

CEYLON ELECTRICITY BOARD

SRI LANKA

GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY IMPROVEMENT INVESTMENT PROGRAM (TRANCHE 2)

(ADB LOAN NO: 3483/3484)

PACKAGE 8 - LOT B

Procurement of Plant

Design, Supply, and Installation

Single-Stage: Two-Envelope
Bidding Procedure

BIDDING DOCUMENT
for
Procurement
of

Augmentation of:
Ambalangoda 132/33kV Grid Substation
Pannala 132/33kV Grid Substation

Information Copy Not for Bidding

VOLUME 6 of 8
Part II- REQUIREMENTS
Section 6 - Employer's Requirements: Part C - Drawings

Issued on: 25 June 2020
Invitation for Bids No.: CEB/AGM/PRO/2019/IFB/GPDEEIP-T2-P8-LOT B
ICB No.: CEB/AGM/PRO/2019/ICB/GPDEEIP-T2-P8-LOT B
Employer: Ceylon Electricity Board
Country: Sri Lanka

Projects Division
Ceylon Electricity Board,
P.O. Box 540, Colombo 02
Sri Lanka
Document – Revision 1

Information Copy - Not for Bidding

Preface

This Bidding Document for Procurement of Plant – Design, Supply, and Installation, has been prepared by Ceylon Electricity Board and is based on the Standard Bidding Document for Procurement of Plant – Design, Supply, and Installation (SBD Plant) issued by the Asian Development Bank dated December 2016.

ADB's SBD Plant has the structure and the provisions of the Master Procurement Document entitled "Procurement of Plant – Design, Supply, and Installation", prepared by multilateral development banks and other public international financial institutions except where ADB-specific considerations have required a change.

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Table of Contents - Summary Description

VOLUME 1 OF 8

PART I BIDDING PROCEDURES

Section 1 - Instructions to Bidders (ITB) -----	1-1
This Section specifies the procedures to be followed by Bidders in the preparation and submission of their Bids. Information is also provided on the submission, opening, and evaluation of bids and on the award of contract.	
Section 2 - Bid Data Sheet (BDS) -----	2-1
This Section consists of provisions that are specific to each procurement and supplement the information or requirements included in Section 1 - Instructions to Bidders.	
Section 3 - Evaluation and Qualification Criteria (EQC) -----	3-1
This Section contains the bid evaluation criteria to determine the lowest evaluated bid and lists the necessary qualifications of Bidders.	

VOLUME 2 OF 8

PART I BIDDING PROCEDURES

Section 4 - Bidding Forms (BDF) -----	4A-1
Part A-Price Bid	
This Section contains the forms which are to be completed by the Bidder and submitted as part of its Bid.	

VOLUME 3 OF 8

PART I BIDDING PROCEDURES

Section 4 - Bidding Forms (BDF) -----	4B-1
Part B-Technical Bid	
This Section contains the forms which are to be completed by the Bidder and submitted as part of its Bid.	
Section 5 - Eligible Countries (ELC) -----	5-1
This Section contains the list of eligible countries.	

VOLUME 4 OF 8

PART II REQUIREMENTS

Section 6 - Employer's Requirements (ERQ) -----	6A-1
Part A-Scope of Works	

VOLUME 5 OF 8

PART II REQUIREMENTS

Section 6 - Employer's Requirements (ERQ) -----	6B-1
Part B-Technical Specification	

VOLUME 6 OF 8**PART II REQUIREMENTS**

Section 6 - Employer's Requirements (ERQ) ----- 6C-1
Part C-Drawings

VOLUME 7 OF 8**PART II REQUIREMENTS**

Section 6 - Employer's Requirements (ERQ) ----- 6D-1
Part D-Supplementary Information

Section 6 - Employer's Requirements (ERQ) ----- 6D-1
Part E-Bank Guarantees and Certificates, Change Orders

VOLUME 8 OF 8**PART III CONDITIONS OF CONTRACT AND CONTRACT FORMS**

Section 7 - General Conditions of Contract (GCC) ----- 7-1
This Section contains the general clauses to be applied in all contracts. These Conditions are subject to the variations and additions set out in Section 8 (Special Conditions of Contract).

Section 8 - Special Conditions of Contract (SCC) ----- 8-1
This Section contains provisions that are specific to each contract and that modify or supplement the GCC. Whenever there is a conflict, the provisions herein shall prevail over those in the GCC. The clause number of the SCC is the corresponding clause number of the GCC.

Section 9 - Contract Forms (COF) ----- 9-1
This Section contains forms, which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

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TABLE OF CONTENTS

DRAWINGS

General

1 TD/CE/1/185/ D/09/00	Map Showing the Location of Site in Year 2027
2 TD/CE/1/185/ D/08/00	CEB Power System Diagram in Year 2027
3 TD/CE/1/185/ D/00/00	Symbols
4 TD/CE/1/185/ D/04/00-A	Typical DC 48V Supply System
5 TD/CE/1/185/ D/04/00-B	Typical DC 110V Supply System
6 TD/CE/1/185/ D/03/00	Typical Inverter Distribution System
7 TD/CE/1/185/ D/60/00-01	Chain Link Fence
8 TD/CE/1/185/ D/60/00-02	Barbed Wire Fence Post
9 TD/CE/1/185/ D/60/00-03	Doors & Windows Details
10 TD/CE/1/185/ D/60/00-04	Remote Operable Gate

Ambalangoda GSS

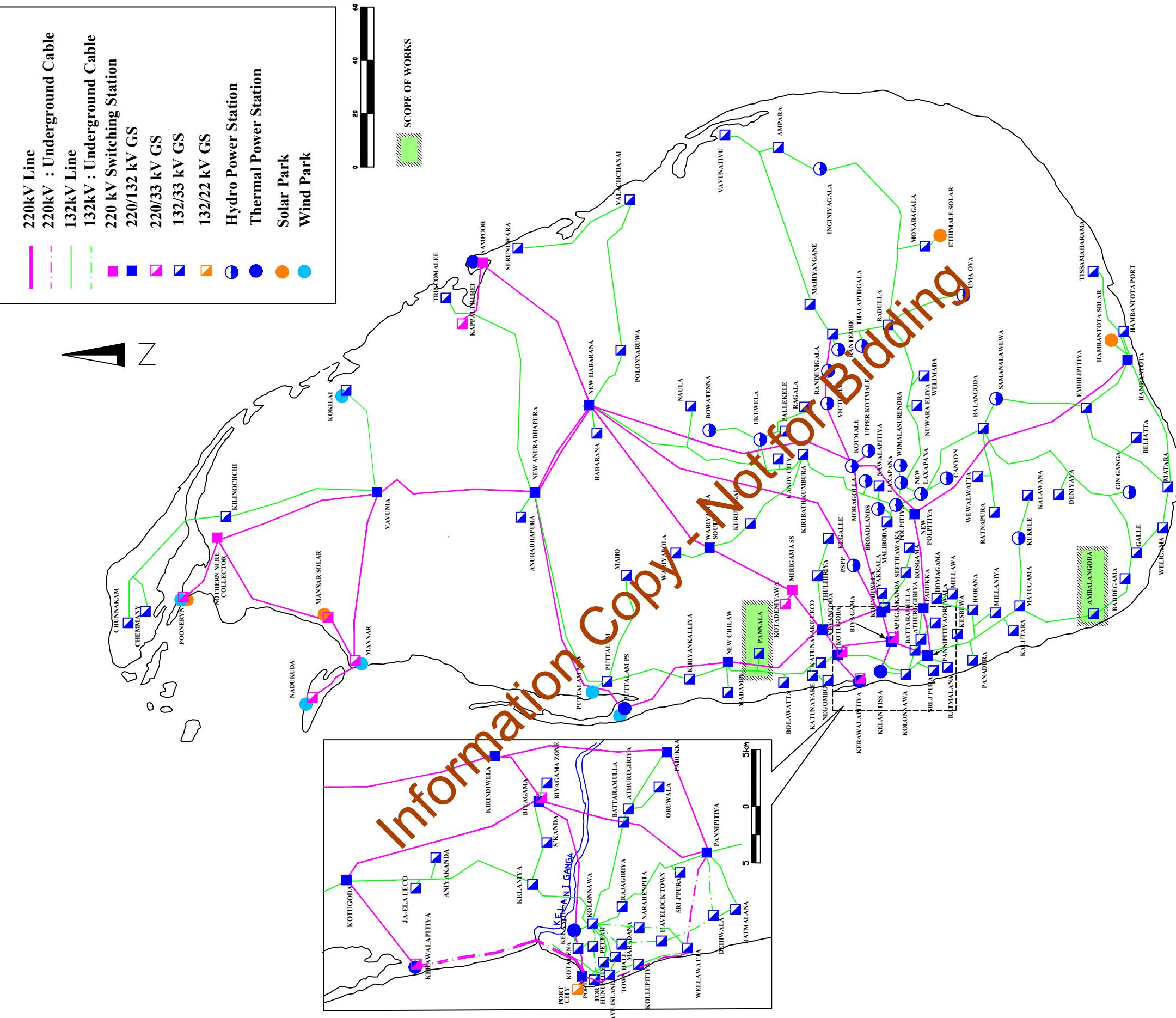
11 TD/CE/1/185/ D/00/01	Proposed Single Line Diagram for Ambalangoda GSS
12 TD/CE/1/185/ D/01/01	General Layout for Ambalangoda GSS
13 TD/CE/1/185/ D/01/01-A	33kV Feeder Take-off Structure Arrangement for Ambalangoda GSS
14 TD/CE/1/185/ D/60/01	Control Building Layout for Ambalangoda GSS
15 TD/CE/1/185/ D/60/01-A	GIS Room Layout for Ambalangoda GSS
16 TD/CE/1/185/ D/07/01	Architecture for the Substation Automation System for Ambalangoda GSS

Pannala GSS

17 TD/CE/1/185/ D/00/02-A	Proposed Single Line Diagram for Pannala GSS
18 TD/CE/1/185/ D/00/02-B	Proposed Single Line Diagram for Pannala GSS
19 TD/CE/1/185/ D/01/02	General Layout for Pannala GSS
20 TD/CE/1/185/ D/01/02-A	33kV Feeder Take-off Structure Arrangement for Pannala GSS
21 TD/CE/1/185/ D/60/02-A	GIS Room Layout for Pannala GSS
22 TD/CE/1/185/ D/60/02-B	GIS Room Section for Pannala GSS
23 TD/CE/1/185/ D/07/02	Architecture for the Substation Automation System for Pannala GSS

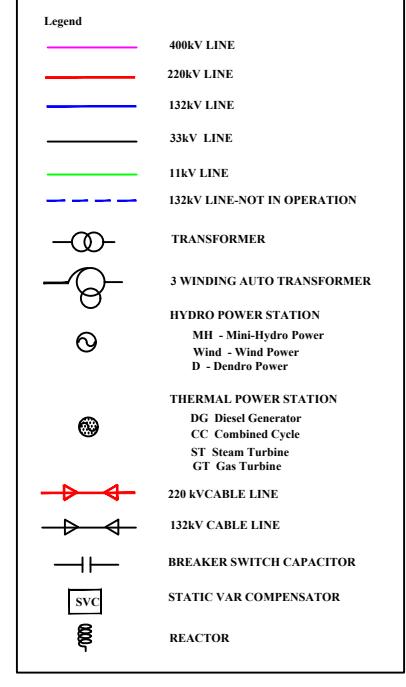
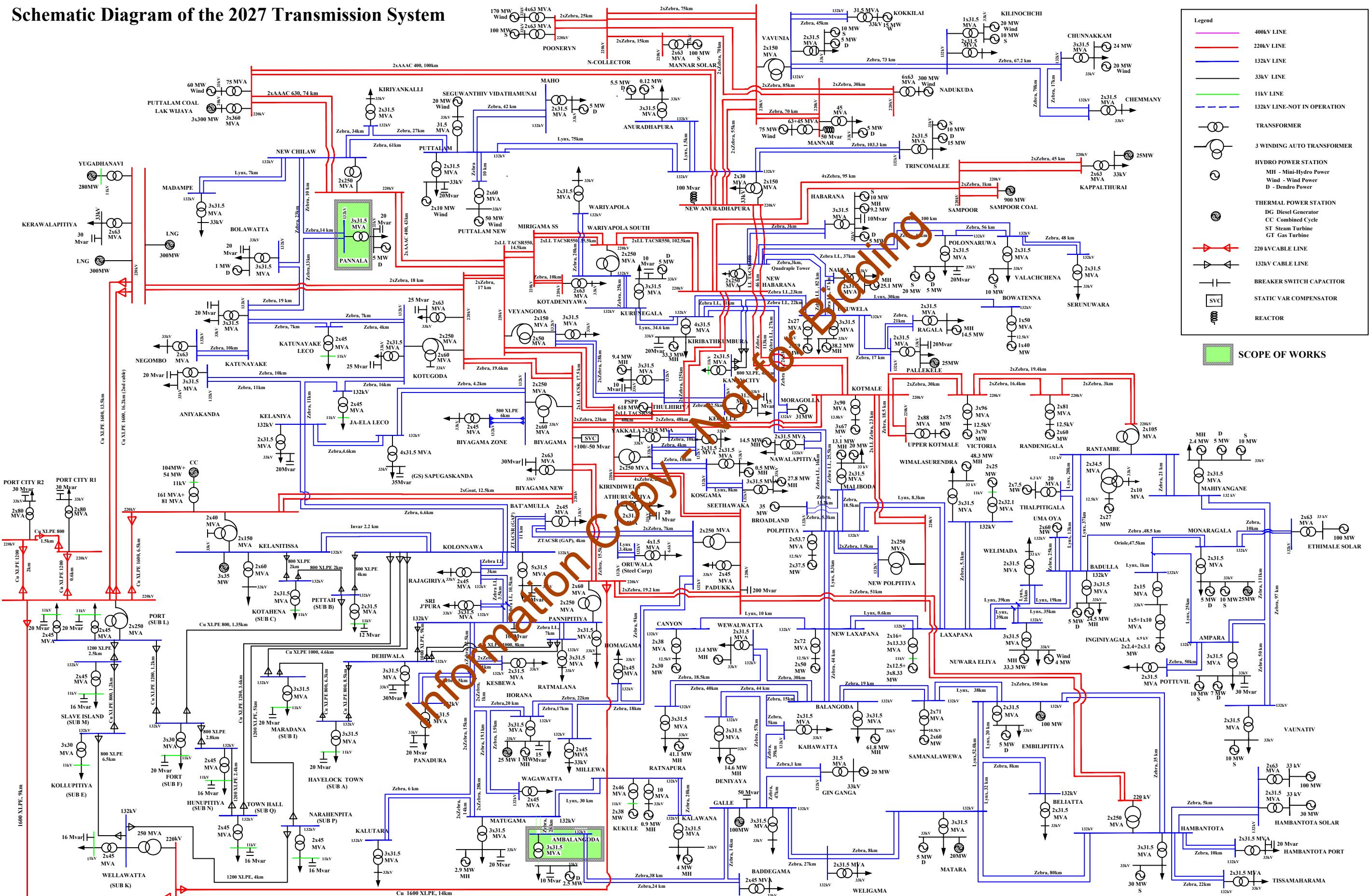
Information Copy - Not for Bidding

