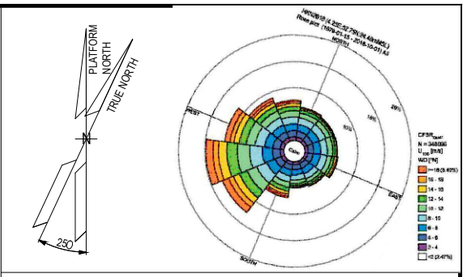
DRAWING NO. 1723001595-EL-DG-00012

REV. 03

Base Load Power Hub (BLPH)

FUNCTIONAL LOGIC DIAGRAM



NOTES

LEGEND

HYOSUNG HEAVY INDUSTRIES

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
3	24/07/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
1	05/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
FUNCTIONAL LOGIC DIAGRAM

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 24/11/23

A1	DRAWING NO. 1723001595-EL-DG-00012	SHEET 000	REV. 4

File Name : 1723001595-EL-DG-00012

DRAWING NO. 1723001595-EL-DG-00012

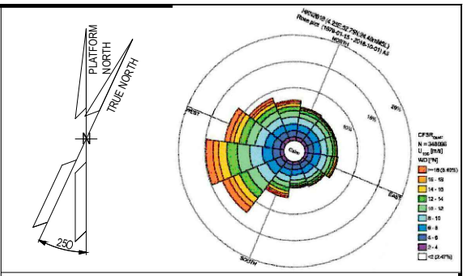
REV. 03

Reference Documents

No.	Reference	Title
001	1723001595-EL-DG-00013	BASE LOAD POWER HUB (BLPH) - 66kV Switchgear (GIS) - Single line diagram
002	1723001595-EL-DG-00014	BASE LOAD POWER HUB (BLPH)- 66 kv SWITCHGEAR (GIS) - GAS SINGLE LINE DIAGRAM
003	1723001595-EL-DG-00015	Circuit and wiring diagram
004	1723001595-EL-DG-00017	Inter-panel logic diagram
005	1723001595-EL-LIS-00011	Switchgear IO list
006	1723001595-EL-PRO-00023	Remote control simulation test procedure
007	1723001595-EL-SO-00019	IED interrogation and programming software
008	1723001595-EL-SO-00020	Relay IED configuration files
009	1723001595-EL-SO-00021	IEC 61850 configuration files

Protection ANSI Codes

ANSI Code	Title
25	CHECK SYNCHRONISATION
26OT	OIL TEMPERATURE INDICATOR
26WT	WINDING TEMPERATURE INDICATOR
50	INSTANTANEOUS OVERCURRENT RELAY (HIGH SET)
50N	INSTANTANEOUS EARTH FAULT RELAY (CORE BALANCE)
51	TIME DEPENDENT (IDMT) OVERCURRENT RELAY
51G	TIME DEPENDENT STANDBY EARTH FAULT RELAY
51N	TIME DEPENDENT EARTH FAULT RELAY
63	BUCHHOLZ RELAY
64	RESTRICTED EARTH FAULT RELAY
67	DIRECTIONAL OVERCURRENT PROTECTION
67N	DIRECTIONAL EARTH FAULT PROTECTION
71	TRANSFORMER OIL LEVEL SWITCH
74	TRIP CIRCUIT SUPERVISION
86-1	INTER TRIP/ LOCKOUT RELAY
86-2	INTER TRIP/ LOCKOUT RELAY
87	DIFFERENTIAL PROTECTION RELAY
87N	RESTRICTED GROUND FAULT PROTECTION RELAY
94B	BUCHHOLZ ALARM AND TRIP RELAY
94L	OIL LEVEL ALARM RELAY
94OT	OIL TEMPERATURE ALARM AND TRIP RELAY
94WT	WINDING TEMPERATURE ALARM AND TRIP RELAY



NOTES

LEGEND

HYOSUNG HEAVY INDUSTRIES

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
3	24/07/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
1	05/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

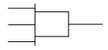
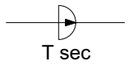
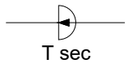
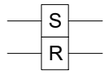
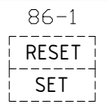
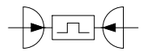
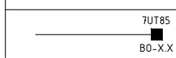
TITLE : BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
FUNCTIONAL LOGIC DIAGRAM(REFERENCE DOCUMENT)

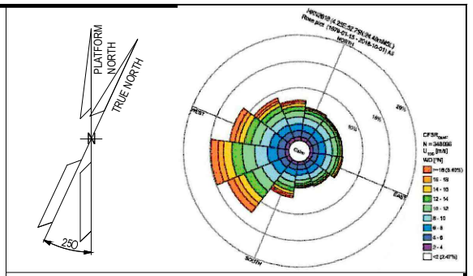
CONTRACT NO./TITLE	CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK		SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 24/11/23
A1	DRAWING NO. 1723001595-EL-DG-00012	SHEET 001	REV. 4

