

NOTES:-

1. ALL RATINGS & SIZING GIVEN IN THE DIAGRAM ARE TENTATIVE RATINGS AND SHALL BE DECIDED DURING DETAIL ENGINEERING.
2. PROTECTION RELAY SIZING ARE TENTATIVE, SHALL BE DECIDED DURING DETAIL ENGINEERING.
3. LINE DIFFERENTIAL SHALL BE USED WITH BUILT IN BACKUP DISTANCE PROTECTION.
4. THE EXISTING SWITCHYARD EQUIPMENT, SCHEME, PHYSICAL CLEARANCE, PHILOSOPHY SHALL BE MAINTAINED SAME FOR THE PROPOSED BAY.

LEGEND:-

SYMBOL	DESCRIPTION
	POTENTIAL TRANSFORMER
	VACUUM CIRCUIT BREAKER
	MCB
	CURRENT TRANSFORMER
	INDICATION LAMP
	FUSE
	SURGE ARRESTER
	CORE BALANCED CURRENT TRANSFORMER

PROTECTION DETAILS:-

27	UNDER VOLTAGE RELAY	87A	DIRECTIONAL EARTH FAULT PROTECTION
27	UNDER VOLTAGE RELAY	79	AUTOMATIC RE-CLOSE RELAY
60	INSTANTANEOUS OVER CURRENT RELAY	85	AC SUPERVISION RELAY
60	INSTANTANEOUS EARTH FAULT RELAY	85	DC SUPERVISION RELAY
51	AC TIME OVERCURRENT RELAY	86	MASTER TRIP RELAY
61B	DMT EARTH FAULT RELAY	87	DIRECTIONAL PROTECTION RELAY
62	LOCAL BREAKER BACKUP PROTECTION	87L	LINE DIFFERENTIAL RELAY
60	OVER VOLTAGE RELAY	88	ANTI PUMPING RELAY
60	PT FUSE FAILURE RELAY	89	TRIP CXT. SUPERVISION RELAY
67	DIRECTIONAL OVER CURRENT PROTECTION	89	DISTURBANCE RECORDER

INSTRUMENTATION:

MFM	DIGITAL MULTI FUNCTION METER
A	DIGITAL AMMETER
V	DIGITAL VOLTMETER
VSS	VOLTAGE SELECTOR SWITCH
ASS	AMMETER SELECTOR SWITCH
ELR	EARTH LEAKAGE RELAY

FOR TENDER PURPOSE

REV.	DATE	DESCRIPTION	DRN.	CHK.	INCHG.	ELC.	INST.	APPROVED BY
1	08.08.2024	ISSUED FOR TENDER	SK	VA				
2	11.07.2024	REVISED AS PER COMMENTS	SK	VA				
3	11.07.2024	REVISED FOR REVIEW	SK	VA				

OWNER'S ENGINEER: **FICHTNER** (P) L14 Consulting Engineers (P)vtl. Private Limited Chennai, Tamil Nadu

BESS DEVELOPER: **NGEAL NEW AND GREEN ENERGY OF ASSAM LIMITED**

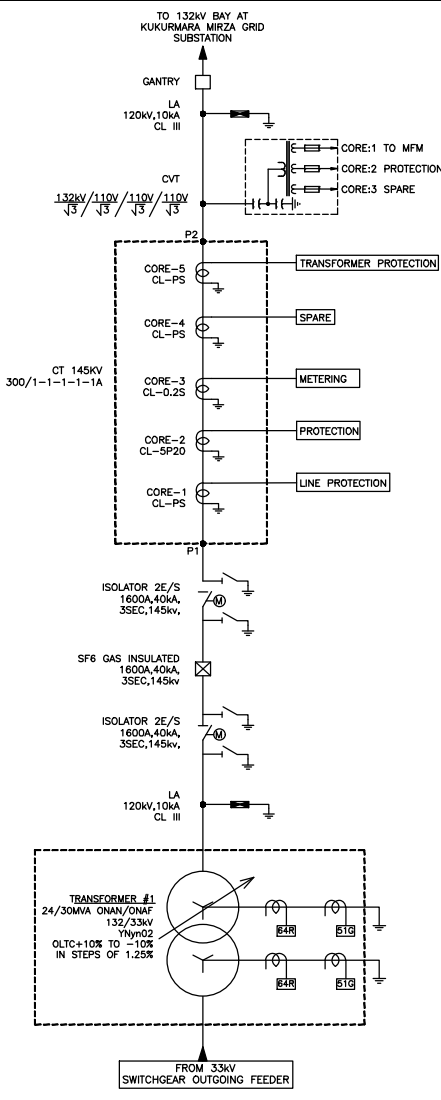
DESIGNED	CHECKED	DATE	PROJECT
SK	SK	08.08.2024	25MW BATTERY ENERGY STORAGE SYSTEM (BESS) AT KUKUHIMARA MIRZA SUBSTATION, ASSAM
NS	NS	08.08.2024	
PS	PS	08.08.2024	
VA	VA	08.08.2024	
SK	SK	11.07.2024	

