General Bid Bulletin No. 25
31 August 2021

THE MALOLOS-CLARK RAILWAY PROJECT AND THE NORTH-SOUTH RAILWAY PROJECT SOUTH LINE COMMUTER PACKAGE CP NS-01: PROCUREMENT OF ELECTRICAL AND MECHANICAL SYSTEMS AND TRACK WORKS (IFB No: 21-040-3)

TO ALL PROSPECTIVE BIDDERS:

This General Bid Bulletin is issued to amend/clarify certain provisions in the Bidding Documents for the above-mentioned Project. Please refer to the attached Annexes of this General Bid Bulletin for details:

1. **Annex "A"** — Clarification to the Bidding Documents
2. **Annex "B"** — Addendum to the Bidding Documents with "**Attachment 1**"
3. **Annex "C"** — Not Applicable

All other portions of the Bidding Documents not affected by these revisions, amendments and/or clarifications shall remain unchanged.

Revisions/amendments/clarifications made herein shall be conserved as an integral part of the Bidding Documents of this Project.

For your guidance and information.

For the Bids and Awards Committee

SIGNATURE REDACTED

ENGR. JAIME M. NAVARRETE, JR
Chairperson

Annex A

PACKAGE CP NS-01: E&M SYSTEMS AND TRACK WORKS
General Bid Bulletin No. 25
Annex A

Item No.	Volume Section No. Page No. Clause No. / Title Reference Text	Clarification Request	Proposed Revised Text (if any)	Response
1	Vol 2, Section V1. Employer's Requirements, ERT-537 ERT-562, GBB No.12 Item No. 51, 82, 83, 84, No.51: The OCS shall be designed in accordance with Table 6.2.2 Ambient Conditions and Usage Environments. No. 82, 83, 84 With regards to the contents of the TOP that are relevant to the OCS design please refer to revised page ERT 537 which states the wind speeds to be used for the design.	According to GBB No.12, OCS design wind speed is unclear. Item No. 51, the design wind speed is 54 m/s specified in Table 6.2.2. Item No. 82, the design wind speed if 47.3 m/s amended by GBB No.12. Please clarify which value should be applied to the OCS design.		Overhead Line design depends on two wind speeds. Survival wind speed which is stated in Table 6.2.2 and maximum operational wind speed which is stated in Clause 6.1.2.
2	Vol 2, Section V1. Employer's Requirements, ERT-537, 6.1.2 Operations Regulations GBB No.12, GBB No. 12 Annexure B Clause 6.1.2 1) Operation regulations for wind speed: a) Normal train speed for wind	From bidder's experience and the Japanese Railway Operator's Regulation, the operational wind speed seems quite high. The Japanese standard regulation as follows; Less than 20m/s: Normal Operation 20m/s to 25m/s: Restricted Speed Operation More than 25m/s: Operation Stop		We confirm that the overhead line design is based on the figures stated in Clause 6.1.2 and Table 6.2.2. The Employer and future Operator will determine the operation regulations.

PACKAGE CP NS-01: E&M SYSTEMS AND TRACK WORKS
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Annex A

Item No.	Volume Section No. Page No. Clause No. / Title Reference Text	Clarification Request	Proposed Revised Text (if any)	Response
	speed of less or equal to 47.3 m/s. b) Train operation stopped for wind speed of more than 47.3 m/s.	The updated criteria of 47.3m/s wind speed is much higher than the above. Please reconfirm operational wind speed and clarify the train operational regulation in Philippine Railway Standard.		
3	4 CP NS-01 BD Draft Part 2 Vol.2 EM Version 11 FINAL REV A, ERT-537, 6.1.2 Operations Regulations GBB No.12, Table 21.2: E&M systems and Track works RAM Targets The OCS shall be designed based on the Traffic Operations Procedures (TOP) set by the Employer w. hich will be used to determine whether to For Example, on LRT Line 2, the TOP was established in order to operate or not to operate the OCS under different conditions such as typhoon, earthquakes, strong winds, etc. The TOP shall be based on the parameters stated below. The Contractor shall ensure adherence to	Please double check the modification concerning the wind speed for normal operation 47.3m/s = 170km/h. According to our experience by this wind speed, no train operation is possible in general.		The decision on whether to run a service will be made by the operator etc, however the OCS shall be designed to support operation at the stated operational wind speed.

PACKAGE CP NS-01: E&M SYSTEMS AND TRACK WORKS
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Annex A

Item No.	Volume Section No. Page No. Clause No. / Title Reference Text	Clarification Request	Proposed Revised Text (if any)	Response
	the TOP provided by the Employer. 1) OExample of operation regulations for wind speed: a) Normal train speed for wind speed of less or equal to 47.3 m/s72 km/h. b) 30 km/h or less train speed for wind speed between 72 km/h and 108 km/h. bc) Train operation stopped for wind speed of more than 47.3108 km/hm/s			

Annex B

PACKAGE CP NS-01: E&M SYSTEMS AND TRACK WORKS
General Bid Bulletin No. 25
Annex B

ITEM NO.	REFERENCE/CLAUSE/SECTION	REVISIONS / AMENDMENTS
Volume II Part 2 – Employer's Requirements		
1	OCS APPENDIX A-21 GBB 22,Page 45	Revised the OCS-APPENDIX A-21 issued in GBB 22.
2	GBB 22 Annex B Item no.30 Page 186- 191	FTI and Sta. Mesa Transformer Capacity Updated.
3	ERT-580 Clause 6.4.2 e) added.	Page reformatted and item e) details of low headroom added "Between approximate chainages 13+746 to 13+900 on the NSRP the railway passes under the low structures in the vicinity of EDSA Stations where there is non-standard headroom. Within this section, it will be necessary to provide alternative arrangements to the specified conventional overhead catenary systems such as an overhead conductor rail system or reduced system height equipment. The use of such alternatives systems shall not impact the current collection by pantographs passing at the maximum design speed for this area."
4	ERT 379 and 429/430 Clause 4.4.2 (2)	Additional text added to rectifier requirements "The contractor can propose other solutions including the increase of the lower transition load percentages subject to the contractor demonstrating there is no detriment to train and system performance."
5	ERT 562. Clause 6.2.3 5)	'Walkway' changed to "upper level maintenance decks". Scope for interlocking doors expanded to cover Light Repair Shops in Mabalacat and Banlic Depots
6	ERT-231: 2) AFC Systems	Deleted: "Power Cable" and "Access point shall be installed in the customer service room, AFC rooms, the waiting room, and on the platform for the ticket counter terminals and the mobile terminals"

<table>
<tr><td></td><td></td><td>Adjusted Statement:” The Contractor shall install either L2 or L3 switches for distances of more than 90 meters between the AFC equipment to the Network’s Point of Connection.”</td></tr>
<tr><td>7</td><td>ERT-246: Interface with AFC Systems</td><td>Adjusted Statement:” For distances of more than 90 meters between the AFC equipment to the Network’s Point of Connection, a switch will be provided which is necessary to facilitate the Backbone Network connection.”

Deleted Phrase: “AFC room, Ticket sales counter, Waiting room, Platform, etc”</td></tr>
<tr><td>8</td><td>ERT-249:Table 3.11.4-NS-01 and MMSP Telecommunication Interface</td><td>a) Time Server and Master Clock System:

Added Statement: “MMSP’s Master clock system to be installed at FTI & Bicutan stations for respective MMSP rail systems utilization.

<table>
<tr><td>Time Server and Master Clock System</td><td>All clocks will be supplied, installed, test and commissioned by NS01, excluding the clocks that will be supplied by CP106 in FTI -MMSP Platform.</td><td>Bicutan and FTI</td><td>CP106</td><td>To supply, install, test and commission all clocks in FTI’s MMSP Platform.

MMSP’s Master clock system to be installed at FTI & Bicutan stations for respective MMSP rail systems utilization.</td></tr>
</table>

b) GSM-R Infrastructure at MMSP Test Track at Valenzuela Depot:
Adjusted Statement:
<table>
<tr><td>GSM-R Infrastruct</td><td>Shall design, install, test, and commission the GSM-</td><td>Valenzuela Depot</td><td>CP106</td><td>CP106: To provide Backbone Facilities for</td></tr>
</table>
</td></tr>
</table>

		ure at MMSP Test Track at Valenzuela Depot	R System/ Infrastructure at MMSP's Valenzuela Depot. Shall identify and supply the testing and diagnostic equipment for the GSM-R Radio Systems			the GSM-R Infrastructure to be connected from Valenzuela Depot Test Track to the Backbone Switch at Bicutan (MMSP's CER).

Deleted Statement: "CIVIL: To provide space and power for the GSM-R Infrastructure"

c) TETRA Infrastructure for Testing at Banlic Depot.

Added Entry:

TETRA Infrastructure for Testing at Banlic Depot.	NS-01- To provide Backbone Facilities for the TETRA Radio Infrastructure to be connected from Banlic Depot to the Backbone Switch at Bicutan (NS-01's CER). CIVIL (S-07)- To provide space and power for the	Banlic Depot / Bicutan Station	CP106	Shall design, install, test, and commission the TETRA Infrastructure at NSCR's Banlic Depot. Shall identify and supply the testing and diagnostic equipment for the TETRA Systems

<table>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td>TETRA Infrastructure at Banlic Depot.</td><td></td><td></td><td></td></tr>
</table>

d) Adjusted Statement:
<table>
<tr><td>GSM-R on-board equipment</td><td>NS-01 shall supply, test, and commission the onboard equipment on MMSP trains.

NS01 and CP107 shall coordinate and agree on the size, space, and location.</td><td>N/A</td><td>CP107</td><td>CP107 shall install the on-board equipment.