File Name : 1723001595-EL-DG-00012

DRAWING NO. 1723001595-EL-DG-00012

REV. 03

FUNCTION	SYMBOL	DEFINITION
AND		OUTPUT EXISTS ONLY WHEN ALL INPUTS ARE PRESENT
OR		OUTPUT EXISTS ONLY WHEN ONE OR MORE INPUTS ARE PRESENT
NOT		OUTPUT EXISTS ONLY WHEN INPUT IN NOT PRESENT
ON DELAY (TIMED MEMORY)		OUTPUT EXISTS ONLY WHEN INPUT HAS BEEN CONTINUOUSLY PRESENT FOR A PRESET TIME AND REMAINS PRESENT
OFF DELAY (TIMED MEMORY)		OUTPUT EXISTS ONLY WHEN INPUT IS PRESENT AND FOR A PRESET TIME AFTER THE INPUT IS NOT PRESENT
MEMORY		SET OUTPUT EXISTS WHEN SET INPUT IS PRESENT AND CONTINUES UNTIL THE RESET INPUT IS PRESENT. RESET OUTPUT EXISTS ONLY WHEN SET OUTPUT IS NOT PRESENT. A CIRCLE AROUND Ⓢ OR Ⓡ INDICATES THE OUTPUT THAT EXISTS WHEN BOTH SET AND RESET INPUTS ARE PRESENT.
LOCK OUT RELAY(86)		THE SET OUTPUT IS PRESENT WHEN THE SET INPUT IS PRESENT UNTIL THE SET INPUT SIGNAL IS NOT PRESENT AND THE RESET SIGNAL IS PRESENT. WHILE THE SET INPUT CONTINUES, THE OUTPUT IS PRESENT EVEN IF THE RESET INPUT IS PRESENT
RETRIGGERABLE MONOSTABLE		OUTPUT EXISTS ONLY PERIOD OF TIME WHEN INPUT HAS BEEN CONTINUOUSLY PRESENT.
LIGHT	 DISPLAY ON THE LCD R: RED G: GREEN Y: YELLOW W: WHITE	RED : BREAKER CLOSED GREEN : BREAKER OPENED YELLOW : OVERLOAD, AUTOMATIC TRIP WHITE : ELECTRICAL POTENTIAL AVAILALBLE, OTHER SPECIAL USES.
LOGIC SIGNAL INTERFACE		COMMAND BY EMCS OR SCADA(STATION BUS COMMUNICATION)
		IED LEVEL(Software logic) LOGIC
		HARDWIRING LOGIC(DLCP)
		LOGIC SIGNAL INPUT TO IED
		LOGIC SIGNAL OUTPUT FROM IED
LOGIC SIGNAL TYPE		LOGIC SIGNAL SHALL BE MOMENTARY OR PULSE
		LOGIC SIGNAL SHALL BE MAINTAINED



NOTES

LEGEND

HYOSUNG HEAVY INDUSTRIES

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
3	24/07/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
1	05/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
FUNCTIONAL LOGIC DIAGRAM(LEGEND)

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 24/11/23

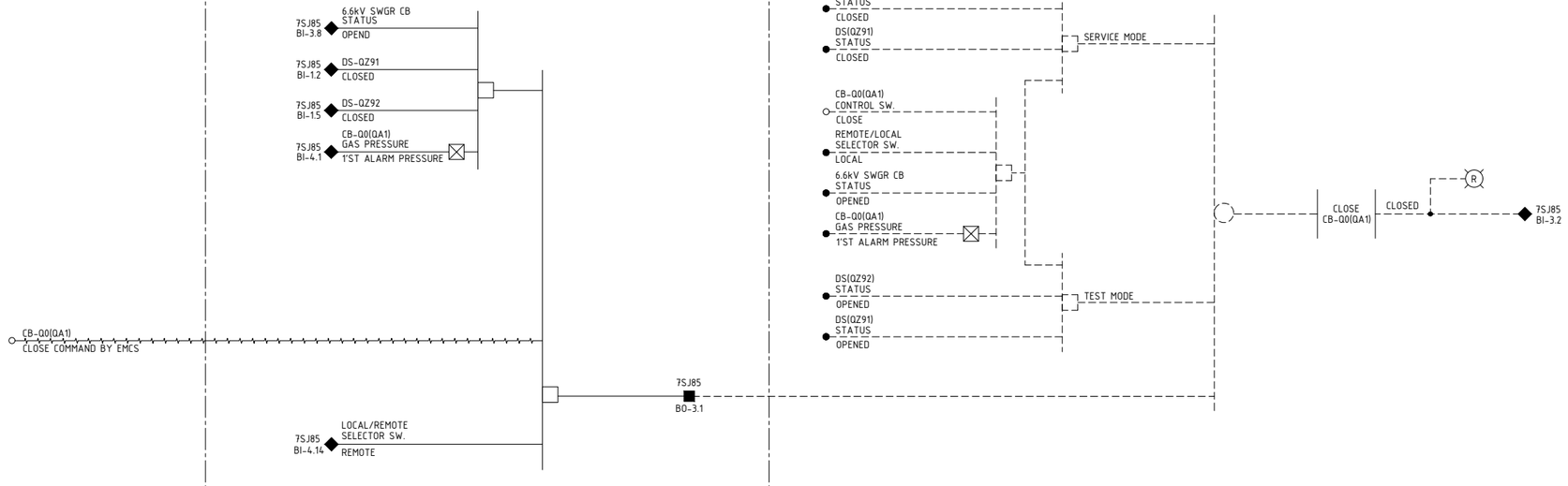
A1	DRAWING NO. 1723001595-EL-DG-00012	SHEET 002	REV. 4