The Map of Sri Lanka Transmission System in Year 2027



Schematic Diagram of the 2027 Transmission System

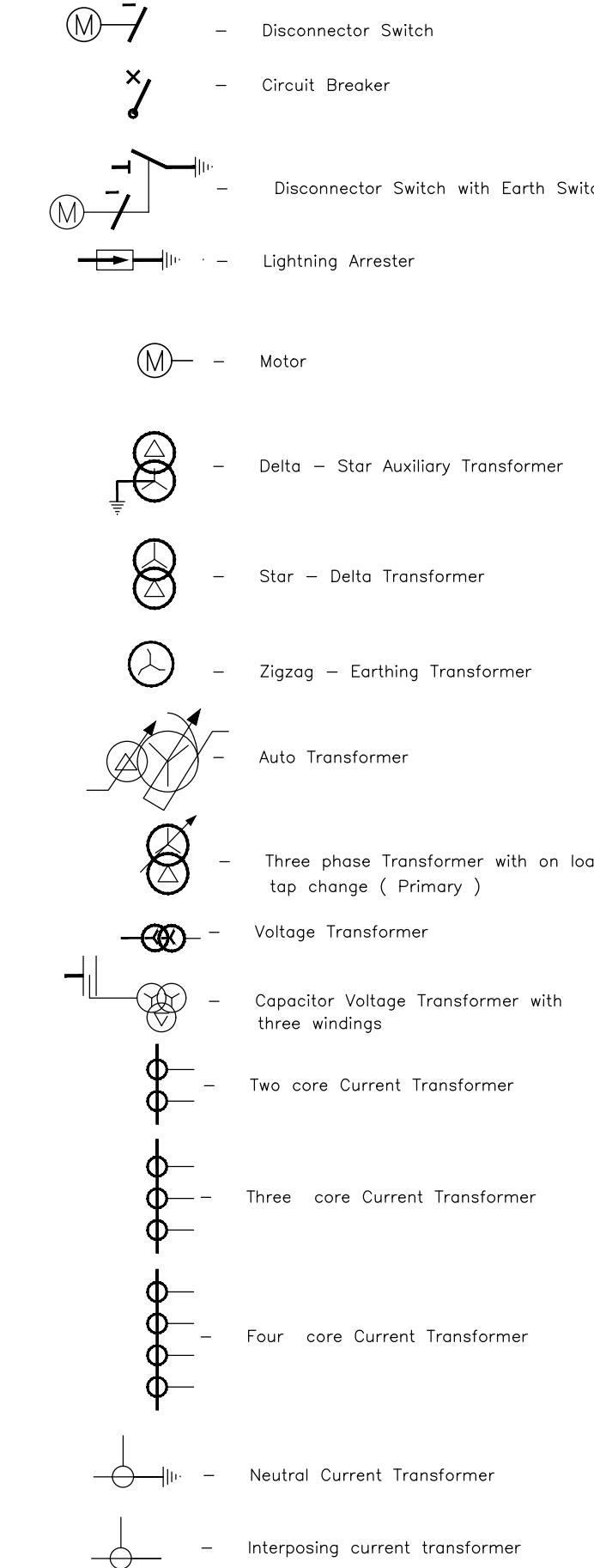
Property of CEB Tr. Design Branch



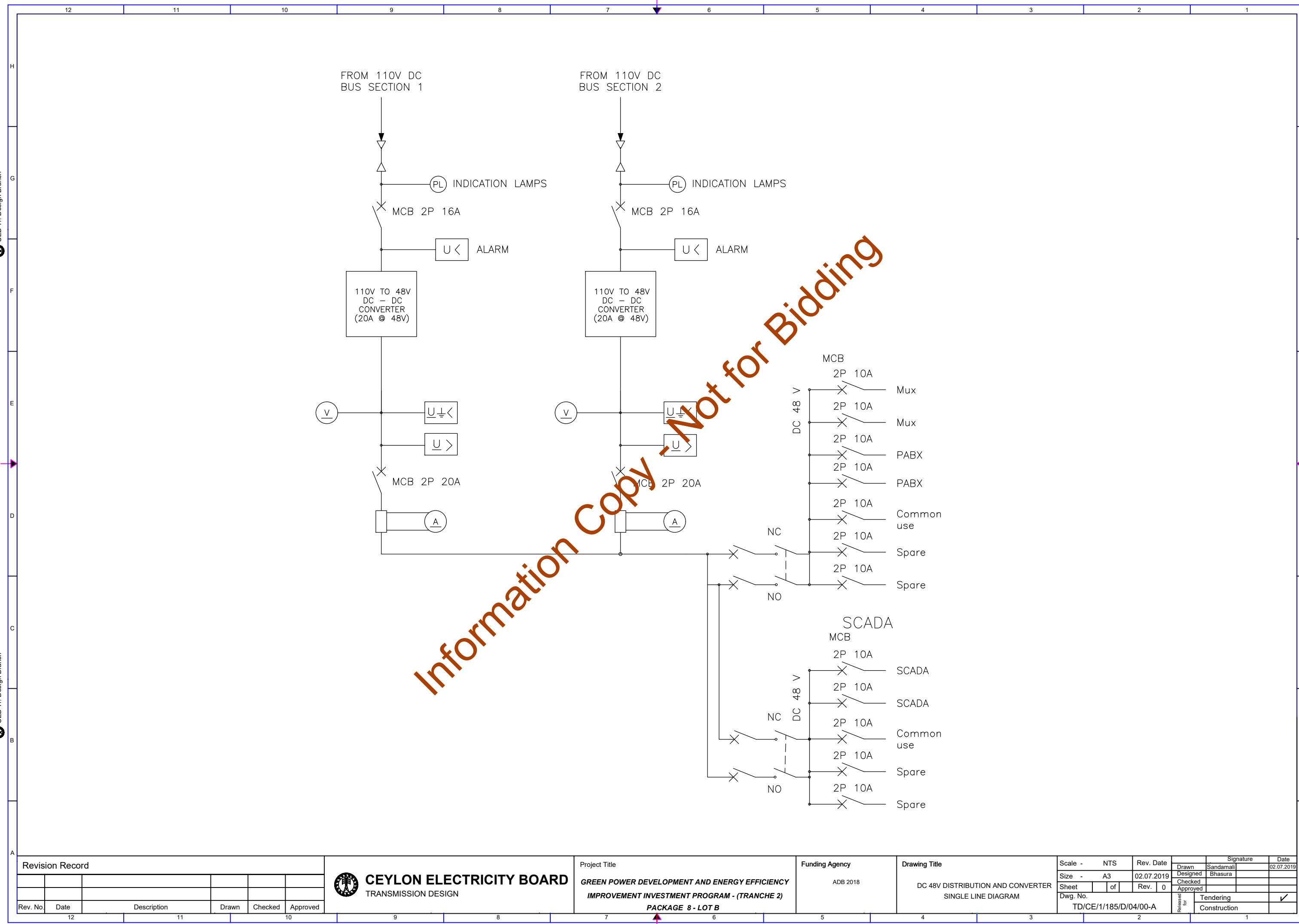
Project Title
GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)
PACKAGE 8 - LOT B

Funding Agency
ADB
Drawing Title
CEB Power System Diagram in Year 2027

Scale -	NTS	Rev. Date	Signature	Date
Drawn	Sandamali	26.04.2019		26.04.2019
Designed	Bhasura			
Checked				
Approved				
Dwg. No.	TD/CE/11185/D/08/00	Rev.	Tendering	
		Released for	Construction	✓



REFERENCE – IEC 617



Revision Record					
Rev. No.	Date	Description	Drawn	Checked	Approved
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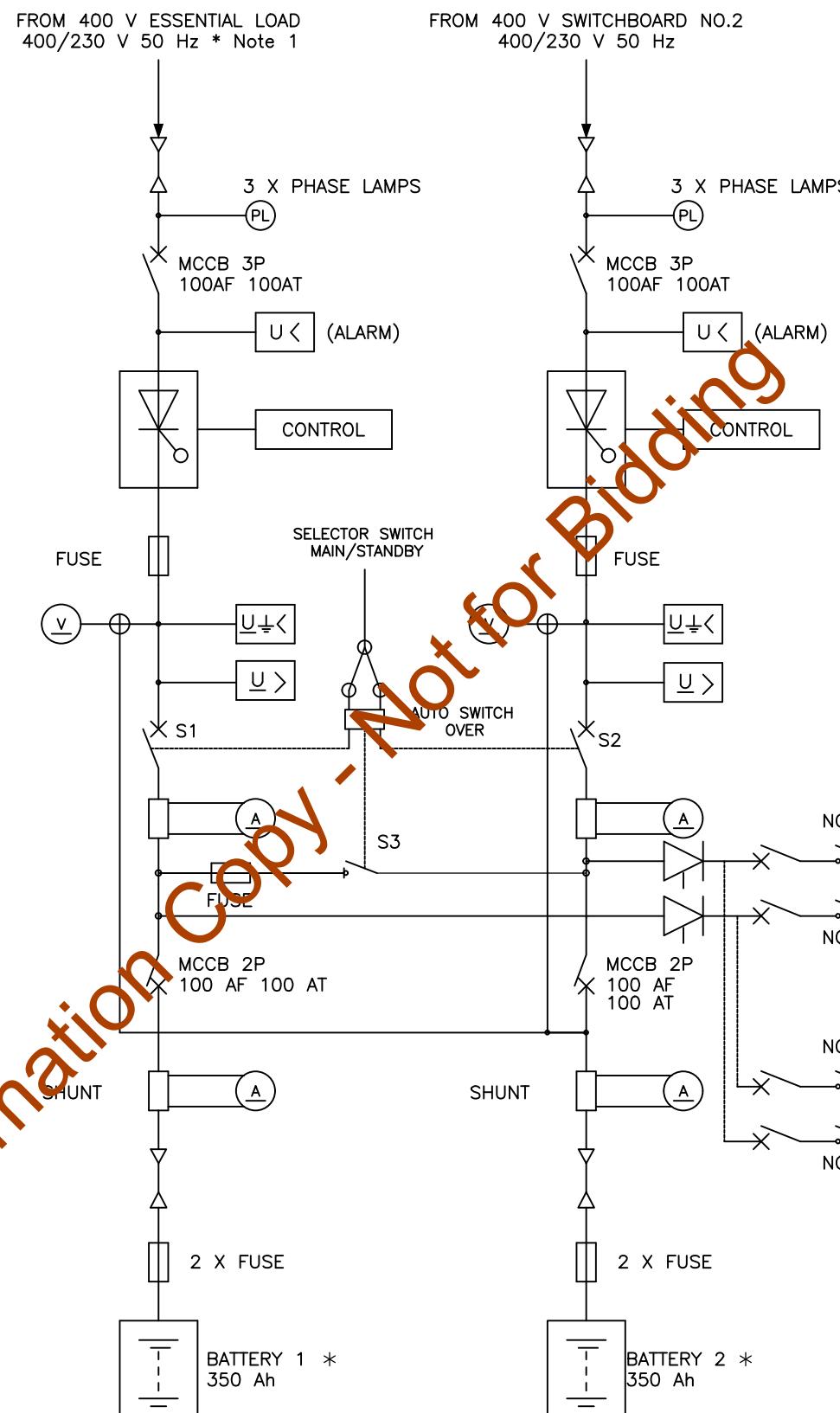
*Note 1 : Secure 400V AC supply by diesel generator in Essential Supply bay

*Note 2 : Quantities and Ratings of MCCBs shall be decided in the design stage.

*Note 3 : When feeding from generator. If Battery Bank 2 Voltage drop up to the minimum Voltage. Bus Section 1 & 2 shall be coupled & Battery Bank 2 and Charger 2 shall be Isolated. Proper Interlocking Scheme shall be provided for above operation and the system shall be back to normal operation when LVAC is available.

*Note 4 : Only for Bidding purpose

* Battery capacity shall be decided as per the Scope.



Information Copy - Not for Bidding

Section 1	Control source for MTR No.1 OLTC (Future)
	MTR No.1 Protection (Future)
	Control source for MTR No.2 OLTC (Future)
	MTR No.2 Protection (Future)
	Control source for MTR No.3 OLTC (Future)
	MTR No.3 Protection (Future)
	MTR cooling fans control No.1 (Future)
	Lamp indication / Alarms
	Control source for switchgear 245kV
	Control source for switchgear 245kV Spring charging motors
	Distribution panel Indoor lighting
	Inverter 1
	DC Lamp for Diesel Generator Room
	220/48V DC-DC Converter for communication equipment
	Common use
DC 220 V	
Section 2	MTR cooling fans control No.2 (Future)
	Lamp indication / Alarms
	MTR cooling fans control No.3 (Future)
	Inverter 2
	Control source for switchgear 245kV
	Control source for switchgear 245kV Spring charging motors
	Distribution panel Indoor lighting
	220/48V DC-DC Converter for communication equipment
	Common use
DC 220 V	
2	2 x each type of ampere ratings

Rev. No.	Date	Description	Drawn	Checked	Approved
12	11	10	9	8	7



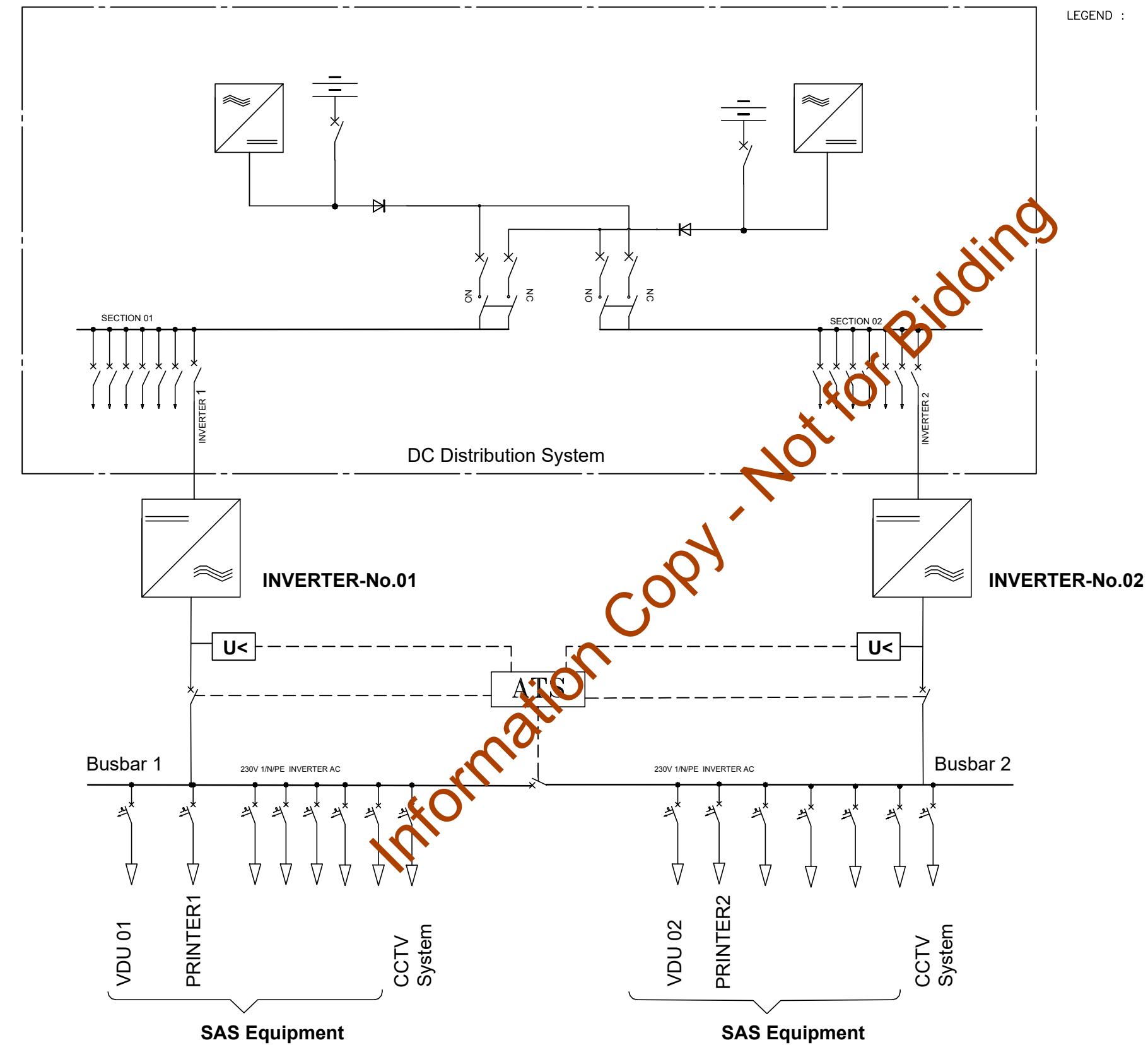
CEYLON ELECTRICITY BOARD
TRANSMISSION DESIGN

