA | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20104 | SHEET 001 | REV. 02 |
|---|---|---|---|

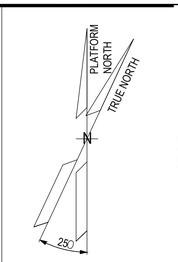
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

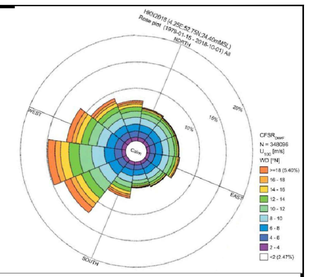
DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20101**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01 |

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

FROM

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

TO

| | | | | | |
|---|---|---|---|---|---|
| TAG COLUMN: A4 | L1 | BK | 82002-CEM-1-L1 1C X 70 mm² | BK | 1U |
| | L2 | BK | 82002-CEM-1-L2 1C X 70 mm² | BK | 1V |
| | L3 | BK | 82002-CEM-1-L3 1C X 70 mm² | BK | 1W |

DESCRIPTION: 6.6/0.42 KV, 1.6MVA TRANSFORMER
TAG NUMBER: TR-200DE1
HV TERMINAL BOX OF TR-200DE1

| | | | | | |
|---|---|---|---|---|---|
| TAG COLUMN: A7 | L1 | BK | 82003-CEM-1-L1 1C X 70 mm² | BK | 1U |
| | L2 | BK | 82003-CEM-1-L2 1C X 70 mm² | BK | 1V |
| | L3 | BK | 82003-CEM-1-L3 1C X 70 mm² | BK | 1W |

DESCRIPTION: 6.6/0.4 KV, 1.25MVA TRANSFORMER
TAG NUMBER: TA30
HV TERMINAL BOX OF TA30

| | | | | | |
|---|---|---|---|---|---|
| TAG COLUMN: A1 | L1 | BK | 82004-CEM-1-L1 1C X 150 mm² | BK | 1U |
| | L2 | BK | 82004-CEM-1-L2 1C X 150 mm² | BK | 1V |
| | L3 | BK | 82004-CEM-1-L3 1C X 150 mm² | BK | 1W |

DESCRIPTION: 6.6/0.4/0.4 KV, 3.15MVA TRANSFORMER
TAG NUMBER: T4
HV TERMINAL BOX OF T4

| | | | | | |
|---|---|---|---|---|---|
| TAG COLUMN: A3 | L1 | BK | 82005-CEM-1-L1 1C X 70 mm² | BK | 1U |
| | L2 | BK | 82005-CEM-1-L2 1C X 70 mm² | BK | 1V |
| | L3 | BK | 82005-CEM-1-L3 1C X 70 mm² | BK | 1W |

DESCRIPTION: 6.6/0.62 KV, 1.25MVA TRANSFORMER
TAG NUMBER: 18T1
HV TERMINAL BOX OF 18T1

| | | | | | |
|---|---|---|---|---|---|
| TAG COLUMN: A2 | L1 | BK | 82006-CEM-1-L1 1C X 70 mm² | BK | 1U |
| | L2 | BK | 82006-CEM-1-L2 1C X 70 mm² | BK | 1V |
| | L3 | BK | 82006-CEM-1-L3 1C X 70 mm² | BK | 1W |

DESCRIPTION: 6.6/0.8 KV, 0.5MVA TRANSFORMER
TAG NUMBER: TR-200ED1
HV TERMINAL BOX OF TR-200ED1

Arm.

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

**ROSETTI MARINO SpA**

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6KV HV SWITCHGEAR

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

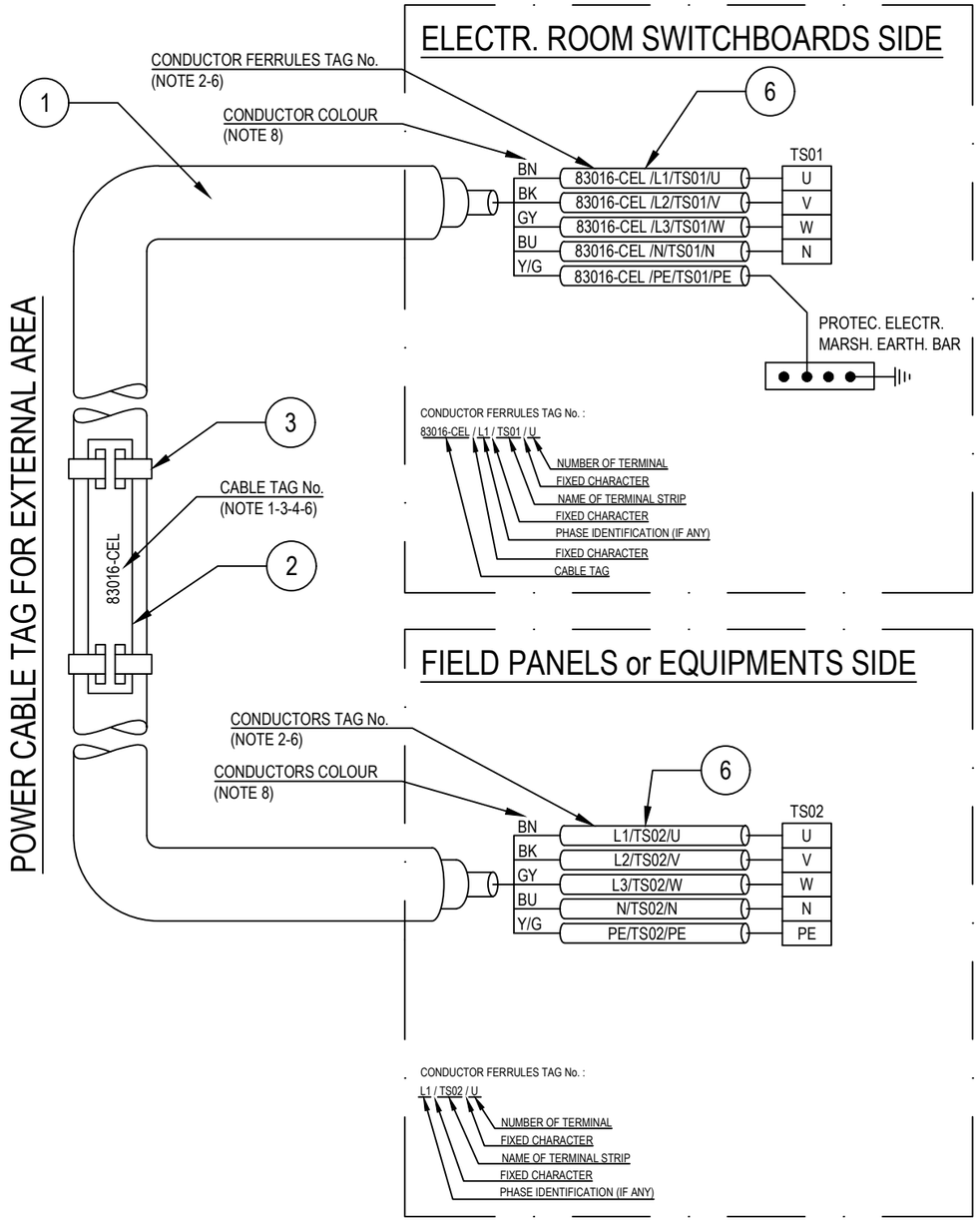
SHEET 016

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

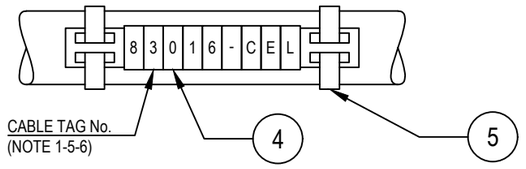
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

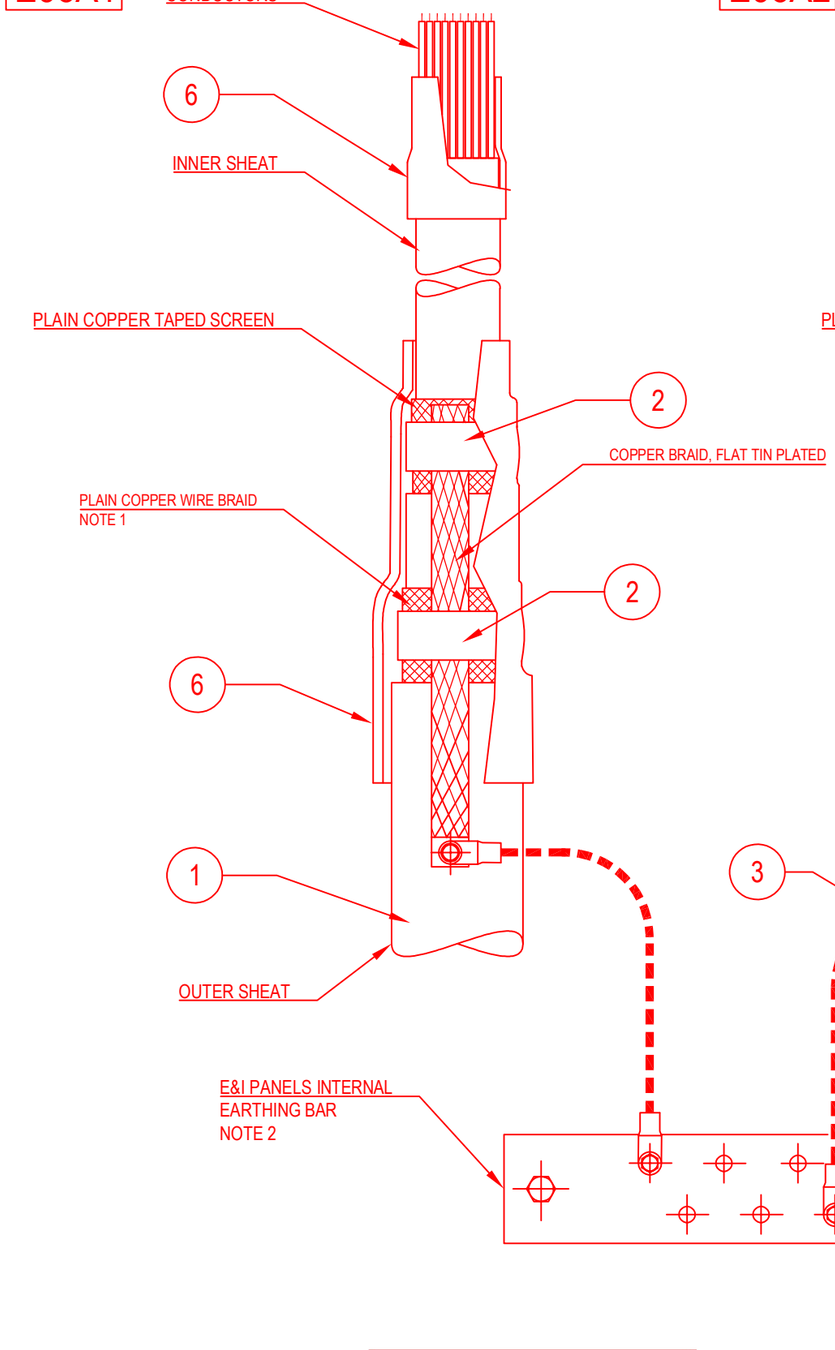
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

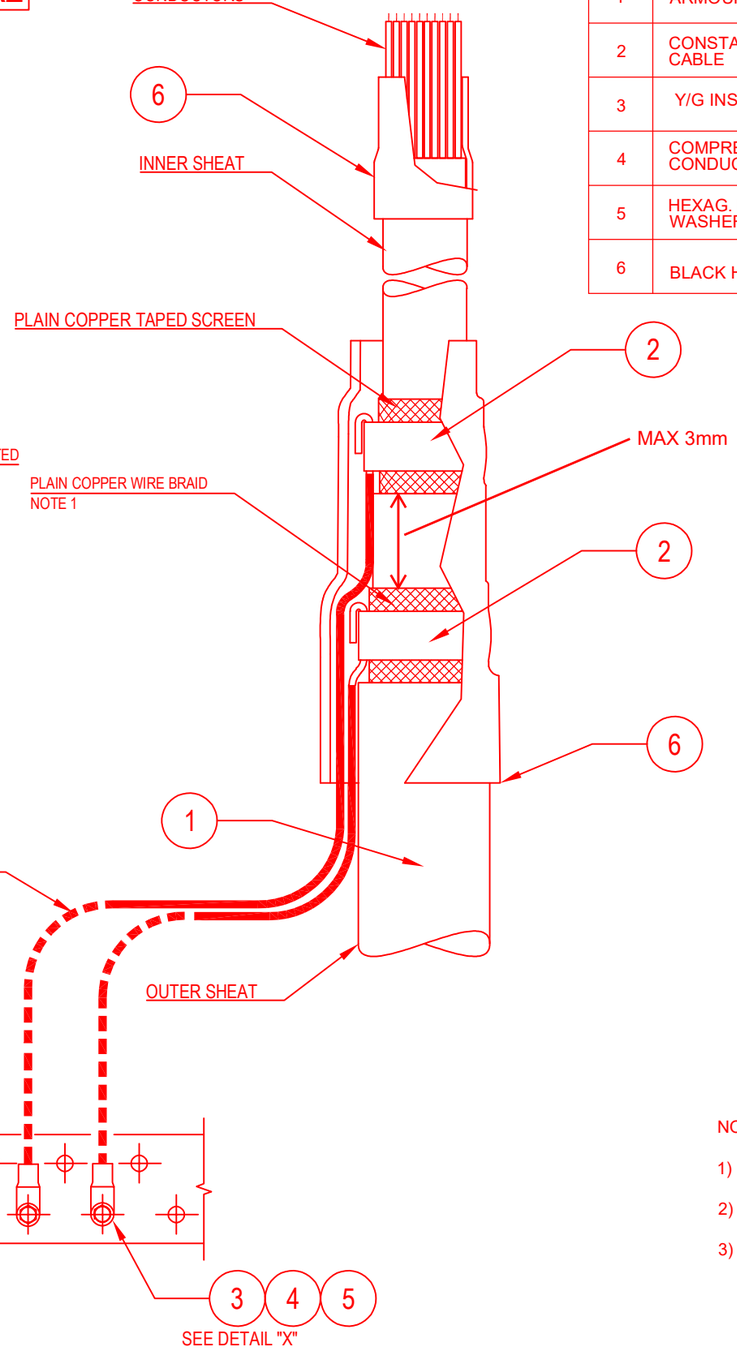
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

## E06A1

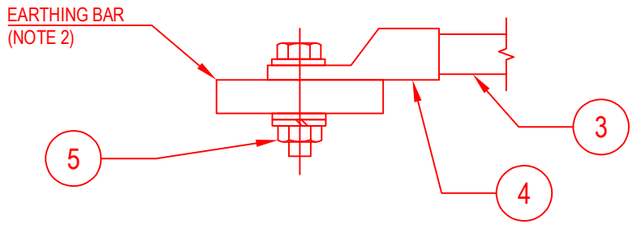



## E06A2




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | ARMOURED CABLE | | | | |
| 2 | CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE | AISI 316L | | | |
| 3 | Y/G INSULATING COPPER CONDUCTOR | COPPER | $16mm^2$ | | |
| 4 | COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR | TINNED COPPER | $16mm^2$ | | |
| 5 | HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT | AISI 316L | M8X30 | | |
| 6 | BLACK HEAT SHRINKABLE SLEEVE | | | | |

## DETAIL "X"




NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DD-20090**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_G | 25/10/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 26/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 10/06/24 | SPS | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20090 RLMU MV CABLES.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 82002-CEM-1-L2 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | SG-100D1 | MV 6,6kV Switchgear | Lower Deck (B-100) | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | ELECV36-1X70 | Cable CU/EPR/CTS/LSZH/CWB/LSZH 6/10kV 1x70mm²- Red | M40 | n.a. | | | T2_M40_Double | | | | L-150-101-MVT-013 / L-600-101-MVT-008 / L-600-101-MVT-009 / E-MCT-103 / L-450-101-MVT-004 / L-300-101-MVT-002 |

| CROSSWIND | HOLLANDSE KUST NOORD WIND PARK Project<br>Contract No. CW-I-WP4-2023-05 | ROSETTI MARINO |
|---|---|---|
| | | Sh: 9 of 35 |
| Document Title: | Technical Data Sheet (TDS) for Electrical Power and Control Cables | Date: 31/07/2024 |
| | | Rev.: 01 |

TITLE

**DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)**

## ELECTRICAL SYSTEM CHARACTERISTIC

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| OPERATING VOLTAGE | 6,6 | kVac | ± | 5 | % | | |
| FREQUENCE | 50 | Hz | ± | 2 | % | | |
| NEUTRAL SYSTEM | ☐ | EARTHED | | | | ☐ | INSULATED |
| | ☑ | EARTHED BY RESISTANCE | | | | ☐ | |
| EXPOSITION OF LIGHTNING OVER VOLTAGE | | | | | | ☐ NO | ☑ YES |

PROJECT SPECIFICATION: 123A90-DDL-EL-SP-20057

## CABLE CHARACTERISTIC

| | | | |
|---|---|---|---|
| GENERAL CHARACT | REFERENCE STD | FOR CONSTRUCTION AND TEST | IEC 60092-350 |
| | | FOR SPECIAL CHARACTERISTIC | **IEC-60754-1, IEC-60332-1-2** |
| | | | **IEC-61034-2** |

RATED VOLTAGE (Uo/U): 3.6/6(7.2) kV

MAX. OPERATING TEMPERATURE 90 °C TEMP.SHORT CIRCUIT TEMPERATURE 250 °C

POWER FREQUENCY TEST VOLTAGE/IMPULSE WITHSTAND VOLTAGE (Up): (AS PER IEC) 21 kV

COEFFICIEN. K: - FOR CONDUCTOR 143 A $\sqrt{s}$ /mm$^2$

- FOR SCREEN OR METAL SHEATS 115 A $\sqrt{s}$ /mm$^2$

| | | | | |
|---|---|---|---|---|
| SPECIAL CHARACT. | ☐ HYDROCARBON RESISTANCE | ☐ NON PROPAGATING FIRE | ☐ FIRE RESISTANCE | |
| | ☐ BUNCHED CABLES NON PROPAGATING FIRE : TOT. Q.TY OF COMBUSTIBLE MATERIAL | | | kg/m |
| | ☐ LOW CORROSIVE GAS EMISSION | ☐ % HCl ≤ 0,3 | ☐ % HCl = | |
| | ☐ LOW TOXIC GAS EMISSION (T INDEX) | ☐ T ≤ 2 | ☐ T= | |
| | ☑ LOW SMOKE EMISION (OPTICAL DENSITY) | ☐ D ≤ 1,5 | ☐ D= | |
| | ☐ U.V. RESISTANT | ☑ HALOGEN FREE COMPOUND | ☑ FLAME RETARDANT | |

| | |
|---|---|
| INSTALL. SPECIAL CONDITION | CABLE LADDER, TREFOIL FORMATION |
| ACCESS. | |

NOTES:

| CROSSWIND | HOLLANDSE KUST NOORD WIND PARK Project<br>Contract No. CW-I-WP4-2023-05 | ROSETTI MARINO<br>Sh: 10 of 35 |
|---|---|---|
| Document Title: | Technical Data Sheet (TDS) for Electrical Power and Control Cables | Date: 31/07/2024<br>Rev.: 01 |

TITLE

**DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)**

## MATERIALS

| | |
|---|---|
| GENERAL DATA | REF.STD N.: IEC 60092-350 |
| CONDUCTOR | MATERIAL: ☑ Cu ☐ Al ☐ Tinned Cu<br>CLASS (1): ☑ CLASS 2 ☐ CLASS 5 (F) ☐ CLASS 6 (H) |
| INSULATION | MATERIAL: EPR |
| SEMI-CONDUCTOR LAYER | ☑ FORESEEN AS PER IEC 60092-350<br>MATERIAL: HF EXTRUDED COMPOUND |
| SCREENS | ☑ FORESEEN AS PER IEC 60092-350<br>MATERIAL: Plain Copper Taped Screen |
| ARMOUR | ☑ REQUIRED TYPE:<br>MATERIAL: Plain Copper Wire Braid |
| OUTER SHEATING | MATERIAL: SHF1 to IEC 60093.360 |
| COMPONENTS AND SPECIAL CONSTR. | |

NOTE: (1) CLASS 1 : SOLID CONDUCOR - (U).
CLASS 2 : STRANDARD CONDUCTOR: CIRCULAR -R-, SHAPED -S-
CLASS 5 : FLEXIBLE CONDUCTOR - (F).
CLASS 6 : HIGHLY FLEXIBLE CONDUCTOR - (H) o (FF).

| CROSSWIND | HOLLANDSE KUST NOORD WIND PARK Project<br>Contract No. CW-I-WP4-2023-05 | ROSETTI MARINO<br>Sh: 11 of 35 |
|---|---|---|
| Document Title: | Technical Data Sheet (TDS) for Electrical Power and Control Cables | Date: 31/07/2024<br>Rev.: 01 |

TITLE

**DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | **CONSTRUCTIVE DATA** | | | | | | |
| 2 | | | | | | | |
| 3 | MR TAG / PART NUMBER | | | Note-3 | Note-3 | | |
| 4 | n° x NOMINAL AREA OF CONDUCTORS | | N.xmm$^2$ | 1Cx70 | 1Cx150 | | |
| 5 | n° AND DIAMETER OF WIRES IN EACH CONDUCTOR | | N.xmm | 352x0,52 | 776X0,51 | | |
| 6 | CONDUCTOR CLASS (2) | | | 2 | 2 | | |
| 7 | RATED CURRENT IN AIR AT 30° | | A | 285 | 460 | | |
| 8 | RATED CURRENT IN GROUND AT 20° | | A | 272 | 416 | | |
| 9 | | | | | | | |
| 10 | A.C. PHASES RESISTANCE AT THE MAX OP. TEMP. | | Ω/km | 0,345 | 0,163 | | |
| 11 | PHASE REACTANCE AT 50 Hz | | Ω/km | 0,110 | 0,097 | | |
| 12 | MINIMUM INSULATION RESISTANCE AT 20° | | MΩ/km | 745 | 567 | | |
| 13 | PHASE CAPACITY | | µF/km | 0,301 | 0,396 | | |
| 14 | | | | | | | |
| 15 | MINIMUM ORDER Q.TY | | m | TBD | TBD | | |
| 16 | MAX LENGHT OF DRUMS | | m | TBD | TBD | | |
| 17 | DIAMETERS | BARE CONDUCTOR | mm | 10 | 14,3 | | |
| 18 | | CORE (INSULATED CORE) | mm | 19,6 | 24 | | |
| 19 | | UNDER ARMOUR | mm | 23,6 | 28,3 | | |
| 20 | | ARMOUR OR CONCENTRIC CONDUCTOR | mm | 24,8 | 29,5 | | |
| 21 | | | | | | | |
| 22 | | | | | | | |
| 23 | | OVERALL | mm | 29 | 34 | | |
| 24 | MASSES | CONDUCTORS | kg/km | 640 | 1350 | | |
| 25 | | INSULATION | kg/km | 290 | 410 | | |
| 26 | | INNER COVERING | kg/km | 180 | 220 | | |
| 27 | | ARMOUR OR CONCENTRIC CONDUCTOR | kg/km | 220 | 250 | | |
| 28 | | OUTER SHEATING | kg/km | 280 | 350 | | |
| 29 | | | | | | | |
| 30 | | TOTAL | kg/km | 1610 | 2580 | | |
| 31 | EXTERNAL COLOUR | | | RED | RED | | |
| 32 | CORE IDENTIFICATION (1) | | | NATURAL | NATURAL | | |
| 33 | | | | | | | |
| 34 | | | | | | | |
| 35 | | | | | | | |
| 36 | | | | | | | |
| 37 | | | | | | | |
| 38 | | | | | | | |

39

40 NOTE: (1) BK=BLACK, BN=BROWN, GY=GRAY, BU=BLUE, RD=RED, Y/G=YELLOW/GREEN

41 (*) TO BE FILLED BY VENDOR

42 NA NOT APPLICABLE

43

44

45

46

47

48

49

50

51

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L3 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD_B-100/LD |
| **TASK** | code | C10000478 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX08 HV Power Cable |

## CABLE DATA

Type CU/EPR/CTS/LSZH/CWB/LSZH  Cores/Size mm² 1X70 mm2  Color RED

From SG-100D1  To TR-200DE1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | OK |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | OK |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | OK |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L3 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD_B-100/LD | |
| **TASK** | code | C10000478 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX08 | HV Power Cable |

| | | | | |
|---|---|---|---|---|
| | **CONTINUITY TESTS** | | | |
| 1 | CORE CONTINUITY | 300 | mΩ | OK |
| 2 | SCREEN CONTINUITY | 300 | mΩ | OK |
| 3 | ARMOUR CONTINUITY | 300 | mΩ | OK |
| | **1st INSULATION TEST** | | | |
| | Voltage applied: | 500 | kV | |
| 4 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 5 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 6 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |
| | **HV TEST 15 min** | | | |
| | Voltage applied: | 1,5 | kV | |
| 7 | Ph1 / Ph2-Ph3-screen-armour-Earth : | 108 | µA | OK |
| 8 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | µA | |
| 9 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | µA | |
| | **2nd INSULATION TEST** | | | |
| | Voltage applied: | 500 | kV | |
| 10 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 11 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 12 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |
| | **RE-CONNECT TERMINATIONS** | | | |
| 13 | Tightening torque | | N.m | Note |

**TESTING INSTRUMENTS USED**

| | | | |
|---|---|---|---|
| TYPE / SERIAL N° | VOLCRAFT 1000V - ET-200 S/N:H240103023 | TYPE / SERIAL N° | Mod:HVA45 S/N:GH5219.16C010 |
| Calibration certificate N° and date: | N°LAT 042 00768/24 _ 12/10/2024 | Calibration certificate N° and date: | LAT04200772/24 _ 02.2024 |
| TYPE / SERIAL N° | Mod:KEW3125A S/N: W8330207 | TYPE / SERIAL N° | |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | |

Comments: Note HV TEST: See attached certificate and Test Report.
Note : Tightening torque will be done by the commissioning activity.



| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM(ROSETTI MARINO) | |
| **Name** | Michele Tartaglia | Giovanni Tangianu | |
| **Date** | 2025-04-15 | 2025-04-15 | |
| **Signature** | PROVERLIS Digitaly signed by Michele Tartaglia 2025-04-15T09:49:11.225Z | PROVERLIS Digitaly signed by Giovanni Tangianu 2025-04-15T10:49:53.654Z | |

# Base Load Power Hub (BLPH)

## Work Instruction – VLF Testing of Installed 6/10 kV Cables

Document Number: 123A90-PML-QHSE-WI-0001

Document Class: 2

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 0 | 01/04/2025 | Issue for Review | R.Degli Esposti | G. Tassinari | A.Iveson |
| Rev. | Date | Description | Prepared | Reviewed | Approved |

*This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy*

Revision / Change Log

| Rev. | Description |
|---|---|
| 0 | Issue for Review (IFR) |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

HOLDS LIST

| No. | Description |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |

# Table of contents


1 Scope ..... 4

2 Applicable Standards ..... 4

3 Equipment Required ..... 4

4 Safety Precautions ..... 4

5 Procedure ..... 4



*This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy*

# 1 SCOPE

This work instruction describes the procedure for Very Low Frequency (VLF) withstand testing on installed 6/10 (12) kV cables in accordance with IEC 60502-2:2014, clause 20.3.1(c).

# 2 APPLICABLE STANDARDS

- IEC 60502-2:2014 – Power cables with extruded insulation from 6 kV to 30 kV

# 3 EQUIPMENT REQUIRED

- VLF test set capable of generating 18 kV RMS at 0.1 Hz
- Voltage and current monitoring equipment
- Grounding and discharge rods
- Insulation resistance tester (Megger)
- Safety barriers and warning signs

# 4 SAFETY PRECAUTIONS

- All personnel must be trained and authorized
- Area must be barricaded with proper warning signs
- Only test personnel shall remain inside the zone during testing
- Confirm absence of voltage and ensure cable is grounded before and after testing
- Issue of work permit

# 5 PROCEDURE

## 5.1 TEST VOLTAGE

With reference to the IEC 60502-2:2014, clause 20.3.1(c), according to the Engineering department's instruction, the VLF test voltage is based on the system operational voltage of 6.6 kV.

Therefore, the value of $U_0$ is derived as:

$U_0 = 6.6\ kV / \sqrt{3} \approx 3.81\ kV$

Following this interpretation, the VLF withstand test shall be performed using:

- Test Voltage: $3 \times U_0 = 3 \times 3.81 \approx 11.43$ kV RMS
- Frequency: 0.1 Hz
- Duration: 15 minutes

## 5.2 VISUALLY INSPECT THE CABLE AND TERMINATIONS.

Inspect the entire length of the cable, joints, and terminations for visible damage, proper preparation, cleanliness, and conformance with installation standards. Check that no mechanical stress, sharp bends, or contamination is present.

## 5.3 VERIFY CABLE IS PROPERLY IDENTIFIED AND TAGGED.

Confirm that the cable is correctly labeled according to project documentation. Identification tags should match drawing references and be securely attached.

### 5.4 PERFORM INSULATION RESISTANCE MEASUREMENT.

Use a calibrated insulation resistance tester (Megger) at 500V for 1 minute to measure the resistance between conductor(s) and earth. Record values and ensure they meet project or manufacturer's criteria prior to proceeding with VLF test.

### 5.5 PREPARE TERMINATIONS, ENSURING CLEANLINESS AND DRYNESS.

Remove any temporary protection, clean the terminations with approved cleaning agents, and ensure the surfaces are dry and free of debris or moisture. Verify correct assembly of stress control components.

### 5.6 CONNECT VLF TEST SET BETWEEN CONDUCTOR AND METALLIC SCREEN (EARTH).

Connect the high-voltage output of the VLF generator to the conductor under test. Connect the return path to the metallic screen or grounding system. Ensure all connections are secure and that the test equipment is rated for the test voltage.

### 5.7 APPLY 11.43 KV RMSAT 0.1 HZ FOR 15 MINUTES.

Gradually ramp up the voltage 11.43 kV RMS. Maintain the voltage for the full duration of 15 minutes while monitoring the test equipment for current, voltage stability, and signs of insulation failure.

### 5.8 MONITOR FOR BREAKDOWNS, DISCHARGES OR CURRENT SPIKES.

Visually observe the test set and cable terminations. Monitor the current for any sharp increases or instability, which may indicate partial discharges or breakdowns.

### 5.9 DISCHARGE AND GROUND CABLE AFTER TEST COMPLETION.

After the test, slowly decrease the voltage to zero. Use a grounding rod to safely discharge any residual voltage from the conductor before handling.

### 5.10 REPEAT POINT 5.4

### 5.11 DOCUMENT ALL RESULTS IN THE ATTACHED TEST REPORT.

Complete the test report form, including all pre-checks, insulation readings, test parameters, observations, and results. Sign and submit the document for recordkeeping.

# TEST REPORT

Cable Tag/ID: _____

Cable Type: _____

Voltage Rating: 6/10 kV

## 5.12 PRE-TEST CHECKLIST

☐ Cable properly tagged and identified

☐ Visual inspection of terminations completed

☐ Insulation resistance test performed

☐ Clean and dry termination surfaces

☐ Metallic screen continuity verified

Client representative present during inspection: Yes ☐/ No ☐

## 5.13 TEST DETAILS

Megger before test: ☐

Test Method: VLF – 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☐

Equipment Used: _____

Serial Number: _____

Operator: _____

## 5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☐

Breakdown occurred: Yes ☐/ No ☐

Final Result: PASS ☐/ FAIL ☐

NOTES: _____

_____

## 5.15 SIGNATURES

Tested by: _____ Signature: _____ Date: _____

Witnessed by: _____ Signature: _____ Date: _____

# 82002-CEM-1-L3

VLF Withstand Report

82002-CEM-1-L3 - Maintenance Test

Auto Test

Test finished successfully

## Report Information

| | |
|---|---|
| Date | 4/14/2025 15:55 PM |
| Company Name | ICS |
| Region | --- |
| Station | --- |
| Operator Name | RECHICHI |
| Work Order | --- |

## Device Under Test (Cable XLPE)

| | |
|---|---|
| Voltage Rating | 11.5 kV |
| Insulation | XLPE |
| Line Length | 80 Meter |
| Size | 1X70 |
| Phase | C |
| Manufacturer Name | --- |

## Equipment:

| | |
|---|---|
| HVA45 | GH5219.16C010 |

## Test Setup

| | |
|---|---|
| Test Purpose | Maintenance |
| Arc Management Mode | Trip out on Arc |

| # | Test Voltage | Waveform | Frequency | Duration |
|---|---|---|---|---|
| 1 | 11.5 kV• | Sine | 0.1 Hz (A) | 15 min |

## Measurements:

Test finished successfully

| # | Voltage | Current | Cap. | Res. | Frequency |
|---|---|---|---|---|---|
| 1 | 11.5 kV• | 108 µA• | 14.9 nF | 5.6 GΩ | 0.1 Hz |

•RMS value

# TEST REPORT

Cable Tag/ID: 82002-CEM-1-L3

Cable Type: 1X70 mm²

Voltage Rating: 6/10 kV

## 5.12 PRE-TEST CHECKLIST

☑ Cable properly tagged and identified

☑ Visual inspection of terminations completed

☑ Insulation resistance test performed

☑ Clean and dry termination surfaces

☑ Metallic screen continuity verified

Client representative present during inspection: Yes ☑/ No ☐

## 5.13 TEST DETAILS

Megger before test: ☑

Test Method: VLF - 0.1 Hz

Test Voltage: 11.43 kV RMS

Duration: 15 minutes

Megger after test: ☑

Equipment Used: HVA 45

Serial Number: QH 5219.16C0.10

Operator: FAUSTO RECHICHI

## 5.14 OBSERVATIONS

Partial Discharge observed: Yes ☐/ No ☑

Breakdown occurred: Yes ☐/ No ☑

Final Result: PASS ☑/ FAIL ☐

NOTES: _____

## 5.15 SIGNATURES

Tested by: FAUSTO RECHICHI Signature: _____ Date: 14/04/2025

Witnessed by: GIOVANNI TARRIANU / DAVE MUSCIRONE Signature: _____ Date: 14/04/2025 / 14/04/2025

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L3 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD |
| **TASK** | code | C10000478 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX08 HV Power Cable |

## CABLE DATA

| | | | | | |
|---|---|---|---|---|---|
| Type | CU/EPR/CTS/LSZH/CWB/LSZH | Cores/Size mm² | 1X70 mm2 | Color | RED |
| From | SG-100D1 | To | TR-200DE1 | | |

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | Note |
| 10 | Check cable earthing against lastest drawings. | OK |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | Note |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82002-CEM-1-L3 | : 6.6KV HV Switchgear / 6.6/0.4 KV, 1.6MVA Transformer | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD | |
| **TASK** | code | C10000478 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX08 | HV Power Cable |

| | | | | |
|---|---|---|---|---|
| | **CONTINUITY TESTS** | | | |
| 1 | CORE CONTINUITY | 400 | mΩ | OK |
| 2 | SCREEN CONTINUITY | 400 | mΩ | OK |
| 3 | ARMOUR CONTINUITY | 400 | mΩ | OK |
| | **1st INSULATION TEST** | | | |
| | Voltage applied: | 2500 | kV | |
| 4 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 5 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 6 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |
| | **HV TEST 15 min** | | | |
| | Voltage applied: | | kV | |
| 7 | Ph1 / Ph2-Ph3-screen-armour-Earth : | | µA | Note |
| 8 | Ph2 / Ph1-Ph3-screen-armour-Earth: | | µA | Note |
| 9 | Ph3 / Ph2-Ph1-screen-armour-Earth: | | µA | Note |
| | **2nd INSULATION TEST** | | | |
| | Voltage applied: | 2500 | kV | |
| 10 | Ph1 / Ph2-Ph3-screen-armour-Earth : | >999 | MΩ | OK |
| 11 | Ph2 / Ph1-Ph3-screen-armour-Earth: | >999 | MΩ | OK |
| 12 | Ph3 / Ph2-Ph1-screen-armour-Earth: | >999 | MΩ | OK |
| | **RE-CONNECT TERMINATIONS** | | | |
| 13 | Tightening torque | | N.m | PL |

**TESTING INSTRUMENTS USED**

| | | | |
|---|---|---|---|
| TYPE / SERIAL N° | Mod:KEW3125A S/N: W8330207 | TYPE / SERIAL N° | Mod:HVA45 S/N:GH5219.16C010 |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | LAT04200772/24 _ 02.2024 |
| TYPE / SERIAL N° | Mod:FLUKE 175 S/N:(AW1/018-17140769) | TYPE / SERIAL N° | |
| Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 | Calibration certificate N° and date: | |

Comments:

Note 4: refer to PL n° C30000652
Note 8: refer to PL n° C30000651
Note 9: refer to PL n° C30000650
Note 12: refer to PL n° C30000649
Note 13: refer to PL n° C30000649

Note HV TEST: See attached certificate



| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Paolo Schintu | |
| **Date** | 2024-11-04 | 2024-11-20 | |
| **Signature** | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-04T17:04:12.314Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-20T14:28:54.250Z | |

**82002-CEM-1-L3**

VLF Withstand Report

82002-CEM-1-L3 - Maintenance Test

Auto Test

Test finished successfully

## Report Information

| | |
|---|---|
| Date | 11/9/2024 2:39 PM |
| Company Name | ICS |
| Region | EMILIA ROMAGNA |
| Station | --- |
| Operator Name | RIELA |
| Work Order | MT-MISURE |

## Device Under Test (Cable XLPE)

| | |
|---|---|
| Voltage Rating | 10.0 kV |
| Insulation | XLPE |
| Line Length | 80 Meter |
| Size | 1X70 |
| Phase | C |
| Manufacturer Name | ICS |

## Equipment:

| | |
|---|---|
| HVA45 | GH5219.16C010 |

## Test Setup

| | |
|---|---|
| Test Purpose | Maintenance |
| Arc Management Mode | Trip out on Arc |

| # | Test Voltage | Waveform | Frequency | Duration |
|---|---|---|---|---|
| 1 | 10.0 kV• | Sine | 0.1 Hz (A) | 5 min |

## Measurements:

Test finished successfully

| # | Voltage | Current | Cap. | Res. | Frequency |
|---|---|---|---|---|---|
| 1 | 10.0 kV• | 71 µA• | 11.0 nF | 614 MΩ | 0.1 Hz |

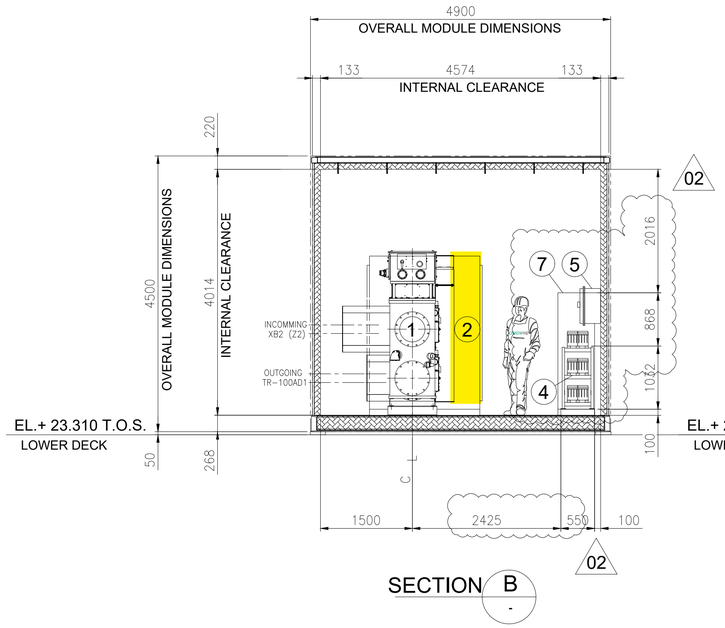
•RMS value

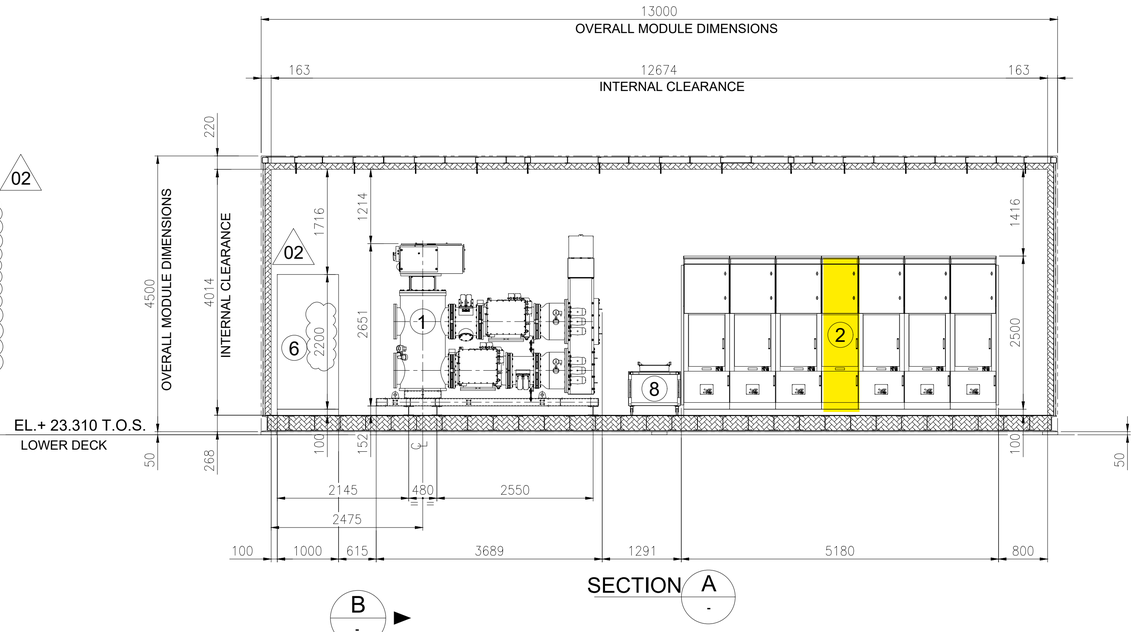
20/11/24

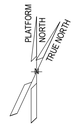
I.P.S. IMPIANTI

BONGIOVANNI CARMELO

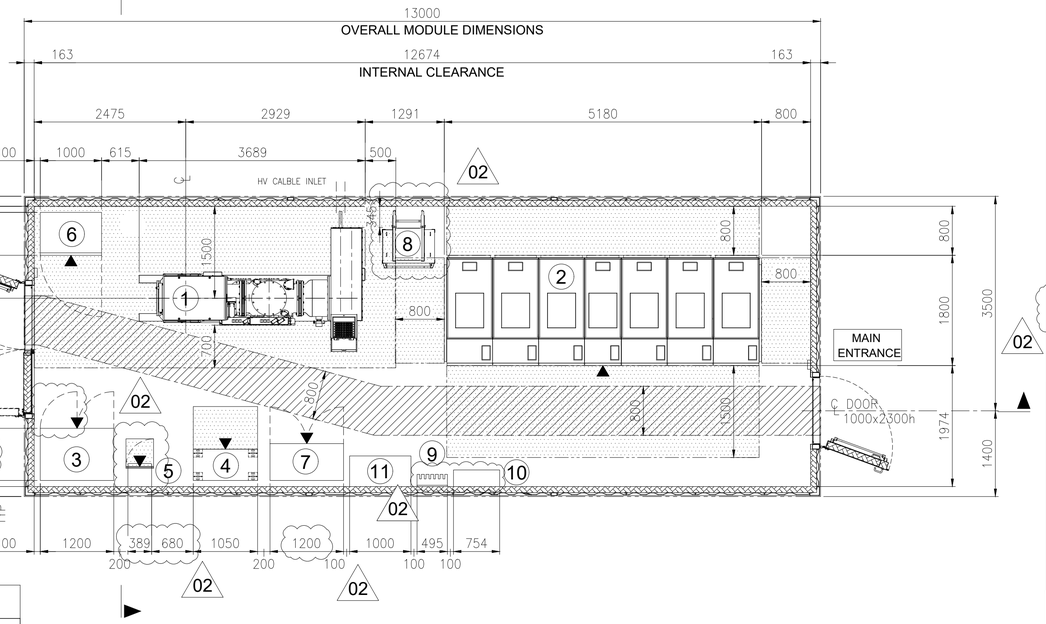
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02

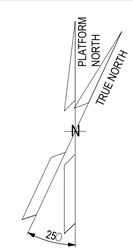


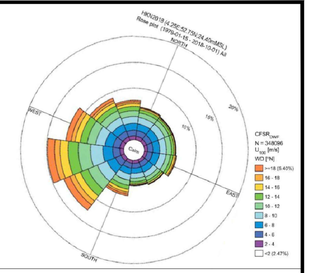




B -




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

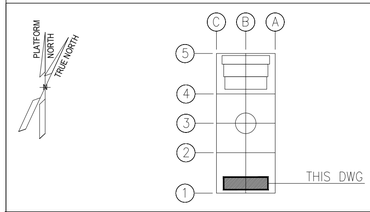
## LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| 66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING | 1723001595-EL-DA-00006 |
| CIRCUIT AND WIRING DIAGRAM | 1723001595-EL-DG-00015 |
| SG-100D1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00006 |
| DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00003 |
| DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00010 |
| B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00014 |

## KEY PLAN




## EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | HNA6-AFA70 | 66kV SWITCHGEAR (GIS) | 3689 | 2025 | 2651 | |
| 2 | SG-100D1 | 6.6kV SWITCHGEAR | 5180 | 1800 | 2500 | |
| 3 | UP-200F1 | DC UPS PANEL | 1200 | 850 | 2105 | |
| 4 | BA-200F1 | DC UPS BATTERY RACK | 1050 | 510 | 1272 | |
| 5 | CB-200F1 02 | ISOLATOR FOR DC UPS | 452 | 377 | 634 | |
| 6 | CP-100E1 | 66 kV SWITCHGEAR LOCAL CONTROL PANEL | 1000 | 700 | 2200 | 02 |
| 7 | B100-HSB-001 | DISTRIBUTION & HVAC PANEL - HV MV ROOM | 1200 | 600 | 1900 | |
| 8 | - | SERVICE TROLLEY FOR 6.6kV SWITCHGEAR | 943 | 862 | 874 | |
| 9 | - | TOOL BOX | 495 | 200 | 200 | |
| 10 | - | SUBSTATION LIFE SAVING & INTERVENTION KIT | 754 | 270 | 840 | |
| 11 | - | TABLE | 1000 | 500 | 750 | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20104**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 10/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

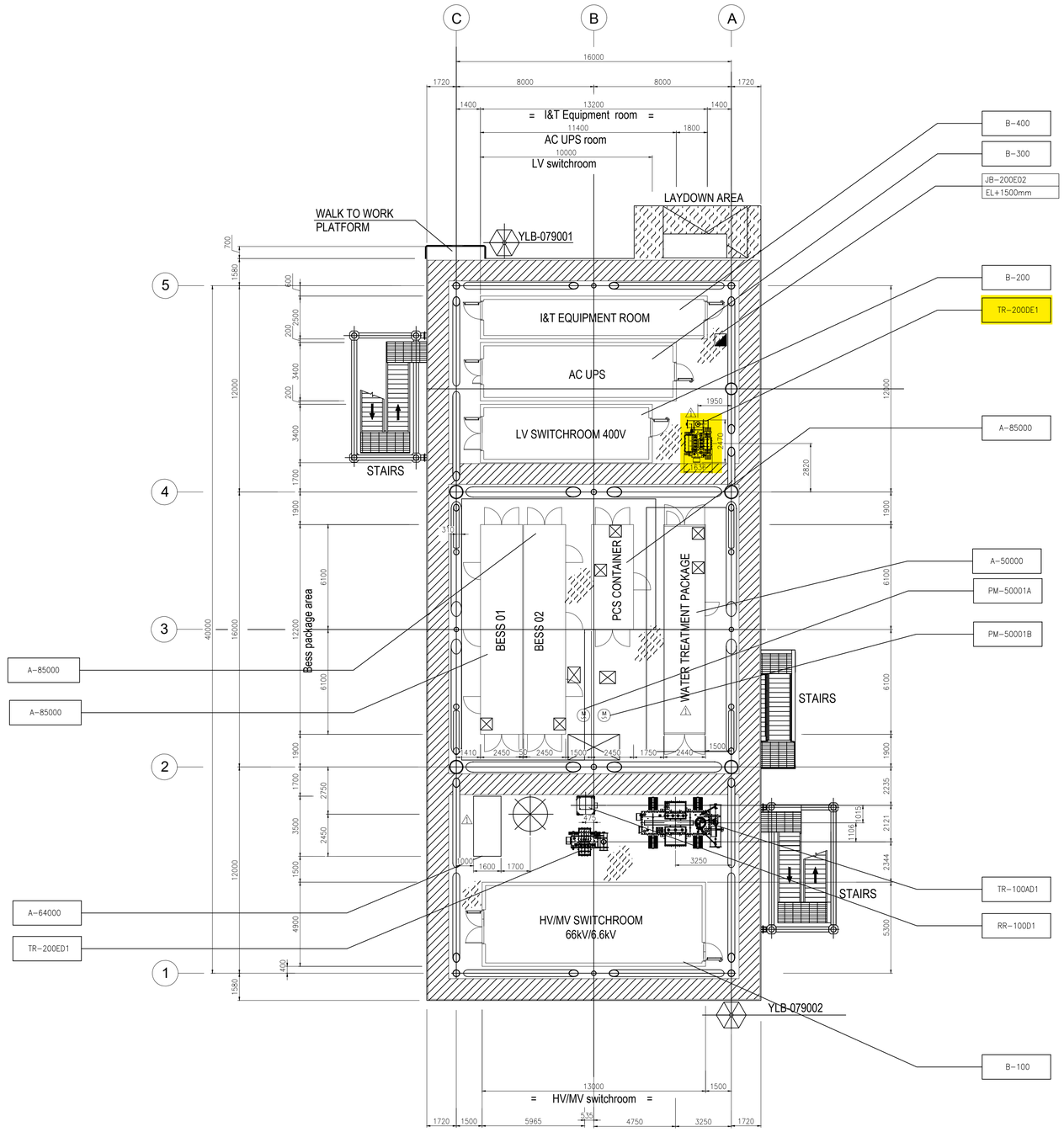
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN GPA | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20104 | SHEET 001 | REV. 02 |
|---|---|---|---|

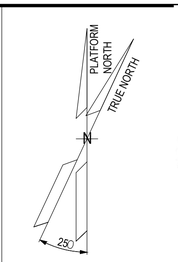
File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

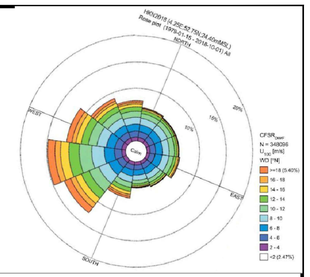
DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20101**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01 |

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

FROM

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

TO

| | | | | | |
|---|---|---|---|---|---|
| TAG COLUMN: A4 | L1 | BK | 82002-CEM-1-L1 1C X 70 mm² | BK | 1U |
| | L2 | BK | 82002-CEM-1-L2 1C X 70 mm² | BK | 1V |
| | L3 | BK | 82002-CEM-1-L3 1C X 70 mm² | BK | 1W |

DESCRIPTION: 6.6/0.42 KV, 1.6MVA TRANSFORMER
TAG NUMBER: TR-200DE1
HV TERMINAL BOX OF TR-200DE1

| | | | | | |
|---|---|---|---|---|---|
| TAG COLUMN: A7 | L1 | BK | 82003-CEM-1-L1 1C X 70 mm² | BK | 1U |
| | L2 | BK | 82003-CEM-1-L2 1C X 70 mm² | BK | 1V |
| | L3 | BK | 82003-CEM-1-L3 1C X 70 mm² | BK | 1W |

DESCRIPTION: 6.6/0.4 KV, 1.25MVA TRANSFORMER
TAG NUMBER: TA30
HV TERMINAL BOX OF TA30

| | | | | | |
|---|---|---|---|---|---|
| TAG COLUMN: A1 | L1 | BK | 82004-CEM-1-L1 1C X 150 mm² | BK | 1U |
| | L2 | BK | 82004-CEM-1-L2 1C X 150 mm² | BK | 1V |
| | L3 | BK | 82004-CEM-1-L3 1C X 150 mm² | BK | 1W |

DESCRIPTION: 6.6/0.4/0.4 KV, 3.15MVA TRANSFORMER
TAG NUMBER: T4
HV TERMINAL BOX OF T4

| | | | | | |
|---|---|---|---|---|---|
| TAG COLUMN: A3 | L1 | BK | 82005-CEM-1-L1 1C X 70 mm² | BK | 1U |
| | L2 | BK | 82005-CEM-1-L2 1C X 70 mm² | BK | 1V |
| | L3 | BK | 82005-CEM-1-L3 1C X 70 mm² | BK | 1W |

DESCRIPTION: 6.6/0.62 KV, 1.25MVA TRANSFORMER
TAG NUMBER: 18T1
HV TERMINAL BOX OF 18T1

| | | | | | |
|---|---|---|---|---|---|
| TAG COLUMN: A2 | L1 | BK | 82006-CEM-1-L1 1C X 70 mm² | BK | 1U |
| | L2 | BK | 82006-CEM-1-L2 1C X 70 mm² | BK | 1V |
| | L3 | BK | 82006-CEM-1-L3 1C X 70 mm² | BK | 1W |

DESCRIPTION: 6.6/0.8 KV, 0.5MVA TRANSFORMER
TAG NUMBER: TR-200ED1
HV TERMINAL BOX OF TR-200ED1

Arm.

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

**ROSETTI MARINO SpA**

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6KV HV SWITCHGEAR

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

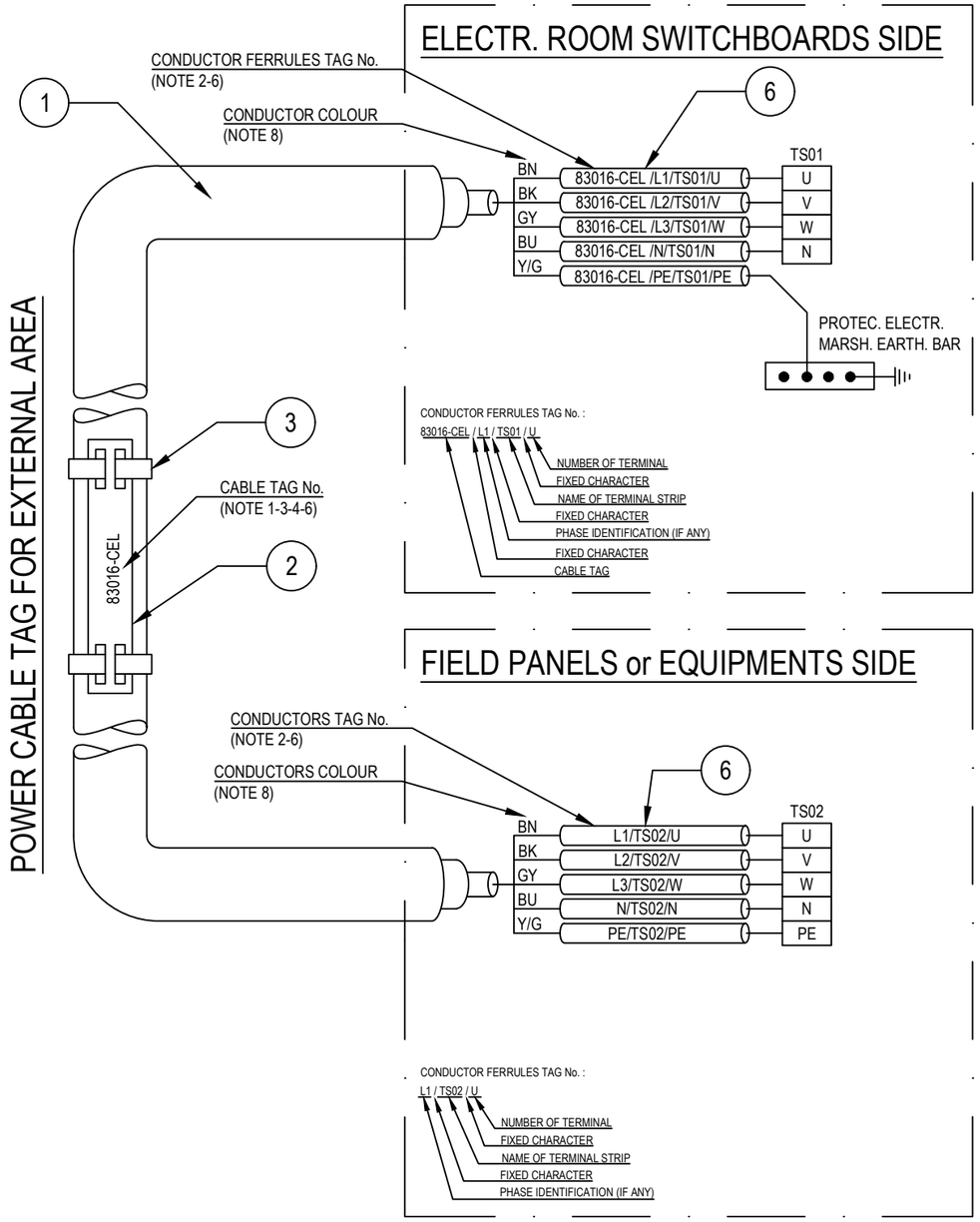
SHEET 016

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

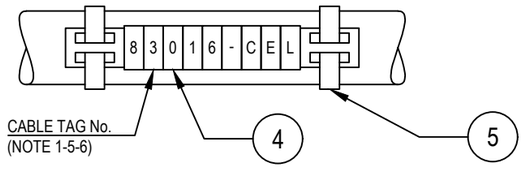
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

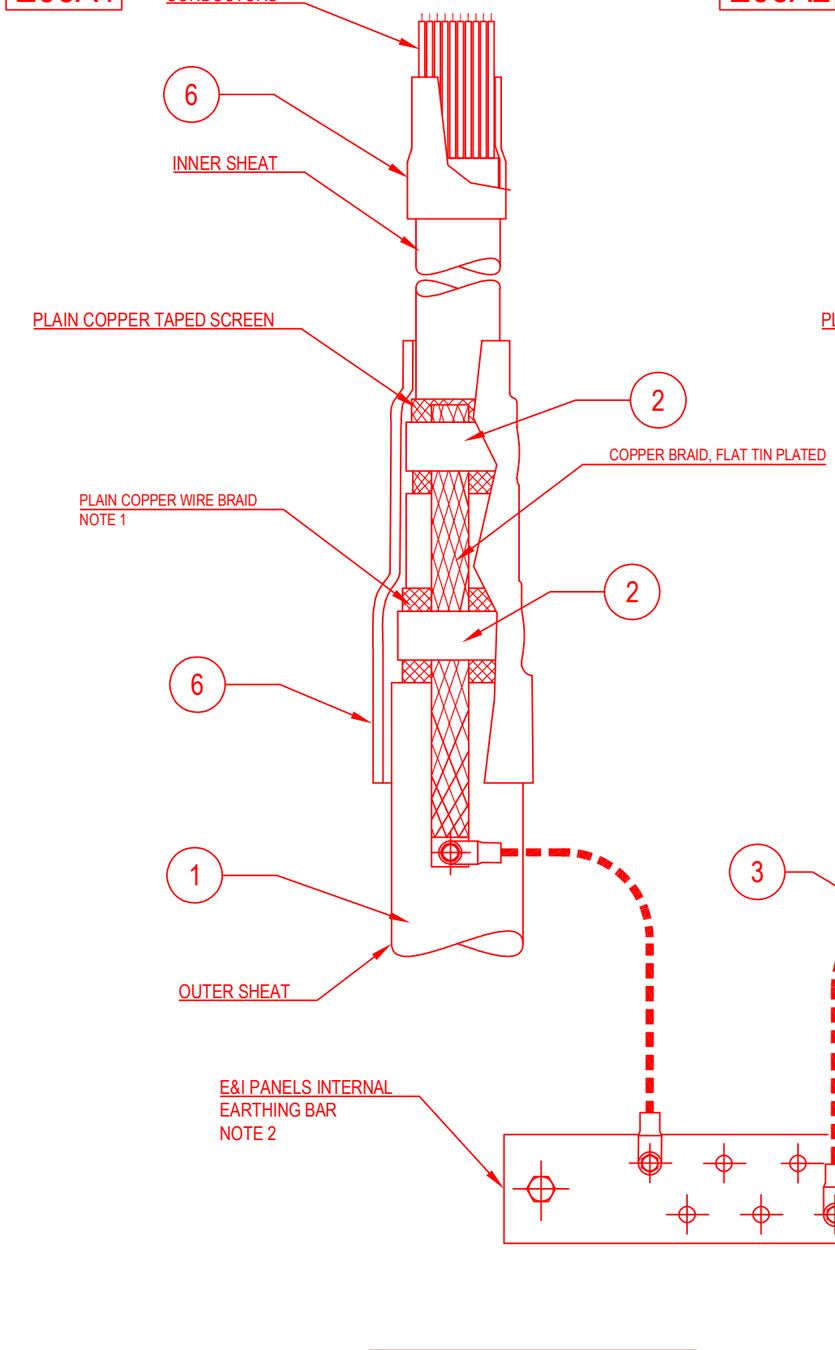
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

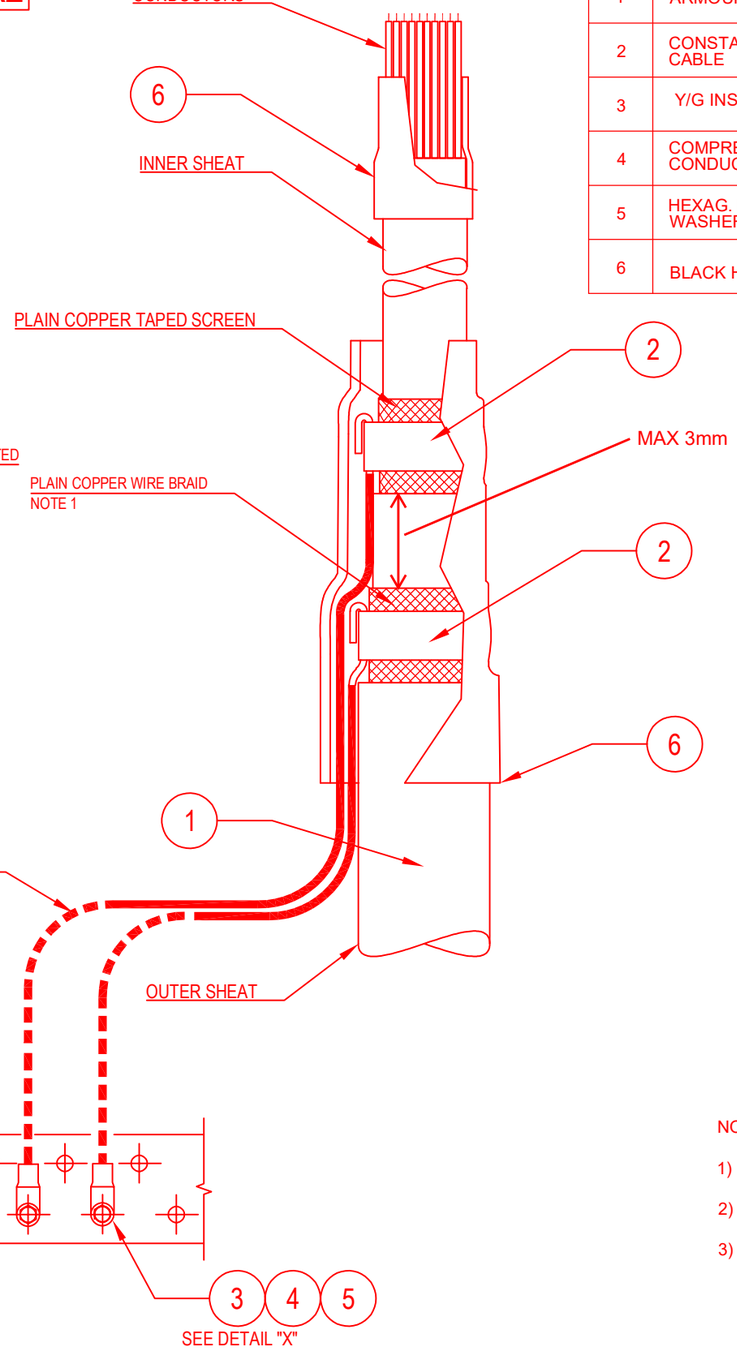
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

## E06A1

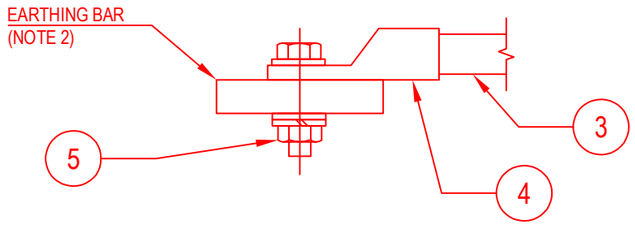



## E06A2




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | ARMOURED CABLE | | | | |
| 2 | CONSTANT FORCE SPRING FOR EARTHING ARMOUR CABLE | AISI 316L | | | |
| 3 | Y/G INSULATING COPPER CONDUCTOR | COPPER | $16mm^2$ | | |
| 4 | COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR | TINNED COPPER | $16mm^2$ | | |
| 5 | HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT | AISI 316L | M8X30 | | |
| 6 | BLACK HEAT SHRINKABLE SLEEVE | | | | |

## DETAIL "X"




NOTES:

1) CABLE ARMOUR SHALL BE EARTHED AT BOTH ENDS.
2) FOR EARTHING BAR INSIDE SWITCHBOARD SEE VENDOR DOCUMENTATION.
3) CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DD-20090**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_G | 25/10/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 26/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 10/06/24 | SPS | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-EARTHING SYSTEM
EARTHING FOR CABLE ARMOUR AND SCREEN (MV CABLES)

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 028 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20090 RLMU MV CABLES.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 82002-CEM-1-L3 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | SG-100D1 | MV 6,6kV Switchgear | Lower Deck (B-100) | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | ELECV36-1X70 | Cable CU/EPR/CTS/LSZH/CWB/LSZH 6/10kV 1x70mm²- Red | M40 | n.a. | | | T2_M40_Double | | | | L-150-101-MVT-013 / L-600-101-MVT-008 / L-600-101-MVT-009 / E-MCT-103 / L-450-101-MVT-004 / L-300-101-MVT-002 |

| CROSSWIND | HOLLANDSE KUST NOORD WIND PARK Project<br>Contract No. CW-I-WP4-2023-05 | ROSETTI MARINO |
|---|---|---|
| | | Sh: 9 of 35 |
| Document Title: | Technical Data Sheet (TDS) for Electrical Power and Control Cables | Date: 31/07/2024 |
| | | Rev.: 01 |

TITLE

**DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)**

## ELECTRICAL SYSTEM CHARACTERISTIC

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| OPERATING VOLTAGE | 6,6 | kVac | ± | 5 | % | | |
| FREQUENCE | 50 | Hz | ± | 2 | % | | |
| NEUTRAL SYSTEM | ☐ | EARTHED | | | | ☐ | INSULATED |
| | ☑ | EARTHED BY RESISTANCE | | | | ☐ | |
| EXPOSITION OF LIGHTNING OVER VOLTAGE | | | | | | ☐ NO | ☑ YES |

PROJECT SPECIFICATION: 123A90-DDL-EL-SP-20057

## CABLE CHARACTERISTIC

| | | | |
|---|---|---|---|
| GENERAL CHARACT | REFERENCE STD | FOR CONSTRUCTION AND TEST | IEC 60092-350 |
| | | FOR SPECIAL CHARACTERISTIC | **IEC-60754-1, IEC-60332-1-2** |
| | | | **IEC-61034-2** |

RATED VOLTAGE (Uo/U): 3.6/6(7.2) kV

MAX. OPERATING TEMPERATURE 90 °C TEMP.SHORT CIRCUIT TEMPERATURE 250 °C

POWER FREQUENCY TEST VOLTAGE/IMPULSE WITHSTAND VOLTAGE (Up): (AS PER IEC) 21 kV

COEFFICIEN. K: - FOR CONDUCTOR 143 A $\sqrt{s}$ /mm$^2$

- FOR SCREEN OR METAL SHEATS 115 A $\sqrt{s}$ /mm$^2$

| | | | | |
|---|---|---|---|---|
| SPECIAL CHARACT. | ☐ HYDROCARBON RESISTANCE | ☐ NON PROPAGATING FIRE | ☐ FIRE RESISTANCE | |
| | ☐ BUNCHED CABLES NON PROPAGATING FIRE : TOT. Q.TY OF COMBUSTIBLE MATERIAL | | | kg/m |
| | ☐ LOW CORROSIVE GAS EMISSION | ☐ % HCl ≤ 0,3 | ☐ % HCl = | |
| | ☐ LOW TOXIC GAS EMISSION (T INDEX) | ☐ T ≤ 2 | ☐ T= | |
| | ☑ LOW SMOKE EMISION (OPTICAL DENSITY) | ☐ D ≤ 1,5 | ☐ D= | |
| | ☐ U.V. RESISTANT | ☑ HALOGEN FREE COMPOUND | ☑ FLAME RETARDANT | |

| | |
|---|---|
| INSTALL. SPECIAL CONDITION | CABLE LADDER, TREFOIL FORMATION |
| ACCESS. | |

NOTES:

| CROSSWIND | HOLLANDSE KUST NOORD WIND PARK Project<br>Contract No. CW-I-WP4-2023-05 | ROSETTI MARINO<br>Sh: 10 of 35 |
|---|---|---|
| Document Title: | Technical Data Sheet (TDS) for Electrical Power and Control Cables | Date: 31/07/2024<br>Rev.: 01 |

TITLE

**DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)**

## MATERIALS

| | |
|---|---|
| GENERAL DATA | REF.STD N.: IEC 60092-350 |
| CONDUCTOR | MATERIAL: ☑ Cu ☐ Al ☐ Tinned Cu<br>CLASS (1): ☑ CLASS 2 ☐ CLASS 5 (F) ☐ CLASS 6 (H) |
| INSULATION | MATERIAL: EPR |
| SEMI-CONDUCTOR LAYER | ☑ FORESEEN AS PER IEC 60092-350<br>MATERIAL: HF EXTRUDED COMPOUND |
| SCREENS | ☑ FORESEEN AS PER IEC 60092-350<br>MATERIAL: Plain Copper Taped Screen |
| ARMOUR | ☑ REQUIRED TYPE:<br>MATERIAL: Plain Copper Wire Braid |
| OUTER SHEATING | MATERIAL: SHF1 to IEC 60093.360 |
| COMPONENTS AND SPECIAL CONSTR. | |

NOTE: (1) CLASS 1 : SOLID CONDUCOR - (U).
CLASS 2 : STRANDARD CONDUCTOR: CIRCULAR -R-, SHAPED -S-
CLASS 5 : FLEXIBLE CONDUCTOR - (F).
CLASS 6 : HIGHLY FLEXIBLE CONDUCTOR - (H) o (FF).

| CROSSWIND | HOLLANDSE KUST NOORD WIND PARK Project<br>Contract No. CW-I-WP4-2023-05 | ROSETTI MARINO<br>Sh: 11 of 35 |
|---|---|---|
| Document Title: | Technical Data Sheet (TDS) for Electrical Power and Control Cables | Date: 31/07/2024<br>Rev.: 01 |

TITLE

**DATA SHEET FOR 6.6KV HV CABLE (LSZH, FLAME RETARDANT)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | **CONSTRUCTIVE DATA** | | | | | | |
| 2 | | | | | | | |
| 3 | MR TAG / PART NUMBER | | | Note-3 | Note-3 | | |
| 4 | n° x NOMINAL AREA OF CONDUCTORS | | N.xmm$^2$ | 1Cx70 | 1Cx150 | | |
| 5 | n° AND DIAMETER OF WIRES IN EACH CONDUCTOR | | N.xmm | 352x0,52 | 776X0,51 | | |
| 6 | CONDUCTOR CLASS (2) | | | 2 | 2 | | |
| 7 | RATED CURRENT IN AIR AT 30° | | A | 285 | 460 | | |
| 8 | RATED CURRENT IN GROUND AT 20° | | A | 272 | 416 | | |
| 9 | | | | | | | |
| 10 | A.C. PHASES RESISTANCE AT THE MAX OP. TEMP. | | Ω/km | 0,345 | 0,163 | | |
| 11 | PHASE REACTANCE AT 50 Hz | | Ω/km | 0,110 | 0,097 | | |
| 12 | MINIMUM INSULATION RESISTANCE AT 20° | | MΩ/km | 745 | 567 | | |
| 13 | PHASE CAPACITY | | µF/km | 0,301 | 0,396 | | |
| 14 | | | | | | | |
| 15 | MINIMUM ORDER Q.TY | | m | TBD | TBD | | |
| 16 | MAX LENGHT OF DRUMS | | m | TBD | TBD | | |
| 17 | DIAMETERS | BARE CONDUCTOR | mm | 10 | 14,3 | | |
| 18 | | CORE (INSULATED CORE) | mm | 19,6 | 24 | | |
| 19 | | UNDER ARMOUR | mm | 23,6 | 28,3 | | |
| 20 | | ARMOUR OR CONCENTRIC CONDUCTOR | mm | 24,8 | 29,5 | | |
| 21 | | | | | | | |
| 22 | | | | | | | |
| 23 | | OVERALL | mm | 29 | 34 | | |
| 24 | MASSES | CONDUCTORS | kg/km | 640 | 1350 | | |
| 25 | | INSULATION | kg/km | 290 | 410 | | |
| 26 | | INNER COVERING | kg/km | 180 | 220 | | |
| 27 | | ARMOUR OR CONCENTRIC CONDUCTOR | kg/km | 220 | 250 | | |
| 28 | | OUTER SHEATING | kg/km | 280 | 350 | | |
| 29 | | | | | | | |
| 30 | | TOTAL | kg/km | 1610 | 2580 | | |
| 31 | EXTERNAL COLOUR | | | RED | RED | | |
| 32 | CORE IDENTIFICATION (1) | | | NATURAL | NATURAL | | |
| 33 | | | | | | | |
| 34 | | | | | | | |
| 35 | | | | | | | |
| 36 | | | | | | | |
| 37 | | | | | | | |
| 38 | | | | | | | |

39

40 NOTE: (1) BK=BLACK, BN=BROWN, GY=GRAY, BU=BLUE, RD=RED, Y/G=YELLOW/GREEN

41 (*) TO BE FILLED BY VENDOR

42 NA NOT APPLICABLE

43

44

45

46

47

48

49

50

51

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-1-L1 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000491 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | PL |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-1-L1 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000491 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

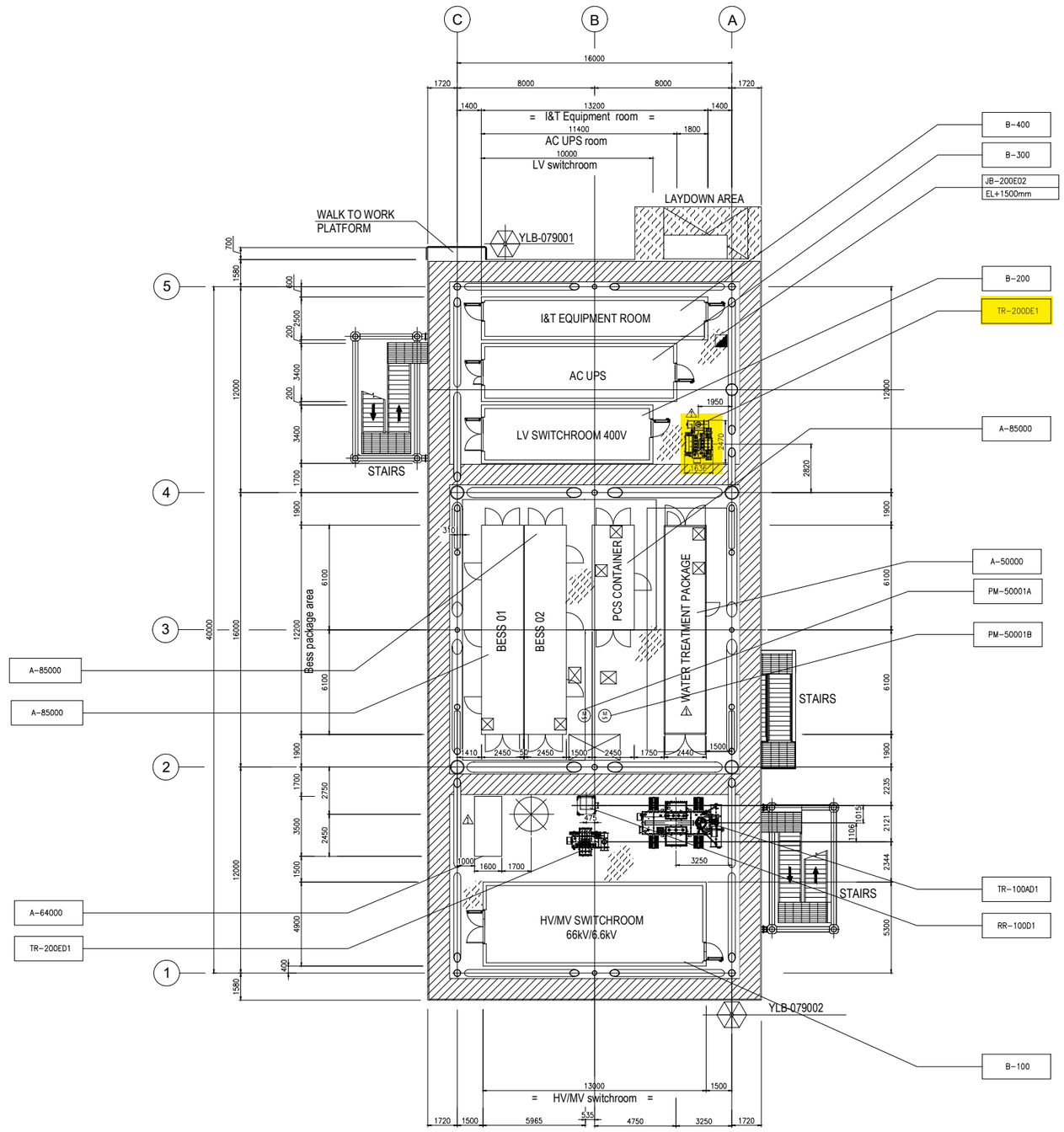
Comments: Note 4 : Refer to PL C30000679



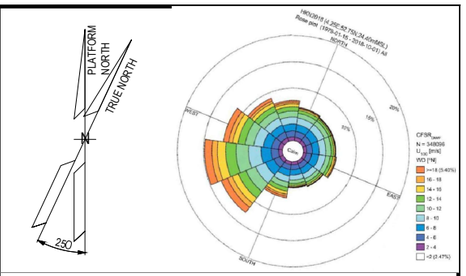
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:17:56.780Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:21:09.466Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

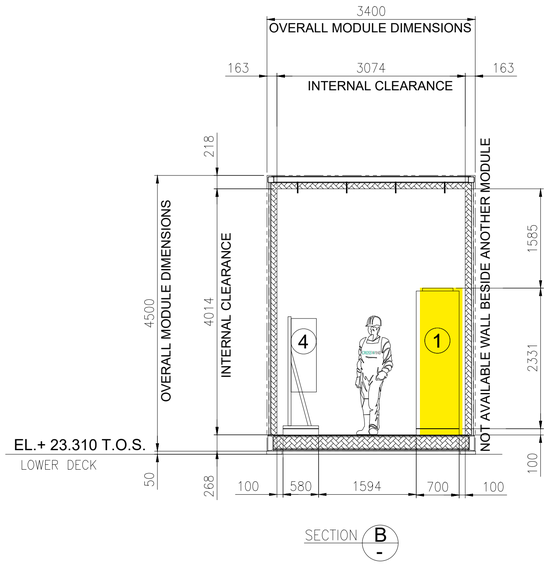
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

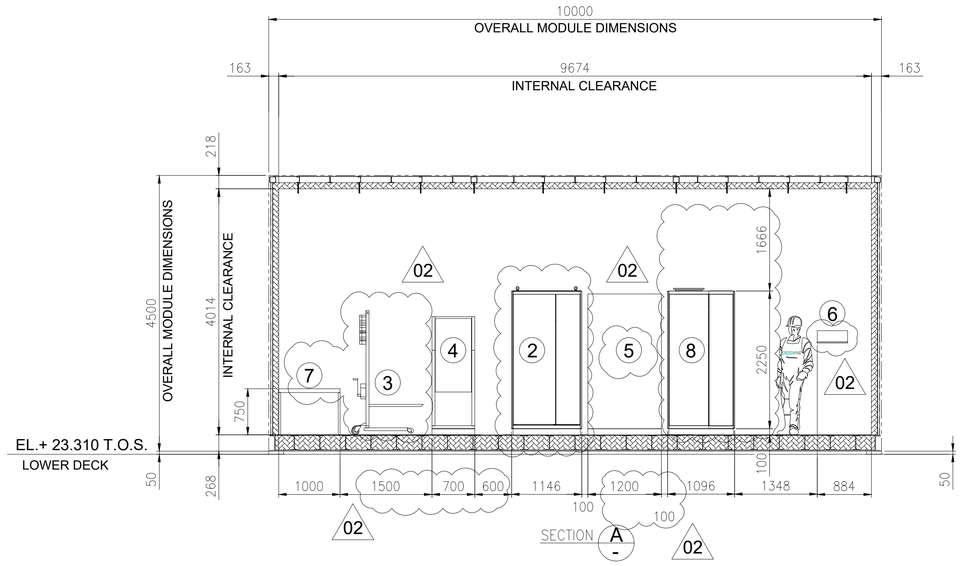
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

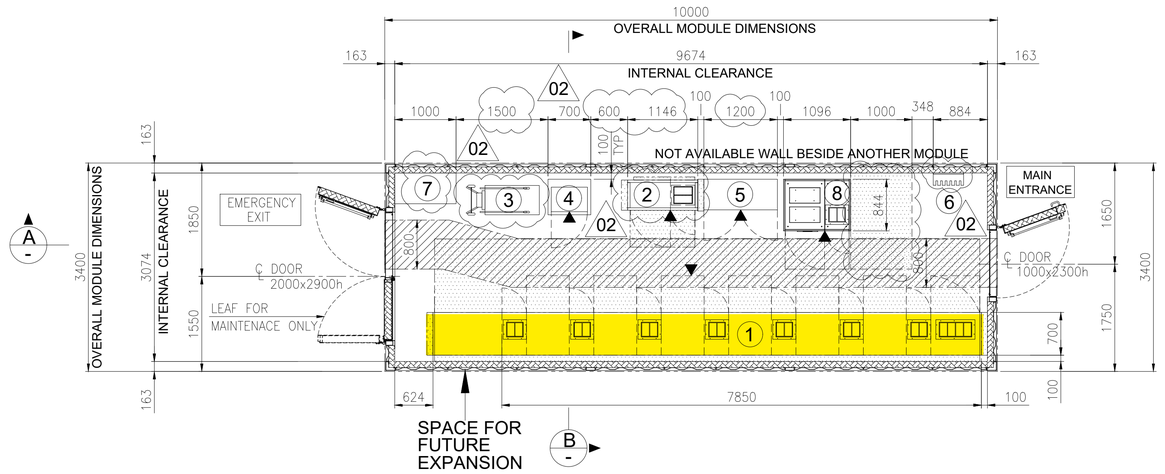
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02



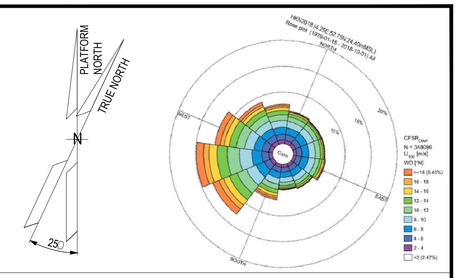




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

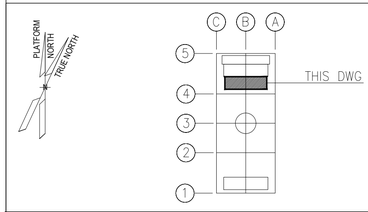
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

## GENERAL NOTES:

1. FOR EQUIPMENT AND SYSTEM TAG NUMBERING REFER THE DOCUMENT 123A90-PML-DIG-PRO-00002

2. IDENTIFICATION ABBREVIATIONS FOR CABLES & OTHER ELECTRICAL EQUIPMENTS:

A) IDENTIFICATION COLOR CODE OF THE ELECTRICAL CABLE

BK = BLACK
BN = BROWN
BU = BLUE
GY = GRAY
RD = RED
Y/G = YELLOW AND GREEN

B) IDENTIFICATION CODE OF THE ELECTRICAL EQUIPMENT

TR = TRANSFORMER
NER = NEUTRAL EARTH RESISTOR
JB = JUNCTION BOX
CP = CONTROL PANEL

C) FUNCTION CODE OF THE ELECTRICAL EQUIPMENT

AP = ALARM PANEL
UP = AC UPS & DC UPS
BA = BATTERY
BC = BATTERY CHARGER / RECTIFIER
CB =CIRCUIT BRAKER BOX
CN = CATHODIC PROTECTION
CP = CONTROL PANEL
DP = DISTRIBUTION PANEL
JB = JUNCTION BOX
NC = NAVIGATIONAL AID CENTRAL CONTROL PANEL
RR = RESISTOR (EARTHING)
SB = SWITCHBOARD

D) IDENTIFIER ABBREVIATIONS OF THE ELECTRICAL SYSTEM:

EMCS = ELECTRICAL MONITORING & CONTROL SYSTEM
GIS = GAS INSULATED SWITCHGEAR
HVAC = HEATING, VENTILATION, AIR CONDITIONING
HV = HIGH VOLTAGE
MV = MEDIUM VOLTAGE
LCP = LOCAL CONTROL PANEL
LV = LOW VOLTAGE
UPS = UNINTERRUPTIBLE POWER SUPPLY
BESS = BATTERY ENERGY STORAGE SYSTEM
PAS = PROCESS AUTOMATION SYSTEM

E) IDENTIFIER OF THE LOADED PHASE FOR SINGLE-PHASE EQUIPMENT POWER SUPPLY(LV):

L = LINE
N = NEUTRAL
PE = PROTECTIVE EARTH

F) IDENTIFIER OF THE LOADED PHASE FOR THREE-PHASE EQUIPMENT POWER SUPPLY(MV&LV):

L1 = LINE 1
L2 = LINE 2
L3 = LINE 3

3. RED CONDUCTOR MUST BE COVERED WITH BLUE SLEEVE AT THE ENDS, TO USE IT AS NEUTRAL.

4. THE MINIMUM CABLE LENGTH IS 15 M, THE CABLE CANNOT BE SHORTER.

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
GENERAL NOTES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

SHEET 006

REV. 01

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

F.to UNI A3: 420mmx297mm

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 (01)

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

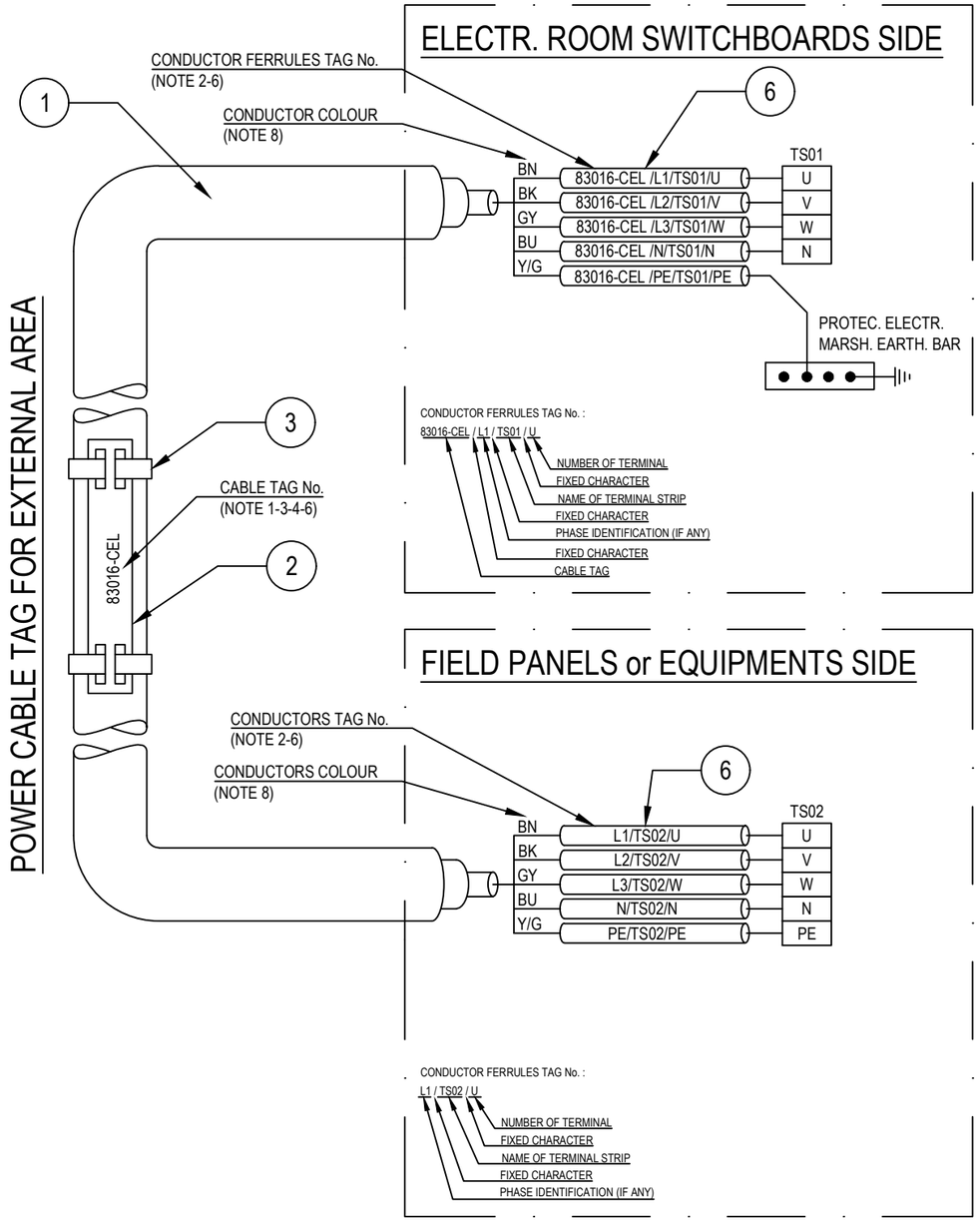
SHEET 017

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

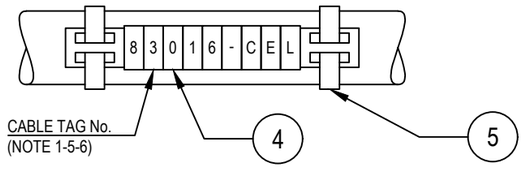
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

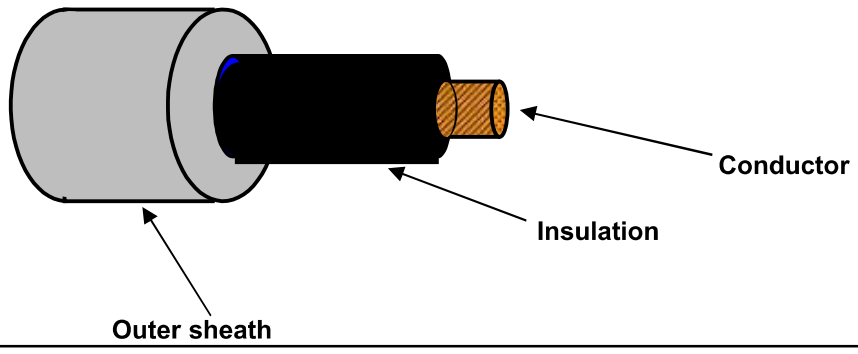
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-1-L1 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-205 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-2-L1 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000492 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-2-L1 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000492 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

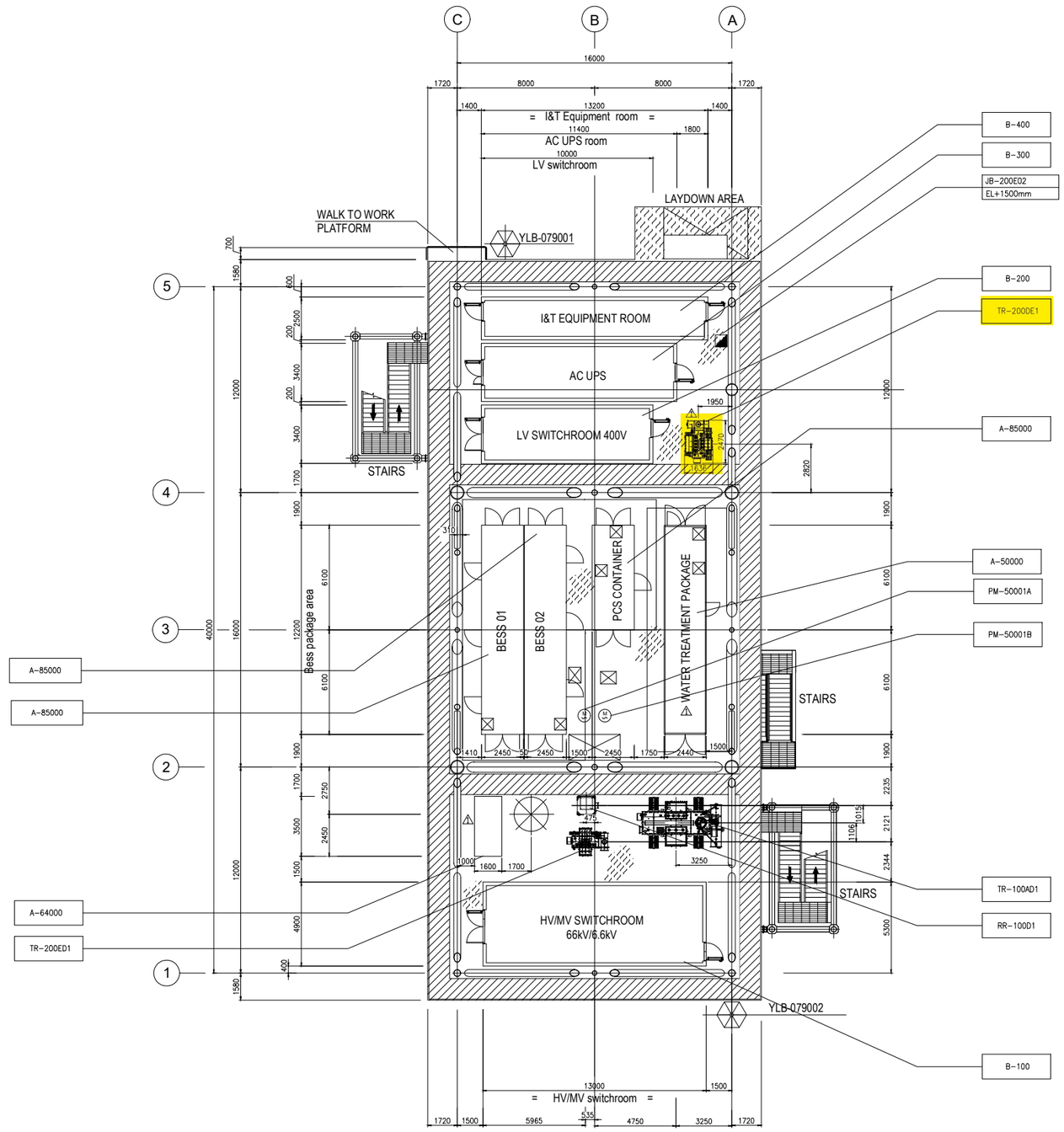
Note 8 : Refer to PL C30000818



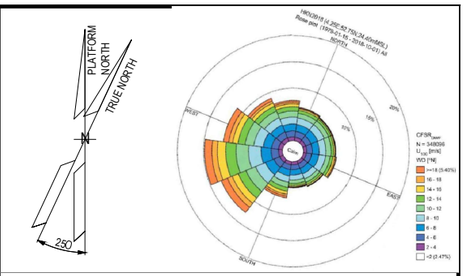
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:18:09.687Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:22:19.103Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

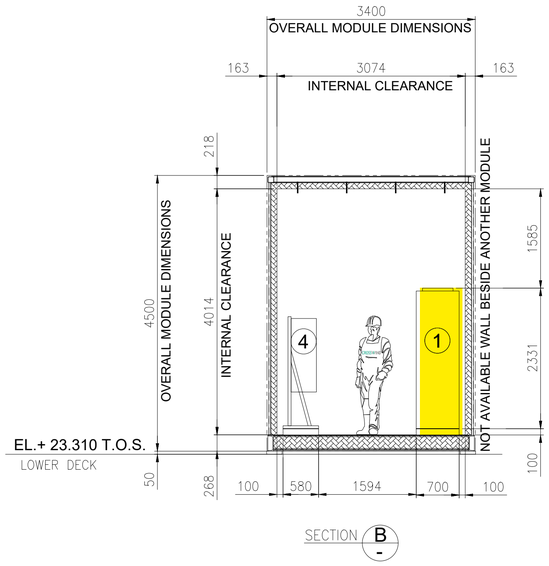
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

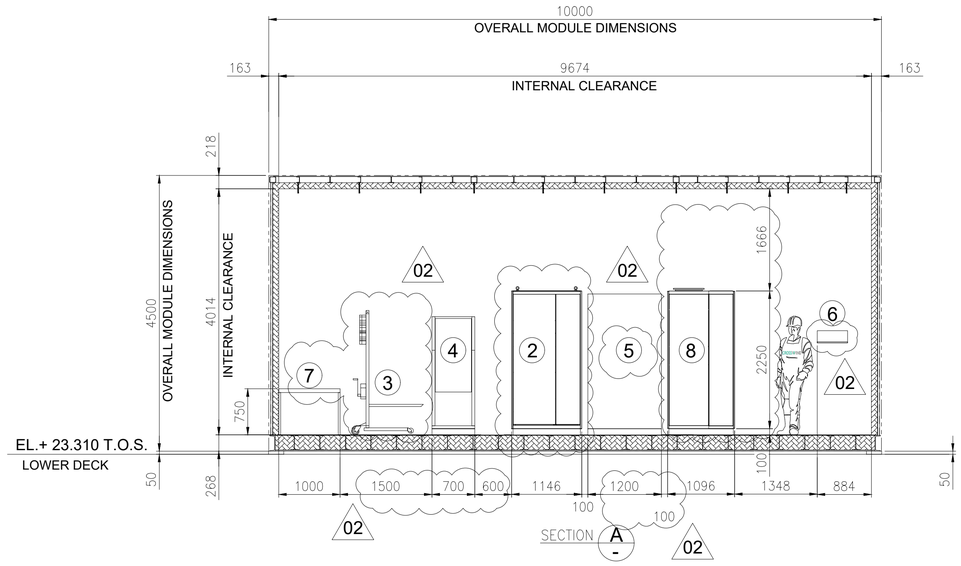
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

