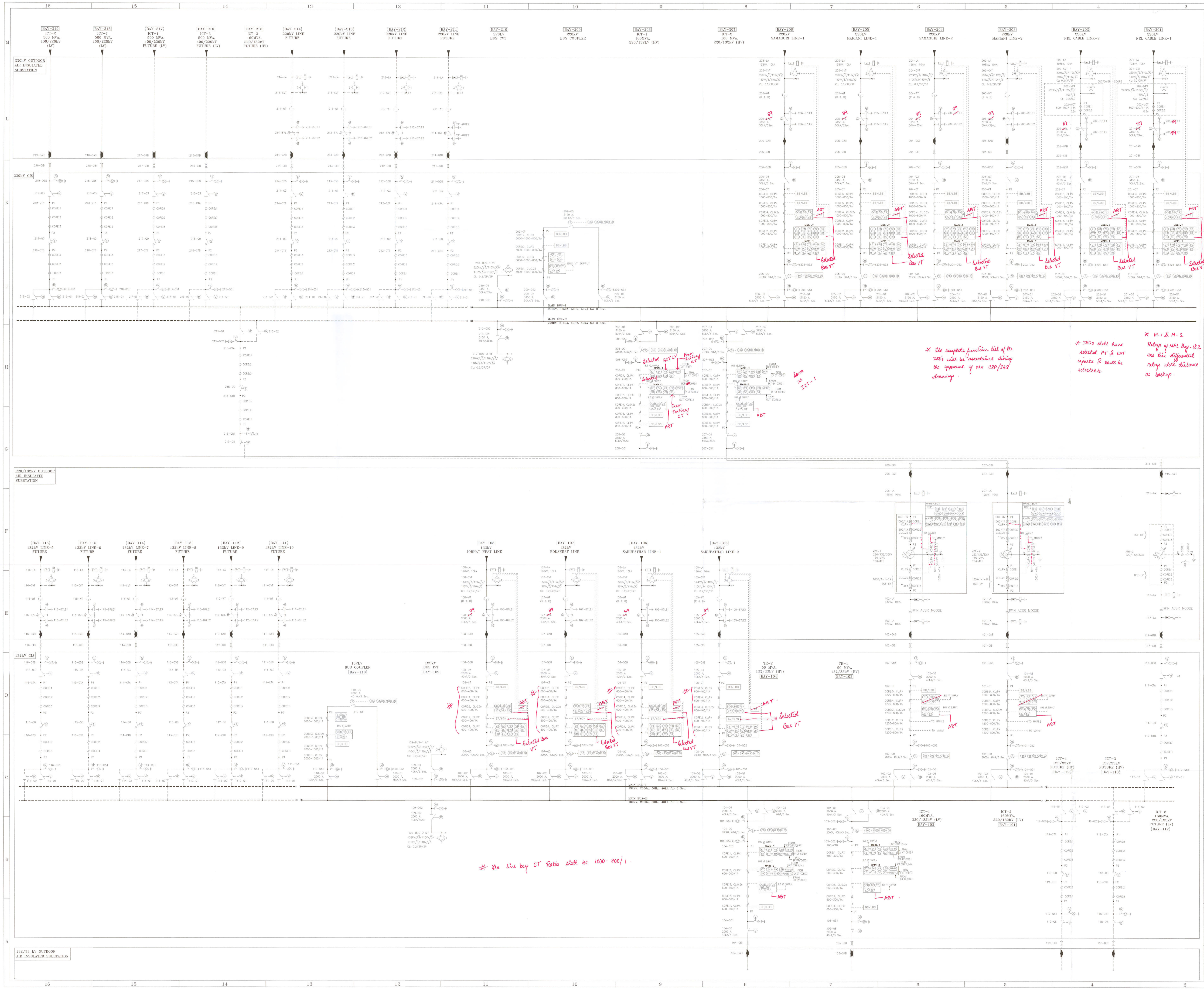

220kV OUTDOOR AIR INSULATED SUBSTATION
220kV GIS
220/132kV OUTDOOR AIR INSULATED SUBSTATION
132kV GIS
132/33 kV OUTDOOR AIR INSULATED SUBSTATION
BAY-219 ICT-2 500 MVA, 400/220kV (LV)
BAY-218 ICT-1 500 MVA, 400/220kV (LV)
BAY-217 ICT-4 500 MVA, 400/220kV FUTURE (LV)
BAY-216 ICT-3 500 MVA, 400/220kV FUTURE (LV)
BAY-215 ICT-3 160MVA, 220/132kV FUTURE (HV)
BAY-214 220kV LINE FUTURE
BAY-213 220kV LINE FUTURE
BAY-212 220kV LINE FUTURE
BAY-211 220kV LINE FUTURE
BAY-210 220kV BUS CVT
BAY-209 220kV BUS COUPLER
BAY-208 ICT-1 160MVA, 220/132kV (HV)
BAY-207 ICT-2 160 MVA, 220/132kV (HV)
BAY-206 220kV SAMAGURI LINE-1
BAY-205 220kV MARIANI LINE-1
BAY-204 220kV SAMAGURI LINE-2
BAY-203 220kV MARIANI LINE-2
BAY-202 220kV NRL CABLE LINK-2
BAY-201 220kV NRL CABLE LINK-1
MAIN BUS-I 220kV, 3150A, 50Hz, 50kA for 3 Sec.
MAIN BUS-II 220kV, 3150A, 50Hz, 50kA for 3 Sec.
BAY-116 132kV LINE-5 FUTURE
BAY-115 132kV LINE-6 FUTURE
BAY-114 132kV LINE-7 FUTURE
BAY-113 132kV LINE-8 FUTURE
BAY-112 132kV LINE-9 FUTURE
BAY-111 132kV LINE-10 FUTURE
BAY-110 132kV BUS COUPLER
BAY-109 132kV BUS IVT
BAY-108 132kV JORHAT WEST LINE
BAY-107 132kV BOKAKHAT LINE
BAY-106 132kV SARUPATHAR LINE-1
BAY-105 132kV SARUPATHAR LINE-2
BAY-104 TR-2 50 MVA, 132/33kV (HV)
BAY-103 TR-1 50 MVA, 132/33kV (HV)
BAY-102 ICT-1 160MVA, 220/132kV (LV)
BAY-101 ICT-2 160MVA, 220/132kV (LV)