Project Title
**GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)**
PACKAGE 8 - LOT B

Funding Agency
ADB

Drawing Title
TYPICAL DC 110V SUPPLY SYSTEM OF
CONTROL CIRCUITS

Scale -	NTS	Rev. Date	Signature	Date
Size -	A3	02.07.2019	Anusha	02.07.2019
Sheet	of	Rev.	Bhasura	
			Checked	
			Approved	
Dwg. No.			Tendering	
			Released for	
			Construction	✓



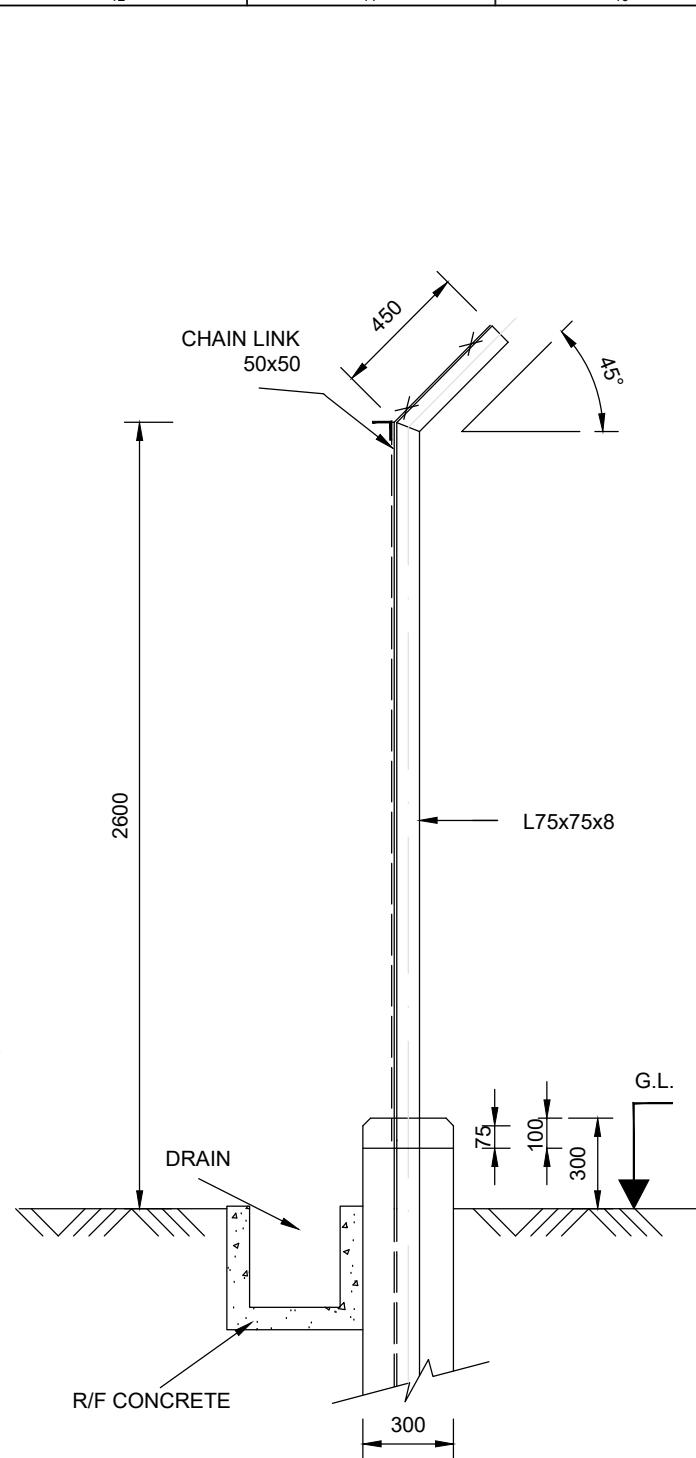
LEGEND :

NO.	DESIGNATION/SYMBOL	MEANING
1.		CIRCUIT BREAKER
2.		MINITUDE CIRCUIT BREAKER
3.		BATTERY CHARGER
4.		BATTERY
5.		FUSE
6.		DIODE (DECOUPLING)
7.		AUTOMATIC TRANSFER SYSTEM
8.		RECTIFIER
9.		INVERTER
10.		UN-INTERRUPTIBLE POWER SUPPLY
11.		SUBSTATION AUTOMATION SYSTEM

2 | 11 | 10 | 9 | 8 | 7 | **6** | 5 | 4 | 3 | 2 | 1

Property of
 CEB Tr. Design Branch

Property of
 CEB Tr. Design Branch



SECTION A-A

NOTE

ALL STEEL COMPONENTS SHALL BE GALVANIZED

ALL DIMENSIONS ARE IN MILLIMETRES

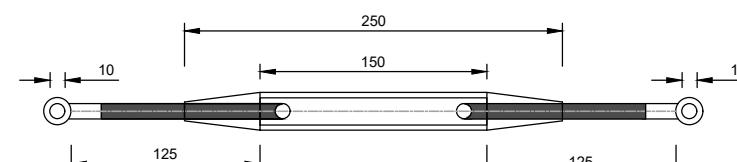
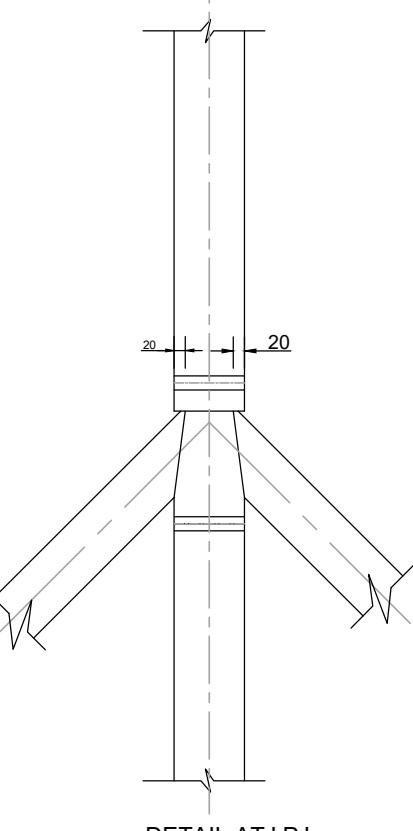
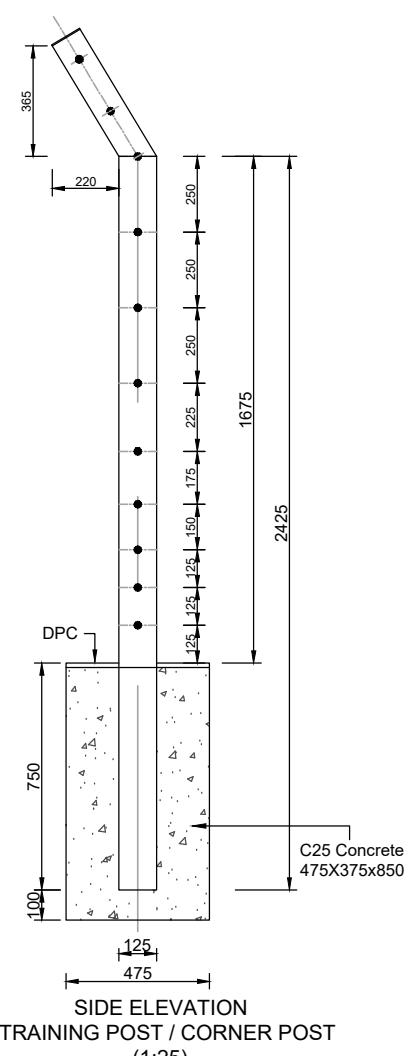
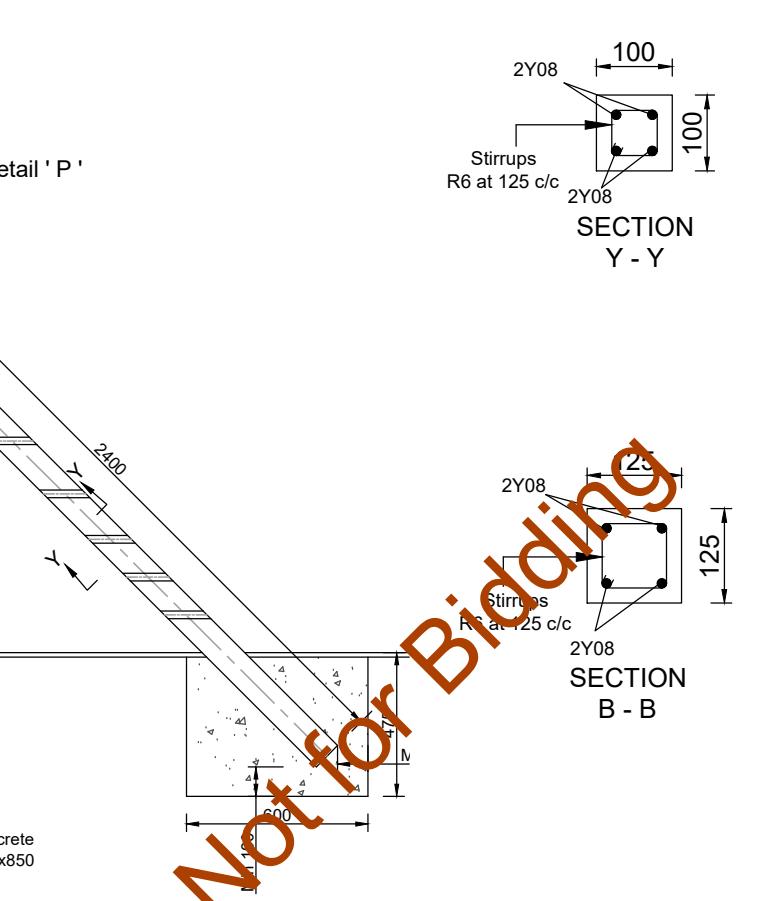
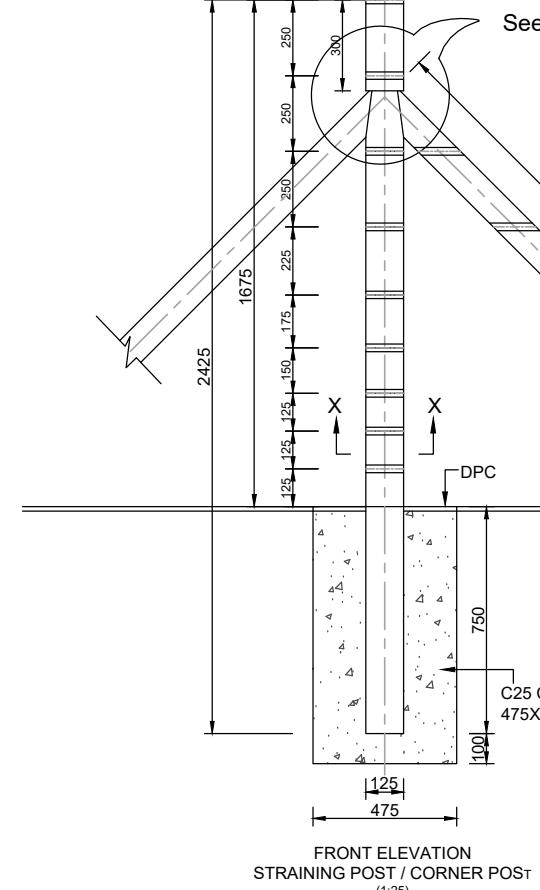
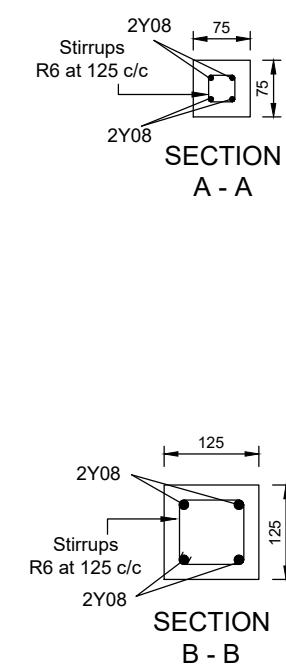
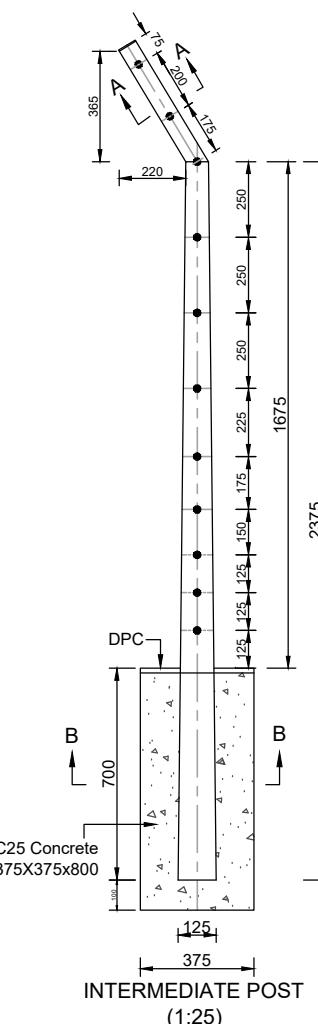


CEYLON ELECTRICITY BOARD
TRANSMISSION DESIGN

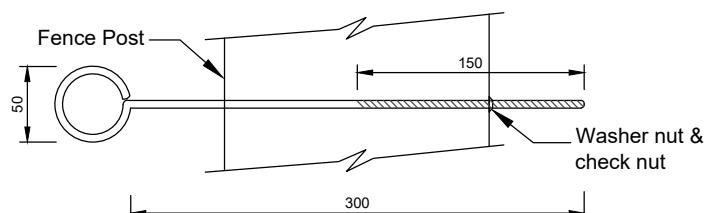
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***GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)***

Funding Agency	Drawing Title
ADB	CHAIN LINK FEN

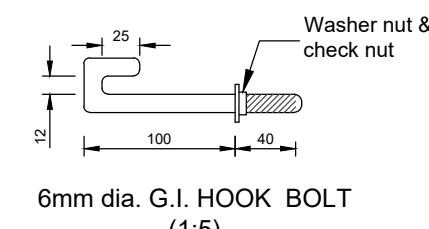
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				Designed	Bhasura	
	Sheet	of	Rev.	Checked		
				Approved		
Dwg. No.			Released for	Tendering		✓
TD/CE/1/185/D/60/00-01				Construction		



TURN BUCKLE FOR STRAINING (1:5)



50mm dia. STRAINING BOLT (1:5)