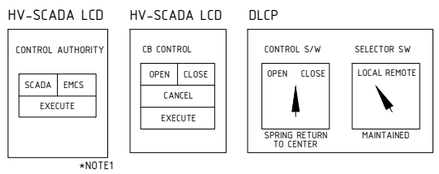
File Name : 1723001595-EL-DG-00012

DRAWING NO. 1723001595-EL-DG-00012

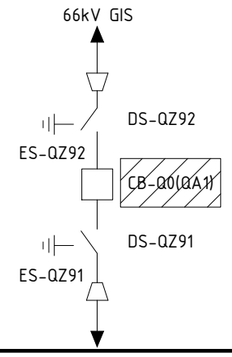
REV. 03

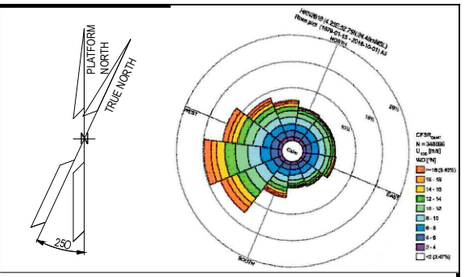
SAS LEVEL(HMI) | IED LEVEL(Software logic)(Software logic) | DLCP(Local Control Panel / Hard wiring logic)





KEY DIAGRAM





NOTES

NOTE1.
If selected as EMSC, SCADA cannot control it, and when selecting also SCADA, EMCS cannot it. EMCS and SCADA use different control(Cloose/open) tag.

LEGEND

HYOSUNG HEAVY INDUSTRIES

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
3	24/07/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
1	05/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
FUNCTIONAL LOGIC DIAGRAM(CB-Q0 / QA1 CLOSE)

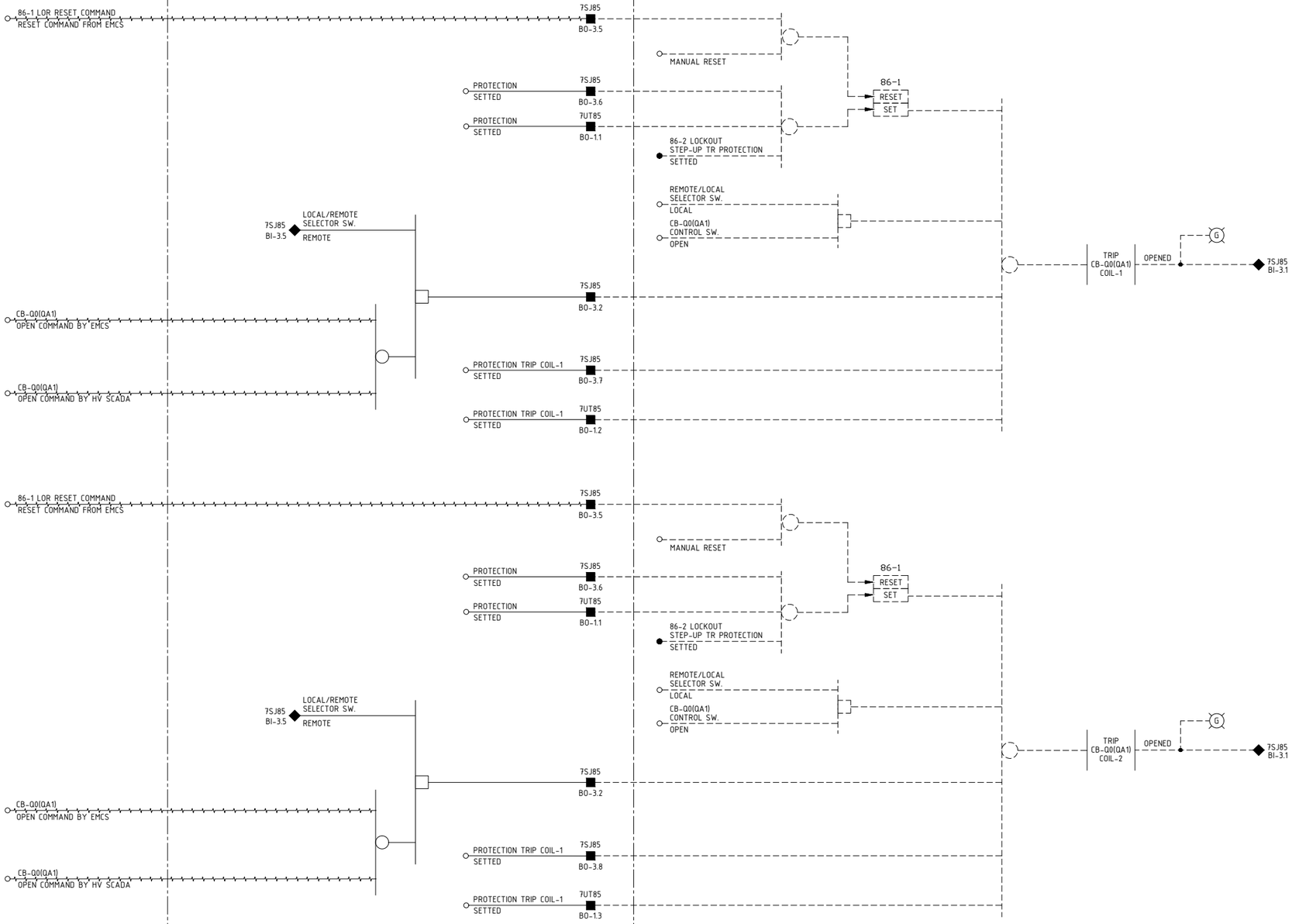
CONTRACT NO./TITLE CW-1-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 24/11/23
A1	DRAWING NO. 1723001595-EL-DG-00012	SHEET 003	REV. 4