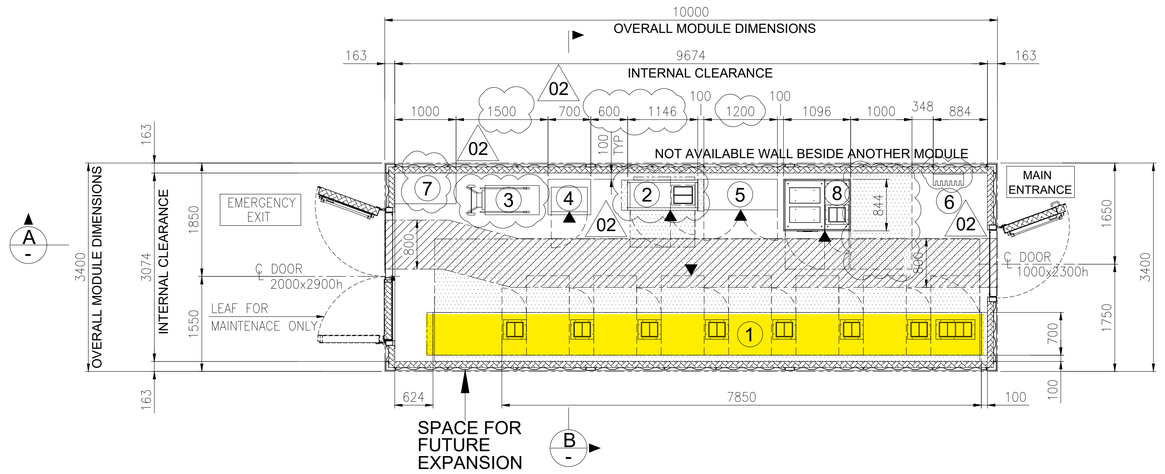
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02



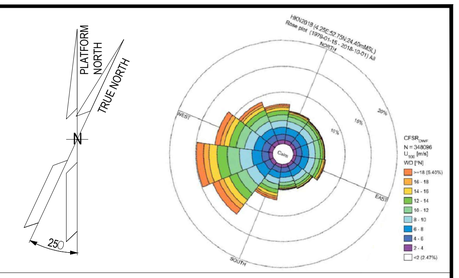




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

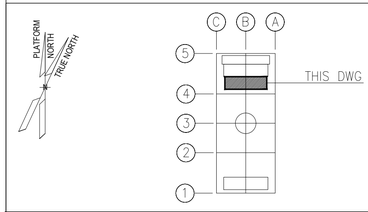
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 (01)

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

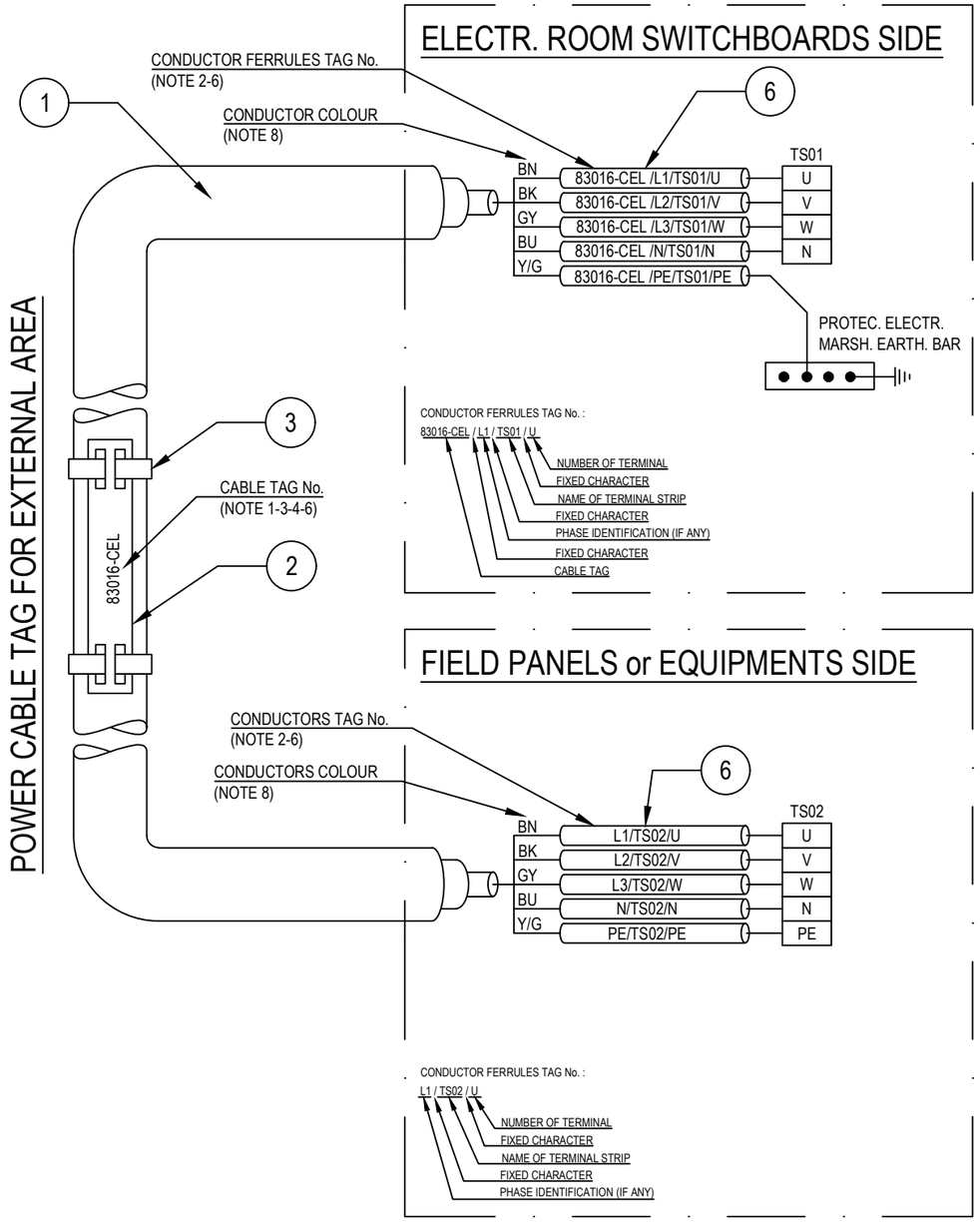
SCALE : 1:X

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DG-20149 | 017 | 01 |

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

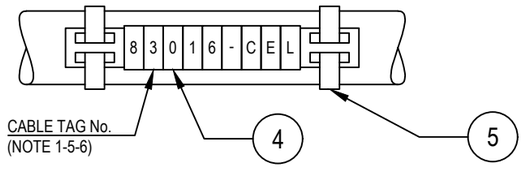
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

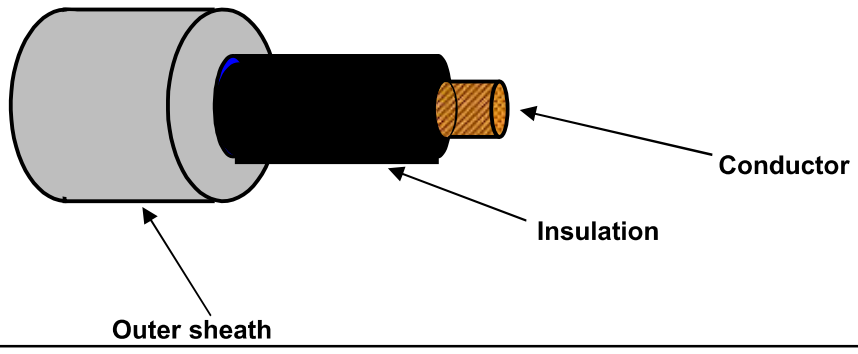
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-2-L1 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-205 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-3-L1 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000493 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-3-L1 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000493 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

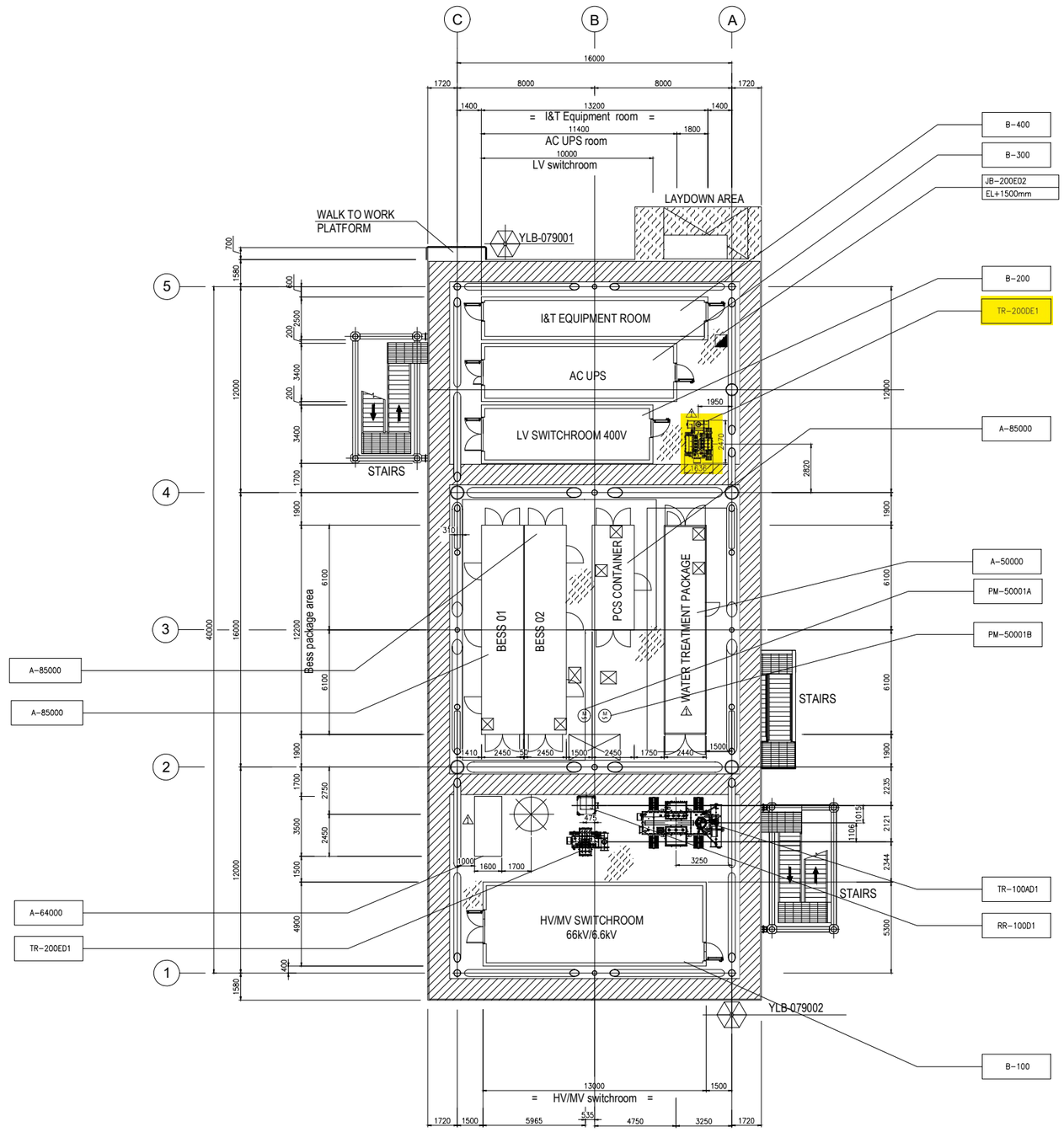
Note 8 : Refer to PL C30000818



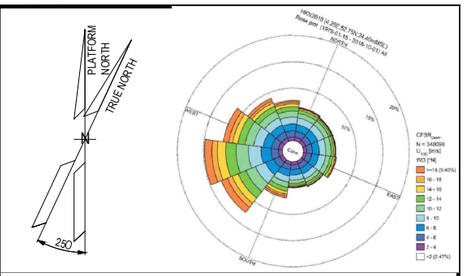
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:18:21.904Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:23:05.016Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

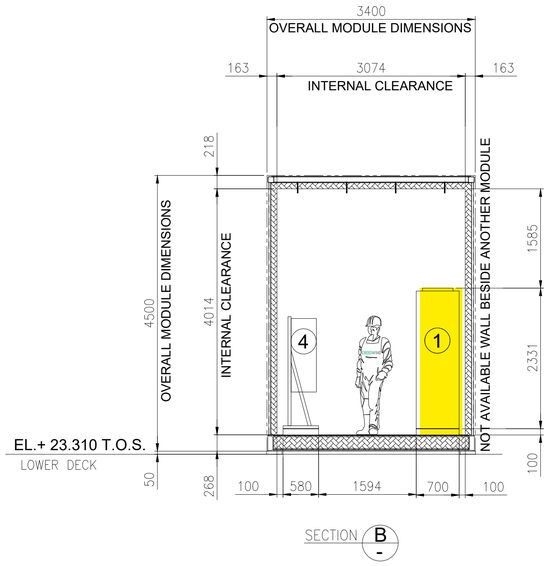
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

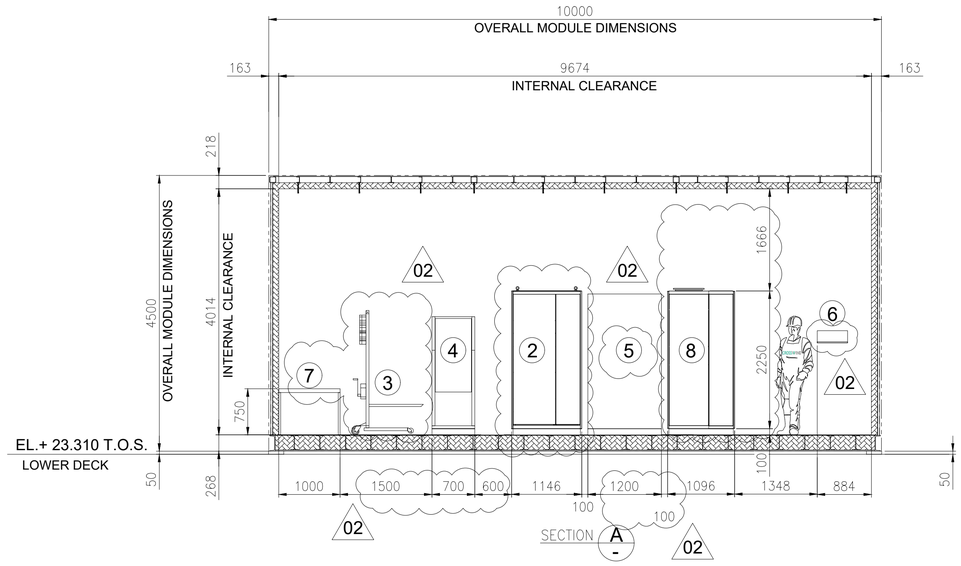
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

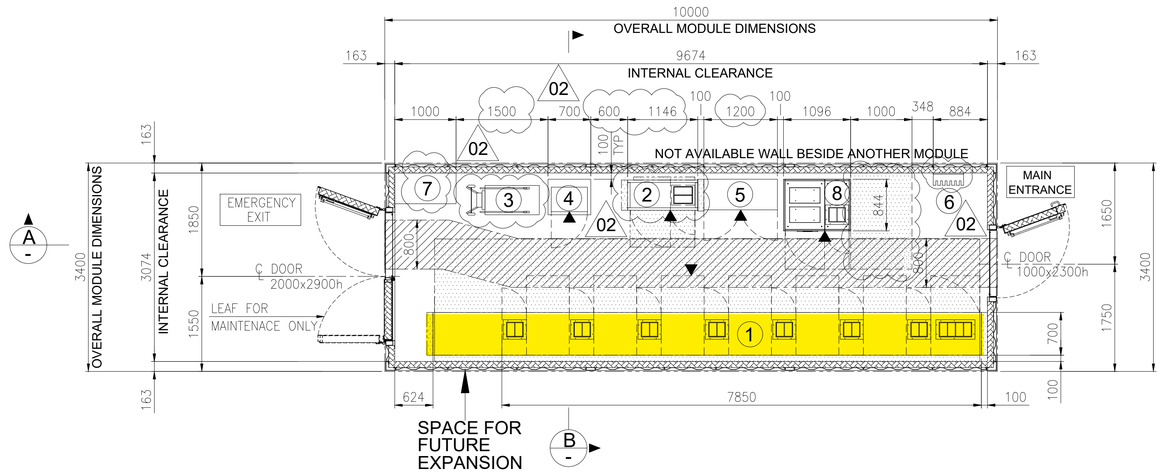
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02



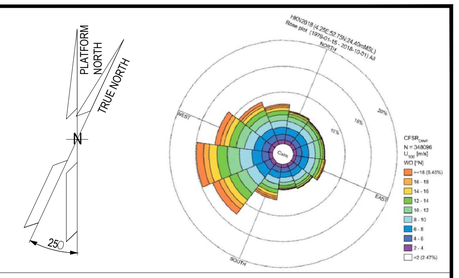




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

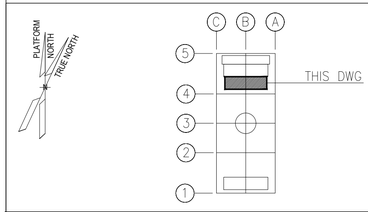
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 (01)

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

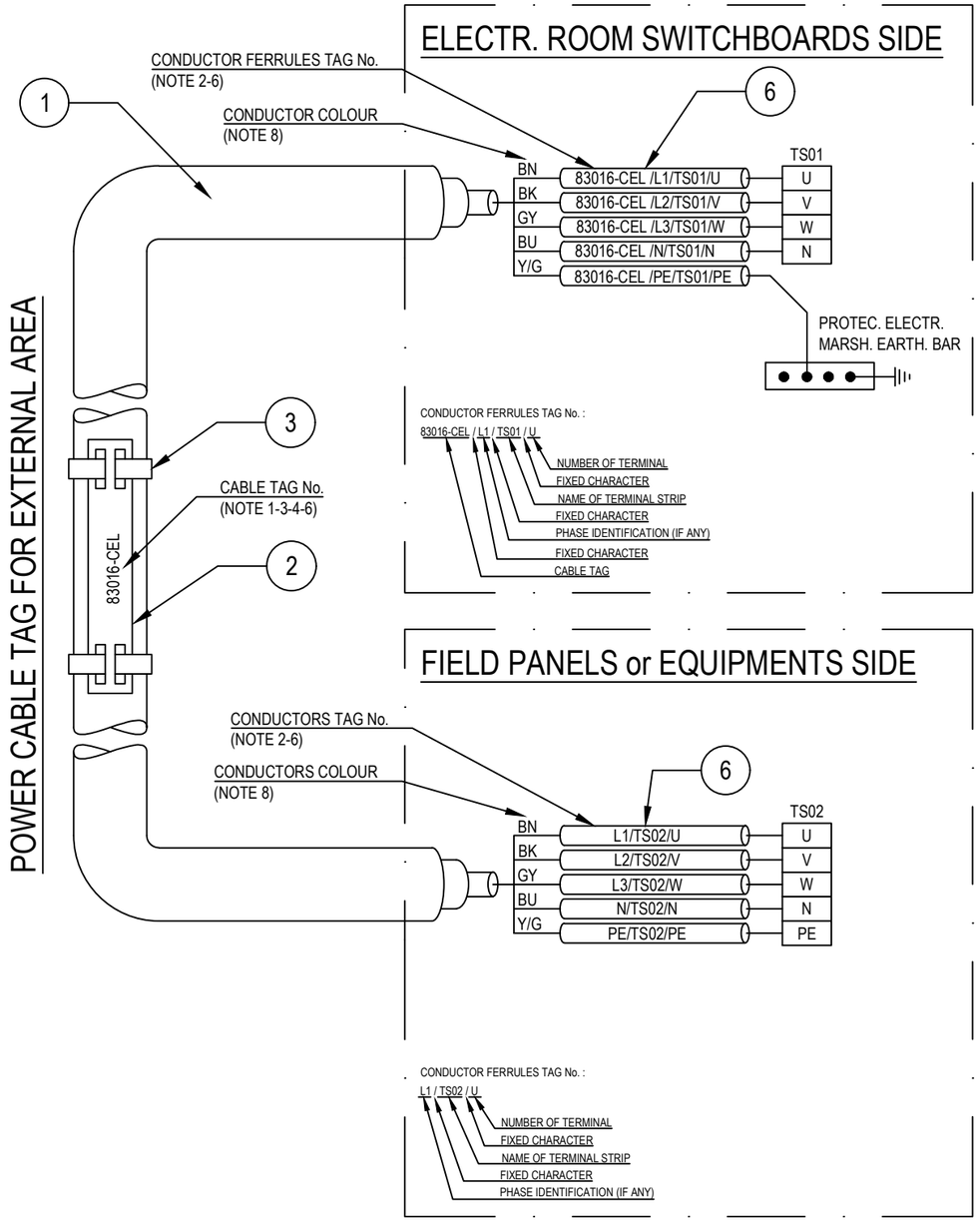
SCALE : 1:X

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DG-20149 | 017 | 01 |

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

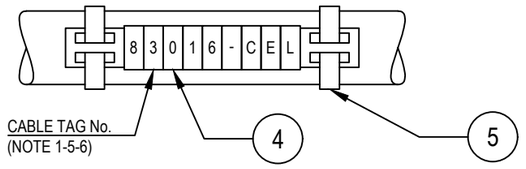
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

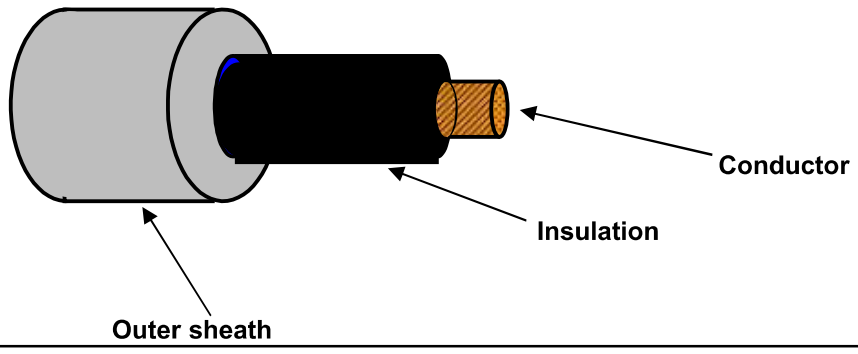
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-3-L1 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-205 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-4-L1 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000494 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-4-L1 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000494 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

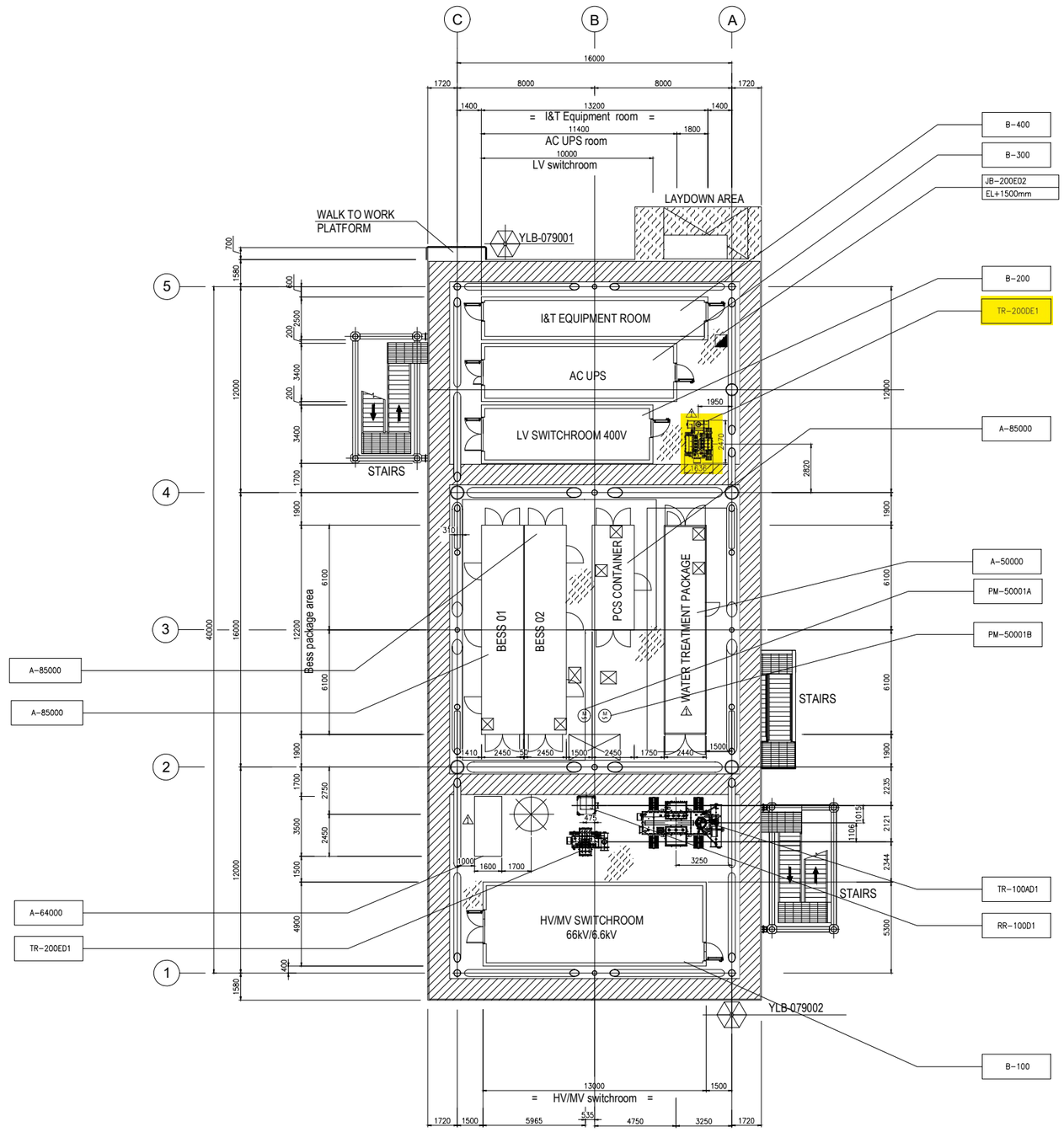
Note 8 : Refer to PL C30000818



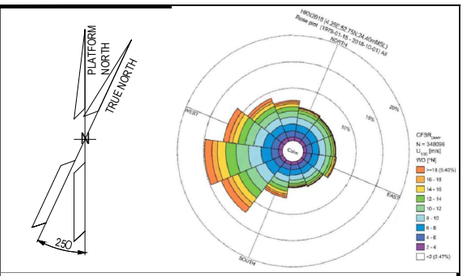
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:18:33.687Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:23:58.432Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

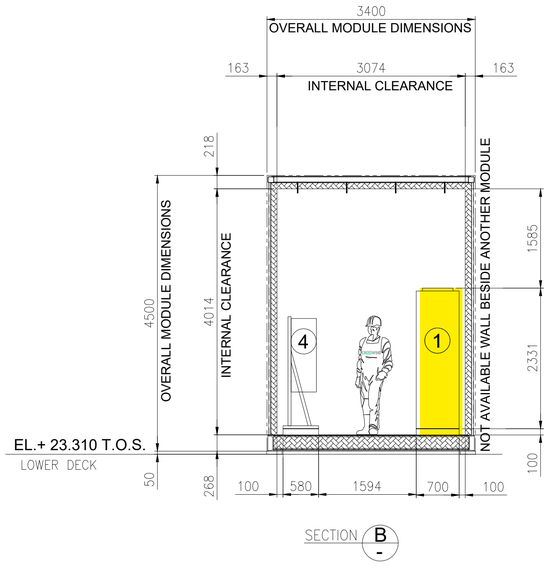
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

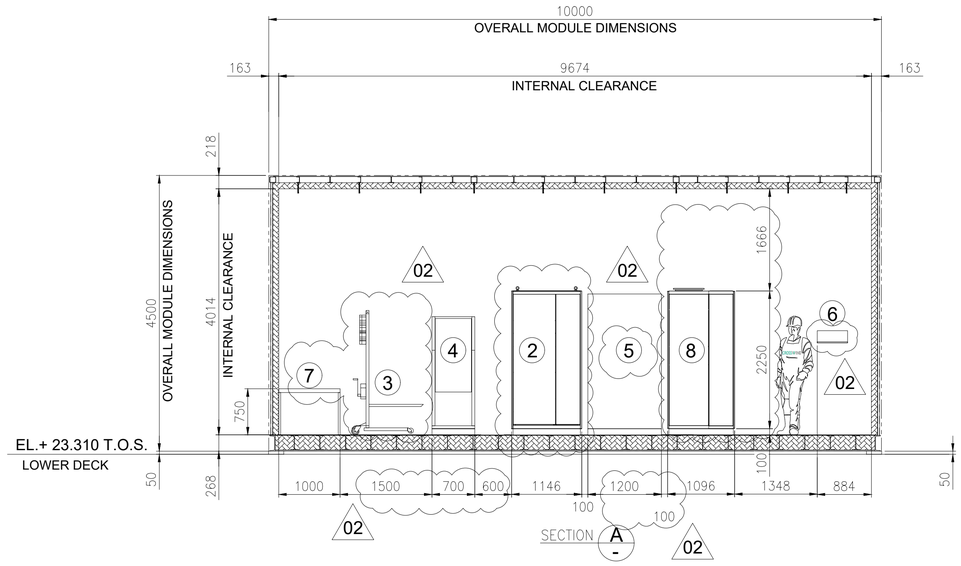
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

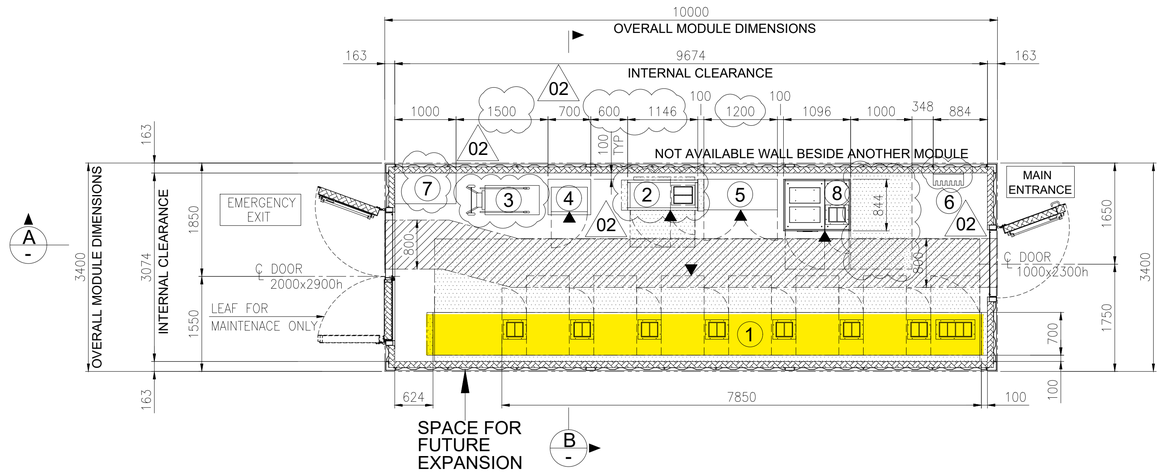
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02



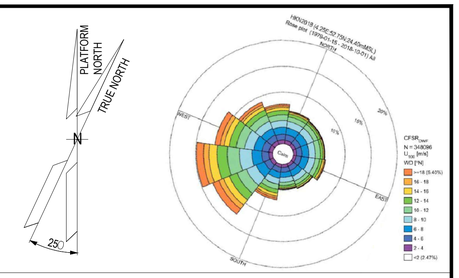




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

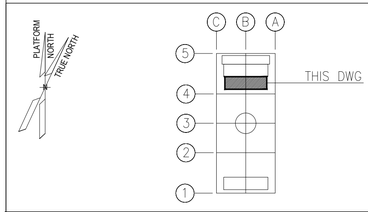
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 (01)

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | EARTH BOSS |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

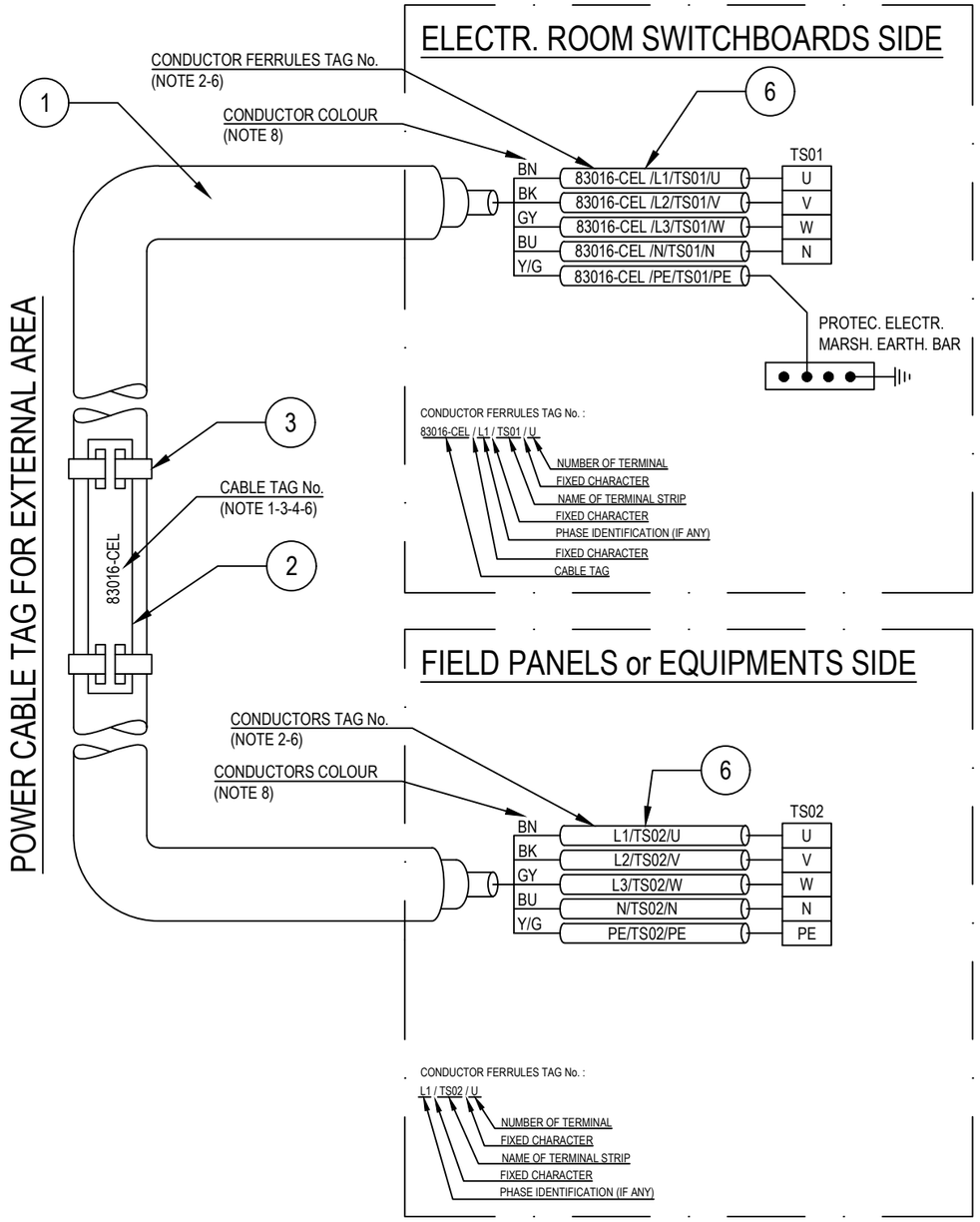
SHEET 017

REV. 01

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

F.to UNI A3: 420mmx297mm

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

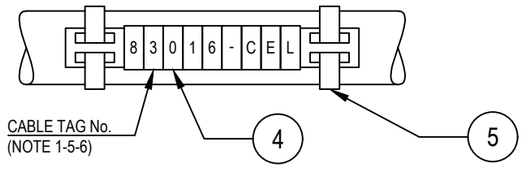
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

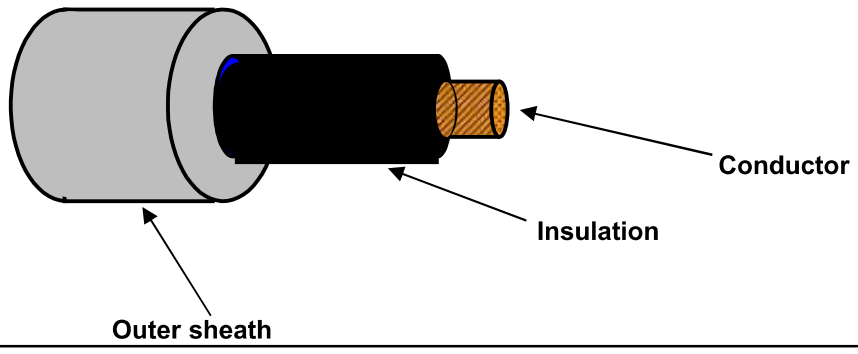
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-4-L1 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-206 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-5-L1 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000495 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-5-L1 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000495 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments: Note 4 : Refer to PL C30000679

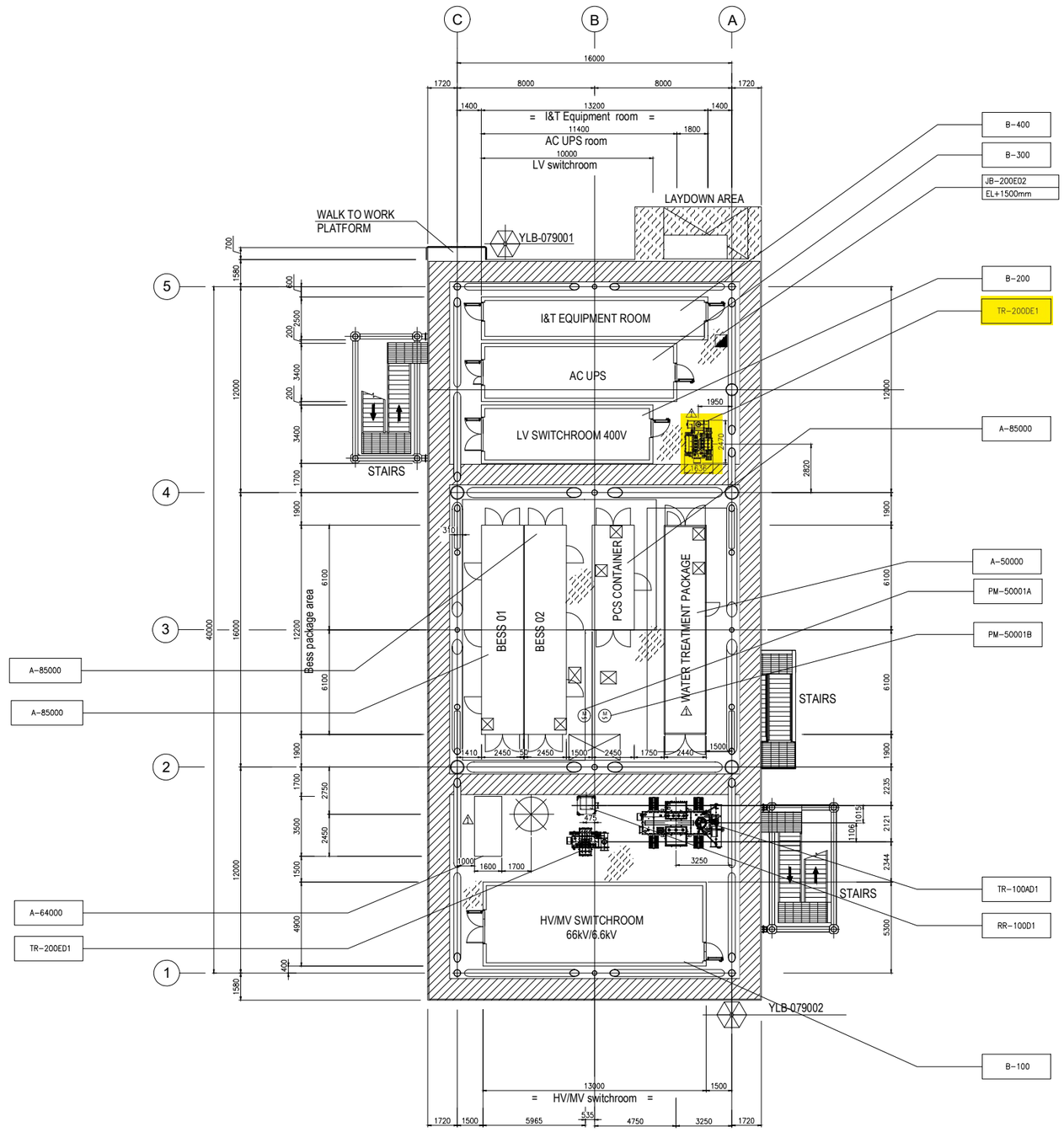
Note 8 : Refer to PL C30000818



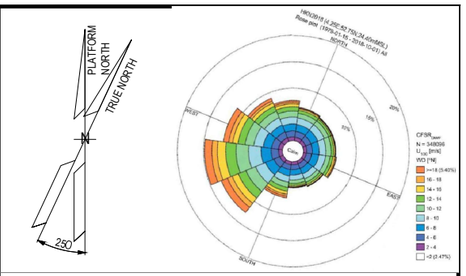
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:18:51.586Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:24:50.476Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

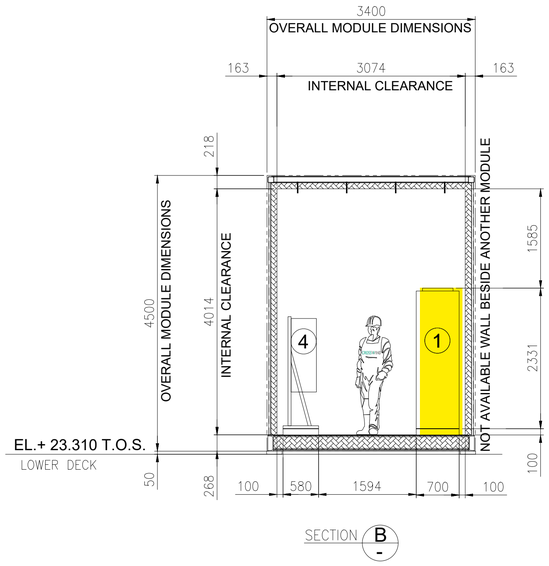
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

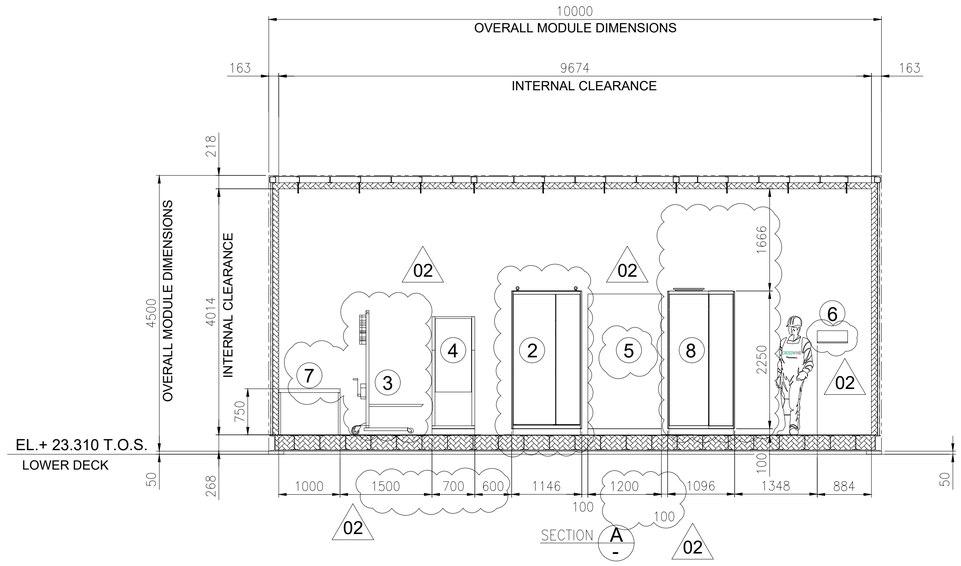
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

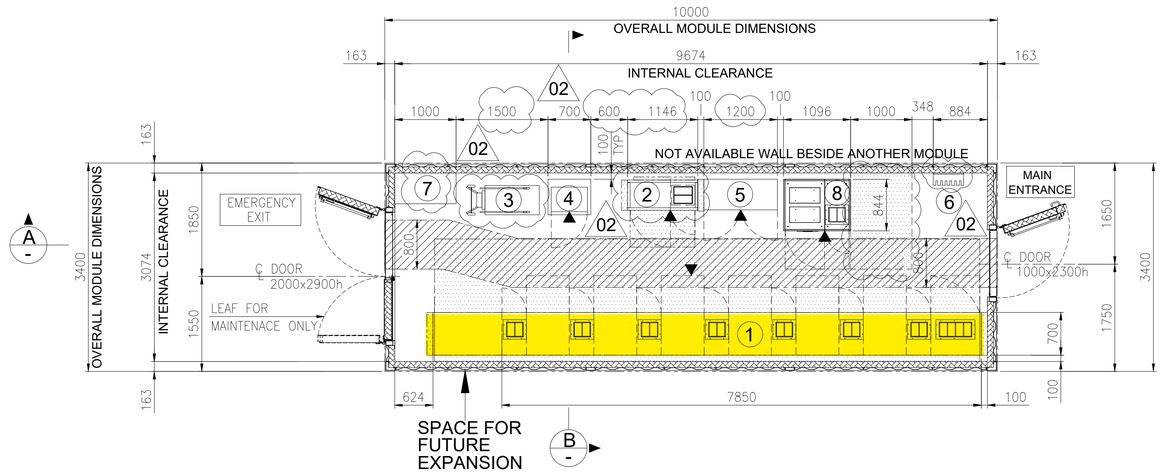
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02



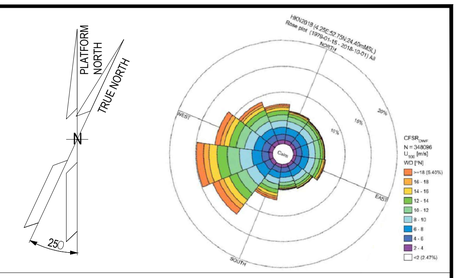




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

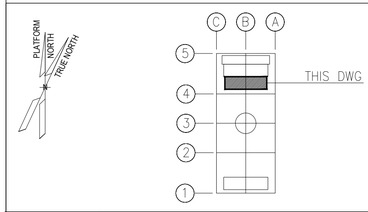
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1<br>1C X 300 mm² | BK | L1 | COLUMN/CUBIC.: A1/+02 | |
| | L1 | BK | 83001-CEL-2-L1<br>1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-3-L1<br>1C X 300 mm² | BK | L1 | LINE-1 | |
| | L1 | BK | 83001-CEL-4-L1<br>1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-5-L1<br>1C X 300 mm² | BK | L1 | | |
| 2V | L2 | BK | 83001-CEL-1-L2<br>1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-2-L2<br>1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-3-L2<br>1C X 300 mm² | BK | L2 | LINE-2 | |
| | L2 | BK | 83001-CEL-4-L2<br>1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-5-L2<br>1C X 300 mm² | BK | L2 | | |
| 2W | L3 | BK | 83001-CEL-1-L3<br>1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-2-L3<br>1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-3-L3<br>1C X 300 mm² | BK | L3 | LINE-3 | |
| | L3 | BK | 83001-CEL-4-L3<br>1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-5-L3<br>1C X 300 mm² | BK | L3 | | |
| 2N | N | BK | 83001-CEL-1-N<br>1C X 300 mm² | BK | N | | |
| | N | BK | 83001-CEL-2-N<br>1C X 300 mm² | BK | N | NEUTRAL | |
| | N | BK | 83001-CEL-3-N<br>1C X 300 mm² | BK | N | | |
| PE | PE | Y/G | 83001-CEL-1-E<br>1C X 150 mm² | Y/G | | | |
| | PE | Y/G | 83001-CEL-2-E<br>1C X 150 mm² | Y/G | | EARTH BOSS | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

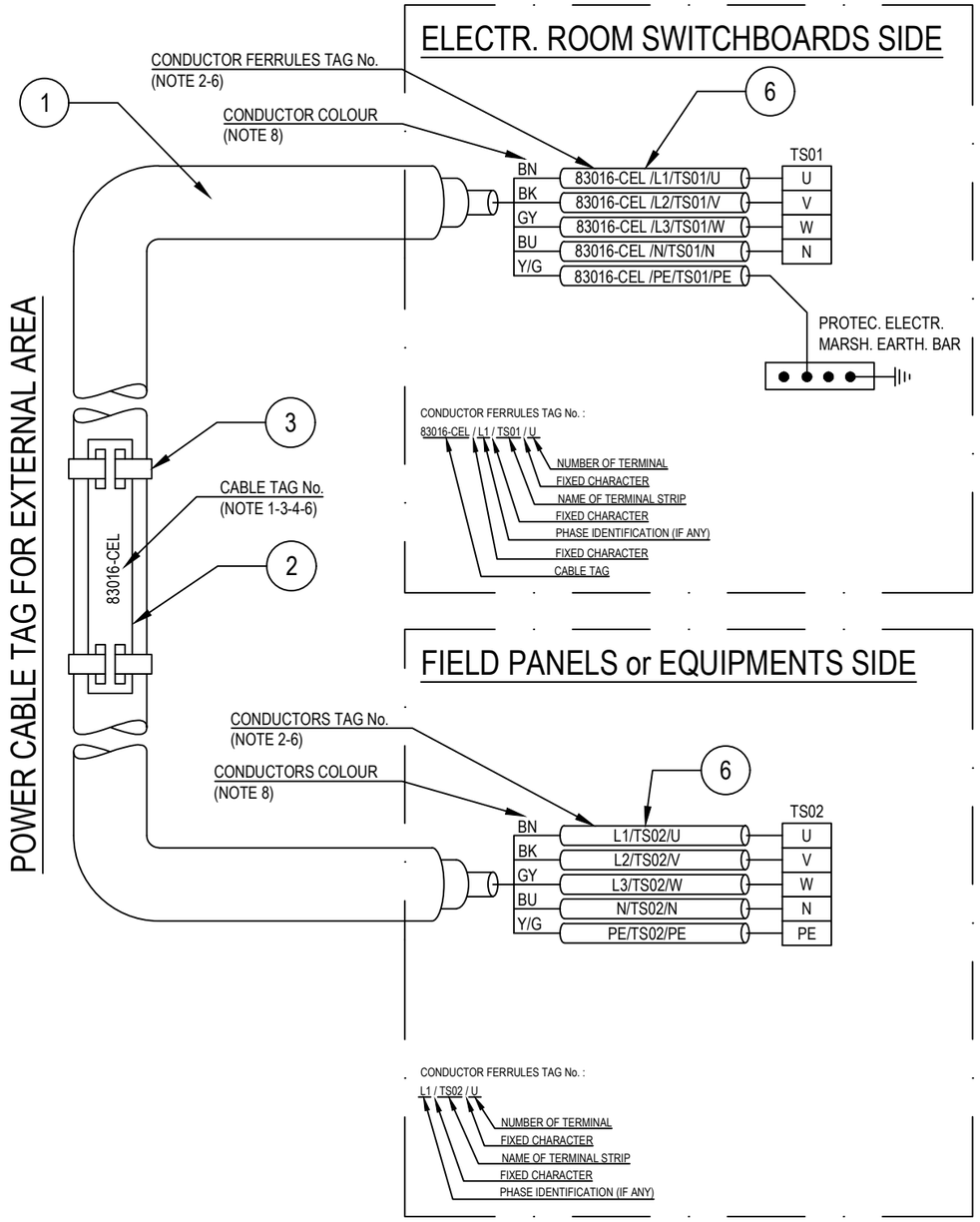
SCALE : 1:X

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DG-20149 | 017 | 01 |

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

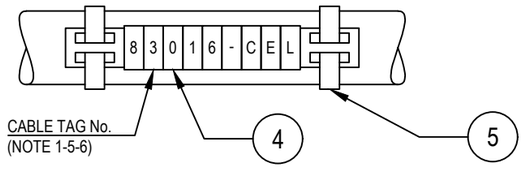
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

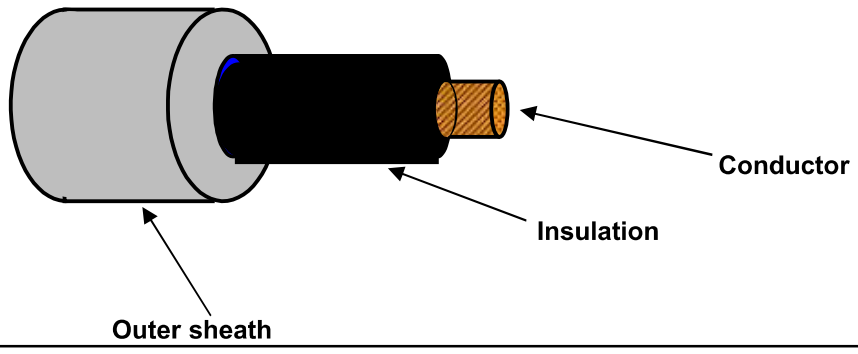
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-5-L1 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-206 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-1-L2 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000496 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-1-L2 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000496 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

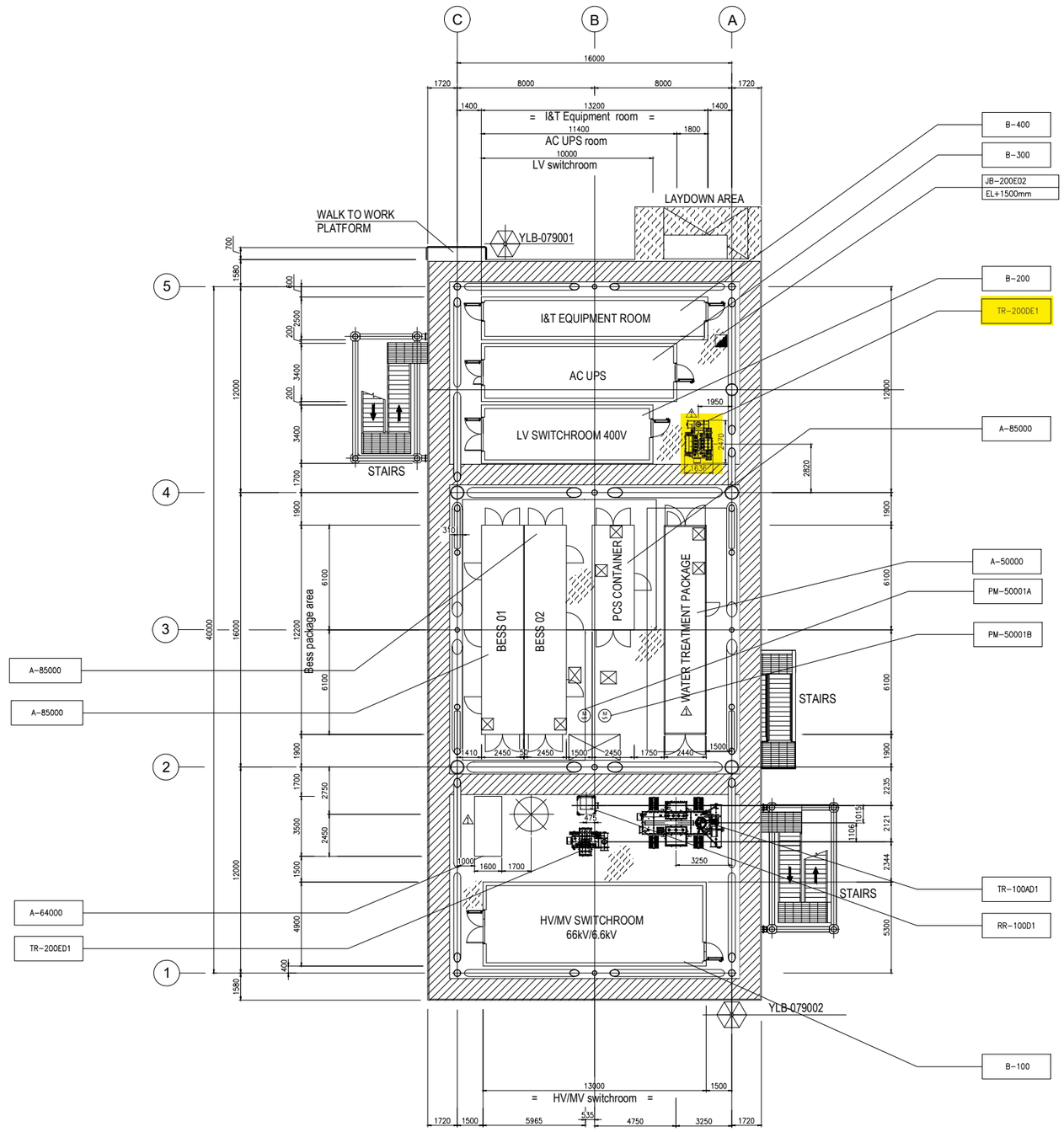
Note 8 : Refer to PL C30000818



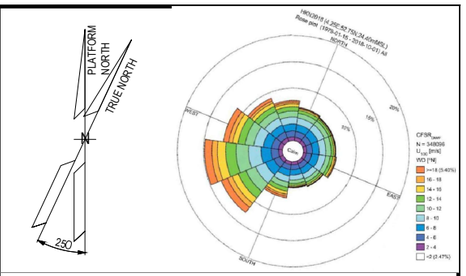
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:19:04.578Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:25:31.127Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

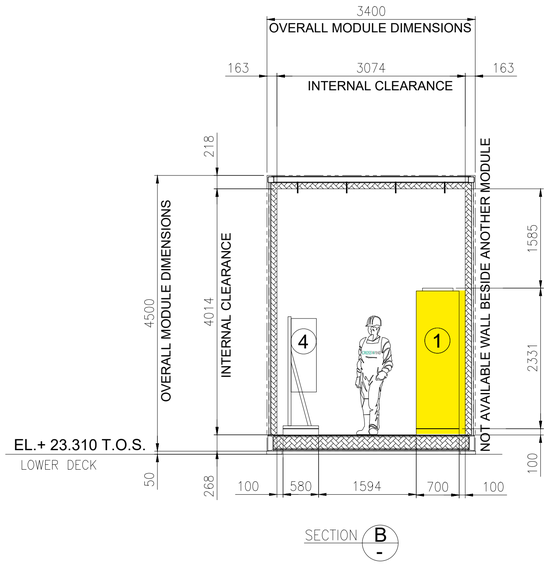
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

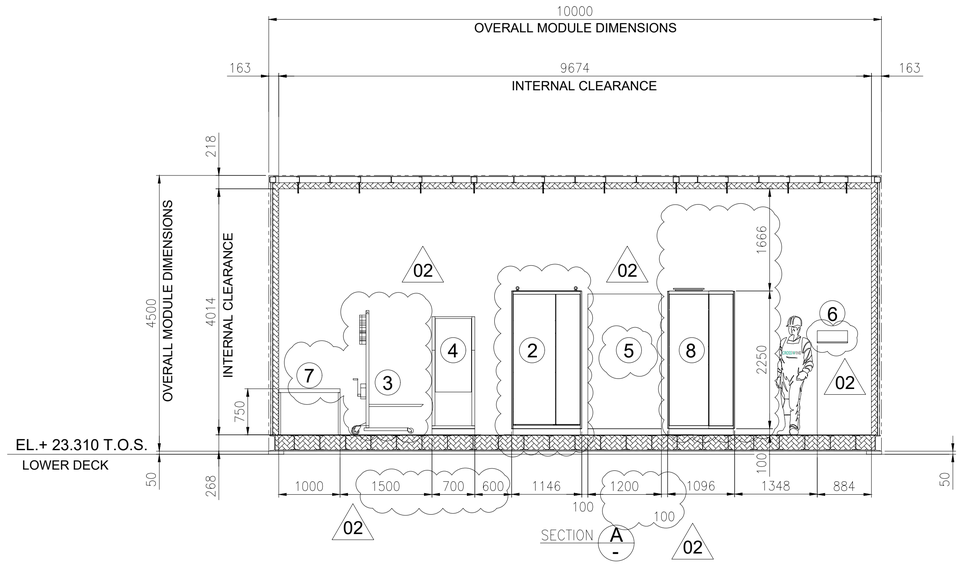
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

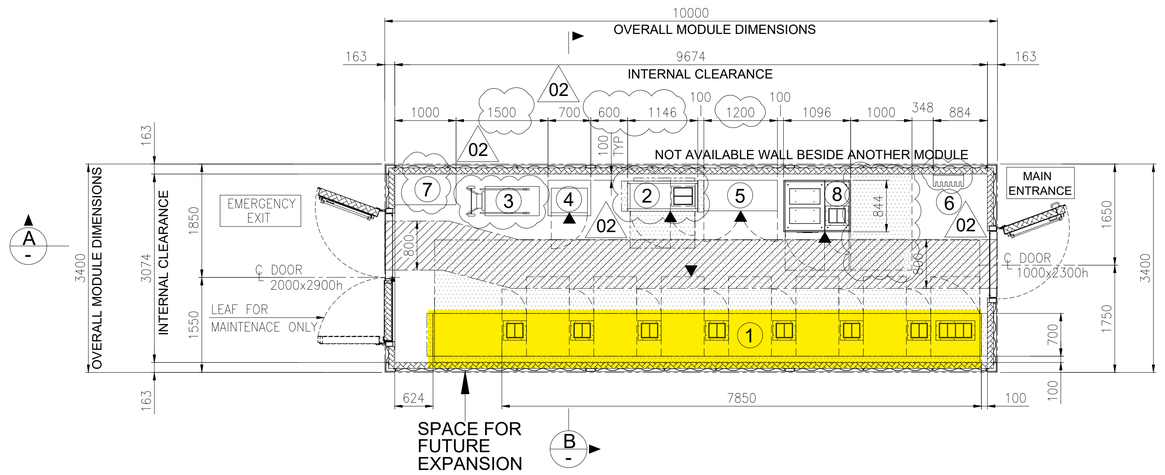
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02




EQUIPMENT LAYOUT

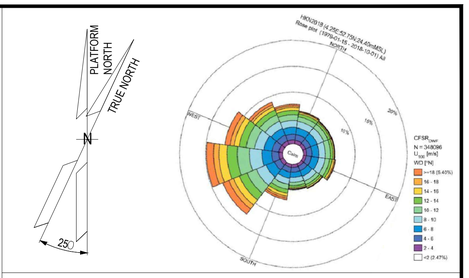
"B-200" LV (400V) SWITCHGEAR ROOM

BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE

T.O.S. _____ TOP OF STEEL

_____ ESCAPE CORRIDOR - WIDTH 800mm.

_____ MAINTENANCE AREA - VENDOR REQUIREMENT

_____ SWITCHGEAR ROOM ENCLOUSURE

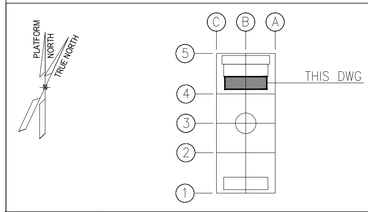
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION

FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 (01)

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | COLUMN/CUBIC.: A1/+02 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

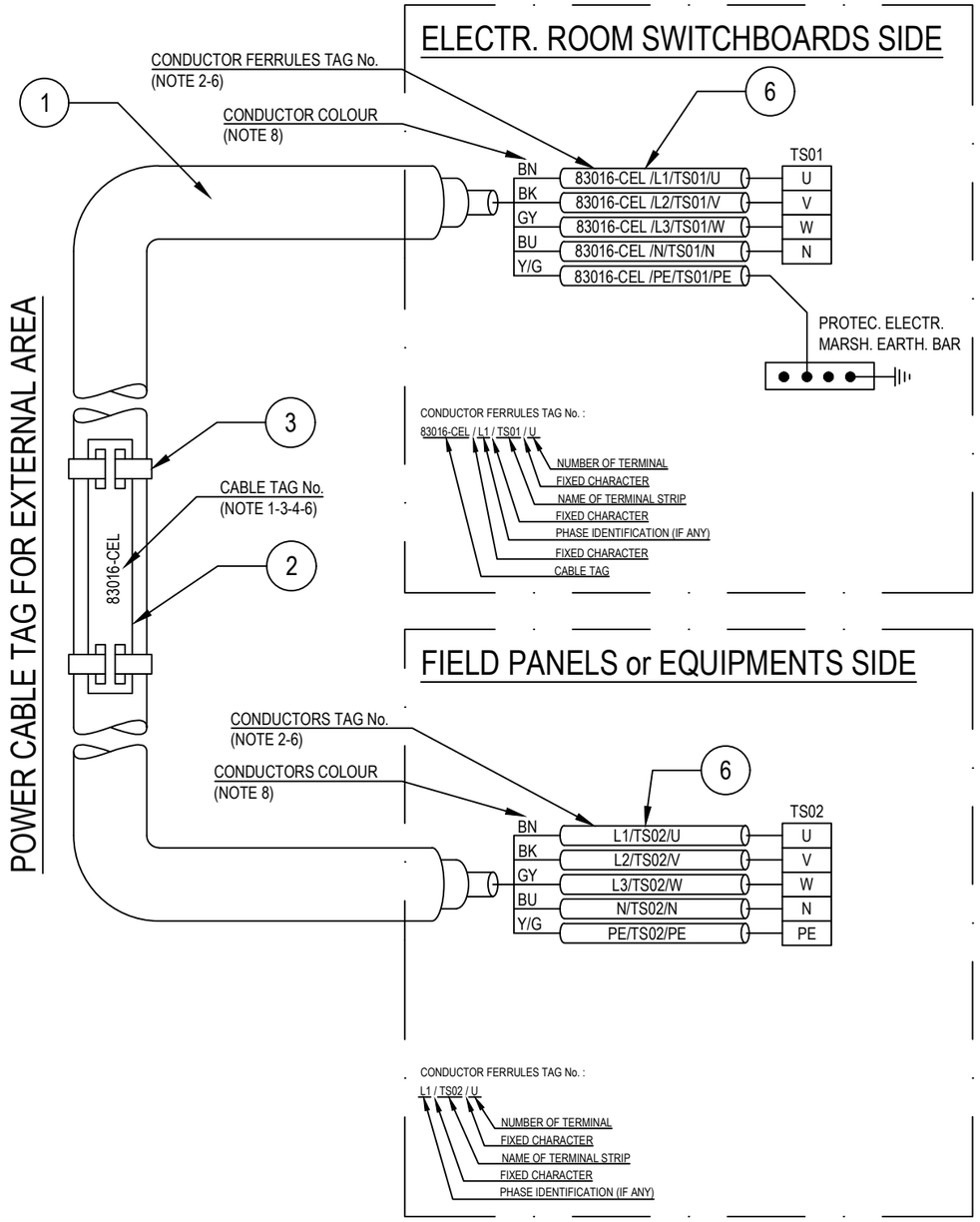
SCALE : 1:X

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DG-20149 | 017 | 01 |

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

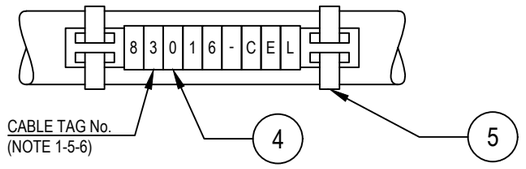
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

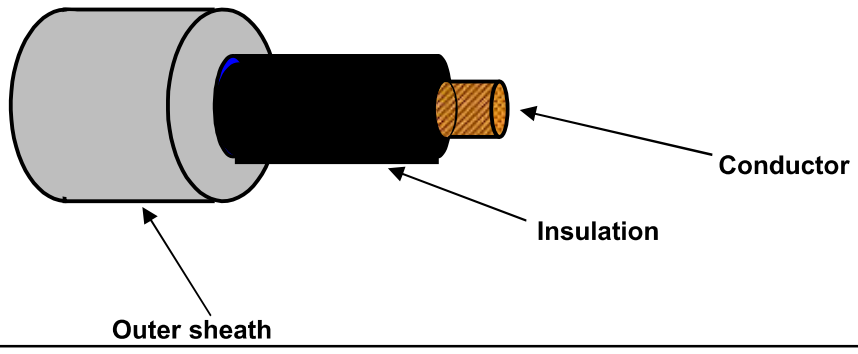
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-1-L2 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-205 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-2-L2 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000497 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO | PROVERLIS | CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-2-L2 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000497 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

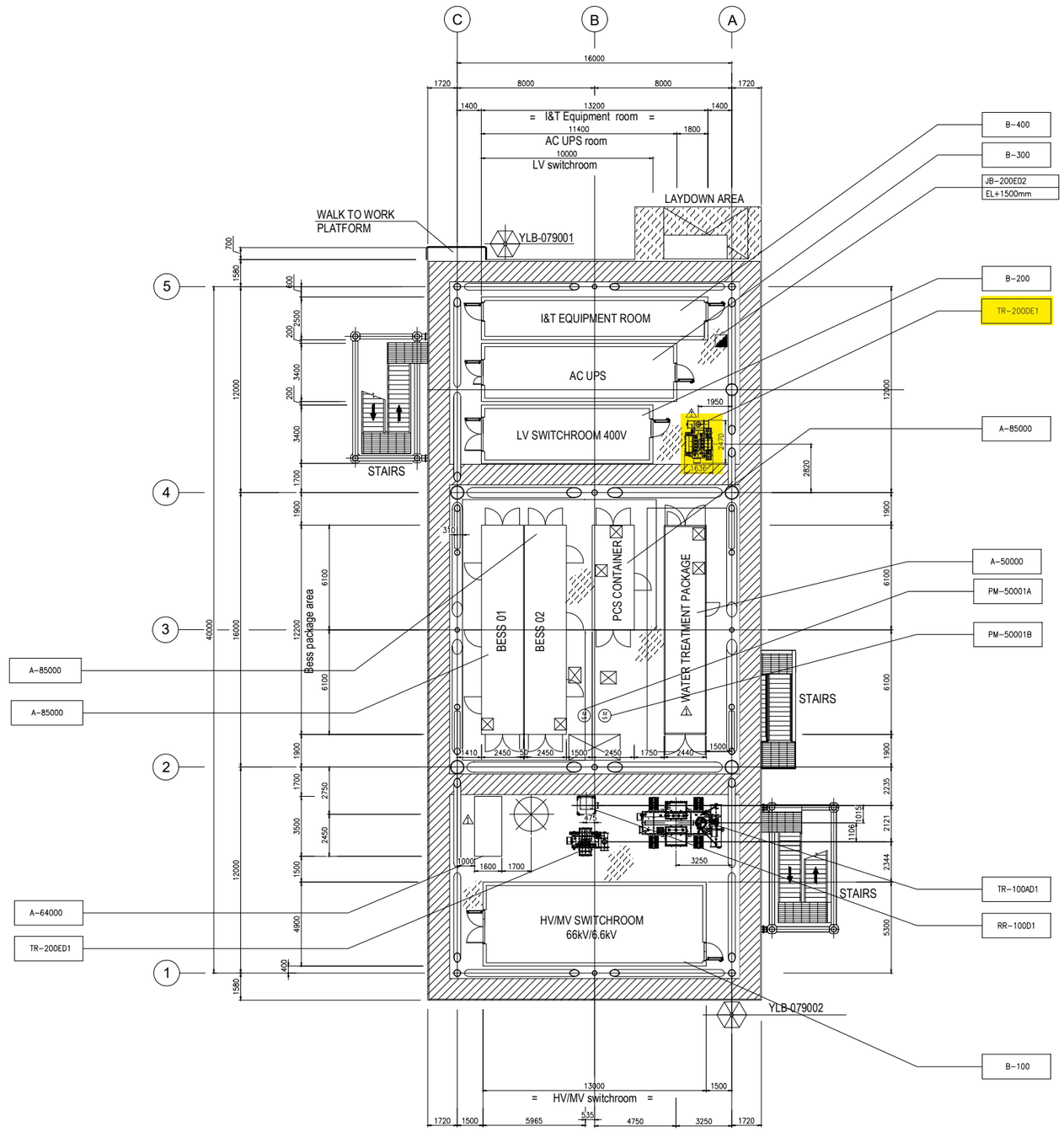
Note 8 : Refer to PL C30000818



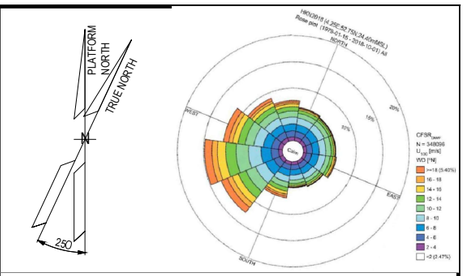
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:19:16.156Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:26:11.014Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

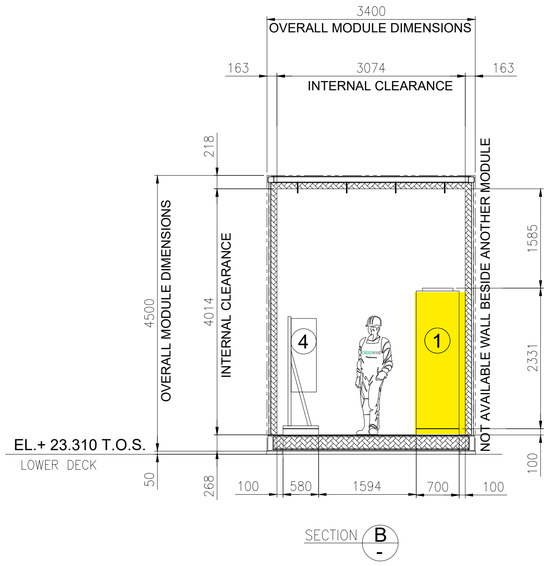
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

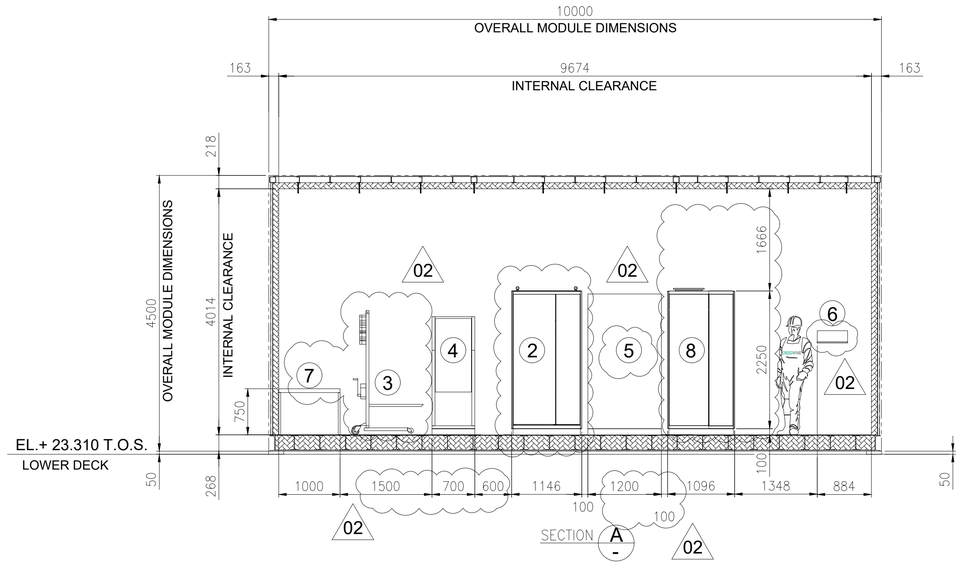
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

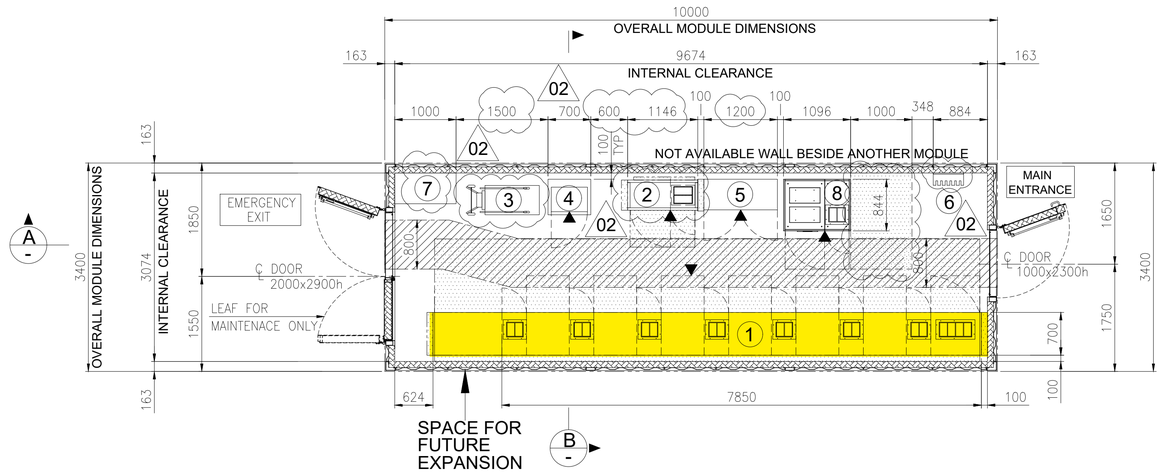
DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02




SECTION B




SECTION A



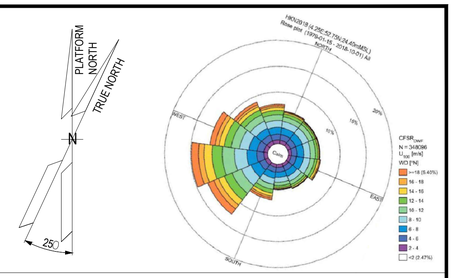

A

EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

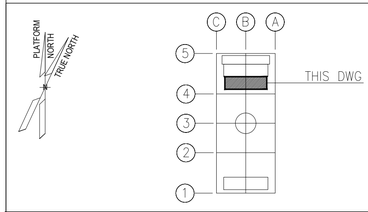
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | COLUMN/CUBIC.: A1/+02 | |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | LINE-1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | LINE-2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | LINE-3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | NEUTRAL | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

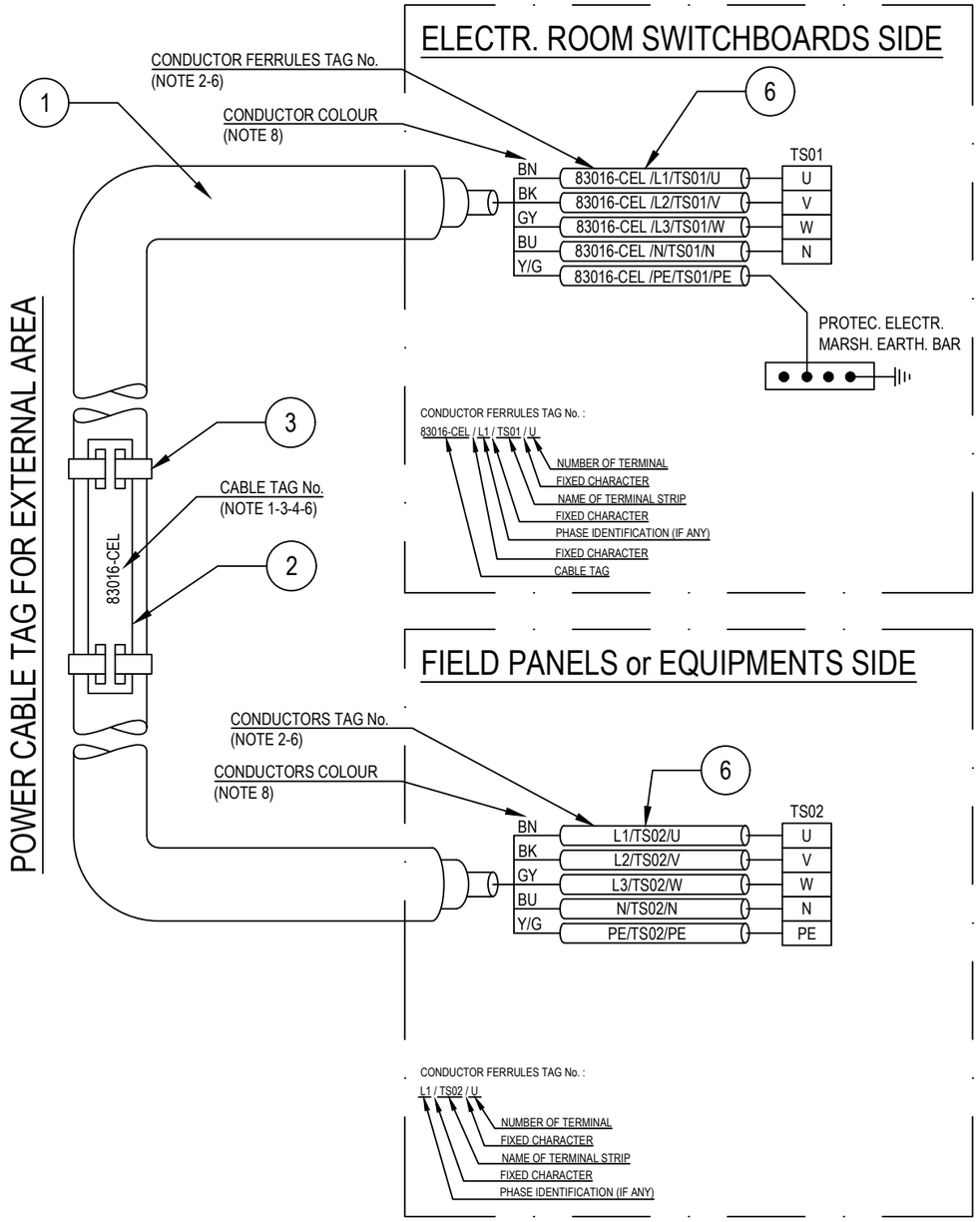
SCALE : 1:X

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DG-20149 | 017 | 01 |

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

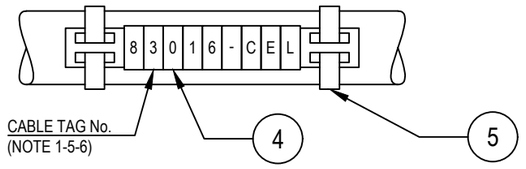
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

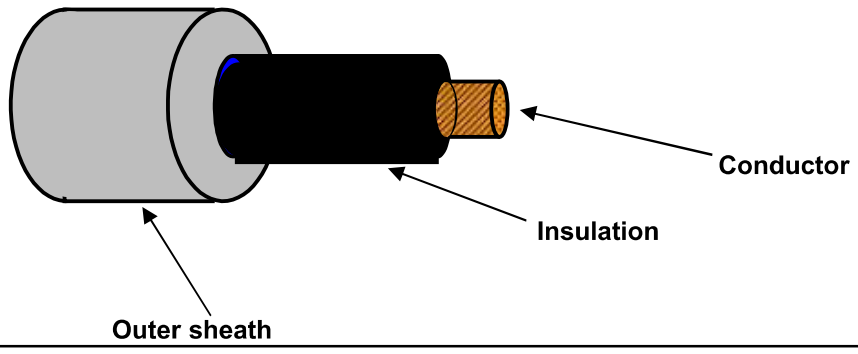
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-2-L2 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-205 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-3-L2 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000498 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO | PROVERLIS | CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-3-L2 | : 6.6/0.415 kV Transformer / LV Switchgear | Dwg | 123A90-DDL-EL-LIS-20148 | | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | Module | LD/LD_B-200 | | |
| **TASK** | code | C10000498 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

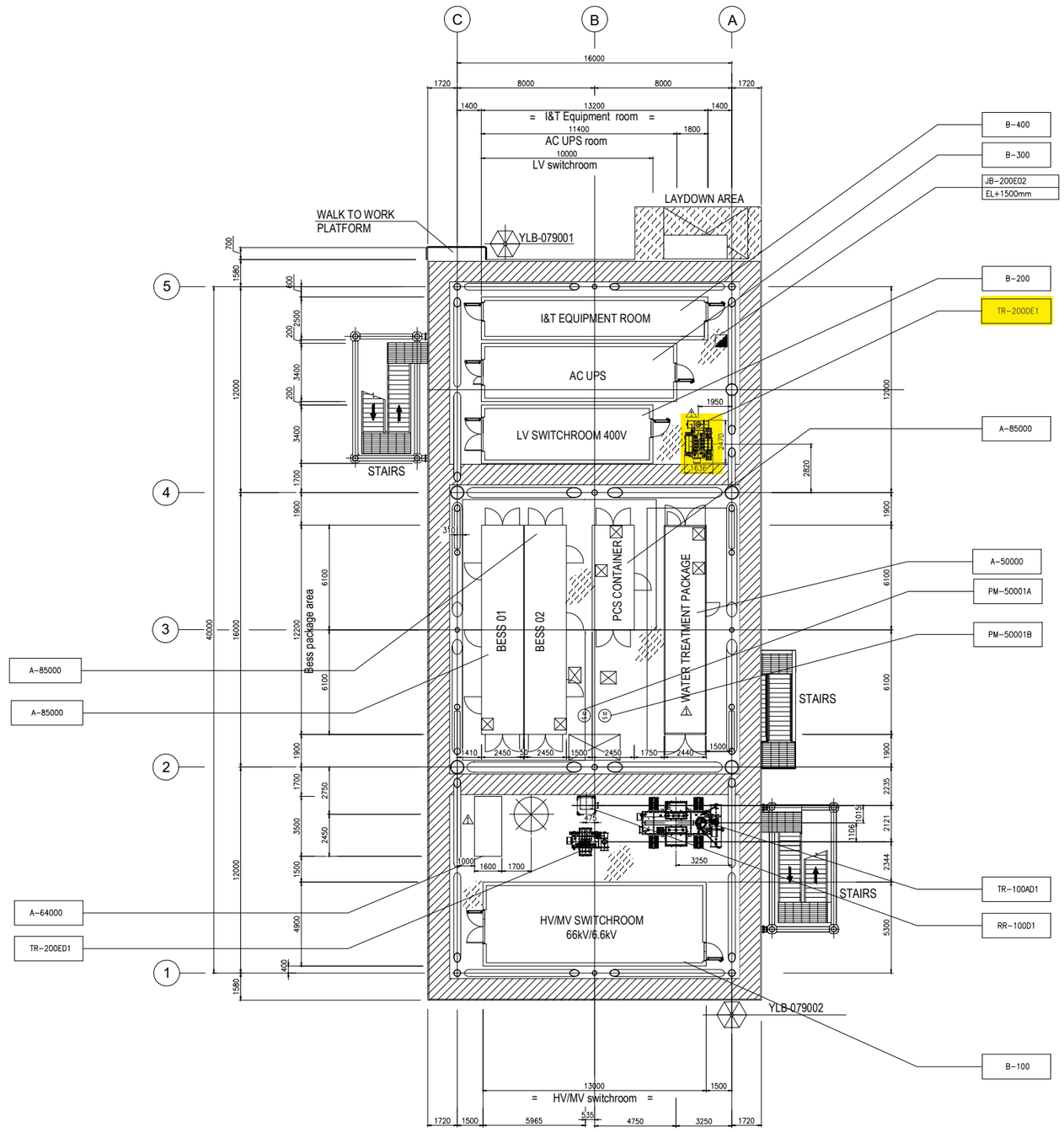
Note 8 : Refer to PL C30000818



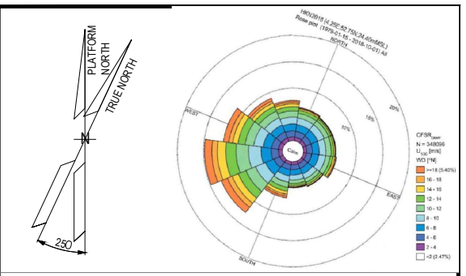
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:19:27.657Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:26:55.664Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

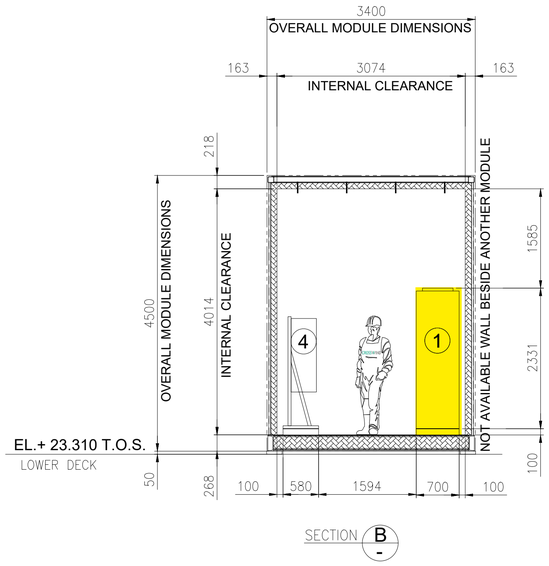
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

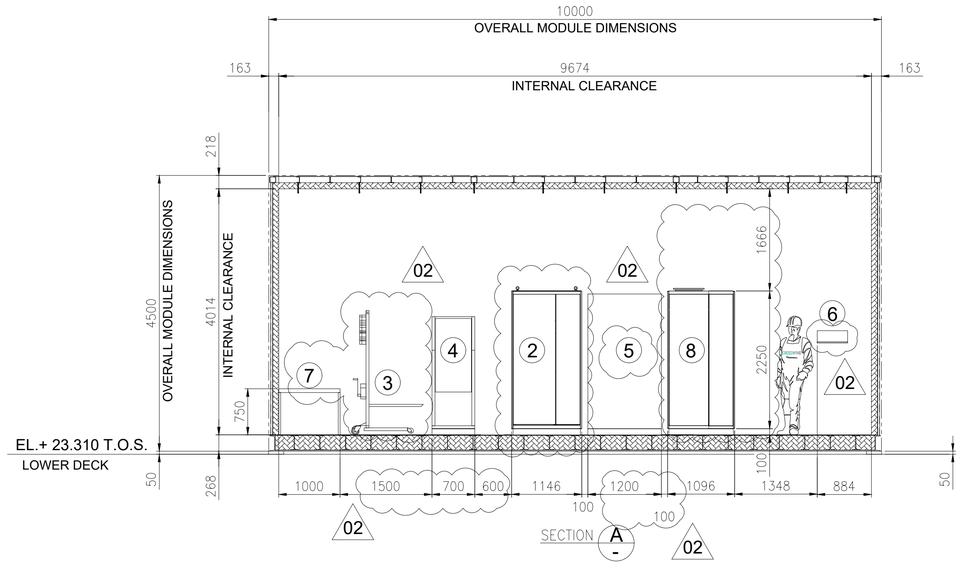
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

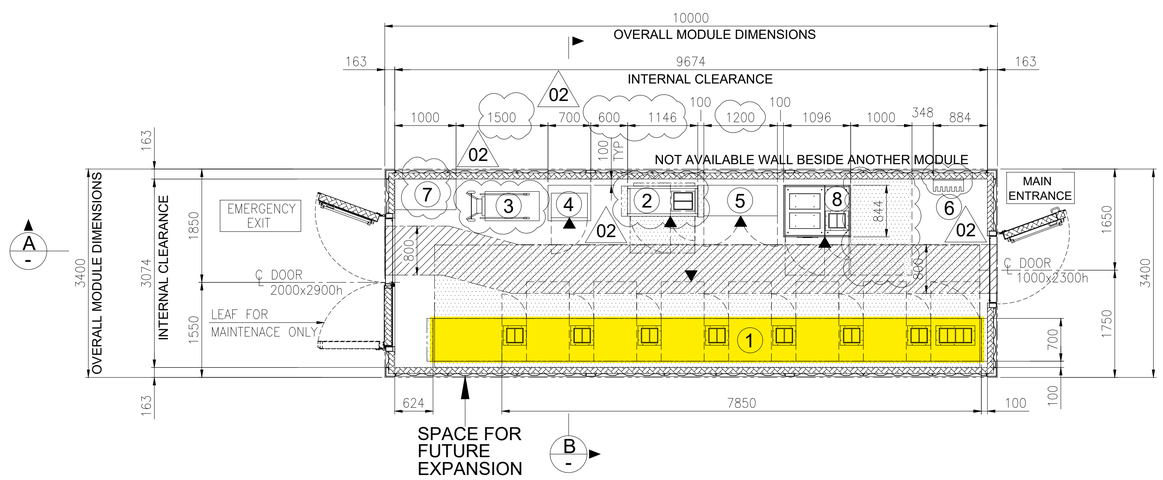
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02



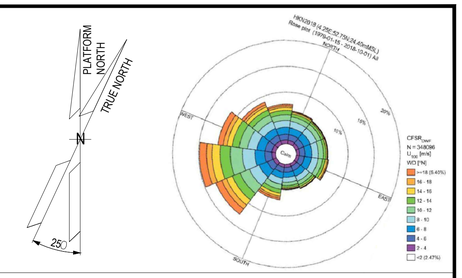




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

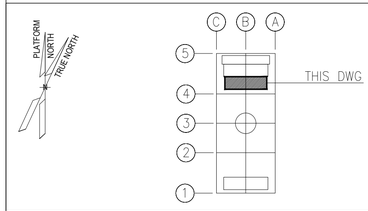
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | COLUMN/CUBIC.: A1/+02 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

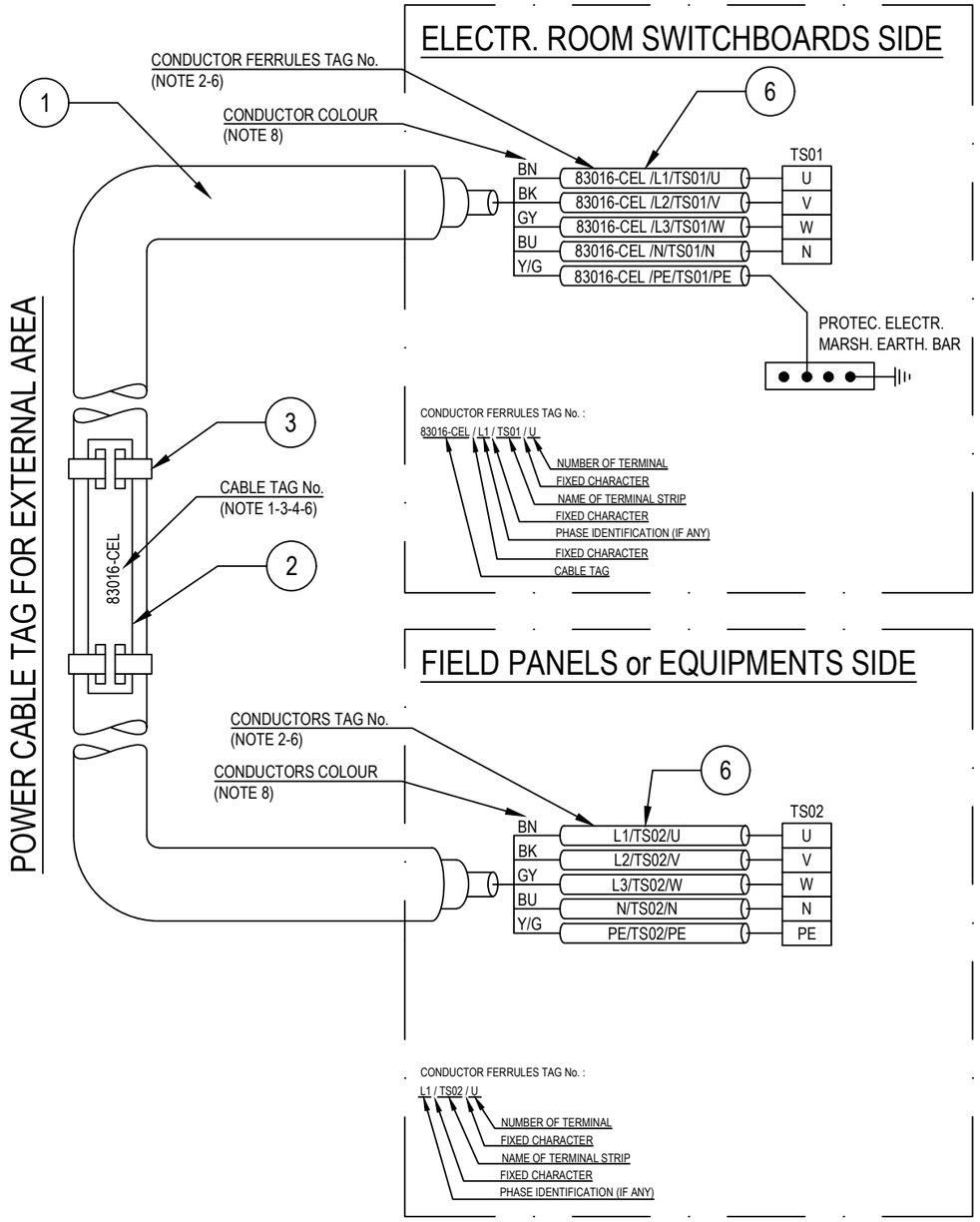
SCALE : 1:X

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DG-20149 | 017 | 01 |

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

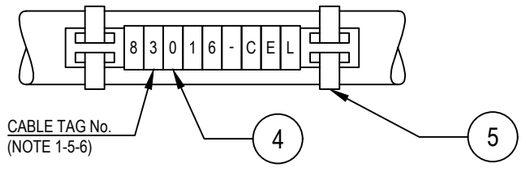
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

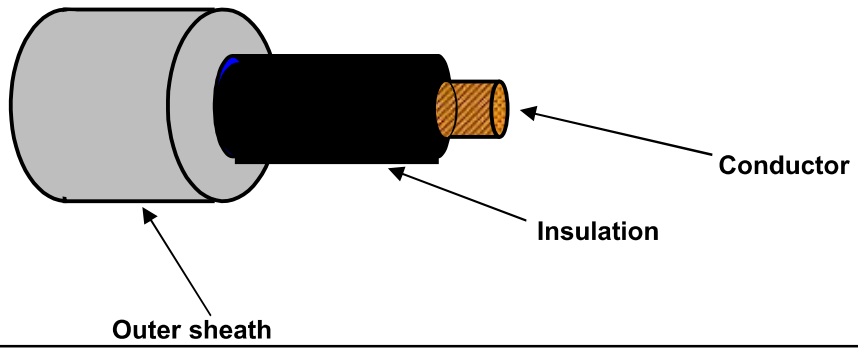
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-3-L2 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-205 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-4-L2 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000499 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-4-L2 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000499 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.7 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments: Note 4 : Refer to PL C30000679