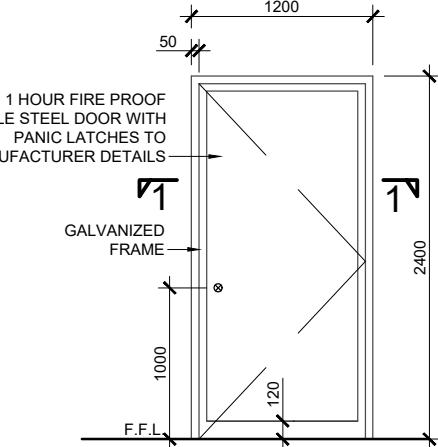
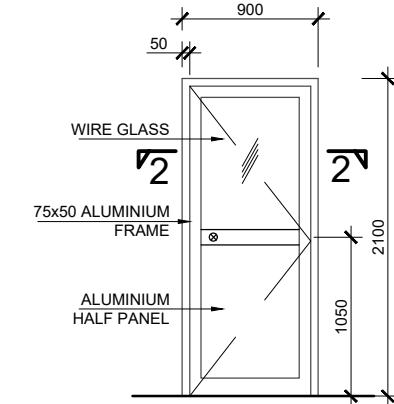
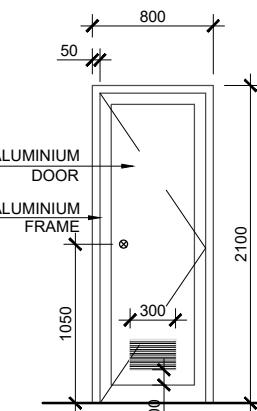
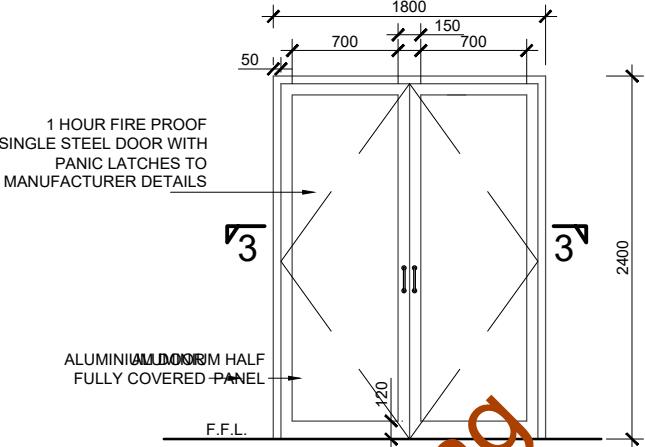
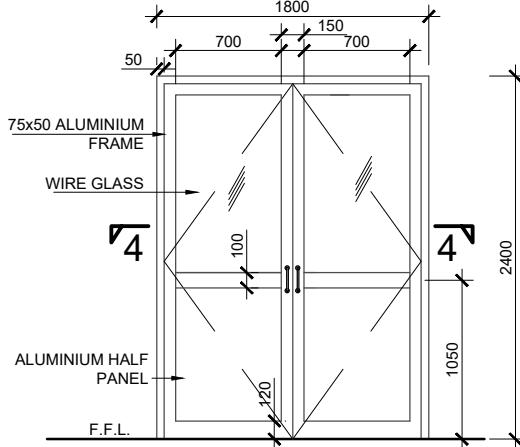
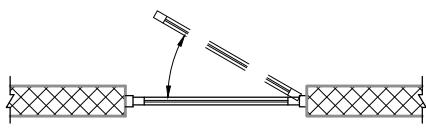
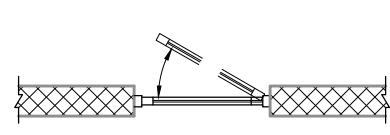
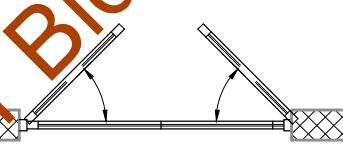
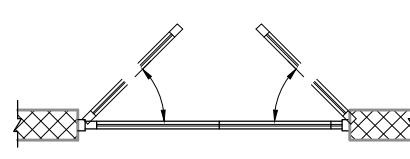
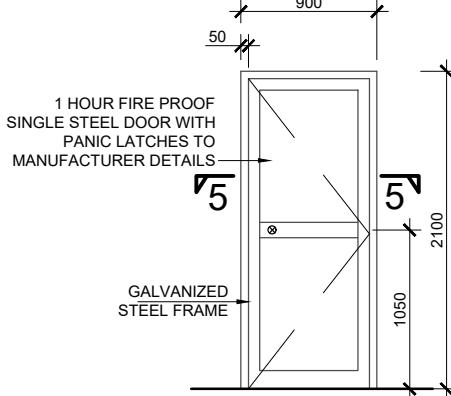
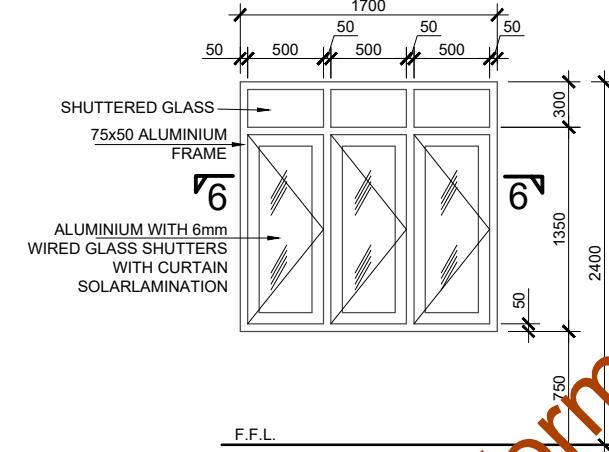
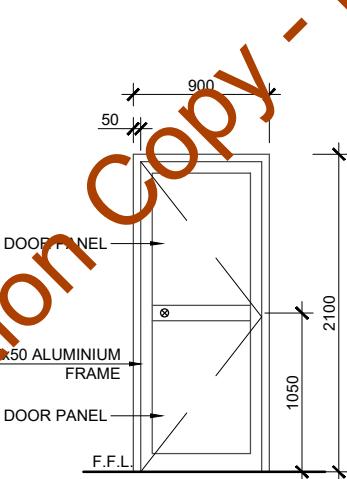
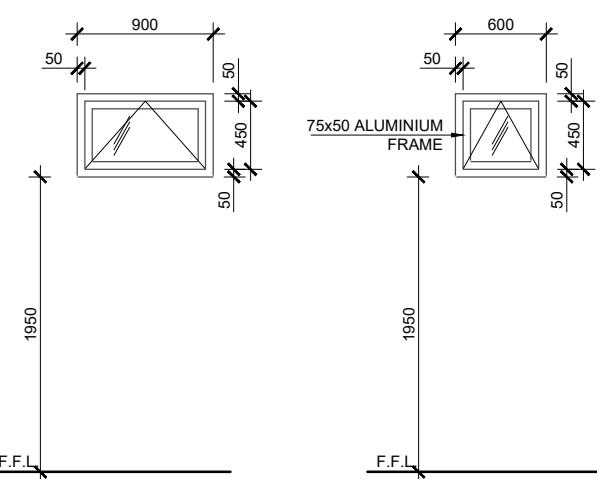
6mm dia. G.I. HOOK BOLT (1:5)

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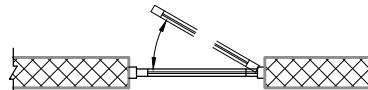
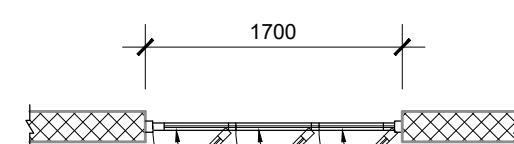
NOTES :-

1. All demensions are in Millimeters.
2. Grade 25 Concrete for Foundation.
3. Minimum cover for main Reinforcement - 20mm
4. Straining Post to be provided at every 06th fence post & at all bends.

Rev. No.	Date	Description	Drawn	Checked	Approved
12	11		10	9	

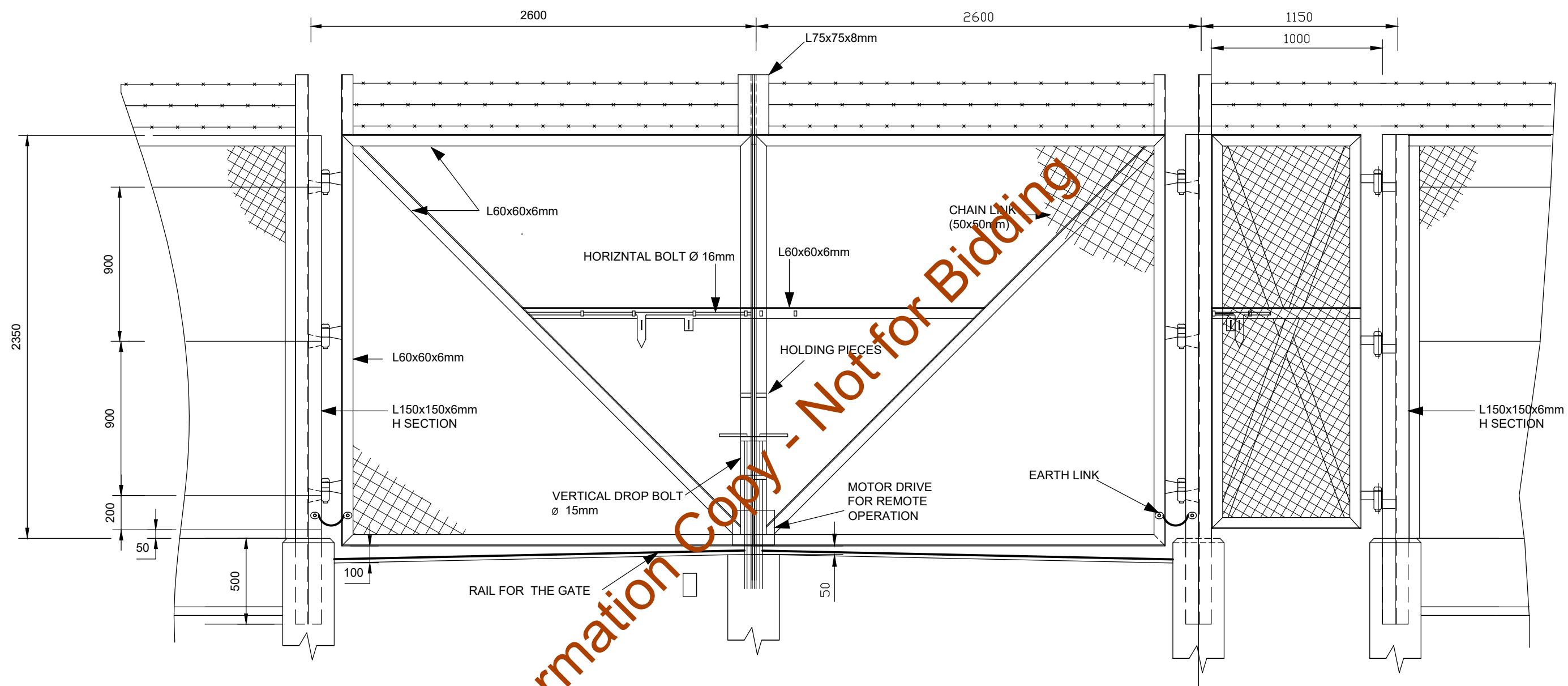
DETAIL OF D1DETAIL OF D2DETAIL OF D4DETAIL OF D5DETAIL OF D6SECTION 1-1SECTION 2-2SECTION 3-3SECTION 4-4DETAIL OF D3DETAIL OF W1DETAIL OF D3ADETAIL OF D2

TYPE	SIZE	DESCRIPTION
D1	1200 x 2400	GALVANIZED STEEL FRAME FIRE PROOF STEEL DOOR WITH PANIC LATCHES SINGLE DOOR
D2	900 x 2100	ALUMINIUM HALF PANEL WITH WIRED GLAZED DOOR
D3	900 x 2100	GALVANIZED STEEL FRAME FIRE PROOF STEEL DOOR WITH PANIC LATCHES SINGLE DOOR
D3A	900 x 2100	ALUMINIUM DOOR
D4	800 x 2100	ALUMINIUM DOOR
D5	1800 x 2400	GALVANIZED STEEL FRAME FIRE PROOF STEEL DOOR WITH PANIC LATCHES DOUBLE DOOR
D6	1800 x 2400	ALUMINIUM HALF PANEL WITH WIRED GLAZED DOOR
W1	1700 x 1650	ALUMINUM FRAME GLAZED WINDOWS
W2	900 x 450	PRESSURE RELEASED WINDOWS
F	600 x 450	ALUMINUM FRAME GLAZED FANLIGHT

SECTION 5-5SECTION 6-6CEYLON ELECTRICITY BOARD
TRANSMISSION DESIGNProject Title
GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)
PACKAGE 8 - LOT BFunding Agency
ADBDrawing Title
DETAILS OF DOORS & WINDOWS

Scale -	1:50	Rev. Date	Signature	Date
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Designed	Bhasura			
Checked				
Approved				
Dwg. No.	TD/CE/1/185/D/60/00-03	Tendering		
Released for	Construction			

Rev. No.	Date	Description	Drawn	Checked	Approved
12	11	10	9	8	7



NOTE :-

- ALL BASE PLATES SHOULD BE WELDED TO FENCE POST COLUMN.
- EACH CORNER POST SHOULD BE PROVIDED TWO STRUTS (IN BOTH DIRECTIONS)
- ALL GATE COMPONENTS WILL BE GALVANIZED
- ALL DIMENSIONS ARE IN MILLIMETERS

Rev. No.	Date	Description	Drawn	Checked	Approved
12	11	10	9	8	7



CEYLON ELECTRICITY BOARD
TRANSMISSION DESIGN

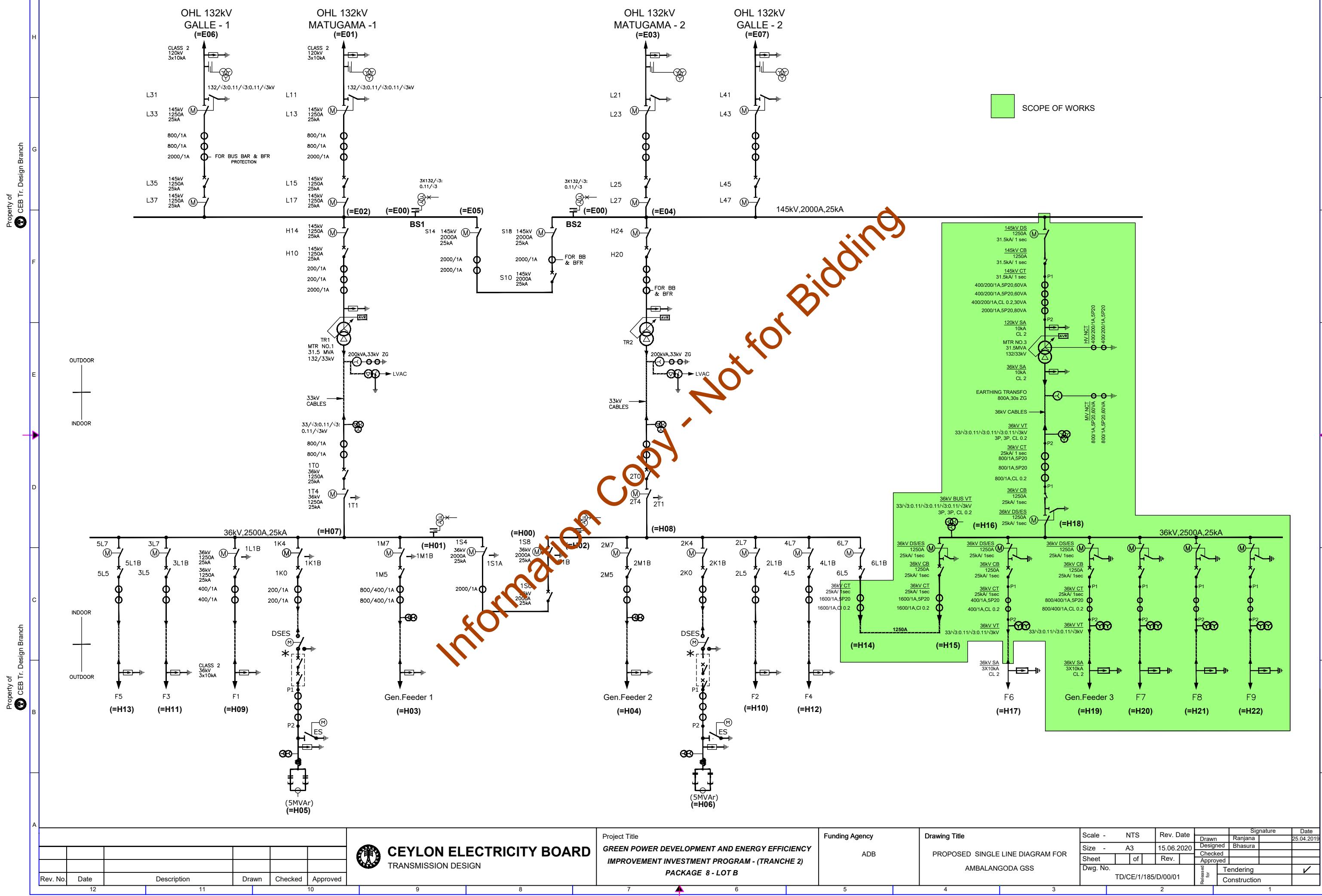
Project Title
**GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)**
PACKAGE 8 - LOT B