CP107 and NS01 shall coordinate and agree on the size, space, and location.</td></tr>
</table>
</td></tr>
<tr><td>9</td><td>ERT-349: 1) Wind speed measuring equipment (Anemometer)</td><td>Adjusted Entry:
“Installation locations:
Stations: Clark, Angeles, San Fernando, Apalit, Buendia, Alabang, and Santa Rosa.”</td></tr>
<tr><td>10</td><td>ERT-349: 2) Rainfall measuring equipment (Rain gauge)</td><td>Adjusted Entry:
“Installation locations
Stations: Clark, San Fernando, and Bicutan.
Depot: Banlic”</td></tr>
<tr><td>11</td><td>ERT-349: Earthquake measuring equipment (Seismograph)</td><td>Adjusted Entry:
“Installation locations
Station: San Fernando, Bicutan, Sucat, and Alabang.
Depot: Banlic”</td></tr>
</table>

12	ERT-226: 3.5. General Design Requirements.	Added Statement: “Compliance to all Telecommunications related requirements of NFPA.”
13	Part 2 Section VI Technical Requirements - AFC ERT 627	Added section 7.6.2 Submission of Samples and Prototypes
14	Chapter 9, Clause 9.2.1.1.2 Page ERT 1008	Revised clause 9.2.1.1.2 as below. 9.2.1.1.2 Driver Console and On-board Equipment Simulator The driver`s console panel and equipment shall follow the actual driver console panel including the on-board equipment. The reaction of moving the handles shall simulate the same effect using the visual image generator, sound generator, body sensitive seat, signal monitor, meters and lamps compared to the real driving environment. Door opening and closing features and operation shall be simulated to reflect the actual equipment used on the train. Interfaces with Rolling stock contractors of CP NS-02 and CP NS-03 shall be carried out for train cab equipment details and views.
Volume III Part 2 – Employer’s Requirements d) Employer’s Drawings		
15	Volume III Part 2- Employers Requirement Drawings (a)	Drawing NSCR-GCR-NS01-ZWE-DWG-DS-000002 Rev.01 issued in GBB 16 is change to drawing; “NSCR-GCR-NS01-ZWE-DWG-DS-000002 Rev.02”
16	Part 2 Vol.3 ERD (a) page 246, MCRP-DWG-DEP-PDS-0015	Drawings Added: Training Centre Electrical Building- Equipment and Generator Foundation & Layout MCRP-DWG-TRC-AR-3106 MCRP-DWG-TRC-AR-3107 MCRP-DWG-TRC-ST-4401 MCRP-DWG-TRC-ST-4403 MCRP-DWG-TRC-ST-4411
17	GBB15 Annex B Item no.11 Page 41, MCRP-DWG-PDS-0004	Transformer sizes revised.

18	Part 2 Vol.3 ERD (a) page 236, MCRP-DWG-CIA-PDS-0005	Transformer sizes revised.
19	Part 2 Vol.3 ERD (a) page 237, MCRP-DWG-CIA-PDS-0006	Transformer sizes revised.
20	Part 2 Vol.3 ERD (a) page 241- MCRP-DWG-DEP-PDS-0010	Transformer sizes revised.
21	Part 2 Vol.3 ERD (a) page 242, MCRP-DWG-DEP-PDS-0011	Transformer sizes revised.
22	Part 2 Vol.3 ERD (a) page 243, MCRP-DWG-DEP-PDS-0012	Transformer sizes revised.
23	Part 2 Vol.3 ERD (a) page 244, MCRP-DWG-DEP-PDS-0013	Generator room layout revised and transformer sizes updated.
24	Part 2 Vol.3 ERD (a) page 245, MCRP-DWG-DEP-PDS-0014	Transformer size updated
25	Part 2 Vol.3 ERD (a) page 246, MCRP-DWG-DEP-PDS-0015	Transformer size updated

26	GBB 12 Annex B Item no.59 Page 215, NSRP-DWG-PDS-0006	Transformer sizes revised.
27	GBB 12 Annex B Item no.59 Page 216, NSRP-DWG-BLU-PDS-0007	Transformer sizes revised.
28	GBB 12 Annex B Item no.59 Page 217, NSRP-DWG-FTI-PDS-0008	Transformer size revised.
29	GBB 12 Annex B Item no.59 Page 218, NSRP-DWG-BIC-PDS-0009	Transformer sizes revised.
30	GBB 12 Annex B Item no.59 Page 219, NSRP-DWG-SUC-PDS-0010	Transformer size revised.
31	GBB 12 Annex B Item no.59 Page 224, NSRP-DWG-DEP-PDS-0015	Transformer sizes revised.
32	GBB 12 Annex B Item no.59 Page 225, NSRP-DWG-DEP-PDS-0016	Transformer sizes revised.
33	GBB 12 Annex B Item no.59 Page 226, NSRP-DWG-DEP-PDS-0017	Transformer sizes revised.

34	GBB 12 Annex B Item no.59 Page 227, NSRP-DWG-DEP-PDS-0018	Transformer sizes revised.

Annex B – Attachment 1

Contract	Segment Reference	Segment Start Chainage	Segment End Chainage	Segment Width (mm)	Span Length (m)	Provision Right Track Facing CIA	Provision Left Track Facing CIA	Notes
N-01	P-281/15	45+914.975	45+917.475	2500	40.000	Blockout "A"	Blockout "A"	
N-01	P-281/16	45+917.475	45+919.950	2475	40.000	Mast	Mast	
N-01	P-281/16	45+917.475	45+919.950	2475	40.000	Blockout "G"	Blockout "G"	
N-01	P-282/1	45+920.000	45+922.475	2475	40.000	Mast	Mast	
N-01	P-282/1	45+920.000	45+922.475	2475	40.000	Blockout "H"	Blockout "H"	
N-01	P-282/2	45+922.475	45+924.975	2500	40.000	Blockout "B"	Blockout "B"	
N-01	P-282/3	45+924.975	45+927.475	2500	40.000	Blockout "F"	Blockout "F"	
N-01	P-282/15	45+954.975	45+957.475	2500	40.000	Blockout "A"	Blockout "A"	
N-01	P-282/16	45+957.475	45+959.950	2475	40.000	Mast	Mast	
N-01	P-283/1	45+960.000	45+962.475	2475	40.000	Blockout "B"	Blockout "B"	
N-01	P-284/1	46+000.000	46+002.475	2475	40.000	Mast	Mast	
N-01	P-284/7	46+014.975	46+017.475	2500	40.000	Backstay	Backstay	
N-01	P-285/1	46+040.000	46+042.475	2475	40.000	Mast	Mast	
N-01	P-286/1	46+080.000	46+082.475	2475	40.000	Mast	Mast	
N-01	P-286/10	46+102.475	46+104.975	2500	40.000	Backstay	Backstay	
N-01	P-286/16	46+117.475	46+119.950	2475	40.000	Mast	Mast	
N-01	P-287/6	46+132.475	46+134.975	2500	35.000	Backstay	Backstay	
N-01	P-287/13	46+149.975	46+152.475	2500	35.000	Mast	Mast	
N-01	P-289/1	46+185.000	46+187.475	2475	35.000	Mast	Mast	
N-01	P-289/11	46+209.975	46+212.475	2500	35.000	Blockout "A"	Blockout "A"	
N-01	P-289/12	46+212.475	46+214.975	2500	35.000	Blockout "A"	Blockout "A"	
N-01	P-289/13	46+214.975	46+217.450	2475	35.000	Mast	Mast	

Contract	Segment Reference	Segment Start Chainage	Segment End Chainage	Segment Width (mm)	Span Length (m)	Provision Right Track Facing CIA	Provision Left Track Facing CIA	Notes
N-01	P-281/15	45+914.975	45+917.475	2500	40.000	Blockout "A"	Blockout "A"	
N-01	P-281/16	45+917.475	45+919.950	2475	40.000	Mast	Mast	
N-01	P-281/16	45+917.475	45+919.950	2475	40.000	Blockout "G"	Blockout "G"	
N-01	P-282/1	45+920.000	45+922.475	2475	40.000	Mast	Mast	
N-01	P-282/1	45+920.000	45+922.475	2475	40.000	Blockout "H"	Blockout "H"	
N-01	P-282/2	45+922.475	45+924.975	2500	40.000	Blockout "B"	Blockout "B"	
N-01	P-282/3	45+924.975	45+927.475	2500	40.000	Blockout "F"	Blockout "F"	
N-01	P-282/15	45+954.975	45+957.475	2500	40.000	Blockout "A"	Blockout "A"	
N-01	P-282/16	45+957.475	45+959.950	2475	40.000	Mast	Mast	
N-01	P-283/1	45+960.000	45+962.475	2475	40.000	Blockout "B"	Blockout "B"	
N-01	P-284/1	46+000.000	46+002.475	2475	40.000	Mast	Mast	
N-01	P-284/7	46+014.975	46+017.475	2500	40.000	Backstay	Backstay	
N-01	P-285/1	46+040.000	46+042.475	2475	40.000	Mast	Mast	
N-01	P-286/1	46+080.000	46+082.475	2475	40.000	Mast	Mast	
N-01	P-286/10	46+102.475	46+104.975	2500	40.000	Backstay	Backstay	
N-01	P-286/16	46+117.475	46+119.950	2475	40.000	Mast	Mast	
~~N-01~~	~~P-287/16~~	~~46+132.475~~	~~46+139.975~~	~~2500~~	~~40.000~~	~~Backstay~~	~~Backstay~~	
~~N-01~~	~~P-287/14~~	~~46+152.475~~	~~46+154.950~~	~~2475~~	~~40.000~~	~~Mast~~	~~Mast~~	
~~N-01~~	~~P-288/4~~	~~46+162.475~~	~~46+164.975~~	~~2500~~	~~40.000~~	~~Mast~~	~~Mast~~	
N-01	P-287/6	46+132.475	46+134.975	2500	35.000	Backstay	Backstay	
N-01	P-287/13	46+149.975	46+152.475	2500	35.000	Mast	Mast	
N-01	P-289/1	46+185.000	46+187.475	2475	35.000	Mast	Mast	
N-01	P-289/11	46+209.975	46+212.475	2500	35.000	Blockout "A"	Blockout "A"	

Station Name	Station Transformer, Signaling & Telecommunication Transformer (kVA)	Q'ty	Total Power (kVA)	Remarks
	100	1		For Signaling System and Telecommunications
BLUMENTRITT	2000	1	2950	For Station Load
	750	1		For Tenant
	200	1		For Signaling System and Telecommunications
ESPANA	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
SANTA MESA	1500	1	2050	For Station Load
	350	1		For Tenant
	200	1		For Signaling System and Telecommunications
PACO	1000	1	1200	For Station Load
	200	1		For Signaling System and Telecommunications
BUENDIA	1,500	1	3200	For Station Load
	1,500	1		For Tenant
	200	1		For Signaling System and Telecommunications
EDSA	1000	1	1200	For Station Load
	200	1		For Signaling System and Telecommunications
NICHOLS	1000	1	1200	For Station Load