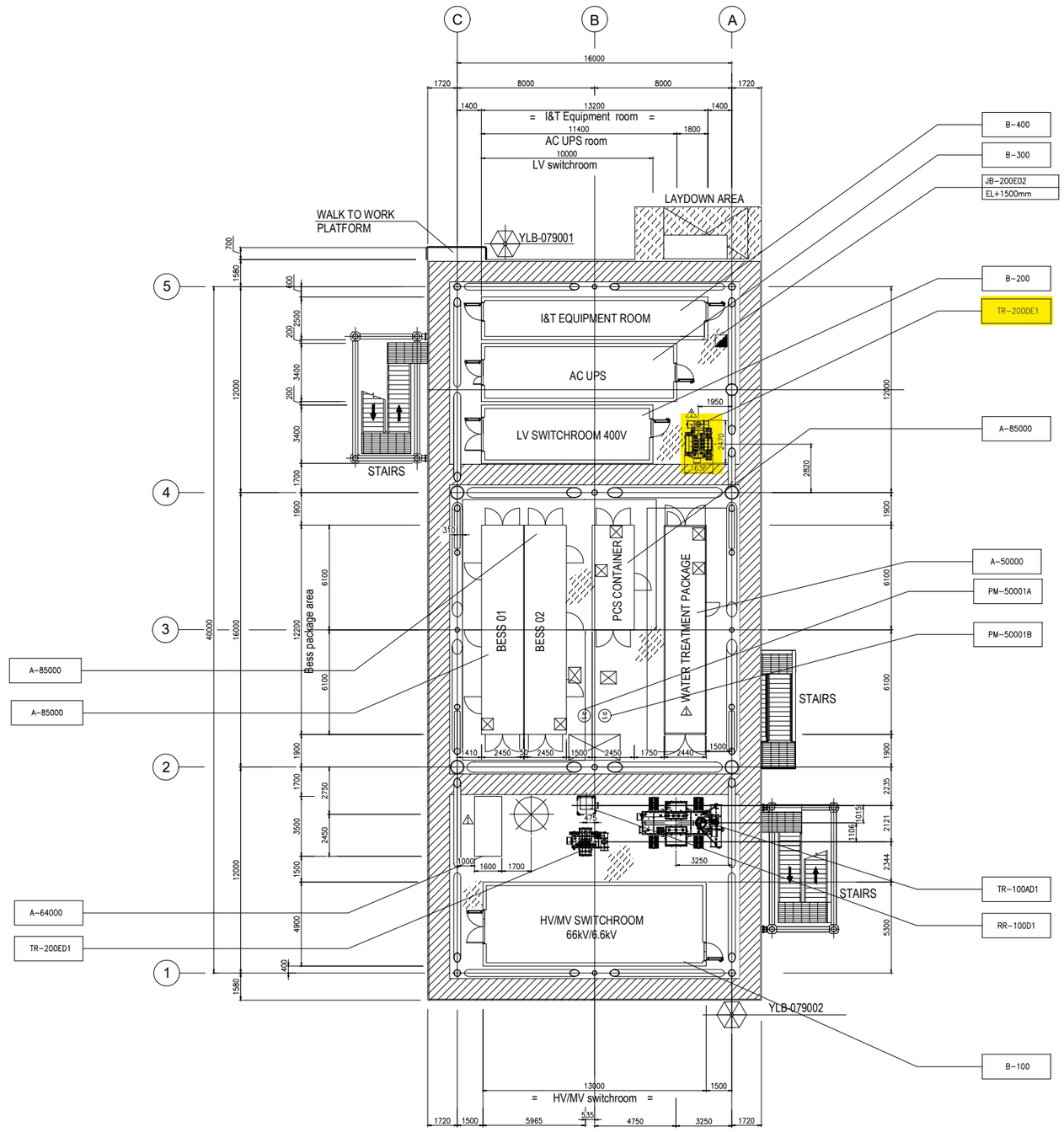
Note 8 : Refer to PL C30000818



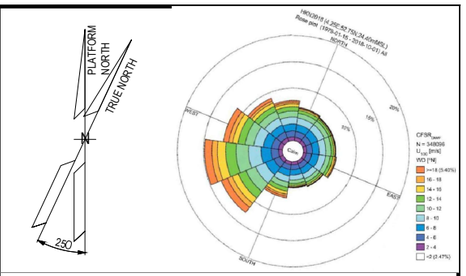
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:19:38.915Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:27:38.814Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

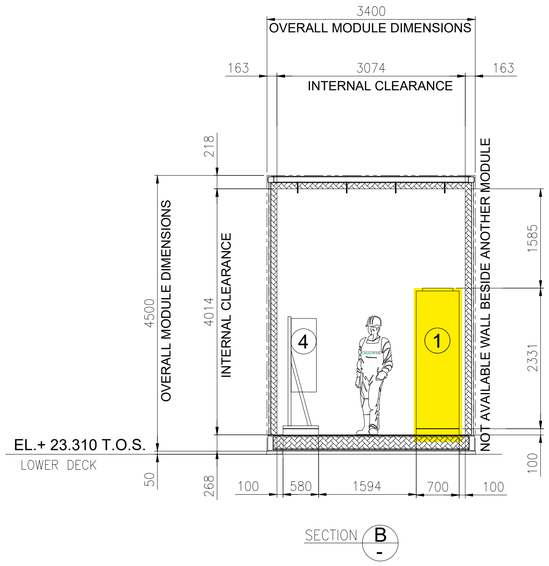
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

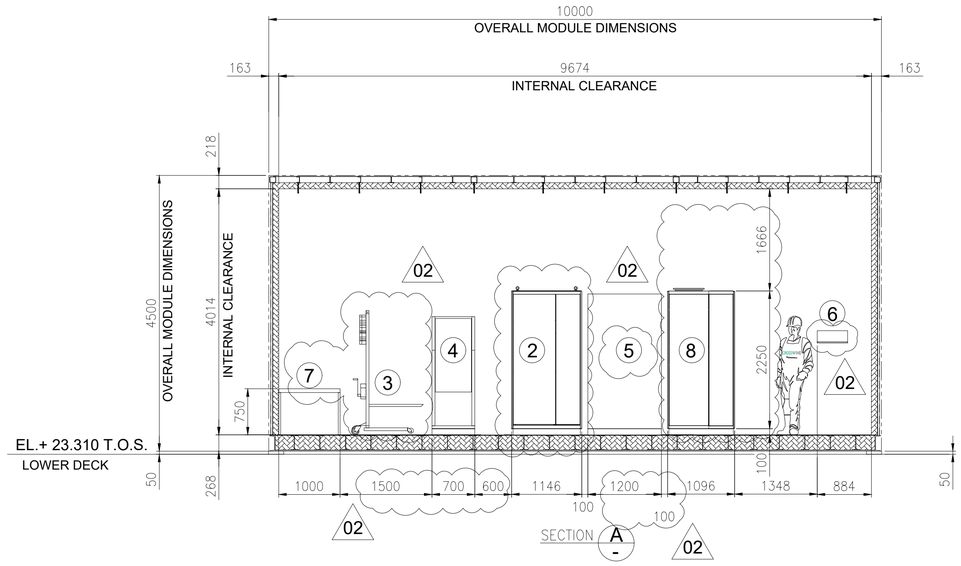
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

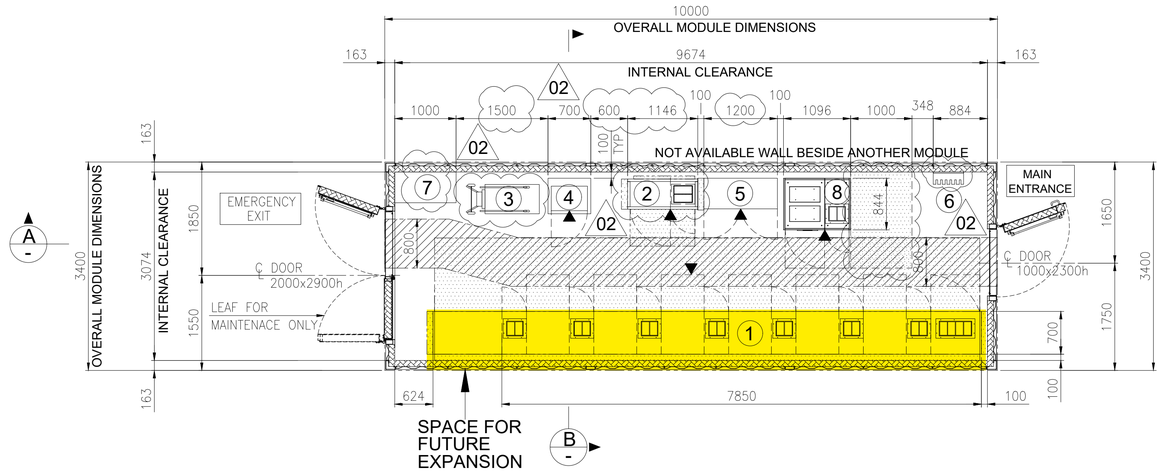
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02



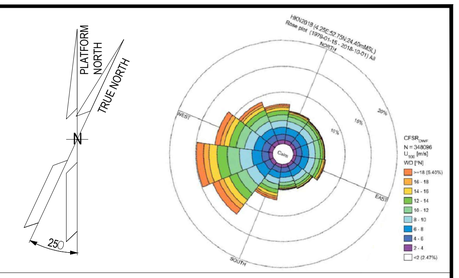




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

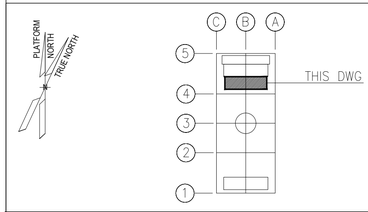
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | COLUMN/CUBIC.: A1/+02 | |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | LINE-1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | LINE-2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | LINE-3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | NEUTRAL | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

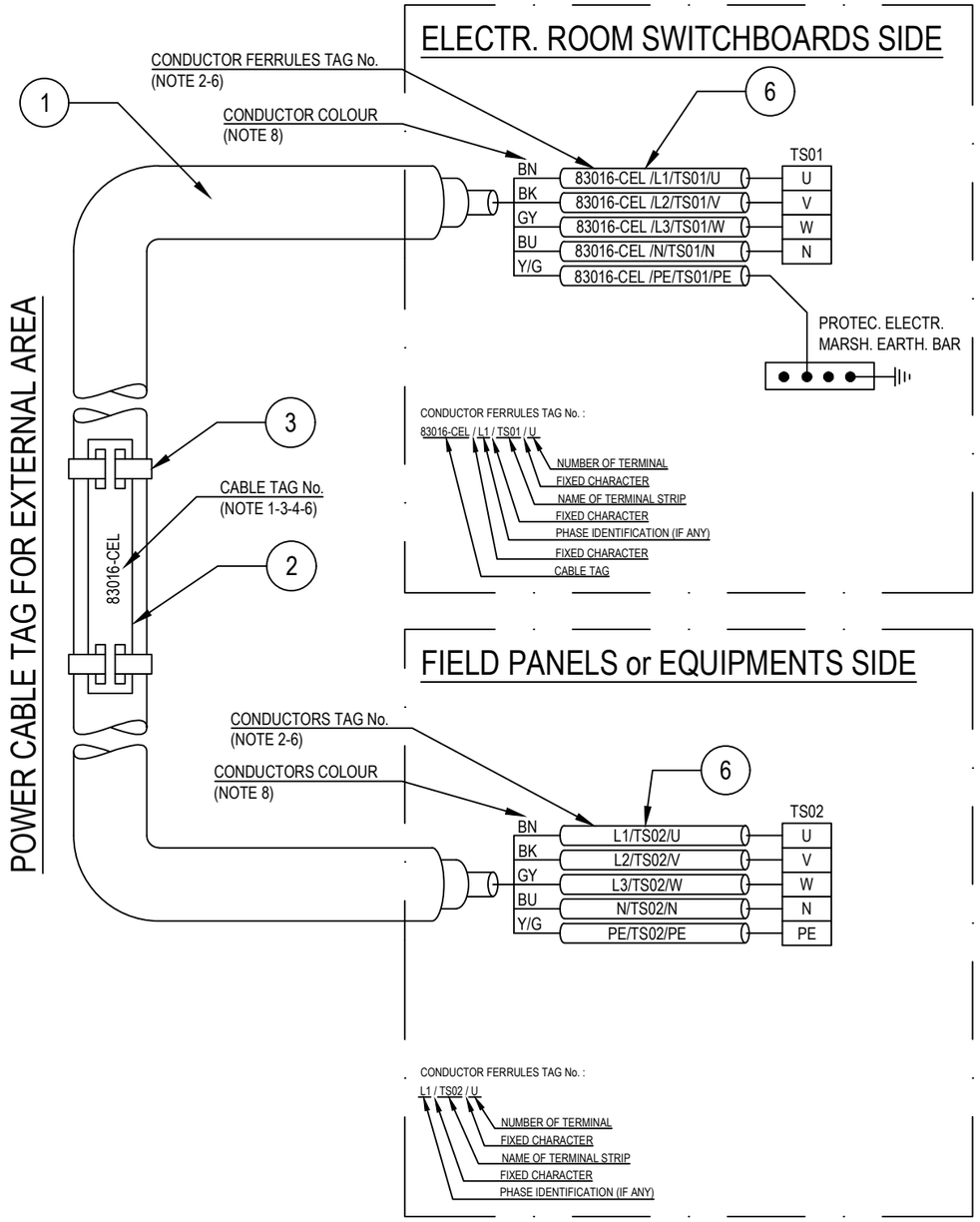
SCALE : 1:X

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DG-20149 | 017 | 01 |

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

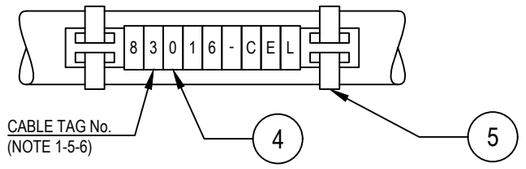
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

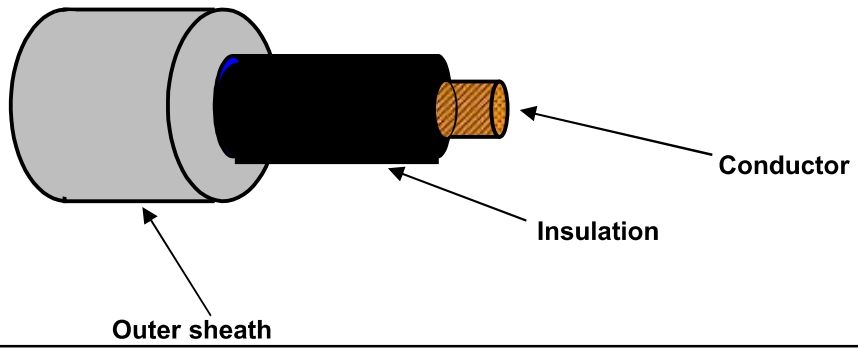
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-4-L2 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-206 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-5-L2 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000500 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-5-L2 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000500 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

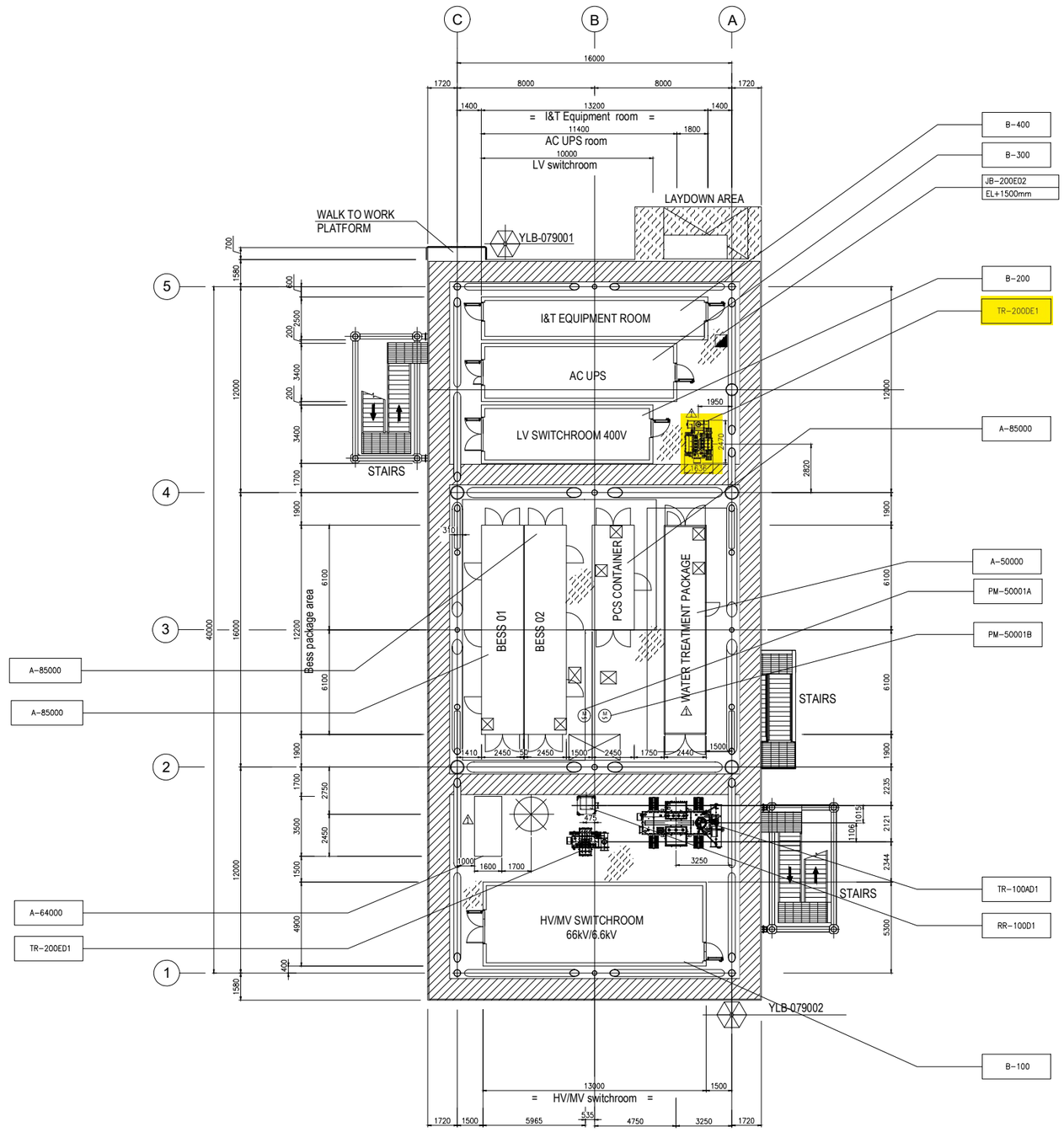
Note 8 : Refer to PL C30000818



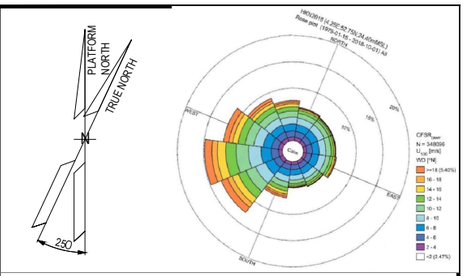
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:19:51.178Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:28:13.242Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

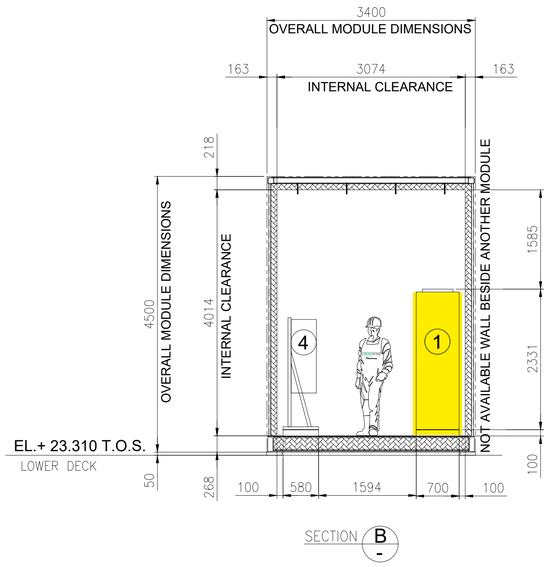
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

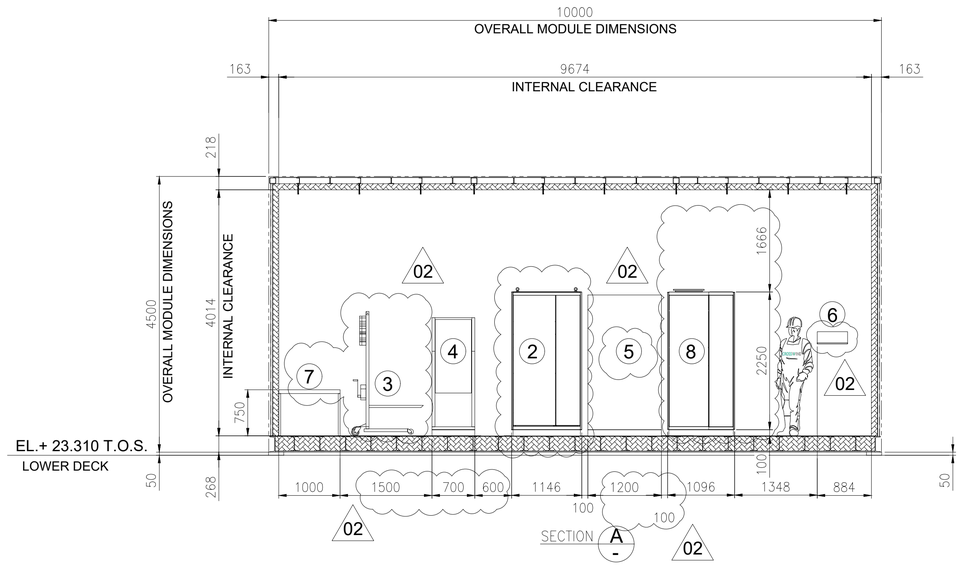
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

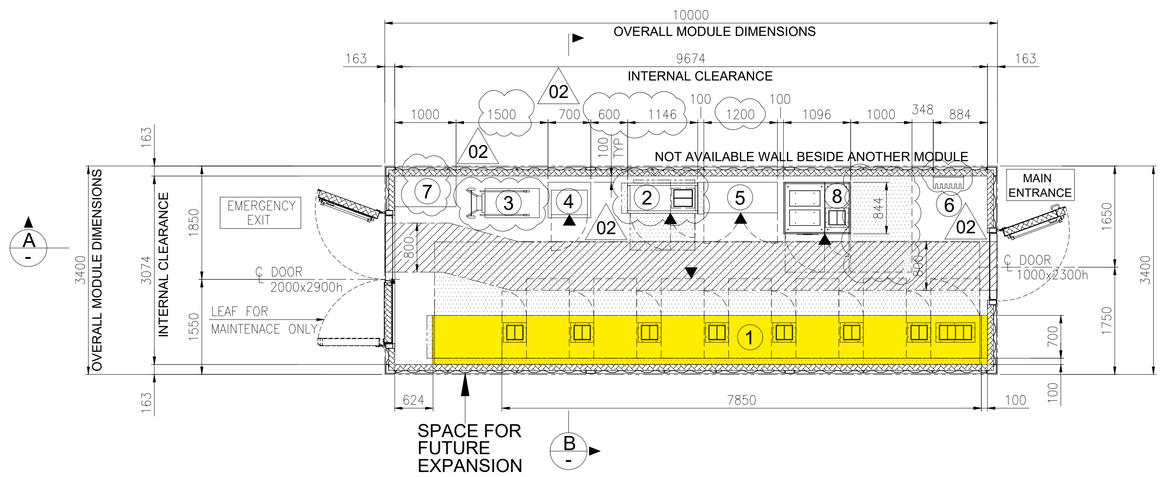
DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02




SECTION B




SECTION A



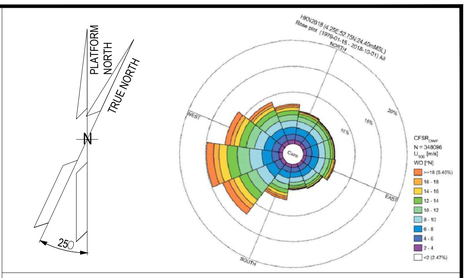

SECTION B

EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

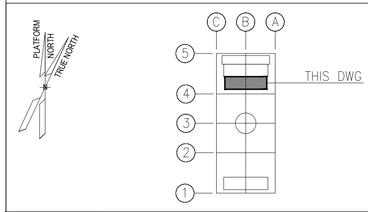
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 (01)

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | COLUMN/CUBIC.: A1/+02 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149
REV.: 1_A | DATE: 17/10/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

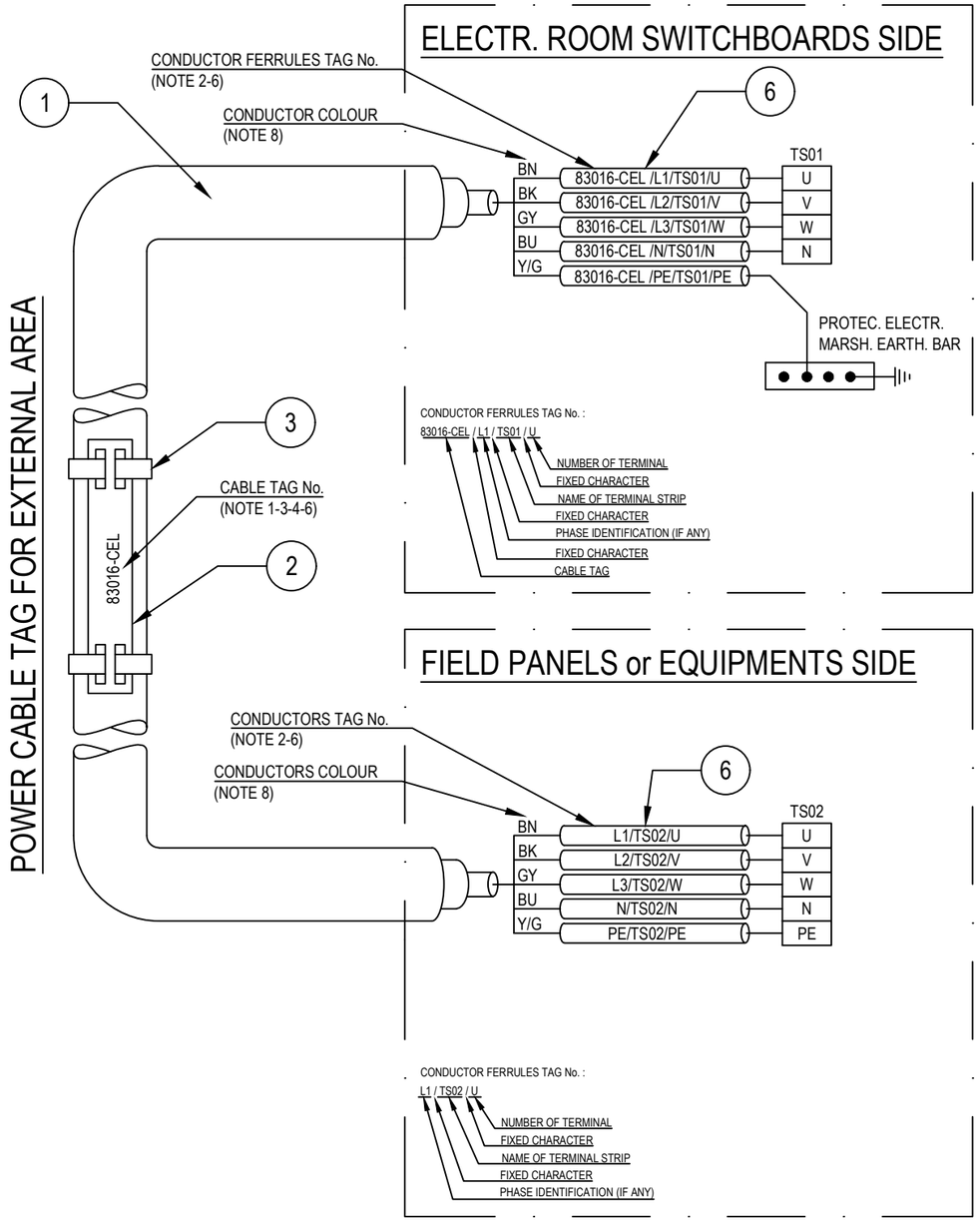
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 017 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

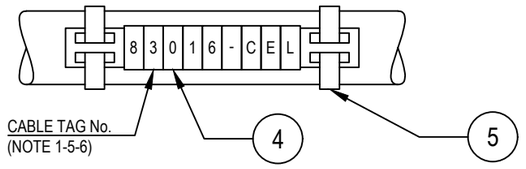
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

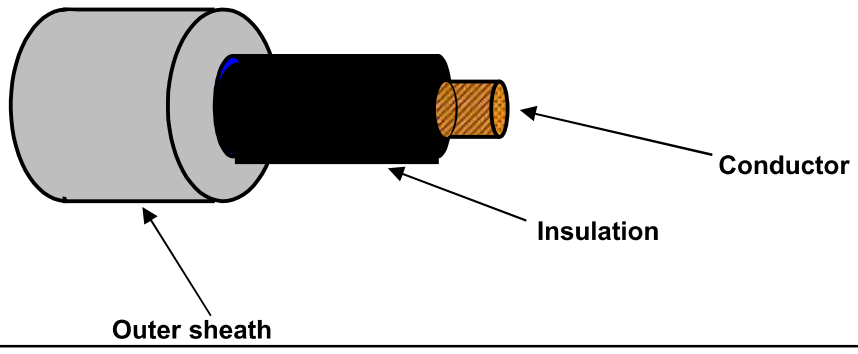
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-5-L2 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-206 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-1-L3 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000501 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-1-L3 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000501 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

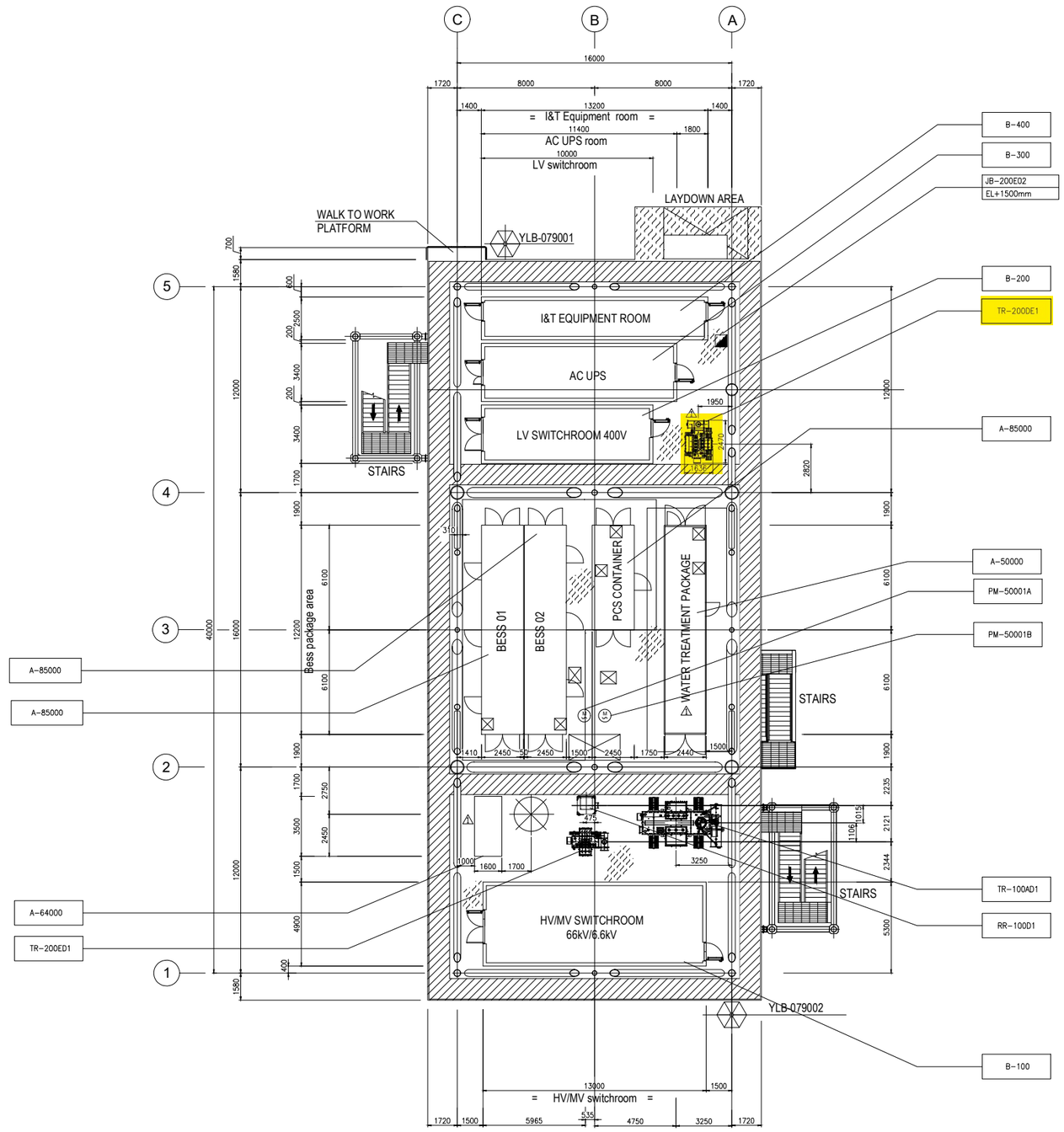
Note 8 : Refer to PL C30000818



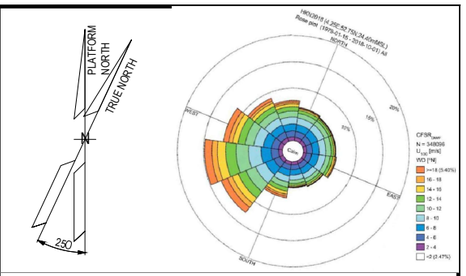
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Paolo Schintu | |
| **Date** | 2024-11-13 | 2024-11-23 | |
| **Signature** | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:20:03.865Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:28:51.694Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

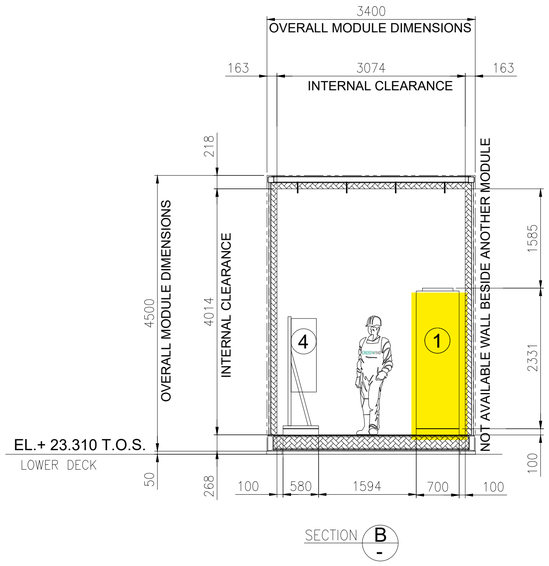
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

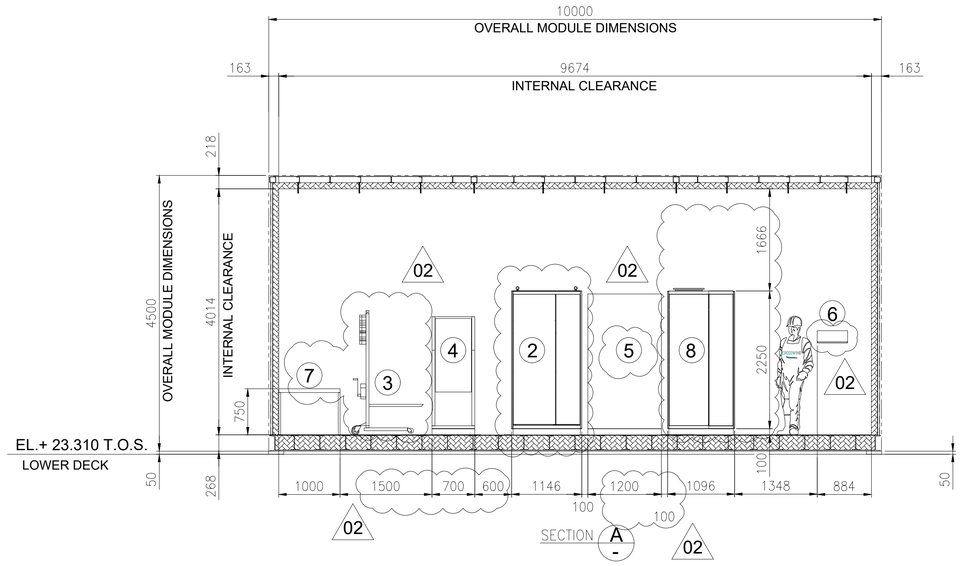
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

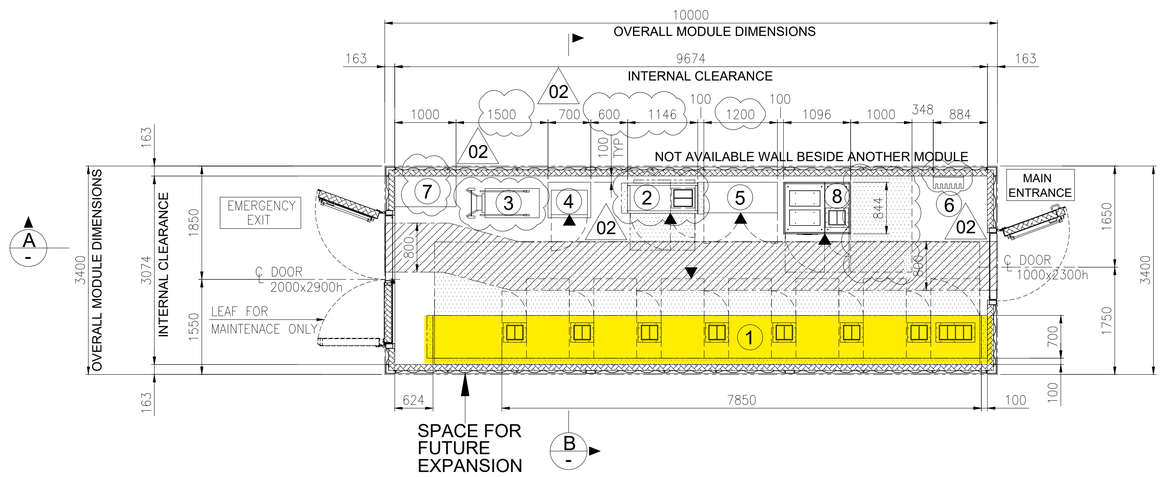
DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02




SECTION B




SECTION A




A

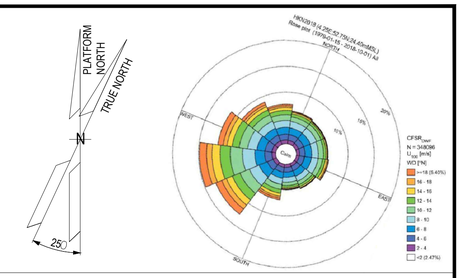
B

EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

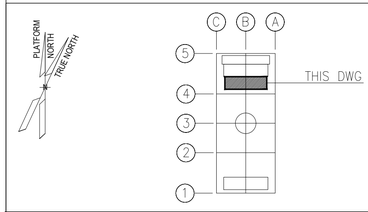
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

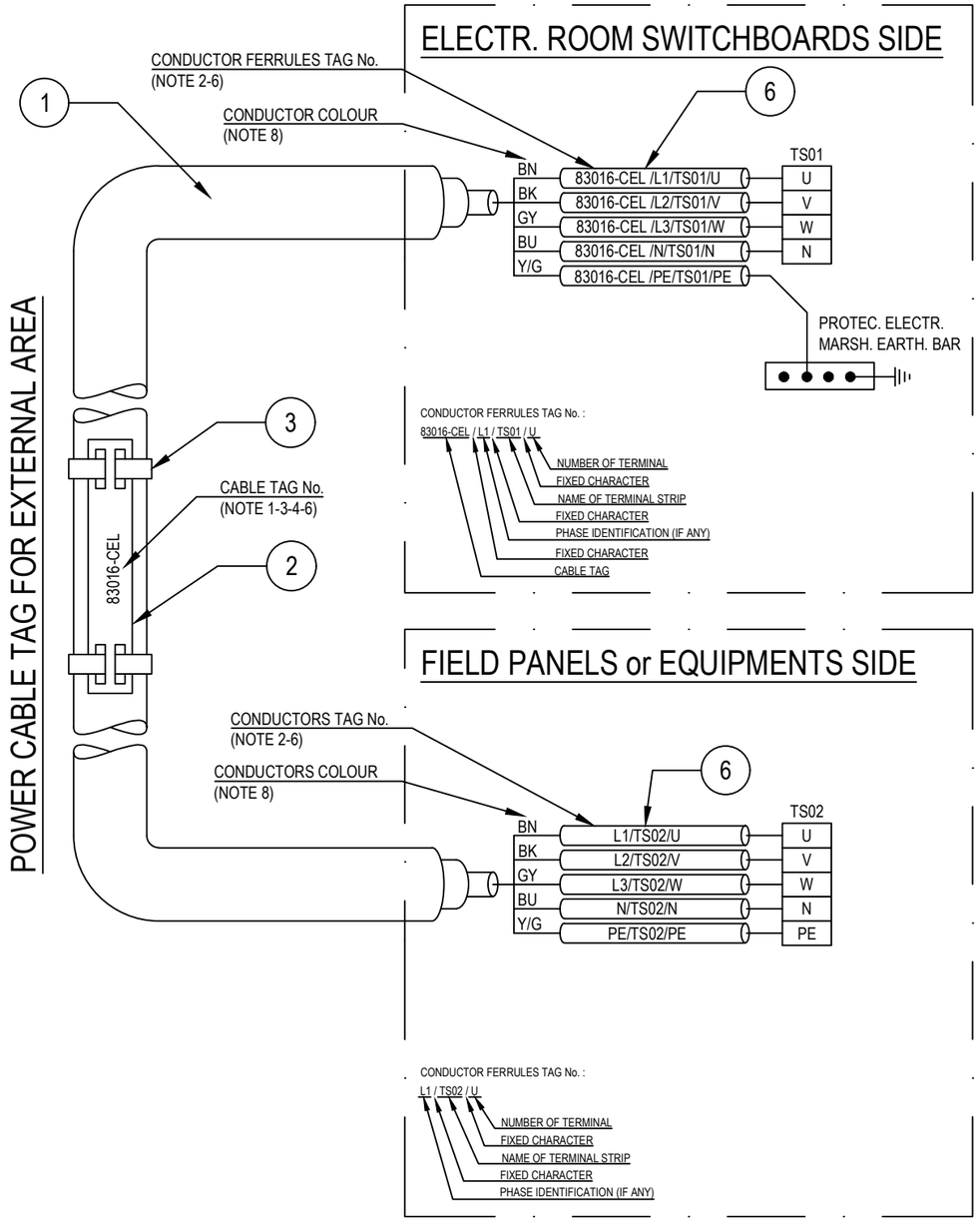
SCALE : 1:X

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DG-20149 | 017 | 01 |

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

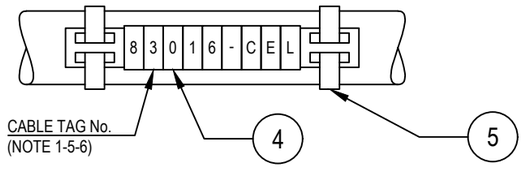
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

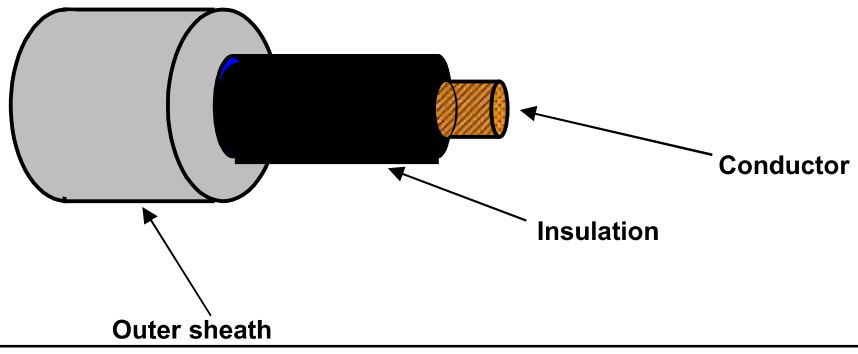
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-1-L3 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-205 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-2-L3 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000502 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-2-L3 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000502 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

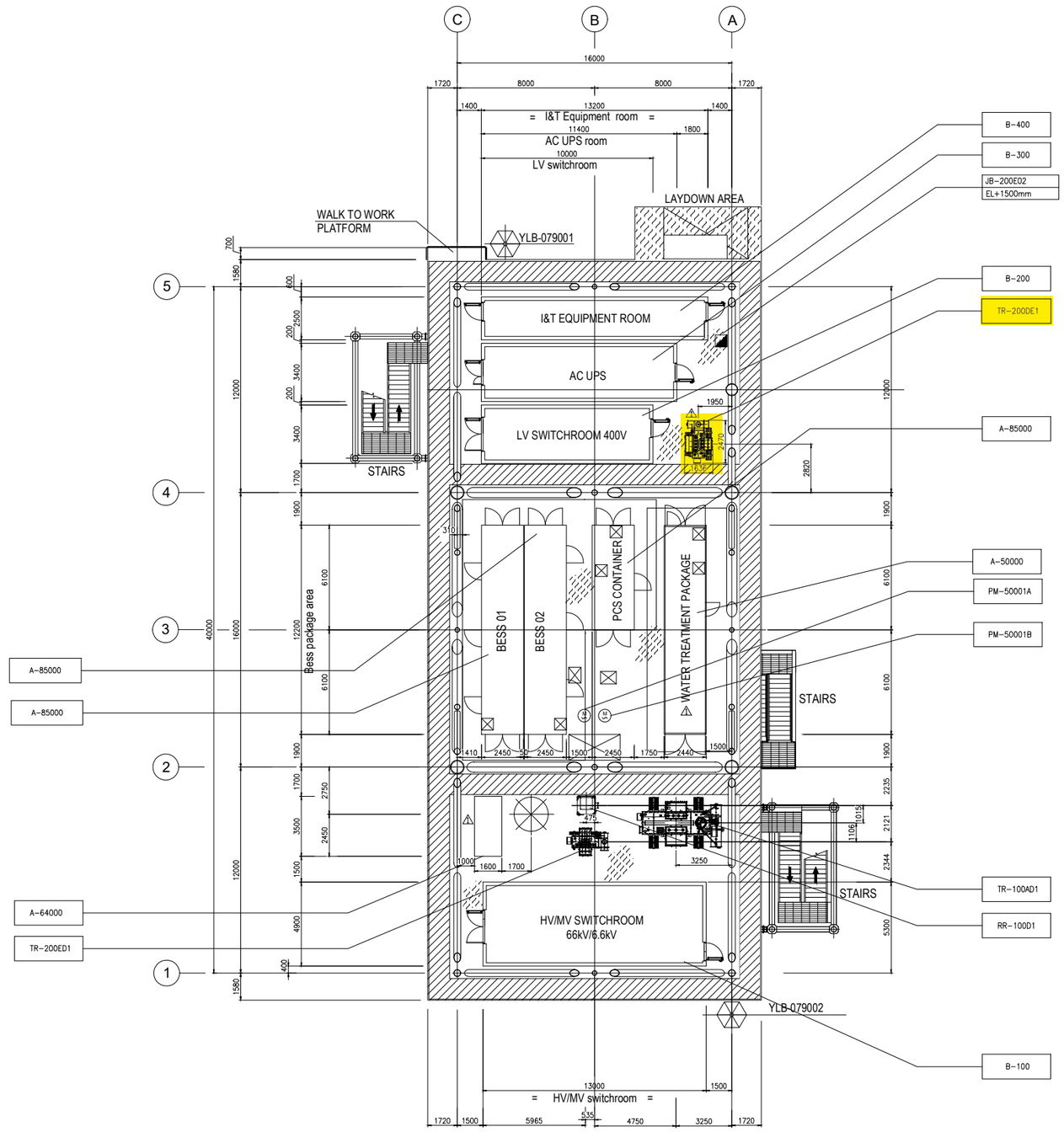
Note 8 : Refer to PL C30000818



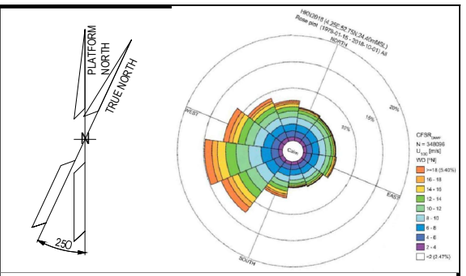
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:20:14.351Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:37:00.628Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

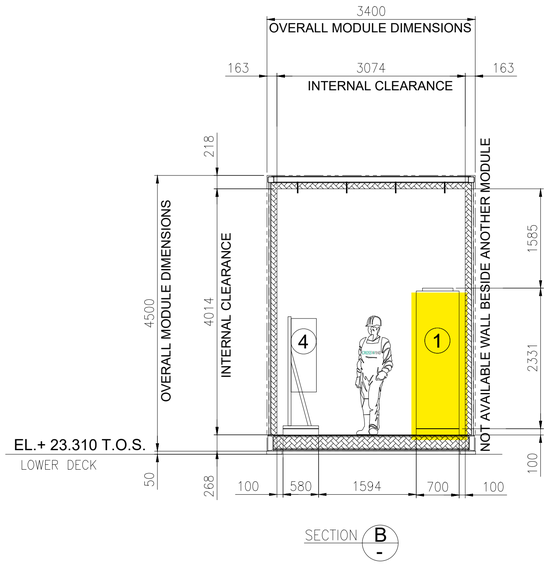
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

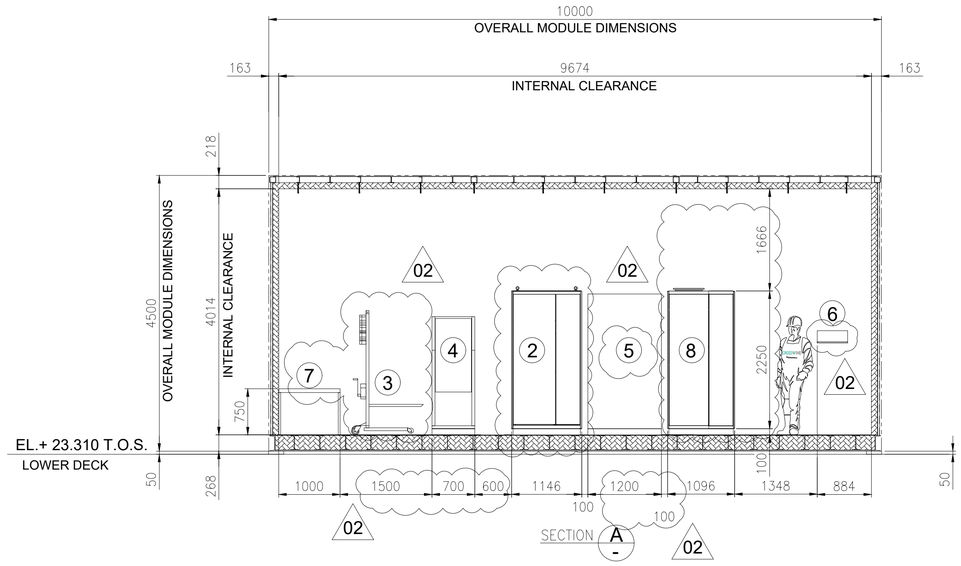
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

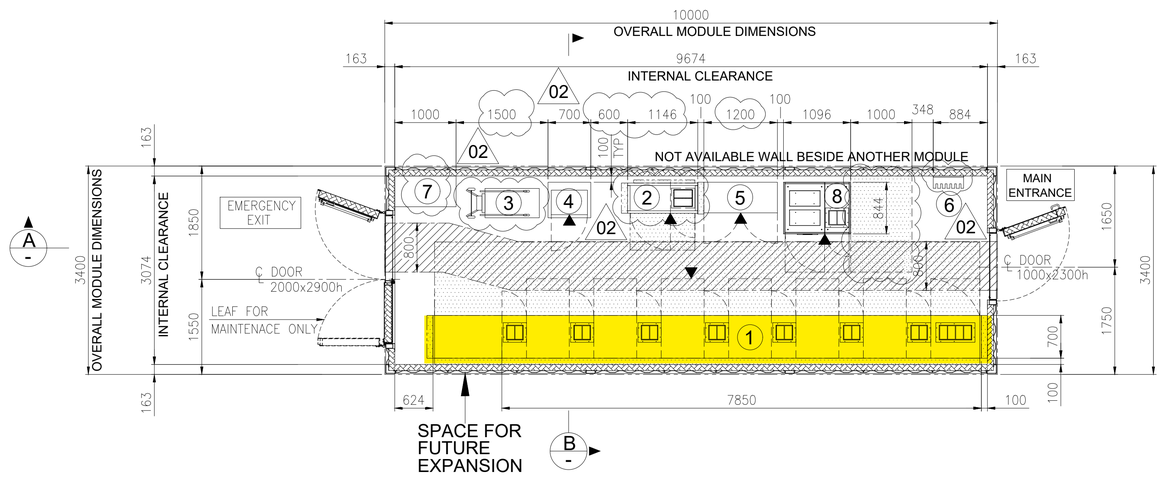
DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02




SECTION B




SECTION A




A

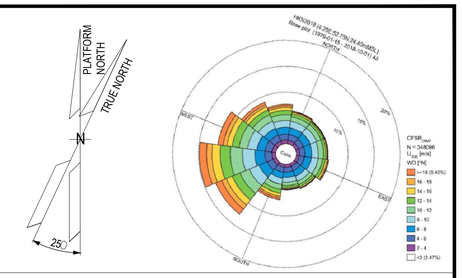
B

EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

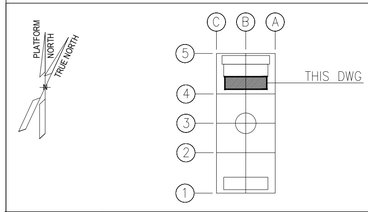
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 | |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | EARTH BOSS | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | | |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149
REV.: 1_A | DATE: 17/10/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

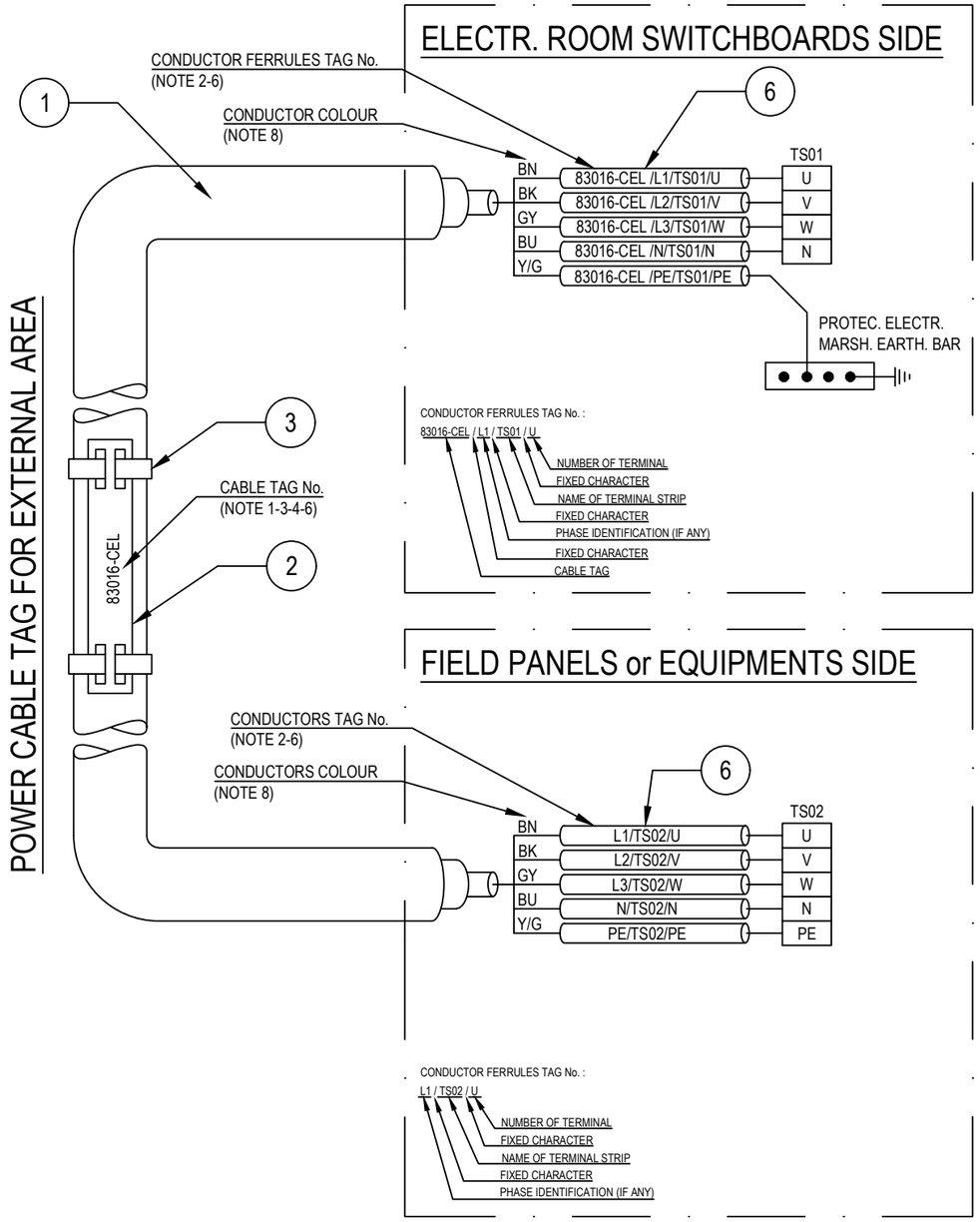
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 017 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

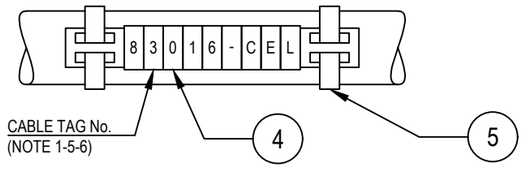
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

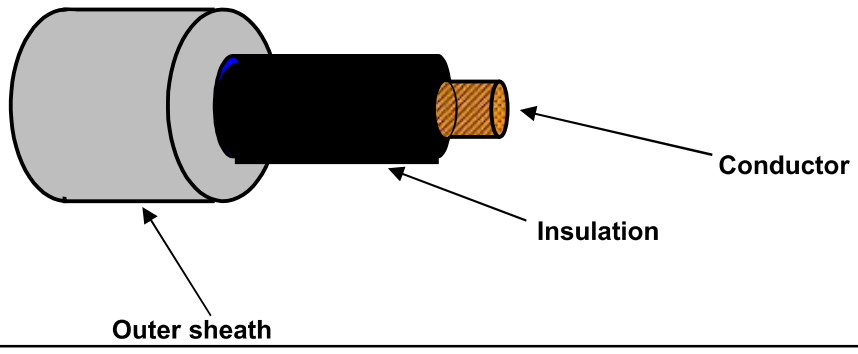
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-2-L3 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-205 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-3-L3 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000503 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-3-L3 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000503 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments: Note 4 : Refer to PL C30000679

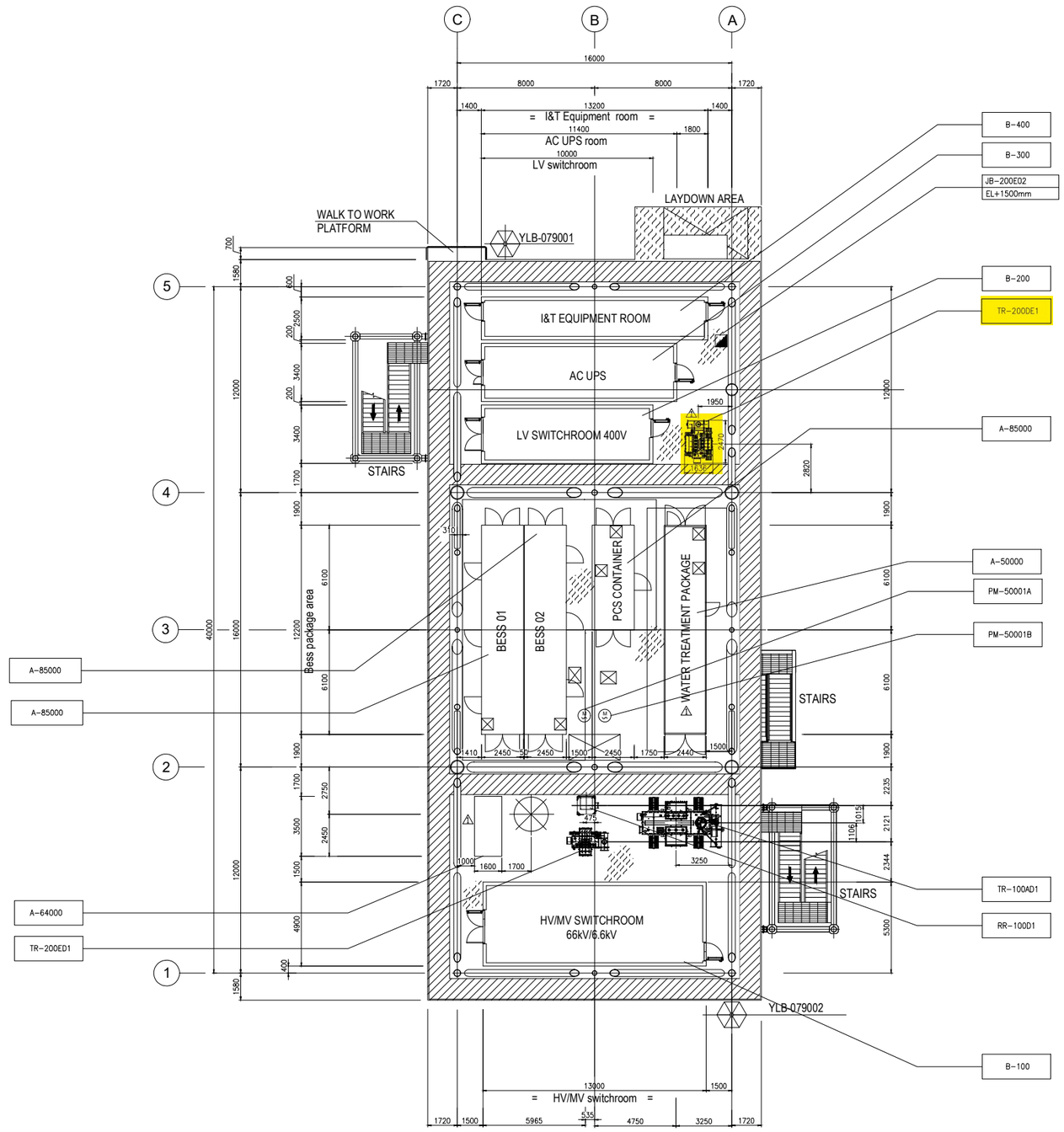
Note 8 : Refer to PL C30000818



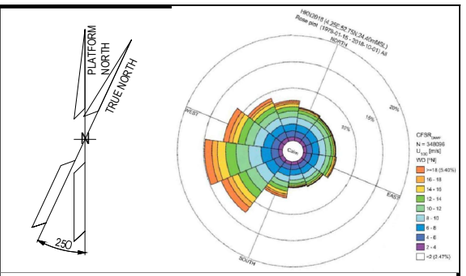
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:20:26.472Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:38:04.887Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

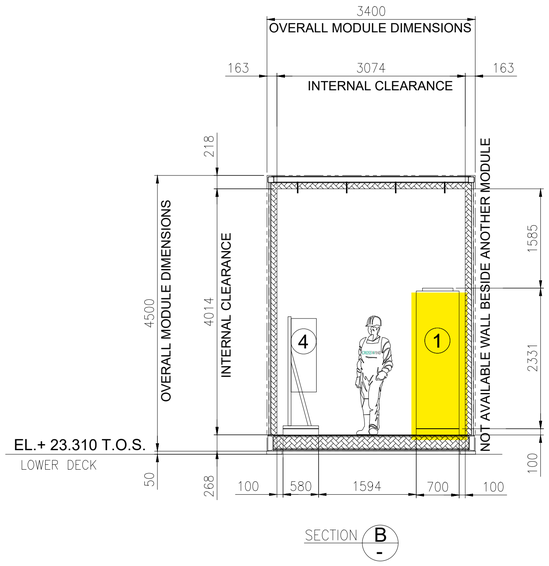
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

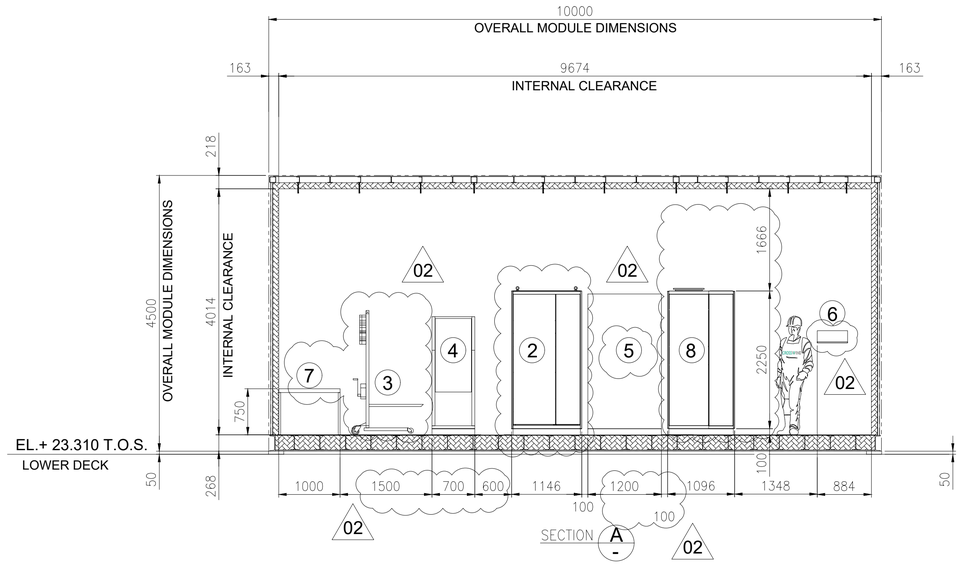
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

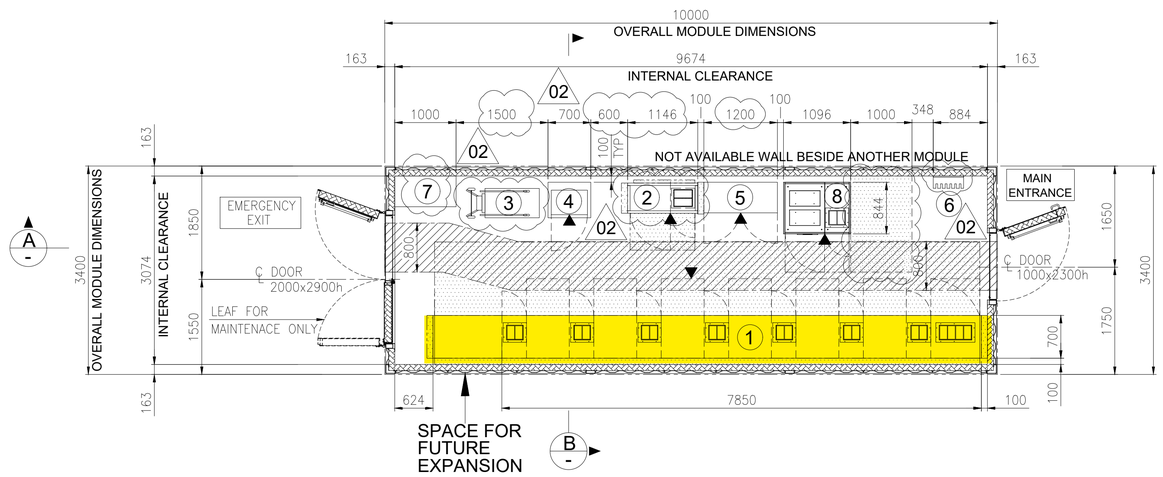
DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02




SECTION B




SECTION A




A

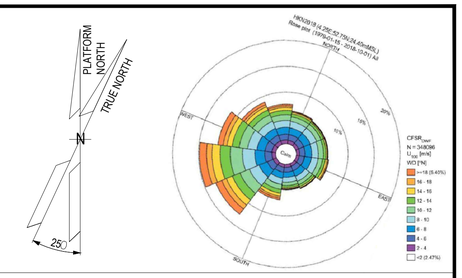
B

EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

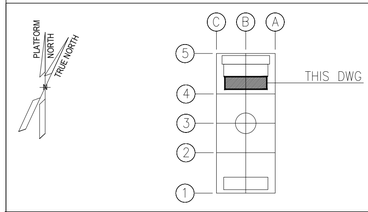
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 | | |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | | | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | | | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | | | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | | | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 | | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | | | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | | | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | | | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | | | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 | | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | | | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | | | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | | | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | | | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL | | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | | | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | | | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | EARTH BOSS | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | | | |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149
REV.: 1_A | DATE: 17/10/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

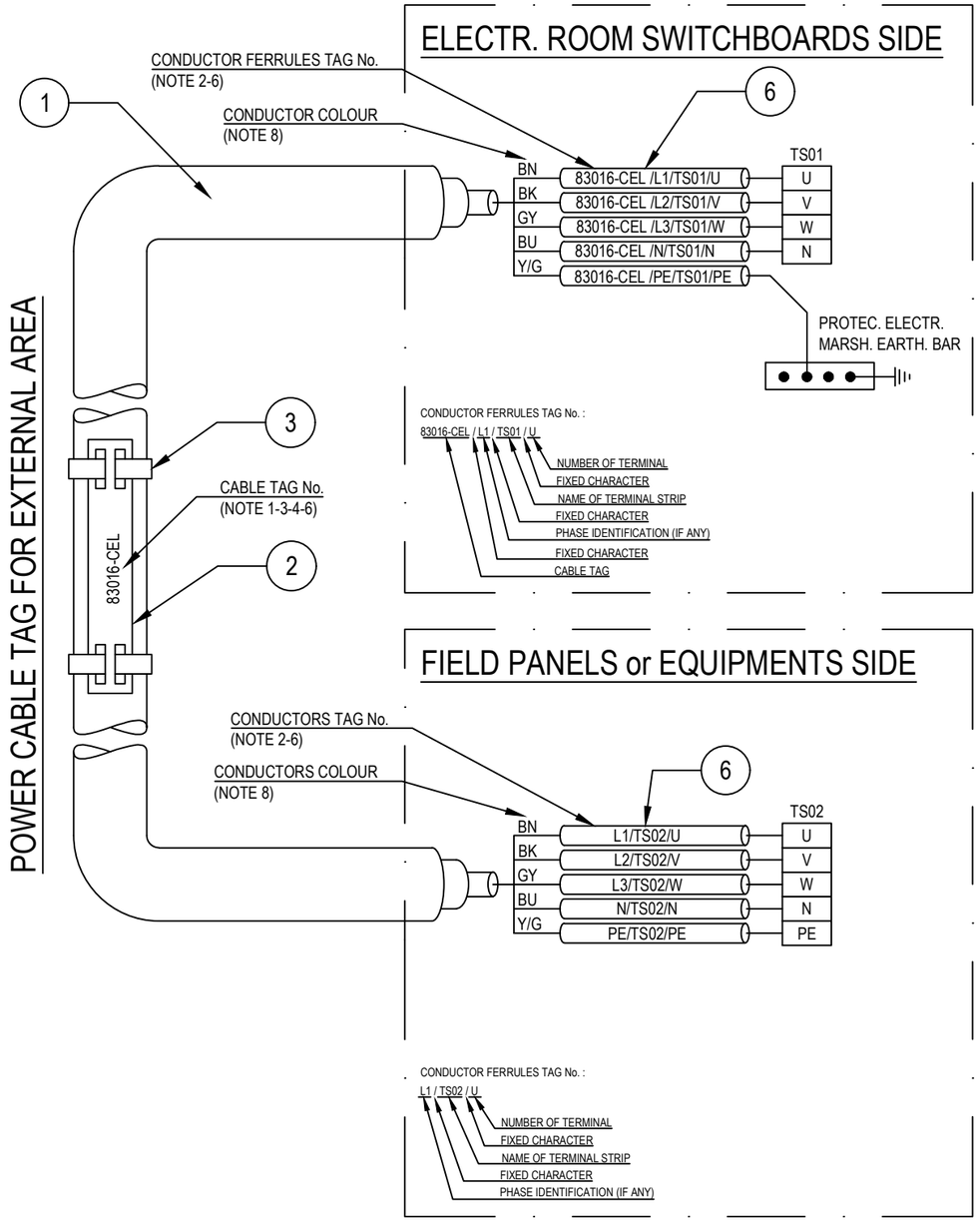
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 017 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

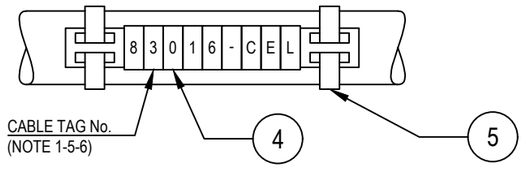
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

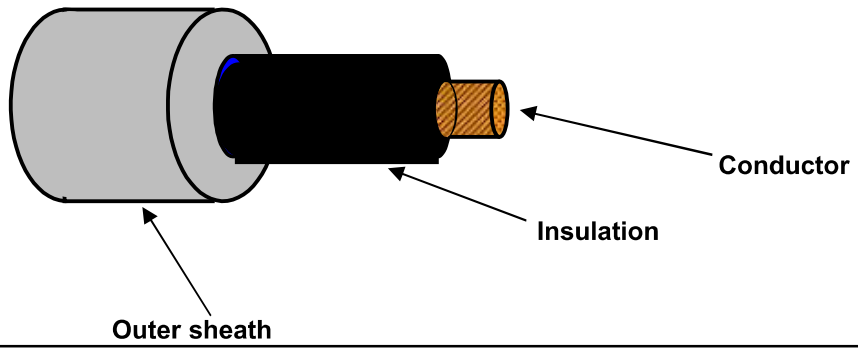
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-3-L3 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-205 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-4-L3 | : 6.6/0.415 kV Transformer / LV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD/LD_B-200 |
| **TASK** | code | C10000504 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

## CABLE DATA

Type Cu Cl.2/EPR/LSZH  Cores/Size mm² 1X300 mm2  Color GREY

From TR-200DE1  To SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-4-L3 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000504 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

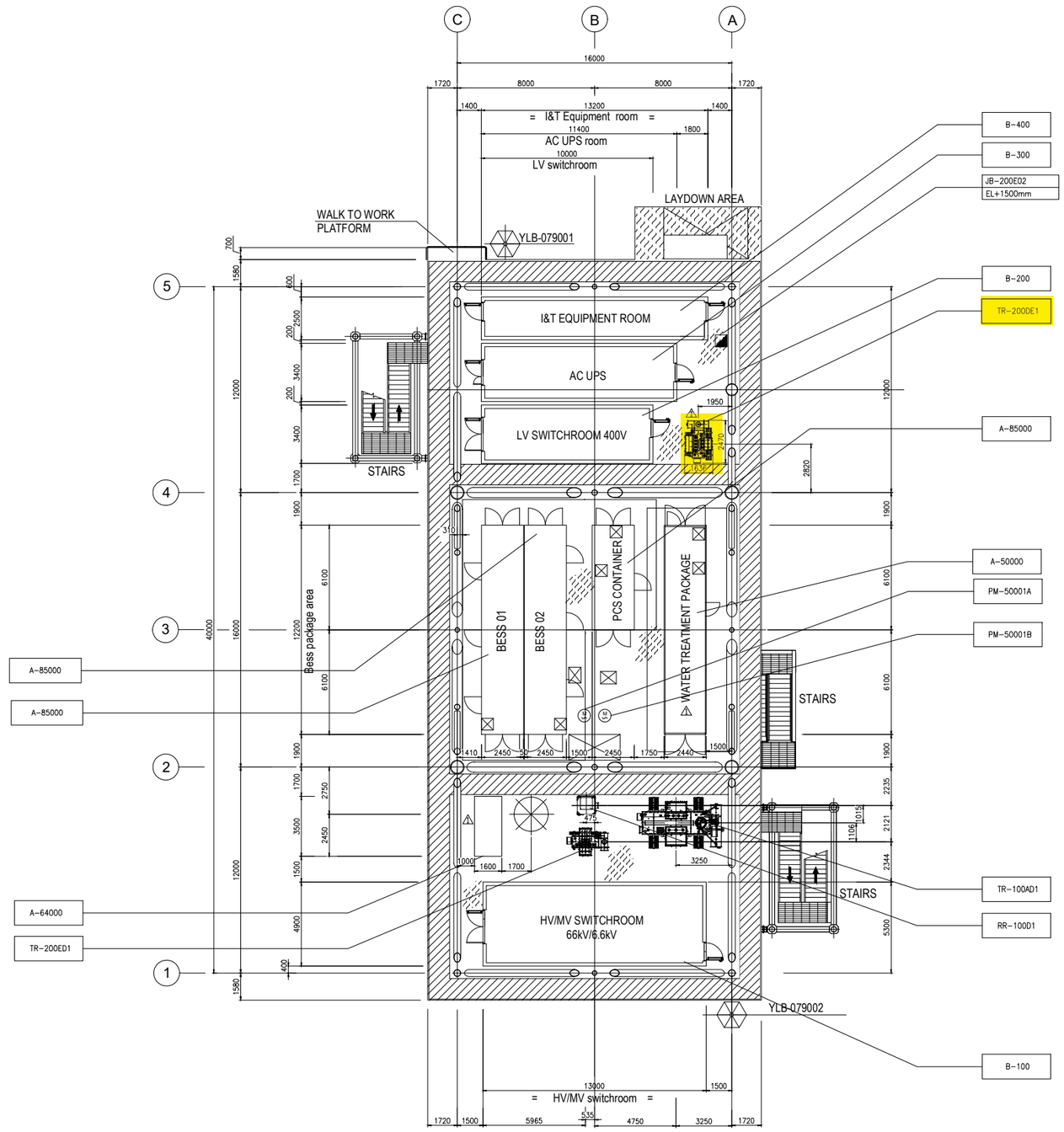
Note 8 : Refer to PL C30000818



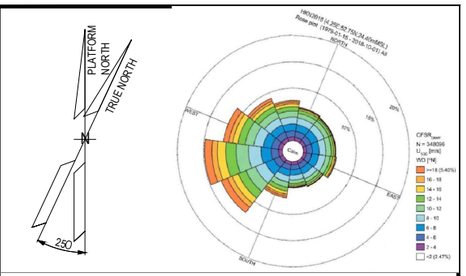
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:20:37.009Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:38:47.895Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

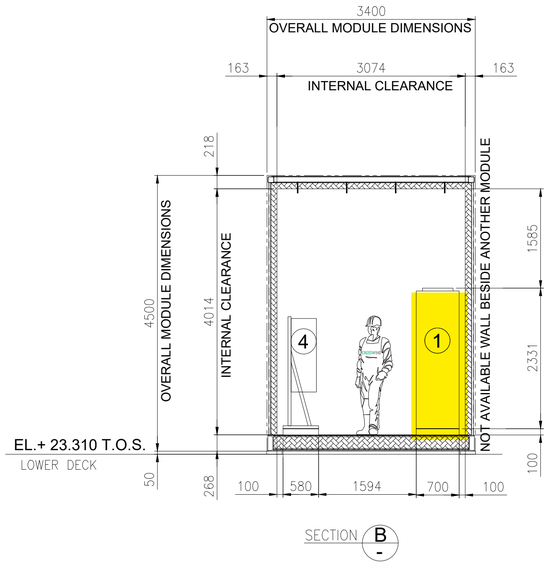
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

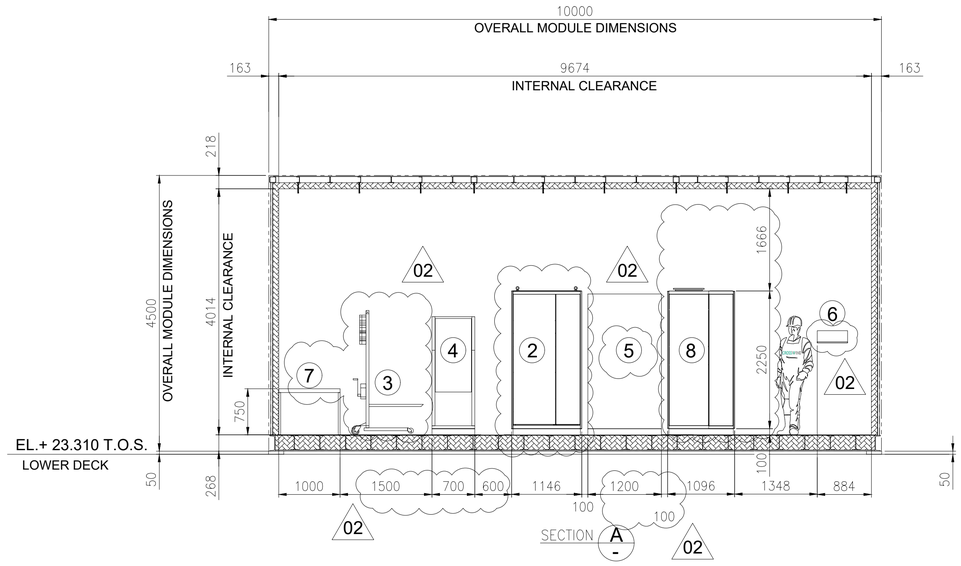
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

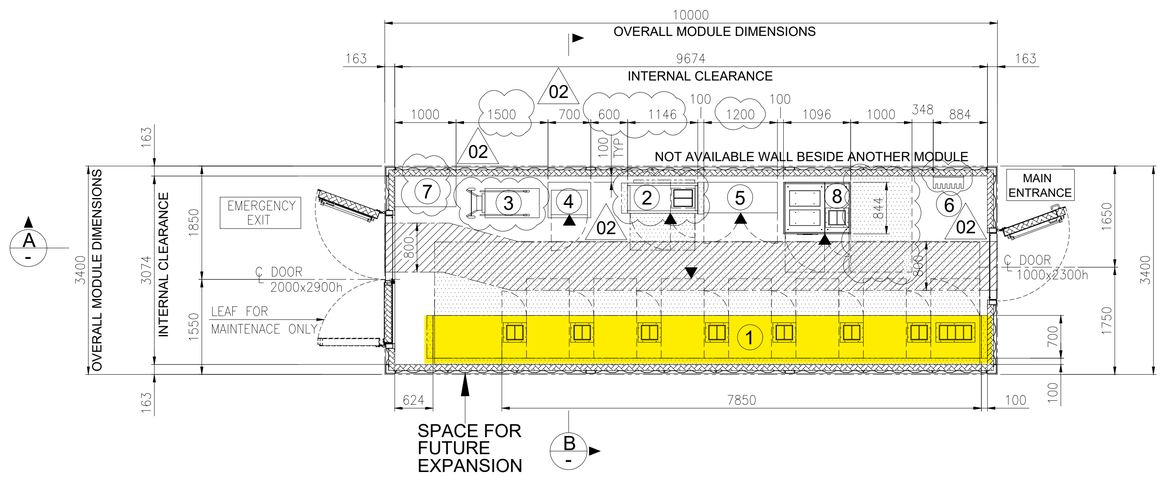
DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02




SECTION B




SECTION A




A

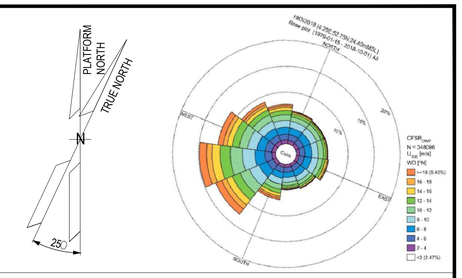
B

EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

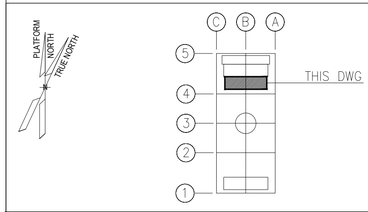
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | EARTH BOSS |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

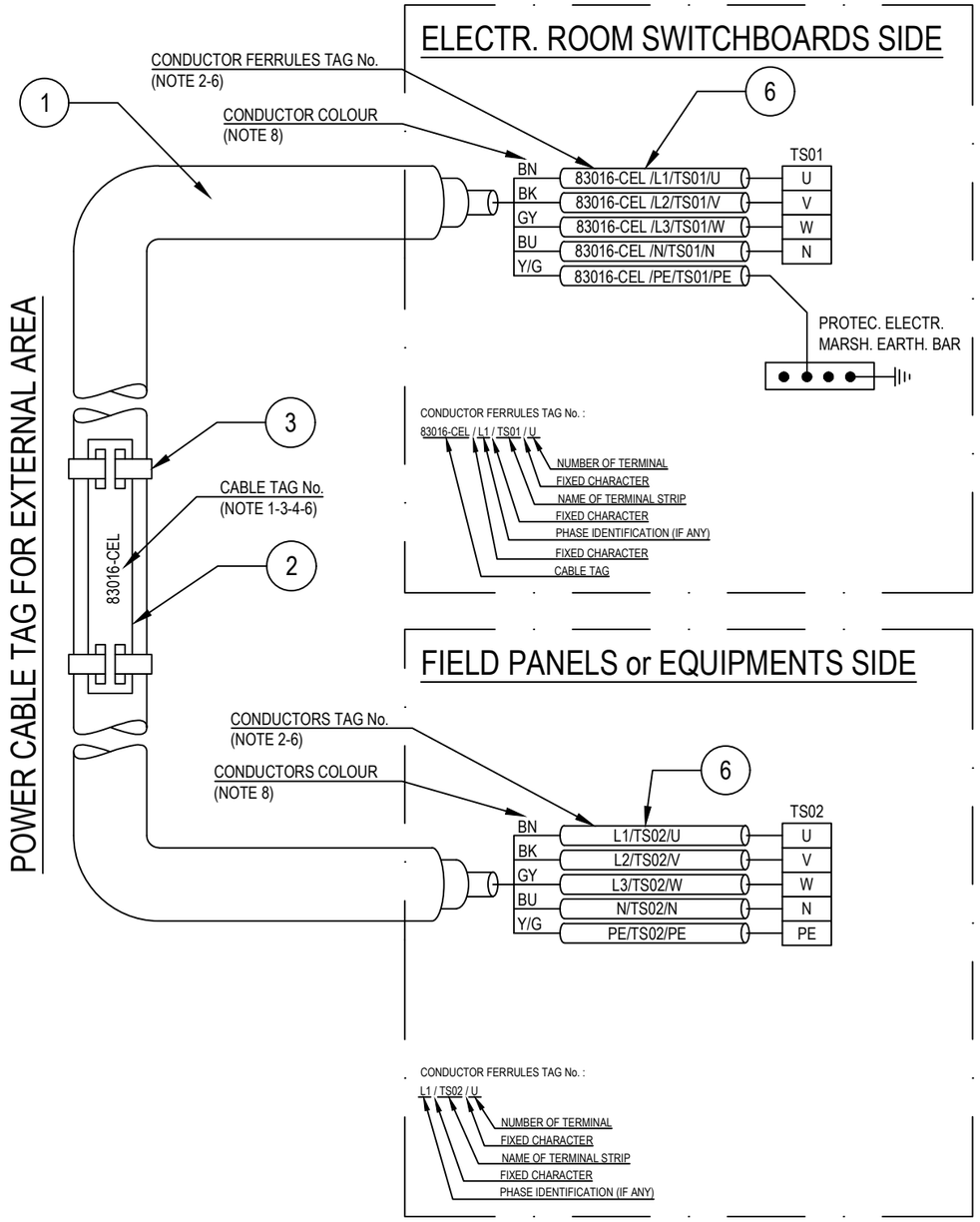
SCALE : 1:X

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DG-20149 | 017 | 01 |

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

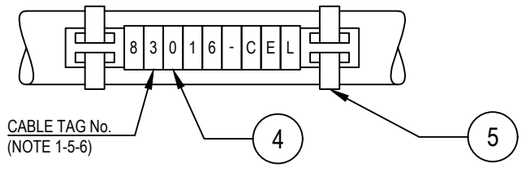
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

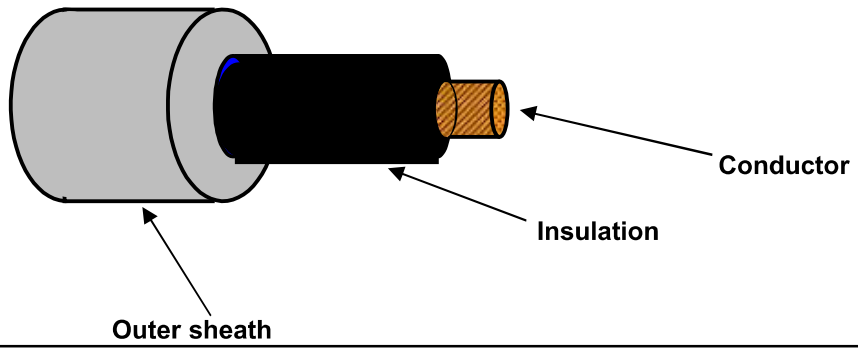
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-4-L3 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-206 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-5-L3 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000505 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

ROSETTI MARINO | PROVERLIS | CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-5-L3 | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000505 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

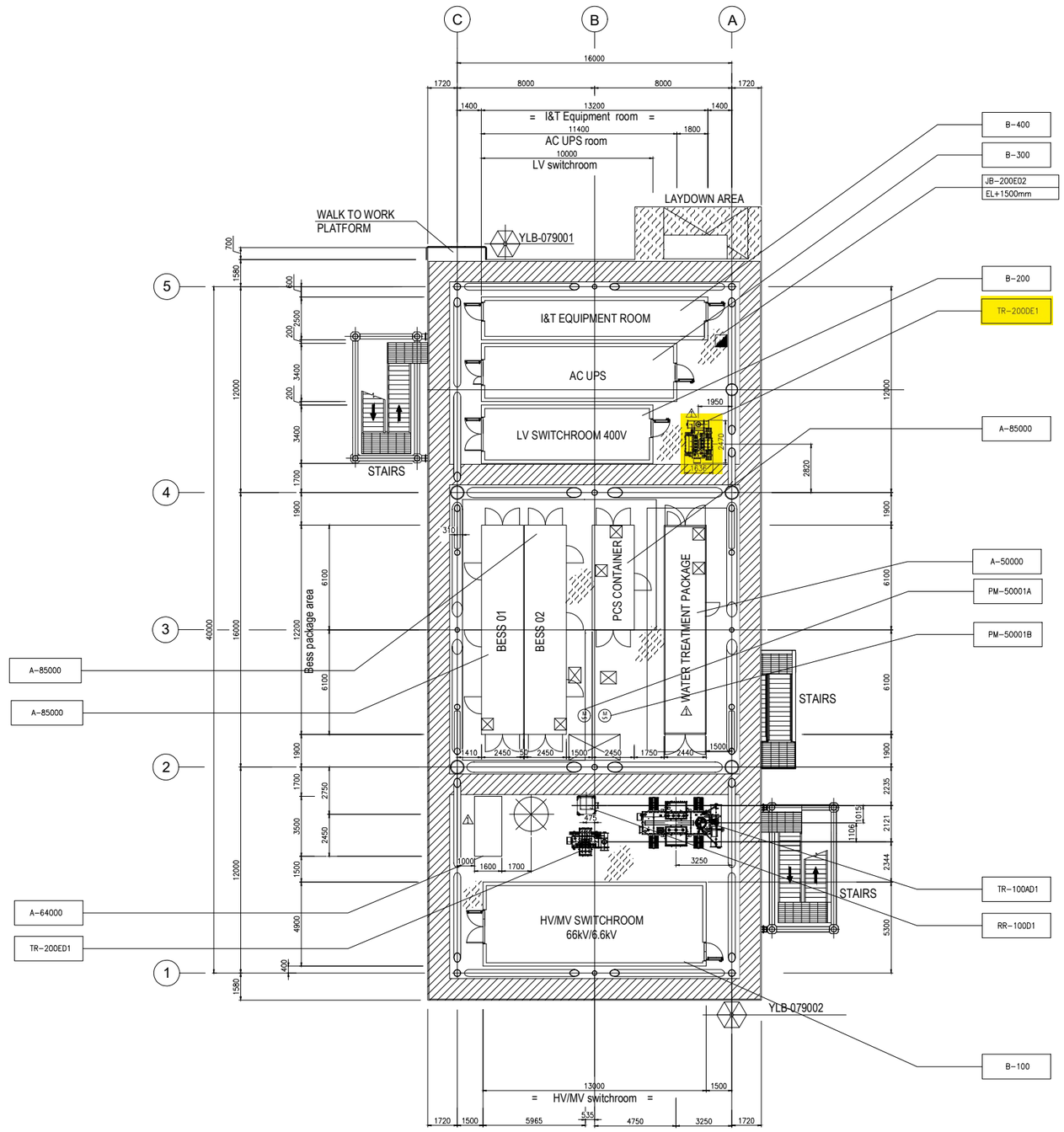
Note 8 : Refer to PL C30000818



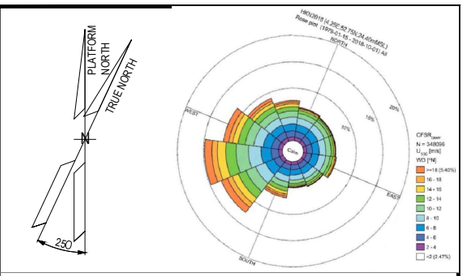
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:20:48.098Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:39:29.171Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

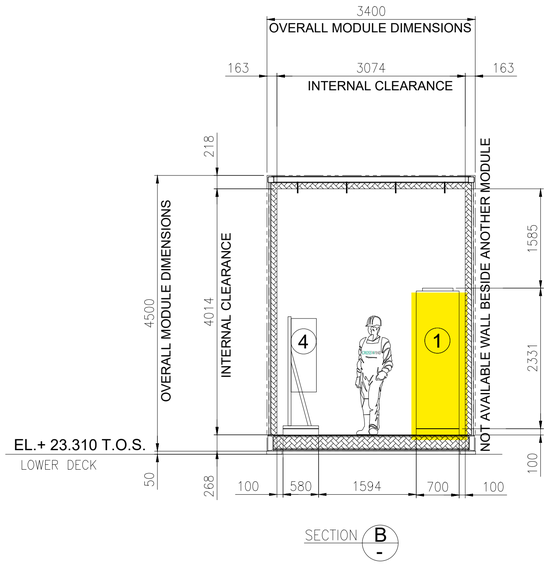
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

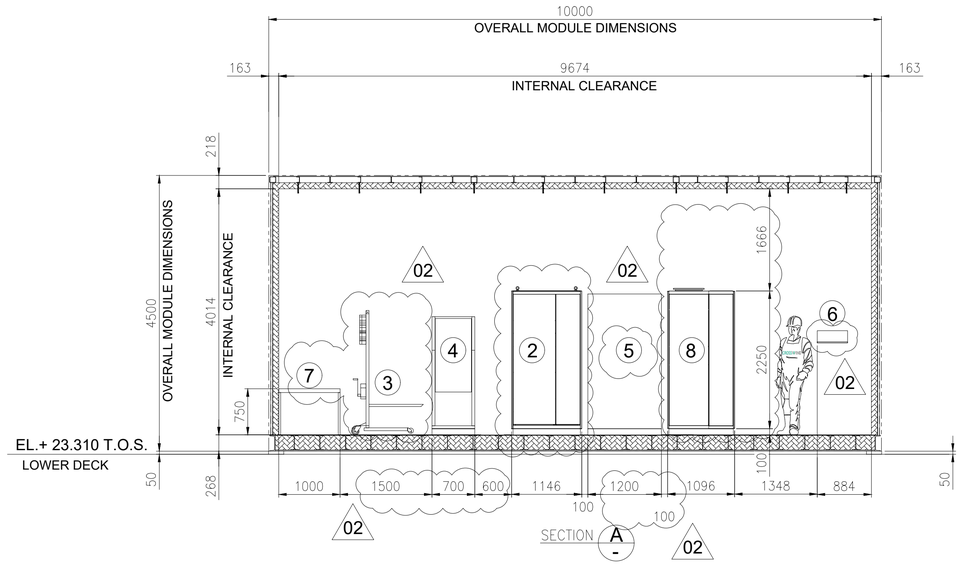
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

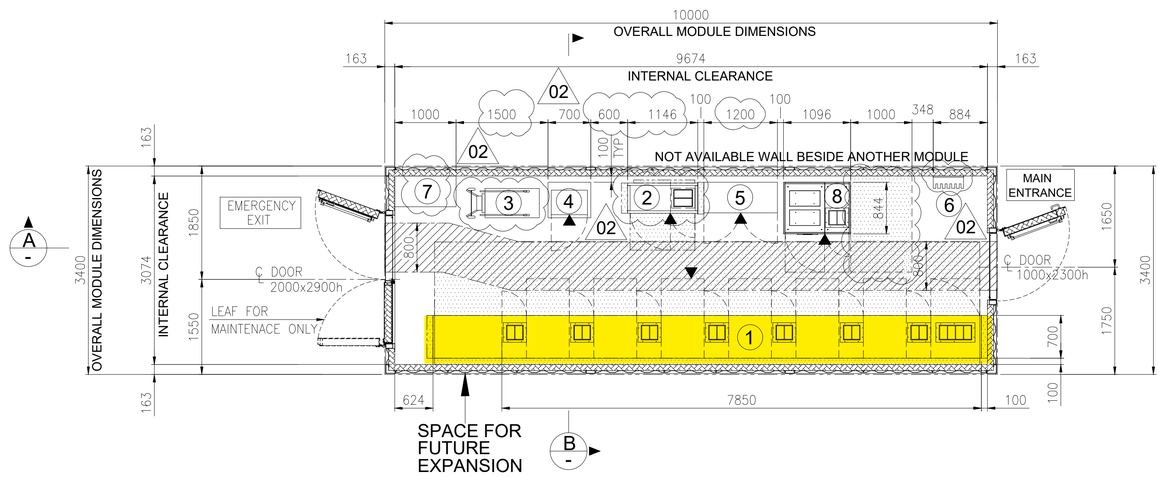
DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02




SECTION B




SECTION A




A

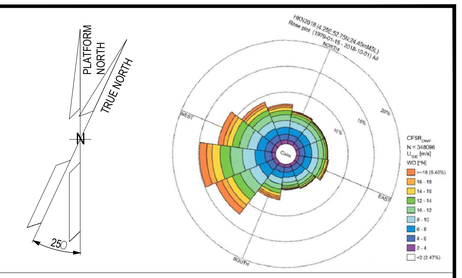
B

EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

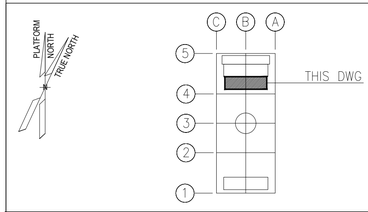
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 (01)