BAY-119 ICT-4 132/33kV FUTURE (HV)
BAY-118 ICT-3 132/33kV FUTURE (HV)
BAY-117 ICT-3 160MVA, 220/132kV FUTURE (LV)
MAIN BUS-I 132kV, 2000A, 50Hz, 40kA for 3 Sec.
MAIN BUS-II 132kV, 2000A, 50Hz, 40kA for 3 Sec.
TWIN ACSR MOOSE
CUSTOMER SCOPE

the line bay CT Ratio shall be 1000-800/1.

Selected Bus VT

ABT

89

Selected BCT LV

From Tertiary CT

Same as ICT-1

* the complete function list of the IED's will be ascertained during the approval of the CRP/SAS drawings.

* IEDs shall have selected PT & CVT inputs & shall be selectable.

* M-1 & M-2 Relays of NRL Bay-1&2 are line differential relays with distance as backup.

SYSTEM PARAMETER DETAILS:-

SL. No.	DESCRIPTION OF PARAMETERS	220kV SYSTEM	132kV SYSTEM	33kV SYSTEM
1	SYSTEM OPERATING VOLTAGE	220 kV	132 kV	33 kV
2	MAXIMUM OPERATING VOLTAGE OF THE SYSTEM (RMS)	245 kV	145 kV	36 kV
3	RATED FREQUENCY	50 Hz	50 Hz	50 Hz
4	NO. OF PHASE	3	3	3
5	RATED INSULATION LEVELS			
i	FULL WAVE IMPULSE WITHSTAND VOLTAGE (1.2/50 microsecs.)	1050 kVP	650 kVP	170 kVP
ii	ONE-MINUTE POWER FREQUENCY DRY/WET WITHSTAND VOLTAGE (RMS)	460 KV	275 KV	70 KV
6	CORONA EXTINCTION VOLTAGE	156 KV	105 KV	–
7	MINIMUM CREEPAGE DISTANCE @ 31 mm/KV	7595 mm	4495 mm	1116 mm
8	RATED SHORT CIRCUIT CURRENT/FOR 3 SEC. DURATION VOLTAGE (RMS)	50 KA FOR 3 SECONDS	40 KA FOR 3 SECONDS	31.5 KA FOR 3 SECONDS
9	SYSTEM NEUTRAL EARTHING	EFFECTIVELY EARTHED	EFFECTIVELY EARTHED	EFFECTIVELY EARTHED