Station Name	Station Transformer, Signaling & Telecommunication Transformer (kVA)	Q'ty	Total Power (kVA)	Remarks
	200	1		For Signaling System and Telecommunications
FTI	2000	1	2200	For Station Load
	200	1		For Signaling System and Telecommunications
BICUTAN	1500	1	2450	For Station Load
	750	1		For Tenant
	200	1		For Signaling System and Telecommunications
SUCAT	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
ALABANG	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
MUNTINLUPA	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
SAN PEDRO	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
PACITA	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications

Station Name	Station Transformer, Signaling & Telecommunication Transformer (kVA)	Q'ty	Total Power (kVA)	Remarks
BINAN	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
SANTA ROSA	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
CABUYAO	1500	1	2200	For Station Load
	500	1		For Tenant
	200	1		For Signaling System and Telecommunications
BANLIC	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
CALAMBA	1500	1	2200	For Station Load
	500	1		For Tenant
	200	1		For Signaling System and Telecommunications
Banlic Depot	3000	2	3000 x2	For OCC Building
	1000	1	1000	For Light Repair Shop
	1,000	1	1,000	For DB

Note:

1. The represented capacity shown above is for reference only. The final rated capacity shall be determined by the Contractor as part of its design of works.
2. The Contractor shall coordinate with other Interface Contractors and other subsystem to obtain the power consumption requirements necessary for the identification of the equipment capacity with design calculation.

Station Name	Station Transformer, Signaling & Telecommunication Transformer (kVA)	Q'ty	Total Power (kVA)	Remarks
	100	1		For Signaling System and Telecommunications
BLUMENTRITT	2000	1	2950	For Station Load
	750	1		For Tenant
	200	1		For Signaling System and Telecommunications
ESPANA	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
SANTA MESA	1500	1	2050~~1750~~	For Station Load
	350	1		For Tenant
	200	1		For Signaling System and Telecommunications
PACO	1000	1	1200	For Station Load
	200	1		For Signaling System and Telecommunications
BUENDIA	1,500	1	3200	For Station Load
	1,500	1		For Tenant
	200	1		For Signaling System and Telecommunications
EDSA	1000	1	1200	For Station Load
	200	1		For Signaling System and Telecommunications
NICHOLS	1000	1	1200	For Station Load

Station Name	Station Transformer, Signaling & Telecommunication Transformer (kVA)	Q'ty	Total Power (kVA)	Remarks
	200	1		For Signaling System and Telecommunications
FTI	2000~~200~~	1	2200~~400~~	For Station Load
	200	1		For Signaling System and Telecommunications
BICUTAN	1500	1	2450	For Station Load
	750	1		For Tenant
	200	1		For Signaling System and Telecommunications
SUCAT	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
ALABANG	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
MUNTINLUPA	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
SAN PEDRO	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
PACITA	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications

Station Name	Station Transformer, Signaling & Telecommunication Transformer (kVA)	Q'ty	Total Power (kVA)	Remarks
BINAN	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
SANTA ROSA	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
CABUYAO	1500	1	2200	For Station Load
	500	1		For Tenant
	200	1		For Signaling System and Telecommunications
BANLIC	1500	1	1700	For Station Load
	200	1		For Signaling System and Telecommunications
CALAMBA	1500	1	2200	For Station Load
	500	1		For Tenant
	200	1		For Signaling System and Telecommunications
Banlic Depot	3000	2	3000 x2	For OCC Building
	1000	1	1000	For Light Repair Shop
	1,000	1	1,000	For DB

Note:

1. The represented capacity shown above is for reference only. The final rated capacity shall be determined by the Contractor as part of its design of works.
2. The Contractor shall coordinate with other Interface Contractors and other subsystem to obtain the power consumption requirements necessary for the identification of the equipment capacity with design calculation.

4) Turnout / Crossover Locations: One additional OCS pole erected at the middle of the viaduct span;
5) Horizontal Curve Sections: For a radius 650m or less an additional pole shall be erected at the middle of the viaduct span;
6) Gradient Changing Sections: Shorter pole spans to ensure the contact wire adapts to the change in gradient with standard of 3 ‰ to a maximum of 5 ‰ in the contact wire;
7) Station Locations: Nearest pole to the station no more than 20m from the station edge.
8) The following viaduct operation loads are taken as permanent loads in the design of the viaduct:

For the MCRP the mast, blockout and backstay locations have been identified by the Engineer and are detailed in Appendix A of this section. Should additional or revised mast, blockout or backstay locations be required the cost for which shall be borne by the NS-01 Contractor.

e) Key Design Constraints

1) Between chainages 16km+860m to 17km+200m on the NSRP the railway passes under the flight path for Ninoy Aquino International Airport. Within the section the maximum height of any overline equipment, including the overhead ground wire or alternative lightning protection solution, shall not exceed EGM 25.63m which is approximately 6m above rail. During construction no equipment shall exceed EGM2008 28.00m.

2) In the CP-S-03a and CP-S-03b contract areas between Chainages 13+566 to 13+870, 15+589 to 16+046 and 16+564 to 18+347 due to clearance restrictions the use of conventical straight circular hollow sectioned masts cannot be adopted and instead cranked masts shall be used which will ensure that all overhead line equipment and supports remains outside of the structure gauge.

3) Between approximate chainages 13+746 to 13+900 on the NSRP the railway passes under the low structures in the vicinity of EDSA Stations where there is non-standard headroom. Within this section, it will be necessary to provide alternative arrangements to the specified conventional overhead catenary systems such as an overhead conductor rail system or reduced system height equipment. The use of such alternatives systems shall not impact the current collection by pantographs passing at the maximum design speed for this area.

4) Turnout / Crossover Locations: One additional OCS pole erected at the middle of the viaduct span;
5) Horizontal Curve Sections: For a radius 650m or less an additional pole shall be erected at the middle of the viaduct span;
6) Gradient Changing Sections: Shorter pole spans to ensure the contact wire adapts to the change in gradient with standard of 3 ‰ to a maximum of 5 ‰ in the contact wire;
7) Station Locations: Nearest pole to the station no more than 20m from the station edge.
8) The following viaduct operation loads are taken as permanent loads in the design of the viaduct:

For the MCRP the mast, blockout and backstay locations have been identified by the Engineer and are detailed in Appendix A of this section. Should additional or revised mast, blockout or backstay locations be required the cost for which shall be borne by the NS-01 Contractor.

e) Key Design Constraints

1) Between chainages 16km+860m to 17km+200m on the NSRP the railway passes under the flight path for Ninoy Aquino International Airport. Within the section the maximum height of any overline equipment, including the overhead ground wire or alternative lightning protection solution, shall not exceed EGM 25.63m which is approximately 6m above rail. During construction no equipment shall exceed EGM2008 28.00m.

2) In the CP-S-03a and CP-S-03b contract areas between Chainages 13+566 to 13+870, 15+589 to 16+046 and 16+564 to 18+347 due to clearance restrictions the use of conventical straight circular hollow sectioned masts cannot be adopted and instead cranked masts shall be used which will ensure that all overhead line equipment and supports remains outside of the structure gauge.

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requirement or equivalent.

1) Design and installation shall be in accordance with relevant standards and regulations.
2) Class and rating shall be suitable for metering, monitoring and protection requirements.

(5) Voltage transformers

Design and supply of voltage transformers for AC and DC shall meet the following requirement or equivalent.

1) Design and installation shall be in accordance with relevant standards and regulations.
2) Class and rating shall be suitable for metering, monitoring and protection requirements.

4.4.2 Rectifiers and Rectifier Transformers

(1) General

1) Each rectifier transformer and rectifier set combination shall incorporate full load overall efficiency of not less than 98% and power factor of not less than 95% lagging.
2) Each rectifier transformer and rectifier set combination shall provide linear inherent DC voltage regulation of not less than 6% of the full load voltage, from light transition load (approximately 1%) to 100% full load and shall be as linear as technically feasible up to the 300% full load current. The inherent voltage regulation at 300% full load shall ensure that the voltage at the rectifier load terminals shall not be less than 1150V DC.

   The contractor can propose other solutions including the increase of the lower transition load percentages subject to the contractor demonstrating there is no detriment to train and system performance.
3) The output DC voltage for each rectifier transformer and rectifier set combination, at light transition load, shall not exceed 1590V DC.
4) The DC traction supply system shall be designed to provide a voltage that is self-limiting to 1650V DC at no load.
5) Each rectifier transformer and rectifier set combination shall be designed in accordance with Engineer's requirements and to satisfy the requirements of this Performance Specification and following:
   a. 100% Continuous
   b. 130% to 150% overload – 120 minutes
   c. 300% overload – 1 minute.

(2) Rectifier Transformers

1) 69kV/1.18kV Rectifier transformers shall comply with relevant standards and regulations. Rectifier transformers shall be rated to supply the full DC traction system load within the continuous rating, with any one rectifier transformer out of service.
2) The overload ratings of rectifier transformers shall be utilized to accommodate any abnormal loading in the event of train bunching or due to any abnormal DC traction feeding arrangements.
3) Rectifier transformers shall be designed in accordance with relevant standards and regulations and shall incorporate an earthed metal screen between high voltage and low voltage windings, if necessary.

modes.

10) In the event of OCS contact feeder protection failure, all the circuit breakers for feeding the same track and the same section shall trip automatically with Tele-command breaking devices.

11) In the event of OCS contact feeder protection failure, all the circuit breakers for feeding the same track, the adjacent section of failure section, all the circuit breakers for feeding another track shall be opened automatically.

12) OCC Operator is able to open the necessary circuit breaker manually in case the command was send from stations, trains and others.

(4) Current transformers

Design and supply of current transformers for AC and DC shall meet the following requirement or equivalent.

1) Design and installation shall be in accordance with relevant standards and regulations.

2) Class and rating shall be suitable for metering, monitoring and protection requirements.

(5) Voltage transformers

Design and supply of voltage transformers for AC and DC shall meet the following requirement or equivalent.