PROJECT: 132kV BAY EXTENSION - TENTATIVE SINGLE LINE DIAGRAM

NO.	REVISION	DATE	SCALE	REV.
1	PRELIMINARY	11.07.2024	ASB NO.2024114	NET
2	TENDER	✓		2
3	ENGINEERING CONSTRUCTION			

DWG. NO. F05-2024114-25-01V3-SLD-08000011

SHEET 01 OF 03



NOTES:-
 1. ALL RATINGS & SIZES GIVEN IN THE DIAGRAM ARE TENTATIVE RATINGS AND SHALL BE DECIDED DURING DETAIL ENGINEERING.
 2. LINE DIFFERENTIAL SHALL BE USED WITH BUILT IN BACKUP DISTANCE PROTECTION.

LEGEND:-

SYMBOL	DESCRIPTION
	POTENTIAL TRANSFORMER
	VACUUM CIRCUIT BREAKER
	MCB
	CURRENT TRANSFORMER
	INDICATION LAMP
	FUSE
	SURGE ARRESTER
	CORE BALANCED CURRENT TRANSFORMER

FOR TENDER PURPOSE

REV.	DATE	DESCRIPTION	DRN.	CHK.	INCHG.	INST.
2	02.08.2024	ISSUED FOR TENDER	SK		VA	
1	01.07.2024	REVISED AS PER COMMENTS	SK		VA	
0	12.07.2024	PREPARED FOR REVIEW	SK		VA	

OWNER'S ENGINEER: **NGEAL NEW AND GREEN ENERGY OF ASSAM LIMITED**

DESIGNER: **FICHTNER** (Pvt.) Ltd. Consulting Engineers (India) Private Limited (Chennai, Bengaluru)

PROJECT: 25MW BATTERY ENERGY STORAGE SYSTEM (BESS) AT KUKURMARA MIRZA SUBSTATION, ASSAM.