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | |

EARTH BOSS

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

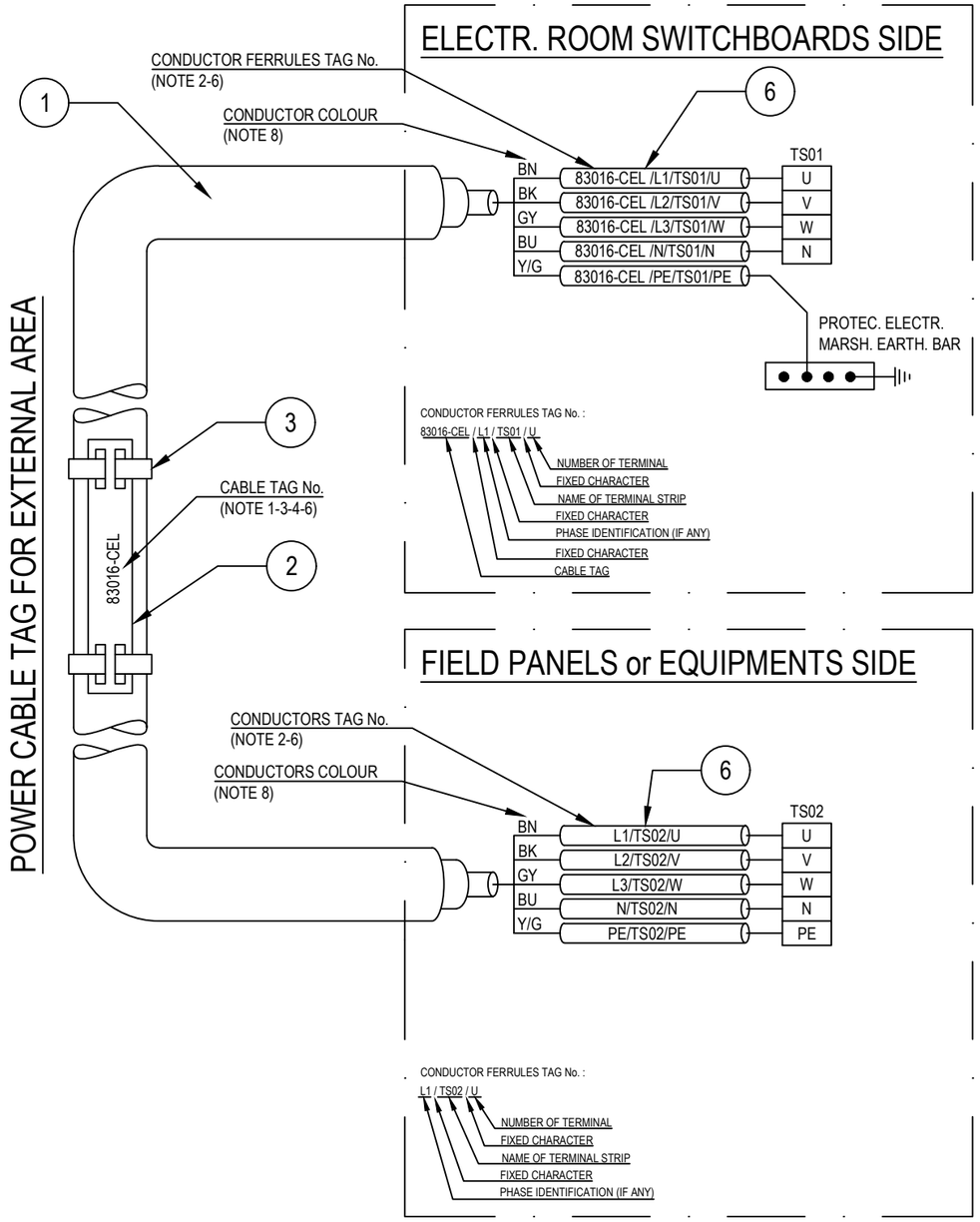
SHEET 017

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

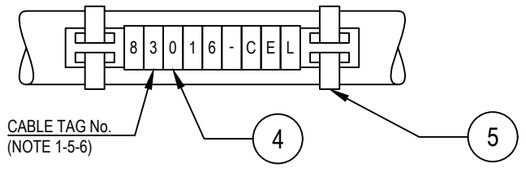
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

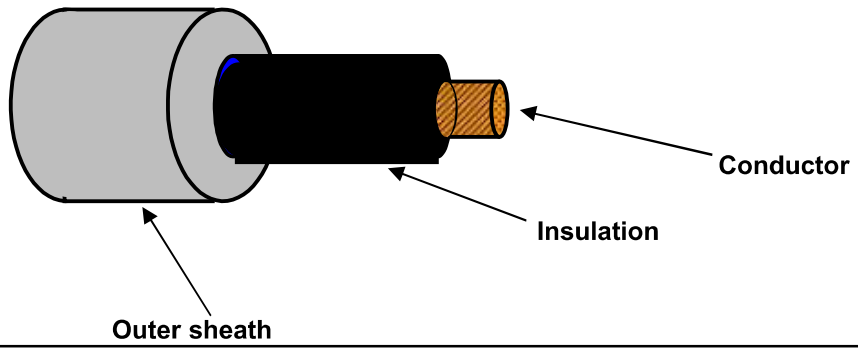
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-5-L3 | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-206 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-1-N | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000506 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-1-N | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000506 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.6 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

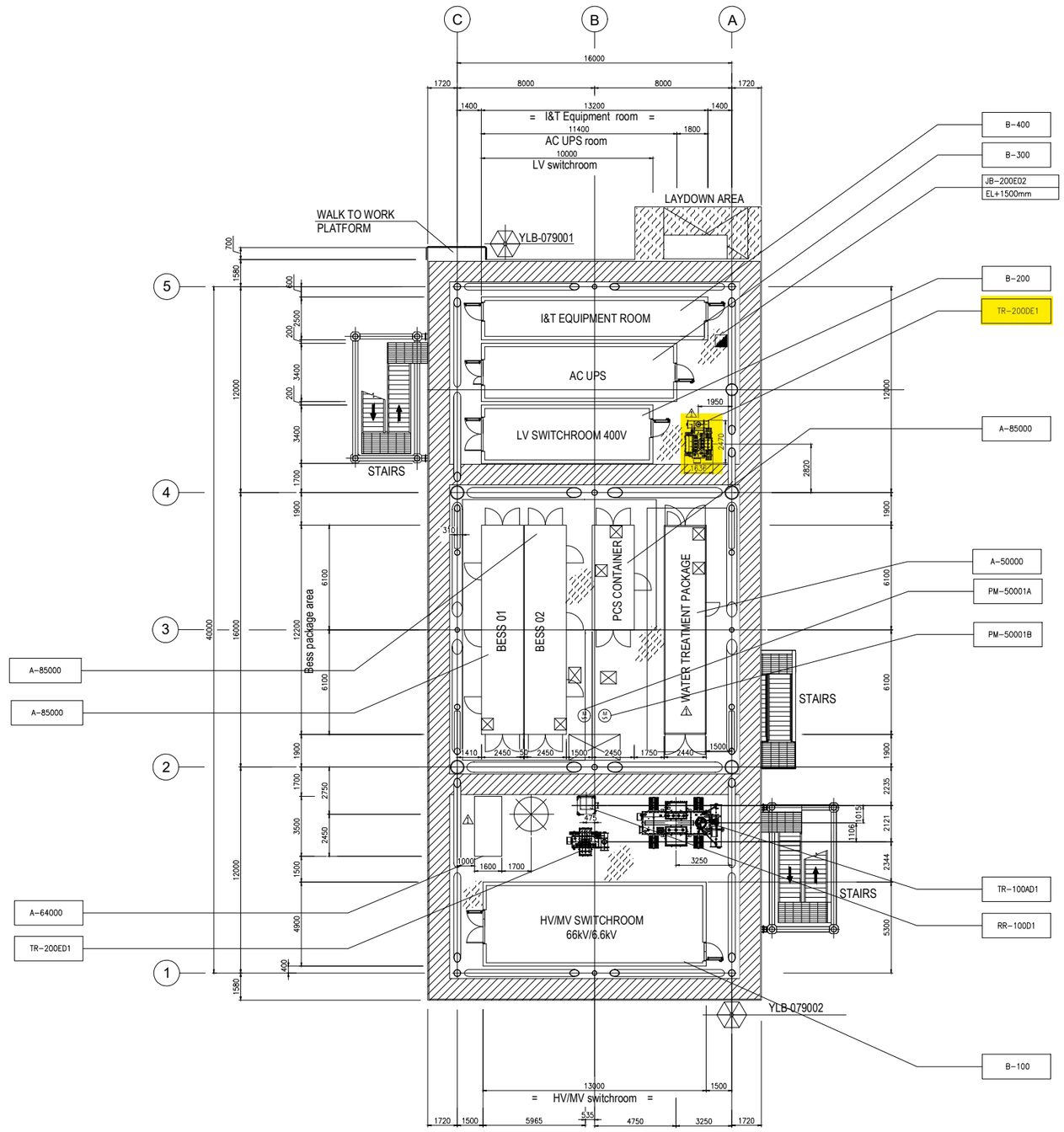
Note 8 : Refer to PL C30000818



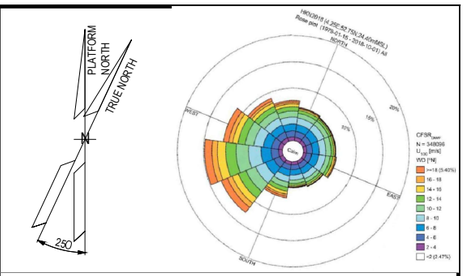
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:20:58.288Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:40:16.516Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

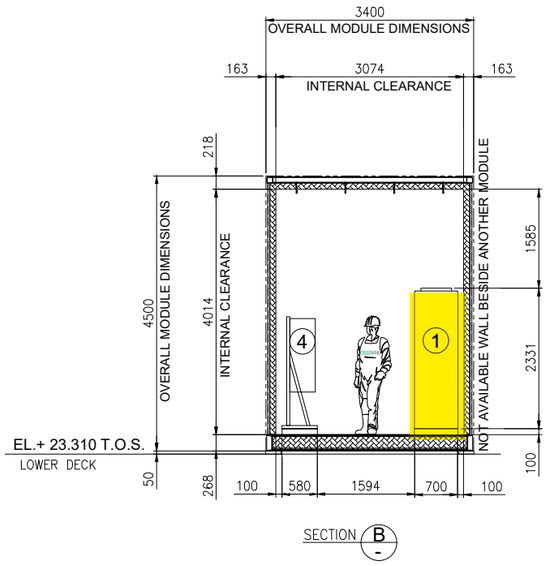
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

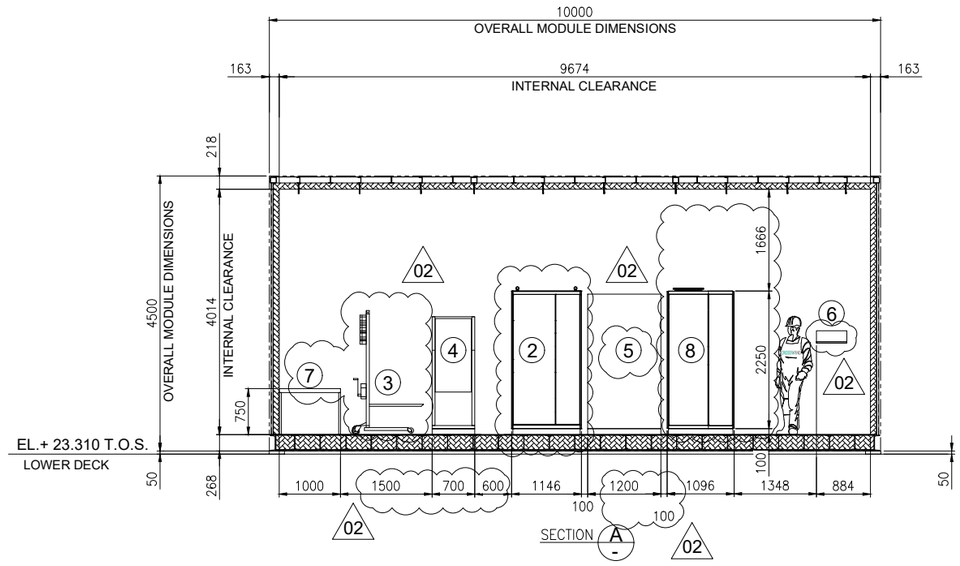
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

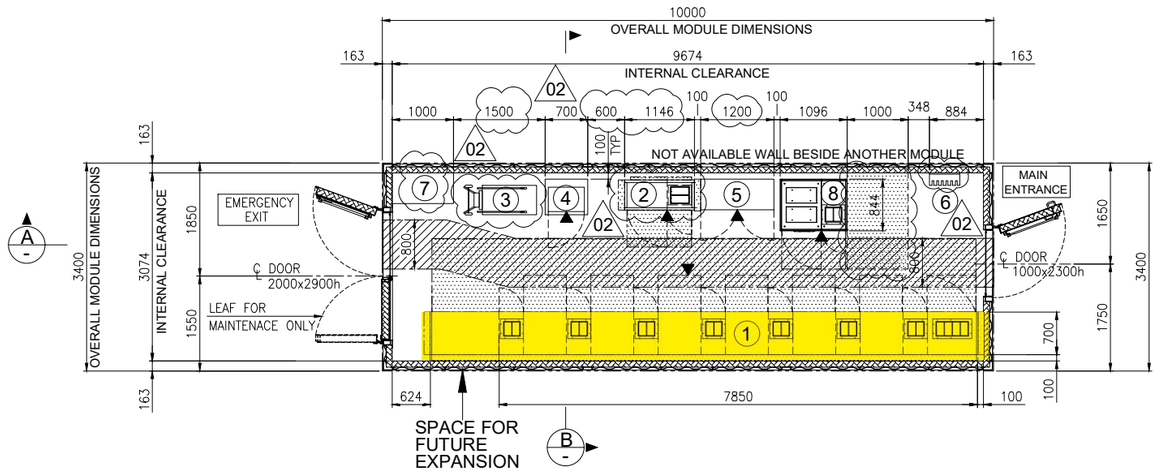
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 | REV. 02



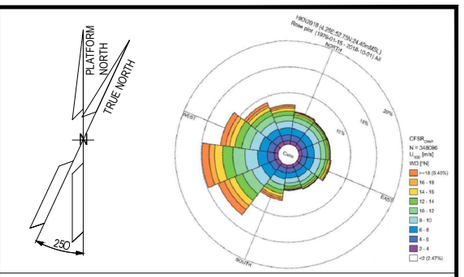




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

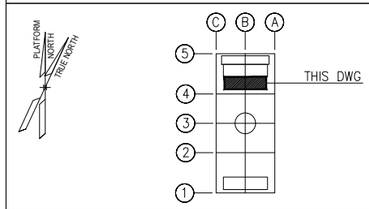
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | OYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20105
REV.: 2_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | COLUMN/CUBIC.: A1/+02 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

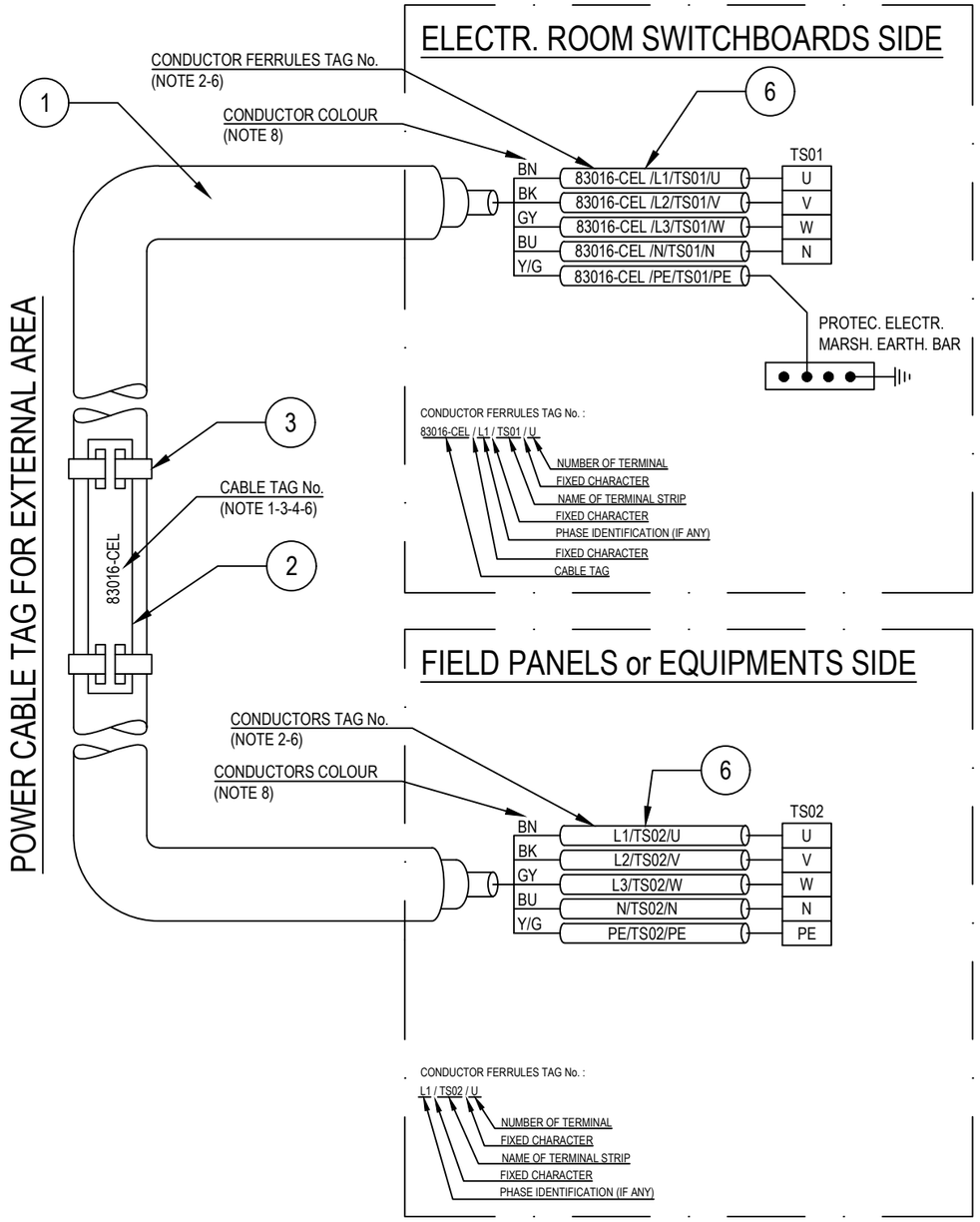
SHEET 017

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

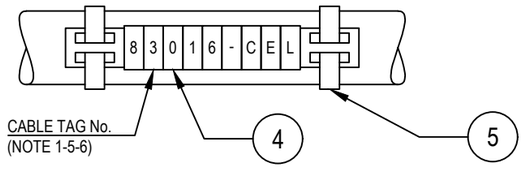
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

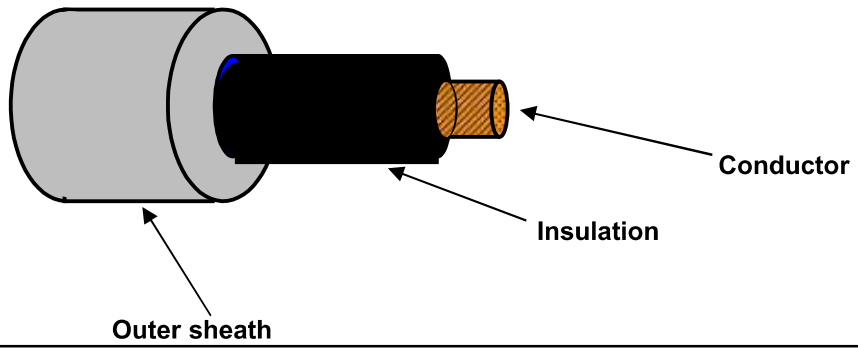
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-1-N | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-206 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-2-N | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000507 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-2-N | : 6.6/0.415 kV Transformer / LV Switchgear | Dwg | 123A90-DDL-EL-LIS-20148 | | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | Module | LD/LD_B-200 | | |
| **TASK** | code | C10000507 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.7 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

Note 4 : Refer to PL C30000679

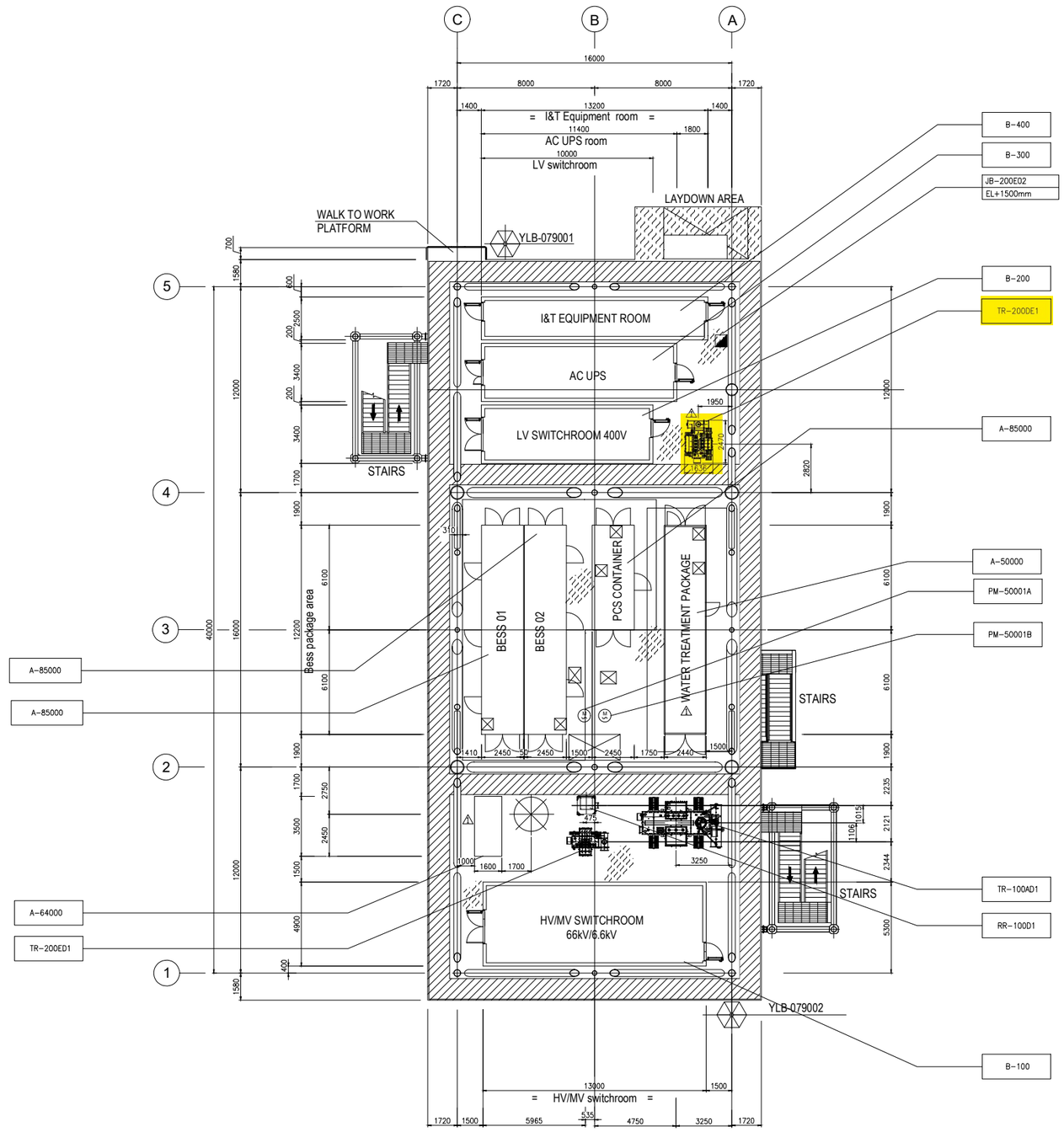
Note 8 : Refer to PL C30000818



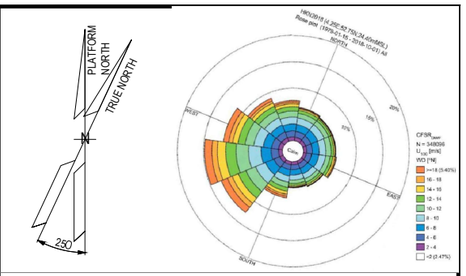
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Paolo Schintu | |
| **Date** | 2024-11-13 | 2024-11-23 | |
| **Signature** | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:21:17.137Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:40:51.433Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

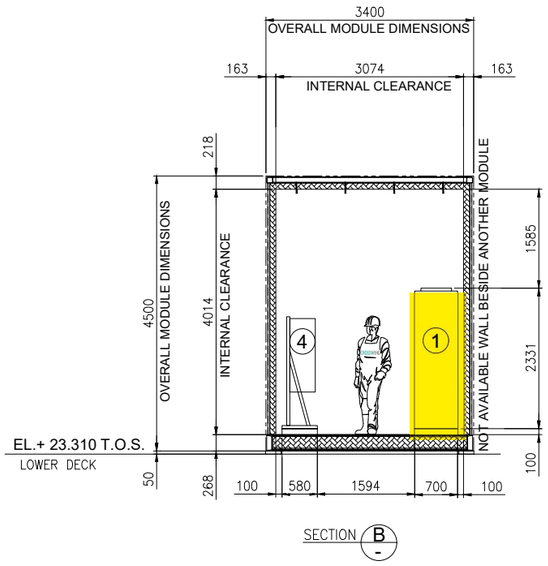
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

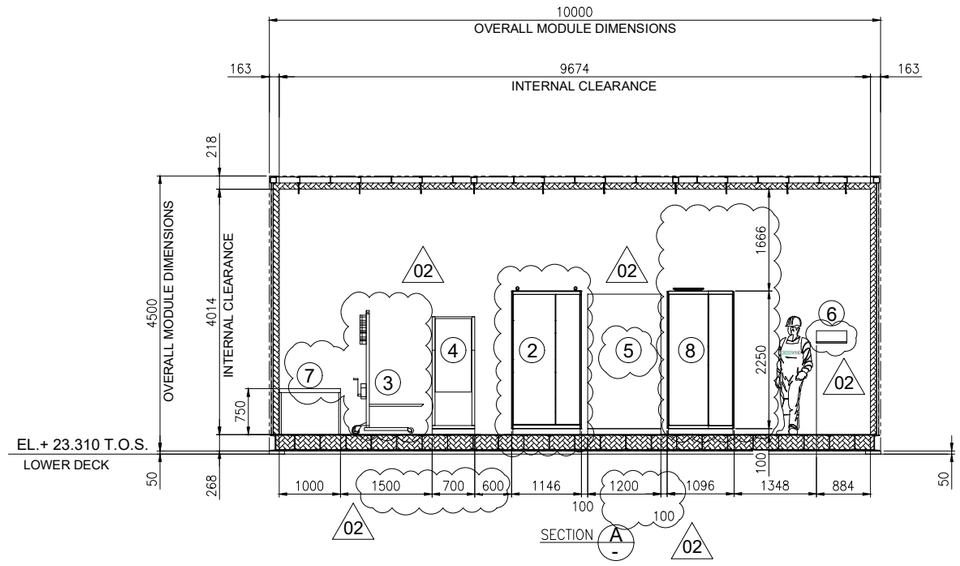
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

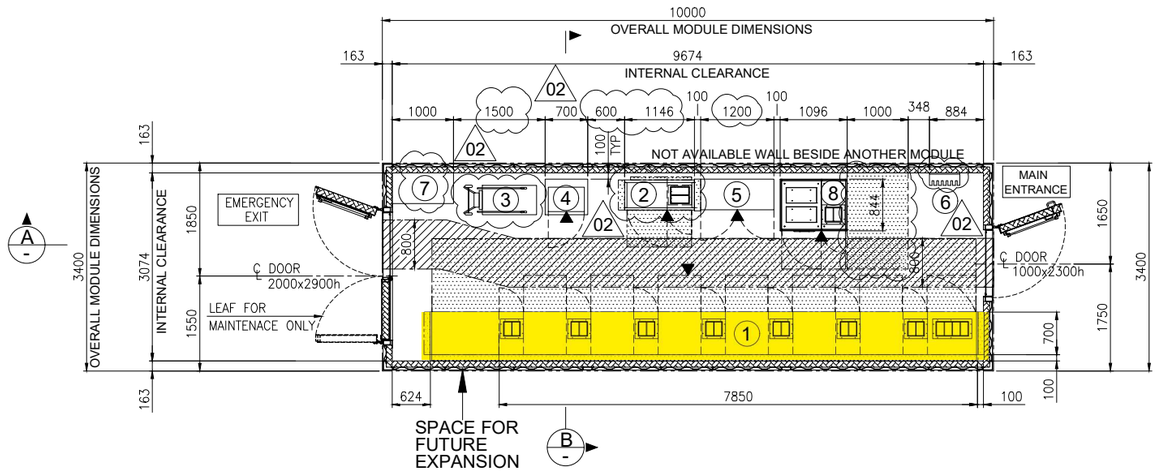
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 | REV. 02



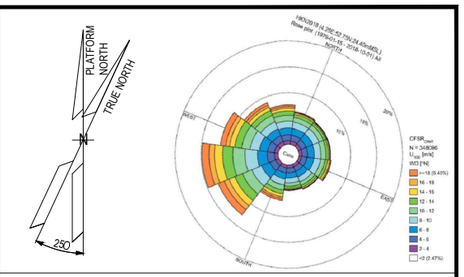




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

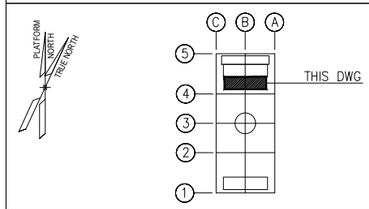
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | OYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20105
REV.: 2_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 | |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | EARTH BOSS | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | | |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149
REV.: 1_A | DATE: 17/10/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

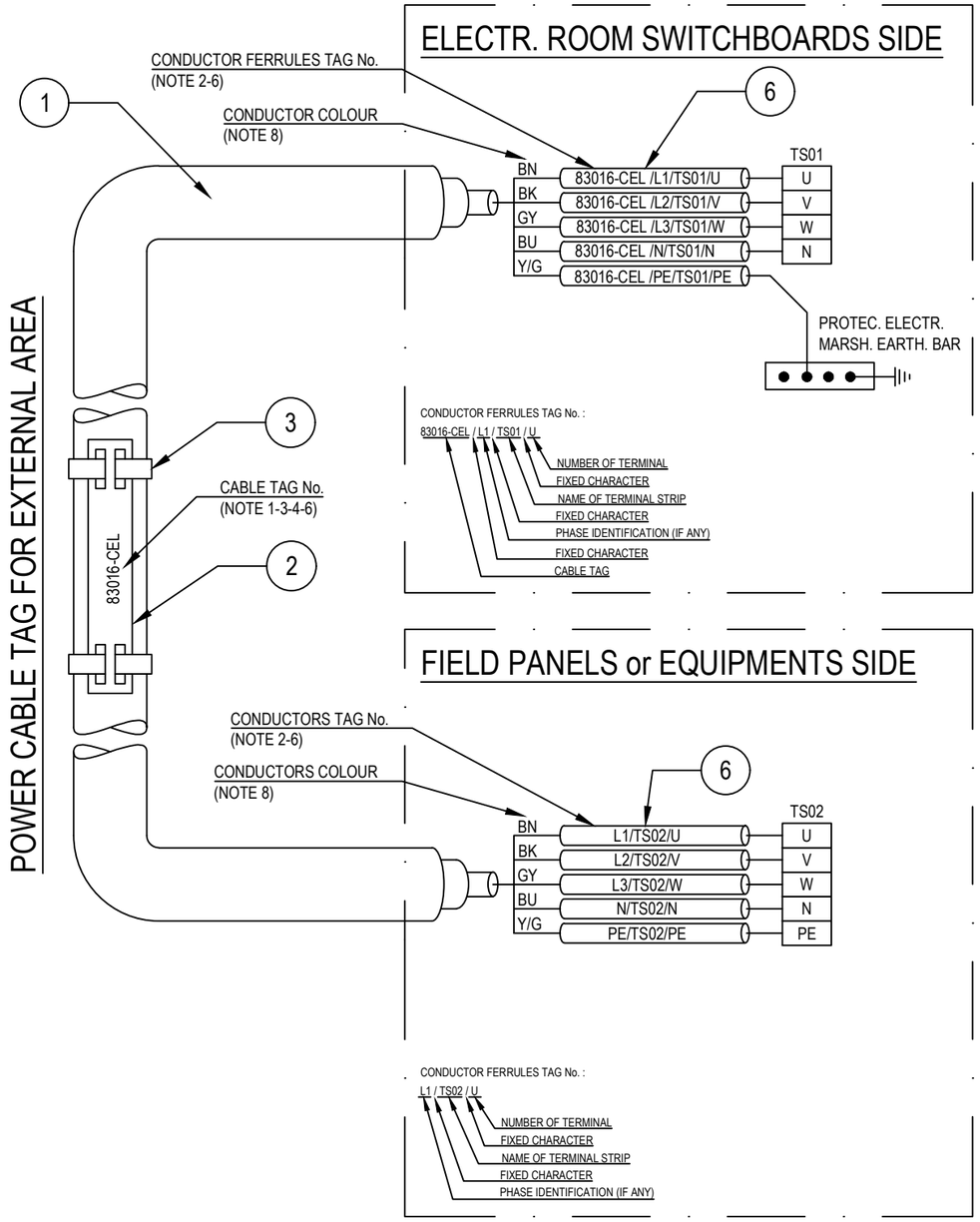
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 017 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

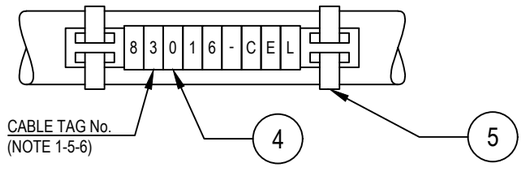
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

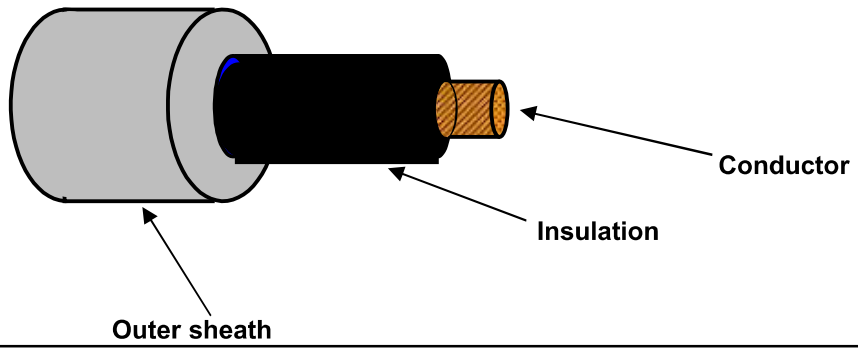
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-2-N | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-206 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-3-N | : 6.6/0.415 kV Transformer / LV Switchgear | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD/LD_B-200 | |
| **TASK** | code | C10000508 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/EPR/LSZH | Cores/Size mm²: 1X300 mm2 | Color: GREY

From: TR-200DE1 | To: SG-200N1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | Note |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-3-N | : 6.6/0.415 kV Transformer / LV Switchgear | Dwg | 123A90-DDL-EL-LIS-20148 | | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | Module | LD/LD_B-200 | | |
| **TASK** | code | C10000508 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form CPX09 | LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.7 | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | NA | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments: Note 4 : Refer to PL C30000679

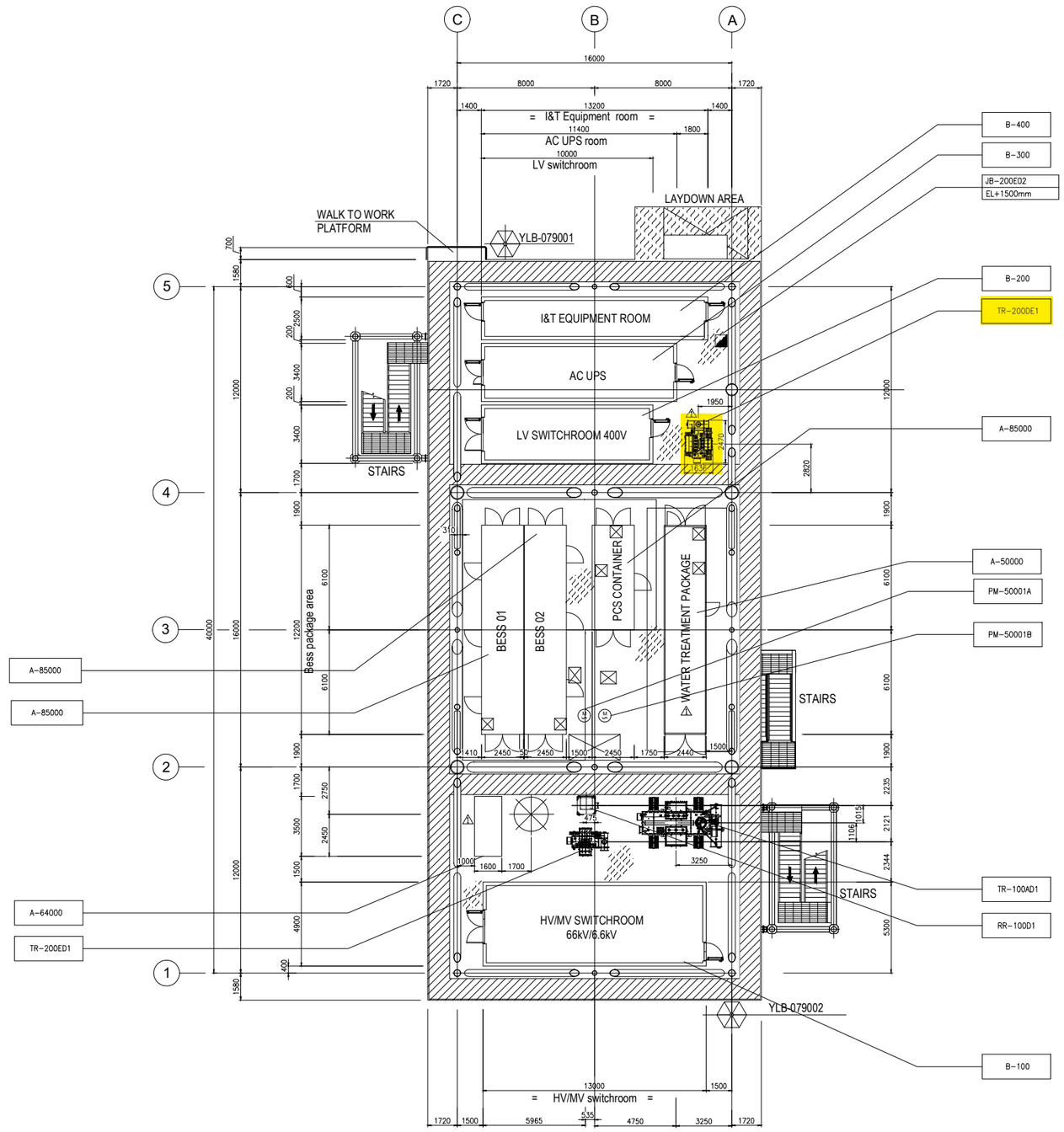
Note 8 : Refer to PL C30000818



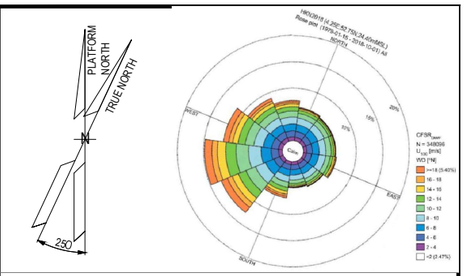
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-13 | 2024-11-23 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-13T21:21:27.289Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T10:41:30.274Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

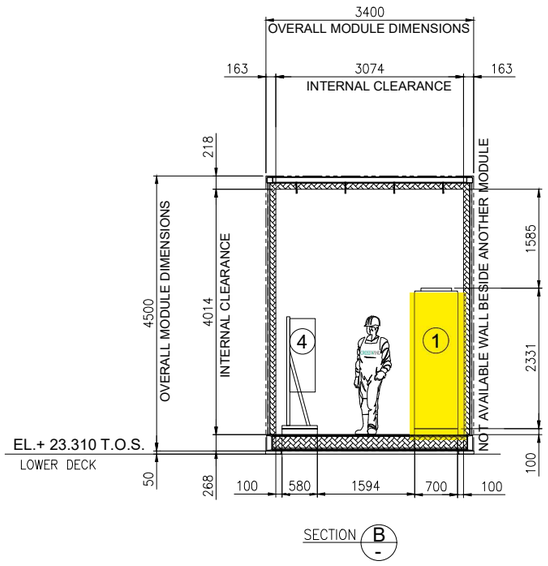
VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20101
REV.: 1_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

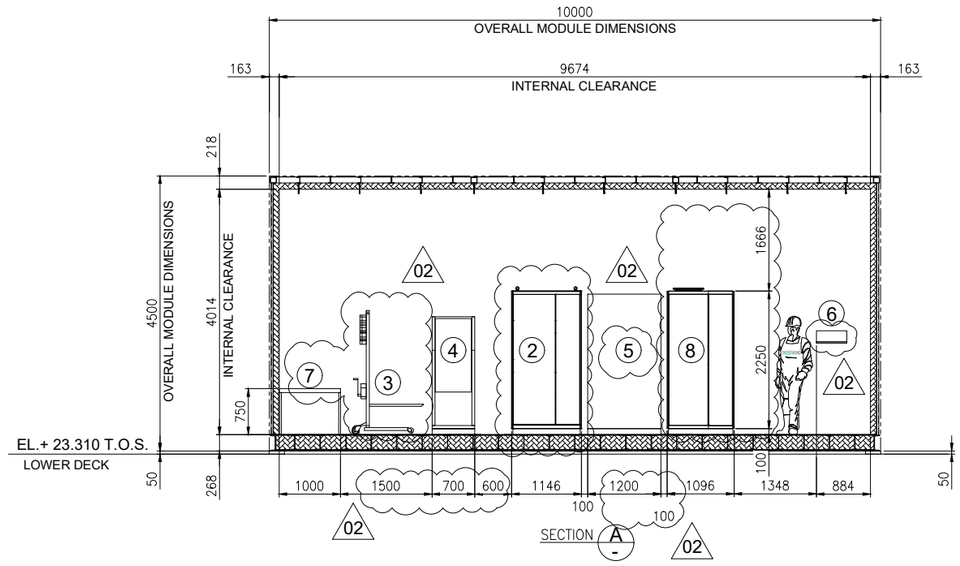
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

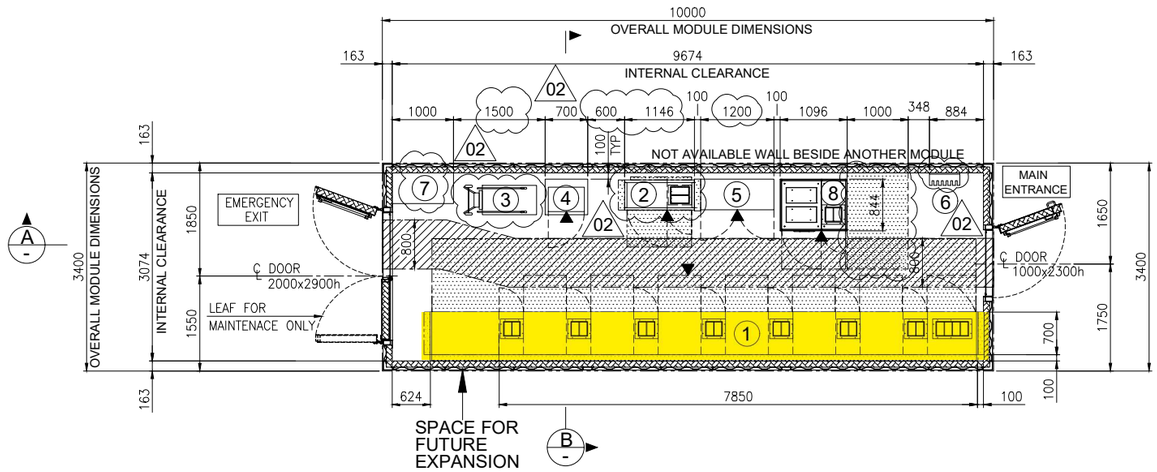
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

DRAWING NO. 123A90-DDL-EL-DL-20105 | REV. 02



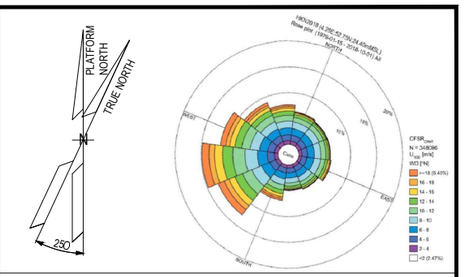




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

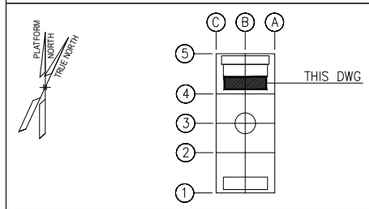
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | OYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20105
REV.: 2_A | DATE: 08/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 | |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | EARTH BOSS | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | | |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

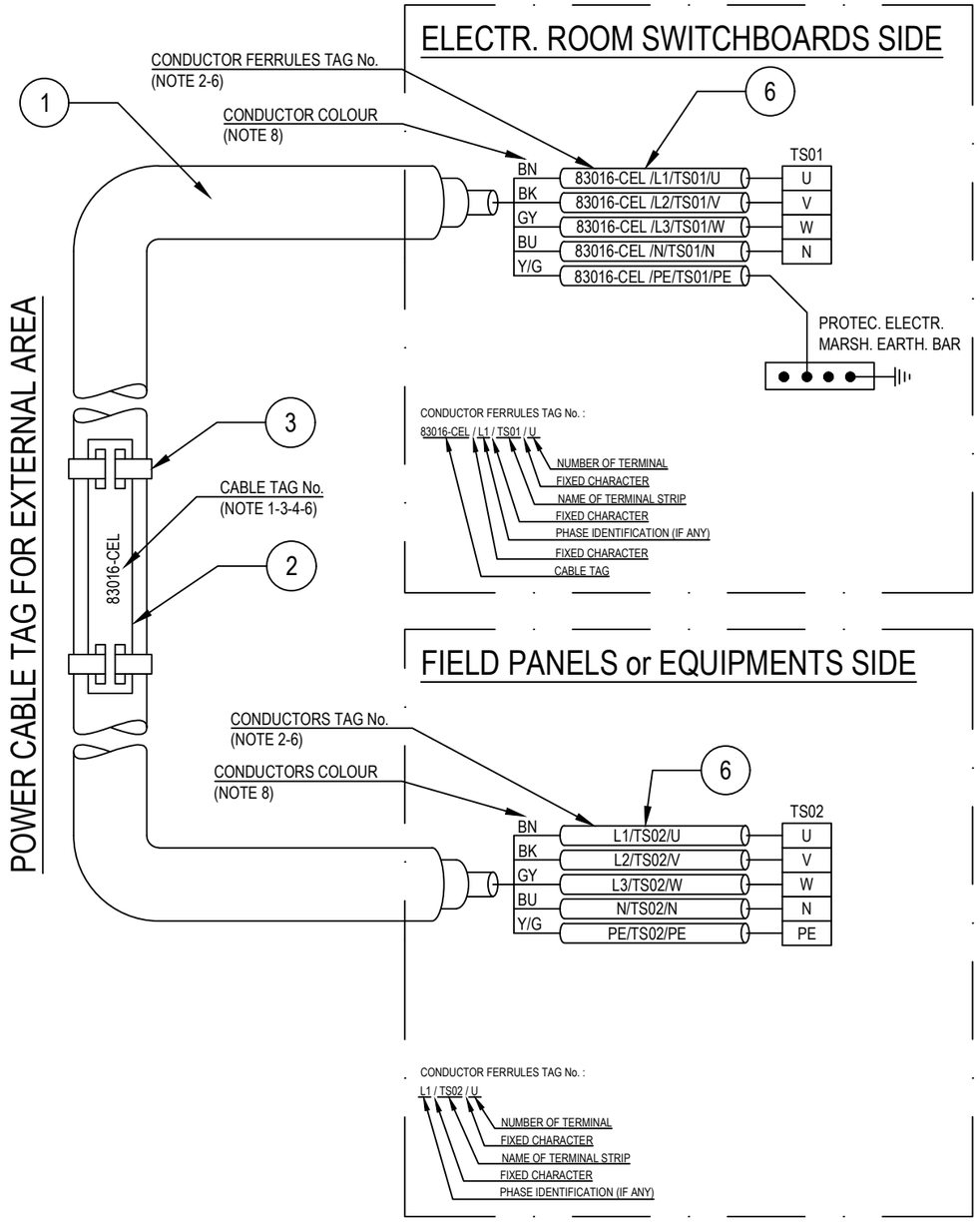
SHEET 017

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

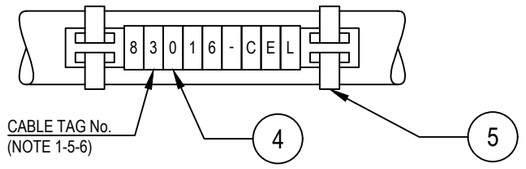
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

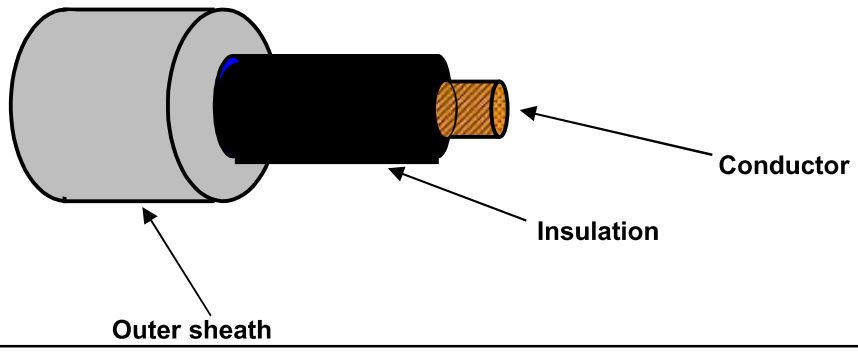
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-3-N | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | SG-200N1 | LV 0,4 kV MCC Switchgear | Lower Deck (B-200) | ELECV01-1X300 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 1Cx300mm² - Grey | M40 | T1_M40_Single | | | n.a. | | | | L-750-101-LVT-001 / E-MCT-206 / L-600-101-LVT-016 / L-450-101-LVT-021 |

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 1CX300 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| Conductor : | **STRANDED COMPACTED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| Insulation : | EPR compound, quality to IEC 60092.360, Nominal Thickness 2,4 mm | |
| Core colour code : | **Black** | |
| Pair Assembling : | Not required | |
| Pair Wrapping: | Not required | |
| Drain wire : | Not required | |
| Pair Shield : | Not required | |
| Shield Insulation : | Not Required | |
| Total Assembling : | Not Required | |
| Overall Wrapping: | Not required | |
| Drain wire : | Not required | |
| Overall Shield: | Not required | |
| Inner covering : | Not required | |
| Inner covering color code: | Not required | |
| Armour : | Not required | |
| Outer sheath : | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,6 mm | |
| Outer sheath color code: | **Grey** | |
| Outer printing (INKJET) : | **FLEI - ELECTRIC CABLE - 1000V - 1CX300 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| Outer diameter : | (29,4 ± 10%) mm | |
| Bending radius : | cable outer diameter x 10 | (in fixed installation) |
| Spark test : | 16 kV a.c. | (on insulation) |
| | 12 kV a.c. | (on outer sheath) |
| Conductors DC Resistance : | | IEC 60228 Class 2 |
| Insulation Resistance : | ≥ 330 MΩ x Km (@ 20°C) | |
| Applicable Standards | | |
| Design Guidelines : | **IEC 60092.353** | |
| ON COMPLETE CABLE | | |
| Flame Retardant test : | IEC 60332.1.2 - IEC 60332.3.22 | |
| Acid Gas generation : | IEC 60754.1/2 | |
| Smoke density/Light Transmittance | IEC 61034.2 (LT ≥ 60%) | |
| Temperature Range : | | |
| ON INSULATION | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| ON COMPLETE CABLE | | |
| During Operation : | (-20°C up to +90°C) | (in fixed installation) |
| During installation : | (- 5°C up to +50°C) | |
| Note : | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Outer sheath together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-1-E | : 6.6/0.4 KV, 1.6MVA Transformer-Neutral / Earth Point | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD | |
| **TASK** | code | C10000509 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/LSZH TI7 | Cores/Size mm²: 1G150 mm2 | Color: Y/G

From: TR-200DE1 | To: TR-200DE1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | OK |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-1-E | : 6.6/0.4 KV, 1.6MVA Transformer-Neutral / Earth Point | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD |
| **TASK** | code | C10000509 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | NA | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | 0.1 | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

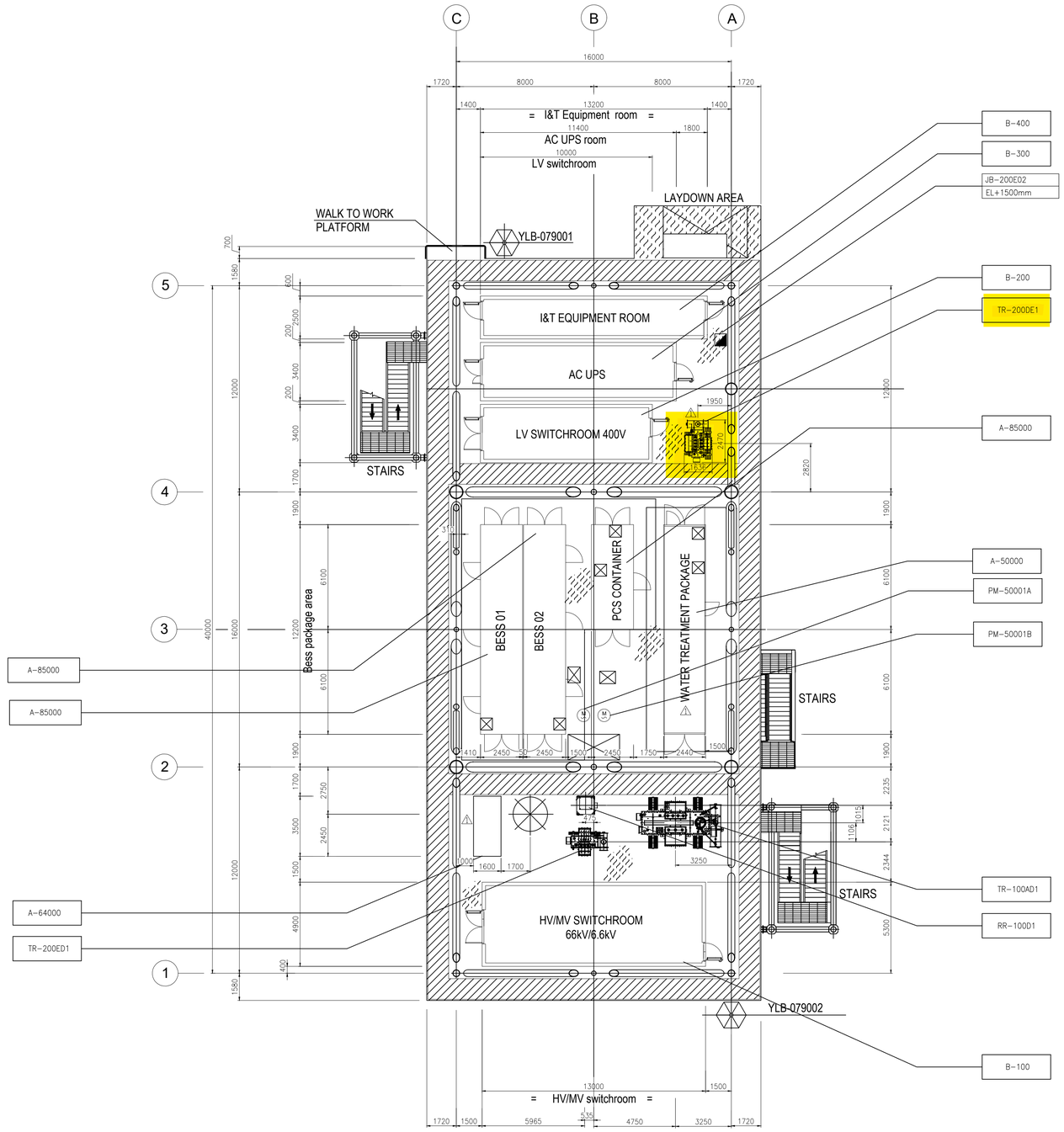
Comments: Note 4 : Refer to PL C30000679



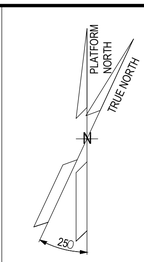
| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Paolo Schintu | |
| **Date** | 2024-11-15 | 2024-11-23 | |
| **Signature** | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-15T12:12:44.862Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T12:12:45.374Z | |

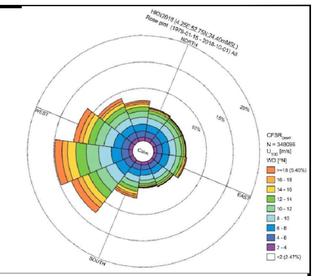
DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150

DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24

A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 | | |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | | | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | | | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | | | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | | | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 | | |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | | | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | | | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | | | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | | | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 | | |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | | | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | | | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | | | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | | | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL | | |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | | | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | | | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | | | |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | EARTH BOSS | | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

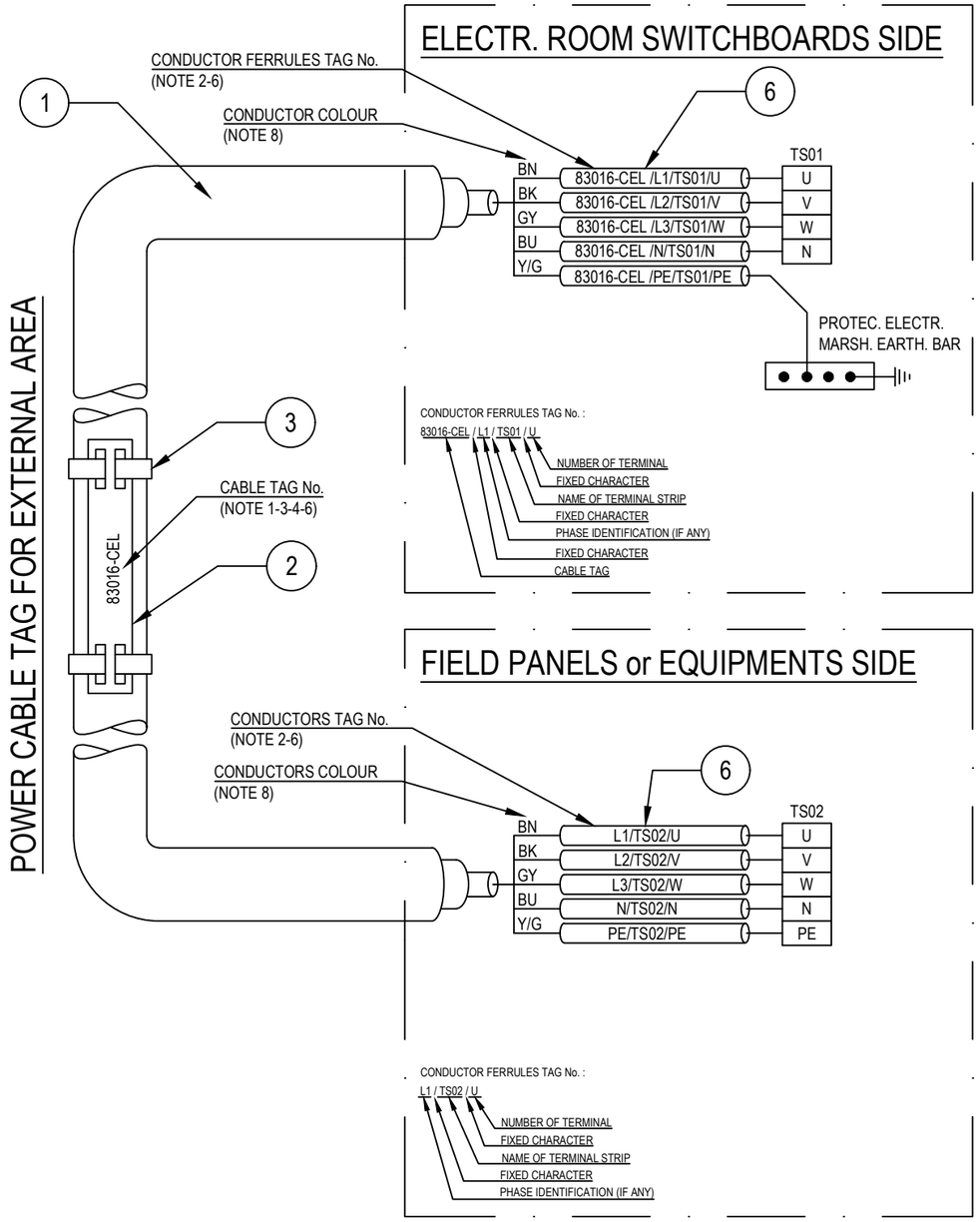
SCALE : 1:X

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DG-20149 | 017 | 01 |

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

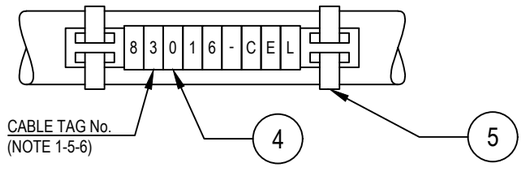
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

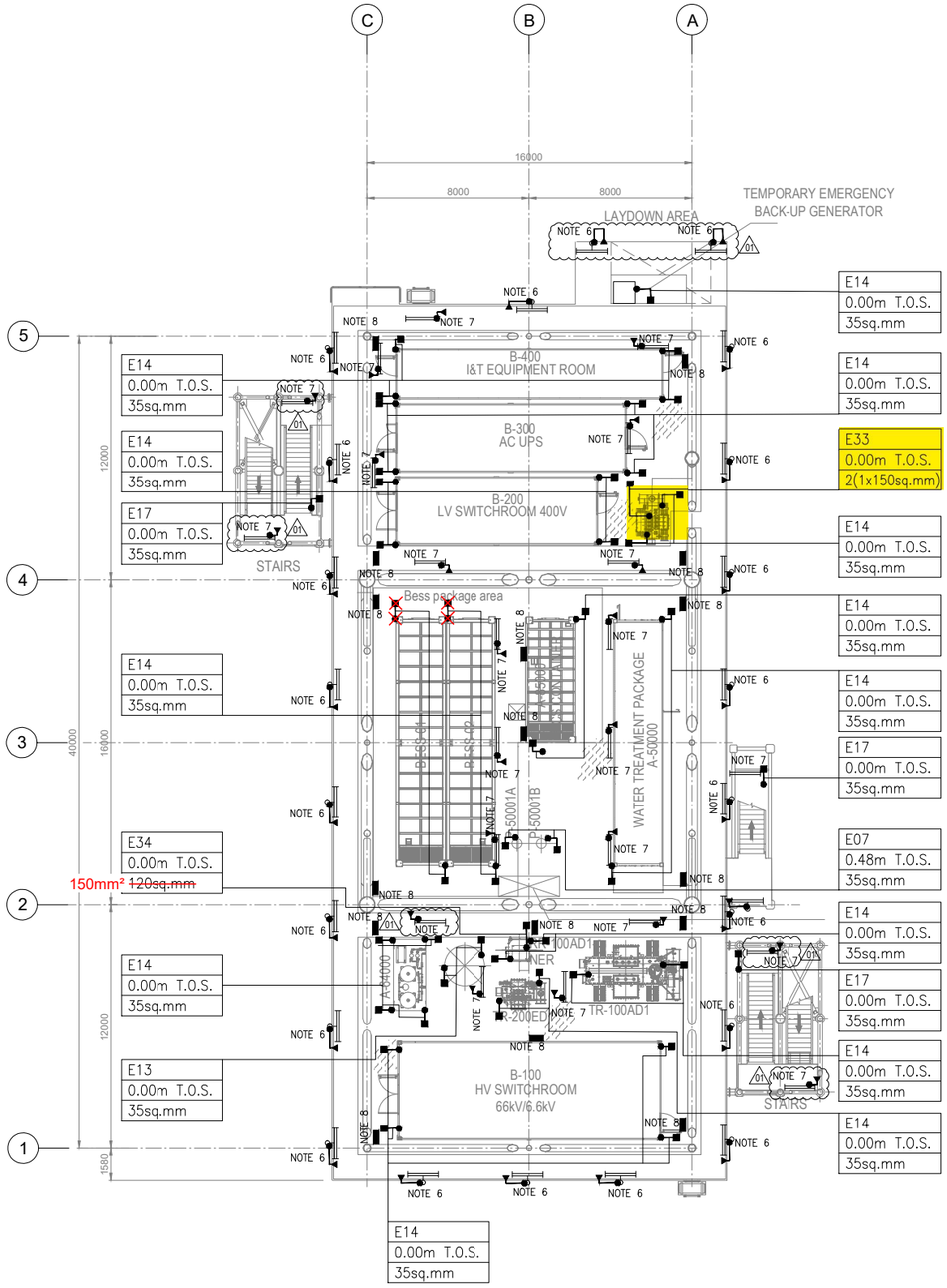
A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

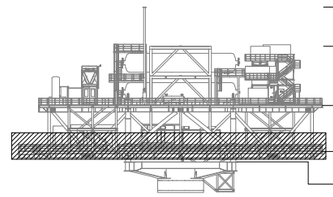
DRAWING NO. 123A90-DDL-EL-DL-20133

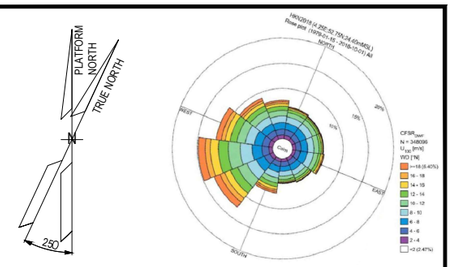
REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.

## KEY PLAN




## NOTES

1. ALL DIMENSIONS AND ELEVATIONS ARE GIVEN IN mm UNLESS OTHERWISE NOTED.
2. ELEVATIONS REFER TO T.O.S.
3. THIS DOCUMENT IS ONLY VALID FOR EARTHING LAYOUT.
4. ALL ELECTRICAL EQUIPMENT NOT DIRECTLY WELDED TO SKID FRAME SHALL BE BONDED TO STEEL TO THE STRUCTURE OF SKID BASEFRAME.
5. FOR LIGHTNING PROTECTION SYSTEM SURGE PROTECTIVE DEVICES (SPD), REFER TO THE DOCUMENT 123A90-DDL-EL-RE-20154.
6. ALL NON-WELDED POLES WILL BE EARTHED AS PER TYPICAL E05 AND E24. 01
7. ALL LINEAR LIGHTING FIXTURE WILL BE EARTHED AS PER TYPICAL E32.
8. EARTH BAR WILL BE FIXED TO THE PRIMARY BEAMS OF THE UPPER DECK. COMPLETE EARTHING INCLUDING WITH 2 THREADED STUDS. ALL EARTH BAR WILL BE EARTHED AS PER TYPICAL E03D / 6.00M T.O.S. / 35 SQ MM.
9. EQUIPOTENTIAL BONDING GROUPING FOR BOLTED HANDRAILS ARE PROVIDED EVERY 3M FOR THE ENTIRE PERIMETER AS TYPICAL E16 AND WILL BE DEFINED DURING ASSEMBLY PHASE

## LEGEND

- LIGHTING FIXTURE POLE MOUNTED
- LINEAR LIGHTING FIXTURE
- EARTHING BOSS AISI316L
- COMPRESSION TYPE LUG TINNED COPPER
- THREADED STUD FOR EARTHING CONNECTION
- Exx EARTHING TYPICAL CODE
- EARTHING BAR

| | |
|---|---|
| TYP. | TYPICAL |
| ELE | ELEVATION |
| SIZE | |

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DD-20090 | ELECTRICAL TYPICAL INSTALLATION DETAILS - EARTHING SYSTEM |
| 123A90-DDL-EL-RE-20154 | LIGHTNING PROTECTION SYSTEM CALCULATION REPORT |
| 123A90-DDL-EL-DL-20119 | LIGHTING & SOCKET LAYOUT - LOWER DECK |
| 123A90-DDL-EL-DL-20101 | ELECTRICAL EQUIPMENT LAYOUT - LOWER DECK |

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 25/07/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 29/05/24 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
EARTHING & LIGHTNING LAYOUT
LOWER DECK

| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SPS | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 25/07/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20133 | SHEET 001 | REV. 01 |

SHEET 001 OF 002

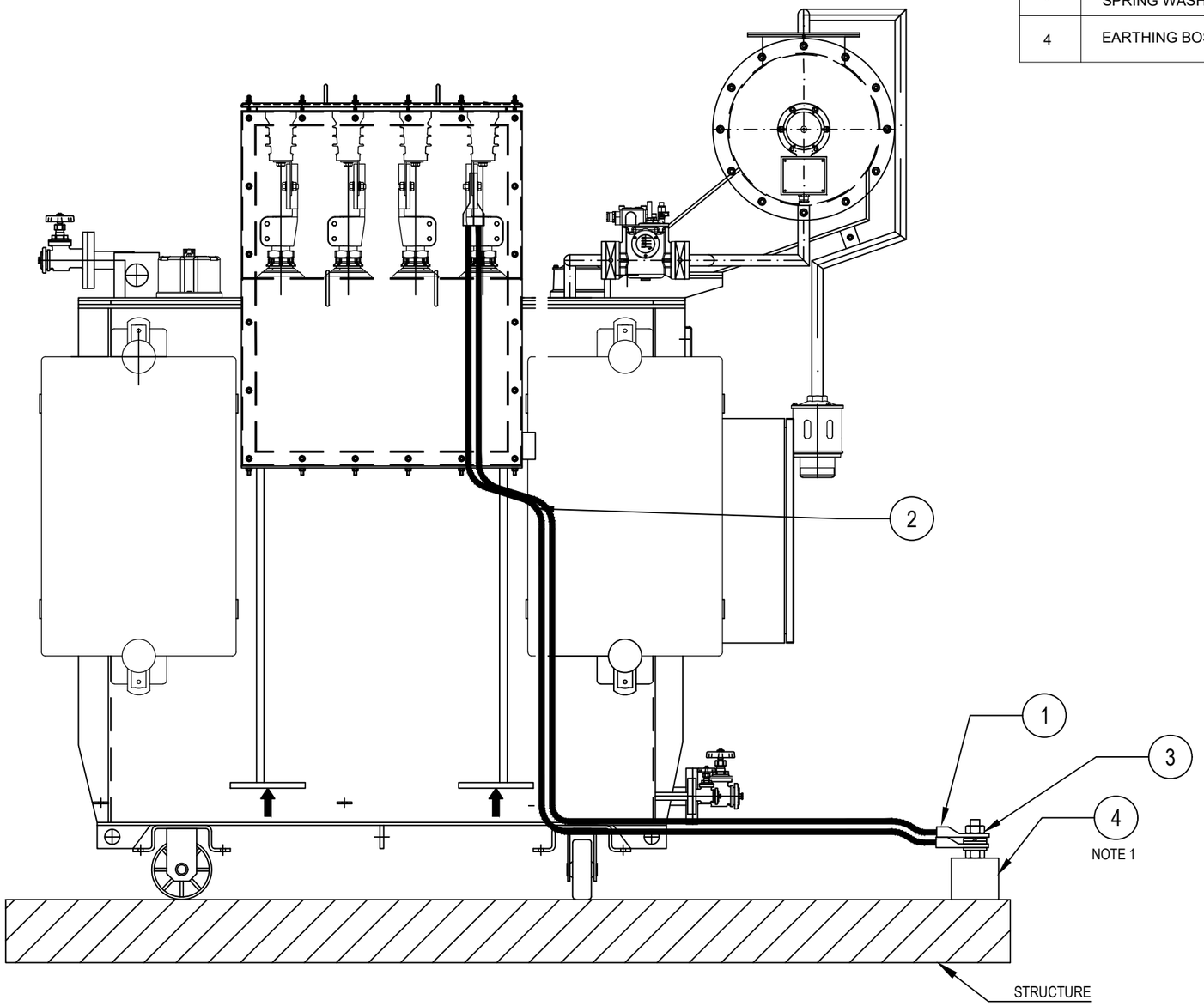
**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20133**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_B | 11/09/24 | G.Randi |

**ROSETTI MARINO SpA**

File Name : 123A90-DDL-EL-DL-20133

E33




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR | TINNED COPPER | | 1 | |
| 2 | Y/G INSULATING COPPER CONDUCTOR | COPPER | 2(1x150mm$^2$) | AS R | |
| 3 | HEXAG. BOLT COMPLETE WITH PLANE WASHERS, SPRING WASHER AND NUT | AISI 316L | M10X30 | 1 | |
| 4 | EARTHING BOSS WITH THREADED HOLE M10 | AISI 316L | 50X50 | | NOTE 2 |

NOTES:
1) FOR EARTHING BOSS TYPICAL DETAIL E11A
2) EXTERNAL EARTHING CONNECTION ONLY SHALL BE PROTECTED AGAINST CORROSION USING OXIDE RESISTANT COMPOUND (E.G. COPPER GREASE)

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DD-20090**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_I | 07/11/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 26/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 10/06/24 | SPS | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS–EARTHING SYSTEM
NEUTRAL EARTHING

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 024 | REV. 02

CROSSWIND

ROSETTI MARINO

F.to UNI A3: 420mmx297mm

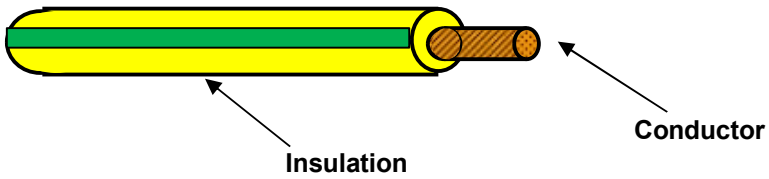
File Name : 123A90-DDL-EL-DD-20090 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-1-E | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | ELECV28-1G150 | Cable Cu Cl.2/LSZH TI7 450/750V 1G150mm² - Yellow with 2 Green Stripes | M25 | T1_M25_Single | | | n.a. | | | | NA |

FLEI s.r.l.

# Cu Cl.2/LSZH 450/750 V

## 1G150 - PE CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| **Conductor :** | **STRANDED COMPACTED** plain/bare annealed copper wires | EN/IEC 60228 Class 2 |
| **Insulation :** | LSZH compound, TI7 quality, Nominal Thickness 1,8 mm | |
| **Core colour code :** | **Yellow with 2 Green stripes** | |
| **Pair Assembling :** | Not required | |
| **Pair Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Pair Shield :** | Not required | |
| **Shield Insulation :** | Not Required | |
| **Total Assembling :** | Not Required | |
| **Overall Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Overall Shield:** | Not required | |
| **Inner covering :** | Not required | |
| **Inner covering color code:** | Not required | |
| **Armour :** | Not required | |
| **Outer sheath :** | Not required | |
| **Outer sheath color code:** | Not required | |
| **Outer printing (INKJET) :** | **FLEI - ELECTRIC CABLE - 450/750 V - 1G150 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 -** | |
| | **Year of Manufacture - CE + Meter Marking** | |
| **Outer diameter :** | (17,7 ± 10%) mm | |
| **Bending radius :** | cable outer diameter x 8 | (in fixed installation) |
| **Spark test :** | 13 kV a.c. | (on insulation) |
| **Conductors DC Resistance :** | | EN/IEC 60228 Class 2 |
| **Insulation Resistance :** | ≥ 10 MΩ x Km (@ 20°C) | |
| **Applicable Standards** | | |
| **Design Guidelines :** | **EN 50525.3.31** | |
| **ON COMPLETE CABLE** | | |
| **Flame Retardant test :** | IEC 60332.1.2 - IEC 60332.3.22 | |
| **Acid Gas generation :** | IEC 60754.1/2 | |
| **Smoke density/Light Transmittance :** | IEC 61034.2 (LT ≥ 60%) | |
| **Temperature Range :** | | |
| **During Operation :** | (-20°C up to +70°C) | (in fixed installation) |
| | (max +160°C) | (max conductors temperature during short-circuit for 5 seconds) |
| **During Installation :** | (-10°C up to +50°C) | |
| **Note :** | **The cable is suitable for installation and use in Zone 1 & Zone 2 (IEC 60079-14) using only correct ATEX approved equipment or accessories** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-2-E | : 6.6/0.4 KV, 1.6MVA Transformer-Neutral / Earth Point | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD | |
| **TASK** | code | C10000510 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

## CABLE DATA

Type: Cu Cl.2/LSZH TI7 | Cores/Size mm²: 1G150 mm2 | Color: Y/G

From: TR-200DE1 | To: TR-200DE1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | OK |
| 8 | Confirm cable labelling is in accordance with specifications. | OK |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check cores marking are in accordance with termination diagram | OK |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |



REFER TO FINAL SHEET FOR ACCEPTANCE

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEL-2-E | : 6.6/0.4 KV, 1.6MVA Transformer-Neutral / Earth Point | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD |
| **TASK** | code | C10000510 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

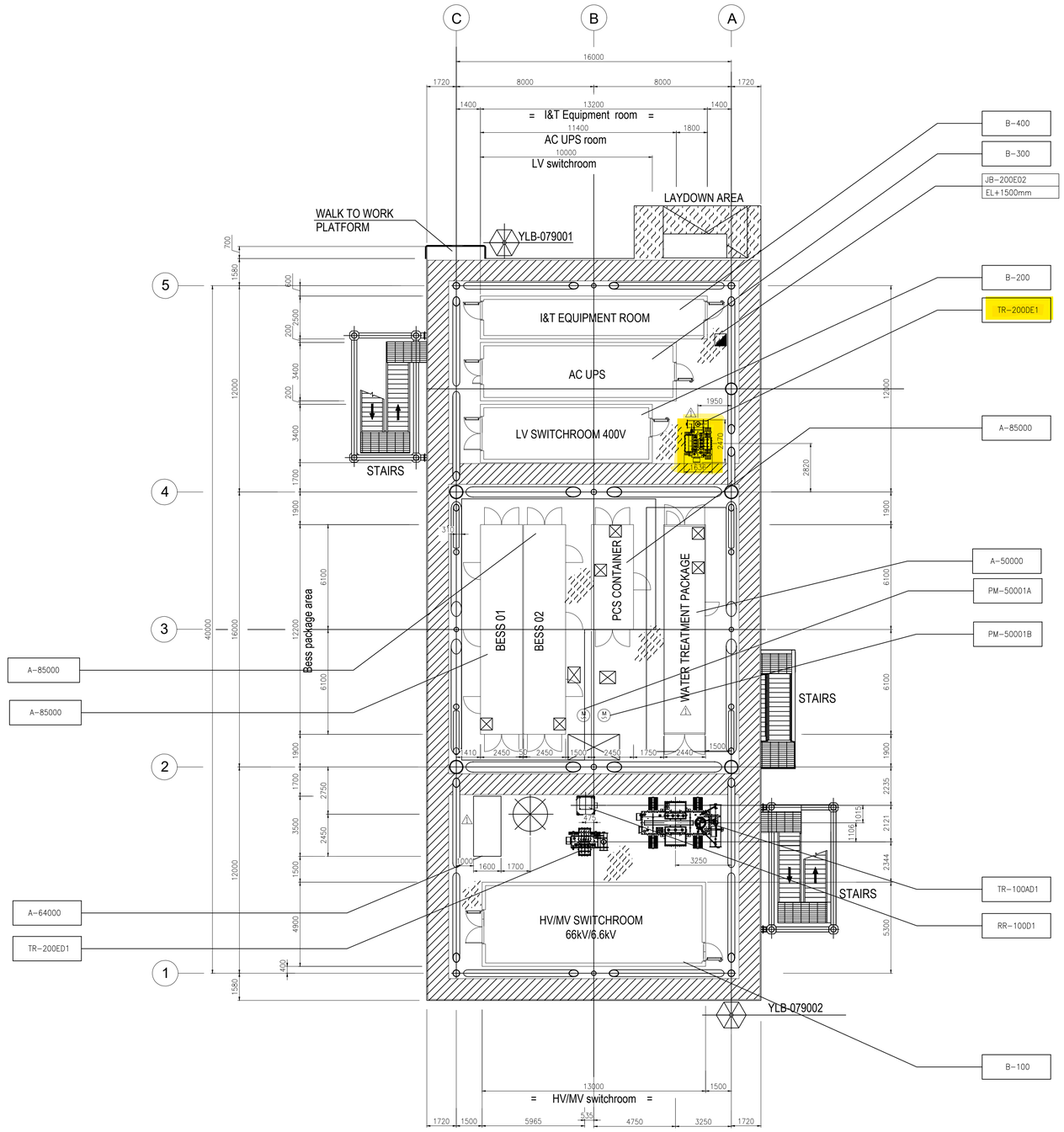
| | | | | |
|---|---|---|---|---|
| **CONTINUITY** | | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | NA | |
| 6 | | PH 2 | NA | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | NA | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | 0.1 | |
| **INSULATION** | | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | NA | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

| **TESTING INSTRUMENTS USED** | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

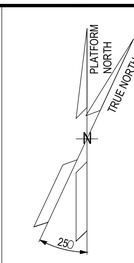
Comments: Note 4 : Refer to PL C30000679

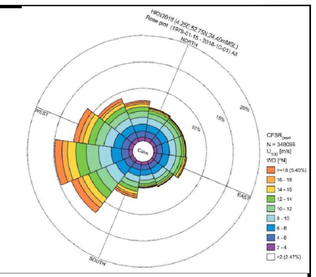


| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Paolo Schintu | |
| **Date** | 2024-11-15 | 2024-11-23 | |
| **Signature** | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-15T12:12:56.024Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-23T12:13:06.512Z | |




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

DRAWING NO. 123A90-DDL-EL-DL-20101 REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.42 KV TRANSFORMER
TAG NUMBER: TR-200DE1 01

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC.: A1/+02

| | | | | | | |
|---|---|---|---|---|---|---|
| 2U | L1 | BK | 83001-CEL-1-L1 1C X 300 mm² | BK | L1 | LINE-1 |
| | L1 | BK | 83001-CEL-2-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-3-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-4-L1 1C X 300 mm² | BK | L1 | |
| | L1 | BK | 83001-CEL-5-L1 1C X 300 mm² | BK | L1 | |
| 2V | L2 | BK | 83001-CEL-1-L2 1C X 300 mm² | BK | L2 | LINE-2 |
| | L2 | BK | 83001-CEL-2-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-3-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-4-L2 1C X 300 mm² | BK | L2 | |
| | L2 | BK | 83001-CEL-5-L2 1C X 300 mm² | BK | L2 | |
| 2W | L3 | BK | 83001-CEL-1-L3 1C X 300 mm² | BK | L3 | LINE-3 |
| | L3 | BK | 83001-CEL-2-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-3-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-4-L3 1C X 300 mm² | BK | L3 | |
| | L3 | BK | 83001-CEL-5-L3 1C X 300 mm² | BK | L3 | |
| 2N | N | BK | 83001-CEL-1-N 1C X 300 mm² | BK | N | NEUTRAL |
| | N | BK | 83001-CEL-2-N 1C X 300 mm² | BK | N | |
| | N | BK | 83001-CEL-3-N 1C X 300 mm² | BK | N | |
| PE | PE | Y/G | 83001-CEL-1-E 1C X 150 mm² | Y/G | | EARTH BOSS |
| | PE | Y/G | 83001-CEL-2-E 1C X 150 mm² | Y/G | | |

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
6.6/0.415 KV TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

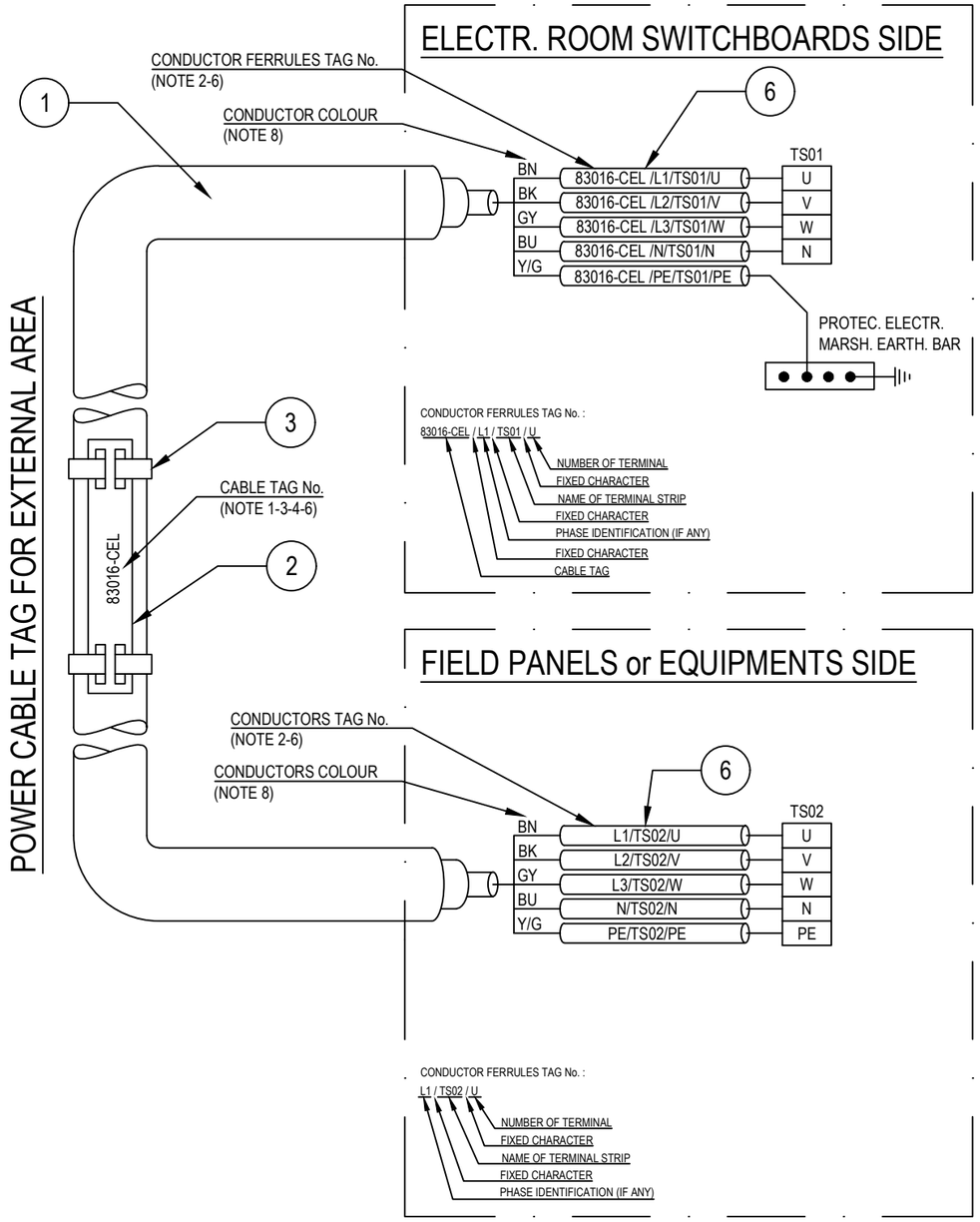
SHEET 017

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

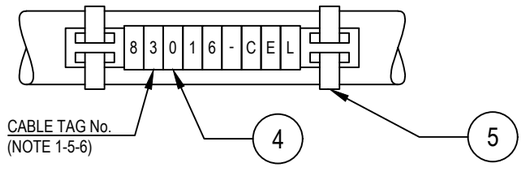
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

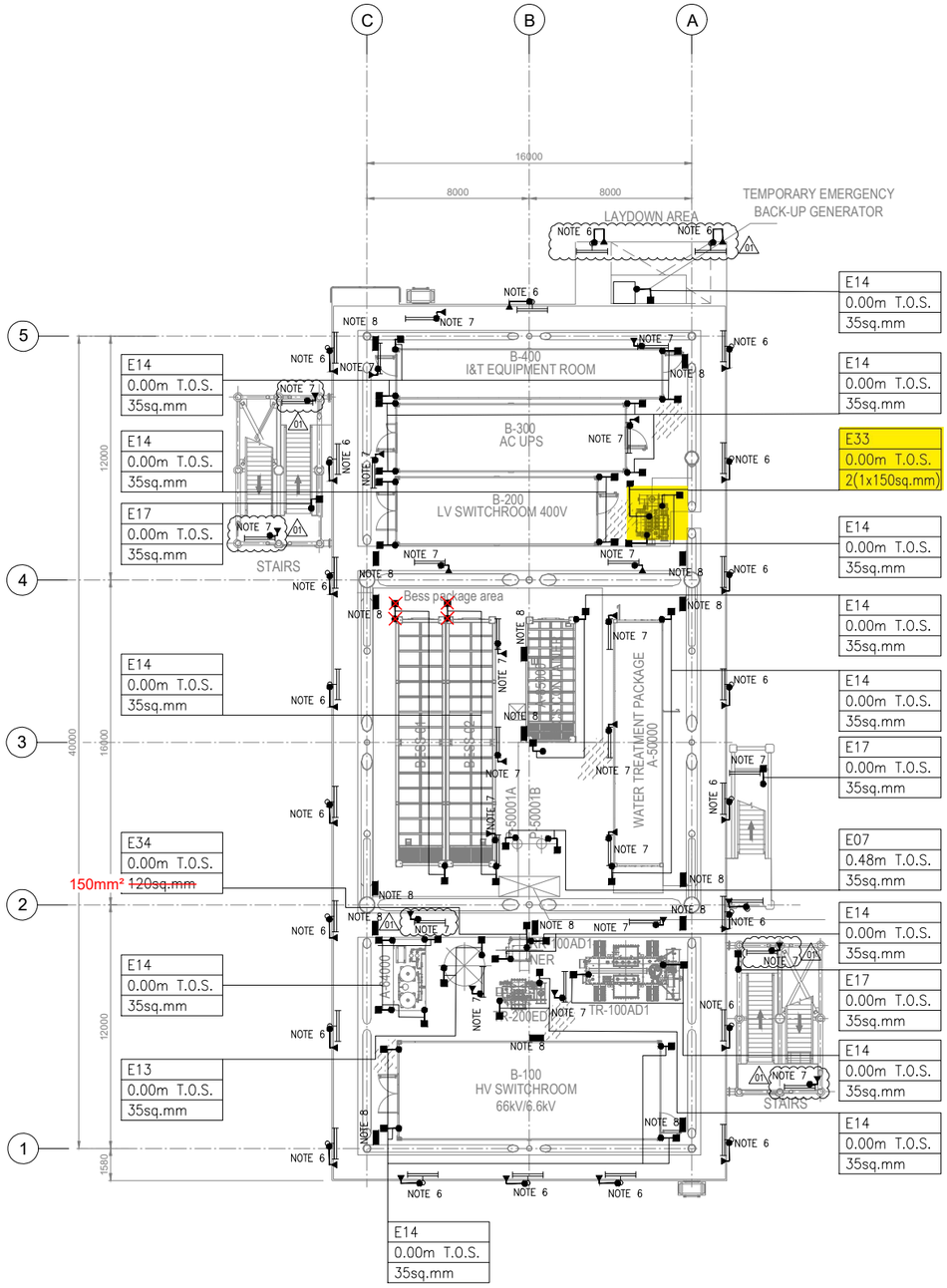
A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

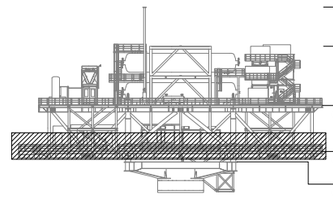
DRAWING NO. 123A90-DDL-EL-DL-20133

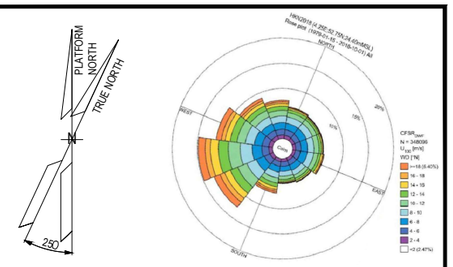
REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.

## KEY PLAN




## NOTES

1. ALL DIMENSIONS AND ELEVATIONS ARE GIVEN IN mm UNLESS OTHERWISE NOTED.
2. ELEVATIONS REFER TO T.O.S.
3. THIS DOCUMENT IS ONLY VALID FOR EARTHING LAYOUT.
4. ALL ELECTRICAL EQUIPMENT NOT DIRECTLY WELDED TO SKID FRAME SHALL BE BONDED TO STEEL TO THE STRUCTURE OF SKID BASEFRAME.
5. FOR LIGHTNING PROTECTION SYSTEM SURGE PROTECTIVE DEVICES (SPD), REFER TO THE DOCUMENT 123A90-DDL-EL-RE-20154.
6. ALL NON-WELDED POLES WILL BE EARTHED AS PER TYPICAL E05 AND E24. 01
7. ALL LINEAR LIGHTING FIXTURE WILL BE EARTHED AS PER TYPICAL E32.
8. EARTH BAR WILL BE FIXED TO THE PRIMARY BEAMS OF THE UPPER DECK. COMPLETE EARTHING INCLUDING WITH 2 THREADED STUDS. ALL EARTH BAR WILL BE EARTHED AS PER TYPICAL E03D / 6.00M T.O.S. / 35 SQ MM.
9. EQUIPOTENTIAL BONDING GROUPING FOR BOLTED HANDRAILS ARE PROVIDED EVERY 3M FOR THE ENTIRE PERIMETER AS TYPICAL E16 AND WILL BE DEFINED DURING ASSEMBLY PHASE

## LEGEND

- LIGHTING FIXTURE POLE MOUNTED
- LINEAR LIGHTING FIXTURE
- EARTHING BOSS AISI316L
- COMPRESSION TYPE LUG TINNED COPPER
- THREADED STUD FOR EARTHING CONNECTION
- Exx EARTHING TYPICAL CODE
- EARTHING BAR

| | |
|---|---|
| TYP. | TYPICAL |
| ELE | ELEVATION |
| SIZE | |

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DD-20090 | ELECTRICAL TYPICAL INSTALLATION DETAILS - EARTHING SYSTEM |
| 123A90-DDL-EL-RE-20154 | LIGHTNING PROTECTION SYSTEM CALCULATION REPORT |
| 123A90-DDL-EL-DL-20119 | LIGHTING & SOCKET LAYOUT - LOWER DECK |
| 123A90-DDL-EL-DL-20101 | ELECTRICAL EQUIPMENT LAYOUT - LOWER DECK |

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 25/07/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 29/05/24 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
EARTHING & LIGHTNING LAYOUT
LOWER DECK

| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SPS | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 25/07/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20133 | SHEET 001 | REV. 01 |

SHEET 001 OF 002

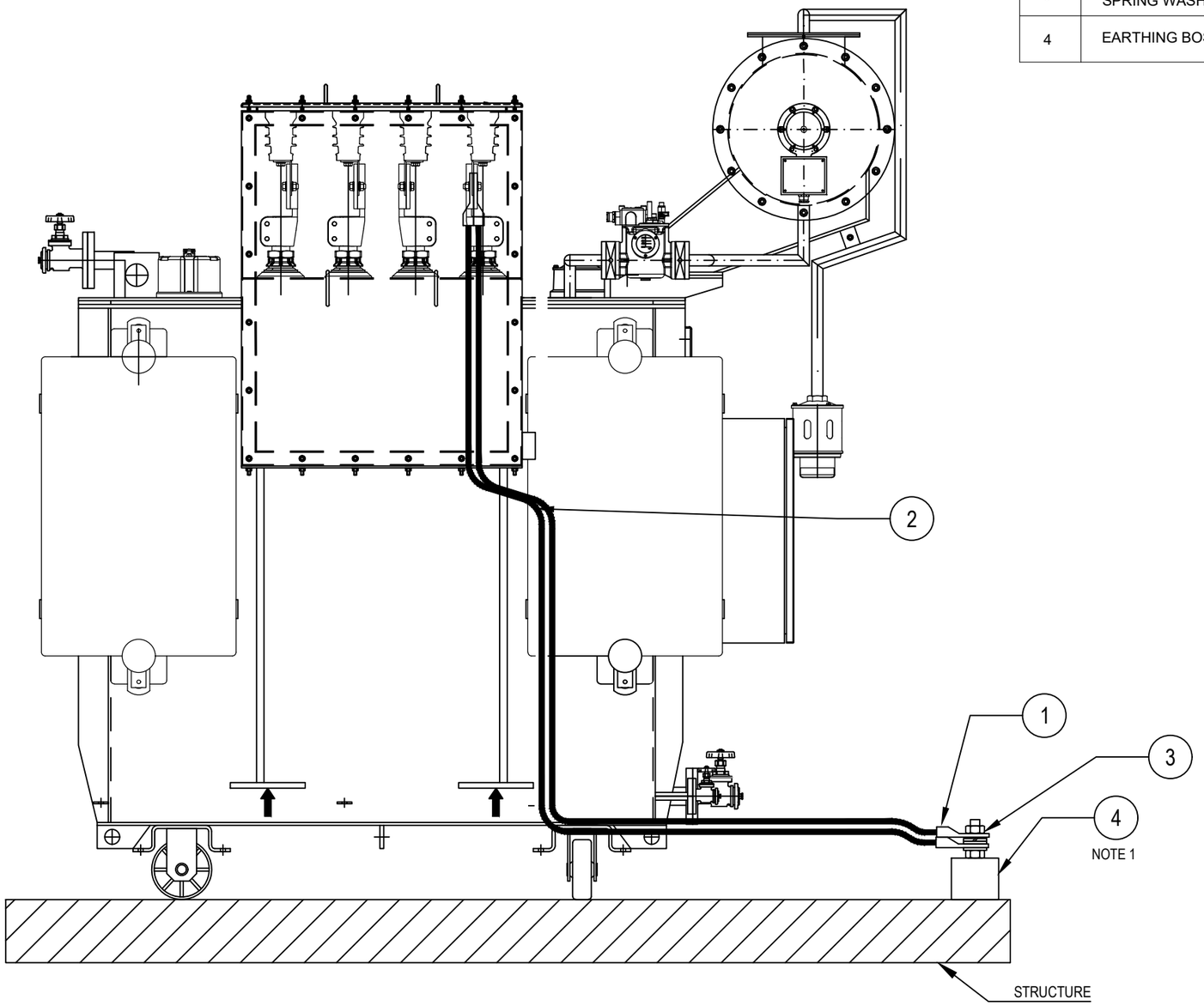
**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20133**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_B | 11/09/24 | G.Randi |

**ROSETTI MARINO SpA**

File Name : 123A90-DDL-EL-DL-20133

E33




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR | TINNED COPPER | | 1 | |
| 2 | Y/G INSULATING COPPER CONDUCTOR | COPPER | 2(1x150mm$^2$) | AS R | |
| 3 | HEXAG. BOLT COMPLETE WITH PLANE WASHERS, SPRING WASHER AND NUT | AISI 316L | M10X30 | 1 | |
| 4 | EARTHING BOSS WITH THREADED HOLE M10 | AISI 316L | 50X50 | | NOTE 2 |

NOTES:
1) FOR EARTHING BOSS TYPICAL DETAIL E11A
2) EXTERNAL EARTHING CONNECTION ONLY SHALL BE PROTECTED AGAINST CORROSION USING OXIDE RESISTANT COMPOUND (E.G. COPPER GREASE)

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DD-20090**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_I | 07/11/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 26/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 10/06/24 | SPS | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS–EARTHING SYSTEM
NEUTRAL EARTHING

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 024 | REV. 02

CROSSWIND

ROSETTI MARINO

F.to UNI A3: 420mmx297mm

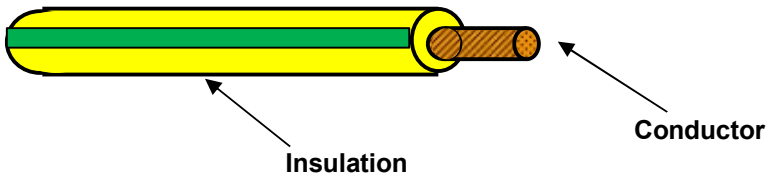
File Name : 123A90-DDL-EL-DD-20090 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Parent Tag | Grouping | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEL-2-E | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | Int-Ext | | | | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | TR-200DE1 | 6,6 / 0,42 kV 1,6 MVA Transformer | Lower Deck | ELECV28-1G150 | Cable Cu Cl.2/LSZH TI7 450/750V 1G150mm² - Yellow with 2 Green Stripes | M25 | T1_M25_Single | | | n.a. | | | | NA |

FLEI s.r.l.