1) Design and installation shall be in accordance with relevant standards and regulations.

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2) Each rectifier transformer and rectifier set combination shall provide linear inherent DC voltage regulation of not less than 6% of the full load voltage, from light transition load (approximately 1%) to 100% full load and shall be as linear as technically feasible up to the 300% full load current. The inherent voltage regulation at 300% full load shall ensure that the voltage at the rectifier load terminals shall not be less than 1150V DC.

The contractor can propose other solutions including the increase of the lower transition load percentages subject to the contractor demonstrating there is no detriment to train and system performance.

3) The output DC voltage for each rectifier transformer and rectifier set combination, at light transition load, shall not exceed 1590V DC.

4) The DC traction supply system shall be designed to provide a voltage that is self-limiting to 1650V DC at no load.

5) Each rectifier transformer and rectifier set combination shall be designed in accordance with Engineer's requirements and to satisfy the requirements of this Performance Specification and following:

a. 100% Continuous

b. 130% to 150% overload – 120 minutes

feeding the same track and the same section shall trip automatically with Tele-command breaking devices.

11) In the event of OCS contact feeder protection failure, all the circuit breakers for feeding the same track, the adjacent section of failure section, all the circuit breakers for feeding another track shall be opened automatically.

12) OCC Operator is able to open the necessary circuit breaker manually in case the command was send from stations, trains and others.

13) In case the command was sent from the train at one side of the station, the OCC Operator should open the necessary circuit breaker manually.

(4) Current transformers

Design and supply of current transformers for AC and DC shall meet the following requirement or equivalent.

1) Design and installation shall be in accordance with relevant standards and regulations.

2) Class and rating shall be suitable for metering, monitoring and protection requirements.

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~~2)~~ The contractor can propose other solutions including the increase of the lower transition load percentages subject to the contractor demonstrating there is no detriment to train and system performance.

3) The output DC voltage for each rectifier transformer and rectifier set combination, at light transition load, shall not exceed 1-590V DC.

4) The DC traction supply system shall be designed to provide a voltage that is self-limiting to 1-650V DC at no load.

5) Each rectifier transformer and rectifier set combination shall be designed in accordance with Engineer's requirements and to satisfy the requirements of this Performance Specification and following:

a. 100% Continuous

b. 130% to 150% overload – 120 minutes

load (approximately 1%) to 100% full load and shall be as linear as technically feasible up to the 300% full load current. The inherent voltage regulation at 300% full load shall ensure that the voltage at the rectifier load terminals shall not be less than 1150V DC.

The contractor can propose other solutions including the increase of the lower transition load percentages subject to the contractor demonstrating there is no detriment to train and system performance.

~~2)~~

3) The output DC voltage for each rectifier transformer and rectifier set combination, at light transition load, shall not exceed 1-590V DC.

4) The DC traction supply system shall be designed to provide a voltage that is self-limiting to 1-650V DC at no load.

5) Each rectifier transformer and rectifier set combination shall be designed in accordance with Engineer's requirements and to satisfy the requirements of this Performance Specification and following:

   a. 100% Continuous

   b. 130% to 150% overload – 120 minutes

   c. 300% overload – 1 minute.

6) The Contractor shall consider how to carry in and install at each substation and plan rectifier transformer that can be divided if necessary.

(2) Rectifier Transformers

1) 115kV/1.18kV Rectifier transformers shall comply with relevant standards and regulations. Rectifier transformers shall be rated to supply the full DC traction system load within the continuous rating, with any one rectifier transformer out of service.

2) The overload ratings of rectifier transformers shall be utilized to accommodate any abnormal loading in the event of train bunching or due to any abnormal DC traction feeding arrangements.

3) Rectifier transformers shall be designed in accordance with relevant standards and regulations and shall incorporate an earthed metal screen between high voltage and low voltage windings, if necessary.

4) Off-load tapping links shall be provided on the high voltage winding to provide rated output at +5.0% to -5.0% of nominal supply voltage, in increments of 2.5%.

5) Two secondary windings shall be provided, one connected in star and the other one connected in delta, to provide double six phases supply to the rectifier.

6) Rectifier transformers shall be fitted with a temperature alarm device, and temperature tripping and pressure alarm and gas pressure tripping to be monitored by the SCADA.

7) Rectifier transformers shall be of gas insulated or oil insulated self-cooling type to have anti-flame-able characteristics and to prevent ingress of moisture with an enclosed bus ducting or cable connection to the rectifier cubicle.

8) The insulation shall conform as a minimum to temperature 'Class B' as defined with relevant standards and regulations.

2) Positive power feeder and negative return cable connections at traction substation.

3) Lightning/Surge Arrester, devices.

As certain works are closely related to civil, architecture, track works, signaling system, Communications System, power delivery system, traction substation, rolling stock, water drain system, water delivery system for firefighting, depot inspection, and operation system, the Contractor shall coordinate with interfacing Contractors for installation works including but not limited to:

a) Supporting structure for feeders and return cables in elevated, embankment section and depot;

b) Installation of return cables fixed with a high resistivity fire-proofed cleat.

c) Crossing conduit for return cables passed through under the plinth, or between plinth gaps or sleeper gaps;

d) Steel tubular pole foundation and guy anchor in elevated and embankment section;

e) Earthing connection between a pole earthing wire and earthing wire on elevated sand embankment sections. The Contractor shall install earthing electrode with resistance prescribed by the provisions and regulations;

f) Connection between lead wire from surge arrester and grounding wire inside PVC conduit embedded along every concrete pier, or at every other concrete pier (depends upon the design of the Contractor to be Approved by the Engineer);

g) Cable wiring for earthing devices of grounding wire and surge arrester for lightning;

h) Excavation, backfill, compacting, and finishes of trough, hand-holes, and pipe conduit for feeders, overhead return wire and return cable in depot; and

i) Furthermore, any matter not stipulated herein shall be determined through mutual consultation between the Engineer and Contractor, with the Engineer's consent ultimately.

4) Sectioning and feeding in the depots shall be designed to suit the various stages of construction and operation up to completion. The sectioning shall be designed to minimize disruption to operation during isolations for maintenance work.

5) For each of the 3 no. upper level maintenance decks in the Mabalacat Depot workshop, and in the Light Repair Shop's at both Mabalacat and Banlic depots interlocking shall be provided between the isolators and the doors giving access to the platforms. The scope of works includes doors, door locks, push bar for emergency escape and associated interlocking for isolators. The contractor shall coordinate with the civil contractor regarding the implementation of these systems.

6.2.4 Environmental Conditions

1) Ambient conditions and usage environments

Table 6.2.2 Ambient Conditions and Usage Environments

2) Positive power feeder and negative return cable connections at traction substation.

3) Lightning/Surge Arrester, devices.

As certain works are closely related to civil, architecture, track works, signaling system, Communications System, power delivery system, traction substation, rolling stock, water drain system, water delivery system for firefighting, depot inspection, and operation system, the Contractor shall coordinate with interfacing Contractors for installation works including but not limited to:

a) Supporting structure for feeders and return cables in elevated, embankment section and depot;

b) Installation of return cables fixed with a high resistivity fire-proofed cleat.

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g) Cable wiring for earthing devices of grounding wire and surge arrester for lightning;

h) Excavation, backfill, compacting, and finishes of trough, hand-holes, and pipe conduit for feeders, overhead return wire and return cable in depot; and

i) Furthermore, any matter not stipulated herein shall be determined through mutual consultation between the Engineer and Contractor, with the Engineer's consent ultimately.

4) Sectioning and feeding in the depots shall be designed to suit the various stages of construction and operation up to completion. The sectioning shall be designed to minimize disruption to operation during isolations for maintenance work.

5) For each of the 3 no. ~~high level walkways~~ upper level maintenance decks in the Mabalacat~~Banlic~~ Depot workshop, and in the Light Repair Shop's at both Mabalacat and Banlic depots interlocking shall be provided between the isolators and the doors giving access to the platforms. The scope of works includes doors, door locks, push bar for emergency escape and associated interlocking for isolators. The contractor shall coordinate with the civil contractor regarding the implementation of these~~is~~ systems.~~s with the access door.~~

6.2.4 Environmental Conditions

1) Ambient conditions and usage environments

Table 6.2.2 Ambient Conditions and Usage Environments

The quantity and location of the digital and analog monitoring and operation points shall follow the requirement of each discipline. All the signals of the above shall be converted to the IP protocol by each discipline Below is the Summary of Scope:

1) Common

- Applied facility: BMS including EAC, Power-SCADA, and Railway Signal
- Line: on Backbone (VLAN) for BMS, Power SCADA, and Railway Signal on separate Cores.
- Installation Division: L2/L3 Switches in CER
- Original Data: Analogue and/or Digital
- Transmission Data: Converted to IP Protocol
- Numbers of Point: provided by each facility

2) AFC System

The scope of works for cable laying and cable containment particularly for AFC systems shall include the following but not limited to:

- The Contractor shall install the communications cable to the AFC Equipment Cabinet.
- Cables shall be installed in locations that pose no danger to passengers and station staff.
- The communication cable shall be installed so that the influence of noise from the power cable is minimized as much as possible.
- The Contractor shall install either L2 or L3 switches for distances of more than 90 meters between the AFC equipment to the Network's Point of Connection.

3.6.4 Cable Systems for Communications

All cables installed on any part of the viaducts, buildings, and stations shall be following the Philippine Electrical Code (PEC 2017 Edition) and Philippine Electronics Code. Where such codes do not comprehensively encompass all requirements, appropriate international standards shall be used.

The cable materials shall be of fire-retardant materials as specified in IEC 60332 or an equivalent standard. Where cables are used in confined spaces the insulation and sheath shall be constructed with Low Smoke Zero Halogen (LS0H, LSZH, LSFH, or LSØH) materials. Testing for halogen-free properties shall be following IEC 60754-1 and 60754-2 or an acceptable equivalent.

All cables and their construction inclusive of any testing certification shall be subject to approval by the Engineer.

All outdoor cables shall be armored and should the cables require screening, the braid shall not be less than 80%.

All cables, wires, cable accessories, termination racks, and other materials shall comply with the Philippines Electrical Code (PEC 2017 Edition) and shall be subject to approval by the Engineer. The Contractor shall supply detailed information and appropriate specifications for all cables, wires, cable accessories, termination racks, and any other materials they propose to use.