DATE: 02.08.2024

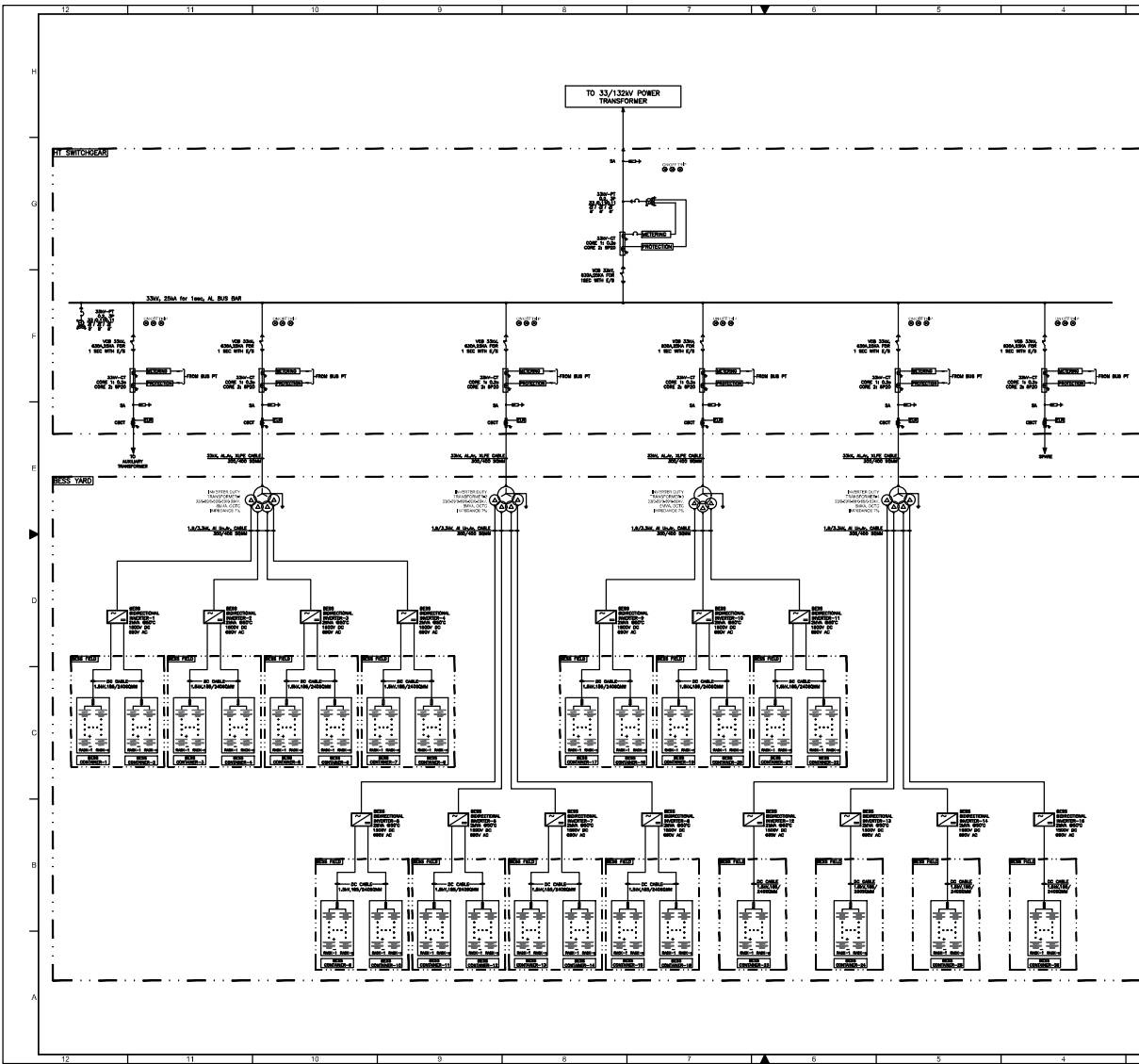
SCALE: 1:1

DWG. NO. 2024144

DEPT. ENGINEERING

CONSTRUCTION

SHEET 02 OF 03



NOTES:-
1. ALL RATINGS & SIZING GIVEN IN THE DIAGRAM ARE TENTATIVE RATINGS AND SHALL BE DECIDED DURING DETAIL ENGINEERING.

LEGEND:-

SYMBOL	DESCRIPTION
	BESS CONTAINER
	POTENTIAL TRANSFORMER
	INVERTER DUTY TRANSFORMER
	VACUUM CIRCUIT BREAKER
	MCB
	MULTIFUNCTION METER
	CURRENT TRANSFORMER
	INDICATION LAMP
	FUSE
	BESS BIDIRECTIONAL INVERTER
	SURGE ARRESTER
	EARTH LEAKAGE RELAY
	CORE BALANCED CURRENT TRANSFORMER