BOQ (220kV AIS EQUIPMENTS):-

SL. NO.	SYMBOLS	DESCRIPTION	QTY.
1.		3Φ, AUTO TRANSFORMER 160MVA, 220/132/33kV, YNa0d11	02 Nos.
2.		245kV, 3150A, 50kA FOR 3 SEC. HORIZONTAL CENTRE BREAK TYPE ISOLATOR WITH DOUBLE EARTH SWITCH GROUP OPERATED	06 Sets.
3.		220kV, 1250A, 50kA FOR 3 sec. (1Φ) WAVE TRAP	08 Nos.
4.		220kV, 4400pF, 220kV/√3/0.11kV/√3, 3-CORE (1Φ) CAPACITOR VOLTAGE TRANSFORMER (FOR LINE FEEDERS)	12 Nos.
5.		198kV, 10kA, (1Φ) SURGE ARRESTER WITH SURGE COUNTER	24 Nos.
6.		245kV, 1000/1A & 600/1A & XXX, CURRENT TRANSFORMER (1Φ) (3-CORE) FOR BCT-HV OF 3Φ, AUTO TRANSFORMER 160MVA	06 Nos.
7.		245kV, 1000/1A, CURRENT TRANSFORMER (1Φ) (3-CORE) FOR BCT-LV OF 3Φ, AUTO TRANSFORMER 160MVA	06 Nos.
8.		245kV, 1000/1A, CURRENT TRANSFORMER (1Φ) (2-CORE) FOR NCT OF 3Φ, AUTO TRANSFORMER 160MVA	02 Nos.

BOQ (220kV GIS EQUIPMENTS):-

SL. NO.	SYMBOLS	DESCRIPTION	QTY.
1.		245kV, 3150A, 50kA FOR 3 SEC. SF6 GIS METAL ENCLOSED CIRCUIT BREAKER. (1Φ)	27 Nos.
2.		245kV, 3150A, 50kA FOR 3 SEC. 3Φ GROUP OPERATED ISOLATOR	28 Nos.
3.		245kV, 3150A, 50kA FOR 3 SEC. 3Φ GROUP OPERATED GROUNDING SWITCHES.	22 Nos.
4.		245kV, 3150A, 50kA FOR 3 SEC. 3Φ HIGH SPEED FAULT MAKE GROUND SWITCH	06 Nos.
5.		245kV, 1000-800/1A, CURRENT TRANSFORMER (1Φ) (3-CORE) FOR LINE FEEDERS.	36 Nos.
6.		245kV, 3000-1600-800/1A, CURRENT TRANSFORMER (1Φ) (2-CORE) FOR BUS COUPLER	06 Nos.
7.		245kV, 800-600/1A, CURRENT TRANSFORMER (1Φ) (3-CORE) FOR 220/132/33kV HV OF AUTO TRANSFORMER.	06 Nos.
8.		245kV, 800-600/1A & 800-600/1-1A, CURRENT TRANSFORMER (1Φ) (3-CORE) FOR 220/132/33kV HV OF AUTO TRANSFORMER.	06 Nos.
9.		220kV, 4400pF, 220kV/√3/0.11kV/√3, 3-CORE (1Φ) VOLTAGE TRANSFORMER FOR BUS BAR	06 Nos.
10.		220kV, 220kV/√3/0.11kV/√3, 3-CORE (1Φ) METERING POTENTIAL TRANSFORMER	06 Nos.
11.		245kV, 800-600/1A & 800-600/1-1A, METERING CURRENT TRANSFORMER (1Φ) (2-CORE)	06 Nos.

BOQ (132kV AIS EQUIPMENTS):-

SL. NO.	SYMBOLS	DESCRIPTION	QTY.
1.		3Φ, POWER TRANSFORMER 50MVA, 132/33kV, YNyn0	02 Nos.
2.		145kV, 2000A, 40kA FOR 3 SEC. HORIZONTAL CENTRE BREAK TYPE ISOLATOR WITH DOUBLE EARTH SWITCH GROUP OPERATED	04 Sets.
3.		132kV, 800A, 40kA FOR 3 sec. (1Φ) WAVE TRAP	08 Nos.
4.		132kV, 4400pF, 132kV/√3/0.11kV/√3, 3-CORE (1Φ) CAPACITOR VOLTAGE TRANSFORMER (FOR LINE FEEDERS)	12 Nos.
5.		120kV, 10kA, (1Φ) SURGE ARRESTER WITH SURGE COUNTER	30 Nos.
6.		132kV, 300/1A, CURRENT TRANSFORMER (1Φ) (3-CORE) FOR BCT-HV OF 3Φ, POWER TRANSFORMER 50MVA	06 Nos.
7.		132kV, 1000/1A, CURRENT TRANSFORMER (1Φ) (3-CORE) FOR BCT-LV OF 3Φ, POWER TRANSFORMER 50MVA	06 Nos.
8.		132kV, 300/1A, CURRENT TRANSFORMER (1Φ) (2-CORE) FOR NCT-HV OF 3Φ, POWER TRANSFORMER 50MVA	02 Nos.
9.		132kV, 1000/1A, CURRENT TRANSFORMER (1Φ) (2-CORE) FOR NCT-LV OF 3Φ, POWER TRANSFORMER 50MVA	02 Nos.