The quantity and location of the digital and analog monitoring and operation points shall follow the requirement of each discipline. All the signals of the above shall be converted to the IP protocol by each discipline ~~.~~

Below is the Summary of Scope:

1) Common

- Applied facility: BMS including EAC, Power-SCADA, and Railway Signal
- Line: on Backbone (VLAN) for BMS, Power SCADA, and Railway Signal on separate Cores.
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2) AFC System

The scope of works for cable laying and cable containment particularly for AFC systems shall include the following but not limited to:

- The Contractor shall install the ~~power cable and~~ communications cable to the AFC Equipment Cabinet.~~equipment.~~
- Cables shall be installed in locations that pose no danger to passengers and station staff.
- The communication cable shall be installed so that the influence of noise from the power cable is minimized as much as possible.
- ~~Access point shall be installed in the customer service room, AFC rooms, the waiting room, and on the platform for the ticket counter terminals and the mobile terminals.~~
- The Contractor shall install either L2 ~~and/~~or L3 switches for distances of more than 90 meters between the AFC equipment to the Network's Point of Connection ~~within the station box if the distance between station CERs and station box exceeds 60 meters~~.

3.6.4 Cable Systems for Communications

All cables installed on any part of the viaducts, buildings, and stations shall be following the Philippine Electrical Code (PEC 2017 Edition) and Philippine Electronics Code. Where such codes do not comprehensively encompass all requirements, appropriate international standards shall be used.

The cable~~s~~ materials shall be of fire-retardant materials as specified in IEC 60332 or an equivalent standard. Where cables are used in confined spaces the insulation and sheath shall be constructed with Low Smoke Zero Halogen (LS0H, LSZH, LSFH, or LSØH) materials. Testing for halogen-free properties shall be following IEC 60754-1 and 60754-2 or an acceptable equivalent.

All cables and their construction inclusive of any testing certification shall be subject to approval by the Engineer.

Item	Interface requirement
Interface with AFC system	It provides a communication line of the AFC system to connect from each station to OCC. POI is a port of L3SW / L2SW installed in the Telecommunication equipment room. For distances of more than 90 meters between the AFC equipment to the Network's Point of Connection, a switch will be provided which is necessary to facilitate the Backbone Network connection.
	Clock system Provides time information received from GPS to the Power system. POI is an output port of the master clock unit or the Sub-master clock unit.
	CCTV in AFC rooms and cash routes
	Data system access points: Provide a Wi-Fi access point to the Express train stop station. (For ticket sales of Express train)
Interface with PSD system	Telecommunication equipment monitoring system It provides a communication line of the PSD system to connect from each station to OCC. The communication line provided is to monitor the operating status of the PSD system. POI is a port of the Telecommunication equipment monitoring system installed in the Telecommunication equipment room.
Interface with Architecture system	Telecommunication equipment room of the station Area of the communication equipment room 50 m² (Does not include an area of the air conditioning.) Communication UPS room area 50 m² (Does not include an area of the air conditioning.) Free access to communication equipment room: 50 cm under the floor Air conditioning: 2 pairs including spare Room temperature: 28℃ or less / Humidity: 80% or less (noncondensing) Floor load: Equipment room 800 kg /m², UPS room 2000 kg /m²
	Telecommunication equipment room of OCC Area of the communication equipment room 70 m² (Does not include an area of the air conditioning.) Communication UPS room area 50 m² (Does not include an area of the air conditioning.) Free access to communication equipment room: 50 cm under the floor Air conditioning: 2 pairs including spare Room temperature: 28℃ or less / Humidity: 80% or less (noncondensing)

Item	Interface requirement
	Clock system Provides time information received from GPS to the Power system. POI is an output port of the master clock unit or the Sub-master clock unit.
Interface with AFC system	MSN system It provides a communication line of the AFC system to connect from each station to OCC. POI is a port of L3SW / L2SW installed in the Telecommunication equipment room. For distances of ~~ranging equal to or~~ more than 9~~6~~0 meters between the AFC equipment to the Network's Point of Connection, a switch will be provided which is ~~CER and AFC rooms, the Telecommunication systems shall provide connection switches~~ necessary to facilitate the Backbone Network connection~~s in AFC AFC related rooms~~.
	Clock system Provides time information received from GPS to the Power system. POI is an output port of the master clock unit or the Sub-master clock unit.
	CCTV in AFC rooms and cash routes
	~~Providing~~ Ddata system access points: Provide a Wi-Fi access point to the Express train stop station. (For ticket sales of Express train) ~~AFC room, Ticket sales counter, Waiting room, Platform, etc.~~
Interface with PSD system	Telecommunication equipment monitoring system It provides a communication line of the PSD system to connect from each station to OCC. The communication line provided is to monitor the operating status of the PSD system. POI is a port of the Telecommunication equipment monitoring system installed in the Telecommunication equipment room.
Interface with Architecture system	Telecommunication equipment room of the station Area of the communication equipment room 50 m² (Does not include an area of the air conditioning.) Communication UPS room area 50 m² (Does not include an area of the air conditioning.) Free access to communication equipment room: 50 cm under the floor Air conditioning: 2 pairs including spare Room temperature: 28℃ or less / Humidity: 80% or less (noncondensing) Floor load: Equipment room 800 kg /m², UPS room 2000 kg /m²
	Telecommunication equipment room of OCC Area of the communication equipment room

	Line; GSM-R Radios will be provided to Bicutan Station Controller including portable Handheld Radio at Drivers lobby for Operations and Disaster Management			
Radio Systems: CBTC		Bicutan	CP106	Shall supply and install, test, and commission all CBTC systems.
Voice and Data System	Shall provide the connectivity for all Voice and Data within the NSCR Line; the line to MMSP PABX System.	Bicutan	CP106	Shall supply and install, test, and commission all MMSP PABX systems.
PIDS		Bicutan	CP106	Shall supply and install, test and commission all PIDS in their platforms and concourses.
Public Address (PA) System	Common PA System for FTI and Bicutan to avoid overlapping, MMSP PS System will be integrated with NSCR and will be managed by Station Operator for station announcements. The central announcements will be done by either MMSP OCC or NSCR OCC.	Bicutan and FTI	CP106	
Time Server and Master Clock System	All clocks will be supplied, installed, test and commissioned by NS01, excluding the clocks that will be supplied by CP106 in FTI -MMSP Platform.	Bicutan and FTI	CP106	To supply, install, test and commission all clocks in FTI's MMSP Platform. MMSP's Master clock system to be installed at FTI & Bicutan stations for respective MMSP rail systems utilization.
GSM-R on-board equipment	NS-01 shall supply, test, and commission the onboard equipment on MMSP trains. NS01 and CP107 shall coordinate and agree on the size, space, and location.	N/A	CP107	CP107 shall install the on-board equipment. CP107 and NS01 shall coordinate and agree on the size, space, and location.
GSM-R Infrastructure at MMSP Test Track at Valenzuela Depot	Shall design, install, test, and commission the GSM-R System/ Infrastructure at MMSP's Valenzuela Depot. Shall identify and supply the testing and diagnostic equipment for the GSM-R Radio Systems	Valenzuela Depot	CP106	CP106: To provide Backbone Facilities for the GSM-R Infrastructure to be connected from Valenzuela Depot Test Track to the Backbone Switch at Bicutan (MMSP's CER).
TETRA Infrastructure for Testing at Banlic Depot.	NS-01- To provide Backbone Facilities for the TETRA Radio Infrastructure to be connected from Banlic Depot to the	Banlic Depot / Bicutan Station	CP106	Shall design, install, test, and commission the TETRA Infrastructure at NSCR's Banlic Depot.

	Backbone Switch at Bicutan (NS-01's CER). CIVIL (S-07)- To provide space and power for the TETRA Infrastructure at Banlic Depot.			Shall identify and supply the testing and diagnostic equipment for the TETRA Systems

Table 3.11.4 NS-01 and MMSP Telecommunication Interface

Sub-System	NS-01	Station/ Depot	MMSP Contract	MMSP
TELECOMMUNICATIONS				
MMSP Millimeter-wave		Bicutan	CP106	Shall supply, install and test and commission the equipment.
Backbone System: OFC	Shall provide connectivity to NSCR OCC for Voice and Data Systems, CCTV, PA, PIDS AFC.	Bicutan	CP106	Shall supply all equipment needed to connect to the NSCR Backbone System.
Radio Systems: GSM-R	Shall provide the GSM-R Network connectivity for all Voice and Data within the NSCR Line; GSM-R Radios will be provided to Bicutan Station Controller including portable Handheld Radio at Drivers lobby for Operations and Disaster Management	Bicutan	CP106	
Radio Systems: CBTC		Bicutan	CP106	Shall supply and install, test, and commission all CBTC systems.
Voice and Data System	Shall provide the connectivity for all Voice and Data within the NSCR Line; the line to MMSP PABX System.	Bicutan	CP106	Shall supply and install, test, and commission all MMSP PABX systems.
PIDS		Bicutan	CP106	Shall supply and install, test and commission all PIDS in their platforms and concourses.
Public Address (PA) System	Common PA System for FTI and Bicutan to avoid overlapping, MMSP PS System will be integrated with NSCR and will be managed by Station Operator for station announcements. The central announcements will be done by either MMSP OCC or NSCR OCC.	Bicutan and FTI	CP106	
Time Server and Master Clock System	All clocks will be supplied, installed, test and commissioned by ~~NSCR~~NS01, excluding the clocks that will be supplied by CP106 in FTI -MMSP Platform.	Bicutan and FTI	CP106	To supply, install, test and commission all clocks in FTI's MMSP Platform. MMSP's Master clock system to be installed at FTI & Bicutan stations for respective MMSP rail systems utilization.