File Name : 1723001595-EL-DG-00012

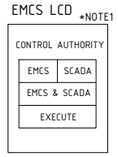
DRAWING NO. 1723001595-EL-DG-00012

REV. 03

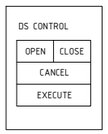
SAS LEVEL(HMI) | IED LEVEL(Software logic)(Software logic) | DLCP(Local Control Panel / Hard wiring logic)



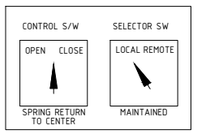
EMCS LCD *NOTE1



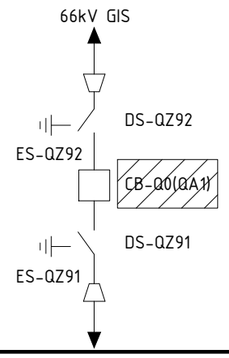
EMCS LCD

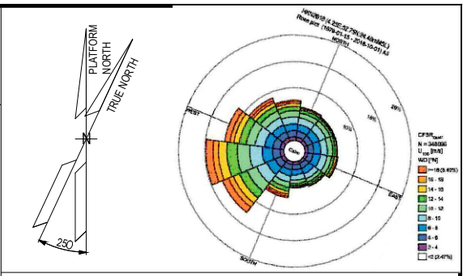


DLCP



KEY DIAGRAM





NOTES

NOTE1.
If selected as EMSC, SCADA cannot control it, and when selecting also SCADA, EMCS cannot it. EMCS and SCADA use different control(Cloose/open) tag.

LEGEND

HYOSUNG HEAVY INDUSTRIES

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
3	24/07/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
1	05/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
FUNCTIONAL LOGIC DIAGRAM(CB-Q0 / QA1 TRIP)

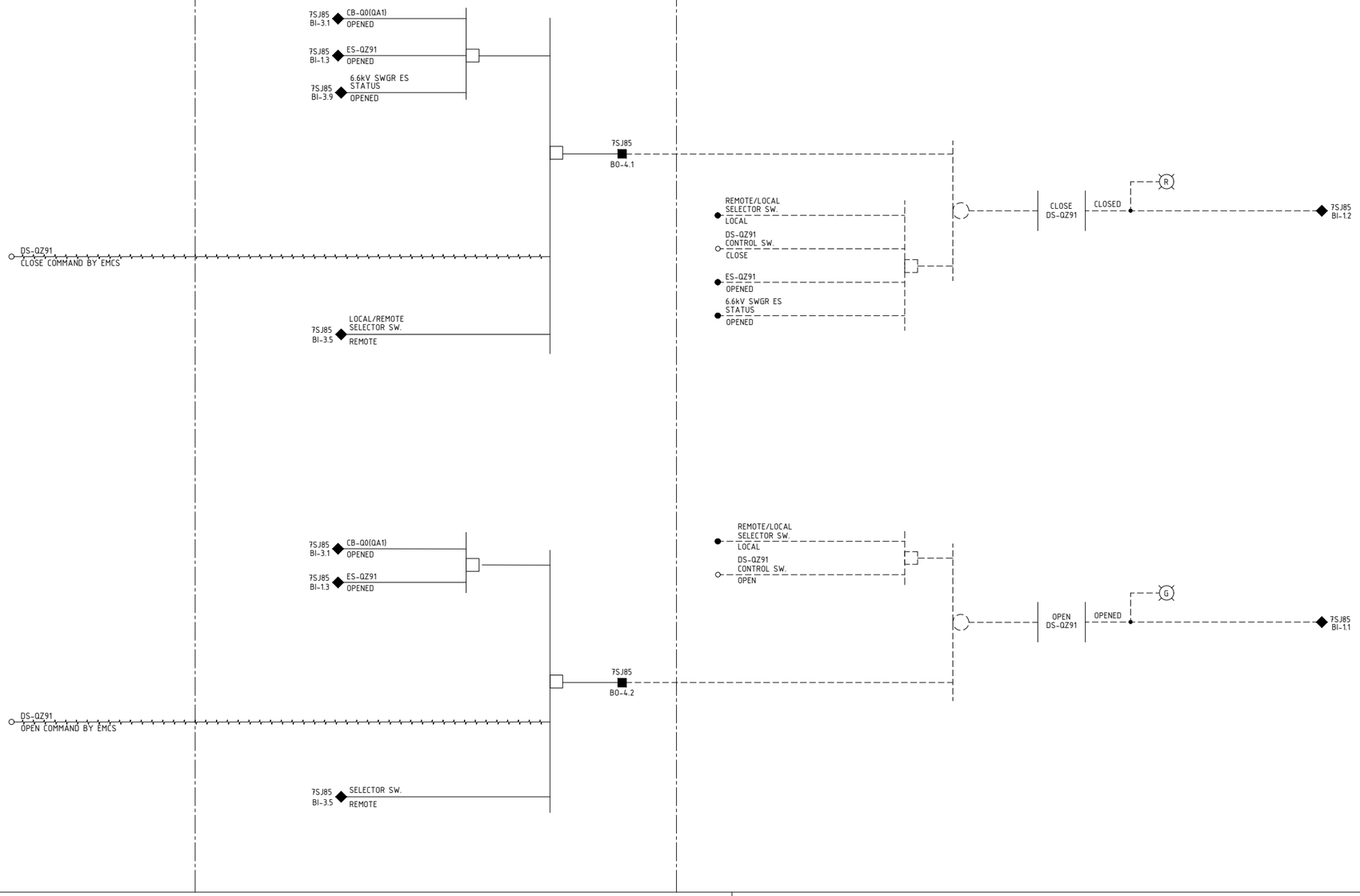
CONTRACT NO./TITLE CW-1-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 24/11/23
A1	DRAWING NO. 1723001595-EL-DG-00012	SHEET 004	REV. 4