# Cu Cl.2/LSZH 450/750 V

## 1G150 - PE CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| **Conductor :** | **STRANDED COMPACTED** plain/bare annealed copper wires | EN/IEC 60228 Class 2 |
| **Insulation :** | LSZH compound, TI7 quality, Nominal Thickness 1,8 mm | |
| **Core colour code :** | **Yellow with 2 Green stripes** | |
| **Pair Assembling :** | Not required | |
| **Pair Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Pair Shield :** | Not required | |
| **Shield Insulation :** | Not Required | |
| **Total Assembling :** | Not Required | |
| **Overall Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Overall Shield:** | Not required | |
| **Inner covering :** | Not required | |
| **Inner covering color code:** | Not required | |
| **Armour :** | Not required | |
| **Outer sheath :** | Not required | |
| **Outer sheath color code:** | Not required | |
| **Outer printing (INKJET) :** | **FLEI - ELECTRIC CABLE - 450/750 V - 1G150 SQMM - LSZH - IEC 60332.1.2 - IEC 60332.3.22 -** | |
| | **Year of Manufacture - CE + Meter Marking** | |
| **Outer diameter :** | (17,7 ± 10%) mm | |
| **Bending radius :** | cable outer diameter x 8 | (in fixed installation) |
| **Spark test :** | 13 kV a.c. | (on insulation) |
| **Conductors DC Resistance :** | | EN/IEC 60228 Class 2 |
| **Insulation Resistance :** | ≥ 10 MΩ x Km (@ 20°C) | |
| **Applicable Standards** | | |
| **Design Guidelines :** | **EN 50525.3.31** | |
| **ON COMPLETE CABLE** | | |
| **Flame Retardant test :** | IEC 60332.1.2 - IEC 60332.3.22 | |
| **Acid Gas generation :** | IEC 60754.1/2 | |
| **Smoke density/Light Transmittance :** | IEC 61034.2 (LT ≥ 60%) | |
| **Temperature Range :** | | |
| **During Operation :** | (-20°C up to +70°C) | (in fixed installation) |
| | (max +160°C) | (max conductors temperature during short-circuit for 5 seconds) |
| **During Installation :** | (-10°C up to +50°C) | |
| **Note :** | **The cable is suitable for installation and use in Zone 1 & Zone 2 (IEC 60079-14) using only correct ATEX approved equipment or accessories** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83116-CEL | : Lighting & Small Power DB BoP / Auxiliary Trafo 1,6MVA | | Dwg | 123A90-DDL-EL-LIS-20148 | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | Module | LD_B-200 | |
| **TASK** | code | C10000635 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline Electrical | Form | CPX09 | LV Power Cable |

## CABLE DATA

Type Cu Cl.2/EPR/LSZH  Cores/Size mm² 3G2.5  Color Grey

From DP-200N1  To CP-200E1

| | | |
|---|---|---|
| 1 | Confirm cable is as specified in project cable schedule | OK |
| 2 | Visual Check cable physical integrity. | OK |
| 3 | Check is installed in accordance with layout drawing (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to project specification. | OK |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Confirm cable glands suit for cable type, correctly mounted and tightened. | OK |
| 7 | Check gland plate for single core cables is non ferrous (non -magnetic). | NA |
| 8 | Confirm cable labelling is in accordance with specifications. | OK |
| 9 | Check cable is correctly loomed and segregated in accordance with specification. | OK |
| 10 | Check cable earthing against lastest drawings. | OK |
| 11 | Check cores marking are in accordance with termination diagram | PL |
| 12 | Check terminations are in accordance with latest termination diagram | OK |
| 13 | If required produce Red Line Mark Up for "AS BUILT" | |

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83116-CEL | : Lighting & Small Power DB BoP / Auxiliary Trafo 1,6MVA | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD_B-200 |
| **TASK** | code | C10000635 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX09 LV Power Cable |

| | | | | |
|---|---|---|---|---|
| | **CONTINUITY** | | | |
| 5 | CORE CONTINUITY Ω | PH 1 | 0.5 | |
| 6 | | PH 2 | 0.4 | |
| 7 | | PH 3 | NA | |
| 8 | ARMOUR CONTINUITY Ω | | 0.4 | |
| 9 | PROTECTIVE CONDUCTOR CONTINUITY Ω | | 0.4 | |
| | **INSULATION** | | | |
| 10 | CORES / ARMOUR+EARTH MΩ | PH1 / PH2-PH3-A-E | >1999 | |
| 11 | | PH2 / PH1-PH3-A-E | >1999 | |
| 12 | | PH3 / PH1-PH2-A-E | NA | |
| 13 | CABLE IS CORRECTLY RE-CONNECTED. | | Yes | |

**TESTING INSTRUMENTS USED**

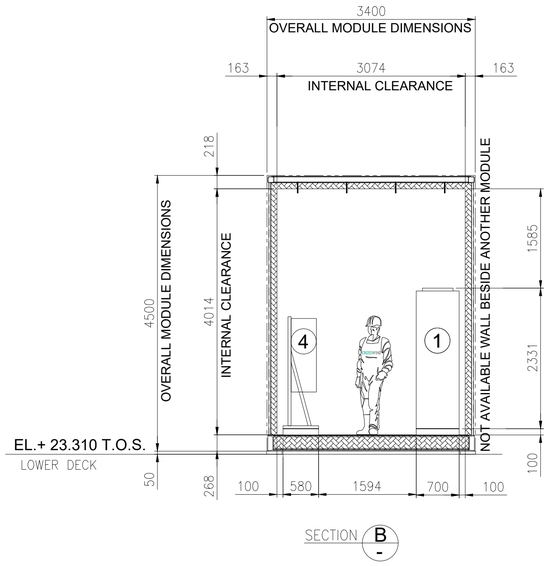
| | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | MEGGER : KEW3125A SERIAL: W8330207 | TYPE / SERIAL N° : | MULTIMETER: FLUKE 175 SERIAL:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

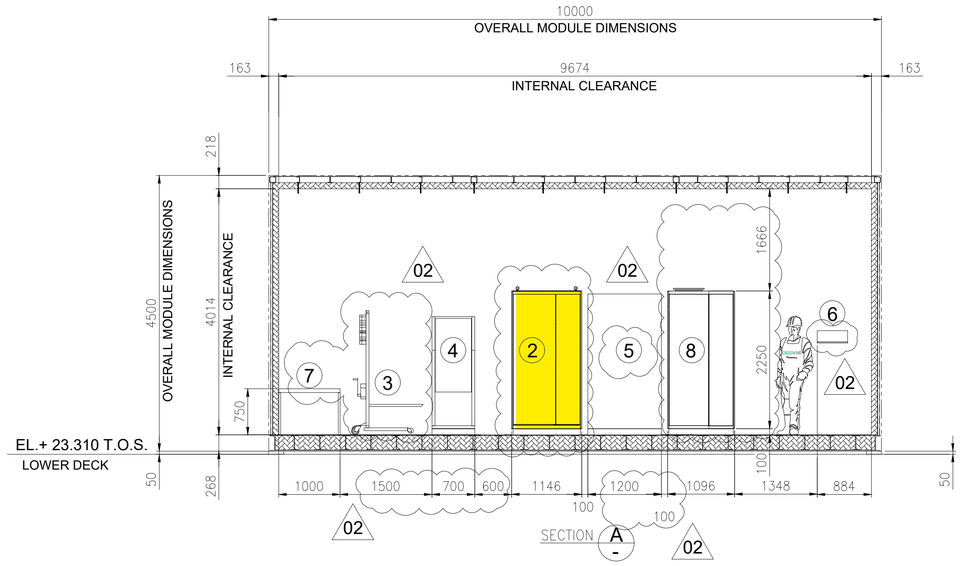
Comments:

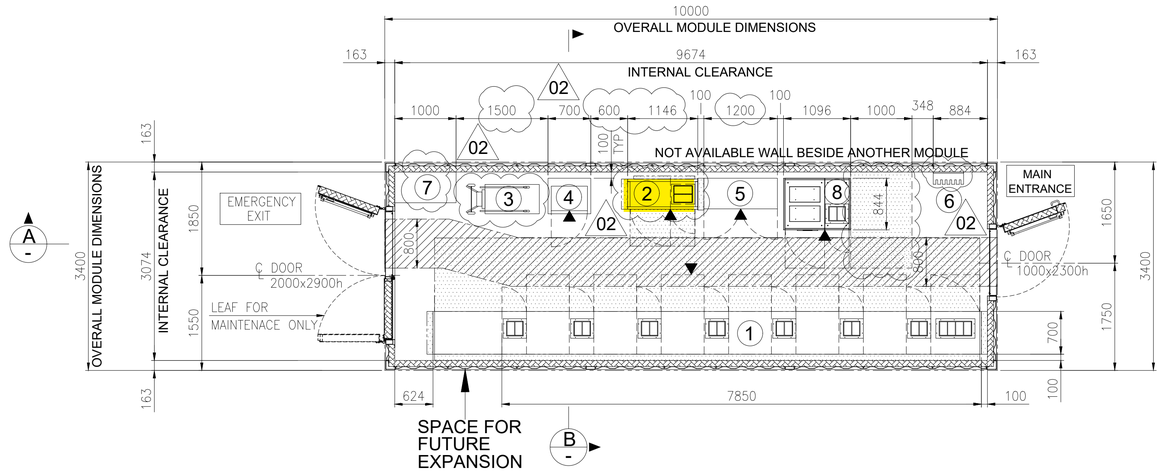


| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| Company | ICS IMPIANTI | RM (Rosetti Marino) | |
| Name | Carmelo Bongiovanni | Paolo Schintu | |
| Date | 2024-11-07 | 2024-11-22 | |
| Signature | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-07T15:28:58.315Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-22T12:44:05.812Z | |

DRAWING NO. 123A90-DDL-EL-DL-20105 REV. 02



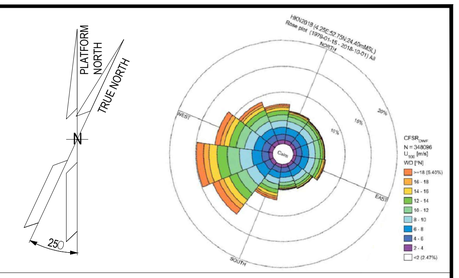




EQUIPMENT LAYOUT
"B-200" LV (400V) SWITCHGEAR ROOM
BOTTOM PLAN

1

EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | SG-200N1 | 400V SWITCHGEAR | 7850 | 700 | 2331 | |
| 2 | DP-200N1 | DISTRIBUTION BOARD FOR LIGHTING AND SMALL POWER B.O.P. | 1146 | 520 | 2250 | |
| 3 | - | SERVICE TROLLEY FOR 400V SWITCHGEAR | 1034 | 490 | 2030 | |
| 4 | CN-200N1 | ICCP PANEL | 700 | 580 | 1830 | |
| 5 | B200-HSB-001 | DISTRIBUTION & HVAC PANEL - LV ROOM | 1200 | 600 | 1900 | 02 |
| 6 | - | TOOL BOX | 495 | 200 | 200 | |
| 7 | - | TABLE | 1000 | 500 | 750 | |
| 8 | SG-200D2 | ACB PANEL FOR SOLAR PACKAGE | 1096 | 844 | 2294 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED.
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT, FOR OTHER SCOPE LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND PROJECT DOCUMENTS.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFORMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

## LEGEND

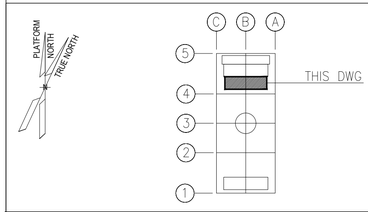
U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| SG-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00007 |
| SG-200D2 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00008 |
| DP-200N1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00009 |
| AC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00004 |
| AC UPS – BATTERY LAYOUT INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00011 |
| B-200 -GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00015 |
| ICCC PANEL GENERAL ARRANGEMENT DRAWING | 144671-CORR-TF-FAB-DWG-0003 |

02

KEY PLAN




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 08/11/2023 | DSF | CB/AMA | DYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

VALID FOR CONSTRUCTION
FDL DWG: **123A90-FDL-EL-DL-20105**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

ROSETTI MARINO SpA

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LV SWITCHROOM

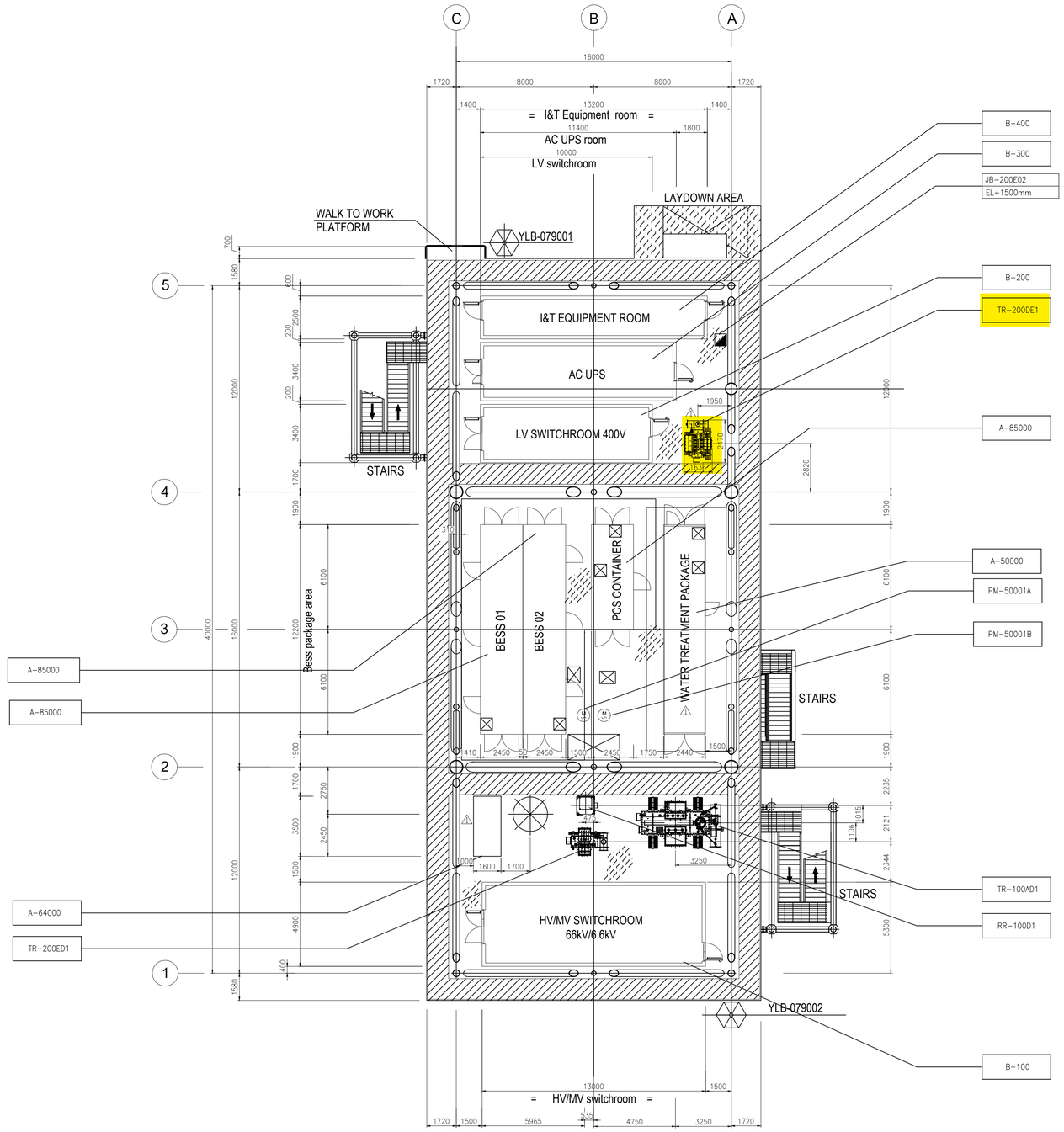
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN FMO | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |

| A1 | DRAWING NO. 123A90-DDL-EL-DL-20105 | SHEET 001 | REV. 02 |
|---|---|---|---|

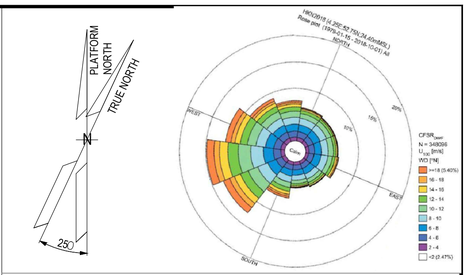
File Name : 123A90-DDL-EL-DL-20105_REV02.dwg

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20101**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

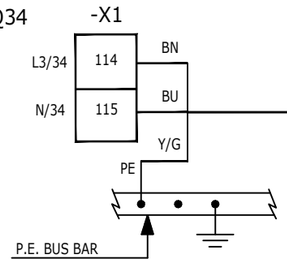
| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01 |

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

| FROM | TO |
|---|---|

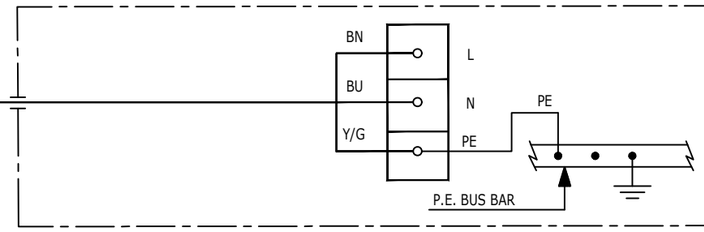
DESCRIPTION: LIGHTING & SMALL POWER DB BOP
TAG NUMBER: DP-200N1

CUBICLE/CB: +03/Q34

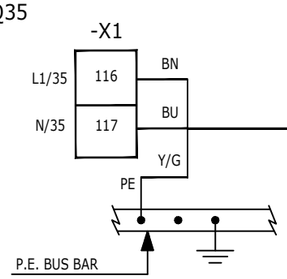



83115-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY NER
TAG NUMBER: RR-100D1

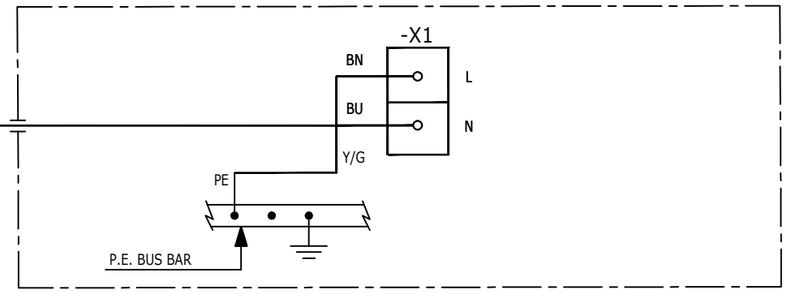



CUBICLE/CB: +03/Q35

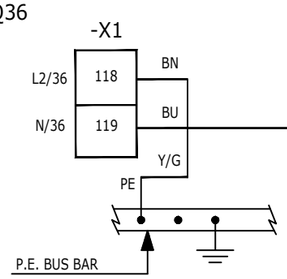



83116-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY TRAFO 1,6MVA
TAG NUMBER: CP-200E1

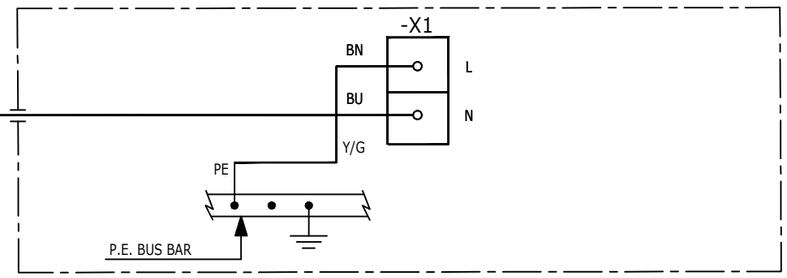



CUBICLE/CB: +03/Q36

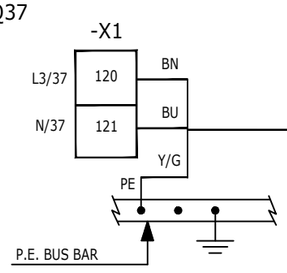



83117-CEL
3G2.5 mm²

DESCRIPTION: AUXILIARY TRAFO SOLAR 0,5MVA
TAG NUMBER: CP-200E2

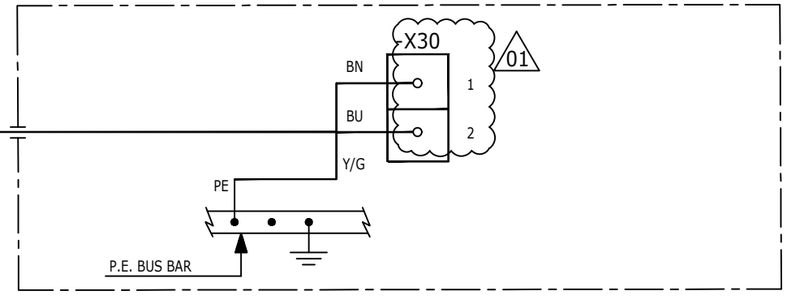



CUBICLE/CB: +03/Q37




83118-CEL
3G6 mm²

DESCRIPTION: AUXILIARY GIS
TAG NUMBER: CP-100E1




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
LIGHTING & SMALL POWER DB BOP

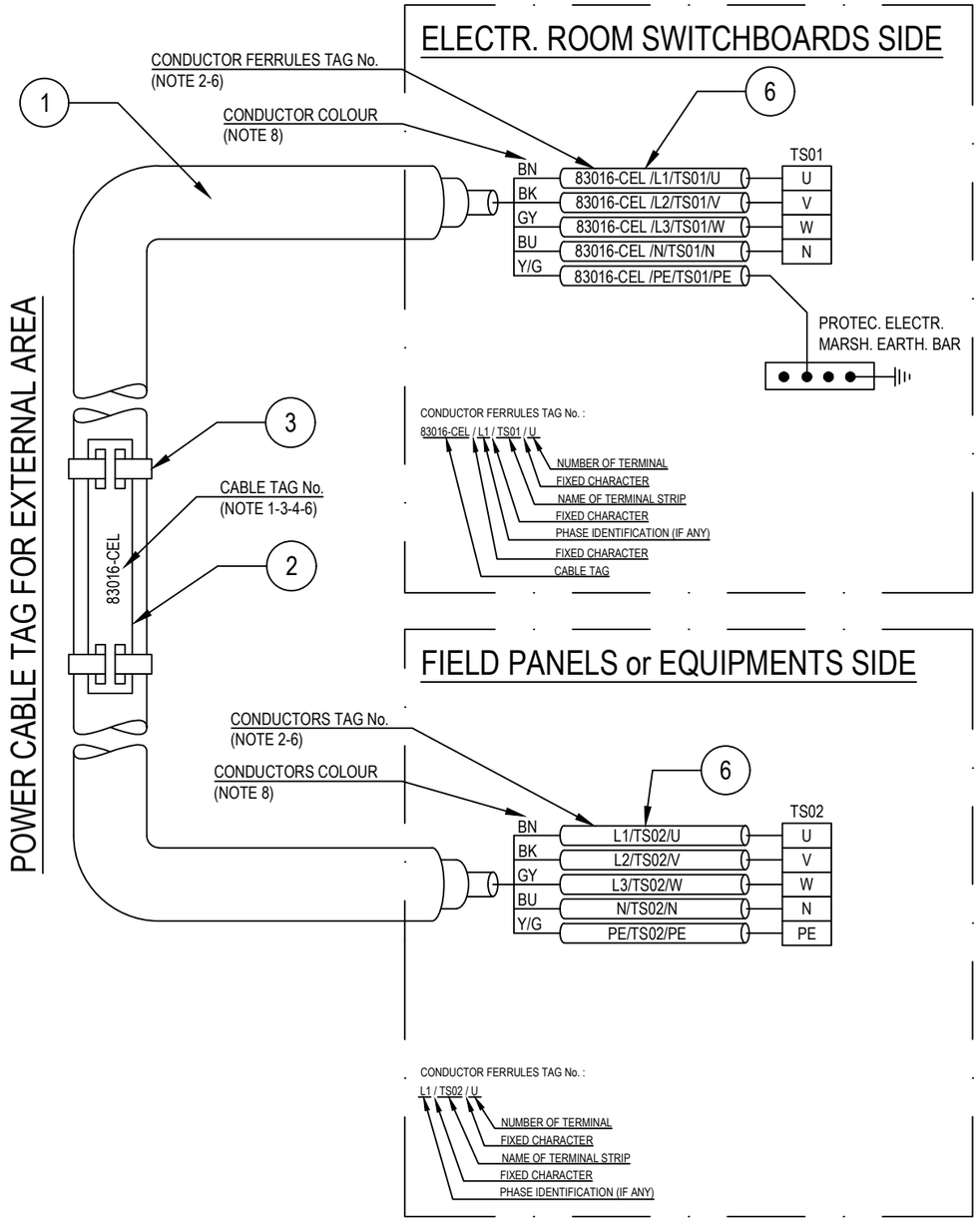
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 055 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C02




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 25 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

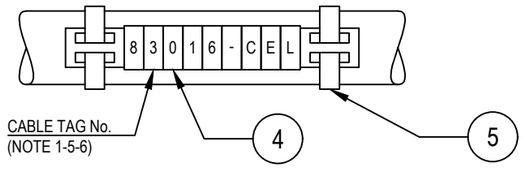
5) THE CABLE TAG FOR INTERNAL AREA SHALL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
- PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH BAR
- EARTH BAR AND EARTH BOSS

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## POWER CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR POWER CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 007 | REV. 02

F.to UNI A3: 420mmx297mm

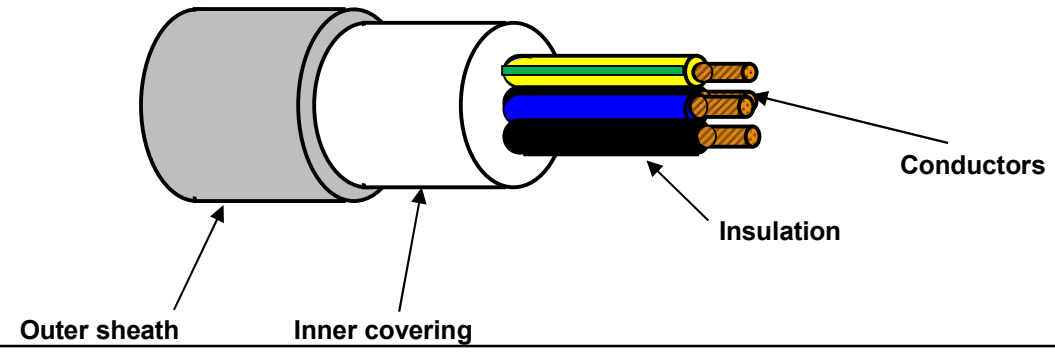
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Layout | Parent Tag | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland St | From Gland | From Entry | From Fittin | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83116-CEL | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | | | | | DP-200N1 | LV 0,4 / 0,23 kV Distribution Switchgear | Lower Deck (B-200) | CP-200E1 | Auxiliary Trafo 1,6 MVA | Lower Deck | ELECV06-3G2,5 | Cable Cu Cl.2/EPR/LSZH 0,6/1kV 3G2,5mm² - Grey | M20 | n.a. | | | T1_M20 _Single | | | | L-450-101-LVT-030 / L-600-101-LVT-020 / L-600-101-LVT-019 / L-600-101-LVT-017 / E-MCT-203 / L-750-101-LVT-013 / L-150-101-LVT-092 |

FLEI s.r.l.

# Cu Cl.2/EPR/LSZH 0,6/1 KV

## 3G2,5 - L.V. POWER CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| **Conductors :** | **STRANDED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| **Insulation :** | EPR compound, quality to IEC 60092.360, Nominal Thickness 1,0 mm | |
| **Cores colour code :** | **Brown - Blue - Yellow/Green** | |
| **Pair Assembling :** | Not required | |
| **Pair Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Pair Shield :** | Not required | |
| **Shield Insulation :** | Not Required | |
| **Total Assembling :** | Cores layed up with optimal lay length | |
| **Overall Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Overall Shield:** | Not required | |
| **Inner covering :** | Extruded LSZH compound, Average Thickness 1,0 mm | |
| **Inner covering color code:** | **Black or Natural** | |
| **Armour :** | Not required | |
| **Outer sheath :** | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm | |
| **Outer sheath color code:** | **Grey** | |
| **Outer printing (INKJET) :** | **FLEI - ELECTRIC CABLE - 1000V - 3G2,5 SQMM - EPR/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -** | |
| | **Year of Manufacture - CE + Meter Marking** | |
| **Outer diameter :** | (13,0 ± 10%) mm | |
| **Bending radius :** | cable outer diameter x 10 | (in fixed installation) |
| **Voltage test :** | 3,5 kV a.c. for 5' (Between Cores) | |
| **Conductors DC Resistance :** | | IEC 60228 Class 2 |
| **Insulation Resistance :** | ≥ 1100 MΩ x Km (@ 20°C) | |
| **Applicable Standards** | | |
| **Design Guidelines :** | **IEC 60092.353** | |
| **ON COMPLETE CABLE** | | |
| **Flame Retardant test :** | IEC 60332.1.2 - IEC 60332.3.22 | |
| **Acid Gas generation :** | IEC 60754.1/2 | |
| **Smoke density/Light Transmittance :** | IEC 61034.2 (LT ≥ 60%) | |
| **Temperature Range :** | | |
| **ON INSULATION** | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| **ON COMPLETE CABLE** | | |
| **During Operation :** | (-20°C up to +90°C) | (in fixed installation) |
| **During installation :** | (- 5°C up to +50°C) | |
| **Note :** | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | TR-200DE1 | : 6,6 / 0,42 kV 1,6 MVA Transformer | | | Dwg | 123A90-DDL-EL-DS-20003 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD |
| **TASK** | code | C10000868 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX02 Power Transformer LV/HV |

| | | |
|---|---|---|
| **1** | Check transformer is de-energized and safe. | OK |
| **2** | Check transformer rating plate is correct. | OK |
| **3** | Check conformity to latest data sheet /project specification. | OK |
| **4** | Check transformer installation against latest drawings. | Note |
| **5** | Check dielectric levels are correct with no leak (visual check). | OK |
| **6** | Check transformer access is properly protected and warning labels and safety instructions are adequately posted. | OK |
| **7** | Check primary terminations are clean, undamaged and correctly identified (phase). | OK |
| **8** | Check secondary terminations are clean, undamaged and correctly identified (phase). | OK |
| **9** | Check all termination enclosures have correct gaskets and fixing bolts. | OK |
| **10** | Check accessories according to data sheet are correctly installed and undamaged (themometers, relay, fans etc...). | OK |
| **11** | Check tap changer selector is correclty fitted and locked in the mid position (where applicable). | OK |
| **12** | Check On load tap changer control panel to wiring diagram (where applicable). | OK |
| **13** | Check mechanichal interlock of terminals. | OK |
| **14** | Check cable connections against drawings (visual check only of power and control cables). | Note |
| **15** | Check coating integrity. | OK |
| **16** | Check earthing and bonding against drawings. | Note |
| **17** | Check transformer is properly clean. | OK |
| **18** | If required produce Red Line Mark Up for "AS BUILT" | |

ROSETTI MARINO PROVERLIS CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | TR-200DE1 | : 6,6 / 0,42 kV 1,6 MVA Transformer | Dwg | 123A90-DDL-EL-DS-20003 | | |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | Module | LD | | |
| **TASK** | code | C10000868 | Location | Onshore Activities | User | Rosetti Marino Quality Control | |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form CPX02 | Power Transformer LV/HV |

## TRANSFORMER DATA

| | | | | | |
|---|---|---|---|---|---|
| Manufacturer : | FM TRANSFORMATORI | Serial N° : | 181023/2 | Rating : | 1600 kWA |
| Primary Voltage | 6600 V | Secondary Voltg. | 420 V | Vector group | dyn11 |
| UpStream Eqp. | SG-100D1 | DownStream Eqp. | SG-200N1 | Data Sheet : | 123A90-DDL-EL-DS-20003 |

## Testing & measurement instruments used

| Type | Serial n° | Calibration certificate | Validity |
|---|---|---|---|
| | | | |
| | | | |

## TEST RESULTS

### INSULATION RESISTANCE / H.V. TESTS

Temperature record:

| | Voltage | Mini Req | Readings MΩ | IR FAT VALUE |
|---|---|---|---|---|
| Primary winding /Secondary windings - Earth | | | | |
| Secondary windings/primary windings- Earth | | | | |
| TANK INSULATION RESISTANCE (if applicable) | | | | |
| AUXILIARY WIRING INSULATION RESISTANCE | | | | |

See Attache

### OIL BREAKDOWN TESTS

| | | |
|---|---|---|
| OIL WATER CONTENT TEST | < 50 | ppm |
| DIELECTRIC STRENGTH | | KV/cm |

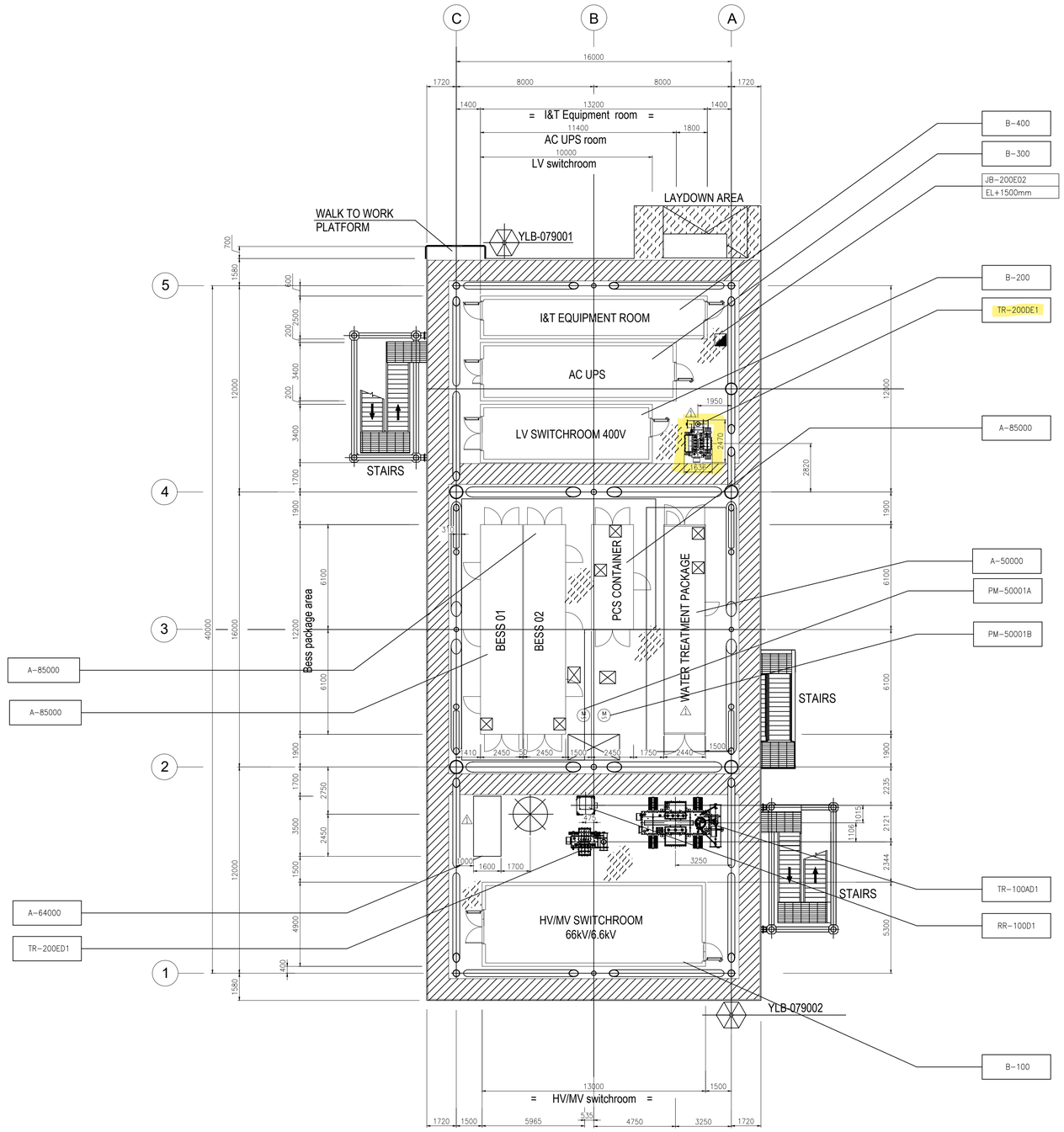
### CONTINUITY CHECK PHASES / TAPPING POSITION (Winding Resistance in mOhms)

| Ph1 / Ph2 | Ph1 / Ph3 | Ph3 / Ph2 | TAPPING POSITION |
|---|---|---|---|
| | | | +5 % |
| | | | +2.5 % |
| | | | 0% |
| | | | -2.5 % |
| | | | -5 % |

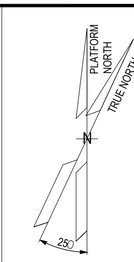
Comments: Note: N°4: See attached RLMU raised during FAT.
Note: N°14;16: check on connection will be done during cable ispection.
Please refer to the relevant ITR.

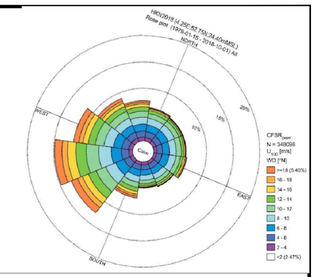


| | Performed by | ● WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Giovanni Tangianu | |
| **Date** | | 2024-09-13 | |
| **Signature** | Firma Digitale Sicura Carmelo Bongiovanni 2024-09-11T17:44:45+0200 | Firma Digitale Sicura Giovanni Tangianu 2024-09-13T09:08:54+0200 | |




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| M | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

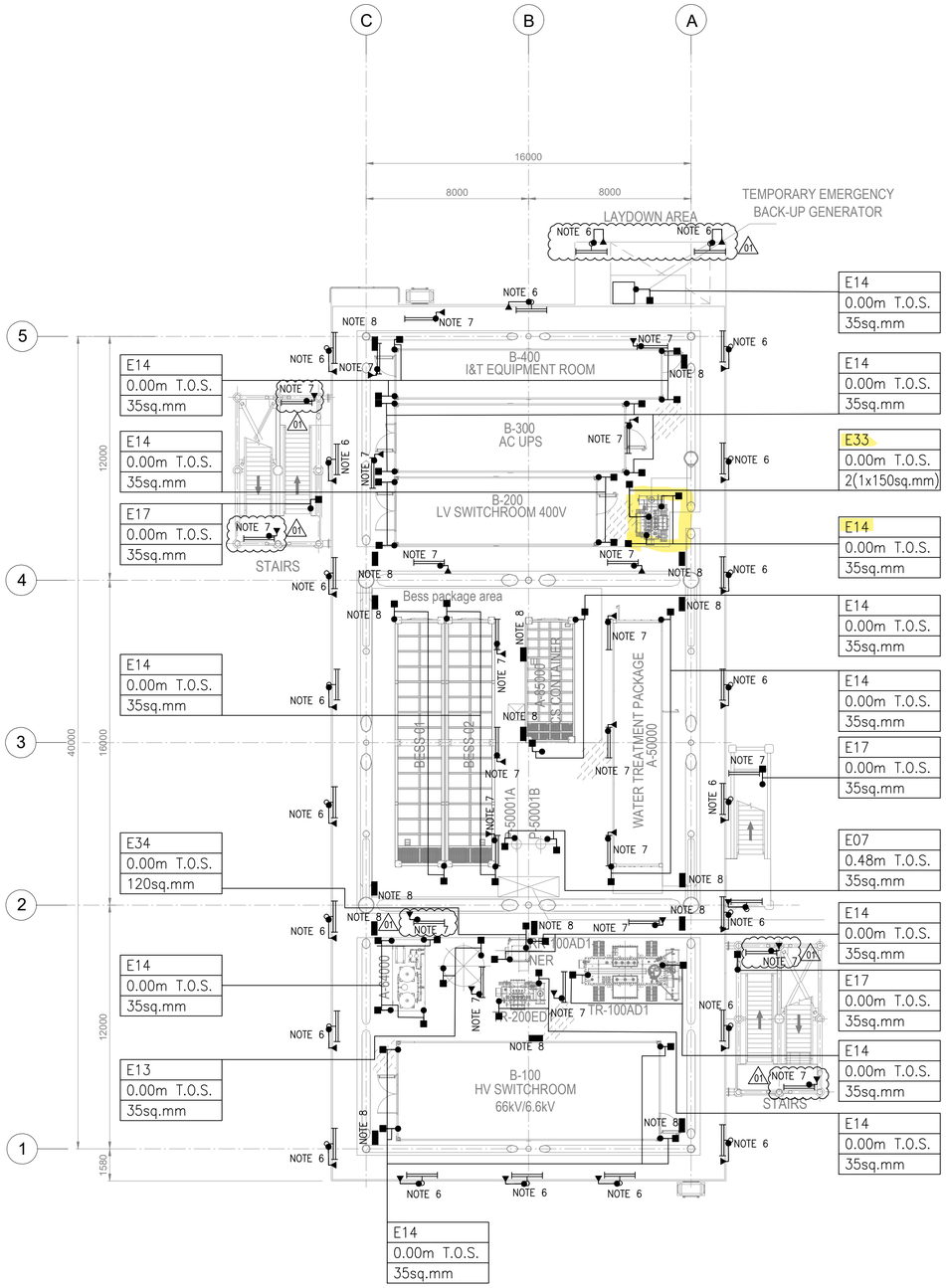
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE 1:150
DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24
A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01

DRAWING NO. 123A90-DDL-EL-DL-20101 REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

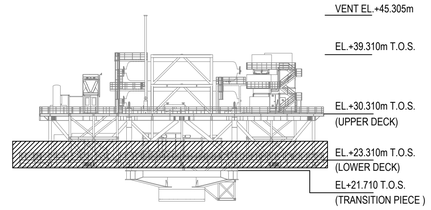
DRAWING NO. 123A90-DDL-EL-DL-20133

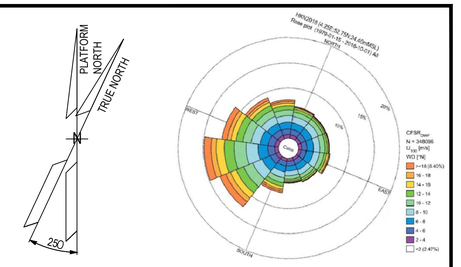
REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.

## KEY PLAN




## NOTES

1. ALL DIMENSIONS AND ELEVATIONS ARE GIVEN IN mm UNLESS OTHERWISE NOTED.
2. ELEVATIONS REFER TO T.O.S.
3. THIS DOCUMENT IS ONLY VALID FOR EARTHING LAYOUT.
4. ALL ELECTRICAL EQUIPMENT NOT DIRECTLY WELDED TO SKID FRAME SHALL BE BONDED TO STEEL TO THE STRUCTURE OF SKID BASEFRAME.
5. FOR LIGHTNING PROTECTION SYSTEM SURGE PROTECTIVE DEVICES (SPD), REFER TO THE DOCUMENT 123A90-DDL-EL-RE-20154.
6. ALL NON-WELDED POLES WILL BE EARTHED AS PER TYPICAL E05 AND E24. 01
7. ALL LINEAR LIGHTING FIXTURE WILL BE EARTHED AS PER TYPICAL E32.
8. EARTH BAR WILL BE FIXED TO THE PRIMARY BEAMS OF THE UPPER DECK. COMPLETE EARTHING INCLUDING WITH 2 THREADED STUDS. ALL EARTH BAR WILL BE EARTHED AS PER TYPICAL E03D / 6.00M T.O.S. / 35 SQ MM.
9. EQUIPOTENTIAL BONDING GROUPING FOR BOLTED HANDRAILS ARE PROVIDED EVERY 3M FOR THE ENTIRE PERIMETER AS TYPICAL E16 AND WILL BE DEFINED DURING ASSEMBLY PHASE

## LEGEND

- LIGHTING FIXTURE POLE MOUNTED
- LINEAR LIGHTING FIXTURE
- EARTHING BOSS AISI316L
- COMPRESSION TYPE LUG TINNED COPPER
- THREADED STUD FOR EARTHING CONNECTION
- Exx EARTHING TYPICAL CODE
- EARTHING BAR

| | |
|---|---|
| TYP. | TYPICAL |
| ELE | ELEVATION |
| SIZE | |

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DD-20090 | ELECTRICAL TYPICAL INSTALLATION DETAILS - EARTHING SYSTEM |
| 123A90-DDL-EL-RE-20154 | LIGHTNING PROTECTION SYSTEM CALCULATION REPORT |
| 123A90-DDL-EL-DL-20119 | LIGHTING & SOCKET LAYOUT - LOWER DECK |
| 123A90-DDL-EL-DL-20101 | ELECTRICAL EQUIPMENT LAYOUT - LOWER DECK |

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 25/07/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 29/05/24 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
EARTHING & LIGHTNING LAYOUT
LOWER DECK

| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SPS | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 25/07/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20133 | SHEET 001 | REV. 01 |

SHEET 001 OF 002

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20133**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 08/08/24 | G.Randi |

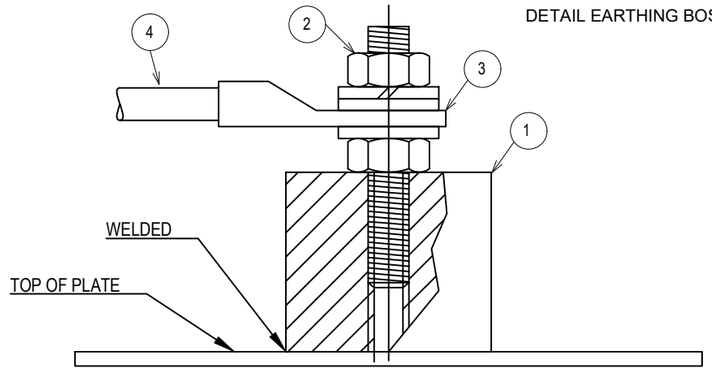
**ROSETTI MARINO SpA**

File Name : 123A90-DDL-EL-DL-20133

| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | EARTHING BOSS WITH THREADED HOLE M10 | AISI 316L | 50X50<br>50X150 | 1 | NOTE 2 |
| 2 | STUD BOLT WITH PLANE WASHER, GROWER AND NUT | AISI 316L | M10X50 | | |
| 3 | COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR | TINNED COPPER | | | ~~NOTE 3~~ |
| 4 | Y/G INSULATING COPPER CONDUCTOR | | | | NOTE 1<br>NOTE 5 |
| 5 | EARTHING PLATE | AISI 316L<br>(NOT PAINTED) | 50X50X5 | | NOTE 4 |
| 6 | HEXAGONAL BOLT WITH PLANE WASHERS, GROWER AND NUT. | AISI 316L | M10X30 | | |
| 7 | THREADED STUD COMPLETE WITH GROWER AND NUTS | AISI 316L | M10X28 | | NOTE 6<br>NOTE 7 |

E11A

DETAIL EARTHING BOSS 50x50

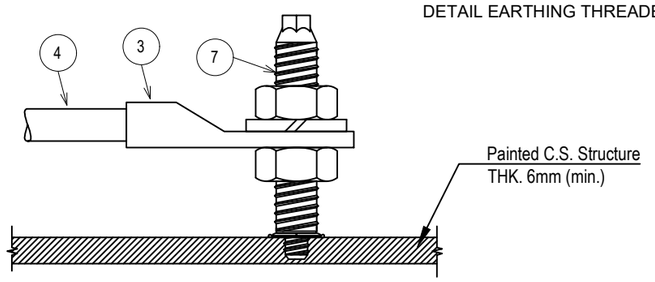



E11D

SEE NOTE 6

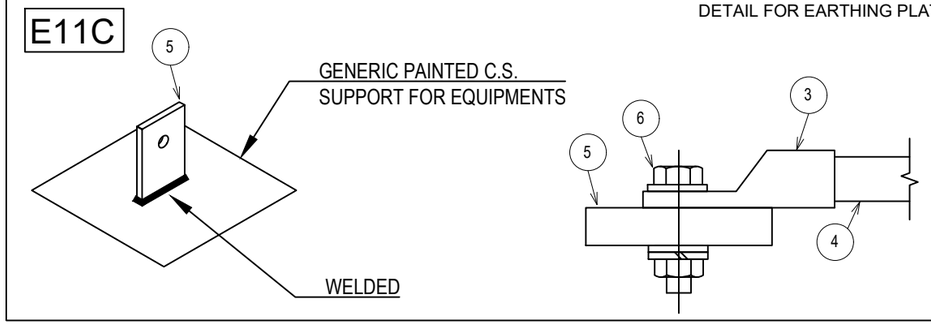
FOR CABLE
MAX 10mm²

DETAIL EARTHING THREADED STUD




E11C

DETAIL FOR EARTHING PLATE

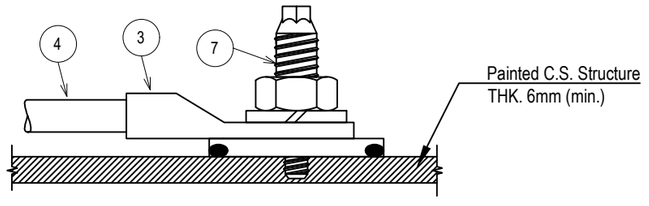



E11E

SEE NOTE 7

FOR CABLE
MAX 35mm²

DETAIL EARTHING THREADED STUD




NOTES:

1) ONLY ONE PROTECTIVE CONDUCTOR TERMINATION LUG SHALL BE CONNECTED TO A DEDICATED EARTHING BOSS, EARTH PLATE OR EARTH STUD.
2) EXTERNAL EARTHING CONNECTION ONLY SHALL BE PROTECTED AGAINST CORROSION USING OXIDE RESISTANT COMPOUND (E.G. COPPER GREASE).
3) ~~CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY.~~
4) EARTHING PLATE SHALL BE DEDICATED TO CABLE TRAY AND PIPE SUPPORTS, JUNCTION BOX, LOCAL CONTROL STATION AND SMALL EQUIPMENT SUPPORTS, LIGHTING POLES, RECEPTACLE SUPPORTS AND REMOVABLE HANDRAILS, ONLY.
5) FOR SIZE OF THE EARTHING CABLE SEE EARTHING LAYOUT DRAWINGS OF RESPECTIVE AREAS
6) HILTI S-BT-ER M10/15 SN6 CERTIFIED FOR EARTHING SYSTEM. RECOMMENDED MAX CONDUCTOR SIZE 10mm².
7) HILTI S-BT-ER M10 HC 120 CERTIFIED FOR EARTHING SYSTEM. RECOMMENDED MAX CONDUCTOR SIZE 35mm².

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DD-20090**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_C | 09/09/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 26/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 10/06/24 | SPS | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS–EARTHING SYSTEM
SINGLE EARTHING CONNECTION

CONTRACT NO./TITLE CW–I–WP4–2023–05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 123A90–DDL–EL–DD–20090

SHEET 003

REV. 02

F.to UNI A3: 420mmx297mm

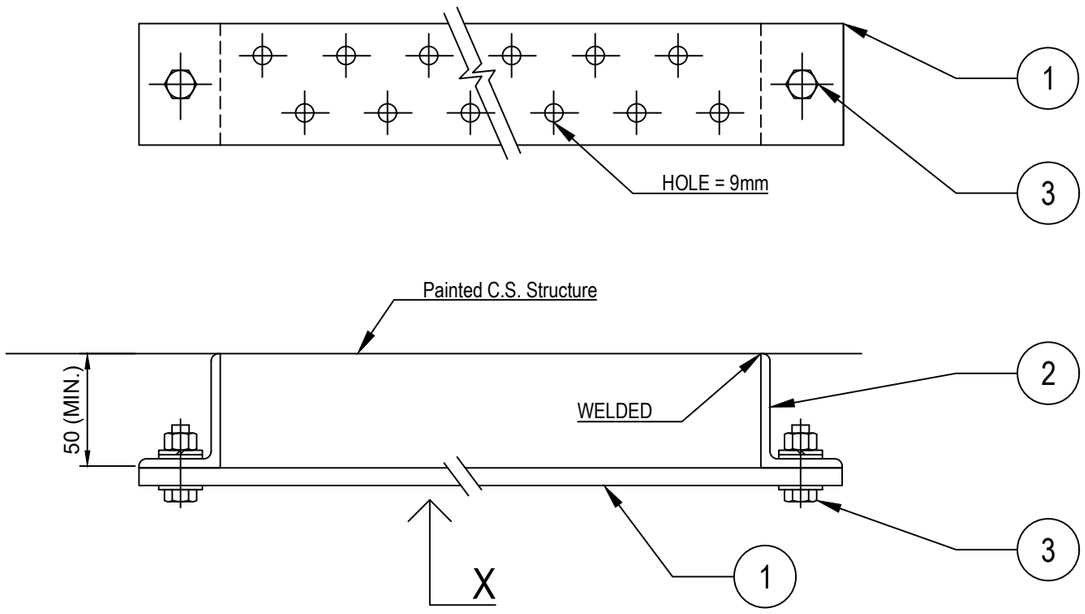
File Name : 123A90-DDL-EL-DD-20090 REV.02.DWG

| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | EARTHING BAR | TINNED COPPER | 285X50X5 | 1 | |
| 2 | PROFILE SUPPORT | AISI 316L | | 2 | |
| 3 | HEXAG. BOLTS, PLANE WASHERS, GROWER SPRING WASHER AND NUT | AISI 316L | M10X30 | 2 | |
| 4 | THREADED STUD | AISI 316L | M10X28 | 2 | NOTE 1 |
| 5 | FEMALE / MALE COUPLING | AISI 316L | M10X50 | 2 | NOTE 2 |
| 6 | PLANE WASHER, GROWER AND NUT | AISI 316L | M10 | 2 | |

# TYPICAL DETAIL VALID FOR EXTERNAL USE ONLY

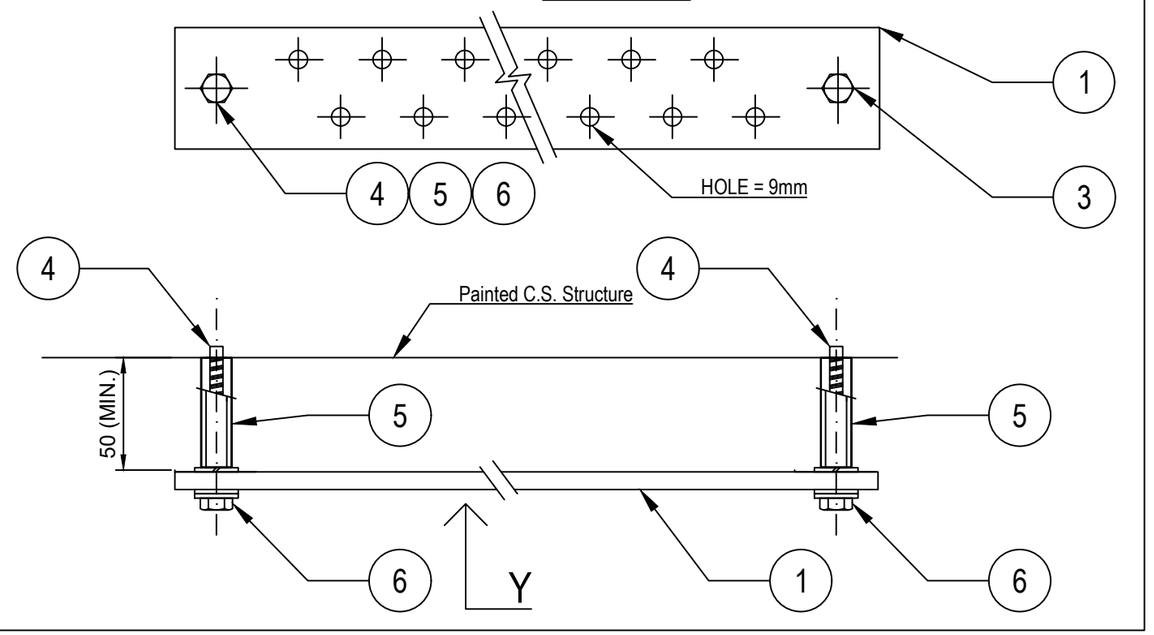
E03A

## VIEW "X"




E03D

## VIEW "Y"




NOTES:

1) THREADED STUD mod. HILTI S-BT-ER M10/15 SN6 CERTIFIED FOR EARTHING SYSTEM.

2) STANDOFF ADAPTER mod. HILTI M10-HC120 50

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DD-20090**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_C | 09/09/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 26/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 10/06/24 | SPS | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS–EARTHING SYSTEM
EARTHING BAR INSTALLED ON WELDED PROFILE OR THREADED STUD

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 123A90-DDL-EL-DD-20090 | 004 | 02 |

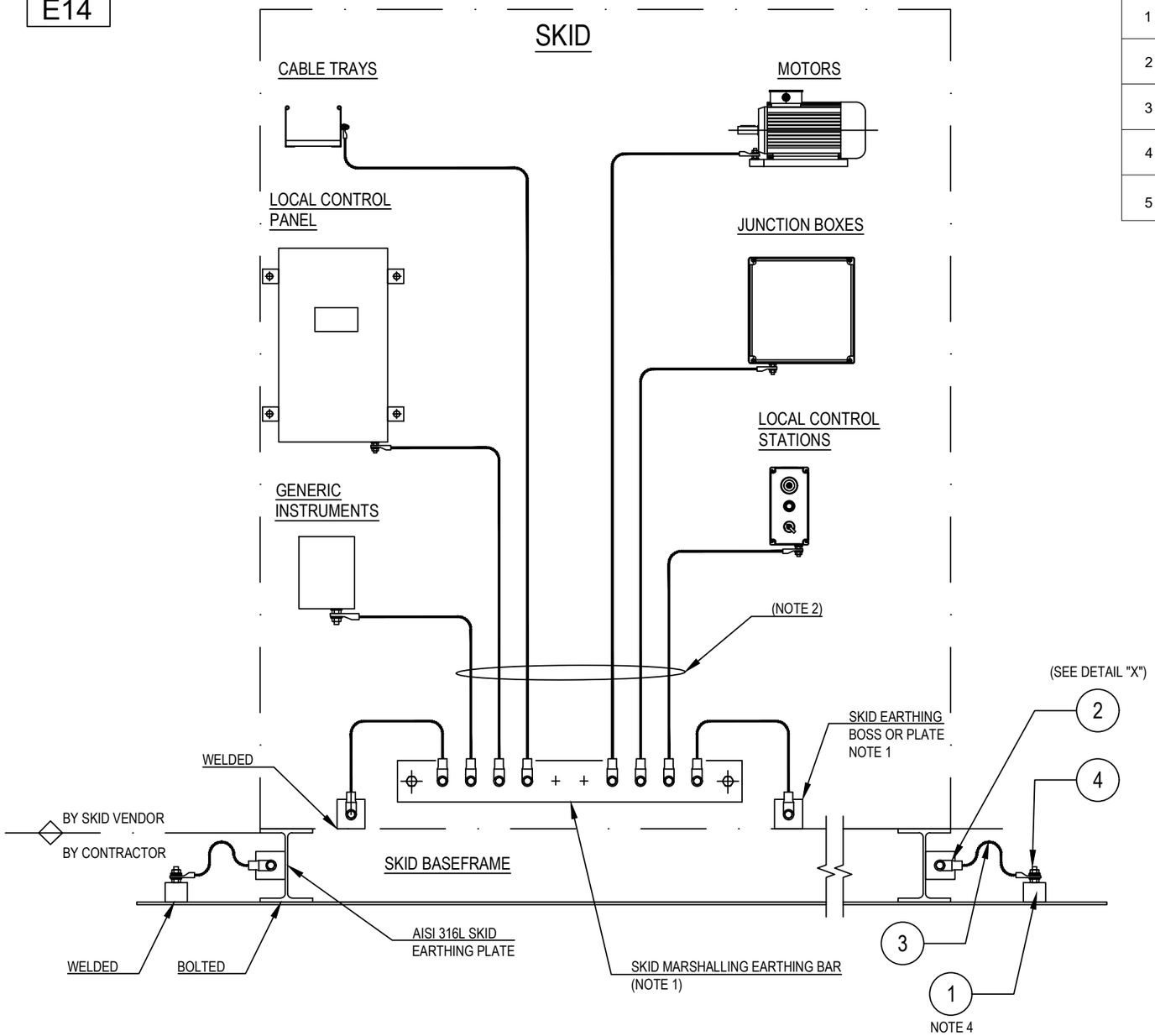
CROSSWIND

ROSETTI MARINO

F.to UNI A3: 420mmx297mm

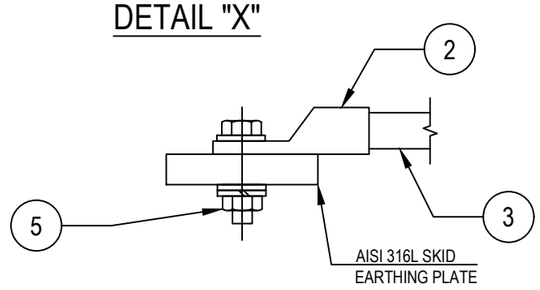
File Name : 123A90-DDL-EL-DD-20090 REV.02.DWG

E14




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | EARTHING BOSS WITH THREADED HOLE M10 | AISI 316L | 50X50 | | NOTE 5 |
| 2 | COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR | TINNED COPPER | 35mm$^2$ | | NOTE 3 |
| 3 | Y/G INSULATING COPPER CONDUCTOR | COPPER | 35mm$^2$ | | NOTE 3 |
| 4 | STUD BOLT WITH PLANE WASHER, SPRING WASHER AND NUT | AISI 316L | M10X50 | | |
| 5 | HEXAG. BOLT COMPLETE WITH PLANE WASHERS, SPRING WASHER AND NUT | AISI 316L | M10X30 | | |

DETAIL "X"




NOTES:
1) EARTHING BAR/BOSS/PLATE SUPPLIED BY SKID MANUFACTURER
2) ALL EQUIPMENTS AND CABLE TRAYS WILL BE EARTHING ON SKID EARTHING BAR BY SKID MANUFACTURER
3) ~~CABLE LUG CRIMPING METHOD SHALL BE HEXAGONAL COMPRESSION DIES ONLY~~
4) FOR EARTHING BOSS TYPICAL DETAIL E11A
5) EXTERNAL EARTHING CONNECTION ONLY SHALL BE PROTECTED AGAINST CORROSION USING OXIDE RESISTANT COMPOUND (E.G. COPPER GREASE)

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DD-20090**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_C | 09/09/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 26/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 10/06/24 | SPS | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS–EARTHING SYSTEM
EARTHING FOR SKID BASEFRAME

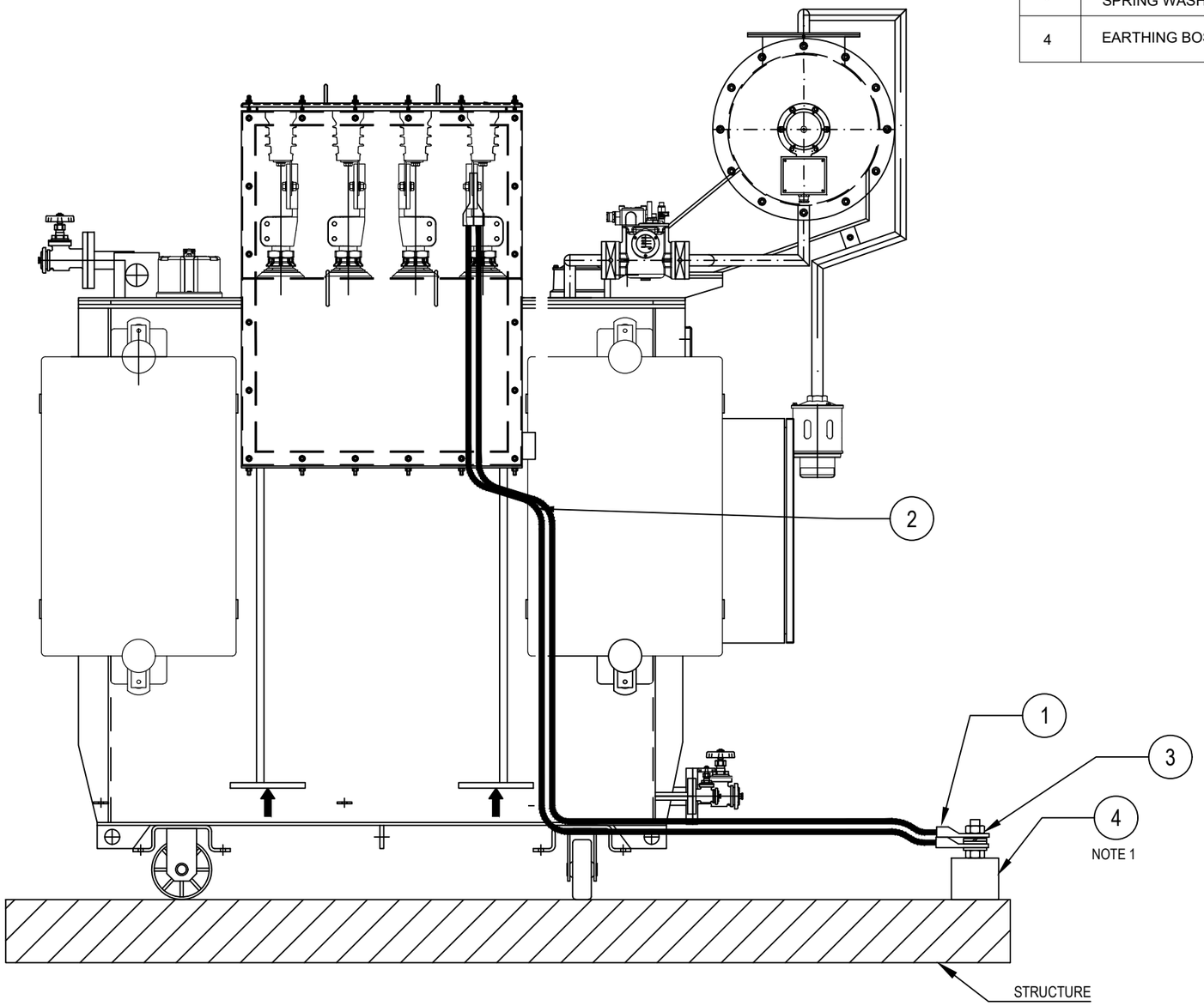
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 014 | REV. 02

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20090 REV.02.DWG

E33




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | COMPRESSION TYPE LUG FOR INSULATION COPPER CONDUCTOR | TINNED COPPER | | 1 | |
| 2 | Y/G INSULATING COPPER CONDUCTOR | COPPER | 2(1x150mm$^2$) | AS R | |
| 3 | HEXAG. BOLT COMPLETE WITH PLANE WASHERS, SPRING WASHER AND NUT | AISI 316L | M10X30 | 1 | |
| 4 | EARTHING BOSS WITH THREADED HOLE M10 | AISI 316L | 50X50 | | NOTE 2 |

NOTES:
1) FOR EARTHING BOSS TYPICAL DETAIL E11A
2) EXTERNAL EARTHING CONNECTION ONLY SHALL BE PROTECTED AGAINST CORROSION USING OXIDE RESISTANT COMPOUND (E.G. COPPER GREASE)

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DD-20090**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_C | 09/09/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 26/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 10/06/24 | SPS | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

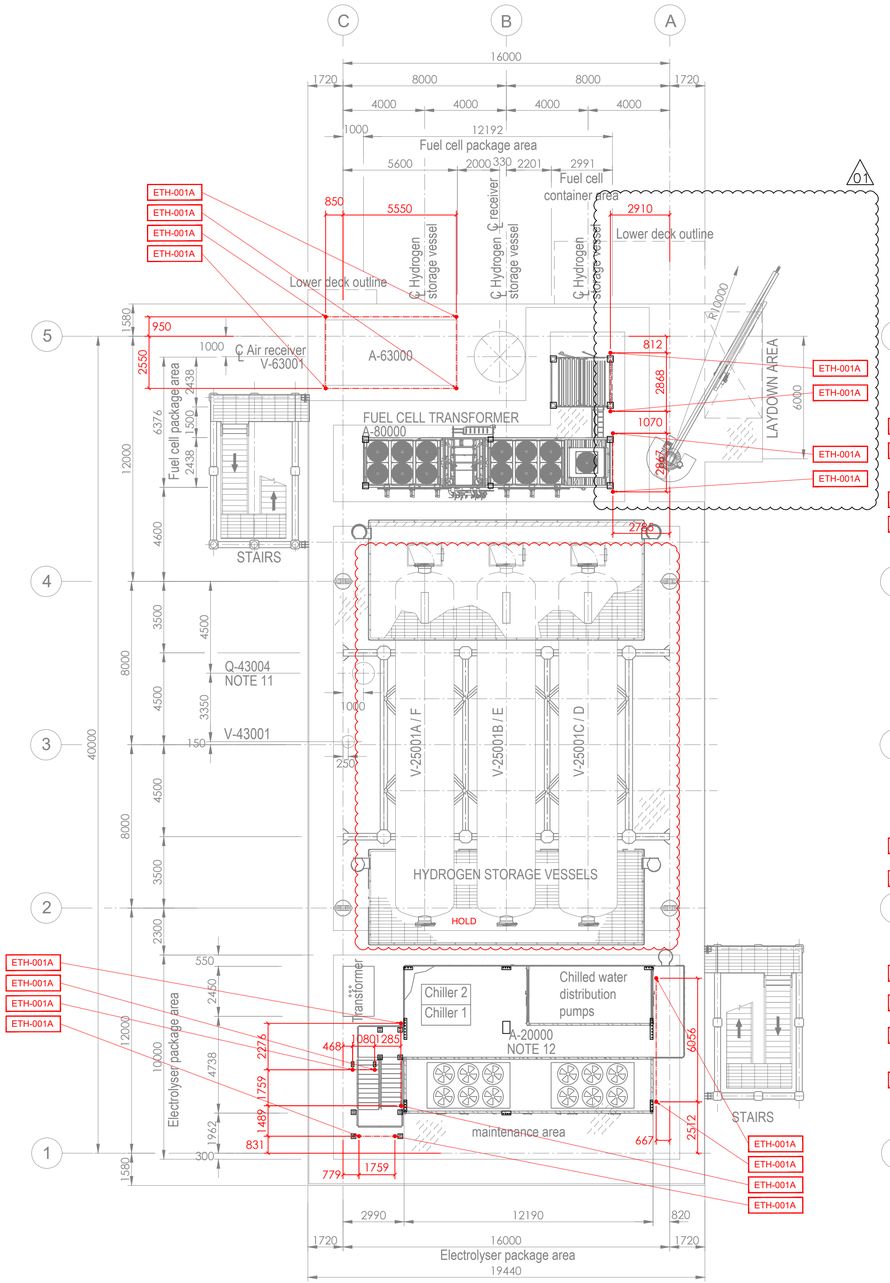
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS–EARTHING SYSTEM
NEUTRAL EARTHING

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

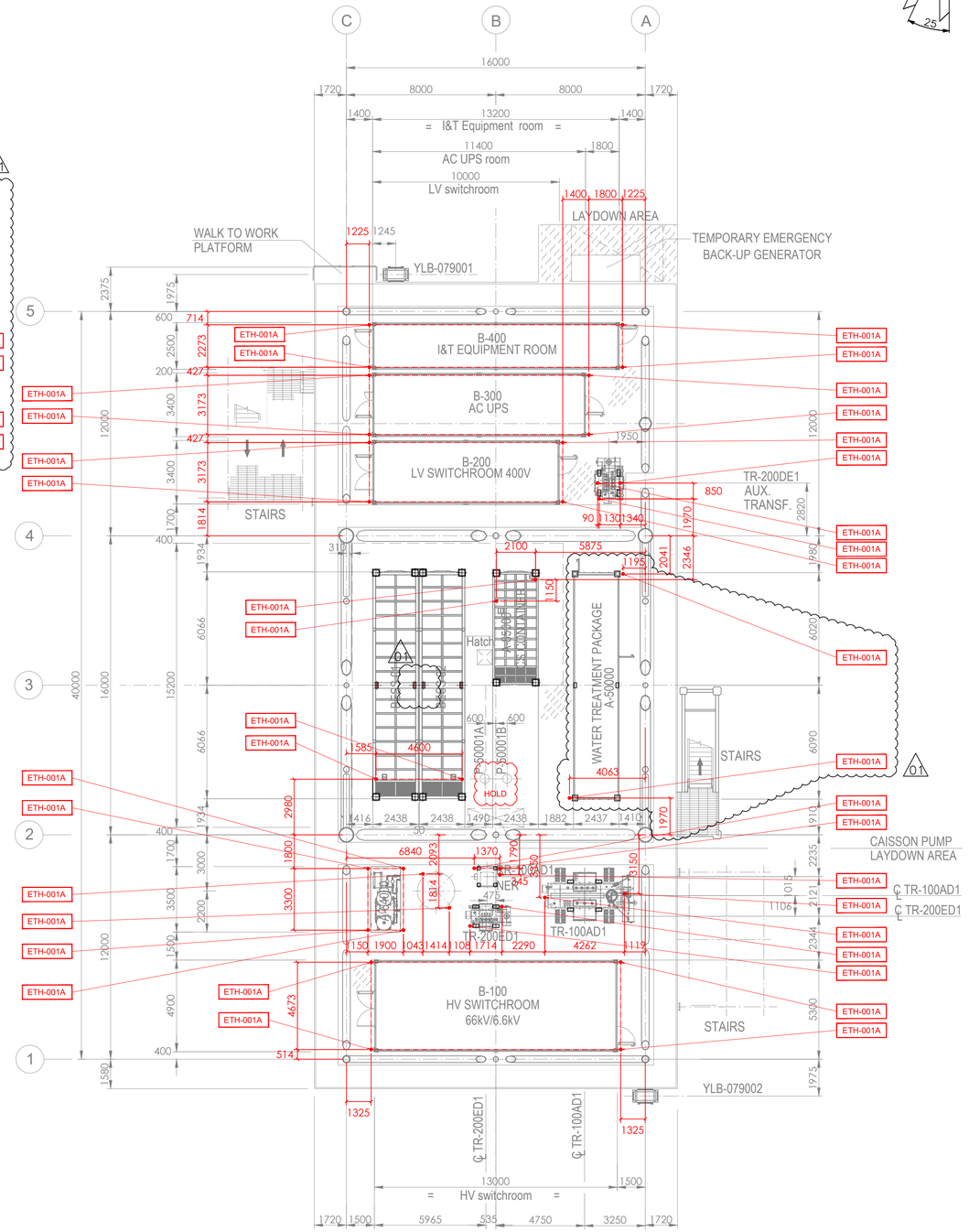
A3 | DRAWING NO. 123A90-DDL-EL-DD-20090 | SHEET 024 | REV. 02

F.to UNI A3: 420mmx297mm

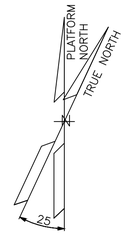
File Name : 123A90-DDL-EL-DD-20090 REV.02.DWG



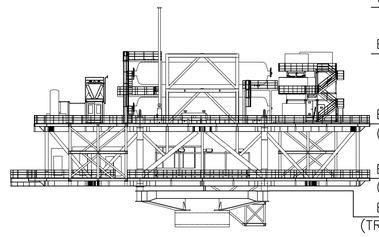

PLAN ON UPPER DECK
EL+30.310 T.O.S.




PLAN ON LOWER DECK
EL+23.310 T.O.S.



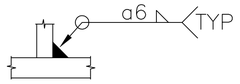

## KEY PLAN




## NOTE

1) Tutte le quote sono espresse in millimetri

2) Tutti i supporti ed earthing boss/plate sono da saldare come da tipico riportato (a=6)




3) Per i dettagli di supporti da installare, vedere gli standard allegati al presente documento

4) In fase di rimozione di supporti già saldati (indicati nelle nuvolette), cercare di recupare il supporto tagliato per suo eventuale riutilizzo.

## LEGEND

| SYMBOL | MARK | Q.ty | DESCRIPTION |
|---|---|---|---|
| ● | EI-ETH-001A | N° 54 | EARTHING BOSS L=50mm<br>Ref. Standard: R-EI-ETH-001A |

01

ROSETTI MARINO

CROSSWIND

Project:
123A90 – BLPH CROSSWIND

Title:
E&I SUPPORTS
WELDED EARTHING BOSS

| Doc. n. | Sheet | Scale | U.M. |
|---|---|---|---|
| 123A90–FDL–FEI–DL–00002 | 1/1 | – | mm |

| REV. | DATE | DESCRIPTION | ISSUED | APPROVED |
|---|---|---|---|---|
| 01 | 09/08/24 | ISSUED FOR CONSTRUCTION | Randi | Randi |
| 00 | 30/07/24 | ISSUED FOR CONSTRUCTION | Randi | Randi |

Print size: A1

This document is propriety of Rosetti Marino spa. The company lawfully reserves all rights.

# BASE LOAD POWER HUB (BLPH)

# TR-200DE1 General arrangement drawings

ROSETTI MARINO

| | |
|---|---|
| 1 | NO COMMENTS - APPROVED - WORK MAY PROCEED |
| 2 | MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED |
| 3 | MAJOR COMMENTS – REJECTED – DO NOT PROCEED |
| 4 | APPROVAL NOT REQUIRED |

*NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.*

| Sign | Date |
|---|---|
| Luca Macula | 03/06/2024 |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 04 | 17/05/24 | ML | MF | MF | ACCEPTED FOR CONSTRUCTION (AFC) |
| 03 | 10/04/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 02 | 08/03/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 01 | 19/01/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 00 | 13/12/23 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 General arrangement drawings
FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723001697-EL-DA-00007 | SHEET 001 | REV. 04

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DA-00007 Rev. 04

| REV. | SHEET NUMBER | DESCRIPTION | REF. CODE |
|---|---|---|---|
| 04 | 001 | FRONT PAGE | |
| 04 | 002 | SUMMARY and GENERAL NOTES | |
| 04 | 003 | GENERAL ARRANGEMENT | |
| 04 | 004 | GENERAL ARRANGEMENT | |
| 04 | 005 | EQUIPMENT LIST | |
| 04 | 006 | H.V. 6.6kV - PROTECTION BOX DETAIL | |
| 04 | 007 | L.V. 420V - PROTECTION BOX DETAIL | |
| 04 | 008 | DETAIL BASE FRAME | |
| 04 | 009 | RATING PLATE | |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 03 | 10/04/24 | ML | MF | MF | |
| 02 | 08/03/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 01 | 19/01/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 00 | 13/12/23 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 General arrangement drawings
SUMMARY and GENERAL NOTES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

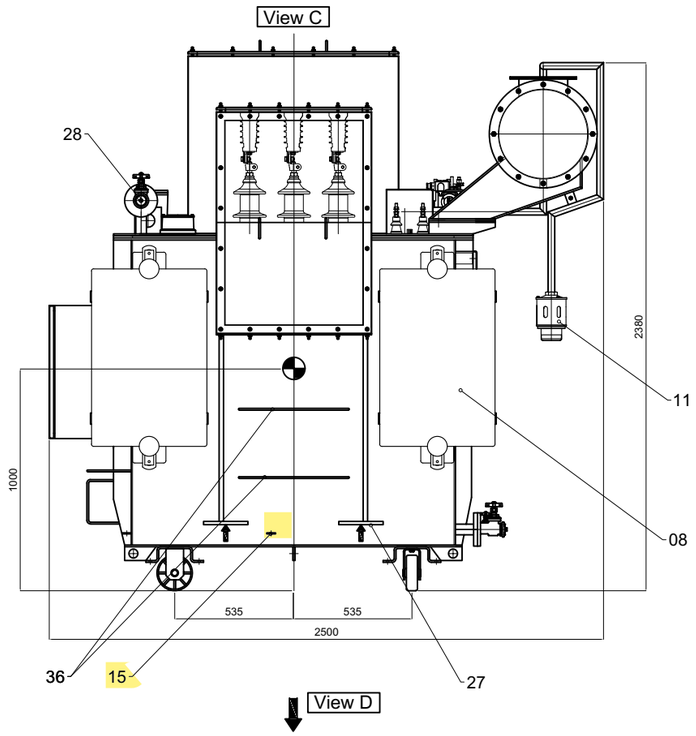
DRAWING NO. 1723001697-EL-DA-00007

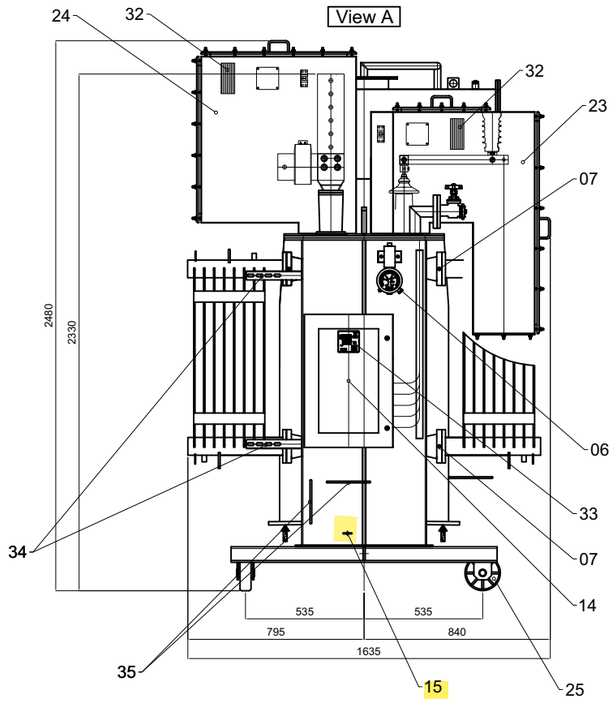
SHEET 002

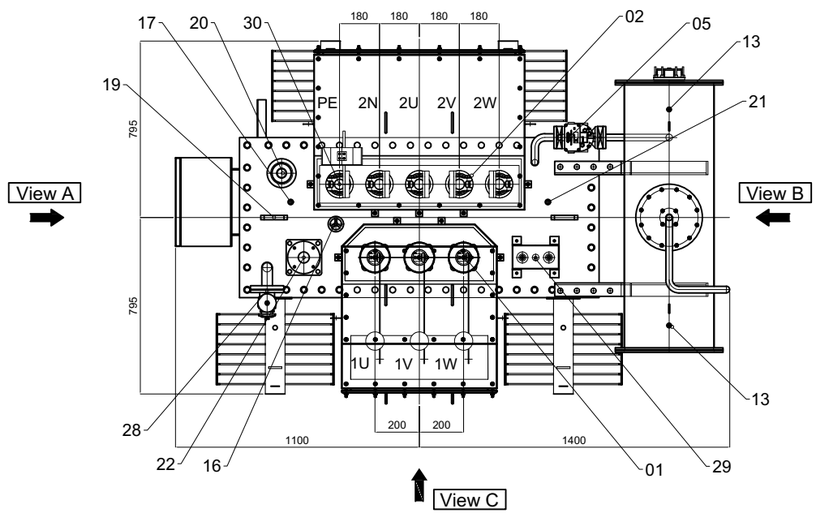
REV.

F.to UNI A3: 420mmx297mm

File Name :




NORTH

Note:

| | |
|---|---|
| - Rated power: | 1600kVA |
| - Rated voltage: | 6600±2x2.5% / 0.42kV |
| - Vector group: | Dyn11 |
| - Oil weight: | 750kg |
| - Total weight: | 5050kg |
| - Painting: | RAL7031 (Cl. CX) |
| - Short circuit impedance: | 6% |
| - Item trafo: | TR-200DE1 |
| Tolerance: | ±20mm |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 03 | 10/04/24 | ML | MF | MF | |
| 02 | 08/03/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 01 | 19/01/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 00 | 13/12/23 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 General arrangement drawings
GENERAL ARRANGEMENT

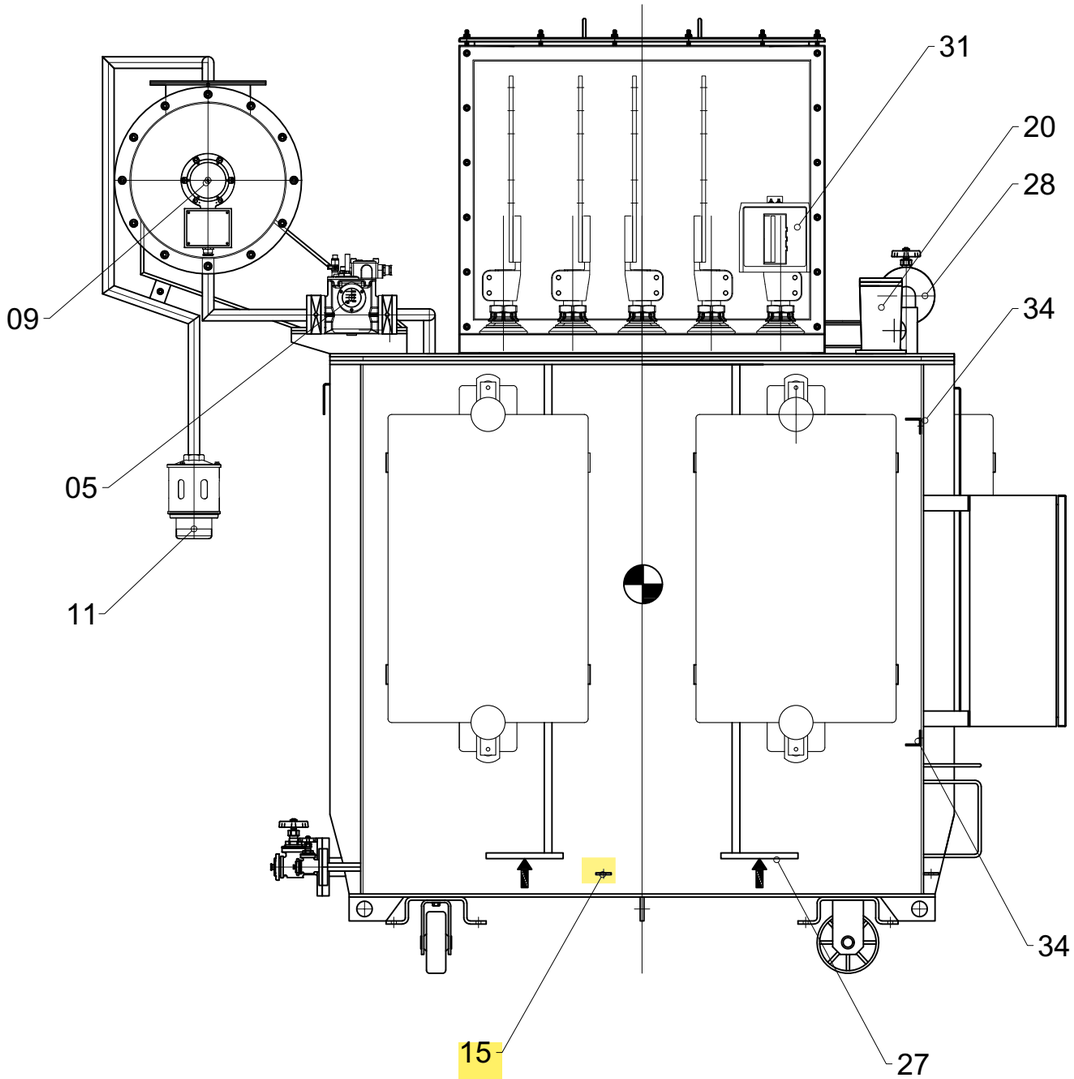
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723001697-EL-DA-00007 | SHEET 003 | REV.

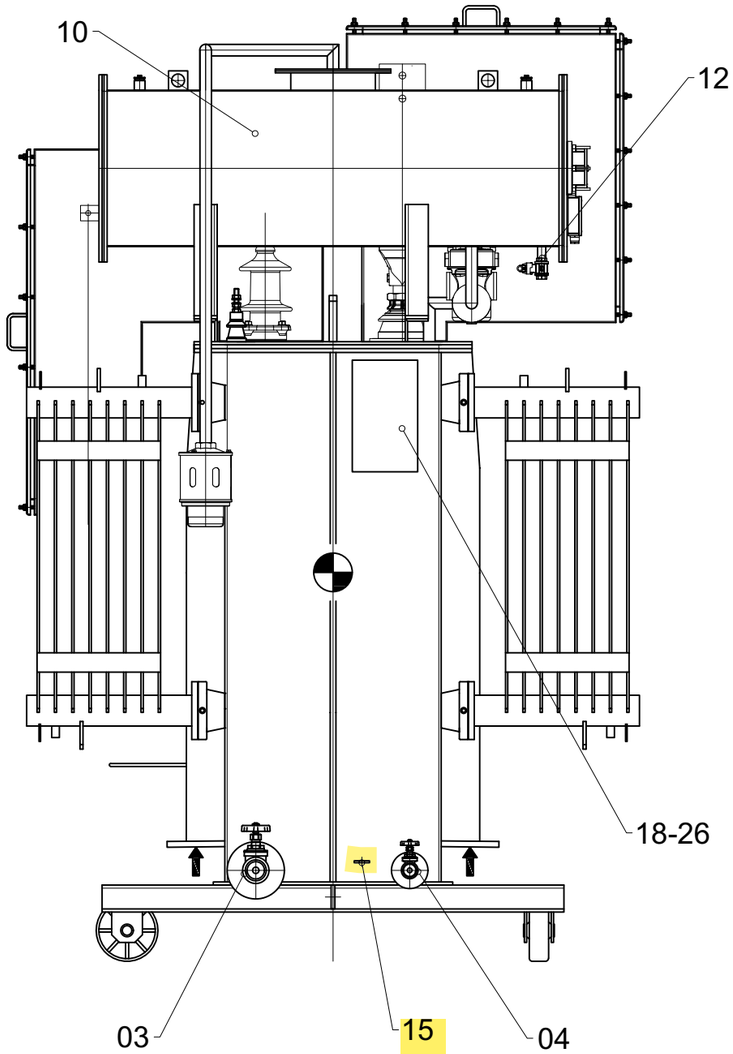
File Name :

F.to UNI A3: 420mmx297mm

View D




View B




| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| 03 | 10/04/24 | ML | MF | MF | |
| 02 | 08/03/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 01 | 19/01/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 00 | 13/12/23 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 General arrangement drawings
GENERAL ARRANGEMENT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DA-00007

SHEET 004

REV.

File Name :

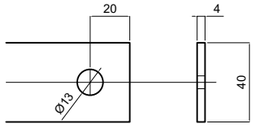
F.to UNI A3: 420mmx297mm

# EQUIPMENT LIST

| ITEM | DESCRIPTION | N° | SUPPLIER | TYPE | ITEM | DESCRIPTION | N° | SUPPLIER | TYPE |
|---|---|---|---|---|---|---|---|---|---|
| 01 | H.V. terminals - 6kV (1U-1V-1W) with extention copper bars | 03 | BARBERI | UNEL 12kV / 630A | 21 | Thermal pocket | 01 | MF | 3/4" |
| 02 | L.V. terminals - 420V (2U-2V-2W-2N) with extention copper bars | 04 | BARBERI | DIN 1kV / 3150A | 22 | Terminal box signal PT100 - windings / core | 02 | ETI | SM2-S |
| 03 | Oil drain valve | 01 | BARBERI | DN25-PN10 | 23 | Protection box - HV terminals | 01 | MF | IP55 |
| 04 | Oil sampling valve | 01 | BARBERI | DN15-PN10 | 24 | Protection box - LV terminals | 01 | MF | IP55 |
| 05 | Bucholz relay with 2 contacts, with valves | 01 | COMEM | C1 | 25 | Bi-directional wheels | 04 | CDR | Ø160 - L=50 |
| 06 | Thermometer with 2 contacts | 01 | TERMAF | TDT/A1-DN100 | 26 | Tag plate | 01 | MF | |
| 07 | Interception radiator valve | 08 | ETI | WU080 | 27 | Jacking pads | 04 | MF | 200x150x15 |
| 08 | Radiator | 04 | WARM | 7 El. - Int. 800 | 28 | Oil treatment valve | 01 | BARBERI | DN25-PN10 |
| 09 | Oil level indicator with 2 contacts | 01 | COMEM | LA14XON | 29 | Core earthing terminals | 02 | MF | |
| 10 | Oil conservator with oil/air insulation membrane | 01 | MF | | 30 | PE terminal with extention copper bar | 01 | BARBERI | DIN 1kV / 3150A |
| 11 | Dehydrating breather - Silicagel | 01 | COMEM | EM1DB | 31 | Current transformer - 2500/1A, 6VA, 5P20 | 01 | FRER | TAT127 |
| 12 | Conservator oil drain valve | 01 | MF | 1/2" | 32 | Heating element with thermostat | 02 | MF | |
| 13 | Conservator vent valve | 01 | MF | 1/2" | 33 | Windiing temperature indicator | 01 | TECSYSTEM | T154 |
| 14 | Auxiliary panel - CP-200E1 | 01 | MF | IP55 | 34 | Support for cable duct | 02 | MF | |
| 15 | Earthing terminals | 04 | MF | Stainless steel 40x30x5<br>n.1 hole Ø13 | 35 | Support for auxiliary cables | 02 | MF | |
| 16 | No load tap changer | 01 | EMC | 335.20/M6 - 90A - 5 pos. | 36 | Support for H.V. 6kV cables | 02 | MF | |
| 17 | Thermal pocket for pos. 6 | 01 | MF | 3/4" | | | | | |
| 18 | Rating plate | 01 | MF | | | | | | |
| 19 | Lifting eyebolts transformer / internal part | 02 | MF | Ø60 | | | | | |
| 20 | Pressure relay with 1 contact | 01 | QUALITROL | 900-FLA-T-NO-STD | | | | | |

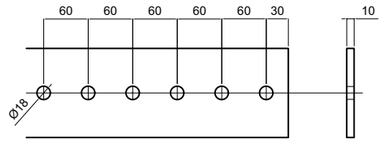
Pos. 01
Detail MV terminal

Copper bar 40x4



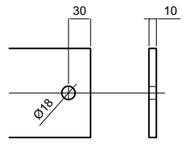

Pos. 02
Detail LV terminal

Copper bar 120x10

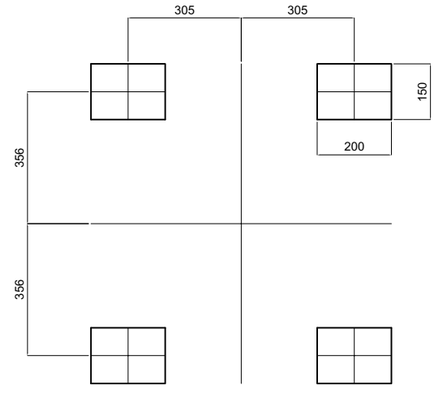



Pos. 30
Detail LV terminal

Copper bar 120x10




Pos. 27
Detail Jacking pads




MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| 03 | 10/04/24 | ML | MF | MF | |
| 02 | 08/03/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 01 | 19/01/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 00 | 13/12/23 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |

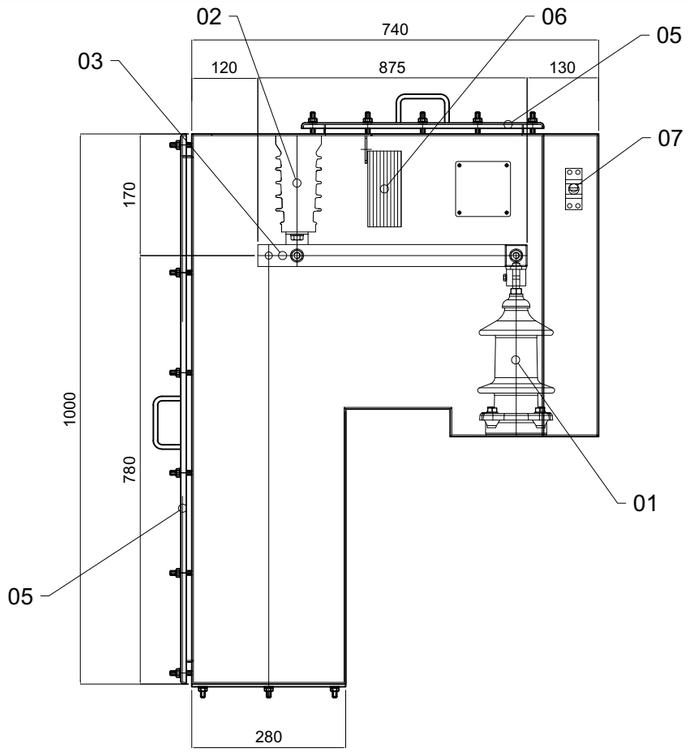
TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 General arrangement drawings
EQUIPMENT LIST

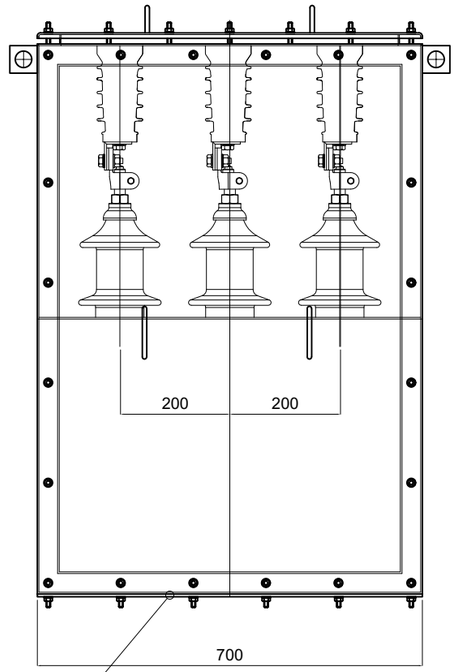
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

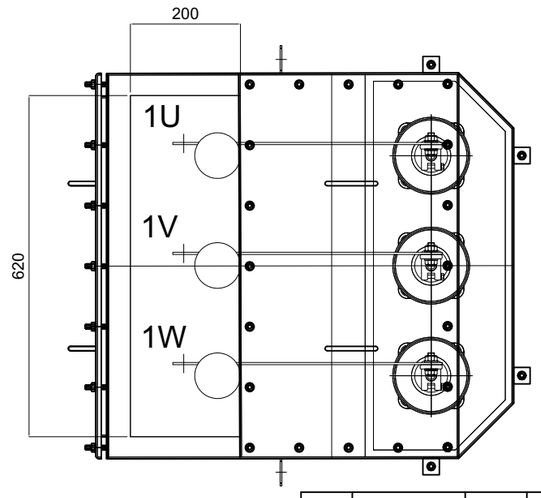
A3 | DRAWING NO. 1723001697-EL-DA-00007 | SHEET 005 | REV.