GSM-R on-board equipment	NS-01 sShall supply,, test, and commission the onboard equipment on MMSP trains. NS01 and CP107 shall coordinate and agree on the size, space, and location and installation plans.	N/A	CP107	CP107 shall install the on-board equipment. Shall install the onboard equipment on MMSP trainsCP107, and NS01 shall coordinate and agree on the size, space, and location. and installation plans.
GSM-R Infrastructure at MMSP Test Track at Valenzuela Depot	Shall design, install, test, and commission the GSM-R Ssystem/ Infrastructure at MMSP's Valenzuela Depot. Shall identify and supply the testing and diagnostic equipment for the GSM-R Radio Systems	Valenzuela Depot	CP106 – CIVIL	CP106: To provide Backbone Facilities for the GSM-R Infrastructure (Base Station) to be connected from Valenzuela Depot Test Track to the Backbone Switch and OCC/IOCC.at Bicutan (MMSP's CER). CIVIL: To provide space and power for the GSM-R Infrastructure.
TETRA Infrastructure for Testing at Banlic Depot.	NS-01- To provide Backbone Facilities for the TETRA Radio Infrastructure to be connected from Banlic Depot to the Backbone Switch at Bicutan (NS-01's CER). CIVIL (S-07)- To provide space and power for the TETRA Infrastructure at Banlic Depot.	Banlic Depot / Bicutan Station	CP106	Shall design, install, test, and commission the TETRA Infrastructure at NSCR's Banlic Depot. Shall identify and supply the testing and diagnostic equipment for the TETRA Systems

This Chapter specifies the technical characteristics of the Meteorological and Seismic Monitoring System of the Telecommunications System.

1.2 Overview of the Meteorological and Seismic Monitoring System

The Meteorological and Seismic Monitoring System shall be provided for the prevention of possible damage suffered from designated natural disasters to the railway facilities and the safety of passengers. The natural disaster shall be predicted by information from the sensor of Anemometer, Rain Gauge, Seismograph, and Water Level.

2. SCOPE OF WORKS

2.1 General

The specific requirements on the scope of the works for the Meteorological and Seismic Monitoring System shall be as specified below.

2.2 Scope of supply for the Meteorological and Seismic Monitoring System

A. System configurations

Meteorological and Seismic Monitoring system consists of sensors (anemometer, rain gauge, seismograph) and measuring equipment, etc. Below is the general specification.

- Wiring: UTP Cat5E (from the sensor to the common backbone).
- Measurement: Continuous data acquisition. Check the data reach alarm setpoints (dry contact).
- Power Supply: 1p2w 230V(100W)

B. System functions

1) Wind speed measuring equipment (Anemometer)

The wind speed measuring equipment shall be able to measure instantaneous wind speed, average wind speed, maximum instantaneous wind speed.

When the wind speed value exceeds the threshold value or when a failure occurs in the equipment, an alarm signal shall be output.

The wind speed measuring equipment is capable of storing measured data and transferring measurement data to external terminals such as PC.

The display of the alarm can arbitrarily be set.

The wind speed measuring equipment shall take countermeasures against surge penetration from the outside and shall have a structure resistant to static electricity and external noise.

・ Function:

Measurement accuracy: Maximum wind speed 70m/s, Resolution ability 1m/s

・ Installation locations:

Stations: Clark, Angeles, San Fernando, Apalit, Buendia, Alabang, and Santa Rosa.

・ Monitoring Department:

Measurement value shall be displayed in real-time on a monitor of the Facility control section of OCC.

・Installation locations:

Stations: Clark, Angeles, San Fernando, Apalit, ~~Malolos station,~~ Buendia, Alabang, and ~~station,~~ Santa Rosa. ~~station, Depots~~

・Monitoring Department:

Measurement value shall be displayed in real-time on a monitor of the Facility control section of OCC.

2) Rainfall measuring equipment (Rain gauge)

The rainfall measuring equipment shall be able to measure 1-hour rainfall, daily rainfall, continuous rainfall, etc.

When the rain value exceeds the threshold value or when a failure occurs in the equipment, an alarm signal shall be output.

The rainfall measuring equipment is capable of storing measured data and transferring measurement data to external terminals such as PC.

The display of the alarm can arbitrarily be set.

The rainfall measuring equipment shall take countermeasures against surge penetration from the outside and shall have a structure resistant to static electricity and external noise.

・Function

Measurement accuracy: When rainfall per hour is 40 mm or less: Within ± 1 mm

When rainfall per hour exceeds 40 mm: Within ± 3%

・Installation locations

Stations: Clark, San Fernando, and Bicutan.

Depot: Banlic

・Monitoring department

Measurement value shall be displayed in real-time on a monitor of the Facility control section of OCC.

3) Earthquake measuring equipment (Seismograph)

The earthquake measuring equipment shall be able to calculate the seismic intensity from the acceleration and period of the shake and to display the seismic intensity on the earthquake measuring equipment.

When an earthquake occurs, an alarm shall be generated and made known.

The display of the alarm can arbitrarily be set.

The earthquake measuring equipment shall take countermeasures against surge penetration from the outside and shall have a structure resistant to static electricity and external noise.

・Function

Measurement accuracy: Acceleration measurement range: 3 directions 3000 gal

Frequency measurement range: 0.3 to 10 Hz

2) Rainfall measuring equipment (Rain gauge)

The rainfall measuring equipment shall be able to measure 1-hour rainfall, daily rainfall, continuous rainfall, etc.

When the rain value exceeds the threshold value or when a failure occurs in the equipment, an alarm signal shall be output.

The rainfall measuring equipment is capable of storing measured data and transferring measurement data to external terminals such as PC.

The display of the alarm can arbitrarily be set.

The rainfall measuring equipment shall take countermeasures against surge penetration from the outside and shall have a structure resistant to static electricity and external noise.

・Function

Measurement accuracy: When rainfall per hour is 40 mm or less: Within ± 1 mm

When rainfall per hour exceeds 40 mm: Within ± 3%

・Installation locations

Stations: Clark, San Fernando, and Bicutan.

Depot: Banlic

・Monitoring department

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The display of the alarm can arbitrarily be set.

The earthquake measuring equipment shall take countermeasures against surge penetration from the outside and shall have a structure resistant to static electricity and external noise.

・Function

Measurement accuracy: Acceleration measurement range: 3 directions 3000 gal

Frequency measurement range: 0.3 to 10 Hz

・Installation locations

Station: San Fernando, Bicutan, Sucat, and Alabang.

Depot: Banlic

・Monitoring department

Display the acceleration value from the display recording device on the monitor of the Facility control section of the OCC.

・Installation locations:

Stations: Clark, Angeles, San Fernando, Apalit, ~~Malolos station,~~ Buendia, Alabang, and ~~station,~~ Santa Rosa. ~~station, Depots~~

・Monitoring Department:

Measurement value shall be displayed in real-time on a monitor of the Facility control section of OCC.

2) Rainfall measuring equipment (Rain gauge)

The rainfall measuring equipment shall be able to measure 1-hour rainfall, daily rainfall, continuous rainfall, etc.

When the rain value exceeds the threshold value or when a failure occurs in the equipment, an alarm signal shall be output.

The rainfall measuring equipment is capable of storing measured data and transferring measurement data to external terminals such as PC.

The display of the alarm can arbitrarily be set.

The rainfall measuring equipment shall take countermeasures against surge penetration from the outside and shall have a structure resistant to static electricity and external noise.

・Function

Measurement accuracy: When rainfall per hour is 40 mm or less: Within ± 1 mm

When rainfall per hour exceeds 40 mm: Within ± 3%

・Installation locations

Stations: Clark, San Fernando, and Bicutan.

Depot: Banlic

・Monitoring department

Measurement value shall be displayed in real-time on a monitor of the Facility control section of OCC.

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The earthquake measuring equipment shall be able to calculate the seismic intensity from the acceleration and period of the shake and to display the seismic intensity on the earthquake measuring equipment.

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Station: San Fernando, Bicutan, Sucat, and Alabang.

Depot: Banlic

・Monitoring department

Display the acceleration value from the display recording device on the monitor of the Facility control section of the OCC.

・Installation locations:

Stations: Clark, Angeles, San Fernando, Apalit, Buendia, Alabang, and Santa Rosa.

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The rainfall measuring equipment shall take countermeasures against surge penetration from the outside and shall have a structure resistant to static electricity and external noise.

・Function

Measurement accuracy: When rainfall per hour is 40 mm or less: Within ± 1 mm

When rainfall per hour exceeds 40 mm: Within ± 3%

・Installation locations

Stations: Clark, San Fernando, and Bicutan~~Nichols station, Bicutan station., Depots~~

Depot: Banlic

・Monitoring department

Measurement value shall be displayed in real-time on a monitor of the Facility control section of OCC.

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The earthquake measuring equipment shall be able to calculate the seismic intensity from the acceleration and period of the shake and to display the seismic intensity on the earthquake measuring equipment.

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The earthquake measuring equipment shall take countermeasures against surge penetration from the outside and shall have a structure resistant to static electricity and external noise.

・Function

Measurement accuracy: Acceleration measurement range: 3 directions 3000 gal

2)	Conditions for exterior/outdoor Equipment	
	a) Temperature Range:	0 to 45°C
	b) Relative Humidity:	Maximum 90%
	c) Solar radiation (heat-up and aging/deterioration)	1120 Watt/sqm
3)	Train-borne equipment	
	a) Temperature Range:	0 to 60°C
	b) Relative Humidity:	Maximum 90%
4)	Altitude:	100m or lower
5)	Reference Wind Velocity:	40m/sec
6)	Lightning Area:	Severe Lightning Area
7)	Salt Damage District:	Around 10 km from the coastline

3.5 General Design Requirements

3.5.1 General

The Contractor shall ensure the design of Telecommunication systems will include the following, but not limited to:

- Safety, reliability, and durability shall be secured under given circumstances by adopting proper protection schemes and reasonable equipment and materials.
- Redundancy of the system shall be secured by adopting duplicated and stacked equipment and materials with hot standby applying LA, STP, and VSS protocol/systems.
- A total of initial and running costs shall be minimized by using high-quality equipment and material and applying high-efficiency engineering. Consideration shall be focused on energy saving.
- Considerations to simplify the maintenance and monitoring work by applying new network technology.
- EMC specified in IEC standards or equivalent shall be met to secure satisfactory electromagnetic compatibility in the given circumferential environment.
- RAMS specified in IEC standards or equivalent shall be applied to secure the safety and reliability of the system.
- Compliance to all Telecommunications related requirements of NFPA.
- Temperature control of equipment room, temperature monitoring and ventilation for equipment housing shall be implemented to reduce heat radiation of the equipment and

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- Compliance to all Telecommunications related requirements of NFPA.
- Temperature control of equipment room, temperature monitoring and ventilation for equipment housing shall be implemented to reduce heat radiation of the equipment and

7.6 Documentation

7.6.1 The Contractor shall submit the following documents:

a) Detailed engineering design, system specification, software specification, hardware specification, software source code;
b) Operation manuals;
c) Maintenance manuals;
d) Installation related drawings;
e) Equipment manufacturing related drawings;
f) Consumables list, maintenance parts list;
g) As built drawings;
h) Spare parts list manual, illustrated parts catalogue (IPC);
i) Special test and tools equipment manuals;
j) Test plans and procedures
k) Method Statements
l) Training Manuals; and
m) Any other documentation deemed necessary by the Engineer.