PROTECTION DETAILS:-

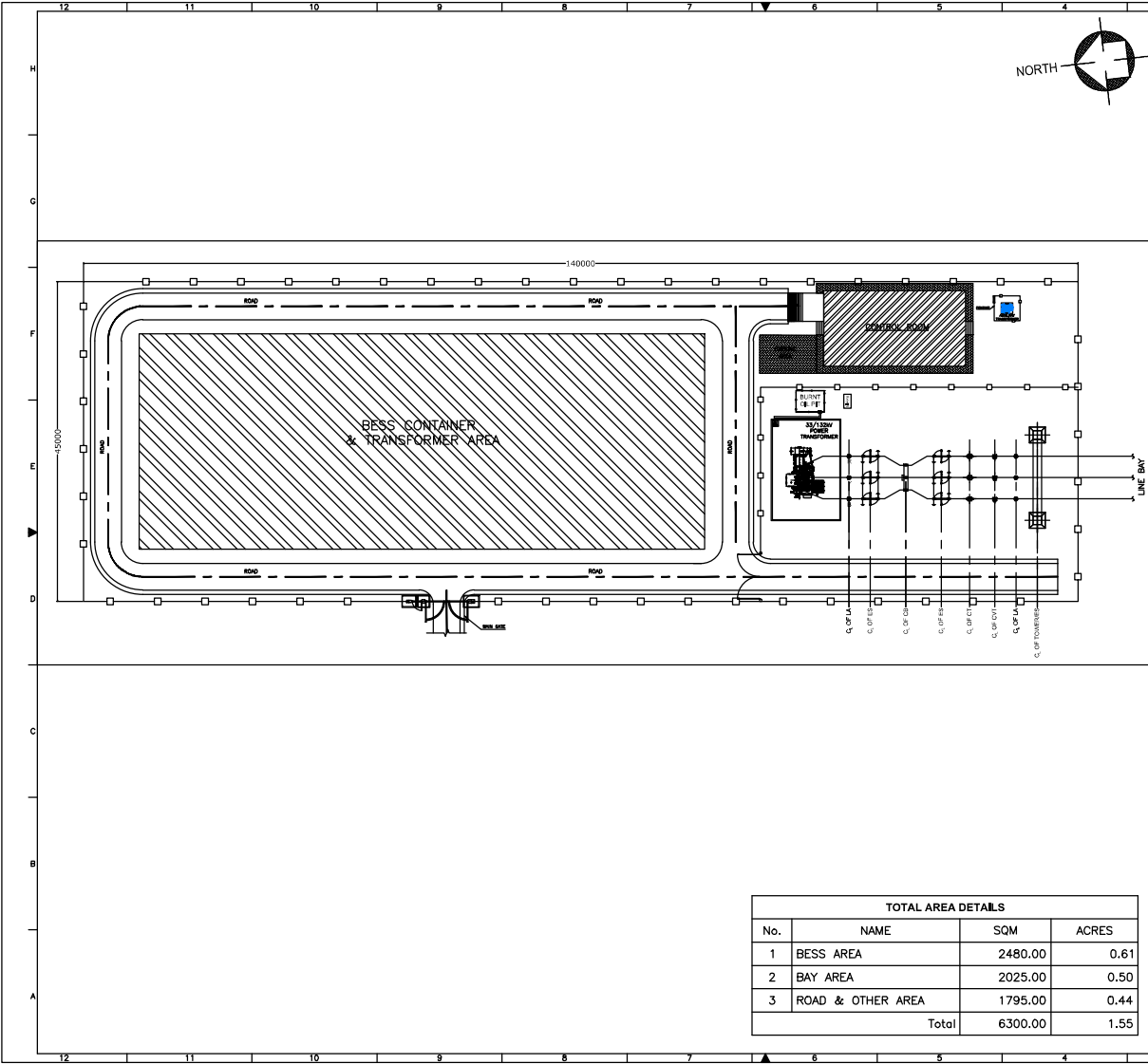
	UNDERLINE RELAY
	INSTANTANEOUS OVER CURRENT RELAY
	NEUTRAL INSTANTANEOUS OVERCURRENT
	BREAKER FAILURE
	AC TIME OVER CURRENT RELAY
	NEUTRAL TIME OVER CURRENT RELAY
	TRANSFORMER DIFFERENTIAL PROTECTION RELAY
	LINE DIFFERENTIAL RELAY

S.NO	NAME	CAPACITY	QUANTITY	TOTAL
1	BESS CONTAINER	25MVA	28 NOS	130MVA
2	PCS	2MVA	15 NOS	30MVA
3	DT	10MVA	03 NOS	24MVA
4	DT	10MVA	01 NO	08MVA

FOR TENDER PURPOSE

NO.	DATE	DESCRIPTION	DRN	CHKD	ISSD	REV.
1	02.08.2024	ISSUED FOR TENDER				
2	07.07.2024	REVISED AS PER COMMENTS				
3	12.07.2024	REVISED FOR REVISION				

OWNERS ENGINEER: [Blank]
DESIGNER: [Blank]
CHECKED: [Blank]
PROJECT: 25MW BATTERY ENERGY STORAGE SYSTEM (BESS) AT KUKURMARA MERZA SUBSTATION, ASSAM.
DRAWN: BK
DESIGNED: PS
CHECKED: KA
PROJECT: 132KV BAY EXTENSION - TENTATIVE SINGLE LINE DIAGRAM
SCALE: N/A
JOB NO: 2024114
DWG. NO: F02-00524114-REC-02W04-046600011
SHEET: 01 OF 03
DATE: 02.08.2024
SCALE: N/A
JOB NO: 2024114
DWG. NO: F02-00524114-REC-02W04-046600011
SHEET: 01 OF 03



NOTES:-
 1. ALL DIMENSION ARE IN MILLIMETERS.
 2. THIS DRAWING IS INDICATIVE AND SHALL BE MODIFIED AS PER PROJECT REQUIREMENT AND DETAIL ENGINEERING.