BOQ (132kV GIS EQUIPMENTS):-

SL. NO.	SYMBOLS	DESCRIPTION	QTY.
1.		145kV, 2000A, 40kA FOR 3 SEC. SF6 GIS METAL ENCLOSED CIRCUIT BREAKER. (1Φ)	27 Nos.
2.		145kV, 2000A, 40kA FOR 3 SEC. 3Φ GROUP OPERATED ISOLATOR	28 Nos.
3.		145kV, 2000A, 40kA FOR 3 SEC. 3Φ GROUP OPERATED GROUNDING SWITCHES.	22 Nos.
4.		145kV, 2000A, 40kA FOR 3 SEC. 3Φ HIGH SPEED FAULT MAKE GROUND SWITCH	06 Nos.
5.		145kV, 600-400/1A, CURRENT TRANSFORMER (1Φ) (3-CORE) FOR LINE FEEDERS.	12 Nos.
6.		145kV, 600-400/1A, CURRENT TRANSFORMER (1Φ) (2-CORE) FOR LINE FEEDERS.	12 Nos.
7.		145kV, 2000-1000/1A, CURRENT TRANSFORMER (1Φ) (2-CORE) FOR BUS COUPLER.	06 Nos.
8.		145kV, 1200-800/1A, CURRENT TRANSFORMER (1Φ) (3-CORE) FOR 220/132/33kV LV OF AUTO TRANSFORMER.	06 Nos.
9.		145kV, 1200-800/1A, CURRENT TRANSFORMER (1Φ) (2-CORE) FOR 220/132/33kV LV OF AUTO TRANSFORMER.	06 Nos.
10.		145kV, 600-300/1A, CURRENT TRANSFORMER (1Φ) (3-CORE) FOR 132/33kV HV OF POWER TRANSFORMER.	06 Nos.
11.		145kV, 600-300/1A, CURRENT TRANSFORMER (1Φ) (2-CORE) FOR 132/33kV HV OF POWER TRANSFORMER.	06 Nos.
12.		132kV, 132kV/√3/0.11kV/√3, 3-CORE (1Φ) INDUCTIVE VOLTAGE TRANSFORMER FOR BUS BAR	06 Nos.

LEGENDS:-

─── PROPOSED	- - - - EXISTING/FUTURE
GIB (GAS INSULATED BUSBAR)	◆ GAB (GAS TO AIR BUSHING)

REV.NO.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
R1	11.09.24	REVICED AS PER COMMANTS	MK	RV	SARK
R0	23.03.23	FIRST SUBMISSION	NPR	MR	SARK

REVISIONS

OWNER'S NAME : ASSAM ELECTRICITY GRID CORP. LTD. BIJULI BHAWAN, GUWHATI, ASSAM

CONSULTANT : M/S PT FEEDBACK INFRA

CONTRACTOR : R.S. INFRAPROJECTS PVT. LTD
(CONSORTIUM WITH)
PARTH ELECTRICALS & ENGINEERING PVT. LTD

PROJECT : 220/132/33KV GIS SUBSTATION AT KHUMTAI, GOLAGHAT (ASSAM)

PACKAGE NAME: CONSTRUCTION OF 220/132/33KV GIS SUBSTATION AT KHUMTAI, GOLAGHAT (ASSAM)

	NAME	SIGN	DATE
DRWN	NPR	NPR	23.03.23
CHKD	MR	MR	23.03.23
APPD	SARK	SARK	23.03.23

TITLE : PROTECTION AND METERING SINGLE LINE DIAGRAM-OVERALL SUBSTATION AT KHUMTAI

SCALE NTS

PROJECTION

DRAWING. No. DP-22100-RS-KHU-OVERALL-PSLD-DWG-001

REV R1

SHEET 01 OF 02

RELEASED FOR ☐ PRELIMINARY ☐ TENDER ☐ INFORMATION ☑ APPROVAL ☐ CONSTRUCTION

A0 SHEET - 1189x841mm

—				
Checked By AM (P&D)	Checked By DM (P&D)	Checked By AGM (P&D)	Checked By DGM (P&D)	Approved By GM (P&D)

APPROVED, subject to the condition that the approval conveyed herein neither relieves the contractor of his contractual obligations and his responsibilities, design details, performance particulars and conformity of the supplies with the Indian Statutory laws / IEC specifications as may be applicable, nor does limit the AEGCL's right under the contract.

R. S. INFRAPROJECTS PVT. LTD. B-133 Sector-2 NOIDA