7.6.2 Submission of Samples and Prototypes

7.6.2.1 The Contractor shall submit samples or prototypes of all material and equipment proposed to be used on the project and shall demonstrate that the materials and equipment are fit for purpose. The Engineer will evaluate all submitted materials and equipment and will advise the Contractor of the acceptance or rejection of the submitted products.

7.6.2.2 The Contractor shall submit the following samples or prototypes, as a minimum, for approval:

a) Prototypes of AFC equipment that can be energized to show the basic functions, prior to the Pre-Final Design Review;
b) All cables, termination boxes, optical pigtails and optical patch cords;
c) Installation materials and accessories, including mounting brackets

7.6.2.3 All samples/prototypes submitted shall be the property of the Employer.

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7.6.2.3 All samples/prototypes submitted shall be the property of the Employer.

a) 4 kinds of weather shall be simulated and be available to be chosen for use: Sunny, Cloudy, Rainy and Misty.
b) 3 kinds of time range shall be simulated and can be chosen: Daytime, Night-time and Twilight.
c) 8 kinds of sound shall be simulated and can be chosen: rail friction sound, rail gap sound, emergency brake sound, inverter sound, turnout passing sound, crash sound, wind/rain/thunder sound and horn sound.
d) 4 kinds of objects shall be simulated as moving objects: trains on railway, passengers on platform, station staff and obstacles.

The simulator shall have the capacity for adding any future phase alignment and station details. The whole MCRP, NSCR and NSRP driver`s view shall be prepared by the Contactor and shared with the NSCR contractor to harmonize the views in the various simulators.

9.2.1.1.2 Driver Console and On-board Equipment Simulator

The driver`s console panel and equipment shall follow the actual driver console panel including the on-board equipment. The reaction of moving the handles shall simulate the same effect using the visual image generator, sound generator, body sensitive seat, signal monitor, meters and lamps compared to the real driving environment. Door opening and closing features and operation shall be simulated to reflect the actual equipment used on the train. Interfaces with Rolling stock contractors of CP NS-02 and~~,~~ CP NS-03~~, CP-03 and CP 107~~ shall be carried out for train cab equipment details and views.

9.2.1.1.3 Driver Training

The Train Operation Simulator shall allow the drivers to be trained under the simulated situation not only for regular operation but also abnormal situations such as rolling Stock failures, signaling failures and railway bogie failures, etc.

Hereinafter, training scenarios shall mean a combination of route settings, environment settings, and events. Details of the scenarios shall be proposed by the Contractor for review and granting of Notice of No Objection by Engineer.

9.2.1.2 Subsystems of Train Operation Simulator

Subsystems of the train operation simulator shall be typically categorized as seen below and the functions and performance shall be defined and specified on each subsystem.

a) Simulated driver's cab;
b) Display system;
c) Computer unit;
d) Instructor's console; and
e) Platform and simulated Platform Information Display (PID) monitors on the platform.

9.2.1.2.1 Rolling Stock Cab (Driver Console subsystem)

The cab equipment, driver's console desk, layout, and operation-related provision shall be the same as the actual ones as much as possible. Driving Cab Equipment's are to be provided by the CP NS-02 and CP NS-03 Contractors whereas Signaling, Telecom and PID items to be provided by System contractor NS-01. Interfacing with other contractors is required to obtain necessary design details and the materials. In addition, speakers for simulated sounds, body sensitive seat for feeling train motion and cameras to monitor trainees shall be installed. One set of doors shall be installed at the right-side back of the driver's cab which will be controlled with a door switch.

a) 4 kinds of weather shall be simulated and be available to be chosen for use: Sunny, Cloudy, Rainy and Misty.
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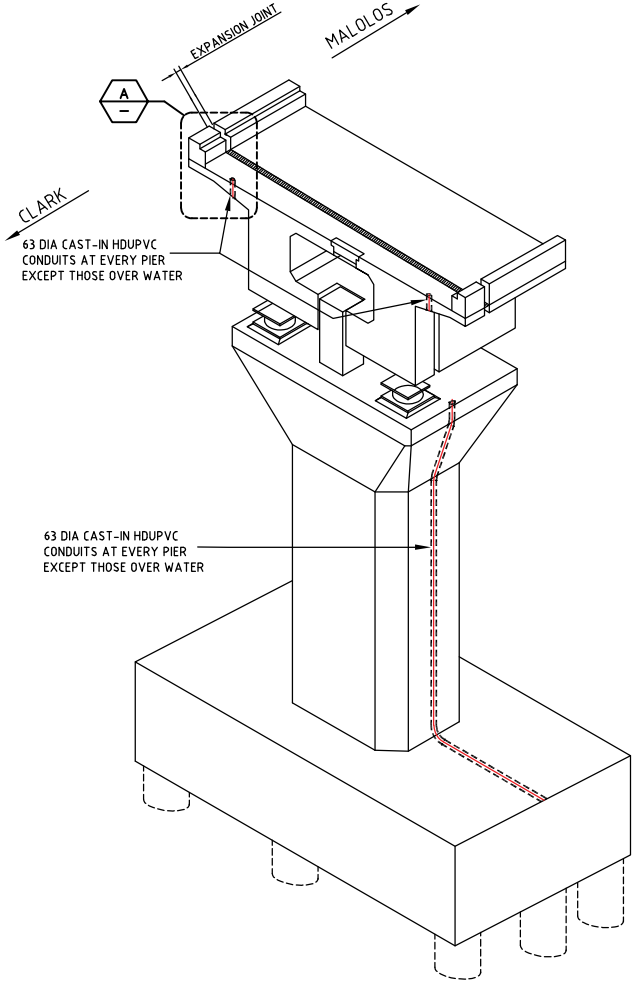
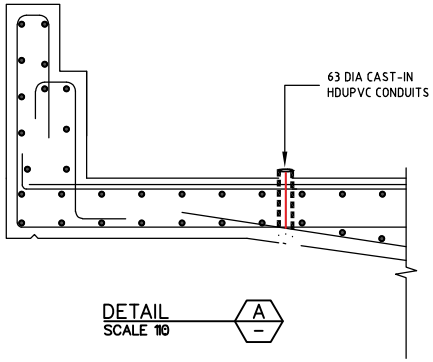
GBB No. 25



ISOMETRIC VIEW OF PIER
SCALE: NTS

NOTES

1. ALL CONDUCTORS AND EARTH RODS TO BE SUPPLIED AND INSTALLED BY CP NS-01 E&M CONTRACTOR.
2. ALL CONDUITS AND DUCTS TO BE PROVIDED WITH SUITABLE DRAW STRINGS.
3. EARTH RODS AND INSPECTION PITS PROVIDED BY THE CP NS-01 E&M CONTRACTOR SHALL BE EQUIPPED WITH SECURE LOCKABLE COVER.
4. THE ARRANGEMENT SHOWN ON THIS DRAWING IS INDICATIVE ONLY. THE CIVIL WORKS CONTRACTOR SHALL COORDINATE FURTHER DETAILS WITH CP NS-01 E&M CONTRACTOR PRIOR TO COMMENCEMENT OF THE RELEVANT CIVIL WORKS.



DETAIL A
SCALE 1:10

SCALE 1:10 0.1 0 0.1 0.2 0.3 0.4 0.5

VERSIONS	DATE	DESCRIPTION
00	04 MAY 2021	ISSUED FOR REFERENCE
01	19 JULY 2021	ISSUED FOR REFERENCE

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO., LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO., LTD.
KATAHIRA & ENGINEERS INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS INC.
PACIFIC CONSULTANTS CO., LTD.
TOKYO METRO CO., LTD

TITLE	–	–
DESIGNER	K.HIGASHITSUJI	–
CHECK	R.ZARASPE	–
TEAM LEADER	P.SWIFT	–
P. MANAGER	Y.MAEDA	–

MALOLOS - CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT-SOUTH (NSRP-SOUTH)

PACKAGE NS-01 : Bidding Documents

LIGHTNING ARRESTER DETAIL

DATE	MAY 2021
SCALE	AS SHOWN IN A1
SHEET No.	1 OF 1
DRG No.	NSCR-GCR-NS01-ZWE-DWG-DS-000002
DRG S.	REV 01

Last modified by USER / 18 Jun 2021
Filename: D:\GCR_Files\01Working\NSCR-Ex\3_MCRP\WORKING\Rev. Drawings\MCRP-DWG-VIA00-(R4)\VIA00 TYPICAL DWGs\MCRP-DWG-VIA00-ST-1901