File Name :

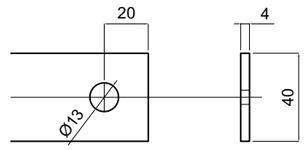
F.to UNI A3: 420mmx297mm




Copper bar 40x4




| Item | Description | Q.ty | Type |
|---|---|---|---|
| 01 | HV Terminal | 3 | UNEL 12kV/250A |
| 02 | Support bushing | 3 | IPA 12kV |
| 03 | Copper bar | 3 | Cu 40x4mm |
| 04 | Cable inlet plate | 1 | Aluminium - th. 5mm |
| 05 | Removable plate | 2 | Painted steel - th. 3mm |
| 06 | Heating element | 1 | 100W |
| 07 | Thermostat | 1 | |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| 03 | 10/04/24 | ML | MF | MF | |
| 02 | 08/03/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 01 | 19/01/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 00 | 13/12/23 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |

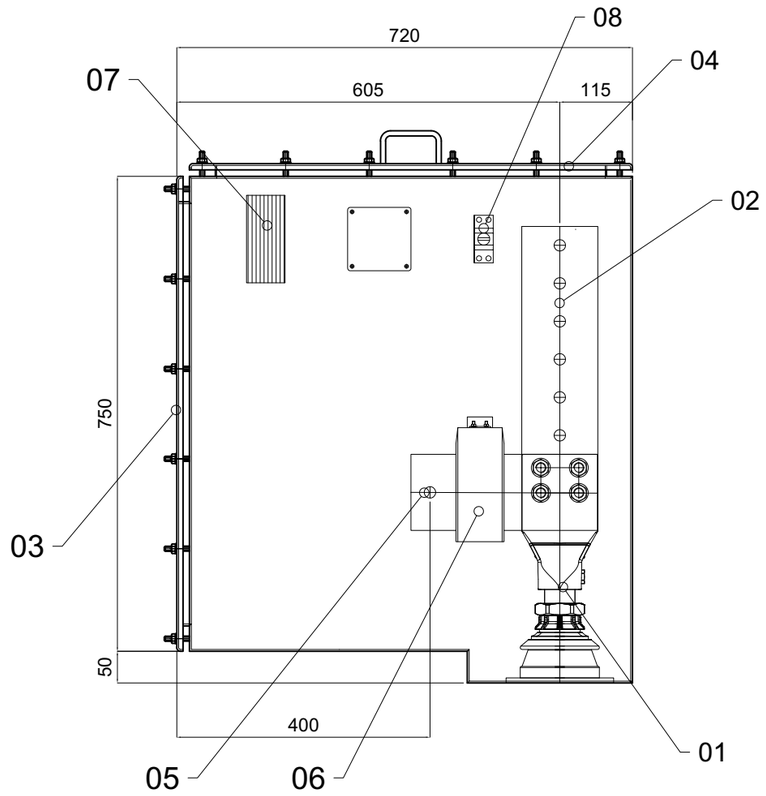
TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 General arrangement drawings
H.V. 6.6kV – PROTECTION BOX DETAIL

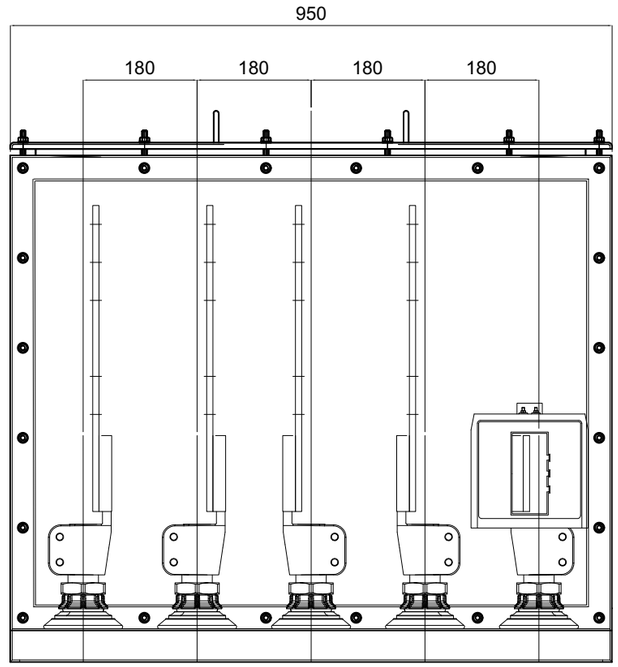
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723001697-EL-DA-00007 | SHEET 006 | REV.

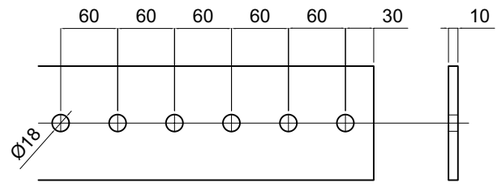
File Name :

F.to UNI A3: 420mmx297mm

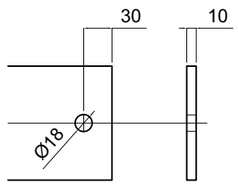


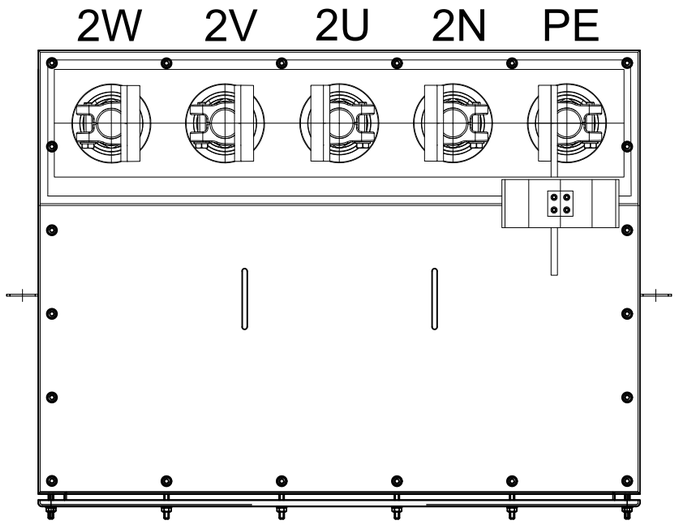




Copper bar 120x10




Copper bar 120x10




| Item | Description | Q.ty | Type |
|---|---|---|---|
| 01 | LV Terminal | 5 | DIN 1kV/3150A |
| 02 | LV copper bar | 4 | Cu 120x10mm |
| 03 | Cable inlet plate | 1 | Aluminium - th. 5mm |
| 04 | Removable plate | 1 | Painted steel - th. 3mm |
| 05 | PE copper bar | 1 | Cu 120x10mm |
| 06 | Current transformer | 1 | 2500/1A - 6VA - 5P20 |
| 07 | Heating element | 1 | 100W |
| 08 | Thermostat | 1 | |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| 03 | 10/04/24 | ML | MF | MF | |
| 02 | 08/03/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 01 | 19/01/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 00 | 13/12/23 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |

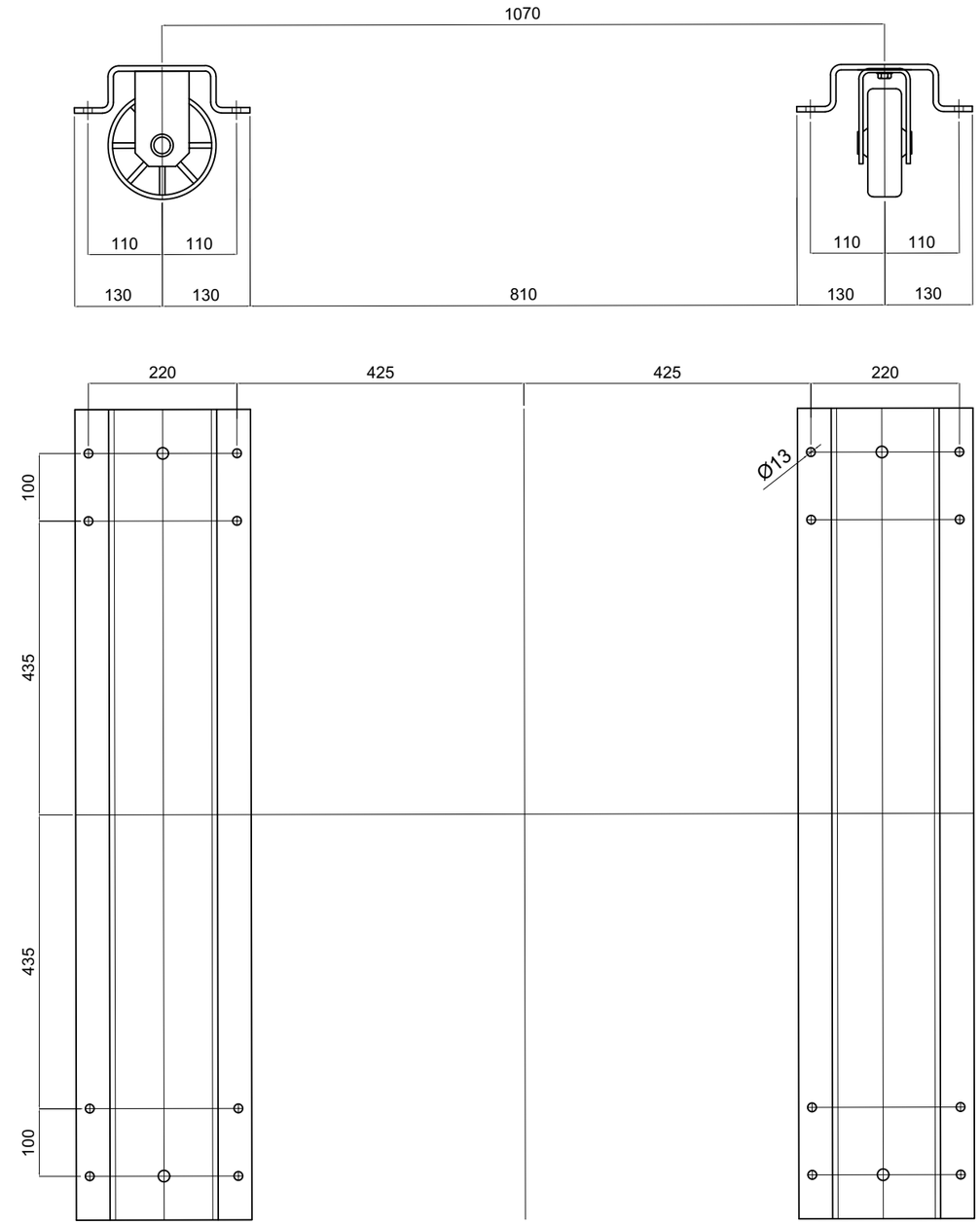
TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 General arrangement drawings
L.V. 420V - PROTECTION BOX DETAIL

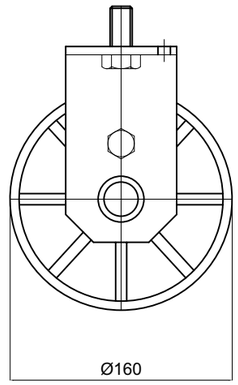
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

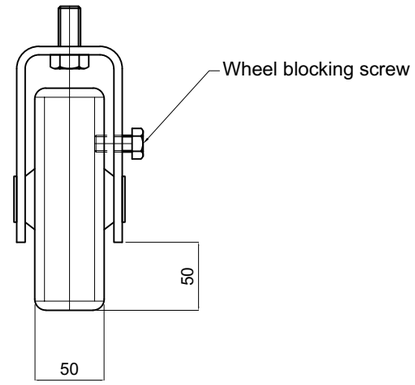
A3 | DRAWING NO. 1723001697-EL-DA-00007 | SHEET 007 | REV.

File Name :

F.to UNI A3: 420mmx297mm




MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| 03 | 10/04/24 | ML | MF | MF | |
| 02 | 08/03/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 01 | 19/01/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 00 | 13/12/23 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 General arrangement drawings
DETAIL BASE FRAME

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

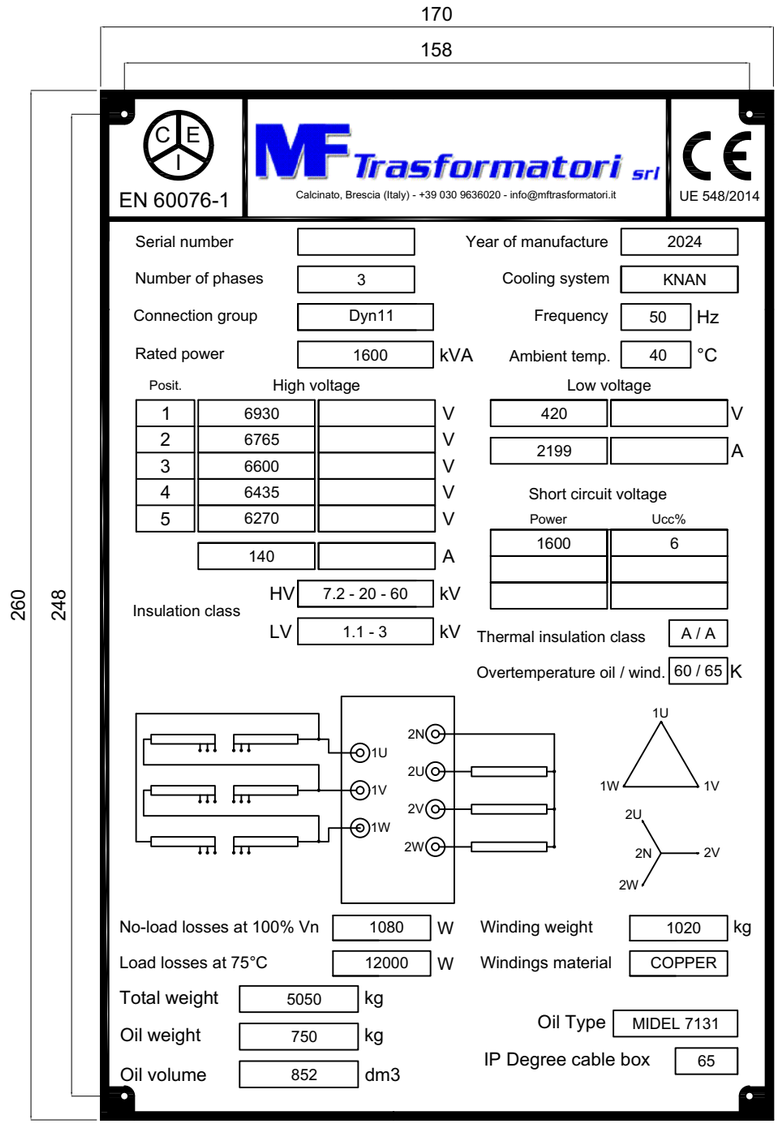
DRAWING NO. 1723001697-EL-DA-00007

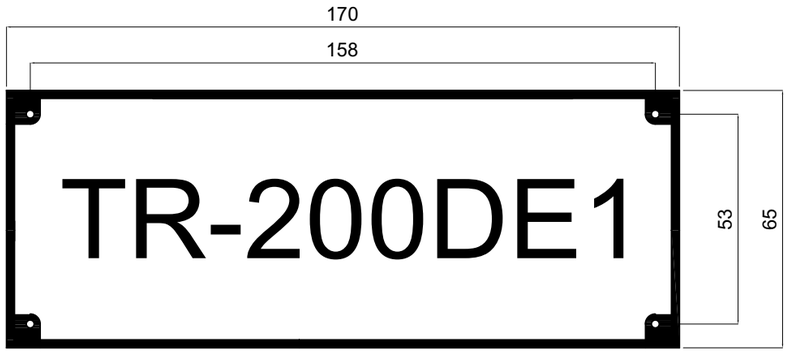
SHEET 008

REV.

File Name :

F.to UNI A3: 420mmx297mm




Note:
- Material: stainless steel
- black writing on a neutral background

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 03 | 10/04/24 | ML | MF | MF | |
| 02 | 08/03/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 01 | 19/01/24 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |
| 00 | 13/12/23 | ML | MF | MF | ISSUE FOR REVIEW (IFR) |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 General arrangement drawings
RATING PLATE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723001697-EL-DA-00007

SHEET 09

REV.

File Name :

F.to UNI A3: 420mmx297mm

# BASE LOAD POWER HUB (BLPH)

# TR-200DE1 Termination and Wiring Diagram

ROSETTI MARINO

| | |
|---|---|
| 1 | NO COMMENTS - APPROVED - WORK MAY PROCEED |
| 2 | MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED |
| 3 | MAJOR COMMENTS – REJECTED – DO NOT PROCEED |
| 4 | APPROVAL NOT REQUIRED |

***NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.***

| Sign | Date |
|---|---|
| Luca Macula | 15/05/2024 |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 04 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 03 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 02 | 09/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 01 | 27/03/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 00 | 16/02/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 Termination and Wiring Diagram
FRONT PAGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723001697-EL-DG-00011 | SHEET 001 | REV. 04

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00011 Rev. 04

| REV. | SHEET NUMBER | DESCRIPTION | REF. CODE |
|---|---|---|---|
| 04 | 001 | FRONT PAGE | |
| 04 | 002 | SUMMARY and GENERAL NOTES | |
| 04 | 003 | LAYOUT - AUXILIARY CONTROL PANEL | |
| 04 | 004 | INTERNAL POWER CIRCUIT DIAGRAM | |
| 04 | 005 | PROTECTION DEVICES ON TRANSFORMER | |
| 04 | 006 | THERMAL CONTROL UNIT | |
| 04 | 007 | TERMINAL STRIP | |
| 04 | 008 | EQUIPMENT LIST | |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 04 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 03 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 02 | 09/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 01 | 27/03/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 00 | 16/02/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 Termination and Wiring Diagram
SUMMARY and GENERAL NOTES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

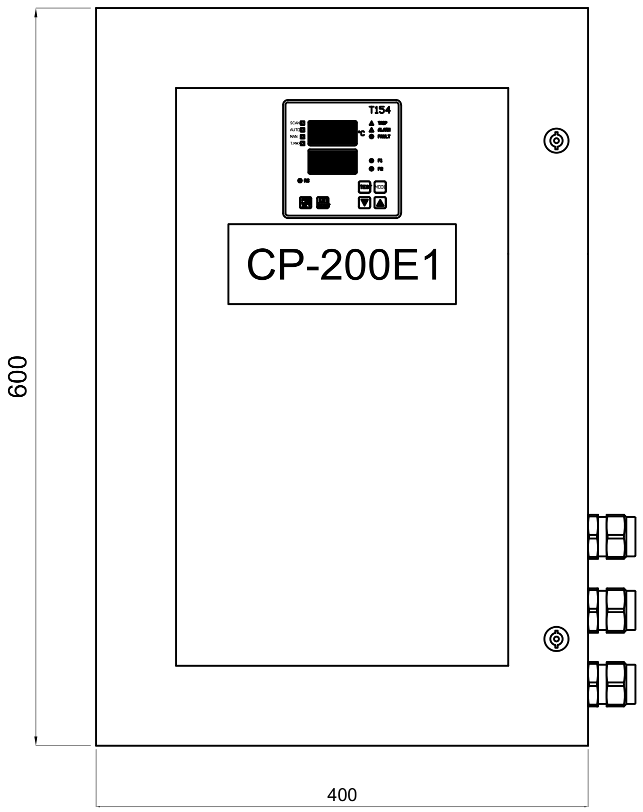
A3 | DRAWING NO. 1723001697-EL-DG-00011 | SHEET 002 | REV. 04

F.to UNI A3: 420mmx297mm

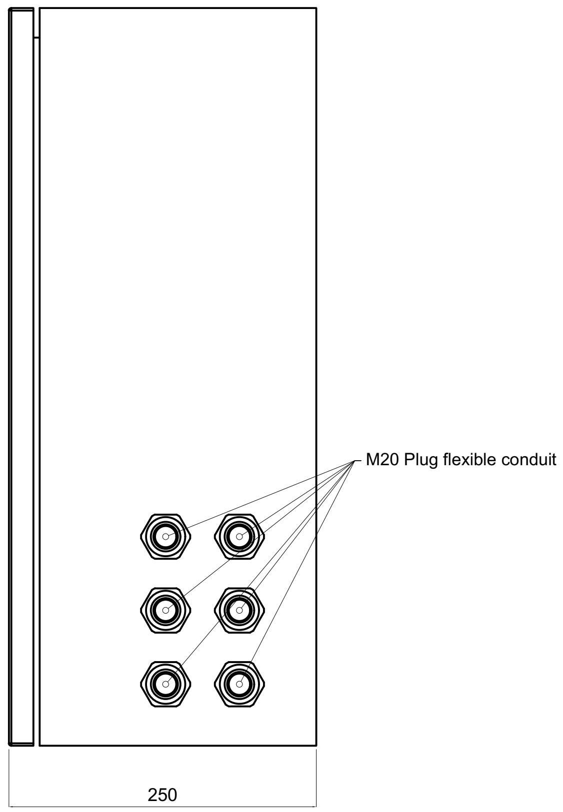
File Name : 1723001697-EL-DG-00011 Rev. 04

# LAYOUT - AUXILIARY CONTROL PANEL

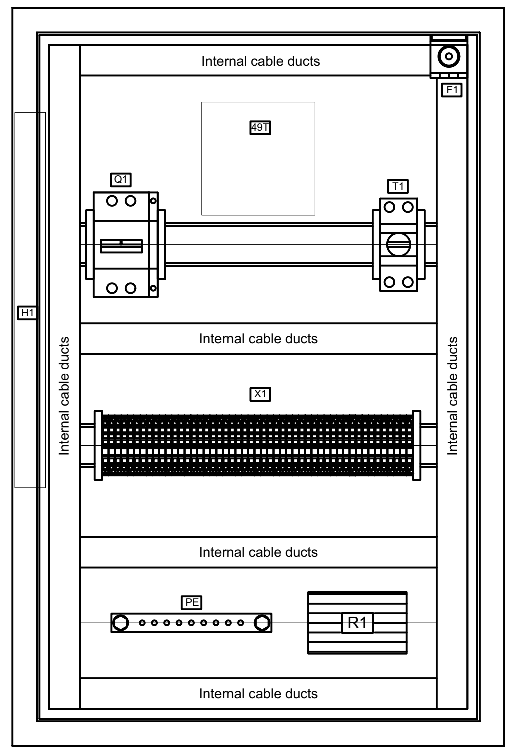
## Frontal view




## Left side view

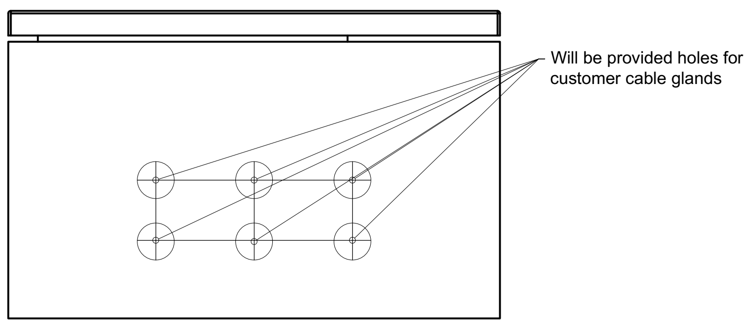



## Internal view




PE BAR IS GROUNDED ON INTERNAL PLATE
OF THE PANEL BOX

## Bottom view




| AUXILIARY CONTROL PANEL | |
|---|---|
| PROTECTION DEGREE : | IP65 |
| VENTILATION : | NATURAL |
| BOX MATERIAL : | STAINLESS STEEL 15/10 |
| INTERNAL REMOVABLE PLATE : | STELL 15/10 |

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 04 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 03 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 02 | 09/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 01 | 27/03/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 00 | 16/02/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

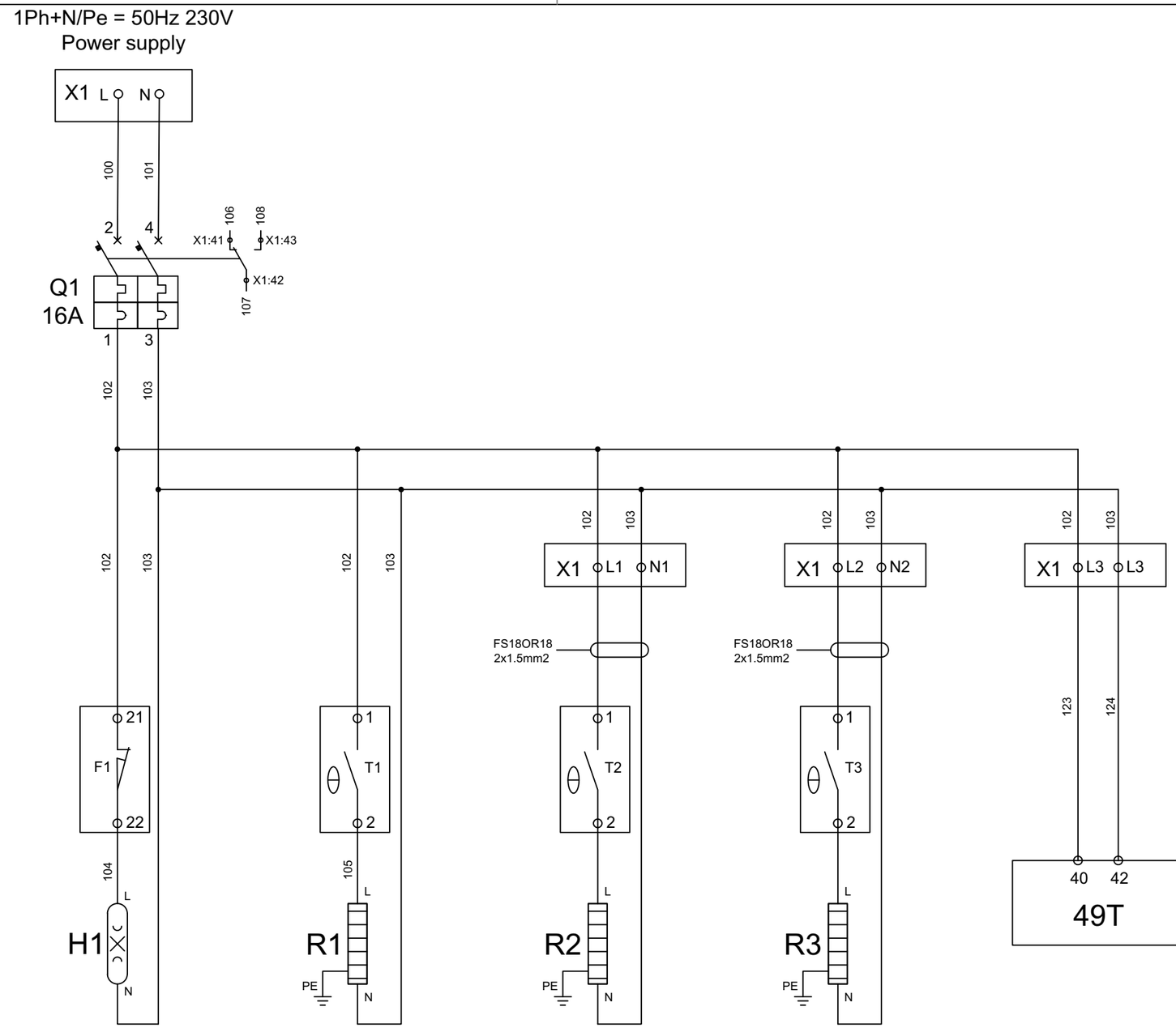
TITLE : BASE LOAD POWER HUB (BLPH)
TR–200DE1 Termination and Wiring Diagram
LAYOUT – AUXILIARY CONTROL PANEL

CONTRACT NO./TITLE CW–I–WP4–2023–05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

| A3 | DRAWING NO. | SHEET | REV. |
|---|---|---|---|
| | 1723001697–EL–DG–00011 | 001 | 04 |

F.to UNI A3: 420mmx297mm

File Name : 1723001697–EL–DG–00011 Rev. 04




| | | | | | |
|---|---|---|---|---|---|
| 04 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 03 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 02 | 09/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 01 | 27/03/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 00 | 16/02/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 Termination and Wiring Diagram
INTERNAL POWER CIRCUIT DIAGRAM

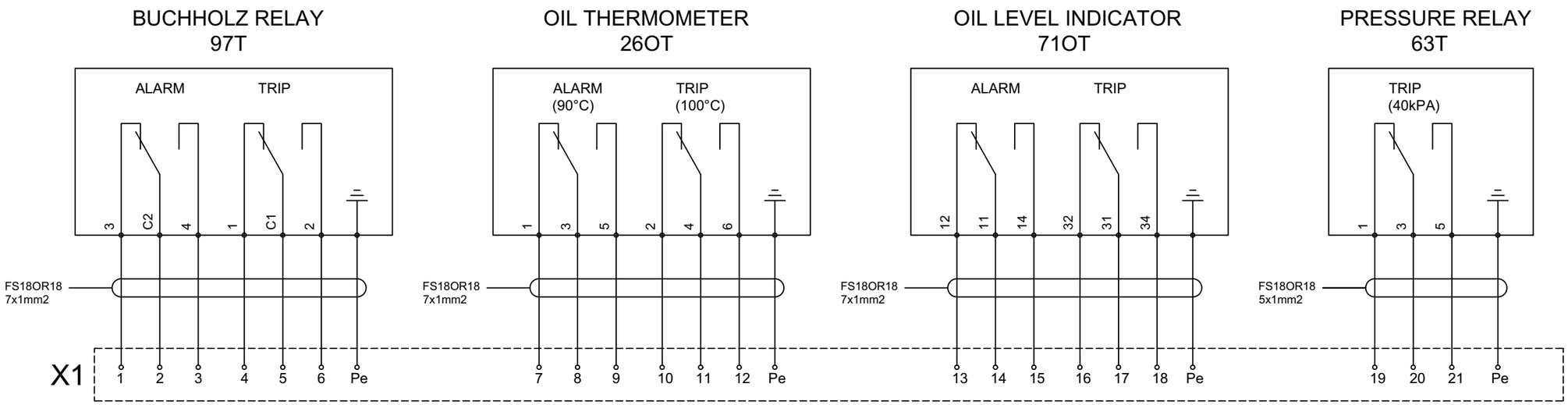
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

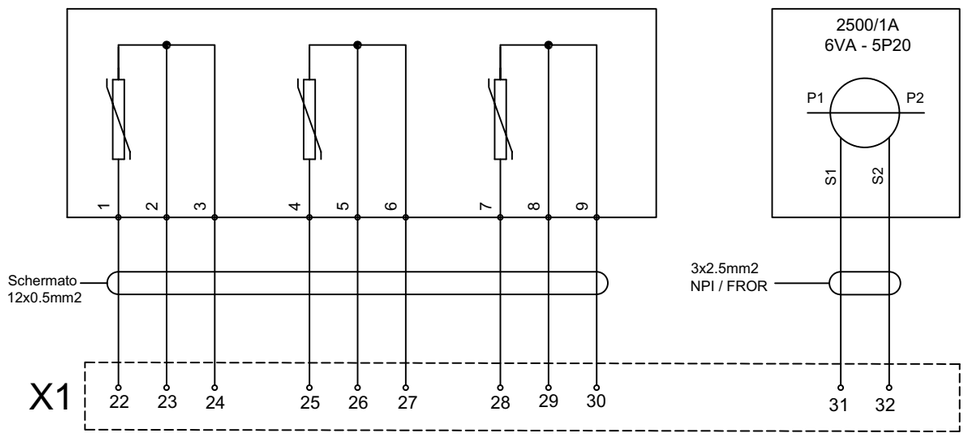
A3 | DRAWING NO. 1723001697-EL-DG-00011 | SHEET 001 | REV. 04

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00011 Rev. 04

# PROTECTION DEVICES ON TRANSFORMER







| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 04 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 03 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 02 | 09/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 01 | 27/03/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 00 | 16/02/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 Termination and Wiring Diagram
PROTECTION DEVICES ON TRANSFORMER

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

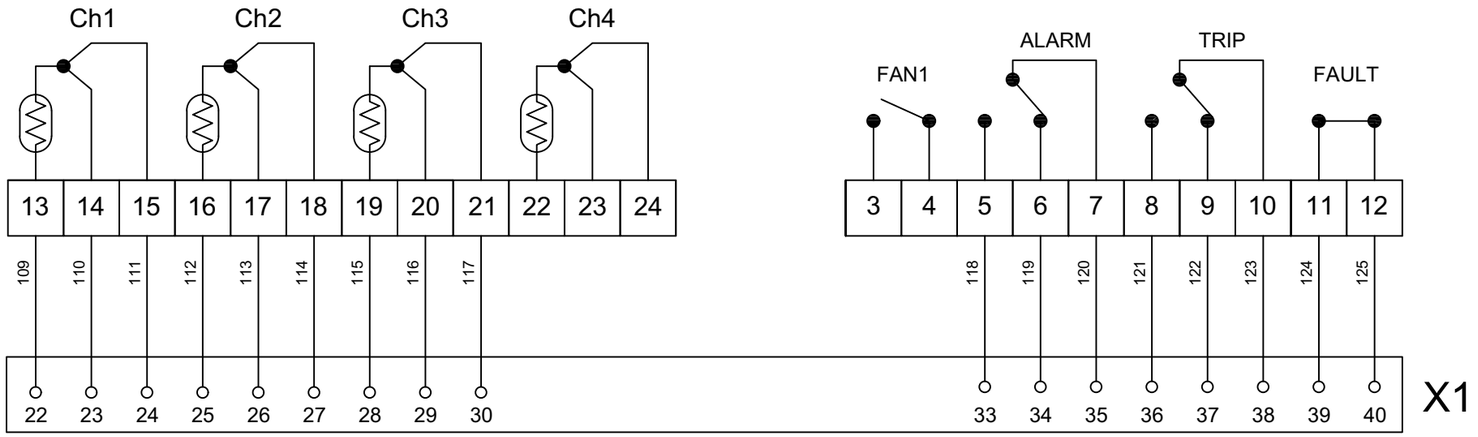
A3 | DRAWING NO. 1723001697-EL-DG-00011 | SHEET 001 | REV. 04

File Name : 1723001697-EL-DG-00011 Rev. 04

F.to UNI A3: 420mmx297mm

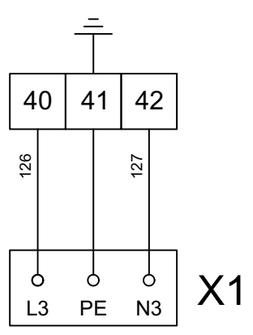
# WINDING TEMPERATURE INDICATOR - 49T

## T154 - TECSYSTEM




POWER SUPPLY

24÷240 Vac-dc 50 / 60Hz




SETTING:

- OIL WINDING: 95°C
- TRIP WINDING: 105°C

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 04 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 03 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 02 | 09/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 01 | 27/03/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 00 | 16/02/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 Termination and Wiring Diagram
THERMAL CONTROL UNIT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

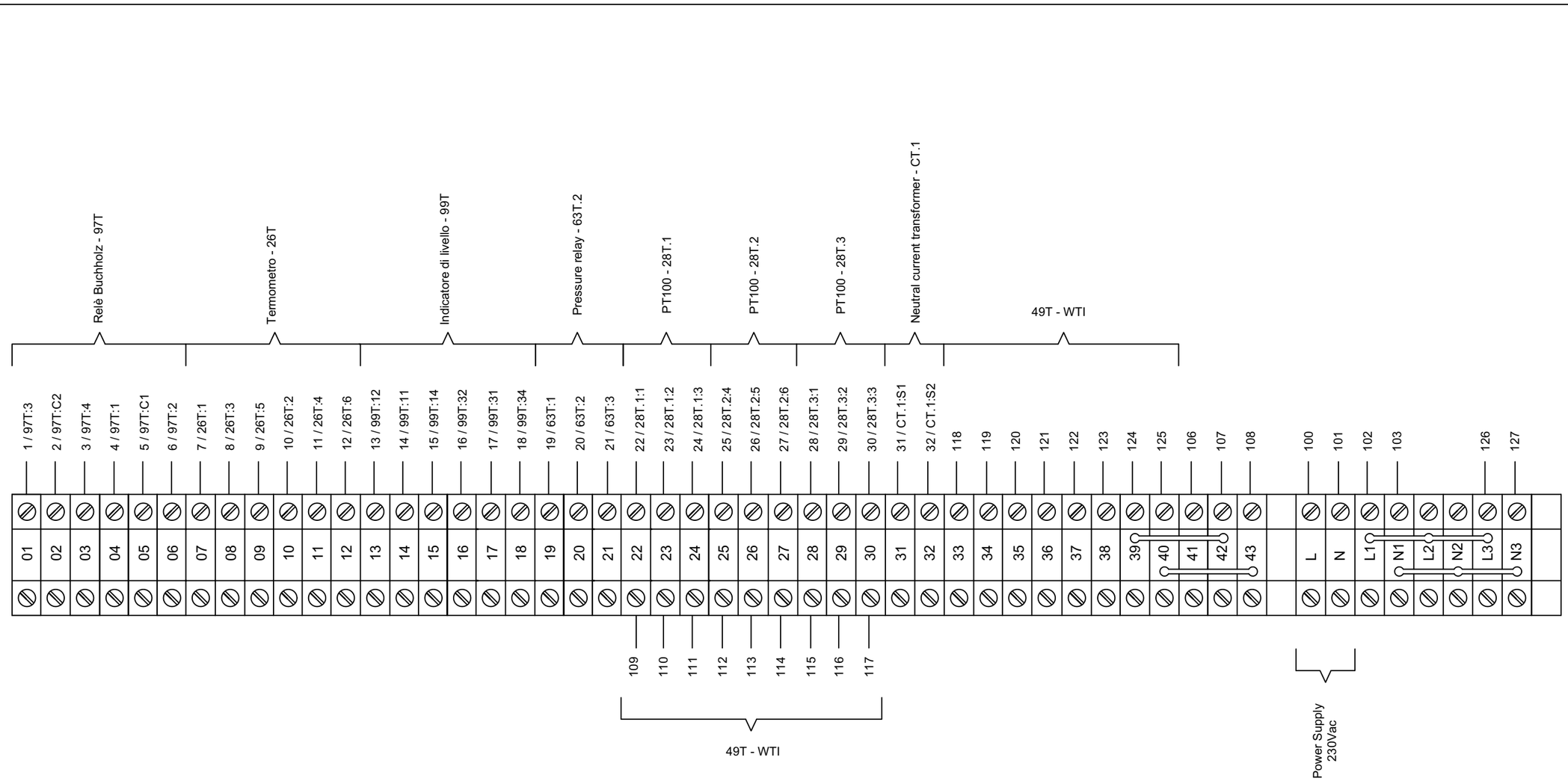
DRAWING NO. 1723001697-EL-DG-00011

SHEET 001

REV. 04

File Name : 1723001697-EL-DG-00011 Rev. 04

F.to UNI A3: 420mmx297mm




ALL PE CONDUCTORS WILL BE CONNECTED AT PE BAR

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 04 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 03 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 02 | 09/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 01 | 27/03/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 00 | 16/02/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |

MF Trasformatori srl

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TR–200DE1 Termination and Wiring Diagram
TERMINAL STRIP

CONTRACT NO./TITLE CW–I–WP4–2023–05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 1723001697–EL–DG–00011

SHEET 001

REV. 04

F.to UNI A3: 420mmx297mm

File Name : 1723001697–EL–DG–00011 Rev. 04

| Label | Description | Supplier | Model No. | Quantity | |
|---|---|---|---|---|---|
| Q1 | MCB | ABB | S202 - C16 + S2C - H6R | 1 | |
| H1 | CONTROL PANEL LAMP | ARTELETA | 230V - 8W | 1 | |
| F1 | MICROSWITCH | PIZZATO | FM 1815-S1 | 1 | |
| R1 | CONTROL PANEL HEATER - 15W | FANDIS | HWM015 | 1 | |
| T1 | CONTROL PANEL THERMOSTAT | FANDIS | TRT-10A230V-NCF | 1 | |
| R2 | H.V. 6.6kV - CABLE BOX HEATER - 100W | FANDIS | HWM0100 | 1 | |
| T2 | H.V. 6.6kV - CABLE BOX HEATER THERMOSTAT | FANDIS | TRT-10A230V-NCF | 1 | |
| R3 | L.V. 420V - CABLE BOX HEATER - 100W | FANDIS | HWM0100 | 1 | |
| T3 | L.V. 420V - CABLE BOX HEATER THERMOSTAT | FANDIS | TRT-10A230V-NCF | 1 | |
| 49T | THERMAL CONTROL UNIT | TECSYSTEM | T154 | 1 | |
| X1 | TERMINAL STRIP | PHOENIX | ST2.5 | 51 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Trasformatori srl

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 04 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 03 | 15/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 02 | 09/05/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 01 | 27/03/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |
| 00 | 16/02/24 | ML | MF | MF | ISSUE FOR INFORMATION (IFI) |

TITLE : BASE LOAD POWER HUB (BLPH)
TR-200DE1 Termination and Wiring Diagram
EQUIPMENT LIST

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 1723001697-EL-DG-00011 | SHEET 001 | REV. 04

F.to UNI A3: 420mmx297mm

File Name : 1723001697-EL-DG-00011 Rev. 04

| Row | | S-720D Data Sheet for Transformers | | | | Issue |
|---|---|---|---|---|---|---|
| 2 | Tag No. : | *TR-200DE1* | | | | 01 |
| 3 | Service : | *6.6/0.42 kV, 1.6 MVA Power Transformer* | | | | 01 |
| 4 | Ref. Clause | Description | | | Additional notes | |
| 5 | | **1. General** | | | | |
| 6 | | Manufacturer : | MF Trasformatori srl | | | 01 |
| 7 | | Vendor : | MF Trasformatori srl | | | 01 |
| 8 | | Equipment identifier : | TR-200DE1 | | | |
| 9 | | Quantity : | 1 | | | |
| 10 | 9,3 | Type of liquid preservation system : | conservator with bladder or diaphragm type | | | 01 |
| 11 | 4.1, 5.7.1, A.1.1 a) to x) | Service : | Distribution transformer | | | |
| 12 | | Conformity assessment system : | D | | | |
| 13 | | **2. Environmental conditions** | | | | |
| 14 | 5.5, A.1.1a) to x) | Altitude (if more than 1000m or 3280ft) : | not more than 1000 m | m | | |
| 15 | 4.2 a) to e), 4.2 f, A.1.1 a) to x) | Minimum ambient temperature : | -8,4 | °C | | |
| 16 | 4.2 a) to e), 4.2 f , A.1.1 a) to x) | Maximum ambient temperature : | 25 | °C | | |
| 17 | 4.2 a) to e), A.1.1 a) to x) | Yearly average ambient temperature : | 10,5 | °C | | |
| 18 | 5.5, A.1.1 a) to x) | Design ambient temperature (if more than 40 °C or 104 °F ) : | not more than 40°C | °C | Offshore (Netherlands) | |
| 19 | 4.2 a) to e), 4.2 f, A.1.1 a) to x) | Relative humidity at maximum operating temperature (if more than 90 %) : | 95 | % | | |
| 20 | 4.2 f | Climatic conditions (K) for liquid immersed transformer : | 4K26 | | | |
| 21 | 4.2 f | Special climatic conditions (Z) for liquid immersed transformer : | 4Z1,4Z5,4Z14, 4Z15, 4Z17, 4Z10 | | | |
| 22 | 4.2 f | Biological conditions (B) for liquid immersed transformer : | 4B2 | | | |
| 23 | 4.2 f | Chemically active substances (C) for liquid immersed transformer : | 4CX | | | |
| 24 | 4.2 f | Mechanically active substances (S) for liquid immersed transformer : | 4S11 | | | |
| 25 | 4.2 f | Mechanical conditions (M) for liquid immersed transformer : | 4M11 | | | |
| 26 | 9.6.18.1, 9.6.18.3 | Corrosion class : | CX | | | |
| 27 | A.1.1 a) to x) | Seismic zone as per IEC 60721-2-6, figure 5 : | zone 2 | | | |
| 28 | 4.2 f , 4.2 i, 5.7.4.2, A.1.1 a) to x) | Location : | offshore fixed | | | |
| 29 | A.1.1 a) to x) | Unusual service conditions : | No | | | |
| 30 | 5.7.3, 5.7.3 | Sound power level : | 60 | dB(A) | | 01 |
| 31 | | **3. Hazardous area classification** | | | | |
| 32 | 4.2 g, A.1.1 a) to x) | Hazardous area classification zone : | non hazardous | | | |
| 33 | 4.2 g, A.1.1 a) to x) | Hazardous area classification gas group : | N/A | | | |
| 34 | 4.2 g, A.1.1 a) to x) | Hazardous area classification temperature class : | N/A | | | |
| 35 | | **4. Technical data** | | | | |
| 36 | | **4.1 Electrical system data** | | | | |
| 37 | 5.4.1, A.1.1 a) to x) | Rated voltage (HV) : | 6,6 | kV | | |
| 38 | 5.4.1 | Rated voltage (LV) : | 0,42 | kV | | |
| 39 | 5.4.1 | Rated voltage (tertiary) : | N/A | kV | | |
| 40 | 5.4.2, A.1.1 a) to x) | Rated frequency : | 50 | Hz | | |
| 41 | A.1.1 a) to x), A.1.2 a) to t) | System short circuit apparent power : | 26,67 | MVA | | |
| 42 | 6.4.3.e | Minimum full load power factor : | 0,8 | | | |
| 43 | A.1.1 a) to x), A.1.2 a) to t) | Supply voltage harmonic content : | 5 | % | | |
| 44 | | **4.2 Transformer/reactor data** | | | | |
| 45 | | **4.2.1 General** | | | | |
| 46 | | **Power frequency withstand voltage** | | | | |
| 47 | A.1.1 a) to x) | Power frequency withstand voltage - HV winding : | 20 | kV | | |
| 48 | A.1.1 a) to x) | Power frequency withstand voltage - LV winding : | 3 | kV | | |
| 49 | A.1.1 a) to x) | Power frequency withstand voltage - tertiary winding : | N/A | kV | | |
| 50 | A.1.1 a) to x) | Power frequency withstand voltage - neutral terminal : | 3 | kV | | 01 |
| 51 | | **Lightning impulse withstand voltage** | | | | |
| 52 | A.1.1 a) to x) | Lightning impulse withstand voltage - HV winding : | 60 | kV | | |
| 53 | A.1.1 a) to x) | Lightning impulse withstand voltage - LV winding : | N/A | kV | | |
| 54 | A.1.1 a) to x) | Lightning impulse withstand voltage - tertiary winding : | N/A | kV | | |
| 55 | A.1.1 a) to x) | Lightning impulse withstand voltage - neutral terminal : | N/A | kV | | |
| 56 | 5.7.2, 7.1.1 , A.1.1 a) to x) | Number of phases : | 3 | | | |
| 57 | 6.4.3.a, A.1.1 a) to x) | Direction of power flow : | step-down | | | |
| 58 | 7.1.5, 5.7.2, 7.1.1, A.1.1 a) to x) | Connection and phase displacement symbol (vector group) : | Dyn11 | | | |
| 59 | A.1.1 a) to x), A.1.2 a) to t), B.4 | Percentage impedance on air natural rating at principal tap : | 6 | % | | |
| 60 | 5.7.2 | High limit for zero sequence impedance : | N/A | ohms/ph | | 01 |
| 61 | 5.7.2 | Low limit for zero sequence impedance : | N/A | Ohms/ph | | 01 |
| 62 | 5.1.1, A.1.1 a) to x) | Rated power in air natural mode (HV) : | 1600 | kVA | | |
| 63 | 5.1.1, A.1.1 a) to x) | Rated power in air natural mode (LV) : | 1600 | kVA | | |
| 64 | 5.1.1, A.1.1 a) to x) | Rated power in air natural mode (tertiary) : | N/A | kVA | | |
| 65 | 5.1.1, 5.1.3, A.1.1 a) to x) | Rated power in forced cooling mode (HV) : | N/A | kVA | | |
| 66 | 5.1.1, 5.1.3, A.1.1 a) to x) | Rated power in forced cooling mode (LV) : | N/A | kVA | | |
| 67 | 5.1.1, 5.1.3, A.1.1 a) to x) | Rated power in forced cooling mode (tertiary) : | N/A | kVA | | |

| Row | | S-720D Data Sheet for Transformers | | | | Issue |
|---|---|---|---|---|---|---|
| 2 | Tag No. : | *TR-200DE1* | | | | 01 |
| 3 | Service : | *6.6/0.42 kV, 1.6 MVA Power Transformer* | | | | 01 |
| 68 | 5.4.3 | Variation in V/Hz ratio from no load to rated load when exceeding 105 % : | Not more than 105 | % | | |
| 69 | A.1.1 a) to x), A.1.2 a) to t), A.2 a) to f) | Parallel operation : | No | | | |
| 70 | 5.1.1 | Requirement of 1.8 times overloading for transformer feeding a group of motors : | No | | | |
| 71 | 5.8, A.1.1 a) to x) | Insulating liquid : | synthetic organic liquid | | MIDEL 7131 | 01 |
| 72 | A.1.1 a) to x), A.1.2 a) to t), Table 1 | Tolerance on total losses when not in accordance with IEC 60076-1 : | N/A | % | | |
| 73 | 6.5, A.1.1 a) to x), A.1.2 a) to t), Table 1 | Tolerance on impedance value when not in accordance with IEC 60076-1 : | N/A | % | | |
| 74 | | **4.2.2 Neutral terminal** | | | | |
| 75 | 9,4 | Level of DC current in neutral : | <5 | % | | |
| 76 | A.1.1 a) to x) | Transformer neutral earthing for HV winding : | N/A | | | |
| 77 | A.1.1 a) to x) | Transformer neutral earthing for LV winding : | solid | | | |
| 78 | A.1.1 a) to x) | Transformer neutral earthing for tertiary winding : | N/A | | | |
| 79 | 9,2 | Sizing of the low voltage neutral terminal : | 100 | % | | |
| 80 | | **4.2.3 Winding** | | | | |
| 81 | A.1.1 a) to x) | Winding conductor material : | copper | | | |
| 82 | 5.7.2 | Requirement of delta connected stabilizing winding : | No | | | |
| 83 | 5.7.2 | Method of earthing of delta connected stabilizing winding : | N/A | | | |
| 84 | A.1.1 a) to x) | Winding class of insulation : | A | | | 01 |
| 85 | A.1.1 a) to x) | Non-uniform (graded) insulation : | No | | | 01 |
| 86 | A.1.1 a) to x) | High temperature insulation : | No | | | 01 |
| 87 | A.1.2 a) to t) | Thermally upgraded paper : | No | | | 01 |
| 88 | | **4.2.4 Termination** | | | | |
| 89 | A.1.1 a) to x), A.1.2 a) to t) | Main external termination details (HV) : | cable box | | | |
| 90 | A.1.1 a) to x), A.1.2 a) to t) | Main external termination details (LV) : | cable box | | | |
| 91 | A.1.1 a) to x), A.1.2 a) to t) | Main external termination details (tertiary) : | N/A | | | |
| 92 | A.1.1 a) to x), A.1.2 a) to t) | Main external termination details (neutral) : | cable box | | | |
| 93 | A.1.1 a) to x), A.1.2 a) to t) | Cable box type : | air insulated | | | |
| 94 | A.1.1 a) to x) | Main cable box design : | supplier standard | | | |
| 95 | A.1.1 a) to x) | Cable type : | insulated | | | |
| 96 | A.1.1 a) to x) | Number of cables (HV) : | 3 | | | 01 |
| 97 | A.1.1 a) to x) | Number of cables (LV) : | 18 | | | 01 |
| 98 | A.1.1 a) to x) | Number of cables (tertiary) : | N/A | | | |
| 99 | 9.6.11.1.4, A.1.1 a) to x) | Cable conductor size (HV) : | 70 | mm² | | 01 |
| 100 | 9.6.11.1.4 | Cable conductor size (LV) : | 300 | mm² | | 01 |
| 101 | 9.6.11.1.4 | Cable conductor size (tertiary) : | N/A | Select | | |
| 102 | 9.6.11.1.4, A.1.1 a) to x) | Number of cores per cable (HV) : | 1 | | | 01 |
| 103 | 9.6.11.1.4 | Number of cores per cable (LV) : | 1 | | | 01 |
| 104 | 9.6.11.1.4 | Number of cores per cable (tertiary) : | N/A | | | |
| 105 | 9.6.11.1.4, A.1.1 a) to x) | Number of cables per phase (HV) : | 1 | | | 01 |
| 106 | 9.6.11.1.4 | Number of cables per phase (LV) : | 5 (phase) + 3 (neutral) | | | 01 |
| 107 | 9.6.11.1.4 | Number of cables per phase (tertiary) : | N/A | | | |
| 108 | 5.6, A.1.1 a) to x) | Separate neutral terminal box : | No | | | 01 |
| 109 | 9.6.9.5, A.1.1 a) to x) | Canopy required for cable box : | No | | | |
| 110 | 9.6.9.9.7 | Breather with dessicant or drain for main cable boxes : | No | | | 01 |
| 111 | A.1.1 a) to x) | Busduct type : | N/A | | | |
| 112 | A.1.1(a to x) | **Bushings** | | | | |
| 113 | A.1.1 a) to x) | Type of bushings (HV) : | Porcelain | | | 01 |
| 114 | A.1.1 a) to x) | Type of bushings (LV) : | Porcelain | | | 01 |
| 115 | A.1.1 a) to x) | Type of bushings (tertiary) : | N/A | | | |
| 116 | A.1.1 a) to x) | Type of bushings (neutral) : | Porcelain | | | 01 |
| 117 | | **4.2.5 Tap changer** | | | | |
| 118 | 6.1, A.1.1 a) to x) | Tap changer required and type : | DETC | | | |
| 119 | 6.4.2.a, 6.4.3.c | Voltage variation required on: : | HV | | | |
| 120 | A.1.1 a) to x) | Type of de-energized tap changer (DETC) : | Hand operated | | | |
| 121 | 9.6.17.2.2 | Tap changer switching medium : | liquid | | | |
| 122 | 6.2.a, 6.2.b, 6.2.c | Category of voltage variation : | CFVV | | | |
| 123 | 6.4.1, 6.4.2.b, 6.4.3.b, 6.4.3.c, A.1.1 a) to x), B.4 | Tapping range : | ±2x2,5 | % | | 01 |
| 124 | 6.4.1, 6.4.2.b, 6.4.3.b, 6.4.3.c, A.1.1 a) to x) | Number of tapping positions : | 5 steps | | | |
| 125 | 6.4.3.b | Principal tapping position : | symmetrical | | | |
| 126 | 6,3 | Maximum current tapping position : | 147,3 | A | | 01 |
| 127 | 9.6.17.3.4 | Remote tap-changer cabinet for OLTC : | No | | | 01 |
| 128 | | **4.2.6 Cooling** | | | | |
| 129 | 5.2, 5.1.3, A.1.1 a) to x) | Type of cooling : | KNAN | | | |
| 130 | 5.1.3, 9.3, A.1.2 a) to t) | Temperature rise of insulating liquid when not in accordance with IEC 60076-2 : | N/A | | | |
| 131 | 5.1.3, A.1.2 a) to t) | Temperature rise of winding when not in accordance with IEC 60076-2 or IEC 60076-11 : | N/A | | | |
| 132 | 4.2 a) to e) | Cooling water inlet temperature when not in accordance with IEC 60076-2 and IEC 60076-11 : | N/A | | | |
| 133 | 5,2 | Provision for mounting of cooling fans : | N/A | | | |

| Row | | S-720D Data Sheet for Transformers | | | | Issue |
|---|---|---|---|---|---|---|
| 2 | Tag No. : | *TR-200DE1* | | | | 01 |
| 3 | Service : | *6.6/0.42 kV, 1.6 MVA Power Transformer* | | | | 01 |
| 134 | A.1.1 a) to x) | AF fan motor cabinet : | N/A | | | |
| 135 | | **4.2.7 Miscellaneous requirements** | | | | |
| 136 | | **a. Construction** | | | | |
| 137 | A.1.1 a) to x) | Type of cover for liquid immersed transformer and reactor : | bolted | | | 01 |
| 138 | A.1.1 a) to x) | Surface finish of tank and radiators : | zinc coated | | | 01 |
| 139 | 9.6.18.1 | Painting class required : | VH | | | |
| 140 | A.1.1 a) to x) | Paint shade : | Suplier Standard | | | |
| 141 | | **b. Interface** | | | | |
| 142 | A.1.1 a) to x) | Auxiliary supply voltage details for cooling fans : | N/A | V | | |
| 143 | A.1.1 a) to x) | Auxiliary supply voltage details for RTCC : | N/A | V | | |
| 144 | 8.3 d) to k) | Requirement of current transformer in neutral terminal box : | Yes | | | |
| 145 | A.1.1 a) to x) | Current transformer ratio : | 2500/1 | A | | 01 |
| 146 | A.1.1 a) to x) | Current transformer accuracy class : | 5P20 | | | 01 |
| 147 | A.1.1 a) to x) | Current transformer burden : | 10 | VA | | 01 |
| 148 | | **c. Transport** | | | | |
| 149 | 5.7.4.1, A.1.2 a) to t) | Limiting transportation dimensions (height) : | 2500 ±20 | mm | | 01 |
| 150 | 5.7.4.1, A.1.2 a) to t) | Limiting transportation dimensions (width) : | 1635 ±20 | mm | | 01 |
| 151 | 5.7.4.1, A.1.2 a) to t) | Limiting transportation dimensions (depth) : | 2480 ±20 | mm | | 01 |
| 152 | 5.7.4.1, A.1.2 a) to t) | Limiting transportation weight : | 5050 | kg | | 01 |
| 153 | A.1.1(a to x) | Impact recorder requirement during transportation : | No | | | |
| 154 | 5.7.4.2 | Acceleration in excess of 1 g during transportation : | Yes | | | 01 |
| 155 | | **4.3 Reactor specific requirements** | | | | |
| 156 | A.1.1 a) to x) | Application : | N/A | | | |
| 157 | A.1.1 a) to x) | Rated current : | N/A | A | | |
| 158 | A.1.1 a) to x) | Rated short circuit current : | N/A | A | | |
| 159 | A.1.1 a) to x) | Time to withstand rated short circuit current : | N/A | s | | |
| 160 | 6.5, A.1.1 a) to x) | Impedance at rated voltage and current : | N/A | Ohms | | |
| 161 | | **5. Accessories** | | | | |
| 162 | 9.1.2, A.1.1 a) to x) | Lifting lugs : | Yes | | | |
| 163 | 9.3, A.1.1 a) to x) | Silica gel breather for main tank : | Yes | | | 01 |
| 164 | A.1.1 a) to x) | Type of silica gel breather : | Manual | | | 01 |
| 165 | A.1.1 a) to x), Annex F, Table F.1 | Liquid level indicator : | Yes | | | |
| 166 | A.1.1 a) to x), Annex F, Table F.1 | Magnetic liquid level gauge with alarm and trip contacts : | Yes | | | |
| 167 | 9.6.3.4, 9.6.3.5, A.1.1 a) to x), Annex F, Table F.1 | Buchholz relay with alarm and trip contacts : | Yes | | | 01 |
| 168 | 9.6.1.1, A.1.1 a) to x), Annex F | Pressure Relief Device (PRD) for transformer/reactor tank : | No | | | 01 |
| 169 | 9.6.1.1 | Pressure relief device for OLTC : | No | | | 01 |
| 170 | 9.6.10.3.2 | Pressure relief device for liquid filled cable box : | N/A | | | |
| 171 | 9.6.1.3 | Facility for directing emissions of liquid from the relief device in the direction specified : | No | | | 01 |
| 172 | A.1.1 a) to x) | Sudden pressure relay : | Yes | | | |
| 173 | A.1.1 a) to x), Annex F, Table F.1 | Liquid temperature Indicator with alarm and trip contacts : | Yes | | | |
| 174 | A.1.1 a) to x), Annex F, Table F.2 | Winding temperature indicator with alarm and trip contacts : | Yes | | | |
| 175 | A.1.1 a) to x), Annex F, Table F.3 | Winding temperature measurement type : | PT100 RTD | | | |
| 176 | A.1.1 a) to x) | Cooling fans : | N/A | | | |
| 177 | A.1.1 a) to x) | Redundancy of cooling fans : | N/A | | | |
| 178 | A.1.1 a) to x), Annex F, Table F.1 | Control panel for fan starters (for AF type transformer) : | N/A | | | |
| 179 | A.1.1 a) to x), Annex F, Table F.2 | Marshalling box : | Yes | | | |
| 180 | A.1.1 a) to x) | HV cable box : | Yes | | | |
| 181 | A.1.1 a) to x) | LV cable box : | Yes | | | |
| 182 | A.1.1 a) to x) | Tertiary cable box : | N/A | | | |
| 184 | 9.6.13, A.1.1 a) to x) | Surge arrester requirement : | No | | | |
| 185 | 9.6.13 | Surge arrester class : | N/A | | | 01 |
| 186 | Annex F | Requirement of online dissolved gas analysis (DGA) : | No | | | |
| 187 | Annex F | Requirement of fiber optic temperature sensing : | No | | | |
| 188 | Annex F | Number of channels of fiber optic temperature sensor : | No | | | |
| 189 | 9.6.6.2 | Core earthing terminals at accessible location. : | Yes | | | |
| 190 | 9.6.6.3, A.1.1 a) to x) | Earthing cable lug size : | Suitable for 35mm² earthing cable | mm | | 01 |
| 193 | 9,3 | Alarm contact for diaphragm failure for transformer with diaphragm in conservator : | No | | | 01 |
| 194 | A.1.1 a) to x) | Bi-directional rollers : | Yes | | | |
| 195 | 4.2 f | Anti-condensation heater for cable box : | Yes | | | |
| 196 | 9.6.17.3.5 | Anti-condensation heater for remote tap-changer cabinet : | No | | | 01 |
| 197 | 9.1.2. Note | Requirement of ladder : | No | | | 01 |
| 198 | | **6. Design data from vendor** | | | | |
| 199 | | **6.1 Electrical parameters** | | | | |
| 200 | A.1.1 a) to x), A.1.2 a) to t) | No-load loss at rated voltage and principal tap : | 1,08 | kW | | 01 |
| 201 | A.1.1 a) to x), A.1.2 a) to t) | Load loss at rated voltage and principal tap : | 12 | kW | | 01 |

| Row | | S-720D Data Sheet for Transformers | | | | Issue |
|---|---|---|---|---|---|---|
| 2 | Tag No. : | *TR-200DE1* | | | | 01 |
| 3 | Service : | *6.6/0.42 kV, 1.6 MVA Power Transformer* | | | | 01 |
| 202 | A.1.1 a) to x) | Percentage regulation at unity power factor : | 0,93 | % | | 01 |
| 203 | A.1.1 a) to x) | Percentage regulation at 0.8 lagging power factor : | 4,265 | % | | 01 |
| 204 | 5.1.1, A.1.1 a) to x) | Efficiency at unity power factor, 50 % load : | 99,49 | % | | 01 |
| 205 | 5.1.1, A.1.1 a) to x) | Efficiency at unity power factor, 100 % load : | 99,19 | % | | 01 |
| 206 | 5.1.1, 6.4.3.e, A.1.1 a) to x) | Efficiency at 0.8 lagging power factor, 50 % load : | 99,37 | % | | 01 |
| 207 | 5.1.1, 6.4.3.e, A.1.1 a) to x) | Efficiency at 0.8 lagging power factor, 100 % load : | 98,99 | % | | 01 |
| 208 | 6.5, 6.5, 6.5 , A.1.1 a) to x), B.4 | Percentage impedance on AN rating at principal tap : | 6 | % | | 01 |
| 209 | 5.7.2 , A.1.1 a) to x) | Zero sequence impedance : | 0,0064 | Ohms/ph | | 01 |
| 210 | | **6.2 Construction** | | | | |
| 211 | A.1.1 a) to x) | Winding conductor material : | copper | | | 01 |
| 212 | | **Winding type** | | | | |
| 213 | A.1.1 a) to x) | HV : | Non-foil | | | 01 |
| 214 | A.1.1 a) to x) | LV : | foil | | | 01 |
| 215 | A.1.1 a) to x) | Tertiary : | Select | | | 01 |
| 216 | A.1.1 a) to x) | Weight of core and windings : | 2750 | kg | | 01 |
| 217 | A.1.1 a) to x), A.1.2 a) to t) | Total weight with insulating liquid : | 5050 | kg | | 01 |
| 218 | A.1.1 a) to x) | Weight of insulating liquid : | 750 | kg | | 01 |
| 219 | 5.8, A.1.1 a) to x) | Insulating liquid : | synthetic organic liquid | | | 01 |
| 220 | A.1.1 a) to x) | On-load tap changer make : | N/A | | | 01 |
| 221 | A.1.1 a) to x) | On-load tap changer power required : | N/A | kW | | 01 |
| 222 | A.1.1 a) to x), A.1.2 a) to t) | Transformer overall assembled length : | 2500 ±20 | mm | | 01 |
| 223 | A.1.1 a) to x), A.1.2 a) to t) | Transformer overall assembled width : | 1635 ±20 | mm | | 01 |
| 224 | A.1.1 a) to x), A.1.2 a) to t) | Transformer overall assembled height : | 2480 ±20 | mm | | 01 |
| 225 | A.1.1 a) to x) | Dimension details for remote tap changer cabinet length : | N/A | mm | | 01 |
| 226 | A.1.1 a) to x) | Dimension details for remote tap changer cabinet width : | N/A | mm | | 01 |
| 227 | A.1.1 a) to x) | Dimension details for remote tap changer cabinet height : | N/A | mm | | 01 |
| 228 | A.1.1 a) to x), A.1.2 a) to t) | Transportation weight : | 5050 | kg | | 01 |
| 229 | 5.7.3, A.1.1 a) to x), A.1.2 a) to t) | Sound power level : | 60 | dB(A) | | 01 |
| 230 | 5.8, A.1.1 a) to x), A.1.2 a) to t) | Use of environmentally harmful materials : | No | | | 01 |
| 231 | 4.2.f | Seismic zone certification : | No | | | 01 |
| 232 | | **7. Testing requirements** | | | | |
| 233 | 11.1.3.a | Temperature rise test : | Yes | | | |
| 234 | 6.6.b | Temperature rise test at tapping other than the maximum current tapping : | No | | | |
| 235 | 11.1.3.d | Power consumption of fans and liquid pump motors : | N/A | | | |
| 236 | 11.1.3.b, A.1.2 a) to t) | Dielectric type tests : | Yes | | | |
| 237 | 11.1.3.c | Sound level test : | Yes | | | |
| 238 | 11.1.3.e | Measurement of no-load loss and current at 90 % and 110 % of rated voltage : | Yes | | | |
| 239 | 11.1.4.a, A.1.2 a) to t) | Dielectric special tests : | No | | | |
| 240 | 11.1.4.b, A.1.2 a) to t) | Winding hot-spot temperature-rise measurements : | No | | | |
| 241 | 11.1.4.c, A.1.2 a) to t) | Determination of capacitances windings-to-earth and between windings : | Yes | | | 01 |
| 242 | 11.1.4.e, A.1.2 a) to t) | Determination of transient voltage transfer characteristics : | Yes | | | |
| 243 | 11.1.4.f, A.1.2 a) to t) | Measurement of zero-sequence impedance : | Yes | | | |
| 244 | 11.1.4.g, A.1.2 a) to t) | Short-circuit withstand test : | Yes | | | |
| 245 | 11.1.4.i, A.1.2 a) to t) | Vacuum deflection test : | No | | | |
| 246 | 11.1.4.j, A.1.2 a) to t) | Pressure deflection test : | No | | | |
| 247 | 11.1.4 | Pressure deflection test for OLTC tank : | No | | | |
| 248 | 11.1.4.k, A.1.2 a) to t) | Vacuum tightness test : | No | | | |
| 249 | 11.1.4 | Vacuum tightness test for OLTC tank : | No | | | |
| 250 | 11.1.4.l, A.1.2 a) to t) | Measurement of frequency response : | No | | | |
| 251 | 11.1.4.m, A.1.2 a) to t) | Check of external coating : | Yes | | | |
| 252 | A.1.2 a) to t) | Measurement of dissolved gasses before and after dielectric tests : | Yes | | | |
| 253 | 11.1.4.o, A.1.2 a) to t) | Mechanical test : | Yes | | | |
| 254 | 11.1.4 | Simulated transformer/motor on load start test for unit transformer : | N/A | | | |
| 255 | 11.1.4 | Routine test for Ex 'P' type transformer in accordance with IEC 60079-13 : | N/A | | | |
| 256 | 11.1.4 | Routine tests for Ex 'O' type transformer in accordance with IEC 60079-6 : | N/A | | | |

MF Trasformatori srl

CERTIFICATE N° 0724089

DATE 25/07/2024

# CHECK CONTROL TRANSFORMER

**Integred diagnostic method for the control of electric devices**

KIT N° 1 SERIAL NUMBER 181023/2 CUSTOMER N° 523/23 SITE ---

| DESCRIPTION | TYPE INSTRUMENT | MANUFACTURER | POWER (KVA) | VOLTAGE V1/V2 | COMMUTATOR X NO-LOAD ☐ UNDER CHARGE | HEAT SINKING FLUID | INSTALLATION | MANUF. YEAR | SILICA GEL |
|---|---|---|---|---|---|---|---|---|---|
| STANDARD FEATURES OF THE EQUIPMENT | TRANSFORMER | MF | 1600 | 6600 / 420 | MAIN TANK | KNAN | --- | 2024 | YES ☐ NO ☐ |

| SPECIFICATIONS OF THE ANALYSED FLUID | OIL TYPE | OIL WEIGHT (kg) | NOME OF PRODUCER | COMMERCIAL CODE OR NAME |
|---|---|---|---|---|
| | SYNTHETIC OIL | 750 | | MIDEL 7131 |

| DRAWING DATA | SAMPLER'S NAME | DATA SAMPLING | DATA OF RICEIPT | OIL T deg C | AMB. T deg C | DRAWING POSITION | OIL LEVEL | LEAKS OIL | COLOUR OF SILICAGEL |
|---|---|---|---|---|---|---|---|---|---|
| | MF TRASFORMATORI | 23/07/2024 | 23/07/2024 | -- | --- | BUCHHOLZ | | ☐ YES X NO | ☐ BLUE ☐ ROSE |

| PARTICULAR MAINTENANCE DONE ON THE TRANSFORMER | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| | | |

**PURCHASER** ROSETTI MARINO SPA

L. PIGNATELLI ON BEHALF OF CROSS WIND

☑ WITNESS ☐ INFORMATION

☐ REVIEW ☐ SPOT WITNESS

DATE 25/7/2024

Witnessed X Reviewed ☐

Lastene Bevoni

on behalf of RMG

Date 25-07-2024

IT IS FORBIDDEN TO REPRODUCE EVEN IN PARTIALLY THIS CERTIFICATE WITHOUT AUTHORIZATION OF MF TRASFORMATORI SRL

**MF TRASFORMATORI**: Sede Amm.:Via S.Anna 25011 Calcinato(BS) PIVA 03550350171 Capitale Sociale € 3'000'000 Tel. 030/9980253 030/9636020 Fax. 030/9980218

MF Trasformatori srl

CERTIFICATE N° 0724089

DATE 25/07/2024

# Results of analysed parameters

KIT N° 1 MANUFACTURING N° 181023/2 CUSTOMER N° 523/23 SITE --- POWER (KVA) 1600

| ANALYSIS DATE | MEASURE UNIT | 23/07/2024 | | | | VALORE DI SOGLIA EN 61203 | VALORE OLIO EN 61099 | NORMA DI RIFERMENTO |
|---|---|---|---|---|---|---|---|---|
| ANALYTIC PARAMETERS | | ANALYST BEDUSCHI S. | ANALYST | ANALYST | ANALYST | | | |
| | | VALUE | VALUE | VALUE | VALUE | | | |
| CARBON MONOXIDE CO | µl/l | 47 | | | | 300 | 80 | NORME ANSI CEI 10 - 10 EN 60599 CEI 10 - 28 |
| HYDROGEN H2 | µl/l | <2 | | | | 100 | 15 | |
| METHANE CH4 | µl/l | <2 | | | | 120 | 5 | |
| ETHYLENE C2H4 | µl/l | <2 | | | | 50 | 2 | |
| ETHANE C2H6 | µl/l | <2 | | | | 65 | 5 | |
| ACETHYLENE C2H2 | µl/l | <2 | | | | 35 | 1 | |
| BURNING GAS | µl/l | 47 | | | | 720 | 108 | |
| C2H2/C2H4 | ----- | / | | | | / | / | |
| CH4/H2 | ----- | / | | | | / | / | |
| C2H4/C2H6 | ----- | / | | | | / | / | |
| I.E.C. CODES | ----- | 0 0 0 | | | | / | / | |
| OXYGEN O2 | µl/l | 2540 | | | | 17500 | 3000 | CEI 10 - 10 EN 60599 CEI 10 - 28 MF |
| NYTROGEN N2 | µl/l | 6041 | | | | 72500 | 10000 | |
| CARBON DIOXIDE CO2 | µl/l | 204 | | | | 2500 | 250 | |
| CO2/CO | µl/l | 4,34 | | | | / | / | |
| TOTAL GASES | µl/l | 8832 | | | | 93000 | / | |
| BREAKDOWN-VOLTAGE | KV | 79,3 | | | | > 30 | > 50 | CEI 61203 / CEI 61099 |
| ASPECT | ----- | CLEAR | | | | LIMPIDO | LIMPIDO | |
| COLOUR | ----- | 100 | | | | < 200 | < 200 | |

NOTE: the sampling will be stocked for one month in our laboratory

**MF TRASFORMATORI**: Sede Amm.:Via S.Anna 25011 Calcinato(BS) PIVA 03550350171 Capitale Sociale € 3'000'000 Tel. 030/9980253 030/9636020 Fax. 030/9980218

L. PIGNATELLI ON BEHALF OF CROSSWIND

☒ WITNESS ☐ INFORMATION

☐ REVIEW ☐ SPOT WITNESS

DATE 25/7/2024

Witnessed ☒ Reviewed ☐

Lastene Bevoni

on behalf of RMG

Date 25-07-2024

MF Trasformatori srl

CERTIFICATE N° 0724089

DATE 25/07/2024

KIT N° 1 SERIAL N° 181023/2 CUSTOMER N° 523/23 SITE --- POWER (KVA) 1600

# Main trend parameters






















L. PIGNATELLI ON BEHALF OF CROSSKINS

☑ WITNESS ☐ INFORMATION

☐ REVIEW ☐ SPOT WITNESS

DATE 25/7/2024

Witnessed ☒ Reviewed ☐
Lastene Bevoni
on behalf of RMG
Date 25-07-2024

## Diagnosis and degradation of the transformer

| | |
|---|---|
| General insulation conditions | NORMAL |
| Fluid conditions | NORMAL |
| Active part conditions | NORMAL |
| Solid insulation condition | NORMAL |
| Important increments of the analysed parameters | /////// |

## Advised operation

| | |
|---|---|
| Next diagnostic control | AFTER 12 MONTHS |
| Other diagnostic proves | /// |
| Fuid operations | /// |
| General operation | /// |
| Note | //// |

ORDINE DEGLI INGEGNERI DELLA PROVINCIA DI BRESCIA
A 6659
Ingegnere
MARCO FESTA
Industriale

CERTIFICATION RELEASED BY MFS LABORATORY.

MF Trasformatori srl
Sede Amm. e Stabilimento: Tel. 030/9636020-028-596
Loc. S.Anna, 22 / 24 FAX 030/9980218
25011 Calcinato (BS) - Italy Partita Iva 03550350171
info@mftrasformatori.it Codice Fiscale 01547220176

Member of CISQ Federation
RINA CERTIFIED MANAGEMENT SYSTEM ISO 9001 - ISO 14001
THE GLOBAL COMPACT WE SUPPORT

# ROSETTI MARINO SPA

## TEST REPORT No. 181023/2

**Customer :** ROSETTI MARINO SPA **Serial No.:** 181023/2

**MF Job No.** 523/23 **Project No. :** 1600ToECO6,6/0.42 - TR-200DE1

CE **REFERENCE STANDARDS :**
EU/548/2014
ECO - TRANSFORMER

Reference Standards: UE/548/2014 & CEI EN 60076 - 1

DATE: 10/11 REVISION: 1

## RATING PLATE DATA

| | | | | | |
|---|---|---|---|---|---|
| Power ( kVA ) : | 1600 | | | Type : | OIL |
| Primary Voltage ( kV ) : | 6,6 ±2×2,5% | | | Connection Group : | Dyn11 |
| Primary Current ( A ): | 140,0 | | | Short-circuit Voltage ( % ) : | 6 |
| Primary Insul. Class ( kV ) : | AC 20 | BIL | 60 | Thermal Insulation Class : | A / A |
| Secondary Voltage ( V ) : | 420 | | | Temperature Rise ( K ) : | 60/65 |
| Secondary Current ( A ) : | 2199 | | | Transformer Weight ( Kg ) | 5050 |
| Secondary Insul. Class : ( kV ) : | AC 3 | BIL | 0 | Oil Weight ( Kg ) : | 750 |
| Frequency ( Hz ) : | 50 | | | | |

## TRANSFORMER RATIO MEASUREMENT AND CHECK OF POLARITY AND CONNECTIONS

| Tap-Changer Pos. | | Primary Voltage | Secondary Voltage | U-Phase | V-Phase | W-Phase | Nominal Ratio |
|---|---|---|---|---|---|---|---|
| + + | 1 | 6930 | 420 | 28,549 | 28,550 | 28,549 | 28,58 |
| + | 2 | 6765 | 420 | 27,882 | 27,882 | 27,881 | 27,90 |
| 0 | 3 | 6600 | 420 | 27,215 | 27,215 | 27,216 | 27,22 |
| - | 4 | 6435 | 420 | 26,546 | 26,547 | 26,546 | 26,54 |
| - - | 5 | 6270 | 420 | 25,877 | 25,878 | 25,877 | 25,86 |

The polarity and connection check have been carried out during the transformer ratio measurement.
Measured Connection: *Dyn11*

## WINDING RESISTANCE MEASUREMENT

| | | | |
|---|---|---|---|
| MV | R-1U1V | 0,1628 | Ohm |
| | R-1V1W | 0,1631 | Ohm |
| | R-1W1U | 0,1648 | Ohm |

Measured at ambient temperature : 32,8 ° C

| | | | |
|---|---|---|---|
| LV | R-2U2V | 0,5712 | mOhm |
| | R-2V2W | 0,5664 | mOhm |
| | R-2W2U | 0,5805 | mOhm |

## CHECK OF AUXILIARIES

| Testing | Grounded Winding |
|---|---|
| auxiliary | Grounded |

| Test Voltage ( V ) | Test Frequency | Test Duration |
|---|---|---|
| 2500 | 50 Hz | 60 Seconds |

During the test no voltage failure occurred.

Result : POSITIVE



| Name and signature of authorized person: | Date | Witnessed by : |
|---|---|---|
| SANDRINI MATTIA | 25/07/24 | ---------- |

MF Trasformatori srl
Località S. Anna N. 22/24
25011 CALCINATO BRESCIA
Tel. +39 (0)30-9636596
Codice Fiscale 01547220176
Partita IVA IT 03550350171

L. PIGNATELLI ON BEHALF OF CROSSWIND

☑ WITNESS ☐ INFORMATION
☐ REVIEW ☐ SPOT WITNESS
DATE 25/7/2024

Witnessed ☒ Reviewed ☐
Lastene Bevoni
on behalf of RMG
Date 25-07-2024

MF Trasformatori srl
Sede Amm. e Stabilimento: Loc. S.Anna, 22 / 24 25011 Calcinato (BS) - Italy info@mftrasformatori.it
Tel. 030/9636020-028-596 FAX 030/9980218 Partita Iva 03550350171 Codice Fiscale 01547220176
Member of CISQ Federation RINA CERTIFIED MANAGEMENT SYSTEM ISO 9001 - ISO 14001
THE GLOBAL COMPACT WE SUPPORT

Reference Standards: UE/548/2014 & CEI EN 60076 - 1

DATE: 10/11 REVISION: 1

# TEST REPORT No. 181023/2

## INSULATION TEST WITH APPLIED VOLTAGE

| Testing Winding | Grounded Winding | Tap-Changer Position | Test Voltage ( V ) | Test Frequency | Test Duration |
|---|---|---|---|---|---|
| MV | LV | 3 | 20000 | 50 Hz | 60 Seconds |

During the test no voltage failure occurred.

Result : POSITIVE

| Testing Winding | Grounded Winding | Tap-Changer Position | Test Voltage ( V ) | Test Frequency | Test Duration |
|---|---|---|---|---|---|
| LV | MV | 3 | 3000 | 50 Hz | 60 Seconds |

During the test no voltage failure occurred.

Result : POSITIVE

## INSULATION TEST WITH INDUCED VOLTAGE

| Fed Winding | Tap-Changer Position | Test Voltage ( V ) | Test Frequency | Test Duration |
|---|---|---|---|---|
| LV | 3 | 840 | 100 Hz | 60 Seconds |

During the test no voltage failure occurred.

Result : POSITIVE

## MEASUREMENT OF NO-LOAD LOSSES AND NO-LOAD CURRENT

| Vm Phase Volt | Vm Line Volt | I U-Phase Ampere | I V-Phase Ampere | I W-Phase Ampere | Im Ampere | Losses Watt | Test Frequency | Io % |
|---|---|---|---|---|---|---|---|---|
| 242,58 | 420 | 3,472 | 2,546 | 3,314 | 3,11 | 1061 | 50 Hz | 0,14 |

| Fed Winding |
|---|
| LV |

| Test Temperature | |
|---|---|
| 32,8 | °C |

Measured No-Load Losses ( W ) : 1061 Contract No-Load Losses ( W ) : 1080 Tolerance : + 0%

## MEASUREMENT OF SHORT-CIRCUIT VOLTAGE, SHORT-CIRCUIT IMPEDANCE AND LOAD-LOSSES

AmbT : 32,ℓ °C

| Vm Phase Volt | Vm Line Volt | I U-Phase Ampere | I V-Phase Ampere | I W-Phase Ampere | Im Ampere | Losses Watt | Test Frequency | Fed Winding | Winding in S/C | Reference Power | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 179,48 | 311 | 111,73 | 110,04 | 110,95 | 110,91 | 6355 | 50 Hz | MV | LV | 1600 | kVA |

Detected Load-Losses at 75 °C ( W ) : 11376 Contract Load-Losses ( W ) : 12000 Tolerance : + 0%

Detected Short-circuit Voltage at 75 °C ( % ) : 5,95 Contract Short-circuit Voltage ( % ) : 6 Tolerance : ± 10 %

**Measured Total Losses ( W ) : 12437 Contract Total Losses ( W ) : 13080 Tolerance : + 0%**

## TIGHTNESS TEST / OIL LEAKAGE TEST

An adequate pressure of 30kPa was applied and maintained for 8 hours. This pressure was applied using a column of liquid (oil).

*Result of check :* POSITIVE



| Name and signature of authorized person: | Date | Witnessed by : |
|---|---|---|
| SANDRINI MATTIA | 25/07/24 | ---------- |

MF Trasformatori srl
Località S. Anna N. 22/24
25011 CALCINATO BRESCIA
Tel. +39 (0)30-9636596
Codice Fiscale 01547220176
Partita IVA IT 03550350171

L. PIGNATELLI ON BEHALF OF CROSSWIND

☑ WITNESS ☐ INFORMATION
☐ REVIEW ☐ SPOT WITNESS

DATE 25/7/2024

Witnessed ☒ Reviewed ☐
Lastene Bevoni
on behalf of RMG
Date 25-07-2024

MF Trasformatori srl
Sede Amm. e Stabilimento: Loc. S.Anna, 22 / 24 25011 Calcinato (BS) - Italy
Tel. 030/9636020-028-596 FAX 030/9980218 Partita Iva 03550350171
info@mftrasformatori.it Codice Fiscale 01547220176

Member of CISQ Federation RINA CERTIFIED MANAGEMENT SYSTEM ISO 9001 - ISO 14001
THE GLOBAL COMPACT WE SUPPORT

Reference Standards: UE/548/2014 & CEI EN 60076 - 1

DATE: 10/11 REVISION: 1

## TEST REPORT No. 181023/2

### MEASUREMENT OF INSULATION RESISTANCE ----- MV - ( LV + G ) ------

5 kV - 1 minute : 2,03 GΩ

### MEASUREMENT OF INSULATION RESISTANCE ----- LV - ( MV + G ) ------

1 kV - 1 minute : 2,64 GΩ

### TIGHTNESS TEST

Result of check : POSITIVE

### MEASUREMENT OF CAPACITANCE AND DISSIPATION FACTOR ----- MV - ( LV+ G ) ------

C : 7,754 nF @ 12 kV Dissipation Factor : 0,298% @ 12 kV

### MEASUREMENT OF CAPACITANCE AND DISSIPATION FACTOR ----- LV - ( MV+ G ) ------

C : 11,92 nF @ 1 kV Dissipation Factor : 0,342% @ 1 kV

### MEASUREMENT OF ZERO-SEQUENCE IMPEDANCE

V :1,4192 I1 : 160,58 I2 : 161,02 Im : 160,8 Z ( V/Im ) . 0,0088 Z ( ZX3 ) : 0,02648 Ω/PHASE
26,47761 mΩ/PHASE

### ENCLOSURE PAINTING CHECK

Enclosure painting : RAL 7031 CHECK POSITIVE

### FUNCTIONAL TEST ON ALL ACCESSORIES

THE FUNCTIONALITY OF THE AUXILIARY ACCESSORIES WAS CHECKED DURING THE FAT CHECK POSITIVE

### MEASUREMENT OF INSULATION RESISTANCE & APPLIED MAGNETIC CORE - ( TANK - CORE-FRAME )

2,5 kV - 1 min. 50 Hz During the test no voltage failure occurred. Result : POSITIVE

### MEASUREMENT OF INSULATION RESISTANCE & APPLIED MAGNETIC CORE-FRAME - ( TANK - CORE )

2,5 kV - 1 min. 50 Hz During the test no voltage failure occurred. Result : POSITIVE



| Name and signature of authorized person: | Date | Witnessed by : |
|---|---|---|
| SANDRINI MATTIA | 25/07/24 | ---------- |

MF Trasformatori srl
Località S. Anna N. 22/24
25011 CALCINATO BRESCIA
Tel. +39 (0)30-9636596
Codice Fiscale 01547220176
Partita IVA IT 03550350171

L. PIGNATELLI ON BEHALF OF CISQ RINA

☑ WITNESS ☐ INFORMATION
☐ REVIEW ☐ SPOT WITNESS
DATE 25/7/2024

Witnessed ☒ Reviewed ☐
Lastene Bevoni
on behalf of RMG
Date 25-07-2024

*Directive 2009/125/EU*

# *DECLARATION OF CONFORMITY*

*No. 374/23*

*WE*

MF Trasformatori srl

*DECLARE THAT*

*the transformer* 1600ToECO6,6/0.42 - TR-200DE1 *no.* 181023/2

*Type*

*OIL*

L. PIGNATELLI ON BEHALF OF CROSS WIND

☐ WITNESS ☐ INFORMATION
☑ REVIEW ☐ SPOT WITNESS
DATE 25/7/2024

***Respects requirements of the Directive 2009/125/EU***

*with reference to Regulation*
*EU/548/2014*

*Other Specifications*

.....

.....

*Name and signature of authorized person*
Ing. Festa M.

*Date*

*25/07/24*

MF Trasformatori srl
Località S. Anna N. 22/24
25011 CALCINATO BRESCIA
Tel. +39 (0)30-9636596
Codice Fiscale 01547220176
Partita IVA IT 03550350171

Witnessed ☐ Reviewed ☒
Lastene Bevoni
on behalf of RMG
Date 25-07-2024

*Directive 2014/30/EU*

# *DECLARATION OF CONFORMITY*

*No. 291/24*

*WE*

MF Trasformatori srl

*DECLARE THAT*

the transformer 1600ToECO6,6/0.42 - TR-200DE1 no. 181023/2

*Type*

OIL

***Respects the electromagnetic compatibility requirements***
***Directive 2014/30/EU***

*with reference to the harmonized standards*
*EN61000-6-1 Electromagnetic compatibilty emissions*
*EN61000-6-3 Electromagnetic compatibility immunity*

L. PIGNATELLI ON BEHALF OF
CROSS WORKS

☐ WITNESS ☐ INFORMATION
☑ REVIEW ☐ SPOT WITNESS

DATE 25/7/2024

*Name and signature of authorized person*
Ing. Festa M.

*Date*

*25/07/24*

MF Trasformatori srl
Località S. Anna N. 22/24
25011 CALCINATO BRESCIA
Tel. +39 (0)30-9636596
Codice Fiscale 01547220176
Partita IVA IT 03550350171

Witnessed ☐ Reviewed ☒
Lastene Bevoni
on behalf of RHG
Date 25-07-2024

MF Trasformatori srl

Sede Amm. e Stabilimento:
Loc. S.Anna 22 / 24
25011 Calcinato (BS) - Italy
info@mftrasformatori.it

Tel. +39 030/9636020-028-596
FAX +39 030/9980218
Partita Iva 03550350171
Codice Fiscale 01547220176

# Oil Certificate

Calcinato, 25/07/24

WE

MF Trasformatori s.r.l.

DECLARE THAT

the oil contained inside the MF transformer no. 181023/2

TYPE

MIDEL 7131

is in conformity with the Standards CEI EN 60296

" Fluids for electrotechnical applications - new mineral insultating oils for transformers"

L. PIGNATELLI ON BEHALF OF CROSSWIND

☐ WITNESS ☐ INFORMATION
☐ REVIEW ☐ SPOT WITNESS
DATE 25/7/2024

Signature and stamp
Ing. Festa M.

MF Trasformatori srl
Località S. Anna N. 22/24
25011 CALCINATO BRESCIA
Tel. +39 (0)30-9636596
Codice Fiscale 01547220176
Partita IVA IT 03550350171

Witnessed ☐ Reviewed ☒
Lastene Bevoni
on behalf of RMG
Date 25-07-2024

MF Trasformatori srl

Sede Amm. e Stabilimento:
Loc. S.Anna 22 / 24
25011 Calcinato (BS) - Italy
info@mftrasformatori.it

Tel. +39 030/9636020-028-596
FAX +39 030/9980218
Partita Iva 03550350171
Codice Fiscale 01547220176

# *WARRANTY*

*Calcinato, 25/07/24*

*Starting from this date the transformer is guaranteed for 36 MAX 48 against any manufacturing defect ( accessories not included ).*
*The incorrect use and/or modifications, which have not been expressly approved by the manufacturer - the removal of trade marks included - imply automatically the expiration of this guarantee.*

*Transformer No.:* *181023/2*

L. PIGNATELLI ON BEHALF OF CROSSWIND

☐ WITNESS ☐ INFORMATION
☒ REVIEW ☐ SPOT WITNESS
DATE 25/7/2024

*Signature and stamp*
Ing. Festa M.