LEGEND:-

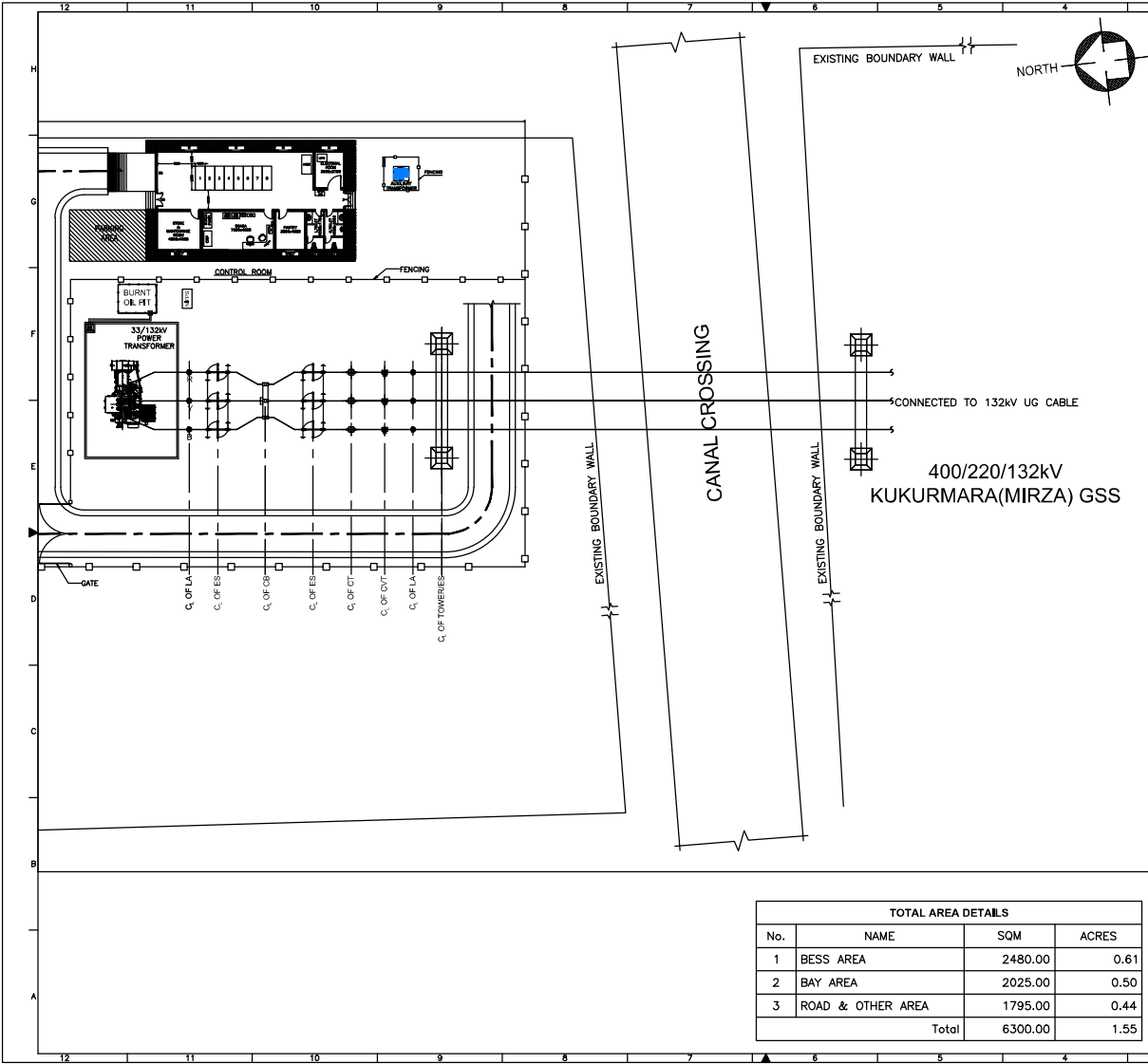
	BESS AREA
	CONTROL ROOM
	AUXILIARY TRANSFORMER
	APPROACH ROAD
	FENCING LINE

FOR TENDER PURPOSE

TOTAL AREA DETAILS			
No.	NAME	SQM	ACRES
1	BESS AREA	2480.00	0.61
2	BAY AREA	2025.00	0.50
3	ROAD & OTHER AREA	1795.00	0.44
Total		6300.00	1.55

REV.	DATE	ISSUED FOR REVIEW	BY	NO.