File Name : 1723001595-EL-DG-00012

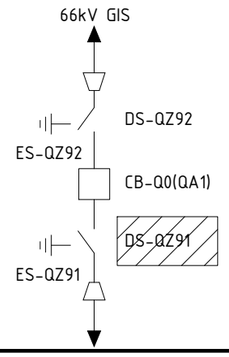
DRAWING NO. 1723001595-EL-DG-00012

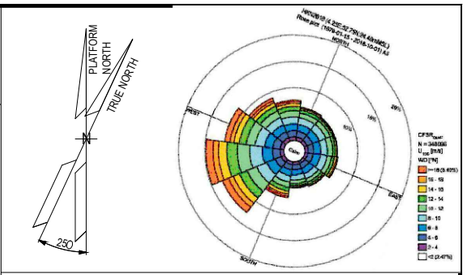
REV. 03

SAS LEVEL(HMI) | IED LEVEL(Software logic) | DLCP(Local Control Panel / Hard wiring logic)



KEY DIAGRAM





NOTES

NOTE1.
If selected as EMSC, SCADA cannot control it,
and when selecting also SCADA, EMCS cannot
it. EMCS and SCADA use different control(Cloose/open)
tag.

LEGEND

HYOSUNG HEAVY INDUSTRIES

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
3	24/07/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
1	05/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
FUNCTIONAL LOGIC DIAGRAM(DS-QZ91)

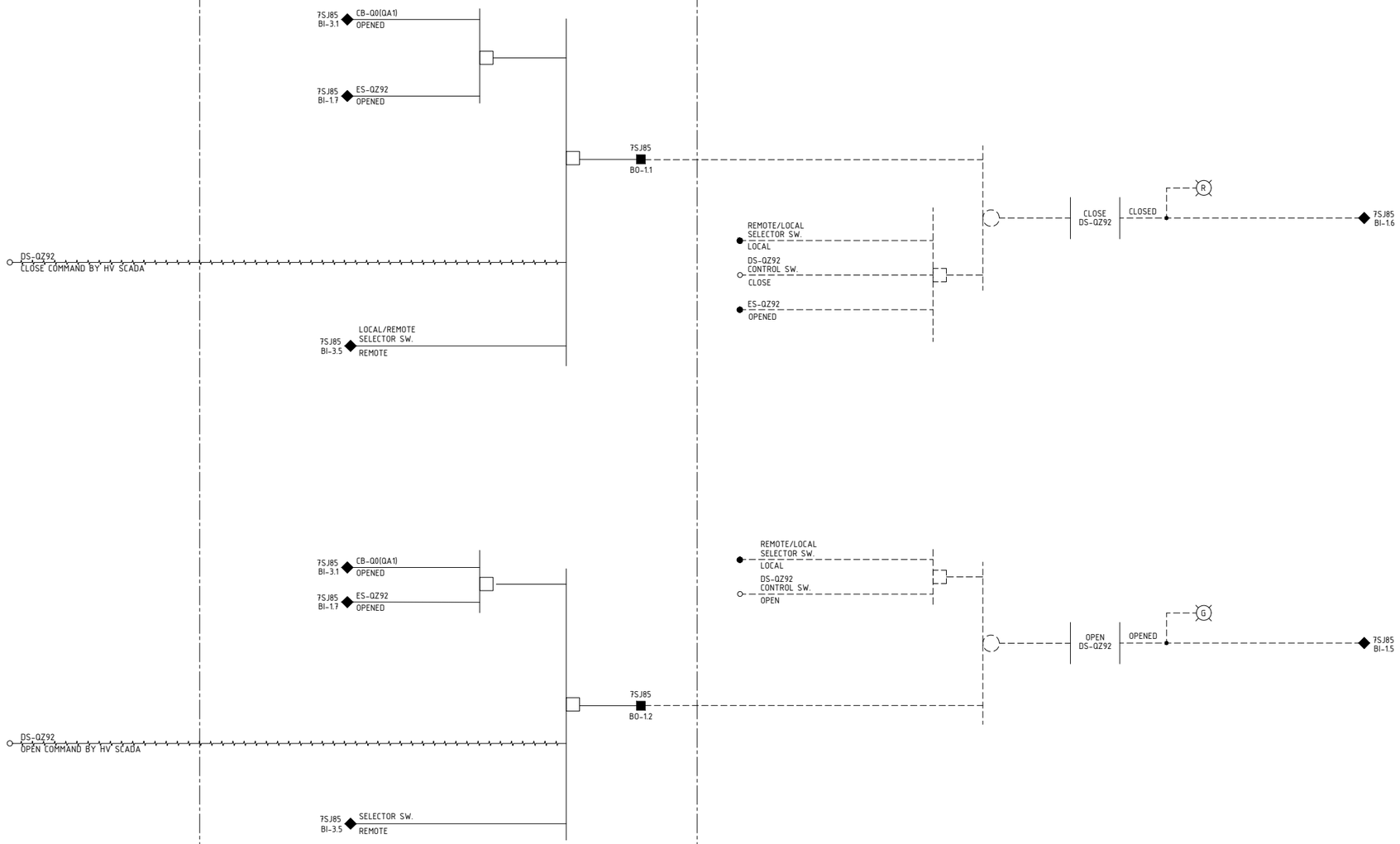
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 24/11/23
A1	DRAWING NO. 1723001595-EL-DG-00012	SHEET 005	REV. 4