MF Trasformatori srl
Località S. Anna N. 22/24
25011 CALCINATO BRESCIA
Tel. +39 (0)30-9636596
Codice Fiscale 01547220176
Partita IVA IT 03550350171

Witnessed ☐ Reviewed ☒
Lastena Bevoni
on behalf of RMG
Date 25-07-2024

ROSETTI MARINO | PROVERLIS | CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83001-CEC | : 6.6/0.415 kV Transformer / 6.6KV HV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD_B-200/LD_B-100 |
| **TASK** | code | C10002134 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX10 Multicore Electrical Control Cable |

## CABLE DATA

Type: Cu Cl.2/XLPE/LSZH — Cores/Size mm²: 7X1,5 mm2 — Color: GREY

From: CP-200E1 — To: SG-100D1

| | | |
|---|---|---|
| 1 | Check cable physical integrity | OK |
| 2 | Check cable data against latest cable schedule. | OK |
| 3 | Check cable routing against latest drawings (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to latest project Specification. | NA |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Check cable and core marking against latest drawings | PL |
| 7 | Check cable labelling is in accordance with latest specification. | PL |
| 8 | Check cable glands suit for cable type and are in accordance with latest specification. | OK |
| 9 | Check terminations are in accordance with latest termination diagram. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check gland plate for single core cables is non magnetic. | NA |
| 12 | If required produce Red Line Mark Up for "AS BUILT" | |

| | | |
|---|---|---|
| CONTINUITY | CORE 1 / All cores+screen+armour+earth | 0.7 |
| | CORE 2 / All cores+screen+armour+earth | 0.7 |
| | CORE 3 / All cores+screen+armour+earth | 0.7 |
| | CORE 4 / All cores+screen+armour+earth | 0.7 |
| | CORE 5 / All cores+screen+armour+earth | 0.7 |
| | CORE 6 / All cores+screen+armour+earth | 0.7 |
| | CORE 7 / All cores+screen+armour+earth | 0.7 |
| | CORE 8 / All cores+screen+armour+earth | NA |
| | CORE 9 / All cores+screen+armour+earth | NA |
| | CORE 10 / All cores+screen+armour+earth | NA |

| | | |
|---|---|---|
| INSULATION | CORE 1 | >999 |
| | CORE 2 | >999 |
| | CORE 3 | >999 |
| | CORE 4 | >999 |
| | CORE 5 | >999 |
| | CORE 6 | >999 |
| | CORE 7 | >999 |
| | CORE 8 | NA |
| | CORE 9 | NA |
| | CORE 10 | NA |
| | SCREEN | NA |
| | EARTH | NA |
| | ARMr | NA |
| | TEST VOLTS | 1000 |

**TESTING INSTRUMENTS USED**

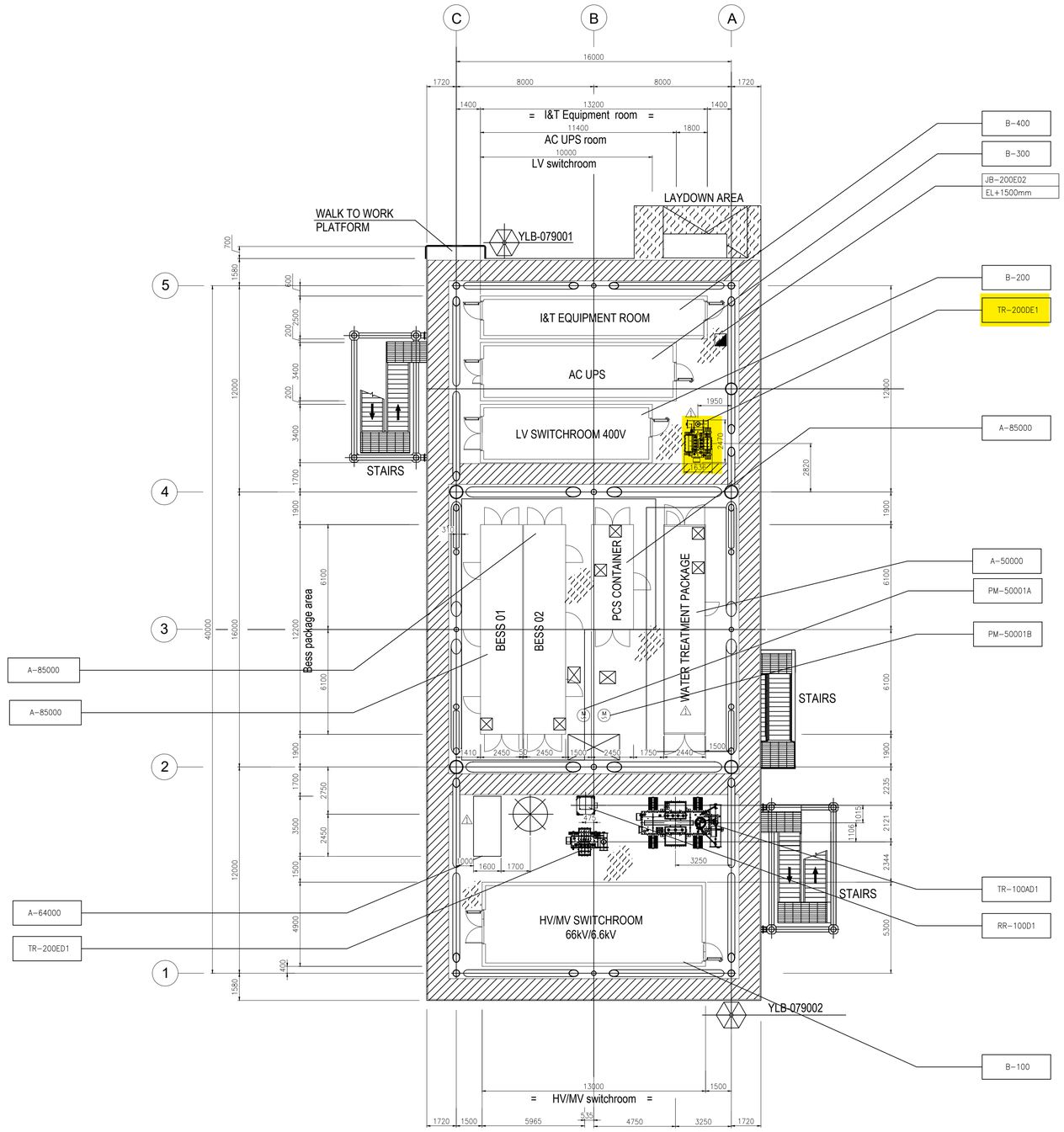
| | |
|---|---|
| TYPE / SERIAL N° : KEW3125A S/N: W8330207<br>Calibration certificate N° and date: N°7722/24 _ 10/07/2024 | TYPE / SERIAL N° : FLUKE 175 S/N:AW1/018(17140769)<br>Calibration certificate N° and date: N°7715/24 _ 10/07/2024 |
| TYPE / SERIAL N° :<br>Calibration certificate N° and date: | TYPE / SERIAL N° :<br>Calibration certificate N° and date: |

Comments: Note 4 : refer to PL C30000679

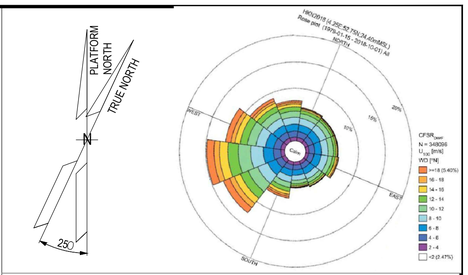
| **Page 1/1** | Performed by | ☐ WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Paolo Schintu | |
| **Date** | 2024-11-07 | 2024-11-22 | |
| **Signature** | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-07T15:33:28.627Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-22T13:03:48.115Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20101**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

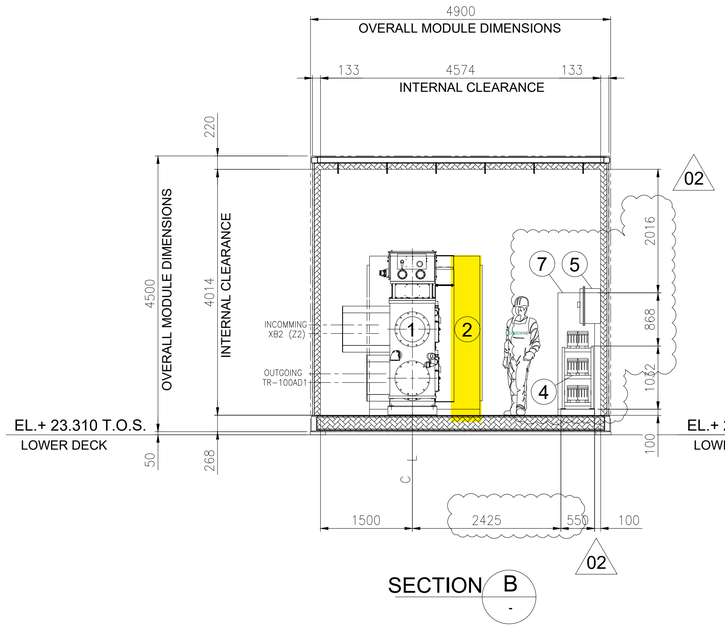
CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

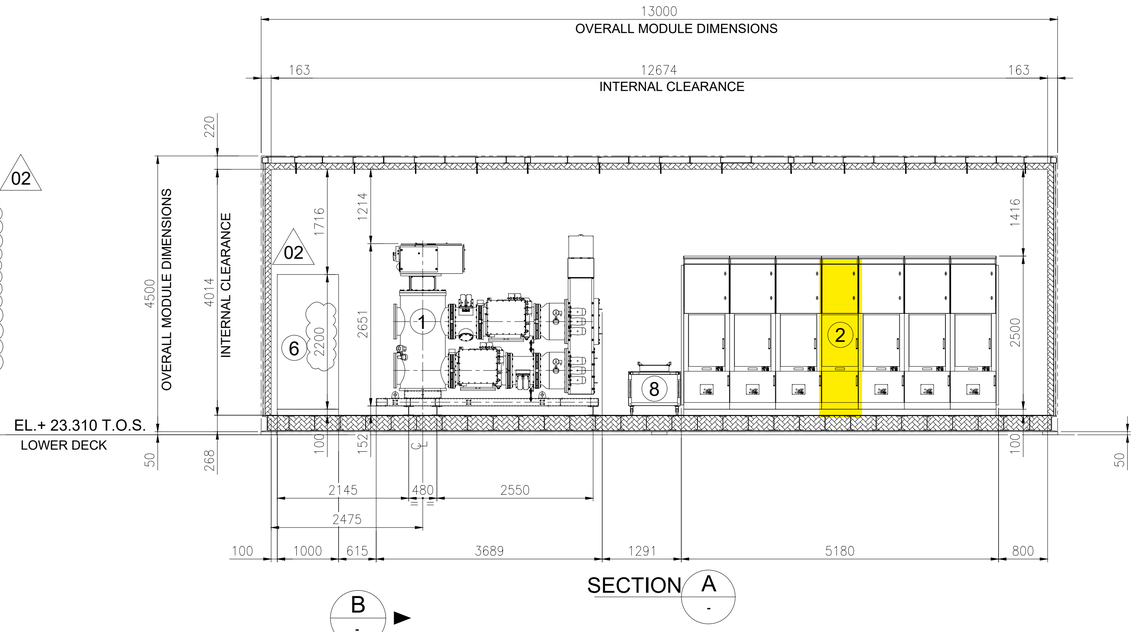
| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01 |

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

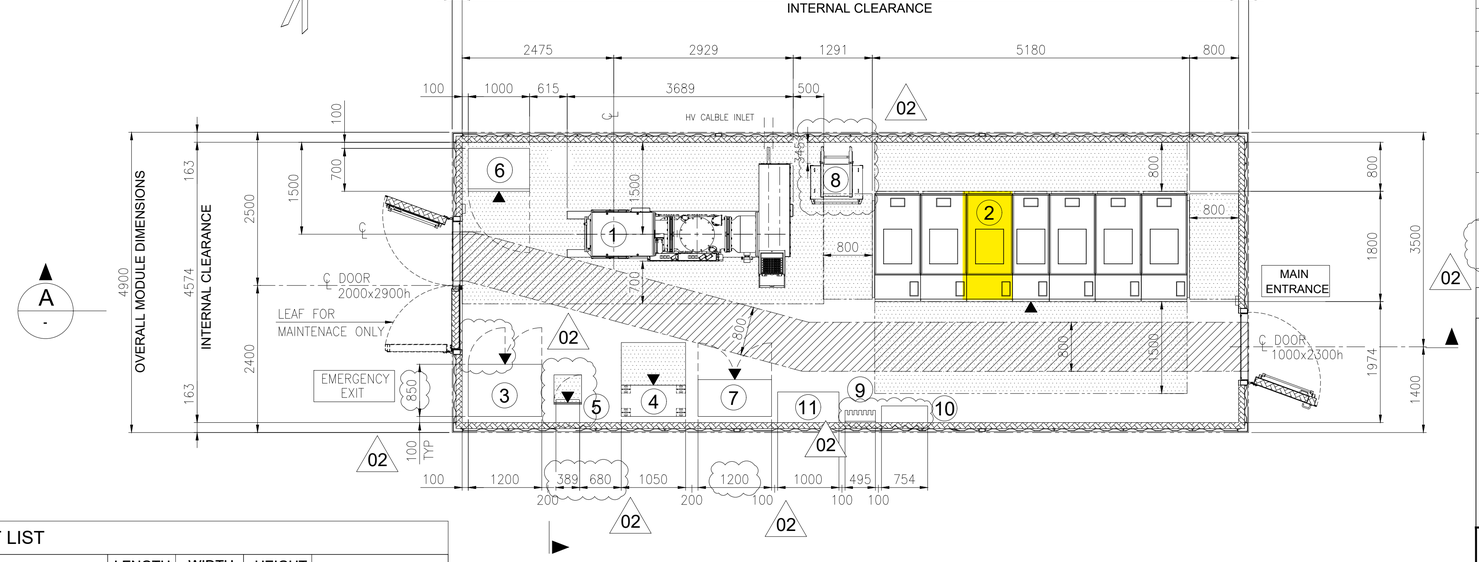
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02




SECTION B / -

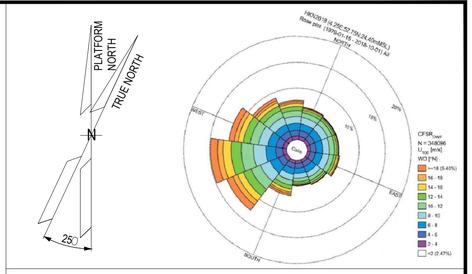



SECTION A / -




## EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | HNA6-AFA70 | 66kV SWITCHGEAR (GIS) | 3689 | 2025 | 2651 | |
| 2 | SG-100D1 | 6.6kV SWITCHGEAR | 5180 | 1800 | 2500 | |
| 3 | UP-200F1 | DC UPS PANEL | 1200 | 850 | 2105 | |
| 4 | BA-200F1 | DC UPS BATTERY RACK | 1050 | 510 | 1272 | |
| 5 | CB-200F1 02 | ISOLATOR FOR DC UPS | 452 | 377 | 634 | |
| 6 | CP-100E1 | 66 kV SWITCHGEAR LOCAL CONTROL PANEL | 1000 | 700 | 2200 | 02 |
| 7 | B100-HSB-001 | DISTRIBUTION & HVAC PANEL - HV MV ROOM | 1200 | 600 | 1900 | |
| 8 | - | SERVICE TROLLEY FOR 6.6kV SWITCHGEAR | 943 | 862 | 874 | |
| 9 | - | TOOL BOX | 495 | 200 | 200 | |
| 10 | - | SUBSTATION LIFE SAVING & INTERVENTION KIT | 754 | 270 | 840 | |
| 11 | - | TABLE | 1000 | 500 | 750 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

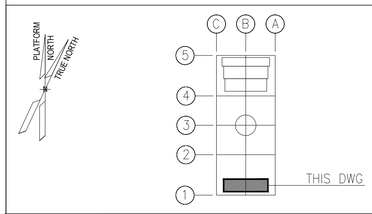
## LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| 66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING | 1723001595-EL-DA-00006 |
| CIRCUIT AND WIRING DIAGRAM | 1723001595-EL-DG-00015 |
| SG-100D1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00006 |
| DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00003 |
| DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00010 |
| B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00014 |

## KEY PLAN




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20104**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 10/11/2023 | DSF | CB/AMA | OYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN GPA | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20104 | SHEET 001 | REV. 02 |

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

## GENERAL NOTES:

1. FOR EQUIPMENT AND SYSTEM TAG NUMBERING REFER THE DOCUMENT 123A90-PML-DIG-PRO-00002

2. IDENTIFICATION ABBREVIATIONS FOR CABLES & OTHER ELECTRICAL EQUIPMENTS:

A) IDENTIFICATION COLOR CODE OF THE ELECTRICAL CABLE

BK = BLACK
BN = BROWN
BU = BLUE
GY = GRAY
RD = RED
Y/G = YELLOW AND GREEN

B) IDENTIFICATION CODE OF THE ELECTRICAL EQUIPMENT

TR = TRANSFORMER
NER = NEUTRAL EARTH RESISTOR
JB = JUNCTION BOX
CP = CONTROL PANEL

C) FUNCTION CODE OF THE ELECTRICAL EQUIPMENT

AP = ALARM PANEL
UP = AC UPS & DC UPS
BA = BATTERY
BC = BATTERY CHARGER / RECTIFIER
CB =CIRCUIT BRAKER BOX
CN = CATHODIC PROTECTION
CP = CONTROL PANEL
DP = DISTRIBUTION PANEL
JB = JUNCTION BOX
NC = NAVIGATIONAL AID CENTRAL CONTROL PANEL
RR = RESISTOR (EARTHING)
SB = SWITCHBOARD

D) IDENTIFIER ABBREVIATIONS OF THE ELECTRICAL SYSTEM:

EMCS = ELECTRICAL MONITORING & CONTROL SYSTEM
GIS = GAS INSULATED SWITCHGEAR
HVAC = HEATING, VENTILATION, AIR CONDITIONING
HV = HIGH VOLTAGE
MV = MEDIUM VOLTAGE
LCP = LOCAL CONTROL PANEL
LV = LOW VOLTAGE
UPS = UNINTERRUPTIBLE POWER SUPPLY
BESS = BATTERY ENERGY STORAGE SYSTEM
PAS = PROCESS AUTOMATION SYSTEM

E) IDENTIFIER OF THE LOADED PHASE FOR SINGLE-PHASE EQUIPMENT POWER SUPPLY(LV):

L = LINE
N = NEUTRAL
PE = PROTECTIVE EARTH

F) IDENTIFIER OF THE LOADED PHASE FOR THREE-PHASE EQUIPMENT POWER SUPPLY(MV&LV):

L1 = LINE 1
L2 = LINE 2
L3 = LINE 3

3. RED CONDUCTOR MUST BE COVERED WITH BLUE SLEEVE AT THE ENDS, TO USE IT AS NEUTRAL.

4. THE MINIMUM CABLE LENGTH IS 15 M, THE CABLE CANNOT BE SHORTER.

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
GENERAL NOTES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

SHEET 006

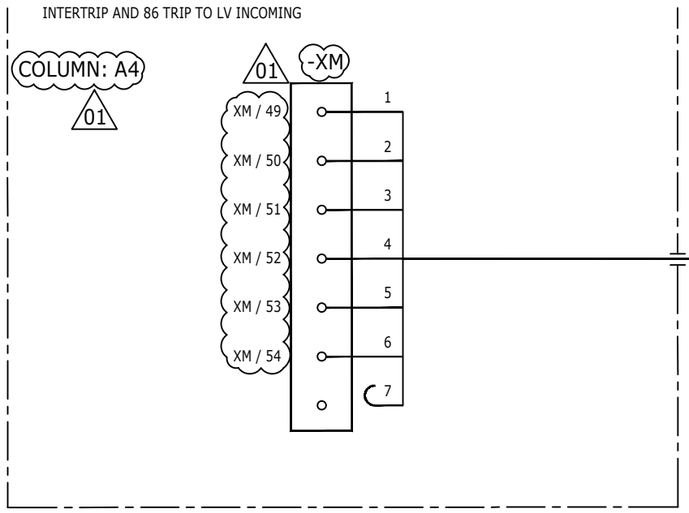
REV. 01

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

F.to UNI A3: 420mmx297mm

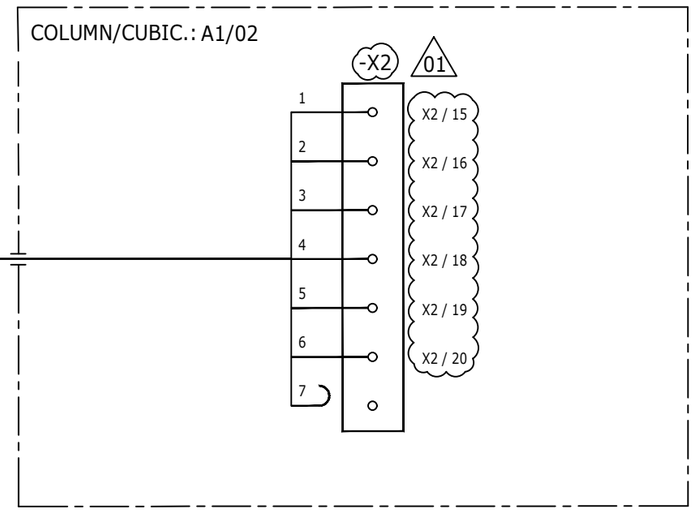
| FROM | TO |
|---|---|

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

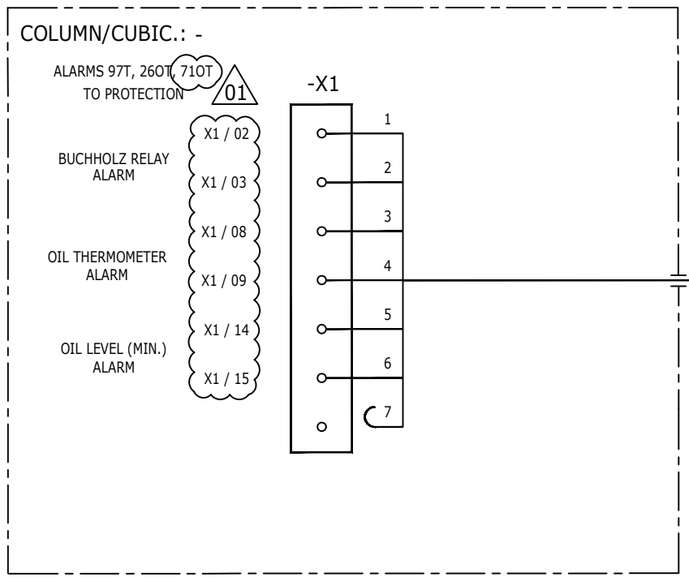



BK — 82013-CEC, 7C X 1.5 mm² — BK

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

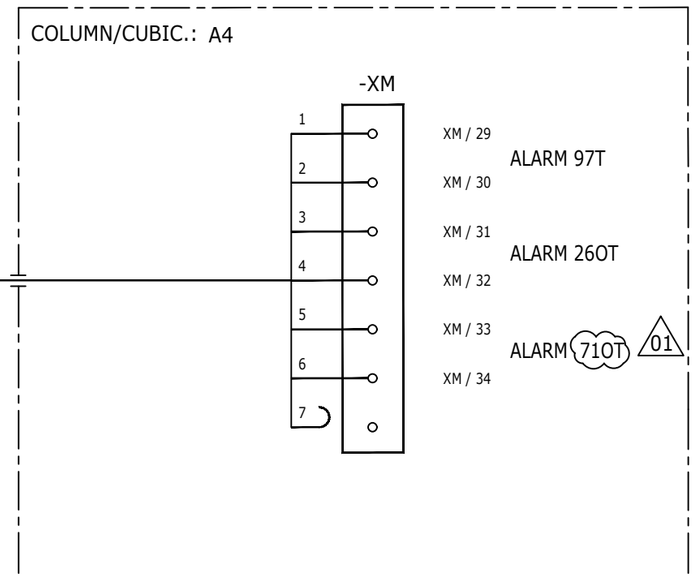



DESCRIPTION: 6.6/0.415 KV TRANSFORMER
TAG NUMBER: CP-200DE1A




BK — 83001-CEC, 7C X 1.5 mm² — BK

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149
REV.: 1_A | DATE: 17/10/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
CP-200DE1A TRANSFORMER ALARMS PROTECTION

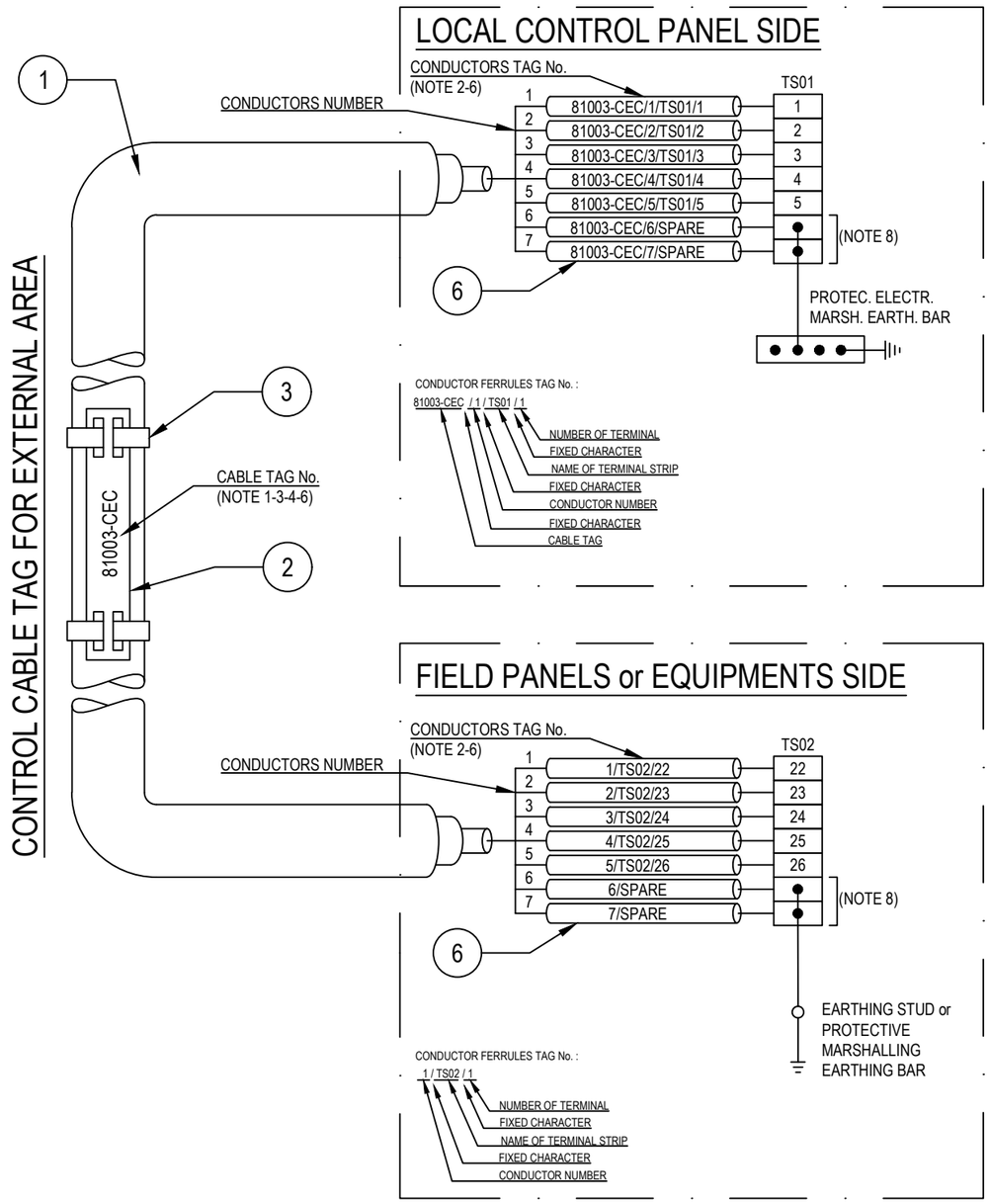
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 078 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C04




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
   CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

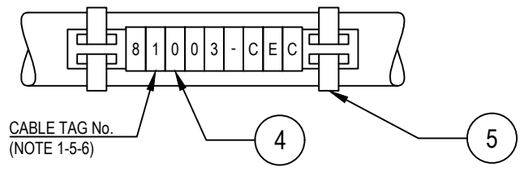
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
   WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
   - PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
   - EARTHING BOSS AND EARTH RING
   - EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## CONTROL CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

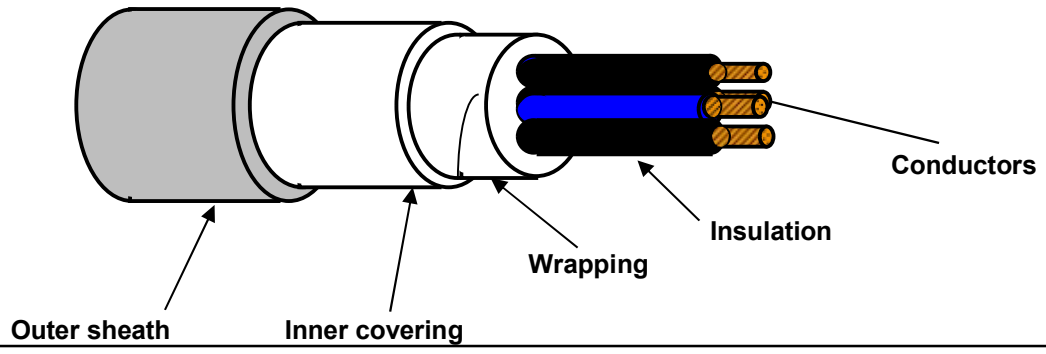
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Layout | Parent Tag | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland St | From Gland | From Entry | From Fittin | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83001-CEC | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | | | | | CP-200E1 | Auxiliary Trafo 1,6 MVA | Lower Deck | SG-100D1 | MV 6,6kV Switchgear | Lower Deck (B-100) | ELECV34-7X1,5 | Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey | M25 | T1_M25_Single | | | n.a. | | | | L-150-101-LVT-092 / L-750-101-LVT-013 / L-750-101-LVT-014 / E-MCT-106 / L-450-101-LVT-075 / L-600-101-LVT-058 / L-300-101-LVT-059 |

FLEI s.r.l.

# Cu Cl.2/XLPE/LSZH 0,6/1 KV

## 7CX1,5 - CONTROL CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| **Conductors :** | **STRANDED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| **Insulation :** | **XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm | |
| **Cores colour code :** | **Black NUMBERED (from 1 to 7)** | |
| **Pair Assembling :** | Not required | |
| **Pair Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Pair Shield :** | Not required | |
| **Shield Insulation :** | Not Required | |
| **Total Assembling :** | Cores layed up with optimal lay length | |
| **Overall Wrapping:** | by plastic tape helically wound | |
| **Drain wire :** | Not required | |
| **Overall Shield:** | Not required | |
| **Inner covering :** | Extruded LSZH compound, Average Thickness 1,0 mm | |
| **Inner covering color code:** | **Black or Natural** | |
| **Armour :** | Not required | |
| **Outer sheath :** | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm | |
| **Outer sheath color code:** | **Grey** | |
| **Outer printing (INKJET) :** | **FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -** | |
| | **Year of Manufacture - CE + Meter Marking** | |
| **Outer diameter :** | (13,5 ± 10%) mm | |
| **Bending radius :** | cable outer diameter x 10 | (in fixed installation) |
| **Voltage test :** | 3,5 kV a.c. for 5' (Between Cores) | |
| **Conductors DC Resistance :** | | IEC 60228 Class 2 |
| **Insulation Resistance :** | ≥ 1000 MΩ x Km (@ 20°C) | |
| **Applicable Standards** | | |
| **Design Guidelines :** | **IEC 60092.353** | |
| **ON COMPLETE CABLE** | | |
| **Flame Retardant test :** | IEC 60332.1.2 - IEC 60332.3.22 | |
| **Acid Gas generation :** | IEC 60754.1/2 | |
| **Smoke density/Light Transmittance :** | IEC 61034.2 (LT ≥ 60%) | |
| **Temperature Range :** | | |
| **ON INSULATION** | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| **ON COMPLETE CABLE** | | |
| **During Operation :** | (-20°C up to +90°C) | (in fixed installation) |
| **During installation :** | (- 5°C up to +50°C) | |
| **Note :** | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ROSETTI MARINO | PROVERLIS | CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83002-CEC | : 6.6/0.415 kV Transformer / 6.6KV HV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD_B-200/LD_B-100 |
| **TASK** | code | C10002135 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX10 Multicore Electrical Control Cable |

## CABLE DATA

Type: Cu Cl.2/XLPE/LSZH | Cores/Size mm²: 7X1,5 mm2 | Color: GREY

From: CP-200E1 | To: SG-100D1

| | | |
|---|---|---|
| 1 | Check cable physical integrity | OK |
| 2 | Check cable data against latest cable schedule. | OK |
| 3 | Check cable routing against latest drawings (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to latest project Specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Check cable and core marking against latest drawings | PL |
| 7 | Check cable labelling is in accordance with latest specification. | PL |
| 8 | Check cable glands suit for cable type and are in accordance with latest specification. | OK |
| 9 | Check terminations are in accordance with latest termination diagram. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check gland plate for single core cables is non magnetic. | NA |
| 12 | If required produce Red Line Mark Up for "AS BUILT" | |

| | | |
|---|---|---|
| CONTINUITY | CORE 1 / All cores+screen+armour+earth | 0.6 |
| | CORE 2 / All cores+screen+armour+earth | 0.6 |
| | CORE 3 / All cores+screen+armour+earth | 0.6 |
| | CORE 4 / All cores+screen+armour+earth | 0.6 |
| | CORE 5 / All cores+screen+armour+earth | 0.6 |
| | CORE 6 / All cores+screen+armour+earth | 0.6 |
| | CORE 7 / All cores+screen+armour+earth | 0.6 |
| | CORE 8 / All cores+screen+armour+earth | NA |
| | CORE 9 / All cores+screen+armour+earth | NA |
| | CORE 10 / All cores+screen+armour+earth | NA |
| INSULATION | CORE 1 | >999 |
| | CORE 2 | >999 |
| | CORE 3 | >999 |
| | CORE 4 | >999 |
| | CORE 5 | >999 |
| | CORE 6 | >999 |
| | CORE 7 | >999 |
| | CORE 8 | NA |
| | CORE 9 | NA |
| | CORE 10 | NA |
| | SCREEN | NA |
| | EARTH | NA |
| | ARMr | NA |
| | TEST VOLTS | 1000 |

**TESTING INSTRUMENTS USED**

| | |
|---|---|
| TYPE / SERIAL N° : KEW3125A S/N: W8330207<br>Calibration certificate N° and date: N°7722/24 _ 10/07/2024 | TYPE / SERIAL N° : FLUKE 175 S/N:AW1/018(17140769)<br>Calibration certificate N° and date: N°7715/24 _ 10/07/2024 |
| TYPE / SERIAL N° :<br>Calibration certificate N° and date: | TYPE / SERIAL N° :<br>Calibration certificate N° and date: |

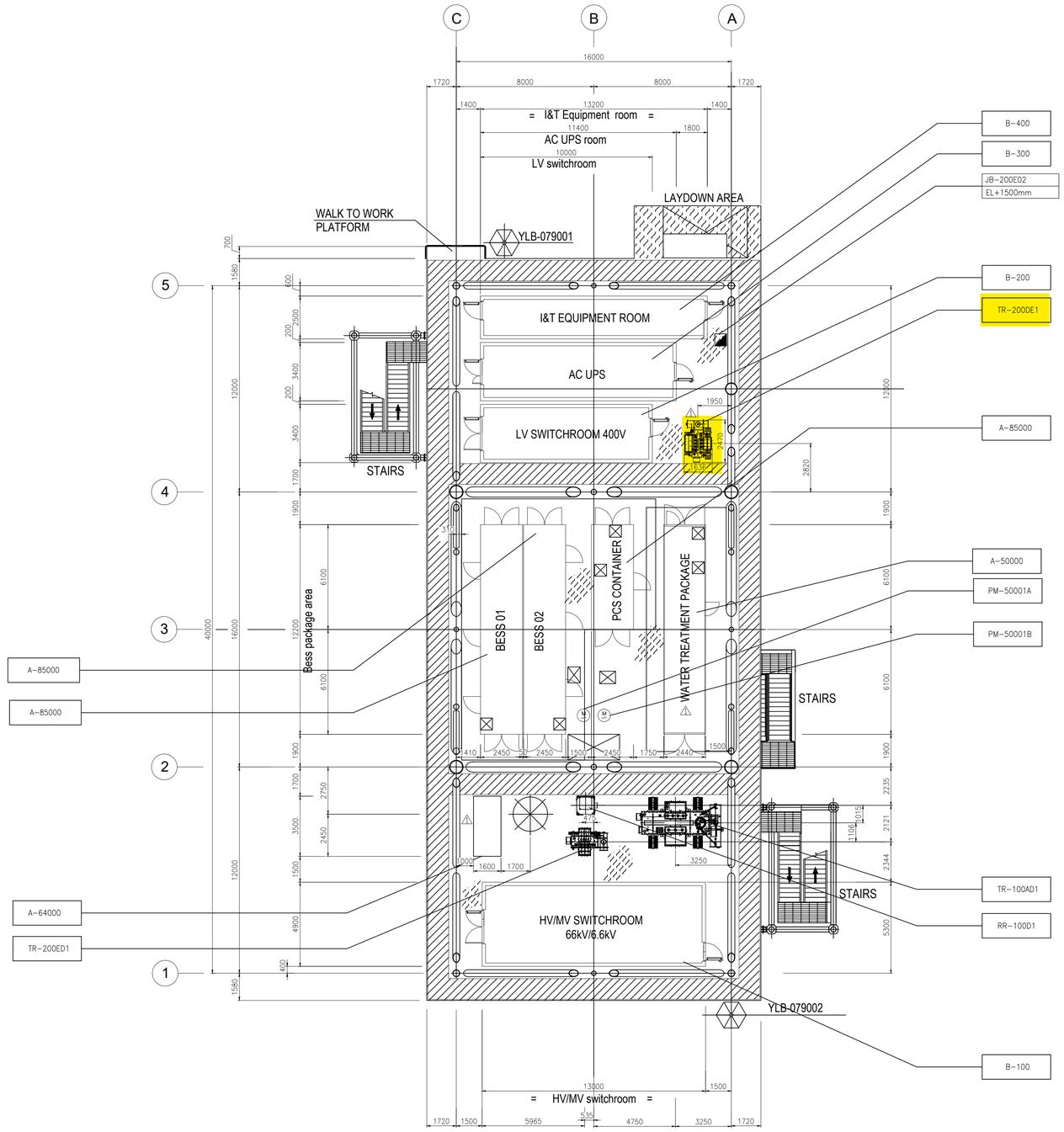
Comments: Note 4: Refer to PL C30000679

**Page 1/1**

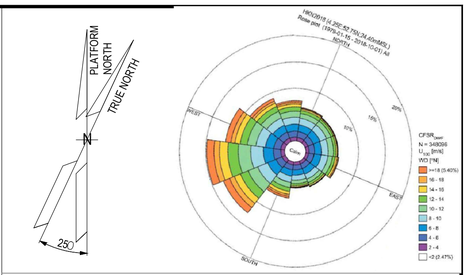
| | Performed by | ☐ WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Paolo Schintu | |
| **Date** | 2024-11-07 | 2024-11-22 | |
| **Signature** | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-07T15:33:48.069Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-22T13:28:56.772Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20101**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

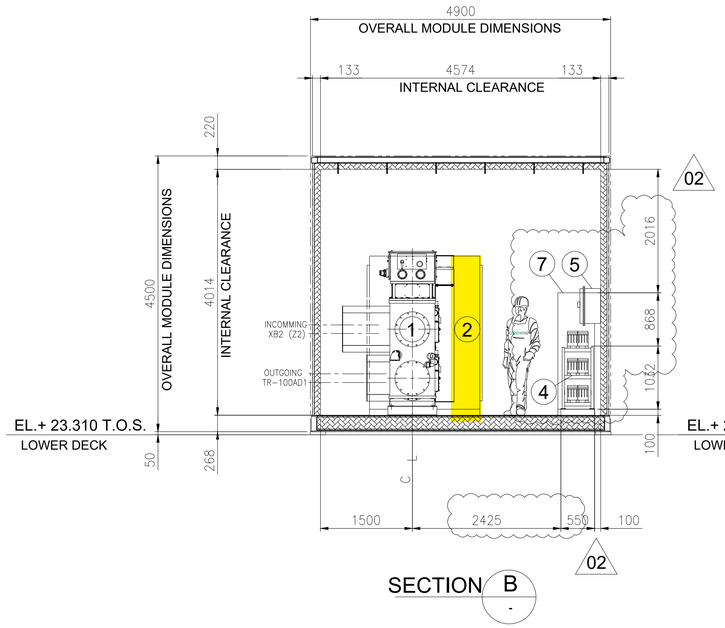
CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

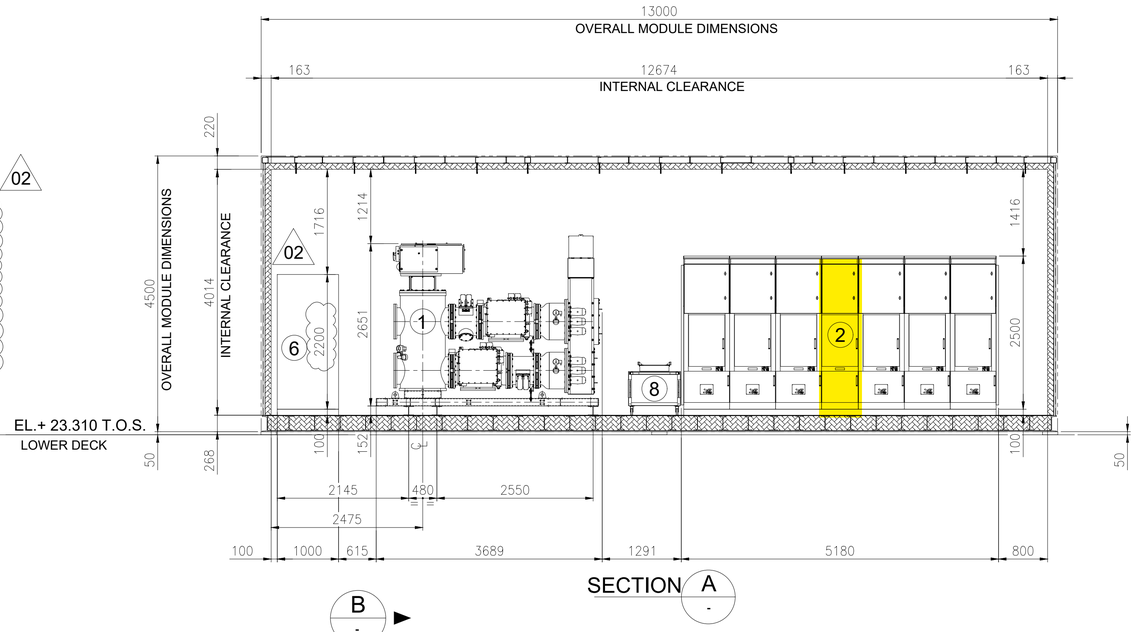
| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01 |

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

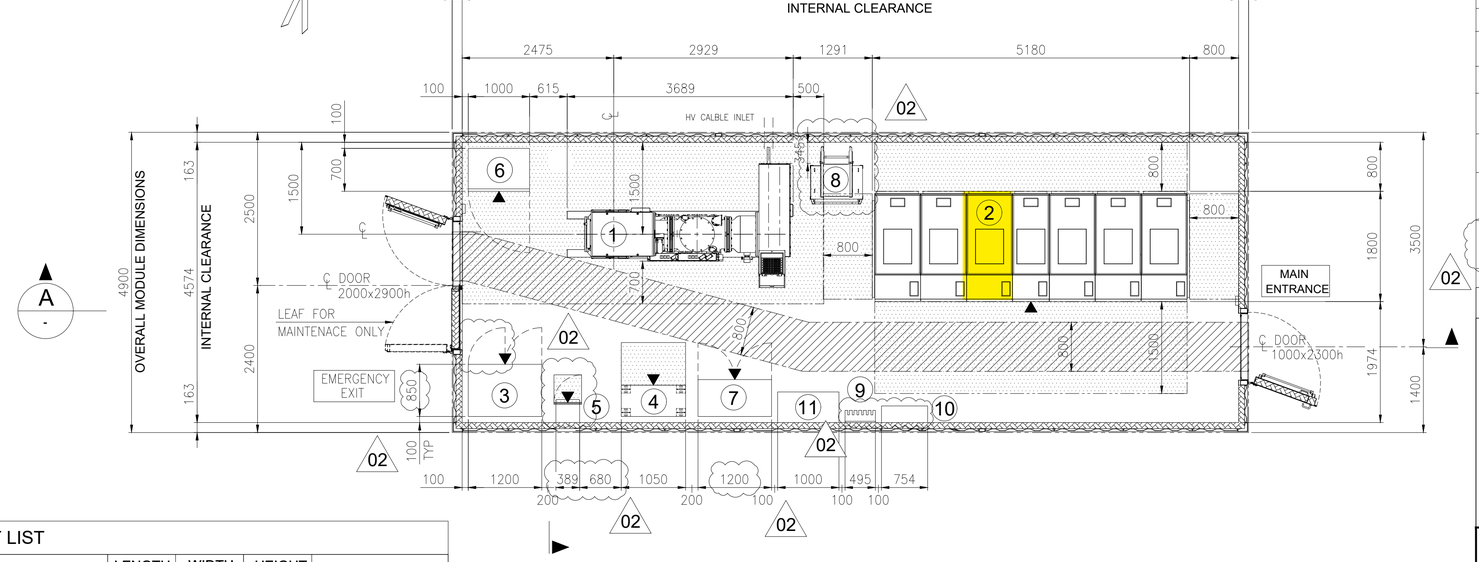
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02




SECTION B / -

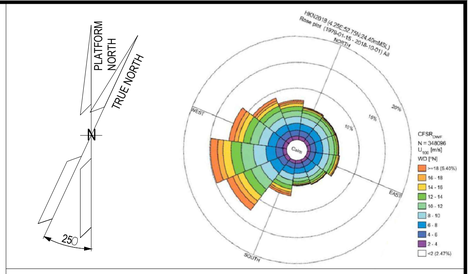



SECTION A / -




## EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | HNA6-AFA70 | 66kV SWITCHGEAR (GIS) | 3689 | 2025 | 2651 | |
| 2 | SG-100D1 | 6.6kV SWITCHGEAR | 5180 | 1800 | 2500 | |
| 3 | UP-200F1 | DC UPS PANEL | 1200 | 850 | 2105 | |
| 4 | BA-200F1 | DC UPS BATTERY RACK | 1050 | 510 | 1272 | |
| 5 | CB-200F1 02 | ISOLATOR FOR DC UPS | 452 | 377 | 634 | |
| 6 | CP-100E1 | 66 kV SWITCHGEAR LOCAL CONTROL PANEL | 1000 | 700 | 2200 | 02 |
| 7 | B100-HSB-001 | DISTRIBUTION & HVAC PANEL - HV MV ROOM | 1200 | 600 | 1900 | |
| 8 | - | SERVICE TROLLEY FOR 6.6kV SWITCHGEAR | 943 | 862 | 874 | |
| 9 | - | TOOL BOX | 495 | 200 | 200 | |
| 10 | - | SUBSTATION LIFE SAVING & INTERVENTION KIT | 754 | 270 | 840 | |
| 11 | - | TABLE | 1000 | 500 | 750 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

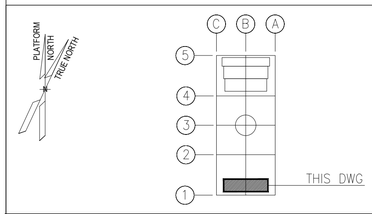
## LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| 66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING | 1723001595-EL-DA-00006 |
| CIRCUIT AND WIRING DIAGRAM | 1723001595-EL-DG-00015 |
| SG-100D1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00006 |
| DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00003 |
| DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00010 |
| B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00014 |

## KEY PLAN




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20104**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 10/11/2023 | DSF | CB/AMA | OYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

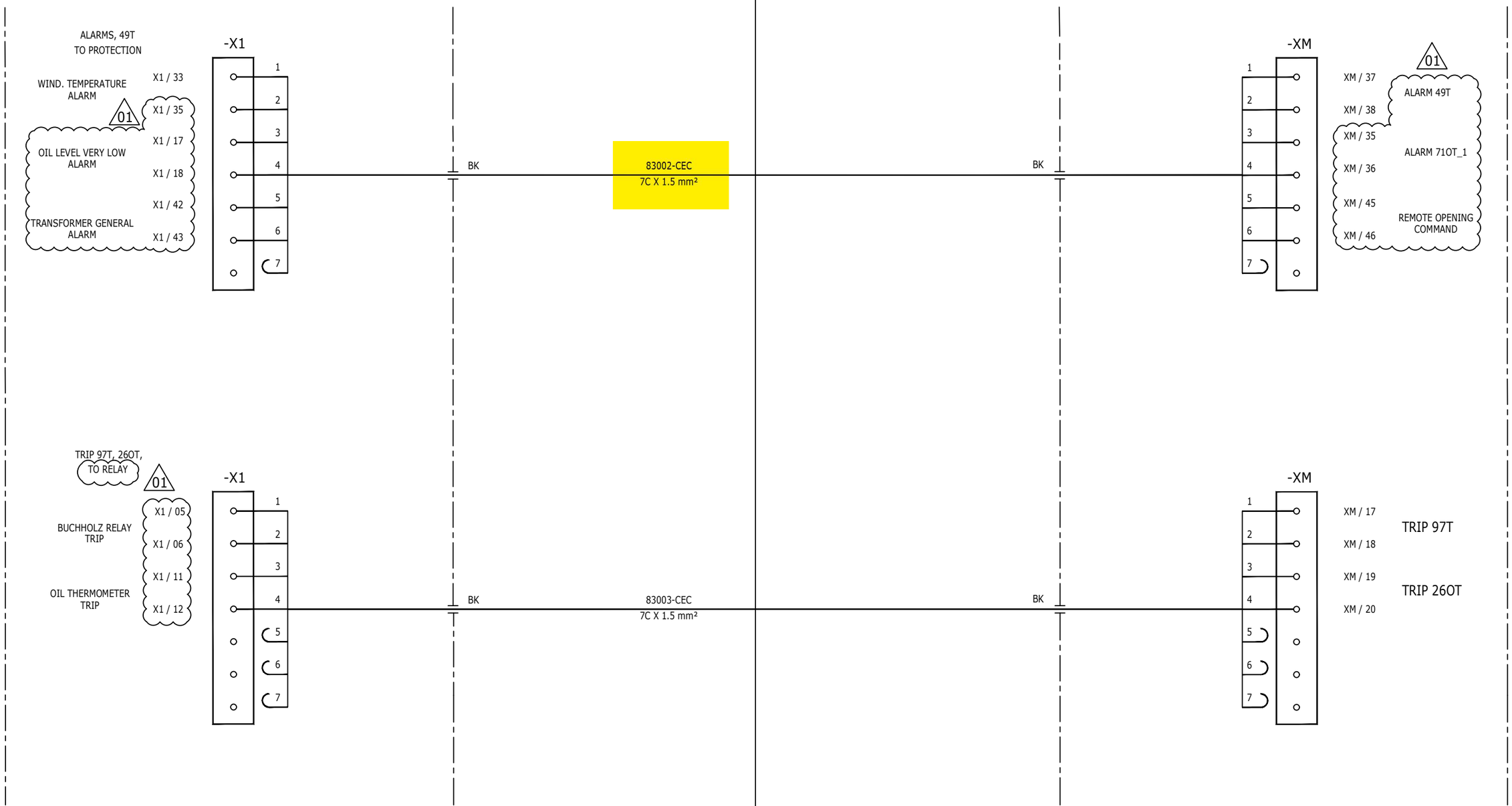
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN GPA | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20104 | SHEET 001 | REV. 02 |

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.415 KV TRANSFORMER
TAG NUMBER: CP-200E1 (01)

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
CP-200DE1A TRANSFORMER TRIP PROTECTION

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

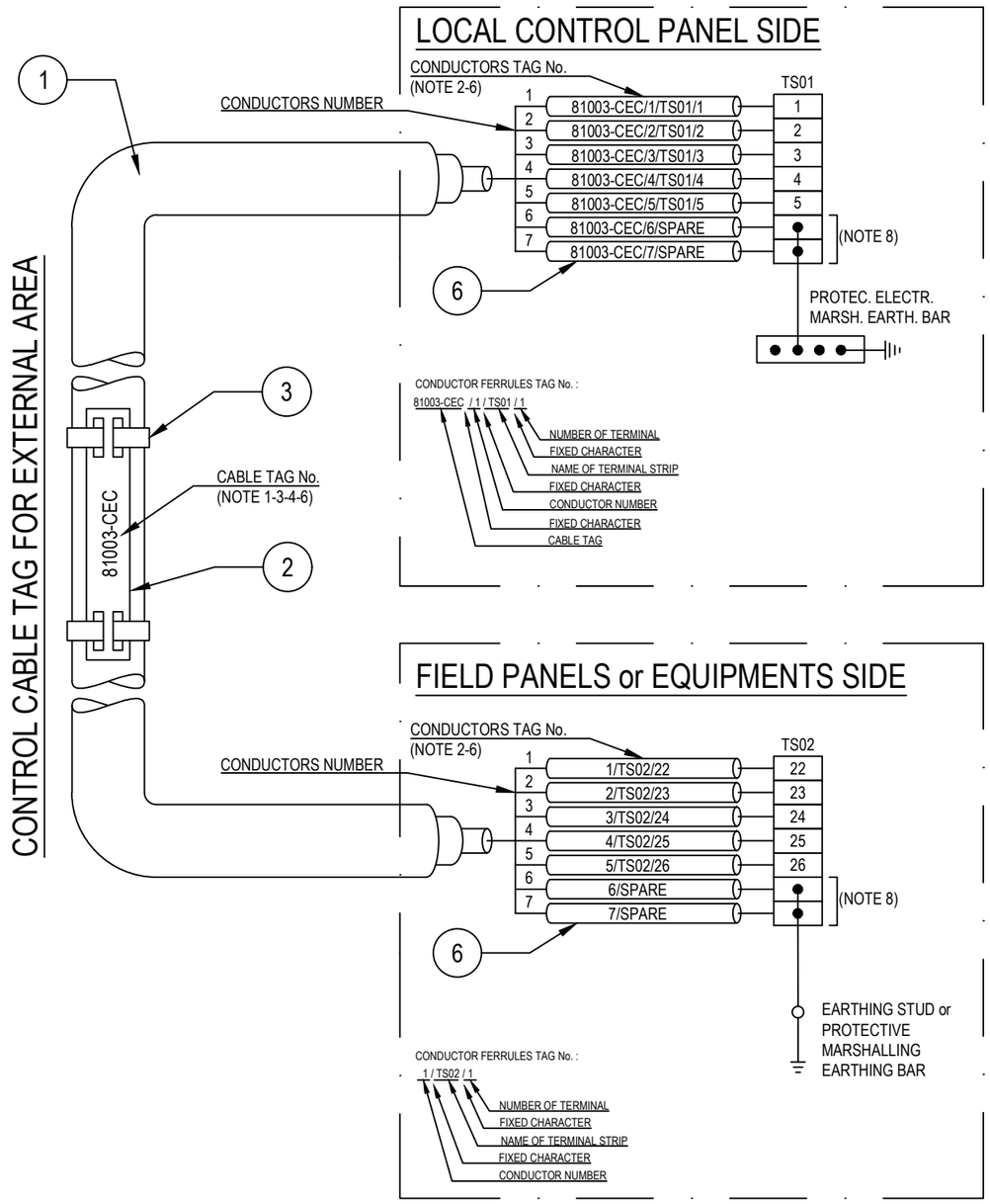
SHEET 079

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C04




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
   CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

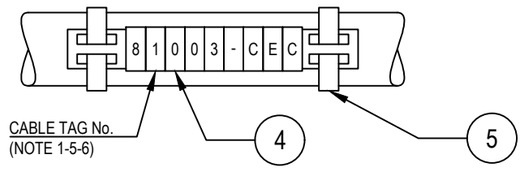
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
   WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
   - PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
   - EARTHING BOSS AND EARTH RING
   - EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## CONTROL CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

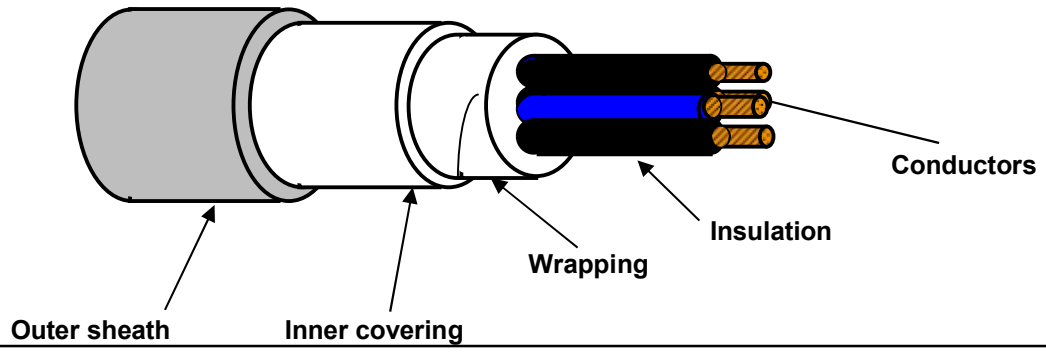
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Layout | Parent Tag | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland St | From Gland | From Entry | From Fittin | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83002-CEC | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | | | | | CP-200E1 | Auxiliary Trafo 1,6 MVA | Lower Deck | SG-100D1 | MV 6,6kV Switchgear | Lower Deck (B-100) | ELECV34-7X1,5 | Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey | M25 | T1_M25_Single | | | n.a. | | | | | L-150-101-LVT-092 / L-750-101-LVT-013 / L-750-101-LVT-014 / E-MCT-106 / L-450-101-LVT-075 / L-600-101-LVT-058 / L-300-101-LVT-059 |

FLEI s.r.l.

# Cu Cl.2/XLPE/LSZH 0,6/1 KV

## 7CX1,5 - CONTROL CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| **Conductors :** | **STRANDED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| **Insulation :** | **XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm | |
| **Cores colour code :** | **Black NUMBERED (from 1 to 7)** | |
| **Pair Assembling :** | Not required | |
| **Pair Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Pair Shield :** | Not required | |
| **Shield Insulation :** | Not Required | |
| **Total Assembling :** | Cores layed up with optimal lay length | |
| **Overall Wrapping:** | by plastic tape helically wound | |
| **Drain wire :** | Not required | |
| **Overall Shield:** | Not required | |
| **Inner covering :** | Extruded LSZH compound, Average Thickness 1,0 mm | |
| **Inner covering color code:** | **Black or Natural** | |
| **Armour :** | Not required | |
| **Outer sheath :** | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm | |
| **Outer sheath color code:** | **Grey** | |
| **Outer printing (INKJET) :** | **FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -** | |
| | **Year of Manufacture - CE + Meter Marking** | |
| **Outer diameter :** | (13,5 ± 10%) mm | |
| **Bending radius :** | cable outer diameter x 10 | (in fixed installation) |
| **Voltage test :** | 3,5 kV a.c. for 5' (Between Cores) | |
| **Conductors DC Resistance :** | | IEC 60228 Class 2 |
| **Insulation Resistance :** | ≥ 1000 MΩ x Km (@ 20°C) | |
| **Applicable Standards** | | |
| **Design Guidelines :** | **IEC 60092.353** | |
| **ON COMPLETE CABLE** | | |
| **Flame Retardant test :** | IEC 60332.1.2 - IEC 60332.3.22 | |
| **Acid Gas generation :** | IEC 60754.1/2 | |
| **Smoke density/Light Transmittance :** | IEC 61034.2 (LT ≥ 60%) | |
| **Temperature Range :** | | |
| **ON INSULATION** | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| **ON COMPLETE CABLE** | | |
| **During Operation :** | (-20°C up to +90°C) | (in fixed installation) |
| **During installation :** | (- 5°C up to +50°C) | |
| **Note :** | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ROSETTI MARINO

CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 82015-CEC | : MV 6,6kV Switchgear / 6,6 / 0,42 kV 1,6 MVA Transformer Control Panel | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD_B-100 |
| **TASK** | code | C10002340 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX10 Multicore Electrical Control Cable |

## CABLE DATA

| | | | | | |
|---|---|---|---|---|---|
| Type | Cu Cl.2/XLPE/LSZH/CWB/LSZH | Cores/Size mm² | 4X4 mm2 | Color | GREY |
| From | SG-100D1 | | To | CP-200E1 | |

| | | |
|---|---|---|
| 1 | Check cable physical integrity | OK |
| 2 | Check cable data against latest cable schedule. | OK |
| 3 | Check cable routing against latest drawings (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to latest project Specification. | OK |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Check cable and core marking against latest drawings | PL |
| 7 | Check cable labelling is in accordance with latest specification. | PL |
| 8 | Check cable glands suit for cable type and are in accordance with latest specification. | OK |
| 9 | Check terminations are in accordance with latest termination diagram. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check gland plate for single core cables is non magnetic. | NA |
| 12 | If required produce Red Line Mark Up for "AS BUILT" | |

| | | |
|---|---|---|
| CONTINUITY | CORE 1 / All cores+screen+armour+earth | 0.6 |
| | CORE 2 / All cores+screen+armour+earth | 0.6 |
| | CORE 3 / All cores+screen+armour+earth | 0.6 |
| | CORE 4 / All cores+screen+armour+earth | 0.6 |
| | CORE 5 / All cores+screen+armour+earth | NA |
| | CORE 6 / All cores+screen+armour+earth | NA |
| | CORE 7 / All cores+screen+armour+earth | NA |
| | CORE 8 / All cores+screen+armour+earth | NA |
| | CORE 9 / All cores+screen+armour+earth | NA |
| | CORE 10 / All cores+screen+armour+earth | NA |
| INSULATION | CORE 1 | >999 |
| | CORE 2 | >999 |
| | CORE 3 | >999 |
| | CORE 4 | >999 |
| | CORE 5 | NA |
| | CORE 6 | NA |
| | CORE 7 | NA |
| | CORE 8 | NA |
| | CORE 9 | NA |
| | CORE 10 | NA |
| | SCREEN | NA |
| | EARTH | NA |
| | ARMr | NA |
| | TEST VOLTS | 1000 |

**TESTING INSTRUMENTS USED**

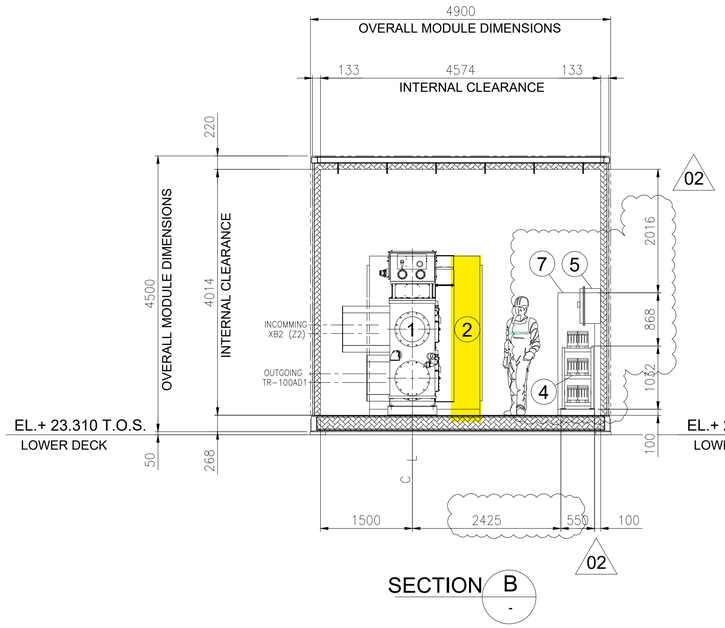
| | | | |
|---|---|---|---|
| TYPE / SERIAL N° : | KEW3125A S/N: W8330207 | TYPE / SERIAL N° : | FLUKE 175 S/N:AW1/018(17140769) |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |
| TYPE / SERIAL N° : | | TYPE / SERIAL N° : | |
| Calibration certificate N° and date: | N°7722/24 _ 10/07/2024 | Calibration certificate N° and date: | N°7715/24 _ 10/07/2024 |

Comments:

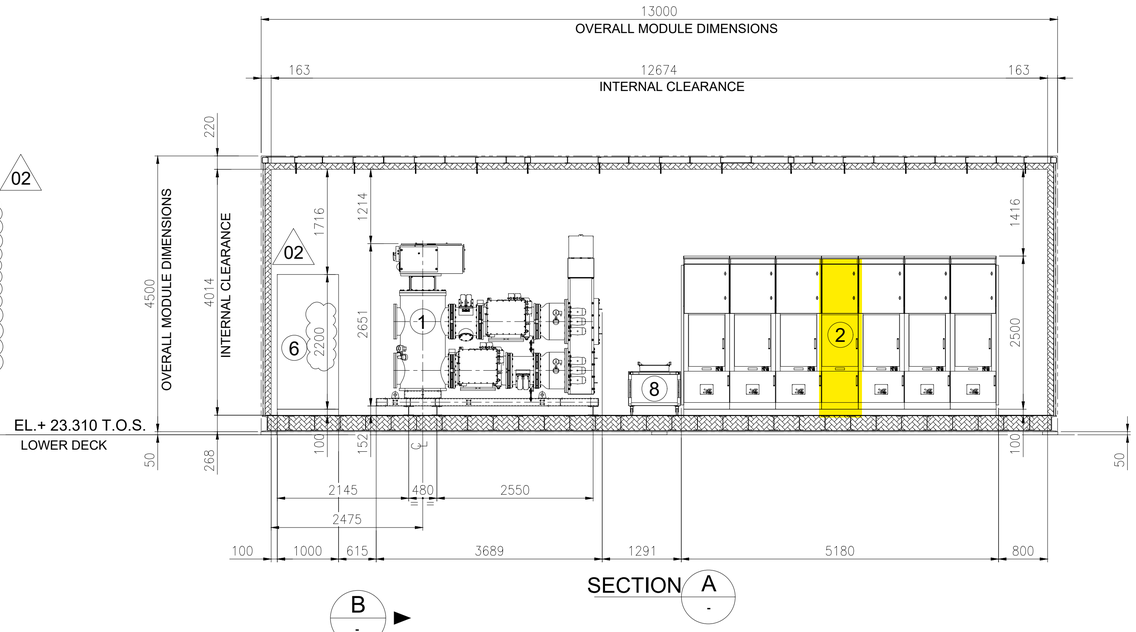
**Page 1/1**

| | Performed by | ☐ WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Paolo Schintu | |
| **Date** | 2024-11-07 | 2024-11-22 | |
| **Signature** | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-07T15:33:59.325Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-22T13:54:08.391Z | |

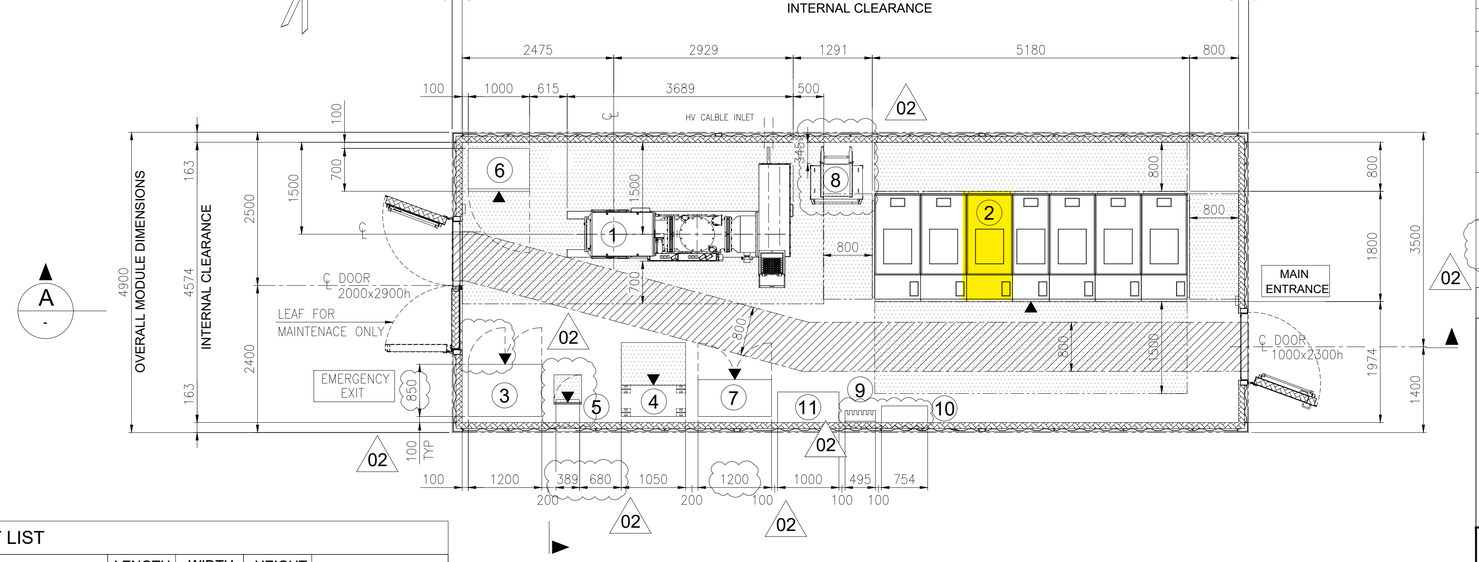
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02




SECTION B / -

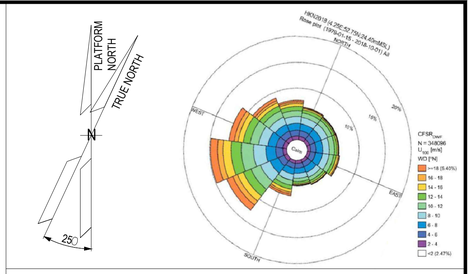



SECTION A / -




## EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | HNA6-AFA70 | 66kV SWITCHGEAR (GIS) | 3689 | 2025 | 2651 | |
| 2 | SG-100D1 | 6.6kV SWITCHGEAR | 5180 | 1800 | 2500 | |
| 3 | UP-200F1 | DC UPS PANEL | 1200 | 850 | 2105 | |
| 4 | BA-200F1 | DC UPS BATTERY RACK | 1050 | 510 | 1272 | |
| 5 | CB-200F1 02 | ISOLATOR FOR DC UPS | 452 | 377 | 634 | |
| 6 | CP-100E1 | 66 kV SWITCHGEAR LOCAL CONTROL PANEL | 1000 | 700 | 2200 | 02 |
| 7 | B100-HSB-001 | DISTRIBUTION & HVAC PANEL - HV MV ROOM | 1200 | 600 | 1900 | |
| 8 | - | SERVICE TROLLEY FOR 6.6kV SWITCHGEAR | 943 | 862 | 874 | |
| 9 | - | TOOL BOX | 495 | 200 | 200 | |
| 10 | - | SUBSTATION LIFE SAVING & INTERVENTION KIT | 754 | 270 | 840 | |
| 11 | - | TABLE | 1000 | 500 | 750 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

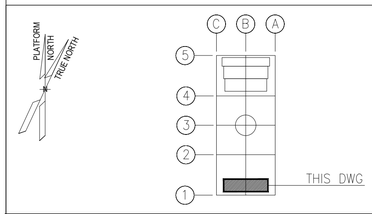
## LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| 66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING | 1723001595-EL-DA-00006 |
| CIRCUIT AND WIRING DIAGRAM | 1723001595-EL-DG-00015 |
| SG-100D1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00006 |
| DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00003 |
| DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00010 |
| B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00014 |

## KEY PLAN




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20104**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 10/11/2023 | DSF | CB/AMA | OYFO/MDO | ISSUE FOR REVIEW (IFR) |

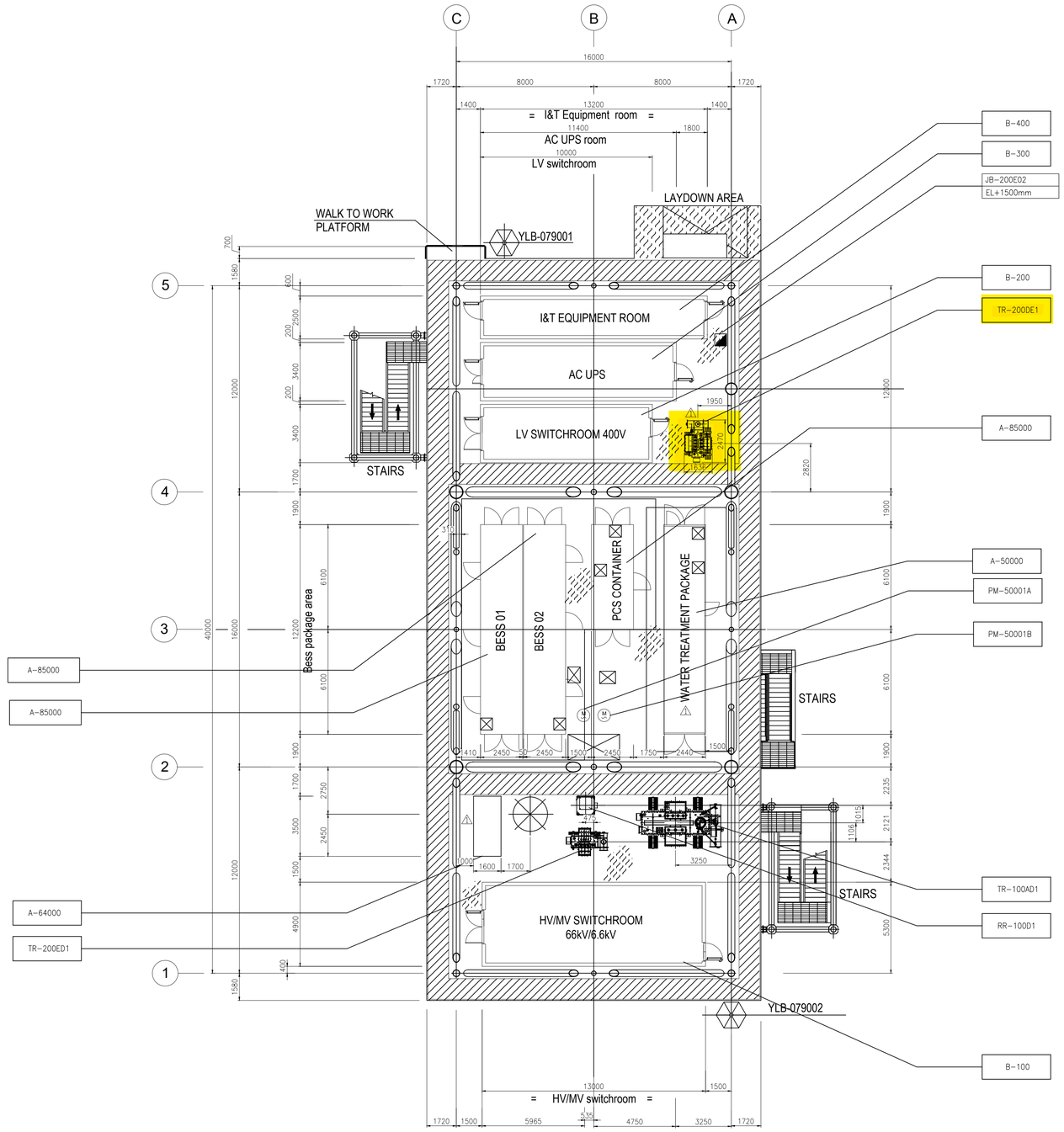
CROSSWIND

ROSETTI MARINO

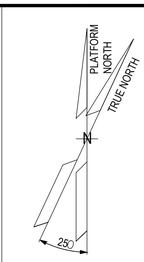
TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

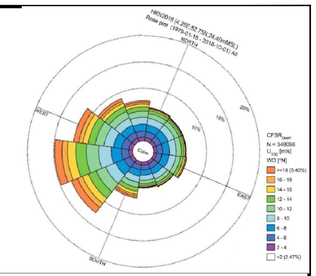
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN GPA | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20104 | SHEET 001 | REV. 02 |

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| ⚠ 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01 |

DRAWING NO. 123A90-DDL-EL-DL-20101 REV. 01

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

## GENERAL NOTES:

1. FOR EQUIPMENT AND SYSTEM TAG NUMBERING REFER THE DOCUMENT 123A90-PML-DIG-PRO-00002

2. IDENTIFICATION ABBREVIATIONS FOR CABLES & OTHER ELECTRICAL EQUIPMENTS:

A) IDENTIFICATION COLOR CODE OF THE ELECTRICAL CABLE

BK = BLACK
BN = BROWN
BU = BLUE
GY = GRAY
RD = RED
Y/G = YELLOW AND GREEN

B) IDENTIFICATION CODE OF THE ELECTRICAL EQUIPMENT

TR = TRANSFORMER
NER = NEUTRAL EARTH RESISTOR
JB = JUNCTION BOX
CP = CONTROL PANEL

C) FUNCTION CODE OF THE ELECTRICAL EQUIPMENT

AP = ALARM PANEL
UP = AC UPS & DC UPS
BA = BATTERY
BC = BATTERY CHARGER / RECTIFIER
CB =CIRCUIT BRAKER BOX
CN = CATHODIC PROTECTION
CP = CONTROL PANEL
DP = DISTRIBUTION PANEL
JB = JUNCTION BOX
NC = NAVIGATIONAL AID CENTRAL CONTROL PANEL
RR = RESISTOR (EARTHING)
SB = SWITCHBOARD

D) IDENTIFIER ABBREVIATIONS OF THE ELECTRICAL SYSTEM:

EMCS = ELECTRICAL MONITORING & CONTROL SYSTEM
GIS = GAS INSULATED SWITCHGEAR
HVAC = HEATING, VENTILATION, AIR CONDITIONING
HV = HIGH VOLTAGE
MV = MEDIUM VOLTAGE
LCP = LOCAL CONTROL PANEL
LV = LOW VOLTAGE
UPS = UNINTERRUPTIBLE POWER SUPPLY
BESS = BATTERY ENERGY STORAGE SYSTEM
PAS = PROCESS AUTOMATION SYSTEM

E) IDENTIFIER OF THE LOADED PHASE FOR SINGLE-PHASE EQUIPMENT POWER SUPPLY(LV):

L = LINE
N = NEUTRAL
PE = PROTECTIVE EARTH

F) IDENTIFIER OF THE LOADED PHASE FOR THREE-PHASE EQUIPMENT POWER SUPPLY(MV&LV):

L1 = LINE 1
L2 = LINE 2
L3 = LINE 3

3. RED CONDUCTOR MUST BE COVERED WITH BLUE SLEEVE AT THE ENDS, TO USE IT AS NEUTRAL.

4. THE MINIMUM CABLE LENGTH IS 15 M, THE CABLE CANNOT BE SHORTER.

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

CROSSWIND

ROSETTI MARINO

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
GENERAL NOTES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : NTS

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

SHEET 006

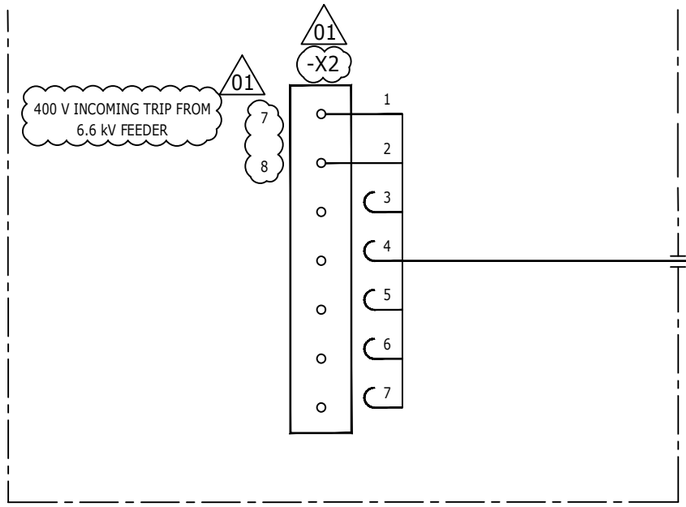
REV. 01

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

F.to UNI A3: 420mmx297mm

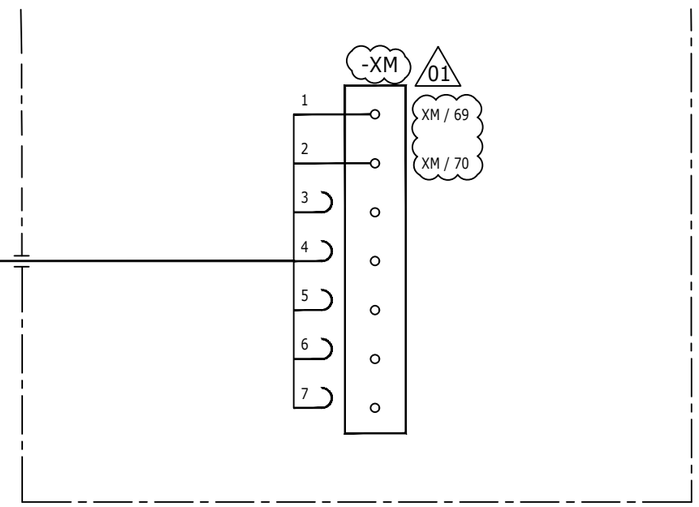
| FROM | TO |
|---|---|

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1



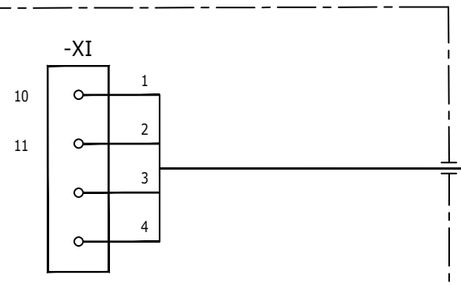

83006-CEC
7C X 1.5 mm²

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1




DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

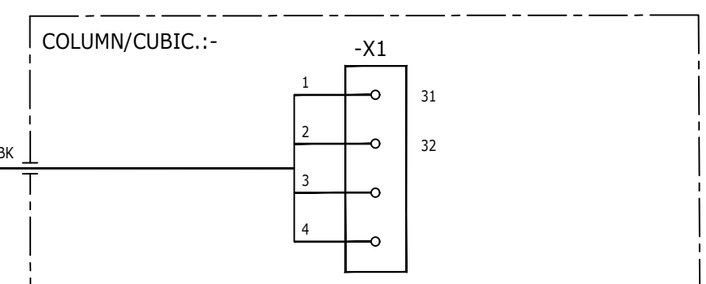
COLUMN/CUBIC.:A4




82015-CEC
4C X 4 mm²

DESCRIPTION: 6.6/0.415 kV, 1.6MVA Transformer
TAG NUMBER: CP-200E1

COLUMN/CUBIC.:-




01

VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DL-20149
REV.: 1_A | DATE: 17/10/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
LV SWITCHGEAR & 6.6KV HV SWITCHGEAR INTERLOCKS

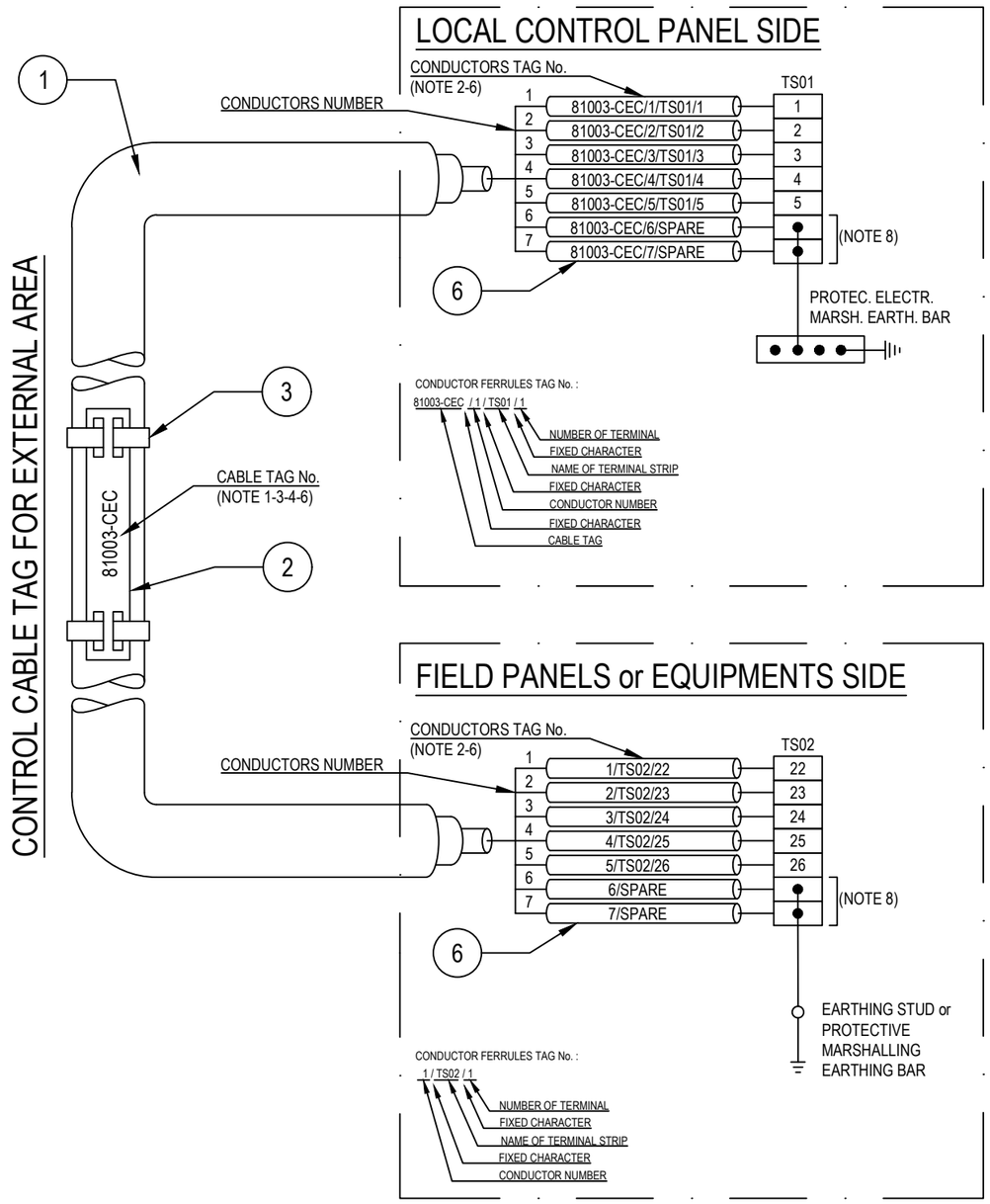
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : 1:X

A3 | DRAWING NO. 123A90-DDL-EL-DG-20149 | SHEET 081 | REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C04




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
   CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

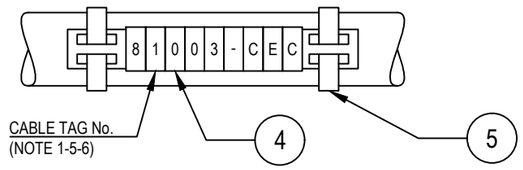
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
   WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
   - PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
   - EARTHING BOSS AND EARTH RING
   - EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## CONTROL CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

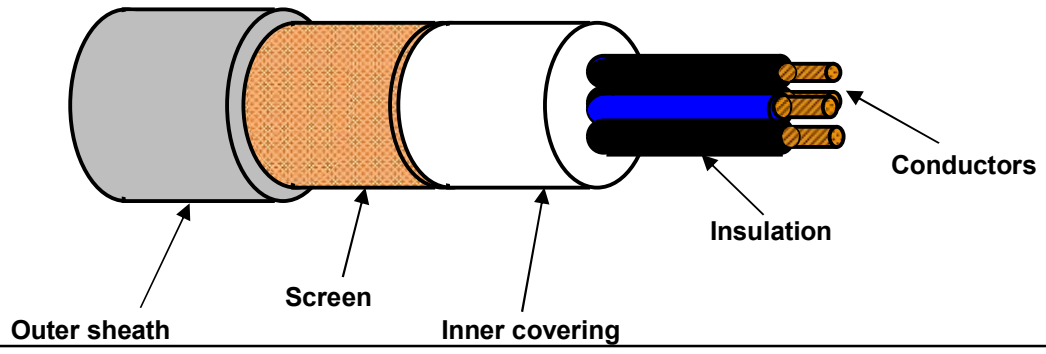
F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Statu | NativeDoc | Layout | Parent Tag | Main Function | Secondary Functio | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland Standard | From Gland | From Entry | From Fitting | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 82015-CEC | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | | | | | SG-100D1 | MV 6,6kV Switchgear | Lower Deck (B-100) | CP-200E1 | Auxiliary Trafo 1,6 MVA | Lower Deck | ELECV35-4X4 | Cable Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1kV 4Cx4mm² - Grey | M20 | n.a. | | | T2_M20_Double | | | | L-300-101-LVT-059 / L-600-101-LVT-058 / L-450-101-LVT-075 / E-MCT-106 / L-750-101-LVT-014 / L-750-101-LVT-013 / L-150-101-LVT-092 |

# Cu Cl.2/XLPE/LSZH/CWB/LSZH 0,6/1 KV

## 4CX4 - CONTROL CABLE - SCREENED - Flame Retardant




**TECHNICAL FEATURES**

| | | |
|---|---|---|
| **Conductors :** | **STRANDED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| **Insulation :** | **XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm | |
| **Cores colour code :** | **Black NUMBERED (from 1 to 4)** | |
| **Pair Assembling :** | Not required | |
| **Pair Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Pair Shield :** | Not required | |
| **Shield Insulation :** | Not Required | |
| **Total Assembling :** | Cores layed up with optimal lay length | |
| **Overall Wrapping:** | Not required | |
| **Inner covering :** | Extruded LSZH compound, Average Thickness 1,0 mm | |
| **Inner covering color code:** | **Black or Natural** | |
| **Screen :** | **Copper Wire Braid (coverage ≥ 90%)** | |
| **Outer sheath :** | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,3 mm | |
| **Outer sheath color code:** | **Grey** | |
| **Outer printing (INKJET) :** | **FLEI - ELECTRIC CABLE - 1000V - 4CX4 SQMM - XLPE/LSZH/CWB/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 - Year of Manufacture - CE + Meter Marking** | |
| **Outer diameter :** | (15,4 ± 10%) mm | |
| **Bending radius :** | cable outer diameter x 10 | (in fixed installation) |
| **Voltage test :** | 3,5 kV a.c. for 5' (Between Cores - Screen) | |
| **Conductors DC Resistance :** | | IEC 60228 Class 2 |
| **Insulation Resistance :** | ≥ 690 MΩ x Km (@ 20°C) | |
| **Applicable Standards** | | |
| **Design Guidelines :** | **IEC 60092.353** | |
| **ON COMPLETE CABLE** | | |
| **Flame Retardant test :** | IEC 60332.1.2 - IEC 60332.3.22 | |
| **Acid Gas generation :** | IEC 60754.1/2 | |
| **Smoke density/Light Transmittance :** | IEC 61034.2 (LT ≥ 60%) | |
| **Temperature Range :** | | |
| **ON INSULATION** | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| **ON COMPLETE CABLE** | | |
| **During Operation :** | (-20°C up to +90°C) | (in fixed installation) |
| **During installation :** | (- 5°C up to +50°C) | |
| **Note :** | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ROSETTI MARINO | PROVERLIS | CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83003-CEC | : Auxiliary Trafo 1,6 MVA / MV 6,6kV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD_B-200/LD_B-100 |
| **TASK** | code | C10003047 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX10 Multicore Electrical Control Cable |

## CABLE DATA

Type: Cu Cl.2/XLPE/LSZH | Cores/Size mm²: 7X1,5 mm2 | Color: GREY

From: CP-200E1 | To: SG-100D1

| | | |
|---|---|---|
| 1 | Check cable physical integrity | OK |
| 2 | Check cable data against latest cable schedule. | OK |
| 3 | Check cable routing against latest drawings (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to latest project Specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Check cable and core marking against latest drawings | PL |
| 7 | Check cable labelling is in accordance with latest specification. | PL |
| 8 | Check cable glands suit for cable type and are in accordance with latest specification. | OK |
| 9 | Check terminations are in accordance with latest termination diagram. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check gland plate for single core cables is non magnetic. | NA |
| 12 | If required produce Red Line Mark Up for "AS BUILT" | |

| | | |
|---|---|---|
| CONTINUITY | CORE 1 / All cores+screen+armour+earth | 0.6 |
| | CORE 2 / All cores+screen+armour+earth | 0.6 |
| | CORE 3 / All cores+screen+armour+earth | 0.6 |
| | CORE 4 / All cores+screen+armour+earth | 0.6 |
| | CORE 5 / All cores+screen+armour+earth | 0.6 |
| | CORE 6 / All cores+screen+armour+earth | 0.6 |
| | CORE 7 / All cores+screen+armour+earth | 0.6 |
| | CORE 8 / All cores+screen+armour+earth | NA |
| | CORE 9 / All cores+screen+armour+earth | NA |
| | CORE 10 / All cores+screen+armour+earth | NA |
| INSULATION | CORE 1 | >999 |
| | CORE 2 | >999 |
| | CORE 3 | >999 |
| | CORE 4 | >999 |
| | CORE 5 | >999 |
| | CORE 6 | >999 |
| | CORE 7 | >999 |
| | CORE 8 | NA |
| | CORE 9 | NA |
| | CORE 10 | NA |
| | SCREEN | NA |
| | EARTH | NA |
| | ARMr | NA |
| | TEST VOLTS | 1000 |

**TESTING INSTRUMENTS USED**

| | |
|---|---|
| TYPE / SERIAL N° : KEW3125A S/N: W8330207<br>Calibration certificate N° and date: N°7722/24 _ 10/07/2024 | TYPE / SERIAL N° : FLUKE 175 S/N:AW1/018(17140769)<br>Calibration certificate N° and date: N°7715/24 _ 10/07/2024 |
| TYPE / SERIAL N° :<br>Calibration certificate N° and date: | TYPE / SERIAL N° :<br>Calibration certificate N° and date: |

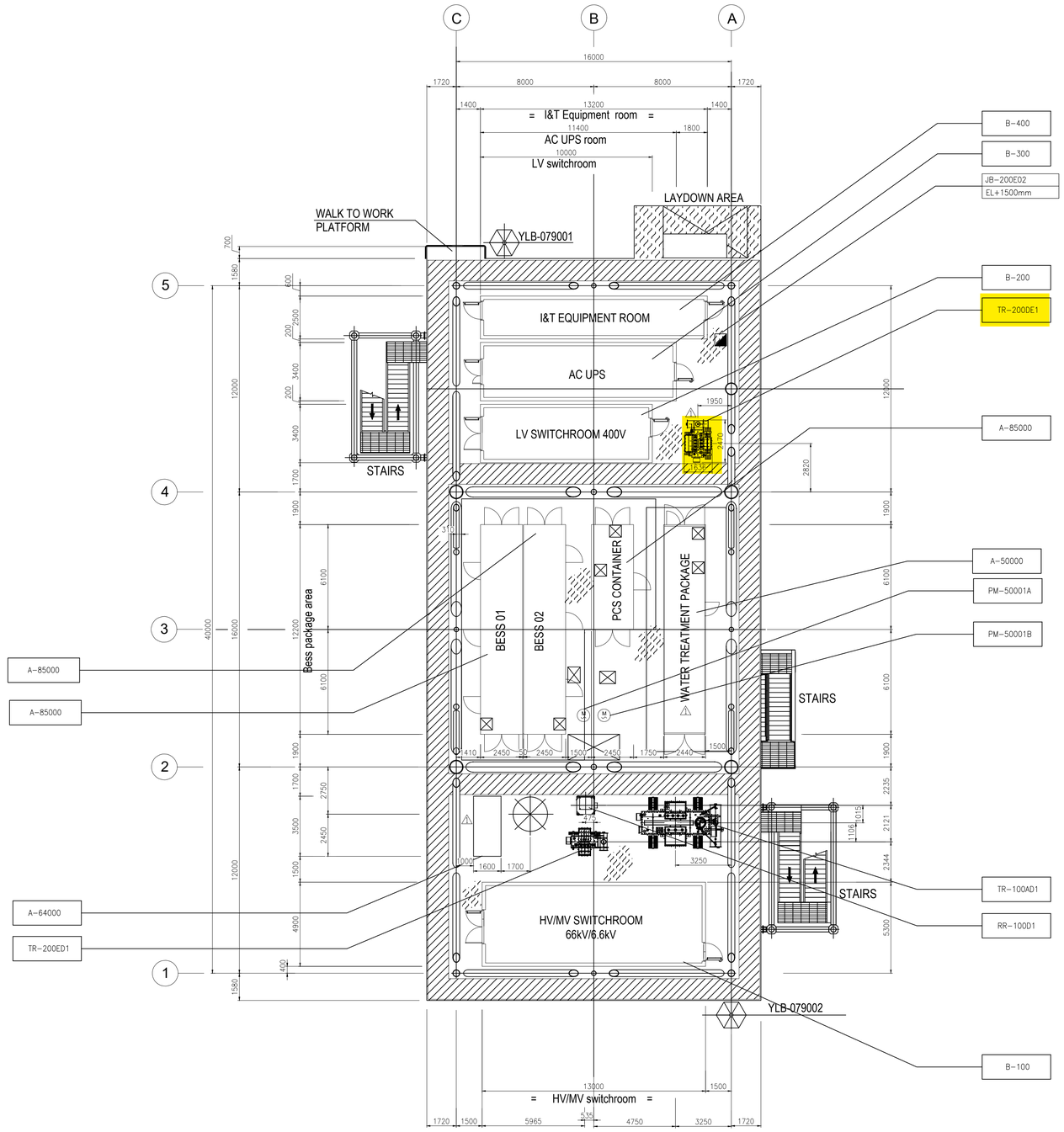
Comments: Note 4: Refer to PL C30000679

**Page 1/1**

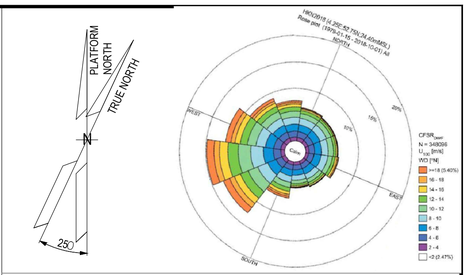
| | Performed by | ☐ WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Paolo Schintu | |
| **Date** | 2024-11-07 | 2024-11-22 | |
| **Signature** | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-07T15:34:57.529Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-22T13:33:16.934Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20101**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

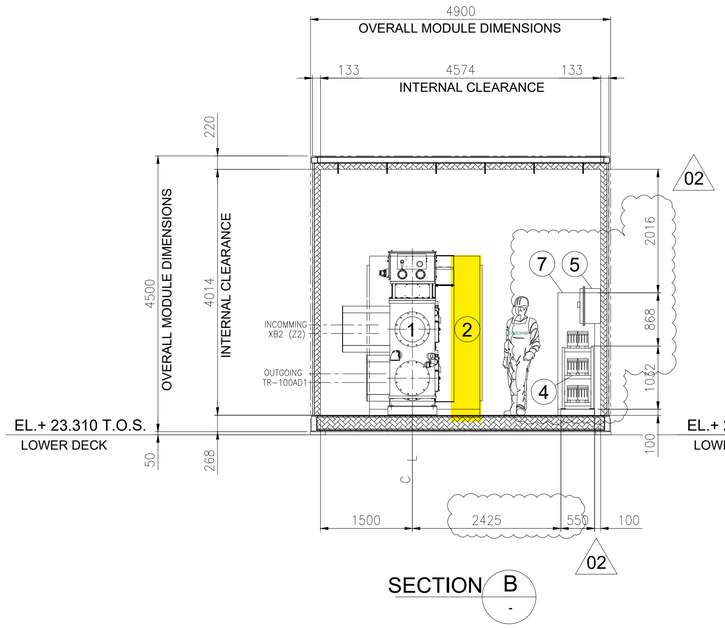
CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

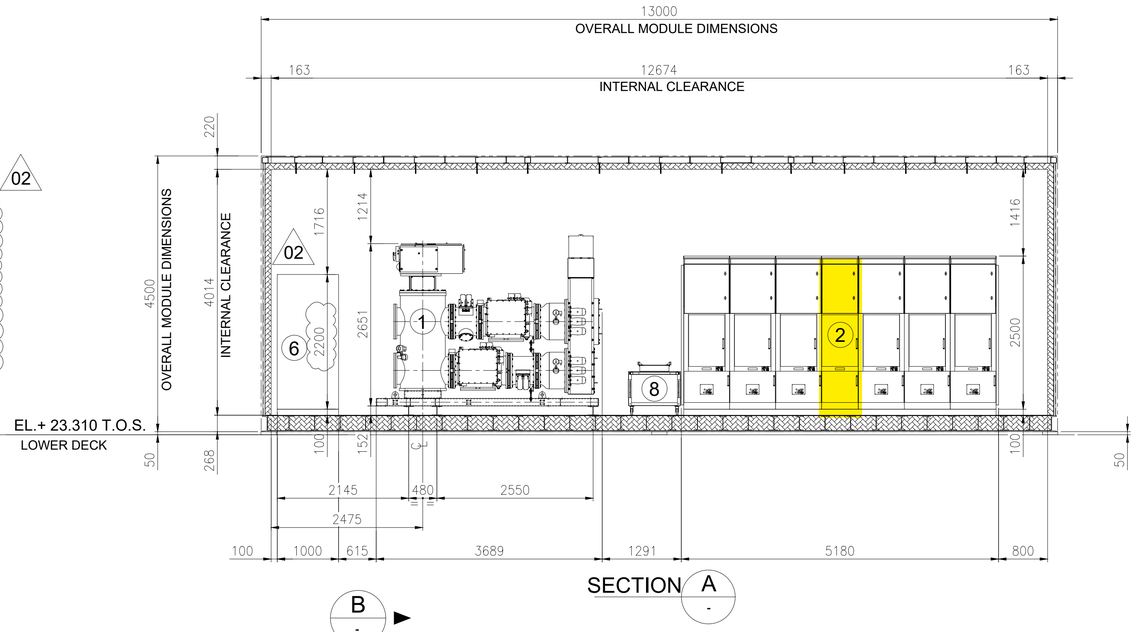
| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01 |

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

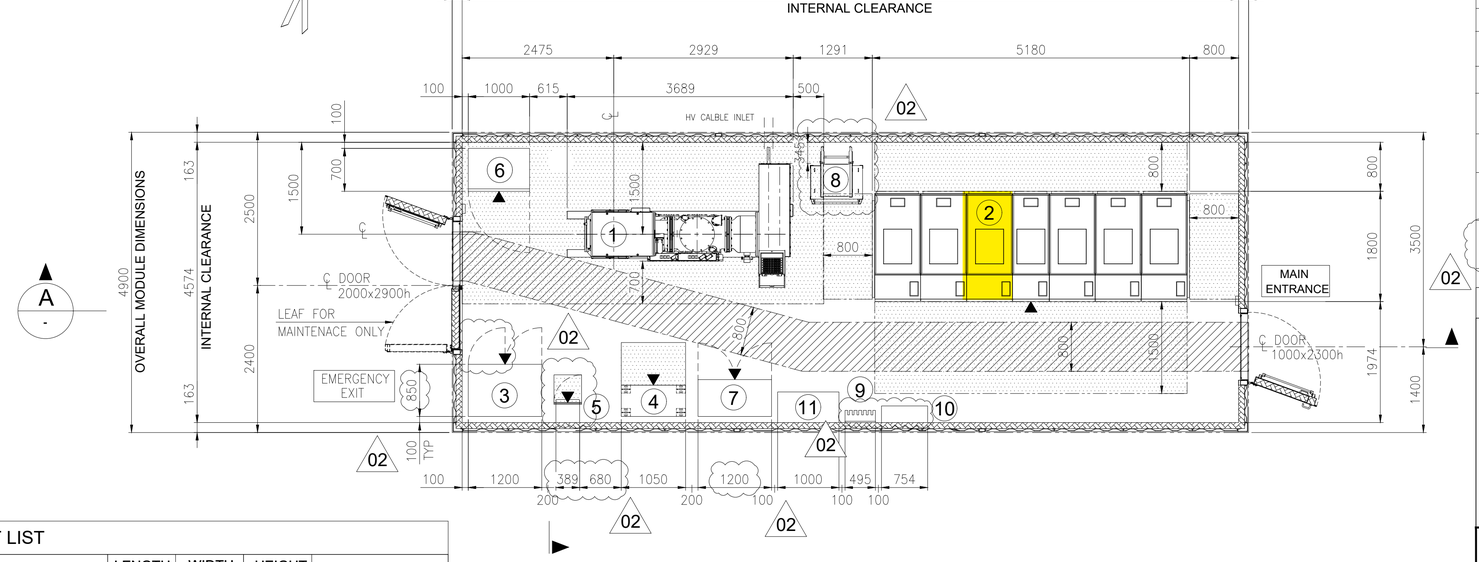
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02




SECTION B / -

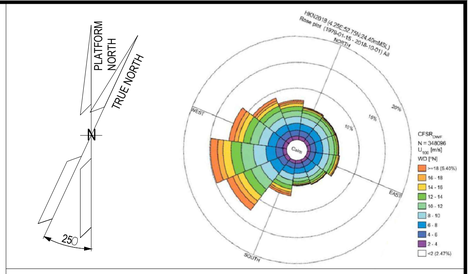



SECTION A / -




## EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | HNA6-AFA70 | 66kV SWITCHGEAR (GIS) | 3689 | 2025 | 2651 | |
| 2 | SG-100D1 | 6.6kV SWITCHGEAR | 5180 | 1800 | 2500 | |
| 3 | UP-200F1 | DC UPS PANEL | 1200 | 850 | 2105 | |
| 4 | BA-200F1 | DC UPS BATTERY RACK | 1050 | 510 | 1272 | |
| 5 | CB-200F1 02 | ISOLATOR FOR DC UPS | 452 | 377 | 634 | |
| 6 | CP-100E1 | 66 kV SWITCHGEAR LOCAL CONTROL PANEL | 1000 | 700 | 2200 | 02 |
| 7 | B100-HSB-001 | DISTRIBUTION & HVAC PANEL - HV MV ROOM | 1200 | 600 | 1900 | |
| 8 | - | SERVICE TROLLEY FOR 6.6kV SWITCHGEAR | 943 | 862 | 874 | |
| 9 | - | TOOL BOX | 495 | 200 | 200 | |
| 10 | - | SUBSTATION LIFE SAVING & INTERVENTION KIT | 754 | 270 | 840 | |
| 11 | - | TABLE | 1000 | 500 | 750 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

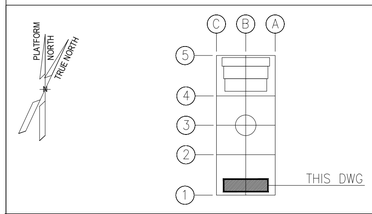
## LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| 66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING | 1723001595-EL-DA-00006 |
| CIRCUIT AND WIRING DIAGRAM | 1723001595-EL-DG-00015 |
| SG-100D1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00006 |
| DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00003 |
| DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00010 |
| B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00014 |

## KEY PLAN




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20104**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 10/11/2023 | DSF | CB/AMA | OYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

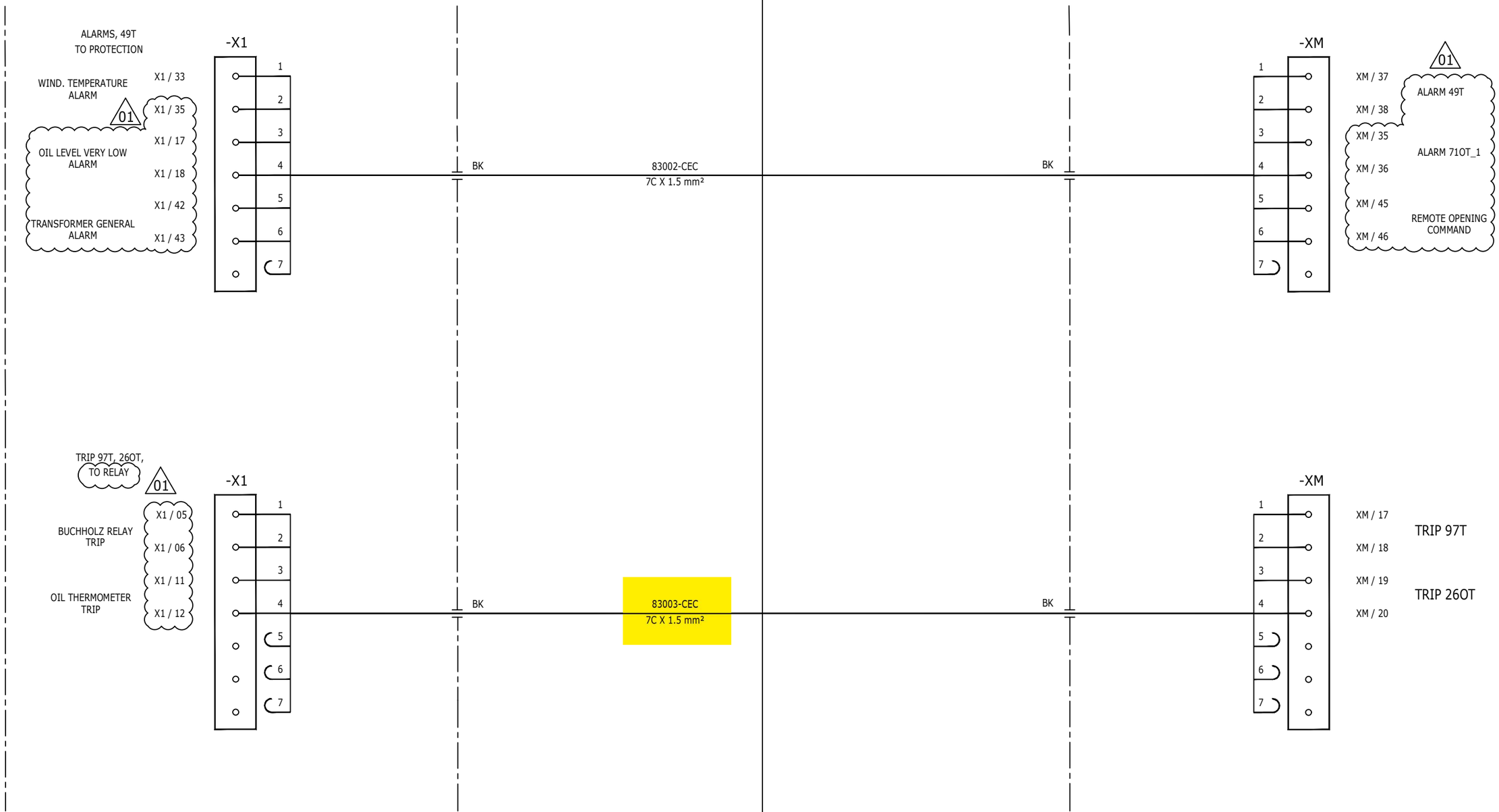
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN GPA | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20104 | SHEET 001 | REV. 02 |

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.415 KV TRANSFORMER
TAG NUMBER: CP-200E1 (01)

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
CP-200DE1A TRANSFORMER TRIP PROTECTION

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

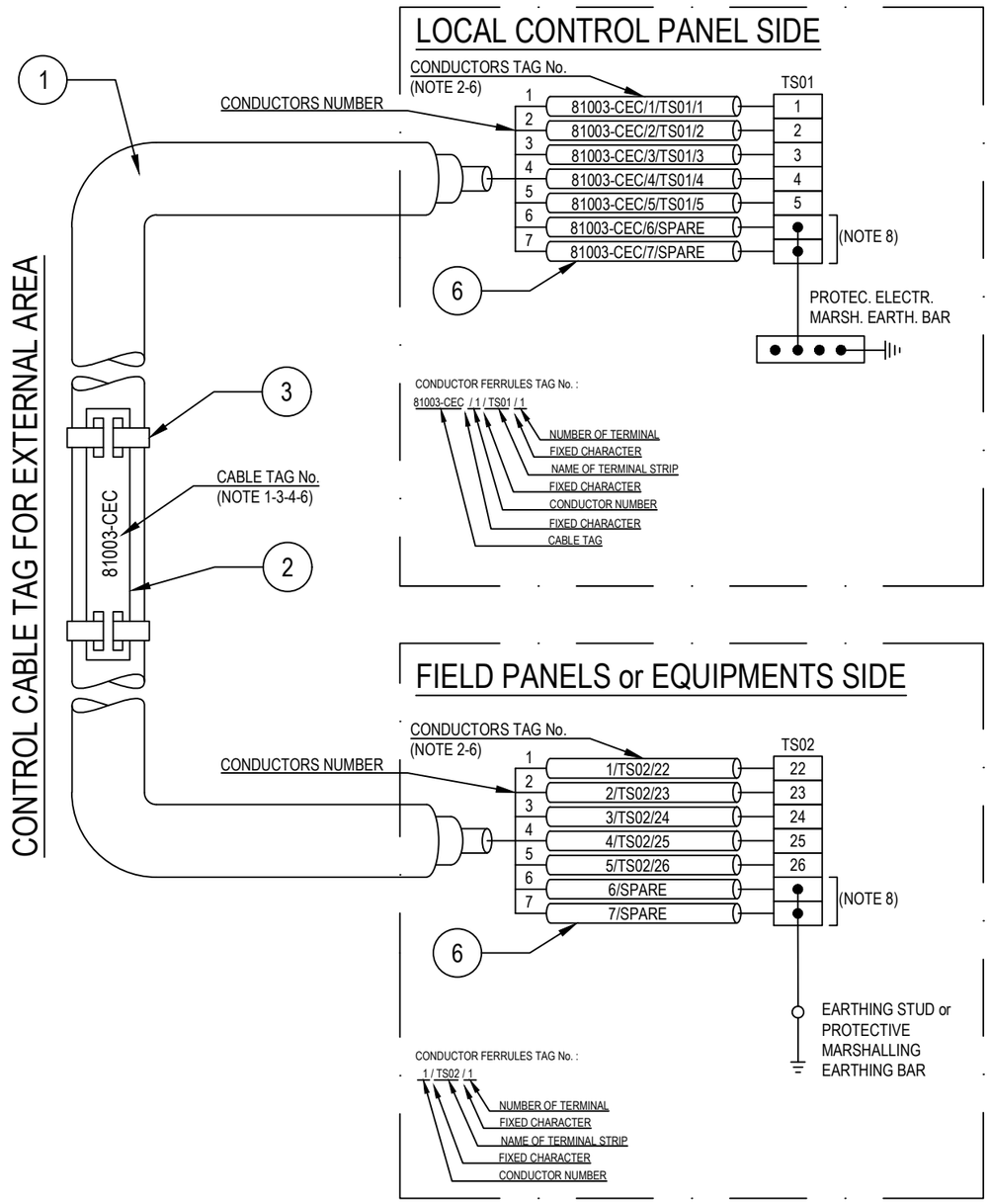
SHEET 079

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C04




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
   CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

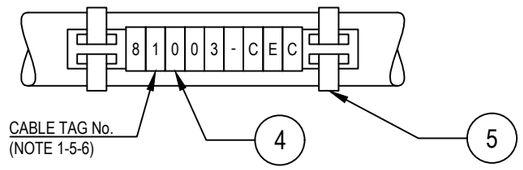
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
   WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
   - PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
   - EARTHING BOSS AND EARTH RING
   - EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## CONTROL CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

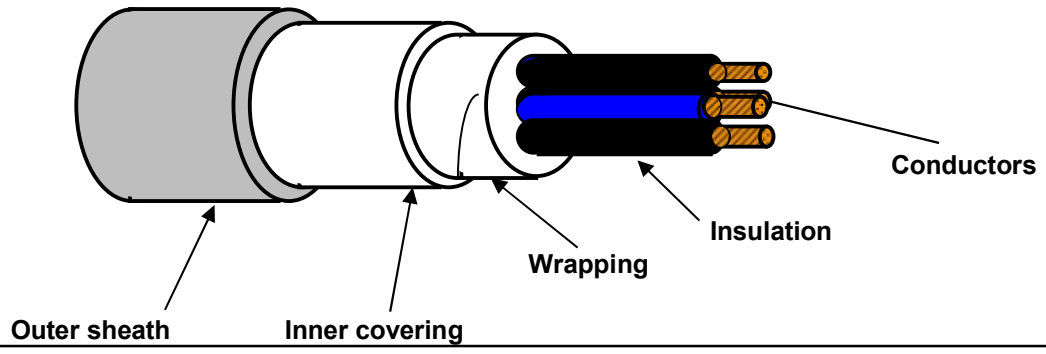
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Layout | Parent Tag | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland St | From Gland | From Entry | From Fittin | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83003-CEC | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | | | | | CP-200E1 | Auxiliary Trafo 1,6 MVA | Lower Deck | SG-100D1 | MV 6,6kV Switchgear | Lower Deck (B-100) | ELECV34-7X1,5 | Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey | M25 | T1_M25_Single | | | n.a. | | | | L-150-101-LVT-092 / L-750-101-LVT-013 / L-750-101-LVT-014 / E-MCT-106 / L-450-101-LVT-075 / L-600-101-LVT-058 / L-300-101-LVT-059 |

FLEI s.r.l.