OWNER'S ENGINEER:	BESS DEVELOPER:
FICHTNER Consulting Engineers India Private Limited Chennai, Bangalore	NGEAL NEW AND GREEN ENERGY OF ASSAM LIMITED
DRAWN: PS (08.08.2024) CHECKED: PS (08.08.2024) DESIGNED: PS (08.08.2024) PROJECT: RE (08.08.2024)	PROJECT: 25MW BATTERY ENERGY STORAGE SYSTEM (BESS) AT KUKUMARA MIRZA SUBSTATION, ASSAM. TITLE: BESS PLANT - TENTATIVE LAYOUT
PRELIMINARY: <input type="checkbox"/> DESIGN: <input checked="" type="checkbox"/> CONSTRUCTION: <input type="checkbox"/>	DEPT: RENEWABLE JOB NO. 20524144 SCALE: NTS REV. 2 DWG. NO. FCE-20524144-RE-DWG-LAY-9500-002 SHEET 01 OF 02



NOTES:-
 1. ALL DIMENSION ARE IN MILLIMETERS.
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LEGEND:-

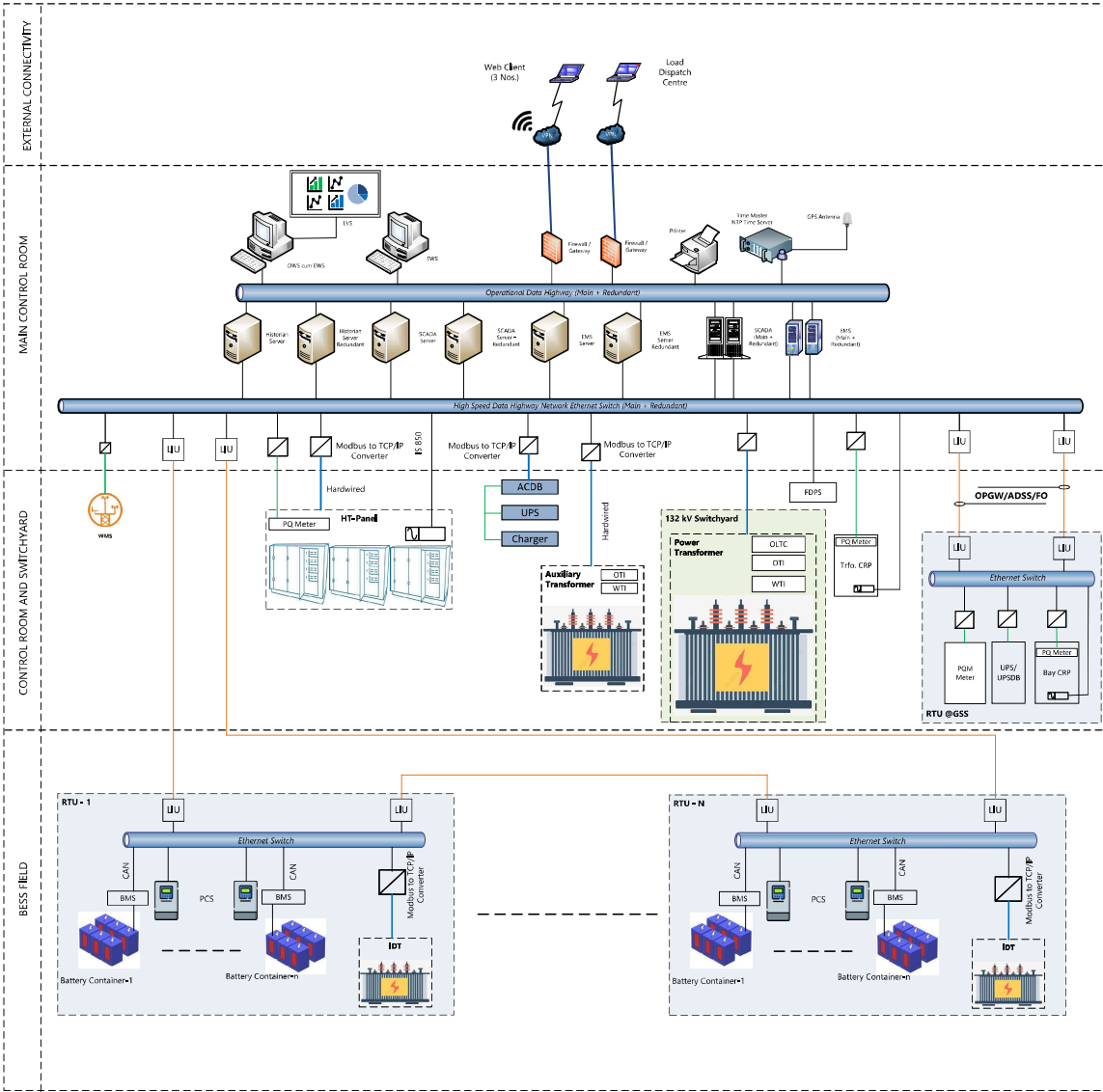
	BATTERY CONTAINER
	TRANSFORMER
	AUXILIARY TRANSFORMER
	APPROACH ROAD
	FENCING LINE
	PCS