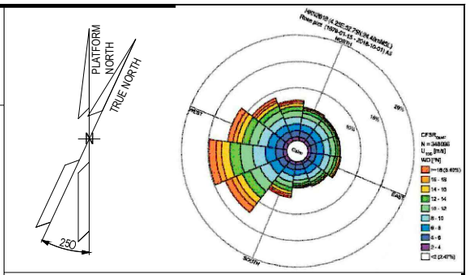
File Name : 1723001595-EL-DG-00012

DRAWING NO. 1723001595-EL-DG-00012

REV. 03

SAS LEVEL(HMI) | IED LEVEL(Software logic) | DLCP(Local Control Panel / Hard wiring logic)

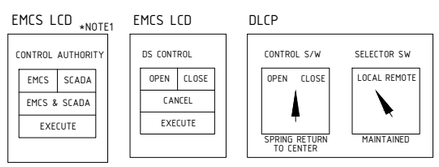




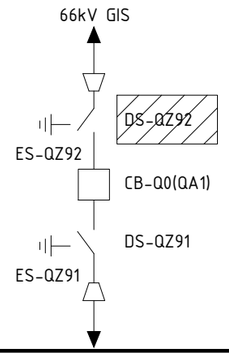
NOTES

NOTE1.
If selected as EMSC, SCADA cannot control it,
and when selecting also SCADA, EMCS cannot
it. EMCS and SCADA use different control(Cloose/open)
tag.

LEGEND



KEY DIAGRAM



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
3	24/07/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
1	05/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)

HYOSUNG HEAVY INDUSTRIES

CROSSWIND | ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
FUNCTIONAL LOGIC DIAGRAM(DS-QZ92)