Funding Agency
ADB

Drawing Title
REMOTE OPERABLE GATE

Scale -	1:25	Rev. Date	Signature	Date
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Sheet	of	Rev.	Designed	Bhasura
Dwg. No.			Checked	
			Approved	
Released for			Tendering	✓
			Construction	

TD/CE/1/185/D/60/00-04



Revision Record					
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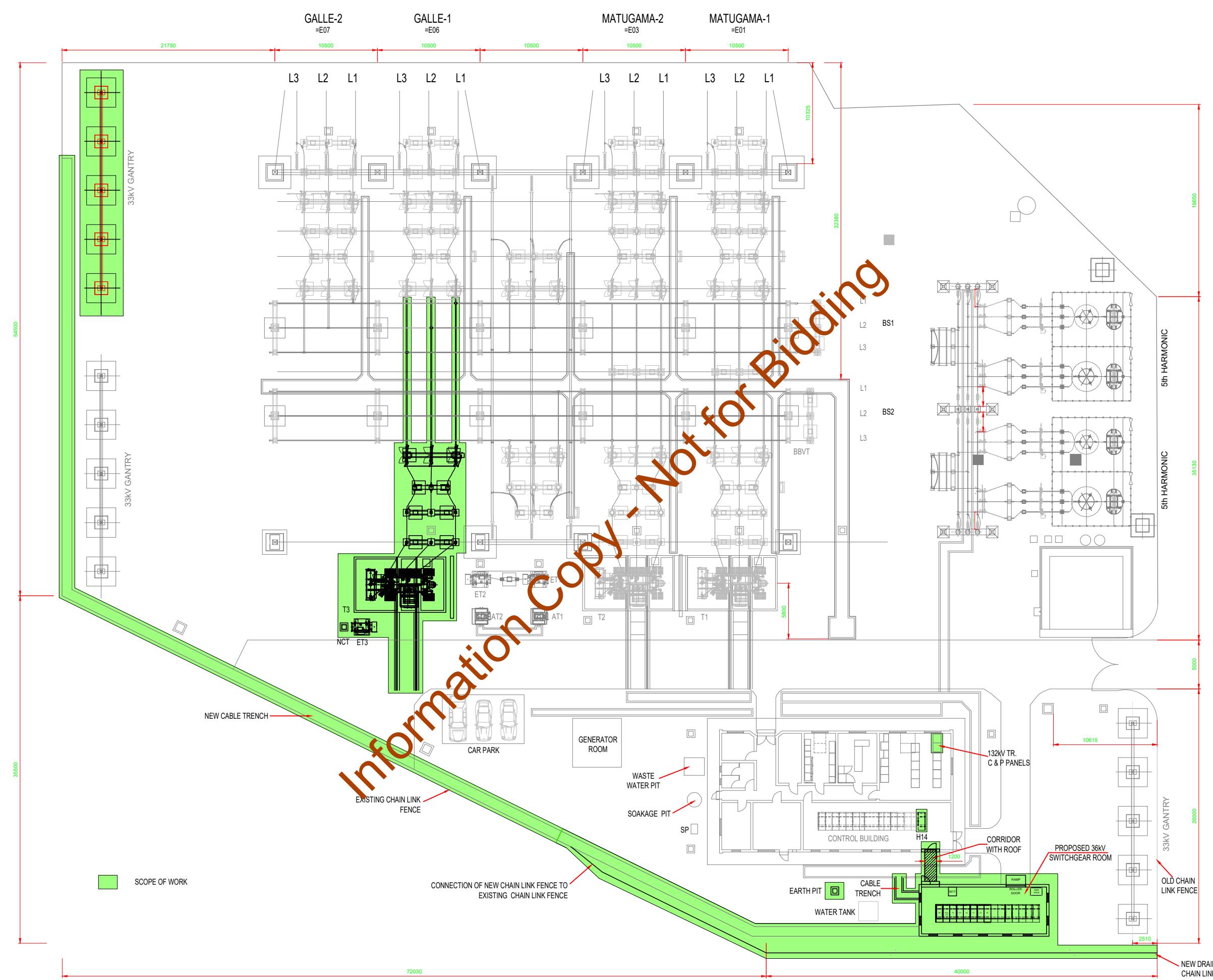
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TRANSMISSION DESIGN

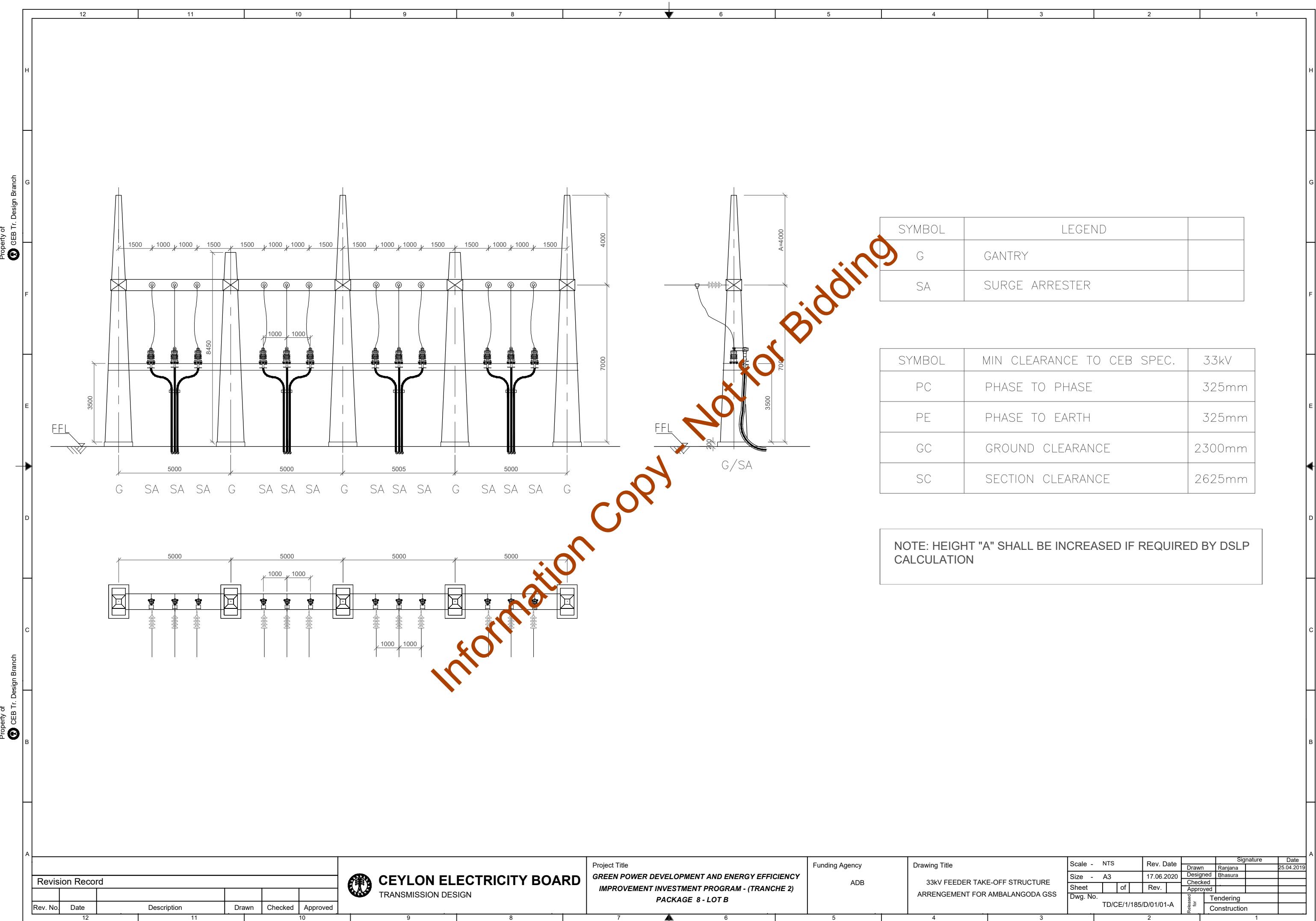
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IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)**
PACKAGE 8 - LOT B

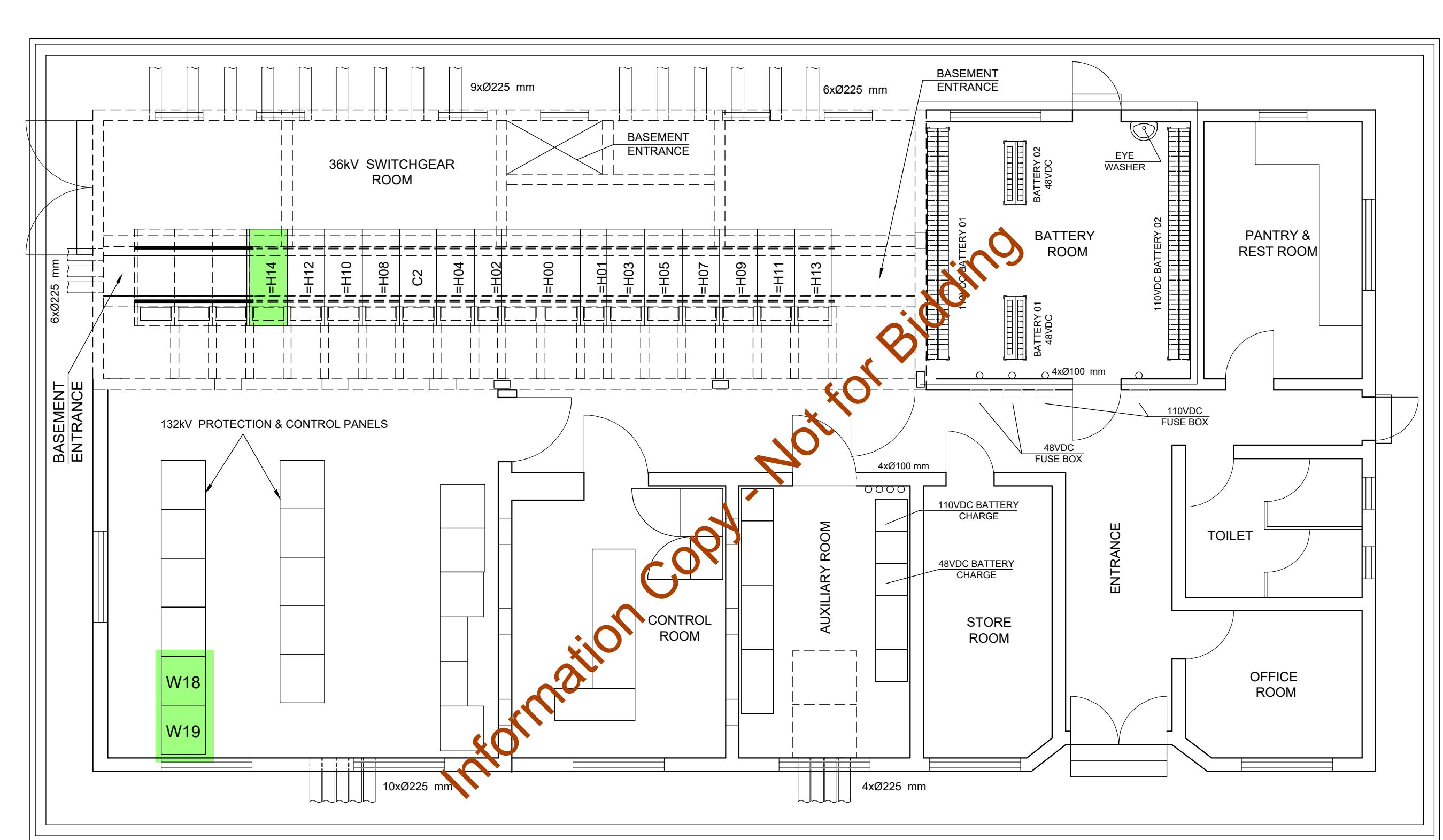
Funding Agency
ADB

Drawing Title
GENERAL LAYOUT FOR AMBALANGODA GSS

Scale - NTS	Rev. Date	Signature	Date
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Designed	Bhasura		
Checked			
Approved			
Dwg. No.	TD/CE/1/185/D/01/01		
Released for	Tendering		
	Construction		







=W18 - T/F No. 3 - CONTROL & PROTECTION PANEL
 =W19 - T/F No. 3 - MECHANICAL PROTECTION & AVR PANEL
 =H14 - EXISTING GIS PANEL FOR 33kV FEEDER NO - 06