# Cu Cl.2/XLPE/LSZH 0,6/1 KV

## 7CX1,5 - CONTROL CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| **Conductors :** | **STRANDED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| **Insulation :** | **XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm | |
| **Cores colour code :** | **Black NUMBERED (from 1 to 7)** | |
| **Pair Assembling :** | Not required | |
| **Pair Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Pair Shield :** | Not required | |
| **Shield Insulation :** | Not Required | |
| **Total Assembling :** | Cores layed up with optimal lay length | |
| **Overall Wrapping:** | by plastic tape helically wound | |
| **Drain wire :** | Not required | |
| **Overall Shield:** | Not required | |
| **Inner covering :** | Extruded LSZH compound, Average Thickness 1,0 mm | |
| **Inner covering color code:** | **Black or Natural** | |
| **Armour :** | Not required | |
| **Outer sheath :** | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm | |
| **Outer sheath color code:** | **Grey** | |
| **Outer printing (INKJET) :** | **FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -** | |
| | **Year of Manufacture - CE + Meter Marking** | |
| **Outer diameter :** | (13,5 ± 10%) mm | |
| **Bending radius :** | cable outer diameter x 10 | (in fixed installation) |
| **Voltage test :** | 3,5 kV a.c. for 5' (Between Cores) | |
| **Conductors DC Resistance :** | | IEC 60228 Class 2 |
| **Insulation Resistance :** | ≥ 1000 MΩ x Km (@ 20°C) | |
| **Applicable Standards** | | |
| **Design Guidelines :** | **IEC 60092.353** | |
| **ON COMPLETE CABLE** | | |
| **Flame Retardant test :** | IEC 60332.1.2 - IEC 60332.3.22 | |
| **Acid Gas generation :** | IEC 60754.1/2 | |
| **Smoke density/Light Transmittance :** | IEC 61034.2 (LT ≥ 60%) | |
| **Temperature Range :** | | |
| **ON INSULATION** | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| **ON COMPLETE CABLE** | | |
| **During Operation :** | (-20°C up to +90°C) | (in fixed installation) |
| **During installation :** | (- 5°C up to +50°C) | |
| **Note :** | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

ROSETTI MARINO | PROVERLIS | CROSSWIND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ITEM** | Tag | 83004-CEC | : 6.6/0.415 kV Transformer / 6.6KV HV Switchgear | | | Dwg | 123A90-DDL-EL-LIS-20148 |
| | S/Sys | 82-40 | : Power Transformer 1.6 MVA (TR-200DE1) | | | Module | LD_B-200/LD_B-100 |
| **TASK** | code | C10004375 | | Location | Onshore Activities | User | Rosetti Marino Quality Control |
| **FORM** | Process | MC | Activity CCK | Discipline | Electrical | Form | CPX10 Multicore Electrical Control Cable |

## CABLE DATA

Type: Cu Cl.2/XLPE/LSZH | Cores/Size mm²: 7X1,5 mm2 | Color: GREY

From: CP-200E1 | To: SG-100D1

| | | |
|---|---|---|
| 1 | Check cable physical integrity | OK |
| 2 | Check cable data against latest cable schedule. | OK |
| 3 | Check cable routing against latest drawings (segregation, distance…). | OK |
| 4 | Check cable is supported and fixed to rack according to latest project Specification. | Note |
| 5 | Check bending radius is within the specified limits. | OK |
| 6 | Check cable and core marking against latest drawings | PL |
| 7 | Check cable labelling is in accordance with latest specification. | PL |
| 8 | Check cable glands suit for cable type and are in accordance with latest specification. | OK |
| 9 | Check terminations are in accordance with latest termination diagram. | OK |
| 10 | Check cable earthing against lastest drawings. | NA |
| 11 | Check gland plate for single core cables is non magnetic. | NA |
| 12 | If required produce Red Line Mark Up for "AS BUILT" | |

| | | |
|---|---|---|
| CONTINUITY | CORE 1 / All cores+screen+armour+earth | 0.7 |
| | CORE 2 / All cores+screen+armour+earth | 0.7 |
| | CORE 3 / All cores+screen+armour+earth | 0.7 |
| | CORE 4 / All cores+screen+armour+earth | 0.7 |
| | CORE 5 / All cores+screen+armour+earth | 0.7 |
| | CORE 6 / All cores+screen+armour+earth | 0.7 |
| | CORE 7 / All cores+screen+armour+earth | 0.7 |
| | CORE 8 / All cores+screen+armour+earth | NA |
| | CORE 9 / All cores+screen+armour+earth | NA |
| | CORE 10 / All cores+screen+armour+earth | NA |
| INSULATION | CORE 1 | >999 |
| | CORE 2 | >999 |
| | CORE 3 | >999 |
| | CORE 4 | >999 |
| | CORE 5 | >999 |
| | CORE 6 | >999 |
| | CORE 7 | >999 |
| | CORE 8 | NA |
| | CORE 9 | NA |
| | CORE 10 | NA |
| | SCREEN | NA |
| | EARTH | NA |
| | ARMr | NA |
| | TEST VOLTS | 1000 |

**TESTING INSTRUMENTS USED**

| | |
|---|---|
| TYPE / SERIAL N° : KEW3125A S/N: W8330207<br>Calibration certificate N° and date: N°7722/24 _ 10/07/2024 | TYPE / SERIAL N° : FLUKE 175 S/N:AW1/018(17140769)<br>Calibration certificate N° and date: N°7715/24 _ 10/07/2024 |
| TYPE / SERIAL N° :<br>Calibration certificate N° and date: | TYPE / SERIAL N° :<br>Calibration certificate N° and date: |

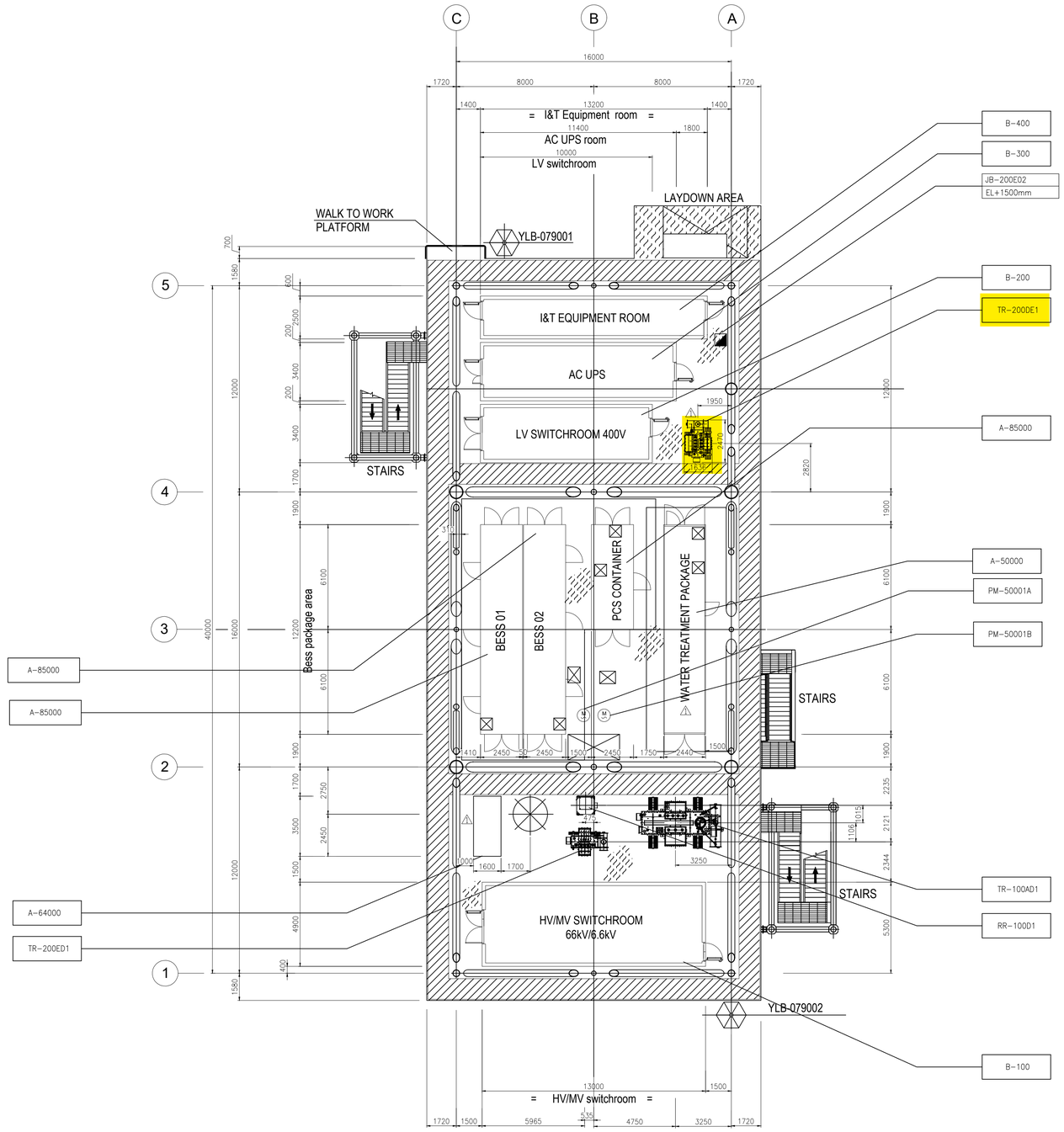
Comments: Note 4: Refer to PL C30000679

**Page 1/1**

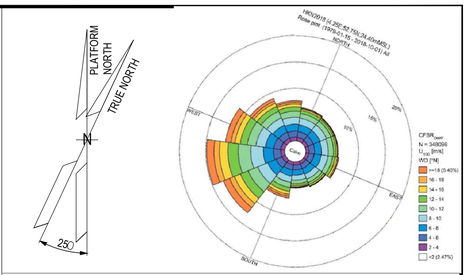
| | Performed by | ☐ WITNESS ☐ REVIEW | ☐ WITNESS ☐ REVIEW |
|---|---|---|---|
| **Company** | ICS IMPIANTI | RM (Rosetti Marino) | |
| **Name** | Carmelo Bongiovanni | Paolo Schintu | |
| **Date** | 2024-11-07 | 2024-11-22 | |
| **Signature** | PROVERLIS Digitaly signed by Carmelo Bongiovanni 2024-11-07T15:35:09.589Z | PROVERLIS Digitaly signed by Paolo Schintu 2024-11-22T13:39:25.002Z | |

DRAWING NO. 123A90-DDL-EL-DL-20101

REV. 01




PLAN ON LOWER DECK
EL+23.310 T.O.S.




## NOTES

1. ALL DIMENSIONS IN MM UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS IN METERS. UNLESS NOTED OTHERWISE.
3. ELEVATIONS REFER TO T.O.S.
4. FOR ELECTRICAL EQUIPMENT LAYOUT OF CONTAINERS B-100, B-200, B-300, B-400 REFER TO THE RESPECTIVE LAYOUTS.

## LEGEND

| | |
|---|---|
| (M) | ELECTRIC MOTOR – LOW VOLTAGE |
| ⊠ | INTERFACE PANEL |
| ◪ | JUNCTION BOX |
| JB-200E2 / EL+500mm | TAG ITEM / REFERED ELEVATION TO T.O.S. (TOP OF STEEL) |

## HOLDS

## REFERENCE DOCUMENTS

| | |
|---|---|
| 123A90-DDL-PP-DL-70070 | PLOT PLAN - LOWER & UPPER DECK |
| 123A90-DDL-EL-DL-20106 | ELECTRICAL EQUIPMENT LAYOUT UPSs & BATTERIES SWITCHROOM |
| 123A90-DDL-IN-DL-40012 | ITER EQUIPMENT LAYOUT |
| 123A90-DDL-EL-DL-20104 | ELECTRICAL EQUIPMENT LAYOUT HV & MV SWITCHROOM |
| 123A90-DDL-EL-DL-20105 | LV SWITCHGEAR ROOM EQUIPMENT LAYOUT |

INSERT SUBCONTRACTOR / VENDOR LOGO HERE

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 06/05/24 | SAM | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 04/03/24 | SAM | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20101**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

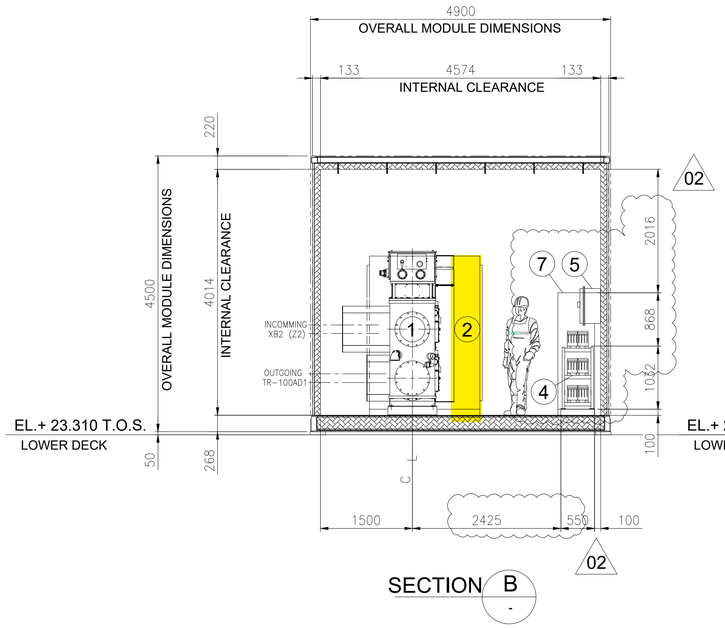
CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
LOWER DECK

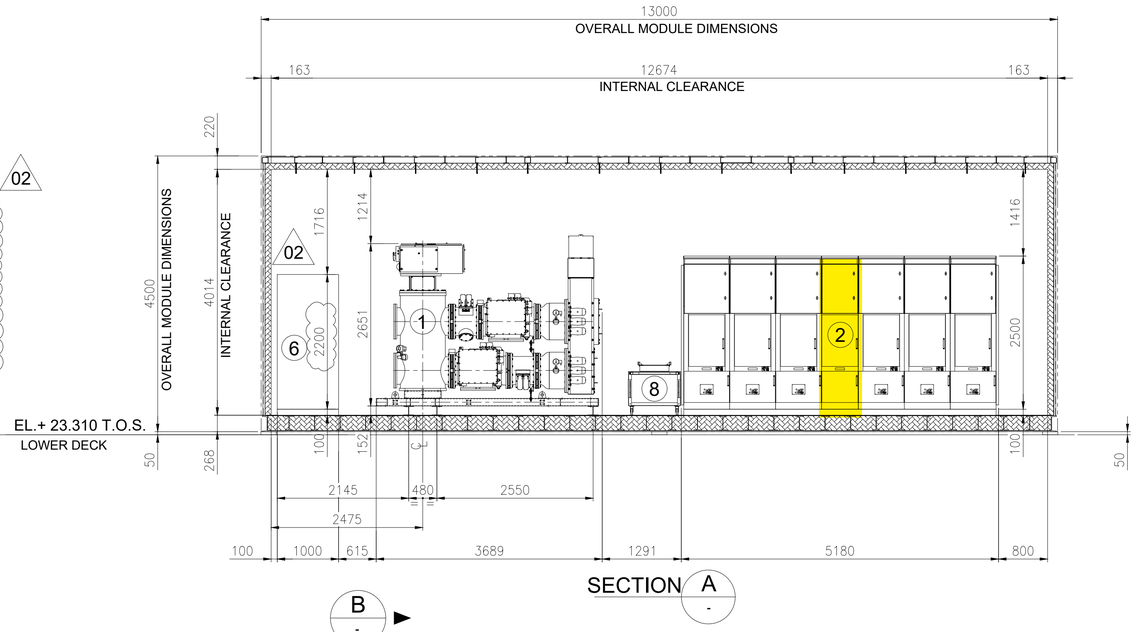
| | | | |
|---|---|---|---|
| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:150 |
| DRAWN SAM | CHECKED FMA/AMA | APPROVED FPA/DLO | DATE 04/03/24 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20101 | SHEET 001 | REV. 01 |

File Name : 123A90-DDL-EL-DL-20101-Electrical Equipment Layout – Lower Deck

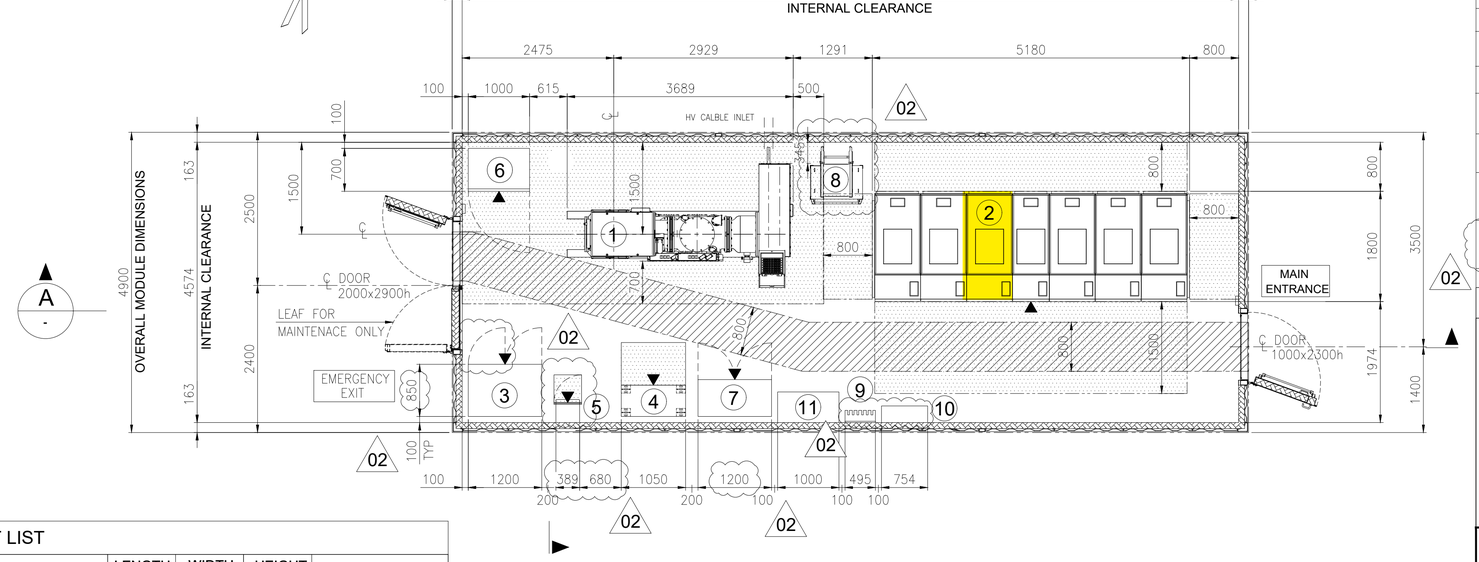
DRAWING NO. 123A90-DDL-EL-DL-20104 REV. 02




SECTION B / -

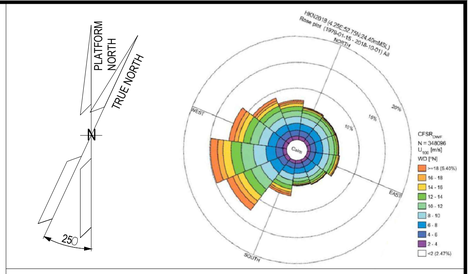



SECTION A / -




## EQUIPMENT LIST

| REF. | TAG No. | DESCRIPTION | LENGTH (mm) | WIDTH (mm) | HEIGHT (mm) | NOTE |
|---|---|---|---|---|---|---|
| 1 | HNA6-AFA70 | 66kV SWITCHGEAR (GIS) | 3689 | 2025 | 2651 | |
| 2 | SG-100D1 | 6.6kV SWITCHGEAR | 5180 | 1800 | 2500 | |
| 3 | UP-200F1 | DC UPS PANEL | 1200 | 850 | 2105 | |
| 4 | BA-200F1 | DC UPS BATTERY RACK | 1050 | 510 | 1272 | |
| 5 | CB-200F1 02 | ISOLATOR FOR DC UPS | 452 | 377 | 634 | |
| 6 | CP-100E1 | 66 kV SWITCHGEAR LOCAL CONTROL PANEL | 1000 | 700 | 2200 | 02 |
| 7 | B100-HSB-001 | DISTRIBUTION & HVAC PANEL - HV MV ROOM | 1200 | 600 | 1900 | |
| 8 | - | SERVICE TROLLEY FOR 6.6kV SWITCHGEAR | 943 | 862 | 874 | |
| 9 | - | TOOL BOX | 495 | 200 | 200 | |
| 10 | - | SUBSTATION LIFE SAVING & INTERVENTION KIT | 754 | 270 | 840 | |
| 11 | - | TABLE | 1000 | 500 | 750 | |




## NOTES

1. U.N.O. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DELETED
3. DOCUMENT VALID ONLY FOR ELECTRICAL COMPONENT.
4. FOR OTHER ITEMS, CORRECT LOCATION AND INFROMATION, PLEASE REFER TO VENDORS AND DEDICATED PROJECT DOCUMENTATION.
5. HEIGHT OF ALL PANELS IN THE EQUIPMENT LIST TABLE IS WITHOUT THE BASE FRAME (100mm)

02

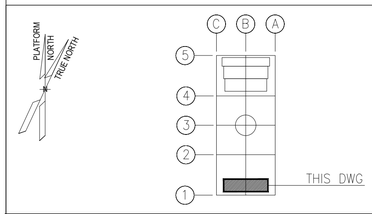
## LEGEND

U.N.O. _____ UNLESS NOTED OTHERWISE
T.O.S. _____ TOP OF STEEL
_____ ESCAPE CORRIDOR - WIDTH 800mm.
_____ MAINTENANCE AREA - VENDOR REQUIREMENT
_____ SWITCHGEAR ROOM ENCLOUSURE
_____ FRONT OF EQUIPMENT

## REFERENCES

| DOCUMENT TITLE | DOCUMENT NUMBER |
|---|---|
| 66kV SWITCHGEAR (GIS) GENERAL ARRANGEMENT DRAWING | 1723001595-EL-DA-00006 |
| CIRCUIT AND WIRING DIAGRAM | 1723001595-EL-DG-00015 |
| SG-100D1 GENERAL ARRANGEMENT DRAWING | 1723002197-EL-DA-00006 |
| DC UPS – GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS | 1724000372-EL-DA-00003 |
| DC UPS – BATTERY LAYOUT AND INTERCONNECTING DIAGRAM | 1724000372-EL-DG-00010 |
| B-100 - GENERAL ARRANGEMENT DRAWINGS - E&I SHELTER | 1724000049-AR-DA-00014 |

## KEY PLAN




**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20104**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 2_A | 08/08/24 | G.Randi |

**ROSETTI MARINO SpA**

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 02 | 27/05/2024 | FMO | LMA/AMA | LMA/MDO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 26/03/2024 | GPA | LMA/AMA | LMA/MDO | ISSUE FOR REVIEW (IFR) |
| 00 | 10/11/2023 | DSF | CB/AMA | OYFO/MDO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL EQUIPMENT LAYOUT
HV SWITCHROOM

| CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | | | SCALE 1:50 |
|---|---|---|---|
| DRAWN GPA | CHECKED LMA/AMA | APPROVED LMA/MDO | DATE 27/05/2024 |
| A1 | DRAWING NO. 123A90-DDL-EL-DL-20104 | SHEET 001 | REV. 02 |

File Name : 123A90-DDL-EL-DL-20104_REV02.dwg

| FROM | TO |
|---|---|

DESCRIPTION: 6.6/0.415 KV TRANSFORMER
TAG NUMBER: CP-200E1 (01)

TRIP 63T, 49T TO RELAY (01)

-X1

| | | |
|---|---|---|
| WIND. TEMPERATURE TRIP | X1 / 36 | 1 |
| | X1 / 38 | 2 |
| PRESSURE RELAY TRIP | X1 / 20 | 3 |
| | X1 / 21 | 4 |
| | | 5 |
| | | 6 |
| | | 7 |

BK — 83004-CEC, 7C X 1.5 mm² — BK

DESCRIPTION: 6.6KV HV SWITCHGEAR
TAG NUMBER: SG-100D1

-XM

| | | |
|---|---|---|
| 1 | XM / 23 | WIND. TEMPERATURE TRIP |
| 2 | XM / 24 | |
| 3 | XM / 21 | PRESSURE RELAY TRIP |
| 4 | XM / 22 | |
| 5 | | |
| 6 | | |
| 7 | | |

DESCRIPTION: LV SWITCHGEAR
TAG NUMBER: SG-200N1

COLUMN/CUBIC. A2/08

PERMISSIVES FROM LV TO 6.6KV FEEDER CB AND EARTHING SWITCH

-X2

| | | |
|---|---|---|
| X2 / 21 | 1 | |
| X2 / 22 | 2 | |
| X2 / 23 | 3 | |
| X2 / 24 | 4 | |
| X2 / 25 | 5 | |
| X2 / 26 | 6 | |
| | 7 | |

BK — 83005-CEC, 7C X 1.5 mm² — BK

-XM

| | | |
|---|---|---|
| 1 | XM / 27 | CB OPENED FROM LV SWBD |
| 2 | XM / 28 | |
| 3 | XM / 39 | CB IN TEST POSITION FROM LV SWBD |
| 4 | XM / 40 | |
| 5 | XM / 41 | FROM LV SWBD TRIPPED |
| 6 | XM / 42 | |
| 7 | | |

**VALID FOR CONSTRUCTION**
FDL DWG: **123A90-FDL-EL-DL-20149**

| REV.: | DATE: | SIGNATURE: |
|---|---|---|
| 1_A | 17/10/24 | G.Randi |

ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| 01 | 16/10/24 | SAI | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 08/07/24 | SAI | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL INTERCONNECTING WIRING DIAGRAM
LV SWITCHGEAR & 6.6KV HV SWITCHGEAR INTERLOCKS

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK

SCALE : 1:X

A3

DRAWING NO. 123A90-DDL-EL-DG-20149

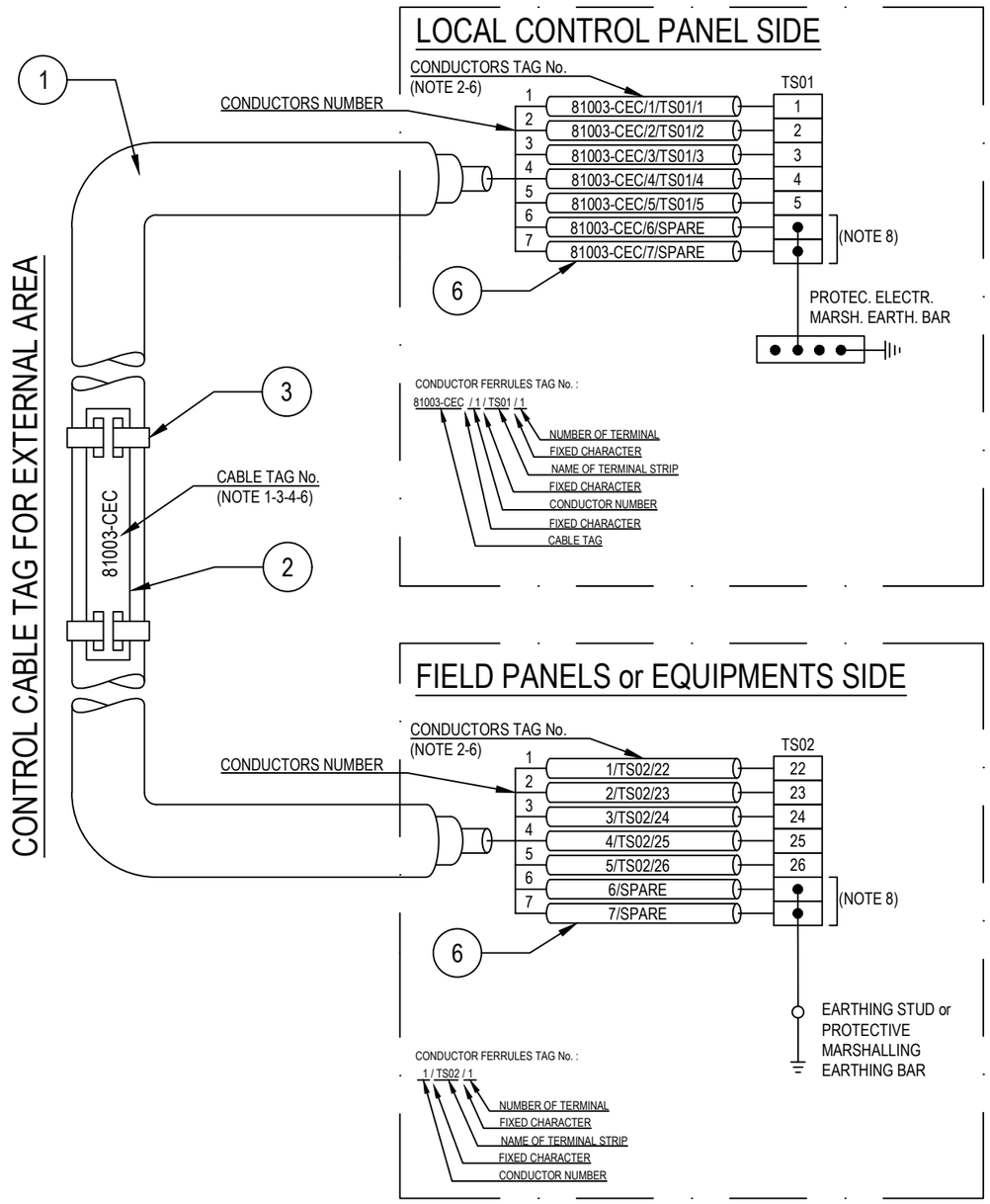
SHEET 080

REV. 01

F.to UNI A3: 420mmx297mm

File Name : 123A90-DDL-EL-DG-20162 Rev. 01

C04




| POS. | DESCRIPTION | MATERIAL | SIZE | Q.TY | NOTE |
|---|---|---|---|---|---|
| 1 | UNARMOURED CABLE | | | | |
| 2 | CABLE TAG FOR EXTERNAL AREA | HDG/SS | | | NOTE 1<br>NOTE 4 |
| 3 | TIE FOR CABLE TAG IN EXTERNAL AREA | HDG/SS | | | |
| 4 | CABLE TAG FOR INTERNAL AREA | PVC | | | NOTE 1<br>NOTE 5 |
| 5 | TIE FOR CABLE TAG IN INTERNAL AREA | NYLON 6.6 | | | |
| 6 | CORE FERRULES | PVC | | | |

NOTES:

1) ALL CABLES SHALL BE IDENTIFIED AT EACH TERMINATION AND EACH SIDE OF ANY OBSTACLE (E.G. CABLE TRANSIT ON WALLS INSIDE SHELTER AND FLOOR DECK CROSSING, BY THEIR RESPECTIVE TAGS/NUMBERS, AS INDICATED ON THE CABLE SCHEDULE.
   CABLE IDENTIFICATION SHALL BE ALSO DONE BELOW AND IN THE SWITCHBOARD CABLE COMPARTMENT.

2) CABLE CORE FERRULES SHALL BE FITTED AT EVERY TERMINATION. THESE FERRULES SHALL BE OF ENGRAVED PLASTIC SLIP ON, INTERLOCKED AND SELF GRIP TYPE.

3) ON CABLE TRAYS OR LADDERS, CABLES SHALL BE IDENTIFIED AT EACH END, AND EVERY 50 METERS.

4) THE CABLE TAG FOR EXTERNAL AREA SHALL DONE BY 316L STAINLESS STEEL LABELS, TAG (H=5mm) SHALL BE LASER PRINTED PREFERABLY OR EMBOSSED, LABEL HELD BY TWO 316L STAINLESS STEEL TIES.

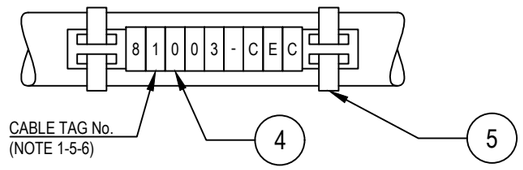
5) THE CABLE TAG FOR INTERNAL AREA SHAL BE DONE BY ENGRAVED PLASTIC SLIP ON CHARACTERS ONTO PLASTIC TIE, BLACK LETTER (H=5mm) ON WHITE.

6) CABLE AND CONDUCTOR TAG ARE INDICATIVE ONLY.

7) THE EARTHING CONNECTION OF THE ARMOUR CABLE IS NOT APPLICABILE IF THE ARMOUR IS CONNECTED TO EARTH WITH METALLIC CABLE GLAND.
   WITHIN TECHNICAL BUILDING, PROTECTIVE CONDUCTOR SHALL BE TAGGED BETWEEN FOLLOWING ITEMS:
   - PANEL (SWITCHBOARD, SWITCHGEAR, DISTRIBUTION BOARD, ETC) AND EARTH RING
   - EARTHING BOSS AND EARTH RING
   - EARTH BAR AND EARTH BAR (IF ANY).

8) ONLY IF NECESSARY, SHRINK TUBES OF THE APPROPRIATE COLOR WILL BE INSTALLED TO COVER THE WRONG CONDUCTOR COLOR, THIS WILL BE PERFORMED IN EACH SIDE OF THE CABLES WHERE NECESSARY.

## CONTROL CABLE TAG FOR INTERNAL AREA




VALID FOR CONSTRUCTION
FDL DWG: 123A90-FDL-EL-DD-20092
REV.: 2_A | DATE: 28/08/24 | SIGNATURE: G.Randi
ROSETTI MARINO SpA

| REV. | DATE | DRN | CHKD | APPD | DESCRIPTION |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 02 | 28/08/24 | GRA | AMA | DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 01 | 04/07/24 | NLK | FMA/AMA | FPA/DLO | ACCEPTED FOR CONSTRUCTION (AFC) |
| 00 | 21/11/23 | SPS | FMA/AMA | FPA/DLO | ISSUE FOR REVIEW (IFR) |

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
ELECTRICAL TYPICAL INSTALLATION DETAILS-POWER SYSTEM & CABLE INSTALLATION
CABLES INSTALLATION SYSTEM IDENTIFICATION FOR CONTROL CABLES

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK | SCALE : NTS

A3 | DRAWING NO. 123A90-DDL-EL-DD-20092 | SHEET 008 | REV. 02

F.to UNI A3: 420mmx297mm

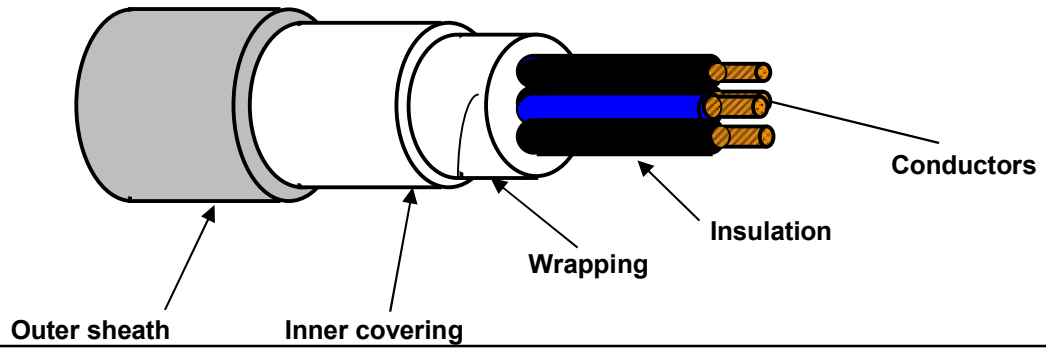
File Name : 123A90-DDL-EL-DD-20092 REV.02.DWG

| Tag Number | Category | Discipline | Eng Status | NativeDoc | Layout | Parent Tag | Main Function | Secondary Function | Area | From Tag | From Main Function | From Area | To Tag | To Main Function | To Area | Material ID | Material Desc. | Gland St | From Gland | From Entry | From Fittin | To Gland | To Entry | To Fitting | Routing | Routing Manual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83004-CEC | Cable | EL | VFC | 123A90-DDL-EL-LIS-20148 | | | | | | CP-200E1 | Auxiliary Trafo 1,6 MVA | Lower Deck | SG-100D1 | MV 6,6kV Switchgear | Lower Deck (B-100) | ELECV34-7X1,5 | Cable Cu Cl.2/XLPE/LSZH 0,6/1kV 7Cx1,5mm² - Grey | M25 | T1_M25_Single | | | n.a. | | | | L-150-101-LVT-092 / L-750-101-LVT-013 / L-750-101-LVT-014 / E-MCT-106 / L-450-101-LVT-075 / L-600-101-LVT-058 / L-300-101-LVT-059 |

FLEI s.r.l.

# Cu Cl.2/XLPE/LSZH 0,6/1 KV

## 7CX1,5 - CONTROL CABLE - Flame Retardant




### TECHNICAL FEATURES

| | | |
|---|---|---|
| **Conductors :** | **STRANDED** plain/bare annealed copper wires | IEC 60228 Class 2 |
| **Insulation :** | **XLPE** compound, quality to IEC 60092.360, Nominal Thickness 0,7 mm | |
| **Cores colour code :** | **Black NUMBERED (from 1 to 7)** | |
| **Pair Assembling :** | Not required | |
| **Pair Wrapping:** | Not required | |
| **Drain wire :** | Not required | |
| **Pair Shield :** | Not required | |
| **Shield Insulation :** | Not Required | |
| **Total Assembling :** | Cores layed up with optimal lay length | |
| **Overall Wrapping:** | by plastic tape helically wound | |
| **Drain wire :** | Not required | |
| **Overall Shield:** | Not required | |
| **Inner covering :** | Extruded LSZH compound, Average Thickness 1,0 mm | |
| **Inner covering color code:** | **Black or Natural** | |
| **Armour :** | Not required | |
| **Outer sheath :** | Extruded LSZH Thermoplastic Compound (O.I. ≥ 30%), type **SHF1** to IEC 60093.360, Average Thickness 1,2 mm | |
| **Outer sheath color code:** | **Grey** | |
| **Outer printing (INKJET) :** | **FLEI - ELECTRIC CABLE - 1000V - 7CX1,5 SQMM - XLPE/LSZH - 0,6/1 KV - IEC 60332.1.2 - IEC 60332.3.22 -** | |
| | **Year of Manufacture - CE + Meter Marking** | |
| **Outer diameter :** | (13,5 ± 10%) mm | |
| **Bending radius :** | cable outer diameter x 10 | (in fixed installation) |
| **Voltage test :** | 3,5 kV a.c. for 5' (Between Cores) | |
| **Conductors DC Resistance :** | | IEC 60228 Class 2 |
| **Insulation Resistance :** | ≥ 1000 MΩ x Km (@ 20°C) | |
| **Applicable Standards** | | |
| **Design Guidelines :** | **IEC 60092.353** | |
| **ON COMPLETE CABLE** | | |
| **Flame Retardant test :** | IEC 60332.1.2 - IEC 60332.3.22 | |
| **Acid Gas generation :** | IEC 60754.1/2 | |
| **Smoke density/Light Transmittance :** | IEC 61034.2 (LT ≥ 60%) | |
| **Temperature Range :** | | |
| **ON INSULATION** | (max +90°C) | (max continuous operation temperature of conductors) |
| | (max +250°C) | (max conductors temperature during short-circuit for 5 seconds) |
| **ON COMPLETE CABLE** | | |
| **During Operation :** | (-20°C up to +90°C) | (in fixed installation) |
| **During installation :** | (- 5°C up to +50°C) | |
| **Note :** | **To meet the requirements of installation and use in Zone 1 & Zone 2 (IEC 60079-14) and "Gas & Vapour Tight" the cable must be provided with Penetrating Inner covering together with correct ATEX approved equipment or accessories.** | |

| *Office* | Date | Sign | Rev. | Date | Sign |
|---|---|---|---|---|---|
| **Drawn by :** | 29/03/2024 | Messa | | | |
| **Checked :** | 29/03/2024 | Spaccasassi | | | |
| **Approved :** | 29/03/2024 | Cucinotta | | | |

The data provided, lending assent for the treatment, will be used to the sense of the article 13 of of the Regulation (UE) 2016/679, also through outsiders, in order to allow the realization of the fulfilments informatives, administrative, commercial and accounting related to the contractual relationship. Integral copy of the informative could be requested at our offices.

All proprietary rights reserved according to law. This document shall be not reproduced without written permission. FLEI reserves the right to change characteristics and technical data of product shown at any time.

# Section 6 MECHANICAL COMPLETION STATUS INDEX - INSTRUMENTAL DISCIPLINE

# NOT APPLICABLE

# Section 7 MECHANICAL COMPLETION STATUS INDEX - MECHANICAL DISCIPLINE

# NOT APPLICABLE

# Section 8 MECHANICAL COMPLETION STATUS INDEX - TELECOMMUNICATION DISCIPLINE

# NOT APPLICABLE

# Section 9 MECHANICAL COMPLETION STATUS INDEX - HVAC DISCIPLINE

# NOT APPLICABLE

# Section 10 MECHANICAL COMPLETION STATUS INDEX - PIPING DISCIPLINE

# NOT APPLICABLE

# Section 11 MECHANICAL COMPLETION INDEX - SAFETY DISCIPLINE

# NOT APPLICABLE

# Section 12 FAT / VENDOR REPORTS

| ROSETTI MARINO | **INSPECTION REPORT** | **Report No.**<br>**IR-1697-MFT-01** | SHEET 1 di 20 |
|---|---|---|---|
| | | **Data**<br>*Date*<br>***22-23-24-25/07/2024 + 30.07.2024*** | Rev.<br>*Rev.*<br>***01*** |
| **PROGETTO**<br>**HOLLANDSE KUST NOORD WIND PARK** | **CLIENTE**<br>CROSSWIND | **COMMESSA** / *Job*<br>**123A90** | **COMMESSA FORNITORE** / *Job Vendor*<br>523.23 (1.6 MVA)<br>524.23 (500 kVA) |
| **FORNITORE**/*Supplier*<br>***MF Trasformatori*** | **No. Ordine**/*P.O. No.*<br>**1723001697 rev.01** | **OGGETTO**/ *Object:*<br>**POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |

| **DESCRIZIONE DEL MATERIALE** / *Material Description* | | | | | |
|---|---|---|---|---|---|
| **POS.** *Item* | **QUANTITA'** *Quantity* | **DESCRIZIONE** *Description* | **Nr. TAG S/N** *TAG No. S/N* | **TIPO DI ISPEZIONE** / *Kind of Inspection* | **ESITO** / *Result* |
| **20** | **1** | **HV TRANSFORMER WITH OIL** | **TR-200DE1** | **FAT (QCP Step 3 & 4)** | **SATISFACTORY** |
| **30** | **1** | **HV TRANSFORMER WITH OIL** | **TR-200ED1** | **FAT (QCP Step 3 & 4)** | **SATISFACTORY** |

| **DOCUMENTI APPLICABILI** / *Applicable Documents* | | | |
|---|---|---|---|
| **TITOLO DOCUMENTO** / *Document Title* | **NUMERO DOCUMENTO** / *Document Number* | **REVISIONE** / *Revision* | **STATO DOCUMENTO** / *Document Status* |
| Inspection and test Plan (ITP) | 1723001697-QC-ITP-00002 | 03 (04-06-2024) | 1 – (No Comments …) |
| Factory Acceptance test (FAT) Procedure | 1723001697-QC-PRO-00014 | 02 (04-06-2024) | 2 – (Minor Comments ...) |
| TR-200DE1 General Arrangement | 1723001697-EL-DA-00007 | 04 (17-05-2024) | 1 – (No Comments …) |
| TR-200DE1 Termination and Wiring Diagram | 1723001697-EL-DG-00011 | 04 (15-05-2024) | 1 – (No Comments …) |
| TR-200ED1 General Arrangement | 1723001697-EL-DA-00008 | 02 (17-05-2024) | 1 – (No Comments …) |
| TR-200ED1 Termination and Wiring Diagram | 1723001697-EL-DG-00012 | 04 (09-05-2024) | 1 – (No Comments …) |

| **DISTRIBUZIONE A: /** *Distribution to:* | |
|---|---|
| ☐**GESTIONE FORNITURE** / *Supply Management Department* | ☐**CAPO COMMESSA** / *Project Manager* |
| ☐**PRODUZIONE** / *Production* | ☒**FORNITORE** / *Supplier* |
| ☐**PPLM** */ Project Procurement & Logistic Manager* | ☐**P.Q.M.** |
| ☐**MAGAZZINO** / *Warehouse* | ☐**P.E.M.** |

**ATTIVITA' ESEGUITE** / *Activities Carried Out*

**A – INTRODUZIONE /** *Preliminary Introduction*

According to Inspection Notification Nr. 01 issued on 06/07/2024, Inspection held at MF Trasformatori premises in Loc. S. Anna 22-24, 25011 Calcinato (BS) - Italy on July 22th to 25th, 2024 in order to attend Factory Acceptance Test of two HV Transformer with Oil.
The following IR describes the tests activities.
The result of the individual tests is Satisfactory as per detail in Pos. B, below.
Exception made for the findings listed in section B that shall be solved by supplier. **Solved on the 30.07.2024 reason of rev.01 – See detail below.**

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

| ROSETTI MARINO | **INSPECTION REPORT** | **Report No.**<br>**IR-1697-MFT-01** | SHEET 2 di 20 |
|---|---|---|---|
| | | **Data**<br>*Date*<br>***22-23-24-25/07/2024 + 30.07.2024*** | Rev.<br>*Rev.*<br>***01*** |

| **PROGETTO**<br>**HOLLANDSE KUST NOORD WIND PARK** | **CLIENTE**<br>CROSSWIND | **COMMESSA** / *Job*<br>**123A90** | **COMMESSA FORNITORE** / *Job Vendor*<br>523.23 (1.6 MVA)<br>524.23 (500 kVA) |
|---|---|---|---|
| **FORNITORE**/*Supplier*<br>***MF Trasformatori*** | **No. Ordine**/*P.O. No.*<br>**1723001697 rev.01** | **OGGETTO**/ *Object:*<br>**POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |

| **B – SCOPO DELL'ISPEZIONE** / *Scope of Inspection* | |
|---|---|
| **DESCRIZIONE DEI TEST PRESENZIATI / Description of witnessed tests** | **ESITO / Result** |
| 3 - FACTORY ACCEPTANCE TEST | |
| 3.1 Visual, labeling, dimensional check and correspondence at technical specification | Satisfactory |
| 3-2 Measurement of voltage ratio and vectorial group check | Satisfactory |
| 3-3 Measurement of winding resistance | Satisfactory |
| 3-4 Separate source AC voltage withstand test | Satisfactory |
| 3-5 Induced AC voltage test | Satisfactory |
| 3-6 Measurement of no-load losses and current | Satisfactory |
| 3-7 Measurement of short circuit impedance and load losses | Satisfactory |
| 3-8 Leak testing with pressure test (tightness test) | Satisfactory |
| 3-9 Functional test on all accessories | Satisfactory |
| 3-10 Breakdown voltage on insulation oil | Satisfactory |
| 3-11 Check of the ratio and polarity of built-in current transformers (if applicable) | Satisfactory |
| 3-12 Measurement of zero sequence impedance | Satisfactory |
| 3-13 Painting check (DFT and color) | Satisfactory |
| 3.14 Measurement for the dissipation factor (tan $\delta$) of the insulation system capacitances | Satisfactory |
| 3.15 Measurement for the d.c. insulation resistance each winding to earth and between windings | Satisfactory |
| 3.16 Measurement for the dissolved gasses in dielectric liquid | Satisfactory |
| 3.17 Determination of capacitances winding to earth and between windings | Satisfactory |
| **4 - TYPE TEST** | Satisfactory |
| 4.1 Full wave lightning impulse test | Satisfactory |
| 4.2 Temperature rise test | Satisfactory |
| 4.3 Noise test | Satisfactory |
| 4.4 Short circuit withstand test | Satisfactory |
| | |

**C –DETTAGLIO DEGLI STRUMENTI UTILIZZATI PER TEST E ISPEZIONE** / *Details of Inspection and Test Instruments used*

| **NOME DELLO STRUMENTO**<br>*Equipment name* | **PRODUTTORE**<br>*Manufacturer* | **MODELLO**<br>*Model* | **PROSSIMA TARATURA**<br>*Next calibration* |
|---|---|---|---|
| | **See Attachment 18** | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

| ROSETTI MARINO | **INSPECTION REPORT** | **Report No.**<br>**IR-1697-MFT-01** | SHEET 3 di 20 |
|---|---|---|---|
| | | **Data**<br>*Date*<br>***22-23-24-25/07/2024 + 30.07.2024*** | Rev.<br>*Rev.*<br>***01*** |

| **PROGETTO**<br>**HOLLANDSE KUST NOORD WIND PARK** | **CLIENTE**<br>CROSSWIND | **COMMESSA** / *Job*<br>**123A90** | **COMMESSA FORNITORE** / *Job Vendor*<br>523.23 (1.6 MVA)<br>524.23 (500 kVA) |
|---|---|---|---|
| **FORNITORE**/*Supplier*<br>***MF Trasformatori*** | **No. Ordine**/*P.O. No.*<br>**1723001697 rev.01** | **OGGETTO**/ *Object:*<br>**POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |

**D –ALLEGATI** / *Attachments (***CERTIFICATI E TEST REPORT** */ Certificates and Test Reports)*

| **NUMERO DOC.** /<br>*Document Number* | **DESCRIZIONE** /<br>*Description* | **TIPO** /<br>*Type* | **NR. PAGINE**<br>*/No. Pages* |
|---|---|---|---|
| 01 | PO Item 20 TR-200DE1 1,6 MVA - Ability to withstand short circuit | Calculation Report | 9 |
| 02 | PO Item 20 TR-200DE1 1,6 MVA - Impulse test | Test Report | 15 |
| 03 | PO Item 20 TR-200DE1 1,6 MVA - Noise Test | Test Report | 1 |
| 04 | PO Item 20 TR-200DE1 1,6 MVA - Oil Test | Test Report | 3 |
| 05 | PO Item 20 TR-200DE1 1,6 MVA - Routine & Special Test | Test Report | 7 |
| 06 | PO Item 20 TR-200DE1 1,6 MVA - Temperature Rise Test | Test Report | 9 |
| 07 | PO Item 20 TR-200DE1 1,6 MVA - General Arrangement with Mark-Up | Drawing | 9 |
| 08 | PO Item 20 TR-200DE1 1,6 MVA - Wiring Diagram with Mark-Up | Drawing | 7 |
| 09 | PO Item 30 TR-200ED1 0,5 MVA - Ability to withstand short circuit | Calculation Report | 9 |
| 10 | PO Item 30 TR-200ED1 0,5 MVA - Impulse test | Test Report | 18 |
| 11 | PO Item 30 TR-200ED1 0,5 MVA - Noise Test | Test Report | 1 |
| 12 | PO Item 30 TR-200ED1 0,5 MVA - Oil Test | Test Report | 3 |
| 13 | PO Item 30 TR-200ED1 0,5 MVA - Routine & Special Test | Test Report | 7 |
| 14 | PO Item 30 TR-200ED1 0,5 MVA - Temperature Rise Test | Test Report | 10 |
| 15 | PO Item 30 TR-200ED1 0,5 MVA - General Arrangement with Mark-Up | Drawing | 9 |
| 16 | PO Item 30 TR-200ED1 0,5 MVA - Wiring Diagram with Mark-Up | Drawing | 7 |
| 17 | Inspection and Test Plan (ITP) | ITP | 21 |
| 18 | Test Instrument List | List | 1 |
| 19 | FAT Procedure | Procedure | 24 |
| 20 | PO 1723001697 123A90A - Rosetti - MF - Points under discussion | List | 1 |
| 21 | Items and ITP points tested with dates | List | 1 |

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

| ROSETTI MARINO | **INSPECTION REPORT** | **Report No.**<br>**IR-1697-MFT-01** | SHEET 4 di 20 |
|---|---|---|---|
| | | **Data**<br>*Date*<br>***22-23-24-25/07/2024 + 30.07.2024*** | Rev.<br>*Rev.*<br>***01*** |

| **PROGETTO**<br>**HOLLANDSE KUST NOORD WIND PARK** | **CLIENTE**<br>CROSSWIND | **COMMESSA** / *Job*<br>**123A90** | **COMMESSA FORNITORE** / *Job Vendor*<br>523.23 (1.6 MVA)<br>524.23 (500 kVA) |
|---|---|---|---|
| **FORNITORE**/*Supplier*<br>***MF Trasformatori*** | **No. Ordine**/*P.O. No.*<br>**1723001697 rev.01** | **OGGETTO**/ *Object:*<br>**POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |

**E – DETTAGLI ED ESITO DELL'ISPEZIONE** / *Details and Results of Inspection*

| **POS.** *Item* | **BREVE DESCRIZIONE MATERIALE** *Material brief description* | **Q.TA' ODA** *Order Q.ty* | **Q.TA' TESTATA** *Tested Q.ty* | **ACCETTATO** *Accepted* | **DATA ACCETTAZIONE** *Acceptance date* |
|---|---|---|---|---|---|
| 20 | 1EQP059 HV Transformer with Oil Transformer 6.6/0,4 kV, 1.6 MVA, 50 Hz, KNAN, Outdoor-Offshore Type | 1 | 1 | **1** | **25-07-2024** |
| 30 | 1EQP059 HV Transformer with Oil Transformer 6.6/0,8 kV, 1500 kVA, 50 Hz, KNAN, Outdoor-Offshore Type | 1 | 1 | **1** | **25-07-2024** |

**F – CONCLUSIONI** / *Conclusions*

According to Inspection Notification Nr. 01 issued on 06/07/2024, Inspection was held at MF Trasformatori premises in Loc. S. Anna 22-24, 25011 Calcinato (BS) - Italy on July 22th to 25th, 2024 in order to attend Factory Acceptance Test of two HV Transformer with Oil.
In the below section, all the activities carried out are listed:

**Activities on Monday 22 July 2024**
Inspector checked documentation with particular attention to the approval status. (See Applicable Documents section).
All documents are approved with approval status "1 No Comments – Approved – Work May Proceed" except the FAT Procedure document which has approval status "2 Minor Comments-Revise and Resubmit-Work May Be Proceed."
With reference to the positions of the ITP, the following tests were performed as per sequence, on both transformers:

4.1 Full wave lightning impulse test
3.4 Separate source AC voltage withstand test
3.14 Measurement for the dissipation factor (tan δ) of the insulation system capacitances
3.17 Determination of capacitances winding to earth and between windings
3.15 Measurement for the d.c. insulation resistance each winding to earth and between windings
3.2 Measurement of voltage ratio and vectorial group check
3.3 Measurement of winding resistance
3.5 Induced AC voltage test
3.6 Measurement of no-load losses and current

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

| ROSETTI MARINO | INSPECTION REPORT | Report No. IR-1697-MFT-01 | SHEET 5 di 20 |
|---|---|---|---|
| | | Data *Date* ***22-23-24-25/07/2024 + 30.07.2024*** | Rev. *Rev.* ***01*** |

| PROGETTO | CLIENTE | COMMESSA / *Job* | COMMESSA FORNITORE / *Job Vendor* |
|---|---|---|---|
| **HOLLANDSE KUST NOORD WIND PARK** | CROSSWIND | **123A90** | 523.23 (1.6 MVA)<br>524.23 (500 kVA) |
| **FORNITORE/***Supplier* ***MF Trasformatori*** | **No. Ordine/***P.O. No.* **1723001697 rev.01** | **OGGETTO/** *Object:* **POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |

**Activities on Tuesday 23 July 2024**

With reference to the positions of the ITP, the following tests were performed as per sequence,

3.7 Measurement of short circuit impedance and load losses (on both transformers)

3.12 Measurement of zero sequence impedance (on both transformers)

3.10 Breakdown voltage on insulation oil (on both transformers)

3.16 Measurement for the dissolved gasses in dielectric liquid (on both transformers)

4.2 Temperature rise test (Begin on TR-200DE1 – 1.6 MVA)

3.8 Leak testing with pressure test (tightness test) (Begin on TR-200ED1 – 0.5 MVA)

**Activities on Wednesday 24 July 2024**

4.3 Noise Test (TR-200ED1 – 0.5 MVA)

3.8 Leak testing with pressure test (tightness test) (End on TR-200ED1 – 0.5 MVA)

4.2 Temperature rise test (End on TR-200DE1 – 1.6 MVA)

3-13 Painting check (DFT and color) (TR-200ED1 – 0.5 MVA)

3-8 Leak testing with pressure test (tightness test) (Begin on TR-200DE1 – 1.6 MVA)

4.2 Temperature rise test (Begin on TR-200ED1 – 0.5 MVA)

4.4 Short circuit withstand test (on both transformers)

3.1 Visual, labeling, dimensional check, and correspondence (TR-200ED1 – 0.5 MVA)

3-9 Functional test on all accessories (TR-200ED1 – 0.5 MVA)

**Activities on Thursday 25 July 2024**

3.1 Visual, labeling, dimensional check, and correspondence (TR-200DE1 – 1.6 MVA)

3-8 Leak testing with pressure test (tightness test) (TR-200DE1 – 1.6 MVA)

3-9 Functional test on all accessories (TR-200ED1 – 0.5 MVA)

3-11 Check of the ratio and polarity of built-in current transformers (TR-200DE1 – 1.6 MVA)

3-13 Painting check (DFT and color) (TR-200DE1 – 1.6 MVA)

4.2 Temperature rise test (End on TR-200ED1 – 0.5 MVA)

4.3 Noise Test (TR-200DE1 – 1.6 MVA)

The result of the individual tests is SATISFACTORY as per detail in Pos. B.

During the visual and dimensional check, some problems were detected, summarized in pos. G, which the Vendor has undertaken to resolve before shipment.

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

| ROSETTI MARINO | INSPECTION REPORT | Report No.<br>IR-1697-MFT-01 | SHEET 6 di 20 |
|---|---|---|---|
| | | Data<br>*Date*<br>***22-23-24-25/07/2024 + 30.07.2024*** | Rev.<br>*Rev.*<br>***01*** |

| PROGETTO | CLIENTE | COMMESSA / *Job* | COMMESSA FORNITORE / *Job Vendor* |
|---|---|---|---|
| **HOLLANDSE KUST NOORD WIND PARK** | CROSSWIND | **123A90** | 523.23 (1.6 MVA)<br>524.23 (500 kVA) |

| FORNITORE/*Supplier* | No. Ordine/*P.O. No.* | OGGETTO/ *Object:* |
|---|---|---|
| ***MF Trasformatori*** | **1723001697 rev.01** | **POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** |

**Update dated 30.07.2024**
**On the 29th of July Supplier provides photos in order to close the issues listed below:**

- 1 -There is no earthing connection between the lid and the transformer tank - TR-200DE1 & TR-200ED1
- 2 - The main earthing point is missing under the oil conservative - TR-200DE1
- 3 - There are no holes for customer cable glands under the control box - TR-200DE1 & TR-200ED1
  On technical drawings, is present note not taken into consideration by the vendor - TR-200DE1 & TR-200ED
- 4 - There are no identification plates of the components within the control boxes - TR-200DE1 & TR-200ED1

**detected during the visit.**
**After checking the same, inspector confirm that the point above shall be considered closed. Please note that concerning the point 3 referred to the holes inspector can only check the number of the same and position shall be evaluated by RMG. (Please refer to pictures added in this revision).**

During the checks, some minor problems were found on the technical documentation and consequently some Mark-ups were inserted.
All the documents issued during the test were checked and signed by the attendees, the same were scanned, and the pdf files are attached to the Report.
The Vendor has undertaken to update them during the As Built phase.

The various testing phases can also be verified on the attached photos

**G – PUNTI IRRISOLTI** / *Outstanding points*

| H – STATO PACKING LIST / *Packing List Status* | ☐ EMESSO / *Issued* | ☐ NON EMESSO / *Not Issued* | DD/MM/YYYY<br>**ULTIMA DATA UTILE** / *Last Date* |
|---|---|---|---|

**PUNCH LIST REPORT: VEDI ALLEGATO N°** / *Refer to Attachment n° N/A*

| L' INCARICATO / *The person in charge* | IL RAPP. DEL CLIENTE / *Client's Representative* | IL FORNITORE / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

| ROSETTI MARINO | INSPECTION REPORT | Report No. IR-1697-MFT-01 | SHEET 7 di 20 |
|---|---|---|---|
| | | Data *Date* ***22-23-24-25/07/2024 + 30.07.2024*** | Rev. *Rev.* ***01*** |
| **PROGETTO** **HOLLANDSE KUST NOORD WIND PARK** | **CLIENTE** CROSSWIND | **COMMESSA** / *Job* **123A90** | **COMMESSA FORNITORE** / *Job Vendor* 523.23 (1.6 MVA) 524.23 (500 kVA) |
| **FORNITORE**/*Supplier* ***MF Trasformatori*** | **No. Ordine**/*P.O. No.* **1723001697 rev.01** | **OGGETTO**/ *Object:* **POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |

**REPORT FOTOGRAFICO (SE PRESENTE)** / *Digital Pictures (if any)*

## Activities on Monday 22 July 2024




01-Transformers on Test Room



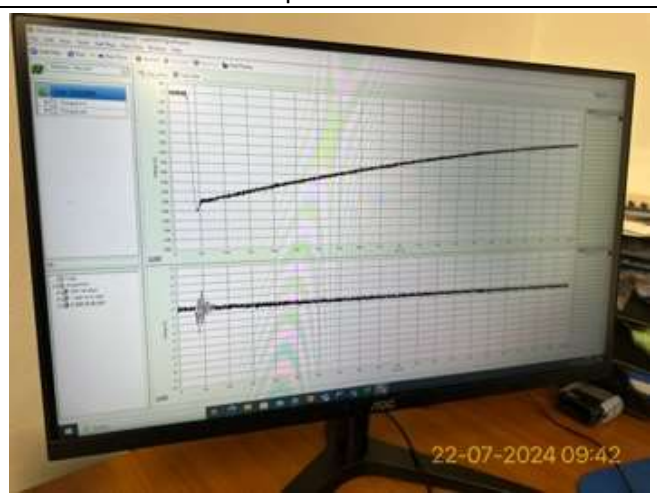

02-TR-200DE1 1.6 MVA prepared for lightning impulse test




03-Desk Control in Test Room




04-Data acquisition




05-Data acquisition




06-TR-200ED1 0.5 MVA prepared for lAC voltage withstand test




07-TR-200ED1 0.5 MVA prepared for lightning impulse test




08-TR-200ED1 0.5 MVA prepared for dissipation factor (Tan Delta)




09-TR-200ED1 0.5 MVA - Insulation resistance winding

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*




10-TR-200ED1 0.5 MVA - Insulation resistance winding




11-TR-200DE1 1.6 MVA - Insulation resistance winding




12-TR-200DE1 1.6 MVA - Insulation resistance winding




13-TR-200ED1 0.5 MVA - Voltage ratio and vectorial group check



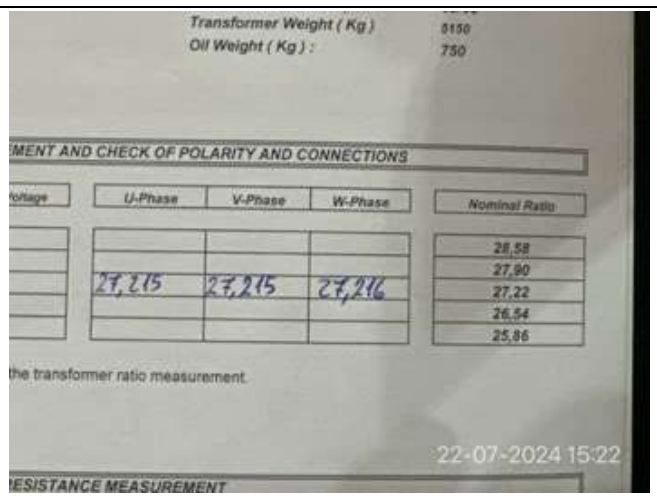

14-TR-200DE1 1.6 MVA - Voltage ratio and vectorial group check




15-TR-200DE1 1.6 MVA - Voltage ratio and vectorial group check




16-TR-200DE1 1.6 MVA - Voltage ratio and vectorial group check




17-TR-200DE1 1.6 MVA - Voltage ratio and vectorial group check




18-TR-200DE1 1.6 MVA -Measurement of winding resistance

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |


QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

| | | |
|---|---|---|
|  |  |  |
| 19-TR-200DE1 1.6 MVA -Measurement of winding resistance | 20-TR-200DE1 1.6 MVA - Measurement of no-load losses and current | 21-TR-200DE1 1.6 MVA - Measurement of no-load losses and current |
| **Activities on Tuesday 23 July 2024** | | |
|  |  |  |
| 01-TR-200DE1 1.6 MVA - Measurement of short circuit impedance and load losses | 02-TR-200DE1 1.6 MVA - Measurement of short circuit impedance and load losses | 03-TR-200DE1 1.6 MVA - Measurement of short circuit impedance and load losses |
|  |  |  |
| 04-TR-200DE1 1.6 MVA - Measurement of short circuit impedance and load losses | 05-TR-200ED1 0.5 MVA - Measurement of short circuit impedance and load losses | 06-TR-200ED1 0.5 MVA - Measurement of short circuit impedance and load losses |

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*




07-TR-200ED1 0.5 MVA - Measurement of short circuit impedance and load losses




08-TR-200ED1 0.5 MVA - Measurement of zero sequence impedance




09-Oil sample collection for breakdown voltage on insulation oil



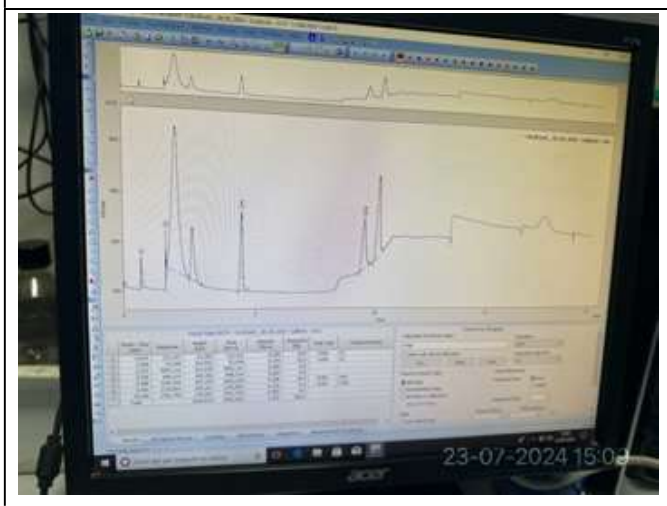
10-Oil sample collection for dissolved gasses in dielectric liquid



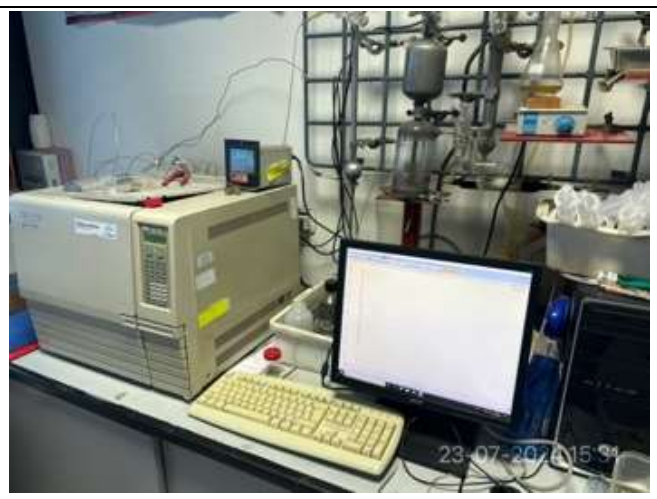

11-Breakdown voltage on insulation oil




12-Measurement for the dissolved gasses in dielectric liquid




13-Measurement for the dissolved gasses in dielectric liquid




14-Measurement for the dissolved gasses in dielectric liquid



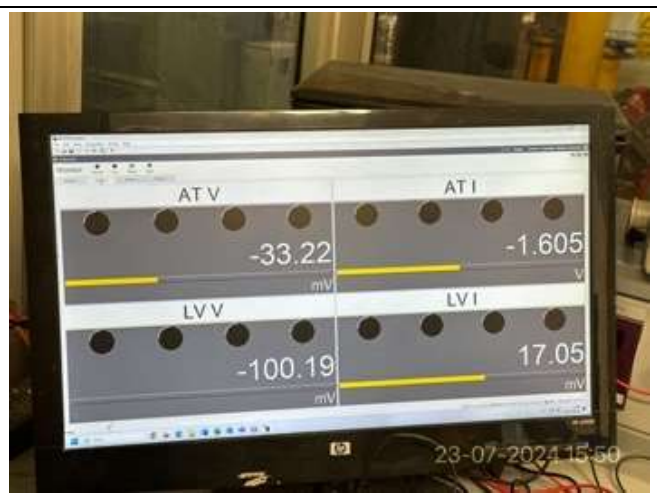

15-TR-200DE1 1.6 MVA - Prepared for temperature rise test

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

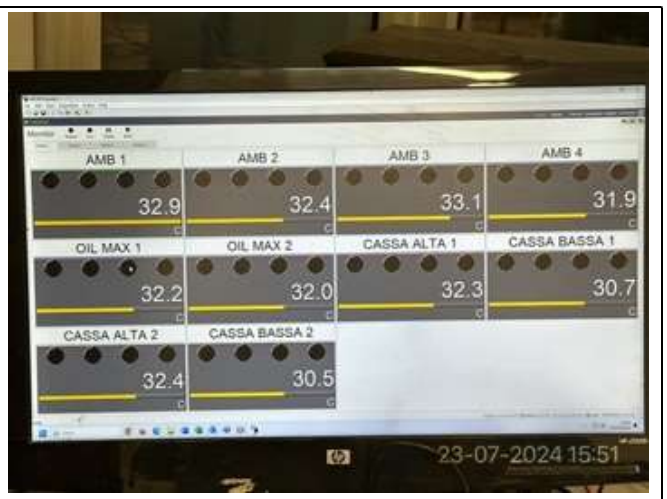

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*




16-TR-200DE1 1.6 MVA - Prepared for temperature rise test




17-TR-200DE1 1.6 MVA - Preparation for temperature rise test




18-TR-200DE1 1.6 MVA - Preparation for temperature rise test




19-TR-200ED1 0.5 MVA - Prepared for leak testing with pressure




20-TR-200ED1 0.5 MVA - Leak testing with pressure - 0 Bar




21-TR-200ED1 0.5 MVA - Leak testing with pressure - Begin at 0,3 Bar

## Activities on Wednesday 24 July 2024




01-TR-200ED1 0.5 MVA - Leak testing with pressure - End




02-TR-200ED1 0.5 MVA - Leak testing with pressure -End at 0,3 Bar




03-TR-200ED1 0.5 MVA - Painting Color Check

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

| PROGETTO | CLIENTE | COMMESSA / *Job* | COMMESSA FORNITORE / *Job Vendor* |
|---|---|---|---|
| **HOLLANDSE KUST NOORD WIND PARK** | CROSSWIND | **123A90** | 523.23 (1.6 MVA)<br>524.23 (500 kVA) |
| **FORNITORE/***Supplier*<br>***MF Trasformatori*** | **No. Ordine/***P.O. No.*<br>**1723001697 rev.01** | **OGGETTO/** *Object:*<br>**POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |

| | | |
|---|---|---|
|  |  |  |
| 04-TR-200ED1 0.5 MVA - Painting Thickness Check | 05-TR-200ED1 0.5 MVA - Painting Thickness Check | 06-TR-200ED1 0.5 MVA - Painting Thickness Check |
|  |  |  |
| 07-TR-200ED1 0.5 MVA - Painting Thickness Check | 08-TR-200ED1 0.5 MVA - Painting Thickness Check | 09-TR-200ED1 0.5 MVA - Painting Thickness Check |
|  |  |  |
| 10-TR-200ED1 0.5 MVA - Painting Thickness Check | 11-TR-200ED1 0.5 MVA - Earthing Point, detail | 12-TR-200ED1 0.5 MVA -Buccholtz Relay |

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |


QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*




13-TR-200ED1 0.5 MVA - LV Terminals




14-TR-200ED1 0.5 MVA - HV Terminals




15-TR-200ED1 0.5 MVA - detail




16-TR-200DE1 1.6 MVA - Leak testing with pressure - Begin




17-TR-200DE1 1.6 MVA - Leak testing with pressure - Begin at 0 bar (0,08 bar)




18-TR-200DE1 1.6 MVA - Leak testing with pressure - Begin at 0,38 bar (+0,3 bar)




19-TR-200ED1 0.5 MVA - Temperature rise test - Begin




20-TR-200ED1 0.5 MVA - Temperature rise test - Begin

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

| ROSETTI MARINO | INSPECTION REPORT | Report No.<br>IR-1697-MFT-01 | SHEET 14 di 20 |
|---|---|---|---|
| | | Data<br>*Date*<br>***22-23-24-25/07/2024 + 30.07.2024*** | Rev.<br>*Rev.*<br>***01*** |
| **PROGETTO**<br>**HOLLANDSE KUST NOORD WIND PARK** | **CLIENTE**<br>CROSSWIND | **COMMESSA** / *Job*<br>**123A90** | **COMMESSA FORNITORE** / *Job Vendor*<br>523.23 (1.6 MVA)<br>524.23 (500 kVA) |
| **FORNITORE**/*Supplier*<br>***MF Trasformatori*** | **No. Ordine**/*P.O. No.*<br>**1723001697 rev.01** | **OGGETTO**/ *Object:*<br>**POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |

## Activities on Thursday 25 July 2024




01-TR-200DE1 1.6 MVA - Visual and dimensional check




02-TR-200DE1 1.6 MVA - Visual and dimensional check




03-TR-200DE1 1.6 MVA - Painting color check




04-TR-200DE1 1.6 MVA - Painting thickness check




05-TR-200DE1 1.6 MVA - Painting thickness check




06-TR-200DE1 1.6 MVA - Painting thickness check




07-TR-200DE1 1.6 MVA - Painting thickness check




08-TR-200DE1 1.6 MVA - Painting thickness check




09-TR-200DE1 1.6 MVA - Painting thickness check

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*



10-TR-200DE1 1.6 MVA - Painting thickness check



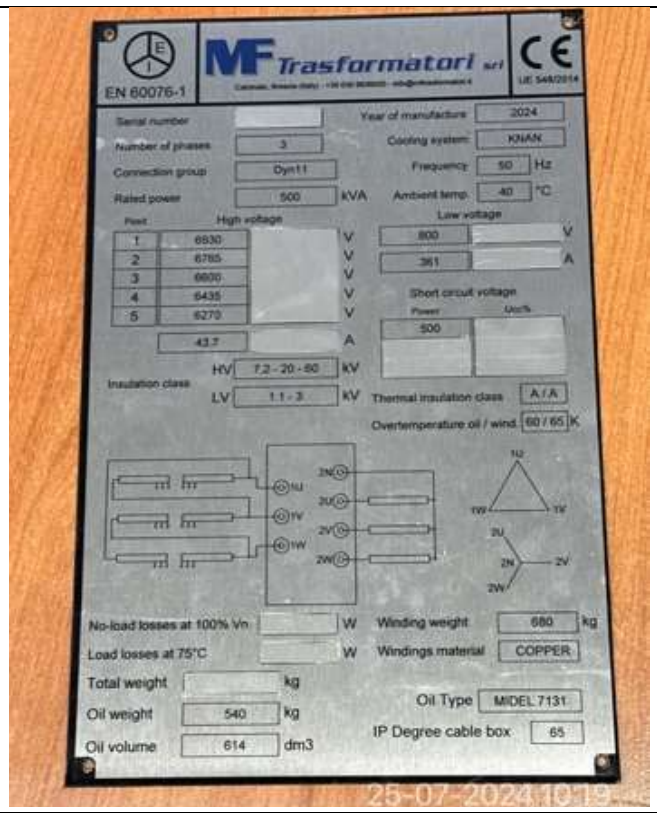

11-TR-200DE1 1.6 MVA - Control box



12-TR-200DE1 1.6 MVA - Control box without holes




13-Synthetic insulating fluid nameplate



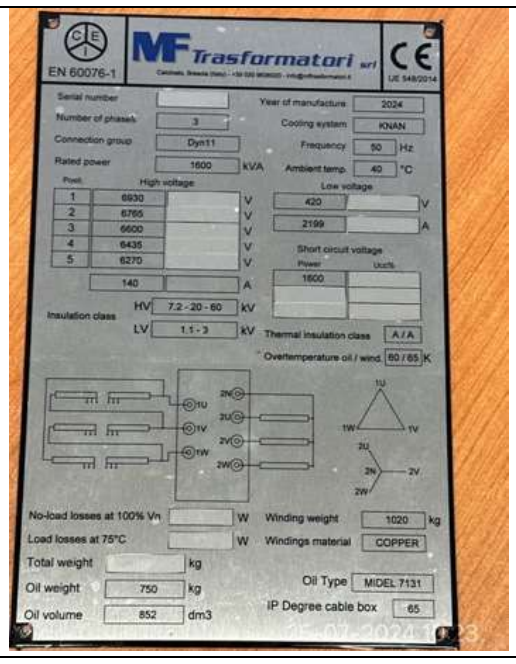

14-TR-200ED1 0.5 MVA - Manufacturer and Data Nameplate




15-TR-200ED1 0.5 MVA - Tag Nameplate and Control Box Nameplate

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |


QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*




16-TR-200DE1 1.6 MVA - Manufacturer and Data Nameplate




17-TR-200DE1 1.6 MVA - Tag Nameplate and Control Box Nameplate copia




18-TR-200DE1 1.6 MVA - Transformer with Protection Box




19-TR-200DE1 1.6 MVA - Transformer with Protection Box




20-TR-200DE1 1.6 MVA - Transformer with Protection Box




21-TR-200DE1 1.6 MVA - Transformer with Protection Box




22-TR-200DE1 1.6 MVA - Transformer with Protection Box, detail




23-TR-200ED1 0.5 MVA - Protection Box, detail



24-TR-200ED1 0.5 MVA - Protection Box, detail

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |


QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

| ROSETTI MARINO | INSPECTION REPORT | Report No.<br>IR-1697-MFT-01 | SHEET 17 di 20 |
|---|---|---|---|
| | | Data<br>*Date*<br>***22-23-24-25/07/2024 + 30.07.2024*** | Rev.<br>*Rev.*<br>***01*** |
| **PROGETTO**<br>**HOLLANDSE KUST NOORD WIND PARK** | **CLIENTE**<br>CROSSWIND | **COMMESSA** / *Job*<br>**123A90** | **COMMESSA FORNITORE** / *Job Vendor*<br>523.23 (1.6 MVA)<br>524.23 (500 kVA) |
| **FORNITORE**/*Supplier*<br>***MF Trasformatori*** | **No. Ordine**/*P.O. No.*<br>**1723001697 rev.01** | **OGGETTO**/ *Object:*<br>**POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |

## Transformer 7 MVA in construction - Monday 22 July 2024




01-Transformer 7 MVA in construction




02-Transformer 7 MVA in construction

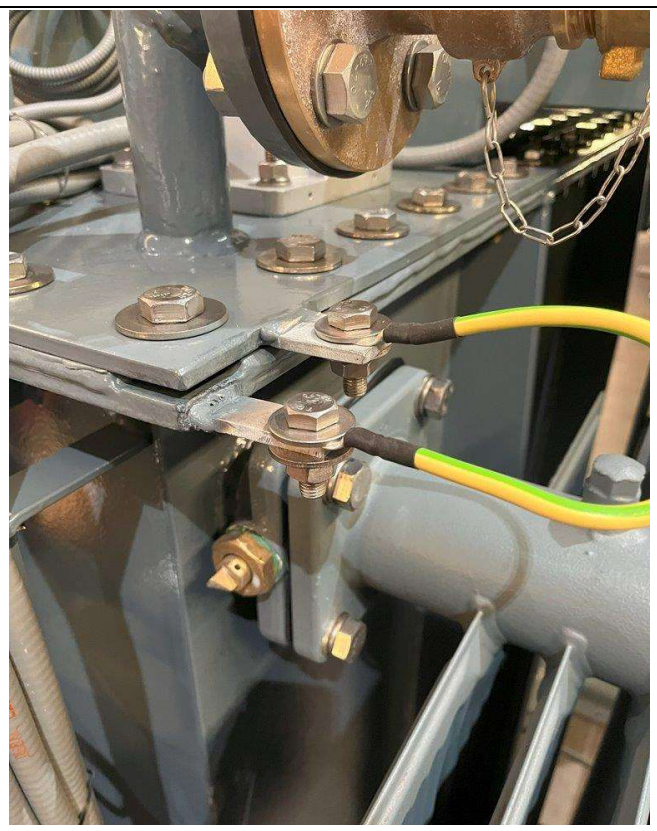



03-Transformer 7 MVA in construction

## Pending Point closure – 30.07.2024




TR-200DE1 – Control box Identification plates



TR-200DE1 – Connection between the lid and the transformer tank




TR-200DE1 – Installed Identification Plates

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*



TR-200DE1 – Earthing Point



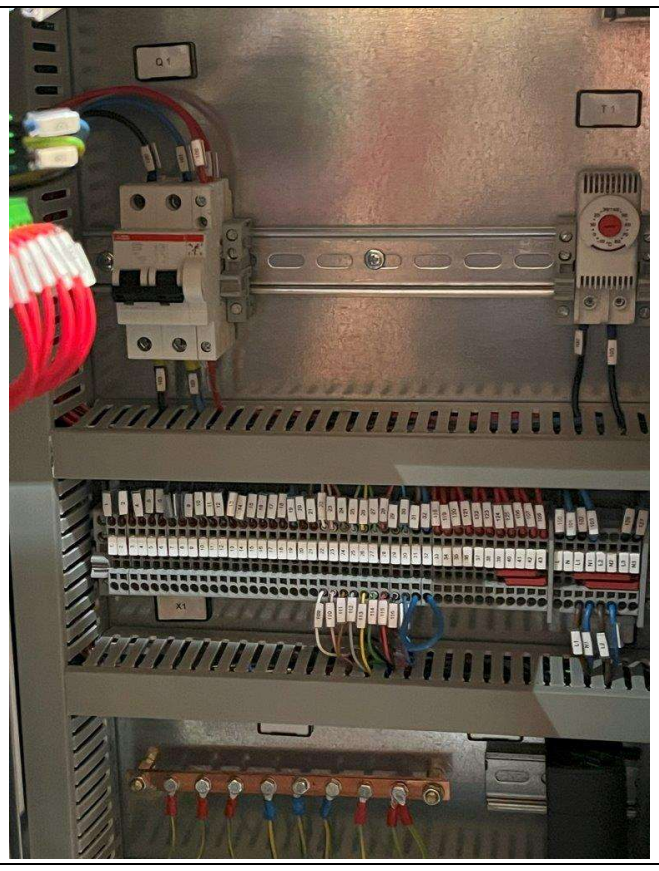
TR-200DE1 – Final assembly



TR-200DE1 – Final assembly



TR-200DE1 – Pending Point 3 – Missing holes

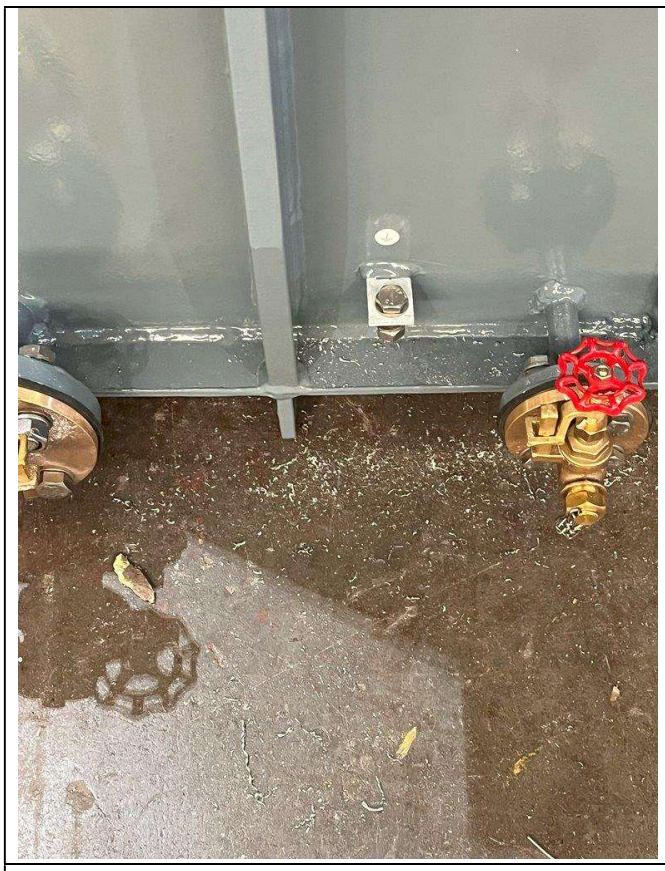
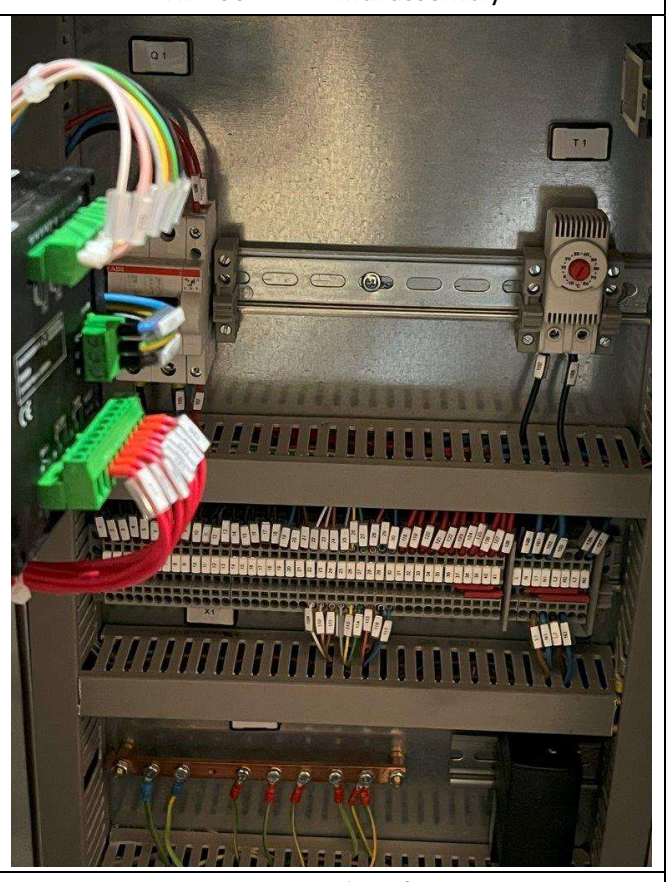


TR-200DE1 – Identification

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |


QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

| ROSETTI MARINO | **INSPECTION REPORT** | **Report No.**<br>**IR-1697-MFT-01** | SHEET 19 di 20 |
|---|---|---|---|
| | | **Data**<br>*Date*<br>***22-23-24-25/07/2024 + 30.07.2024*** | Rev.<br>*Rev.*<br>***01*** |
| **PROGETTO**<br>**HOLLANDSE KUST NOORD WIND PARK** | **CLIENTE**<br>CROSSWIND | **COMMESSA** / *Job*<br>**123A90** | **COMMESSA FORNITORE** / *Job Vendor*<br>523.23 (1.6 MVA)<br>524.23 (500 kVA) |
| **FORNITORE**/*Supplier*<br>***MF Trasformatori*** | **No. Ordine**/*P.O. No.*<br>**1723001697 rev.01** | **OGGETTO**/ *Object:*<br>**POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |

| | | |
|---|---|---|
|  |  |  |
| TR-200ED1 – Earthing Point | TR-200ED1 - Earthing Point | TR-200ED1 – Final assembly |
|  |  |  |
| TR-200ED1 - Final assembly | TR-200ED1 – Pending Point 3 – Missing holes | TR-200ED1 - Identification |

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |

QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

| PROGETTO | CLIENTE | COMMESSA / *Job* | COMMESSA FORNITORE / *Job Vendor* |
|---|---|---|---|
| **HOLLANDSE KUST NOORD WIND PARK** | CROSSWIND | **123A90** | 523.23 (1.6 MVA)<br>524.23 (500 kVA) |
| **FORNITORE/***Supplier* ***MF Trasformatori*** | **No. Ordine/***P.O. No.* **1723001697 rev.01** | **OGGETTO/** *Object:* **POWER TRANSFORMERS & NEUTRAL EARTHING RESISTOR** | |



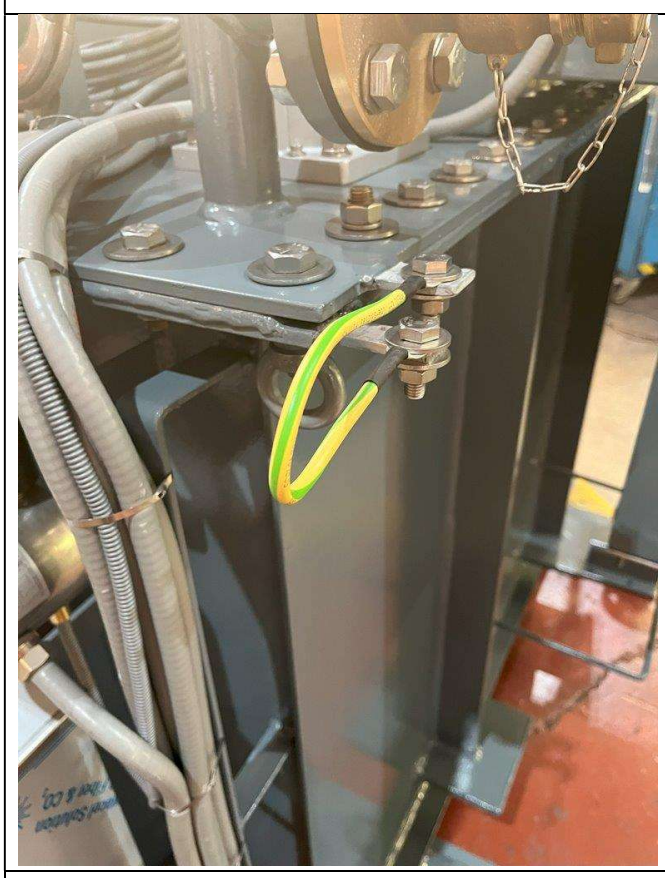

TR-200ED1 - Control box Identification plates



TR-200ED1 – Earthing Point




TR-200ED1 - Connection between the lid and the transformer tank



TR-200ED1 - Connection between the lid and the transformer tank

**NON VALIDO PER IL RILASCIO DELLA FORNITURA /** *It is not valid for the supply's release*

| **L' INCARICATO** / *The person in charge* | **IL RAPP. DEL CLIENTE** / *Client's Representative* | **IL FORNITORE** / *Supplier* |
|---|---|---|
| Lastene Bevoni<br>Obo<br>Rosetti Marino | Luigi Pignatelli<br>Inspector<br>On behalf of Crosswind | Mattia Sandrini<br>Test Room Manager<br>MF Trasformatori |


QUESTO DOCUMENTO NON SOLLEVA IL FORNITORE DALLA RESPONSABILITA' DI EVENTUALI DIFETTI E/O MALFUNZIONAMENTI RILEVATI DURANTE L'USO /
*This document does not relieve the Supplier of the responsibility of any possible defects and/or misfunctioning arising during the utilisation.*

# Section 13 MECHANICAL COMPLETION CHANGES / MARK-UPS

# NOT APPLICABLE