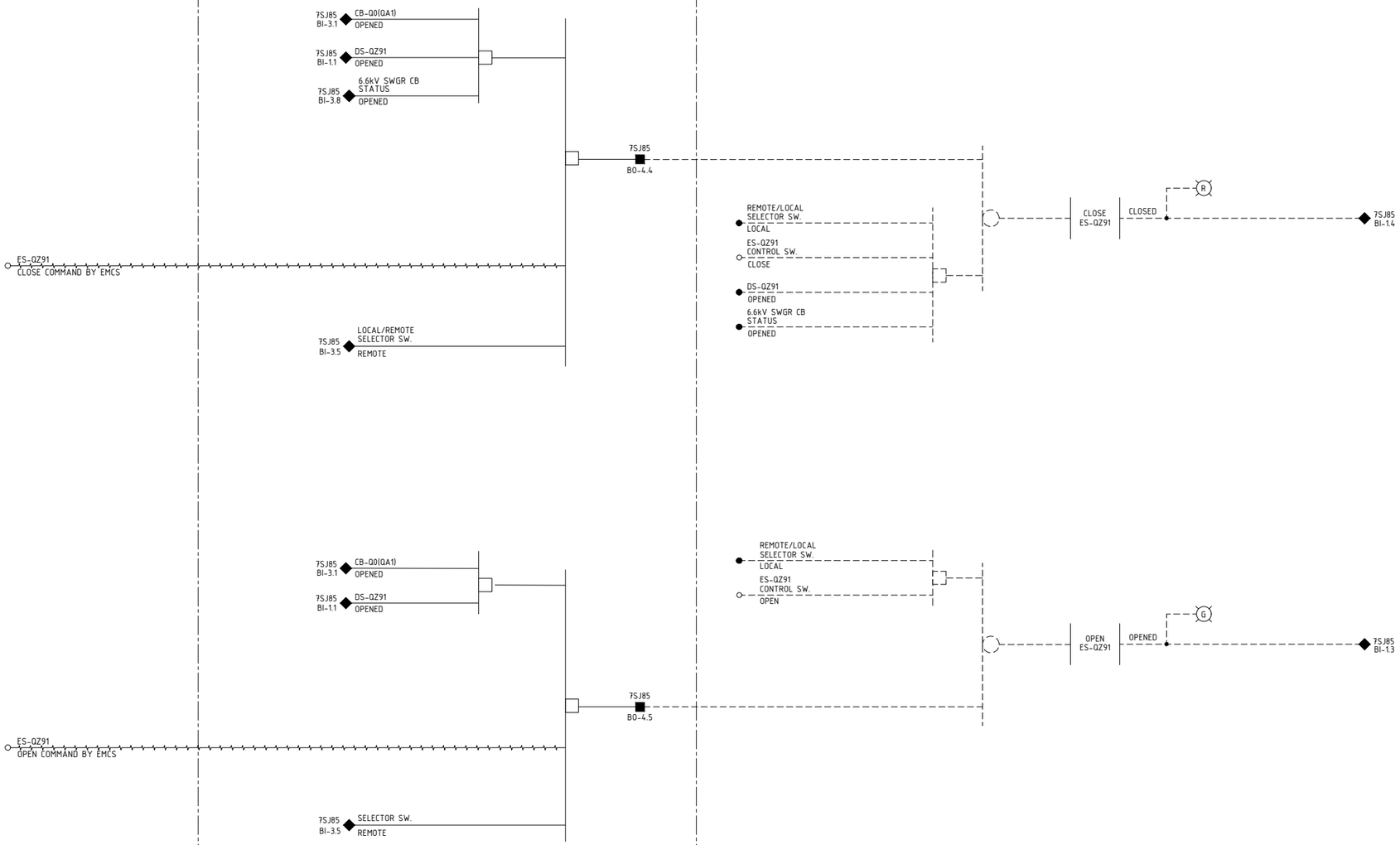
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 24/11/23
A1	DRAWING NO. 1723001595-EL-DG-00012	SHEET 006	REV. 4

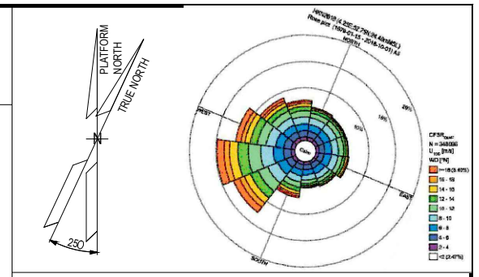
File Name : 1723001595-EL-DG-00012

DRAWING NO. 1723001595-EL-DG-00012

REV. 03

SAS LEVEL(HMI) | IED LEVEL(Software logic) | DLCP(Local Control Panel / Hard wiring logic)



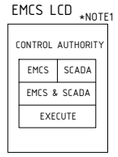


NOTES

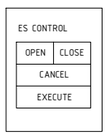
NOTE1.
If selected as EMSC, SCADA cannot control it, and when selecting also SCADA, EMCS cannot it. EMCS and SCADA use different control(Cloose/open) tag.

LEGEND

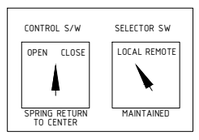
EMCS LCD *NOTE1



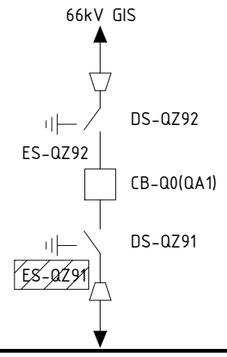
EMCS LCD



DLCP



KEY DIAGRAM



REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
3	24/07/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
1	05/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)

HYOSUNG HEAVY INDUSTRIES

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
FUNCTIONAL LOGIC DIAGRAM(ES-QZ91)