FOR TENDER PURPOSE

TOTAL AREA DETAILS			
No.	NAME	SQM	ACRES
1	BESS AREA	2480.00	0.61
2	BAY AREA	2025.00	0.50
3	ROAD & OTHER AREA	1795.00	0.44
Total		6300.00	1.55

REV.	DATE	ISSUED FOR REVIEW	BY	NO.
0	04.08.2024			

OWNER'S ENGINEER: FICTIONER Consulting Engineers (India) Private Limited Chennai, Bangalore	BESS DEVELOPER: NGEAL NEW AND GREEN ENERGY OF ASSAM LIMITED
PROJECT: 25MW BATTERY ENERGY STORAGE SYSTEM (BESS) AT KUKURMARA MIRZA SUBSTATION, ASSAM.	TITLE: BESS PLANT - TENTATIVE LAYOUT
DEPT. RENEWABLE JOB NO.20824144 SCALE: NPS	REV. 2
DWG.NO. FCE-20824144-RE-DWG-LAY-9600-002	DATE: 04.08.2024



ABBREVIATIONS

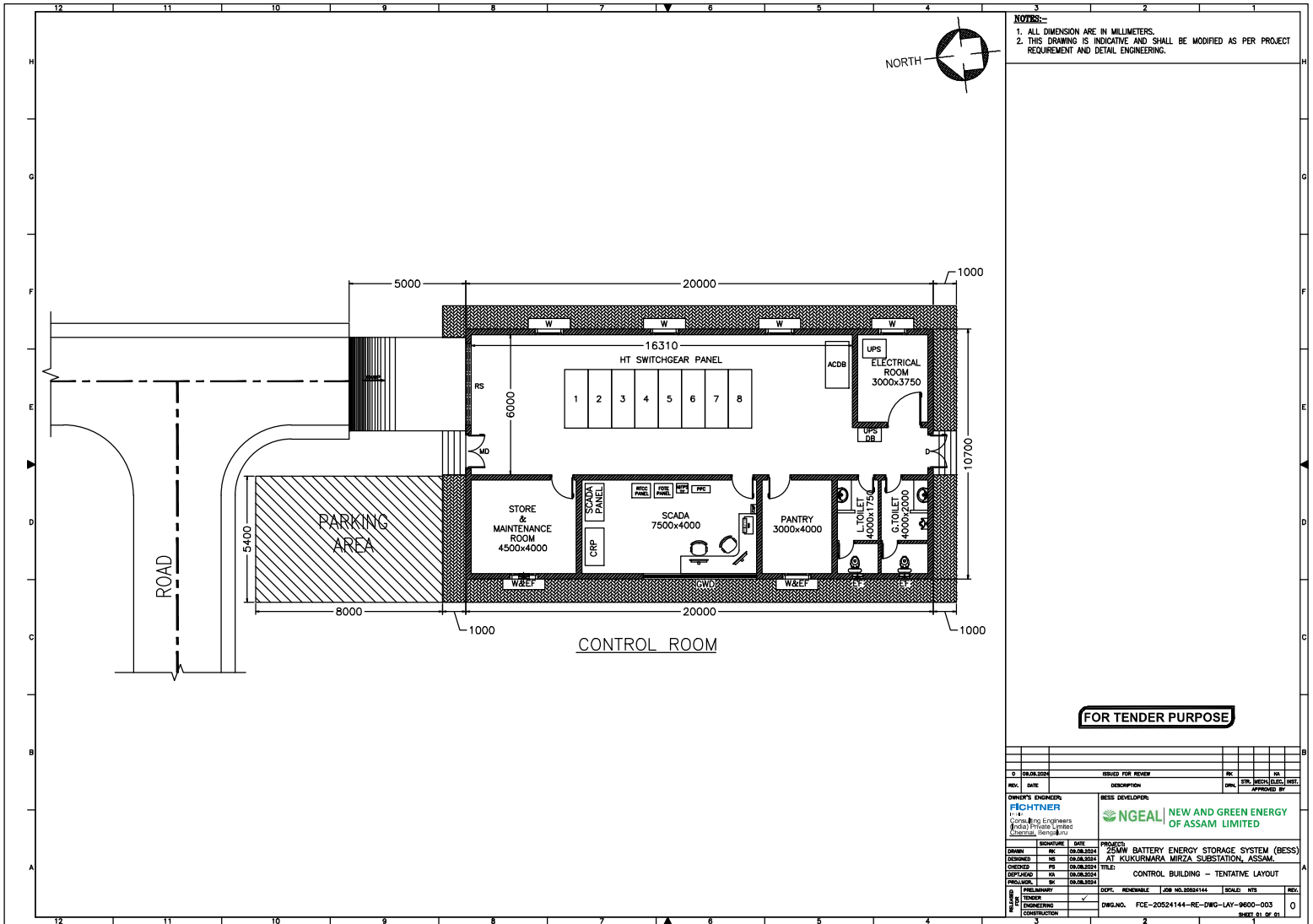
BESS	-	BATTERY ENERGY STORAGE SYSTEM
BMS	-	BATTERY MANAGEMENT SYSTEM
CAN	-	CONTROLLER AREA NETWORK
FDPS	-	FIRE DETECTION AND PROTECTION SYSTEM
ICOG	-	INCOMING AND OUTGOING PANEL
IDT	-	INVERTER DUTY TRANSFORMER
LIU	-	LIGHT INTERFACE UNIT
MPM	-	MULTI-FUNCTION METER
OTI	-	OIL TEMPERATURE INDICATOR
PCS	-	POWER CONDITIONING SYSTEM
PQ	-	POWER QUALITY
RTU	-	REMOTE TERMINAL UNIT
SBMU	-	SYSTEM BATTERY MANAGEMENT UNIT
SCADA	-	SUPERVISORY CONTROL AND DATA ACQUISITION
SWGR	-	SWITCHGEAR
UPS	-	UNINTERRUPTIBLE POWER SUPPLY
WMS	-	WEATHER MONITORING STATION
WTI	-	WINDING TEMPERATURE INDICATOR