- SCOPE OF WORK

Revision Record					
Rev. No.	Date	Description	Drawn	Checked	Approved
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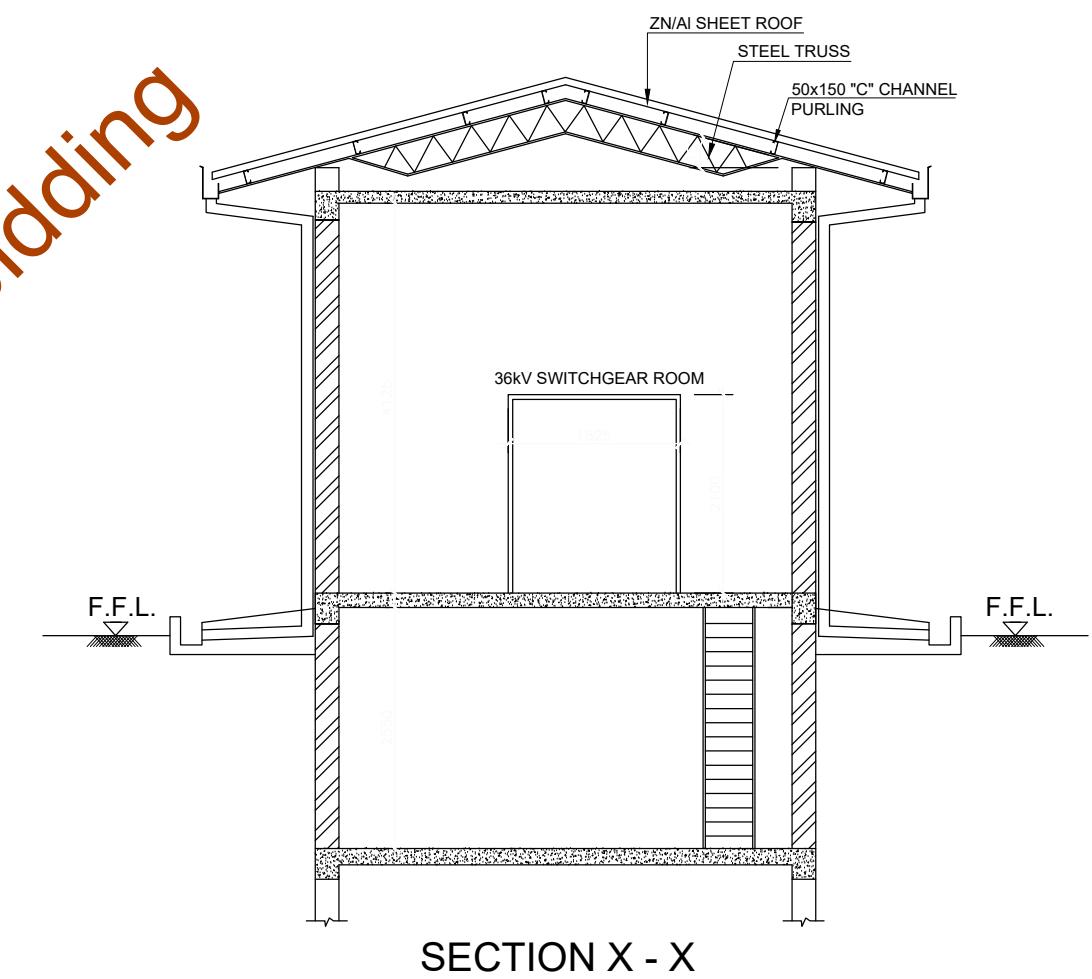
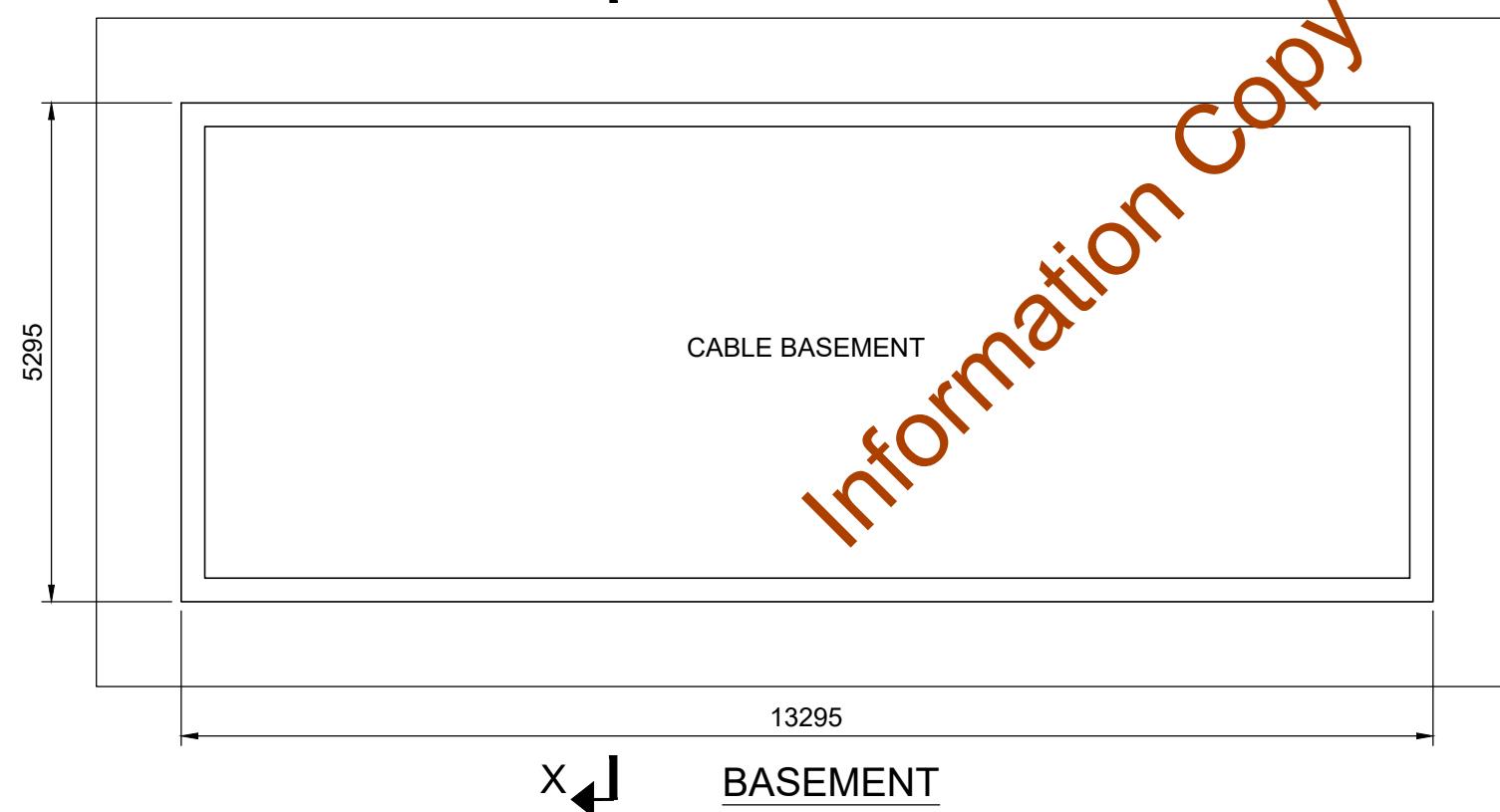
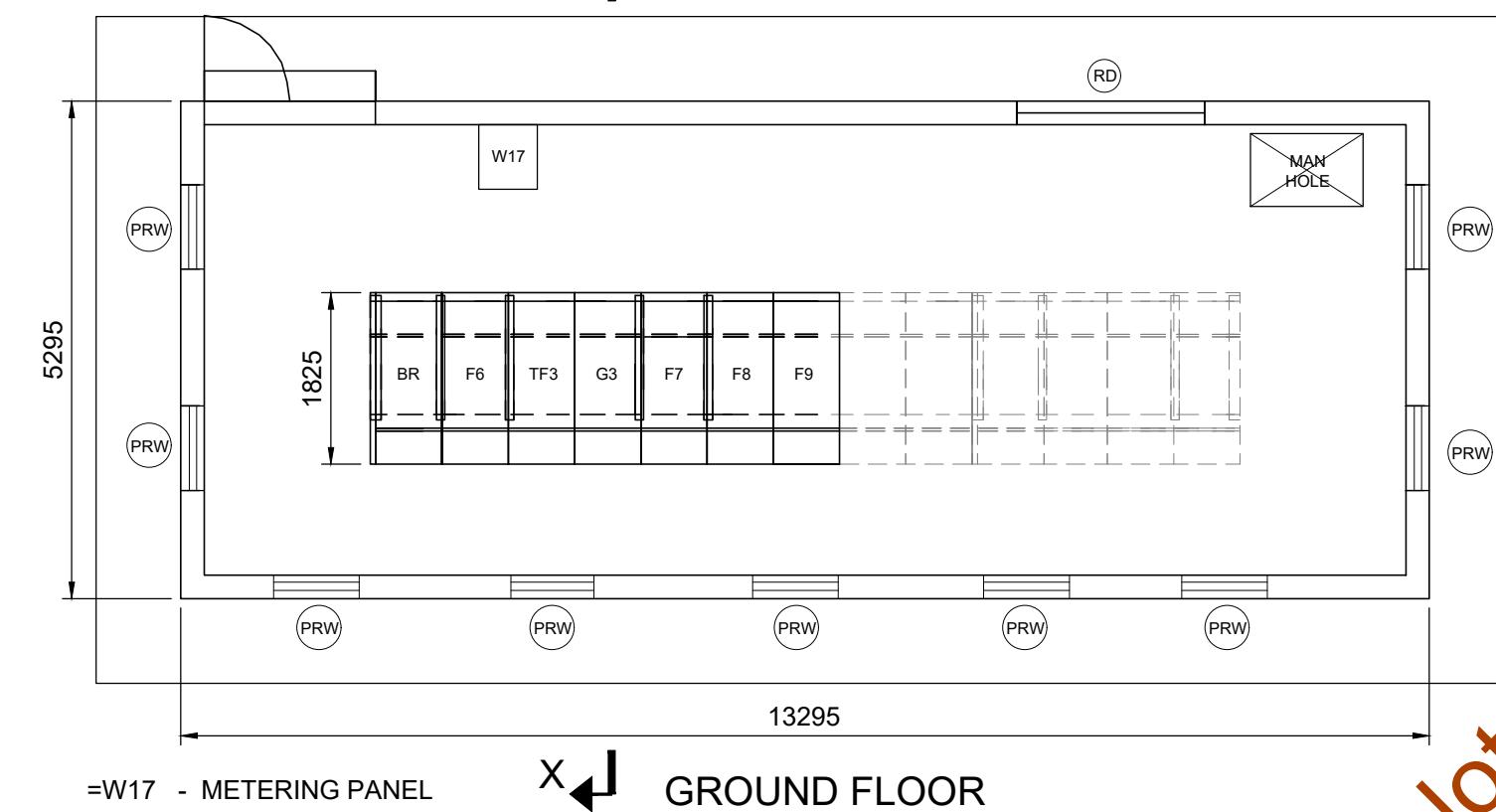


Project Title
**GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
 IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)**
 PACKAGE 8 - LOT B

Funding Agency
 ADB

Drawing Title
 CONTROL BUILDING LAYOUT
 FOR AMBALANGODA CSS

Scale - 1:100		Rev. Date	Signature	Date
Drawn	Ranjana	25.04.2019		
Designed	Bhasura			
Checked				
Approved				
Dwg. No.	TD/CE/1/185/D/60/01			
Released for	Tendering			
	Construction			



Revision Record					
Rev. No.	Date	Description	Drawn	Checked	Approved
12	11	10	9	8	7



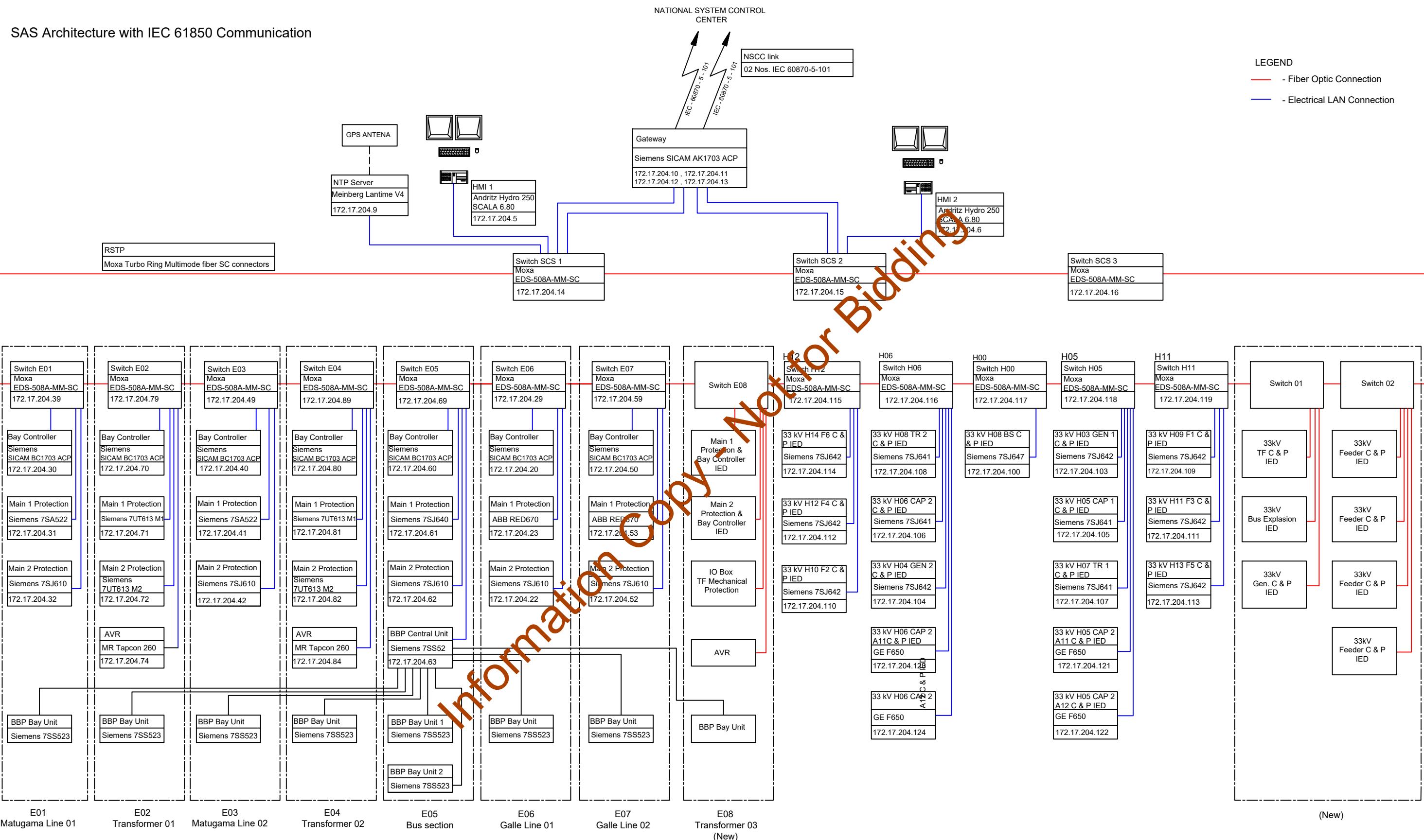
CEYLON ELECTRICITY BOARD
TRANSMISSION DESIGN

Project Title
**GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)**
PACKAGE 8 - LOT B

Funding Agency
ADB
Drawing Title
GIS ROOM LAYOUT FOR
AMBALANGODA GSS

Scale - NTS	Rev. Date	Signature	Date
Size - A3	17.06.2020	Drawn	Ranjana
Sheet	of	Designed	Bhasura
Approved		Checked	05.04.2019
Dwg. No. TD/CE/1/185/D/60/01-A		Released for Tendering	
		Construction	

SAS Architecture with IEC 61850 Communication



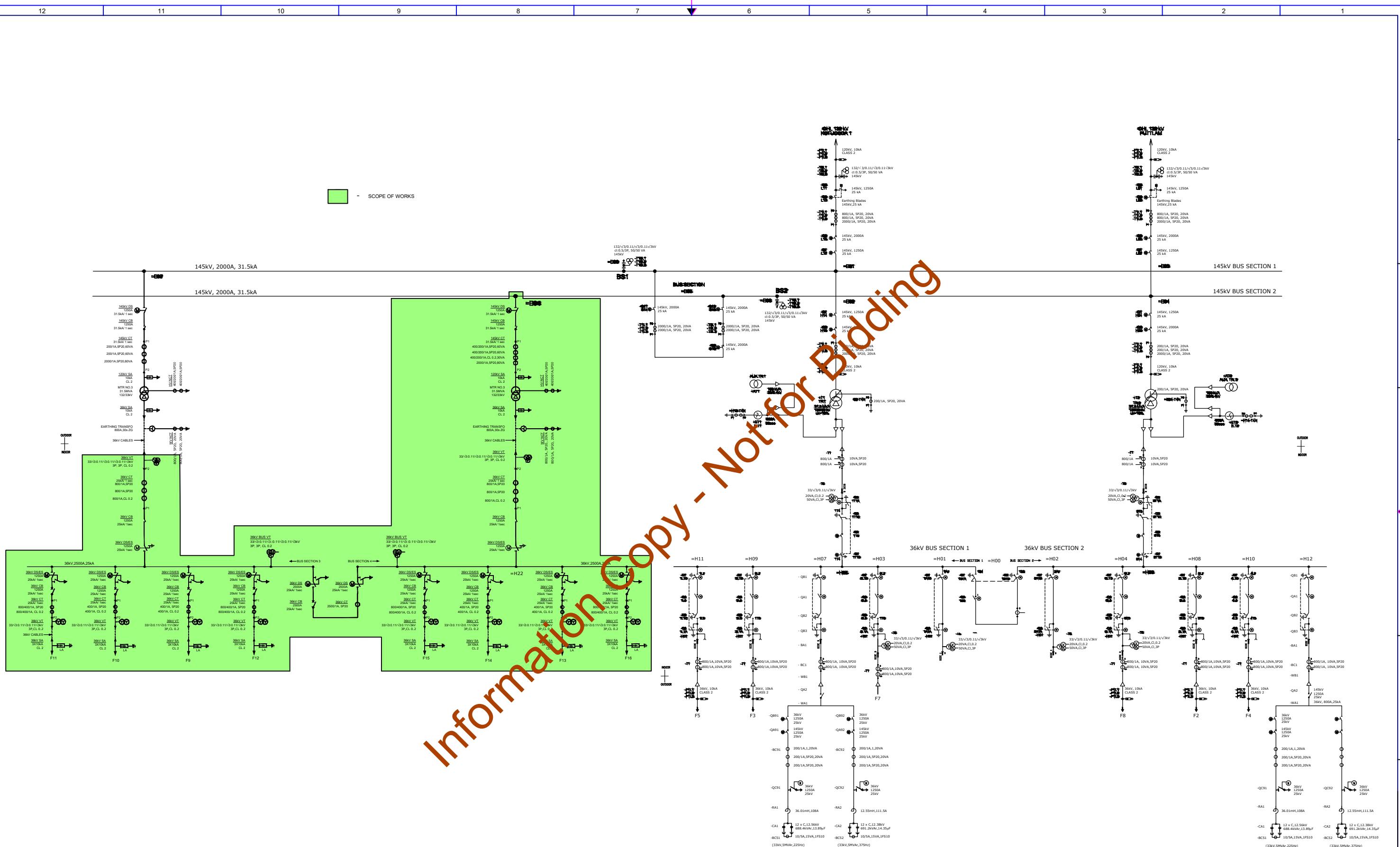
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Project Title
**GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)
PACKAGE 8 - LOT B**