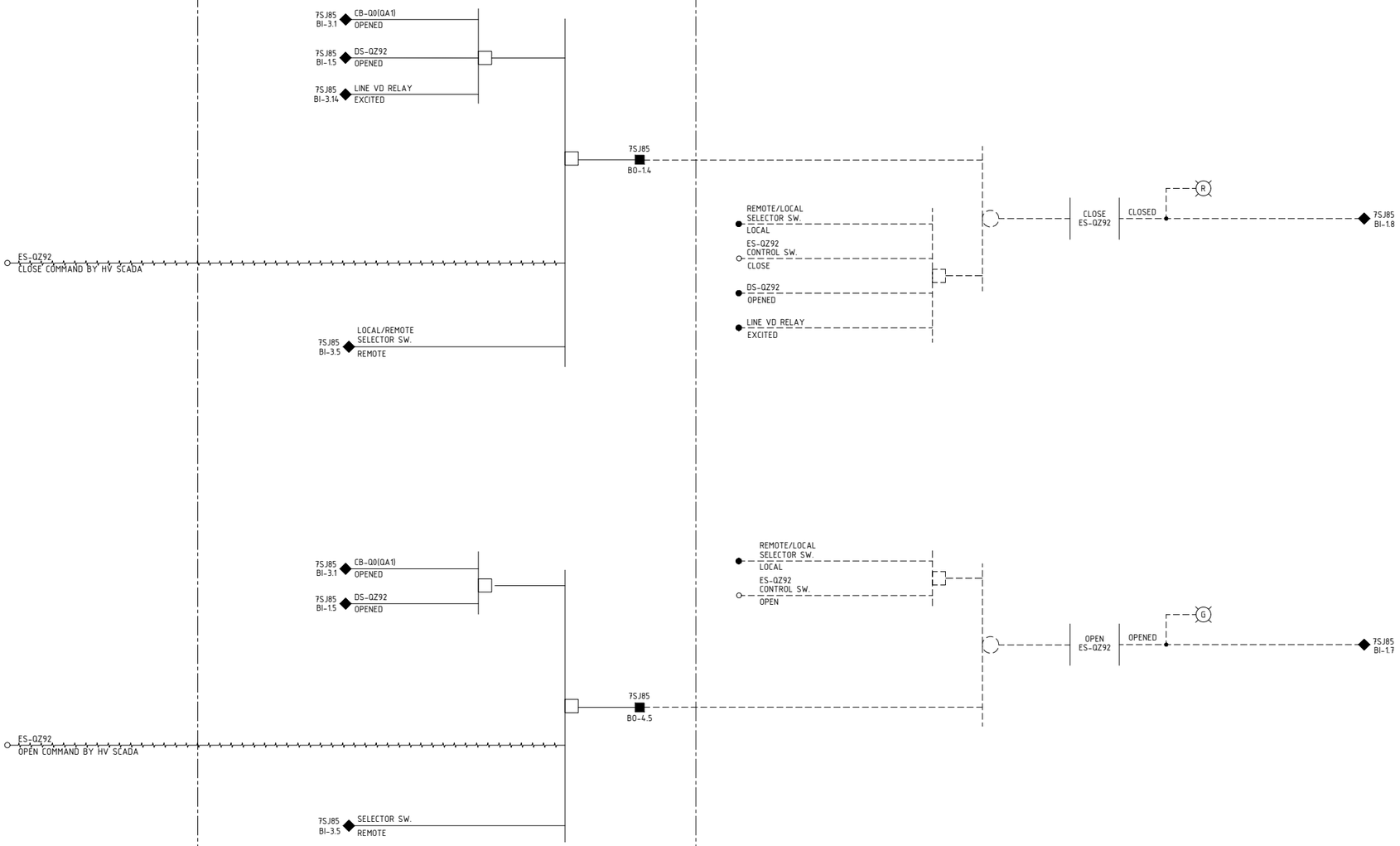
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 24/11/23
A1	DRAWING NO. 1723001595-EL-DG-00012	SHEET 007	REV. 4

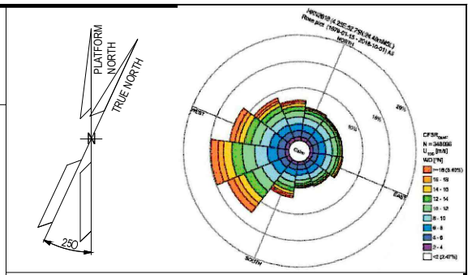
File Name : 1723001595-EL-DG-00012

DRAWING NO. 1723001595-EL-DG-00012

REV. 03

SAS LEVEL(HMI) | IED LEVEL(Software logic) | DLCP(Local Control Panel / Hard wiring logic)

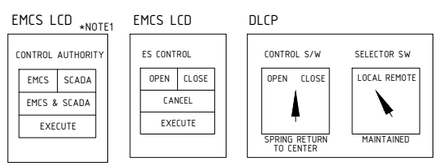




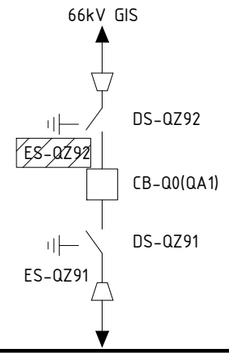
NOTES

NOTE1.
If selected as EMSC, SCADA cannot control it, and when selecting also SCADA, EMCS cannot it. EMCS and SCADA use different control(Cloose/open) tag.

LEGEND



KEY DIAGRAM



HYOSUNG HEAVY INDUSTRIES

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
4	20/08/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
3	24/07/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ACCEPTED FOR CONSTRUCTION(AFC)
2	17/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
1	05/04/24	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)
0	10/11/23	Y.D.LEE	Y.W.LEE	S.J.CHO	ISSUE FOR REVIEW (IFR)

CROSSWIND | ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
66kV SWITCHGEAR (GIS)
FUNCTIONAL LOGIC DIAGRAM(ES-QZ92)

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1_:_NS
DRAWN Y.D.LEE	CHECKED Y.W.LEE	APPROVED S.J.CHO	DATE 24/11/23
A1	DRAWING NO. 1723001595-EL-DG-00012	SHEET 008	REV. 4

File Name : 1723001595-EL-DG-00012