LEGEND

	Fibre Optic
	CAT 6 UTP
	RS 485
	Hard Wired
	Power Line comm. / RS 485
	Numerical Relay
	Converters as applicable
	WMS (Weather Monitoring Station)
	Wi-Fi (Wireless Fidelity)/Internet Access

- NOTE**
1. All the connections shown in Main Control room are redundant.
 2. PCS to RTU panel communication shall be as per PCS vendor communication scheme.
 3. The ABT meter scheme shall be placed in switchyard for tariff metering purpose.

CONSULTANT		OWNER	
FICHTNER INDIA		NGEAL NEW AND GREEN ENERGY OF ASSAM LIMITED	
PROJECT: 25MW/100MWh BESS ENERGY STORAGE PROJECT IN ASSAM			
TITLE: SCADA ARCHITECTURE (Preliminary)			
DATE: 08/11/2024	REV: 01	DATE: 08/11/2024	REV: 01
PROJECT: RENEWABLES	SCALE: NTS	PROJECT: RENEWABLES	SCALE: NTS
PROJECT: RENEWABLES	SCALE: PRELIMINARY	PROJECT: RENEWABLES	SCALE: PRELIMINARY
1 OF 1		1 OF 1	



NOTES:-
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FOR TENDER PURPOSE

3		REVISED FOR REVIEW		AK	SK
REV.	DATE	REVISION	BY	CHKD.	APPD.
OWNER'S ENGINEER:			BESS DEVELOPER:		
FICHTNER Consulting Engineers 8/10, Pinnacal Centre Assam, India			NGEAL NEW AND GREEN ENERGY OF ASSAM LIMITED		
DRAWN	BY	DATE	PROJECT	25MW BATTERY ENERGY STORAGE SYSTEM (BESS)	
DESIGNED	BY	DATE	AT KUKURMARA MIRZA SUBSTATION, ASSAM.		
CHECKED	BY	DATE	TITLE		
DEVELOPED	BY	DATE	CONTROL BUILDING - TENTATIVE LAYOUT		
APPROVED	BY	DATE	DPT.	RENEWABLE	JOB NO. 20524144
PREPARED BY: _____ TENDER: _____ ENGINEERING: _____ CONSTRUCTION: _____			SCALE:	NTS	REV.
			DWG. NO.	FCE-20524144-RE-DWG-LAY-9600-003	0
			SHEET 51 OF 51		