Funding Agency
ADB
Drawing Title
ARCHITECTURE FOR THE SUBSTATION
AUTOMATION SYSTEM FOR AMBALANGODA GSS

Scale -	NTS	Rev. Date	Signature	Date
Size -	A3	18.06.2020	Anusha	01.07.2019
Sheet	of	Rev. 0	Bhasura	
Dwg. No.			Approved	
TD/CE/1/185/D/07/01			Tendering	
Revised for			Construction	



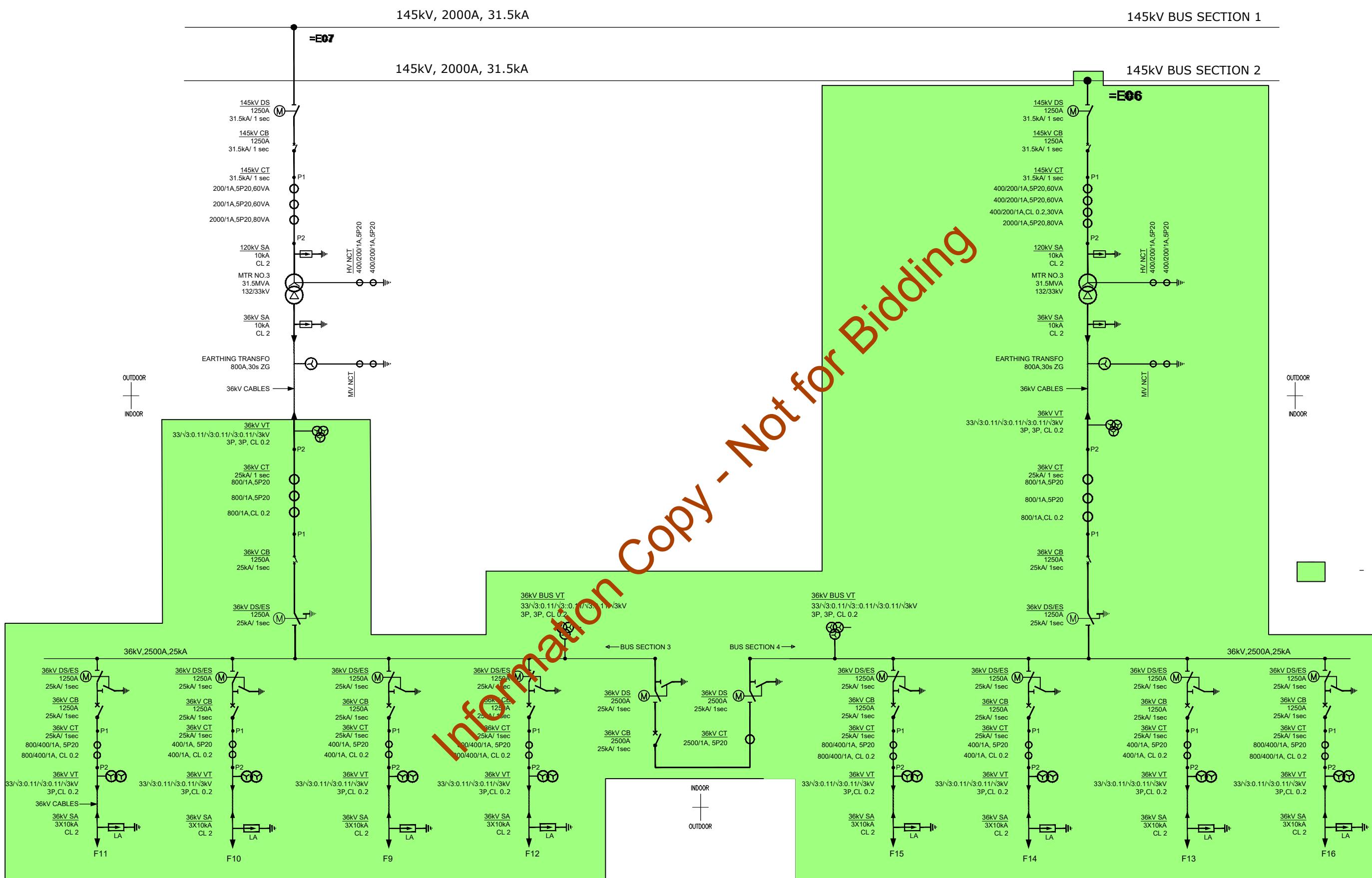
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Project Title
**GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)
PACKAGE 8 - LOT B**

Funding Agency
ADB
Drawing Title
**PROPOSED SINGLE LINE DIAGRAM FOR
PANNALA GSS**

Scale - NTS	Rev. Date	Signature	Date
Drawn	Anusha		19.06.2019
Designed	Bhasura		
Checked			
Approved			
Dwg. No.			
TD/CE/1/185/D/00/02-A			Tendering
DRAFT			Revised for



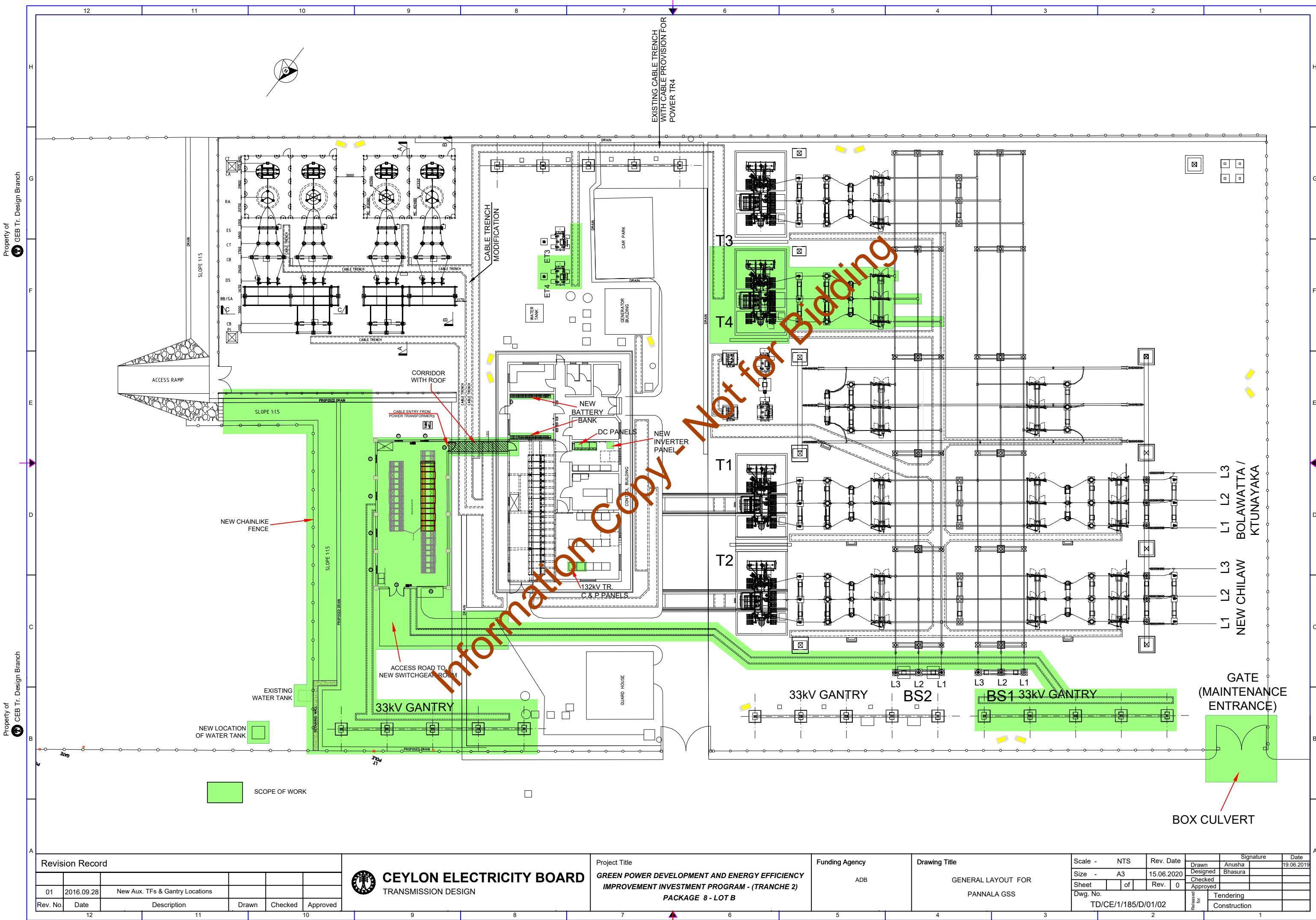
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Rev. No.	Date	Description	Drawn	Checked	Approved
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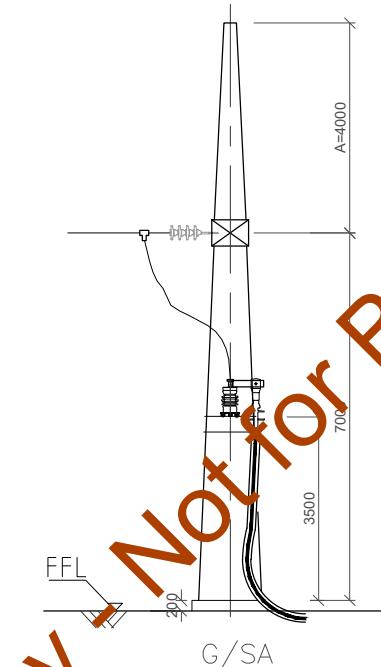
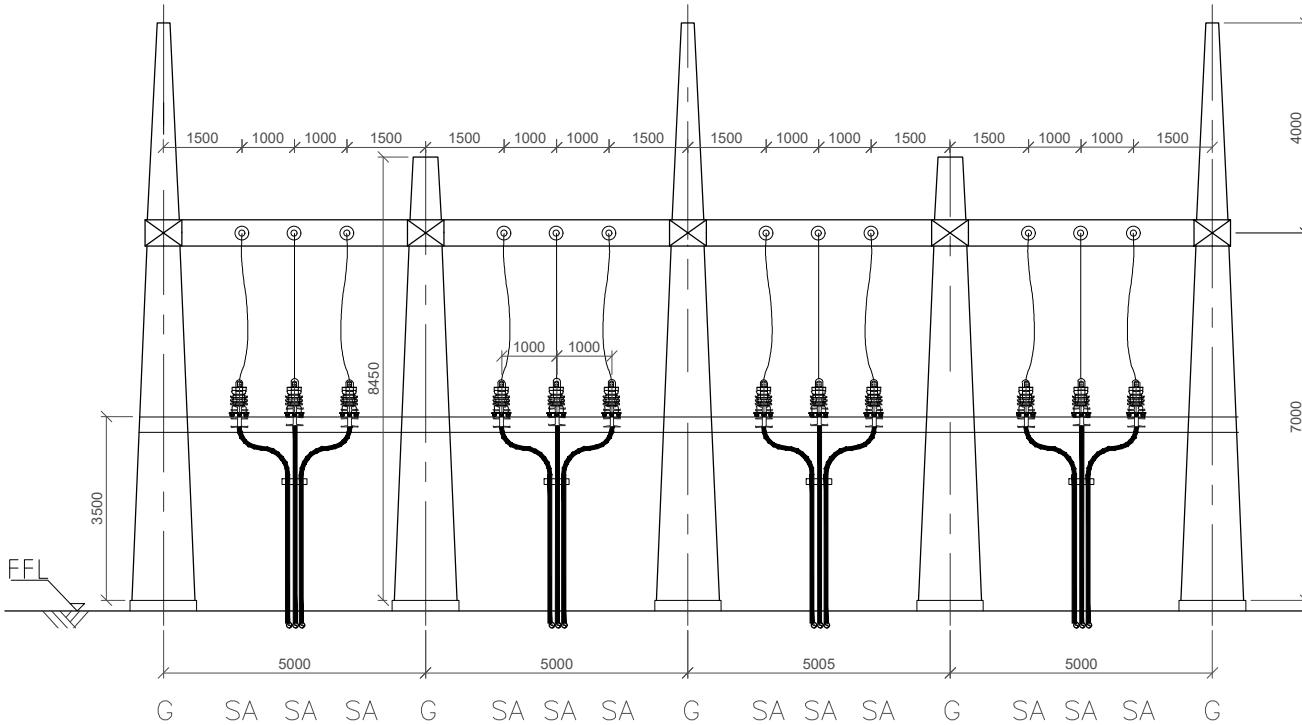


Project Title
**GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
 IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)
 PACKAGE 8 - LOT B**

Funding Agency
ADB
 Drawing Title
**PROPOSED SINGLE LINE DIAGRAM FOR
 PANNALA GSS**

Scale -	NTS	Rev. Date	Signature	Date
Drawn	Anusha	19.06.2019		
Designed	Bhasura			
Checked				
Approved				
Dwg. No.				
TD/CE/1/185/D/00/02				Tendering
Released for	DRAFT			

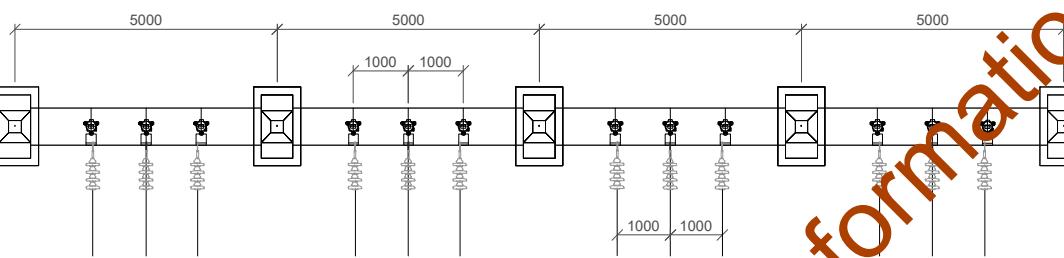




LEGEND	
G	GANTRY
SA	SURGE ARRESTER

SYMBOL	MIN CLEARANCE TO CEB SPEC.	33kV
PC	PHASE TO PHASE	325mm
PE	PHASE TO EARTH	325mm
GC	GROUND CLEARANCE	2300mm
SC	SECTION CLEARANCE	2625mm

NOTE: HEIGHT "A" SHALL BE INCREASED IF REQUIRED BY DSPL CALCULATION



CEYLON ELECTRICITY BOARD
TRANSMISSION DESIGN

Project Title
**GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)**
PACKAGE 8 - LOT B

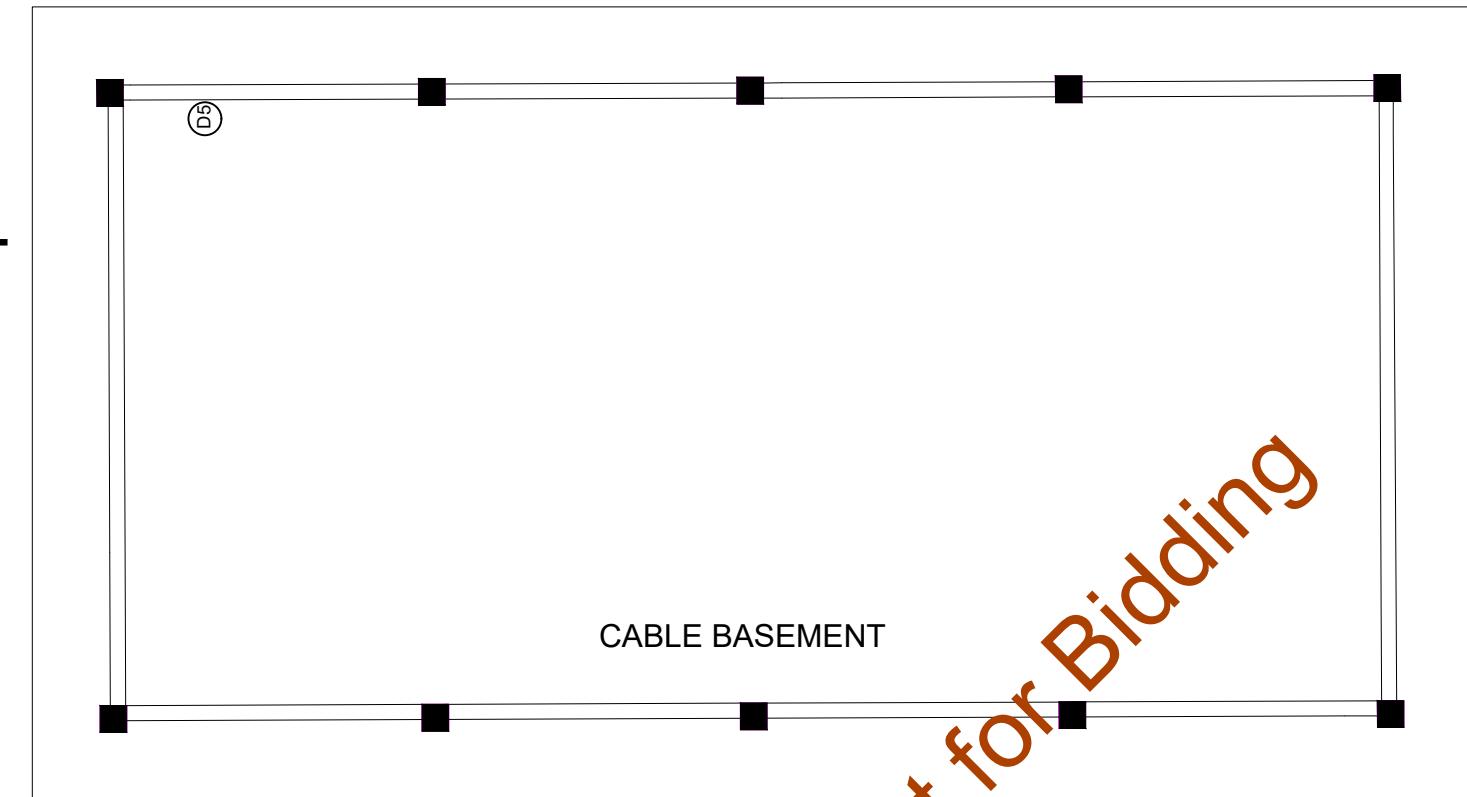
Funding Agency
ADB
Drawing Title
**33kV FEEDER TAKE-OFF STRUCTURE
ARRANGEMENT FOR PANNALA GSS**

Scale - NTS	Rev. Date	Signature	Date
Drawn	Ranjana		25.04.2019
Designed	Bhasura		
Checked			
Approved			
Dwg. No.	TD/CE/1/185/D/01/02-A	Tendering	
Released for		Construction	

Revision Record					
Rev. No.	Date	Description	Drawn	Checked	Approved

X

Y



X

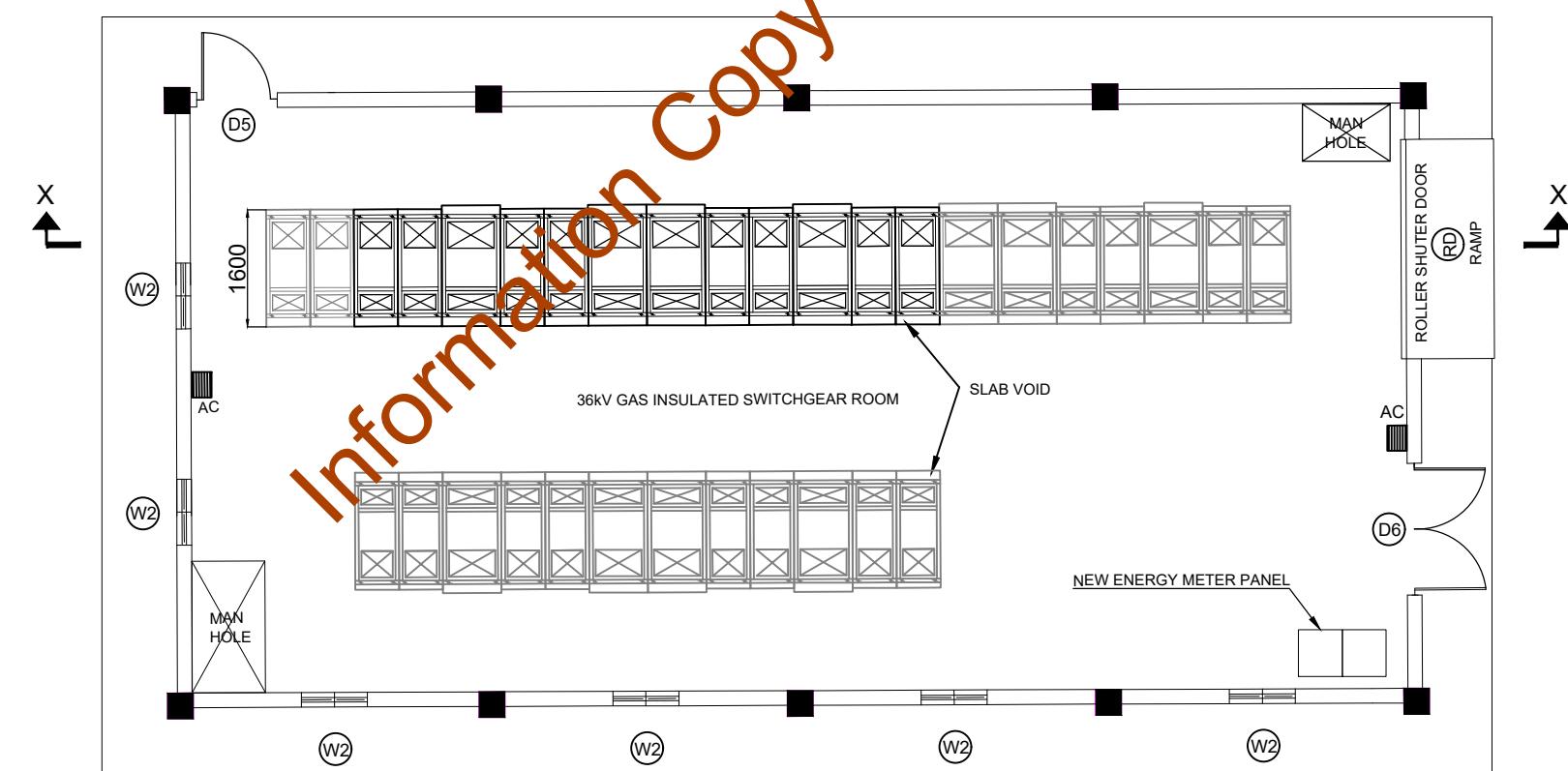
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BASEMENT

X

Y

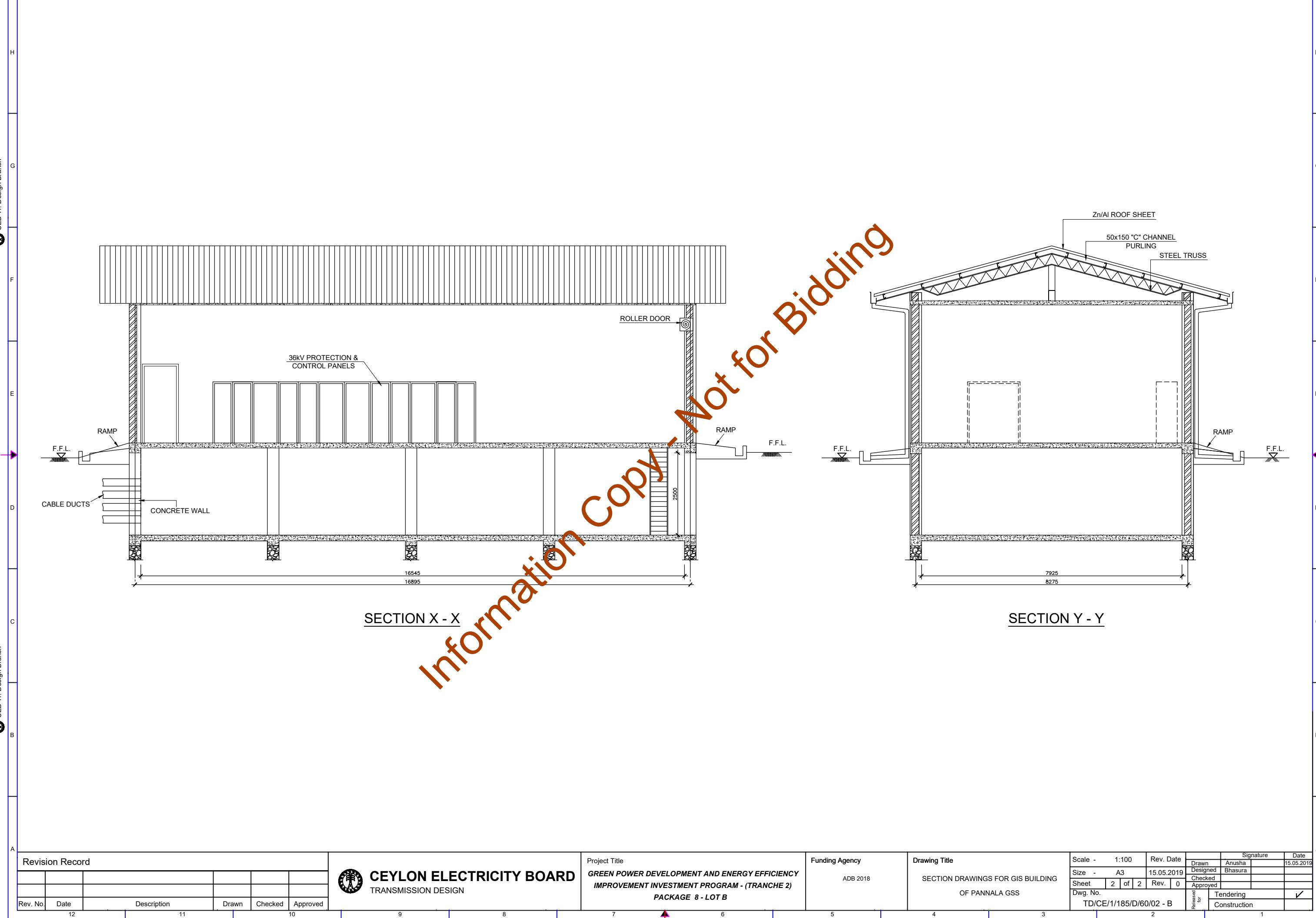
GROUND FLOOR

CEYLON ELECTRICITY BOARD
TRANSMISSION DESIGNProject Title
**GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)
PACKAGE 8 - LOT B**Funding Agency
ADB 2018Drawing Title
PROPOSED LAYOUT & BASEMENT FOR
GIS BUILDING OF PANNALA GSS

Scale - 1:100		Rev. Date	Signature	Date
Drawn	Anusha	15.05.2020		
Designed	Bhasura			
Checked				
Approved				
Dwg. No.				
TD/CE/1/185/D/60/02 - A		Tendering		✓
Released for Construction				

Revision Record					
Rev. No.	Date	Description	Drawn	Checked	Approved
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Information Copy - Not for Bidding



NATIONAL SYSTEM CONTROL CENTER

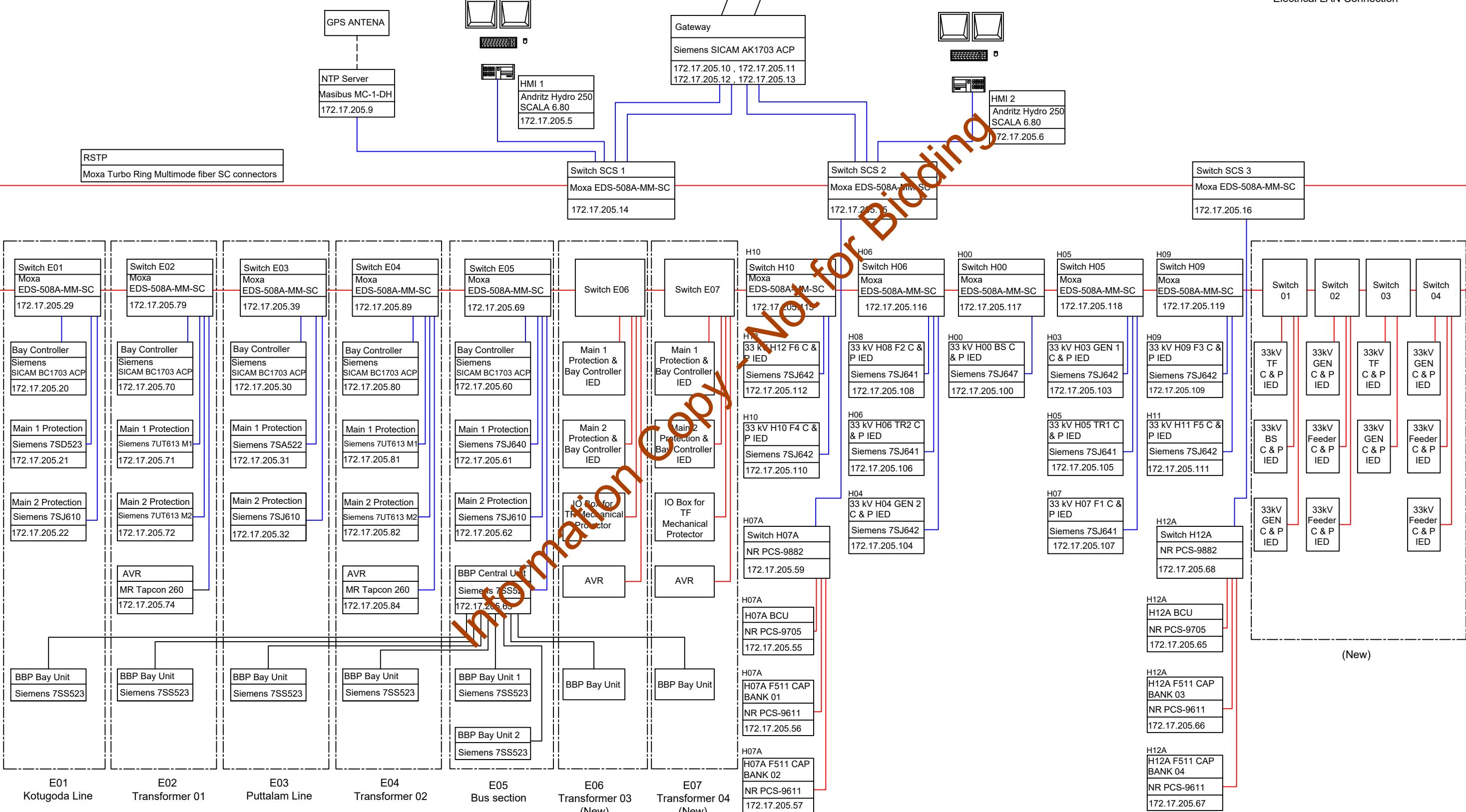
NSCC link
02 Nos. IEC 60870-5-101

SAS Architecture with IEC 61850 Communication

LEGEND

- Fiber Optic Connection
- Electrical LAN Connection

Property of CEB Tr. Design Branch



Revision Record



Project Title
**GREEN POWER DEVELOPMENT AND ENERGY EFFICIENCY
IMPROVEMENT INVESTMENT PROGRAM - (TRANCHE 2)**
PACKAGE 8 - LOT B

Funding Agency
ADB

Drawing Title
ARCHITECTURE FOR THE SUBSTATION
AUTOMATION SYSTEM FOR PANNALA GSS

Scale -		NTS	Rev. Date	Signature	Date
Drawn	Anusha		01.07.2019		
Designed	Bhasura				
Checked					
Approved					
Dwg. No.					
TD/CE/1/185/D/07/02					
Released for					
Tendering					
Construction					
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Rev. No. Date Description Drawn Checked Approved

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