GBB No. 25

NOTES

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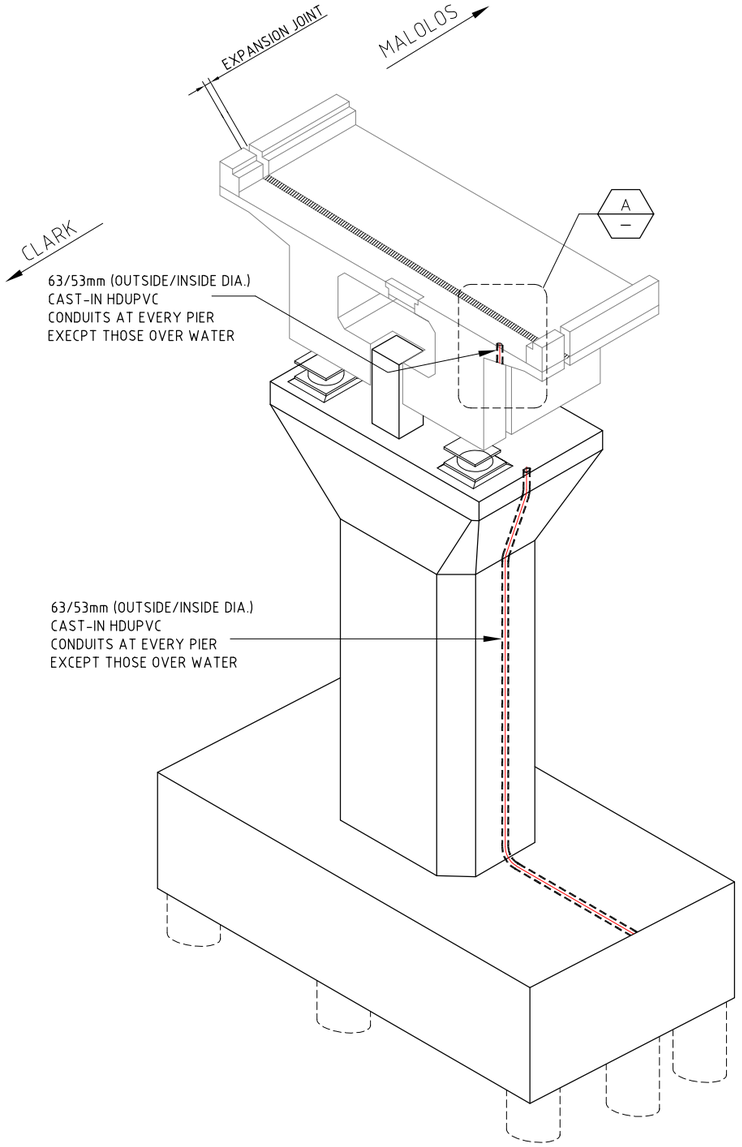
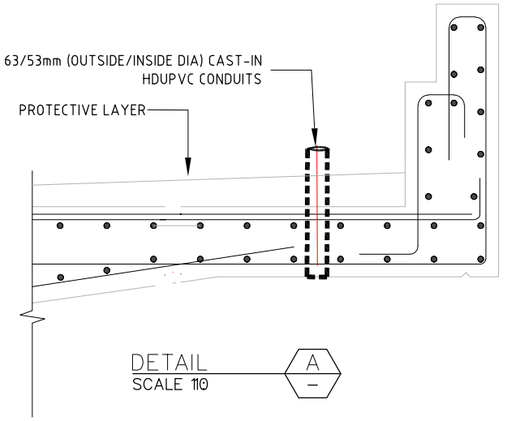
2. ALL CONDUITS AND DUCTS TO BE PROVIDED WITH SUITABLE DRAW STRINGS.
3. EARTH RODS AND INSPECTION PITS PROVIDED BY THE CP NS-01 E&M CONTRACTOR SHALL BE EQUIPPED WITH SECURE LOCKABLE COVER.
4. THE ARRANGEMENT SHOWN ON THIS DRAWING IS INDICATIVE ONLY. THE CIVIL WORKS CONTRACTOR SHALL COORDINATE FURTHER DETAILS WITH CP NS-01 E&M CONTRACTOR PRIOR TO COMMENCEMENT OF THE RELEVANT CIVIL WORKS.



ISOMETRIC VIEW OF PIER
SCALE: NTS



DETAIL A
SCALE 110

SCALE 1:10 0.1 0 0.1 0.2 0.3 0.4 0.5

VERSIONS	DATE	DESCRIPTION
00	04 MAY 2021	ISSUED FOR REFERENCE
01	19 JULY 2021	ISSUED FOR REFERENCE
02	24 AUG 2021	ISSUED FOR REFERENCE

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO., LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO., LTD.
KATAHIRA & ENGINEERS INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS INC.
PACIFIC CONSULTANTS CO., LTD.
TOKYO METRO CO., LTD

TITLE	JDT	SMEC
DESIGNER	K.HIGASHITSUJI	–
CHECK	R.ZARASPE	–
TEAM LEADER	P.SWIFT	–
P. MANAGER	Y.MAEDA	–

MALOLOS - CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT-SOUTH (NSRP-SOUTH)

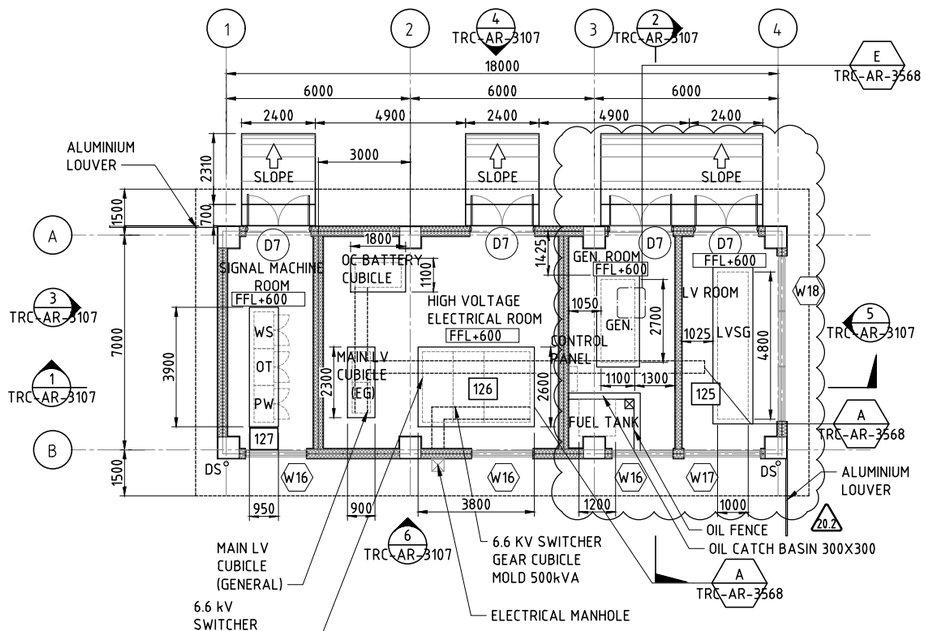
PACKAGE NS-01 : Bidding Documents

LIGHTNING ARRESTER DETAIL

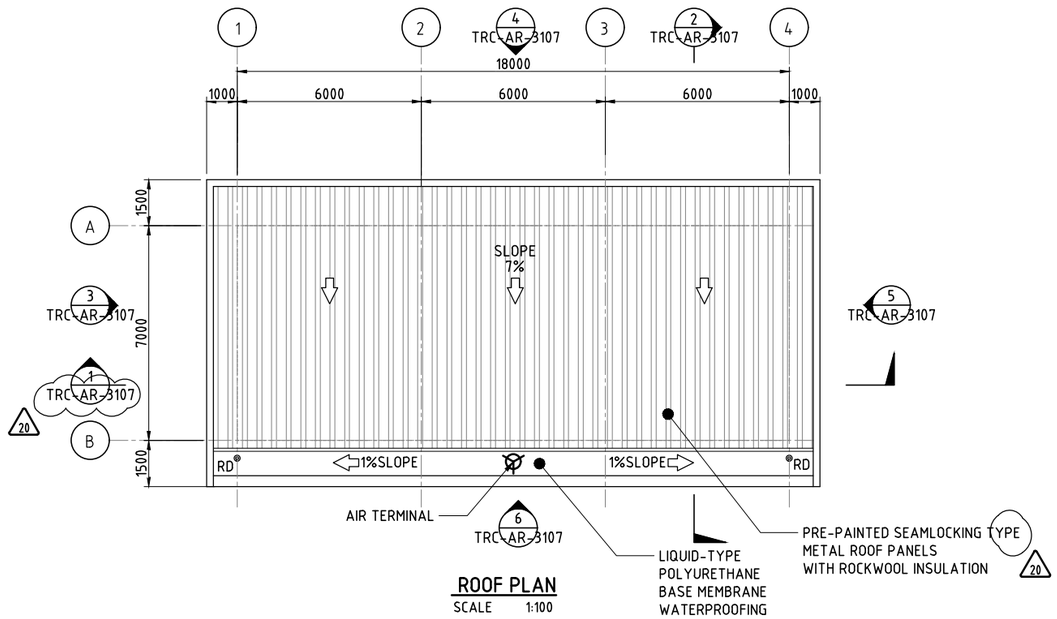
DATE	MAY 2021
SCALE	AS SHOWN IN A1
SHEET No.	1 OF 1
DRG No.	NSCR-GCR-NS01-ZWE-DWG-DS-000002
DRG S.	REV 02

Last modified by USER / 11 Aug 2021
Filename: C:\Users\User\Downloads\MCRP-DWG-VIA00-ST-1901\MCRP-DWG-VIA00-ST-1901_1

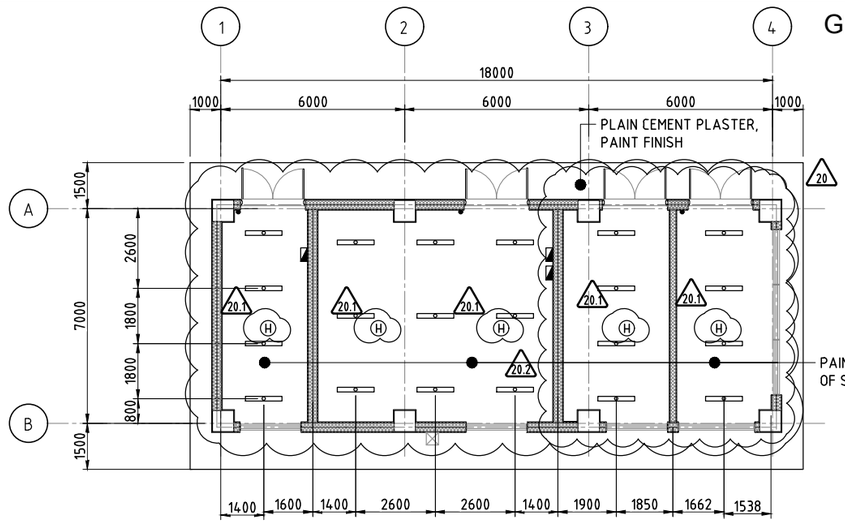
GBB No. 25



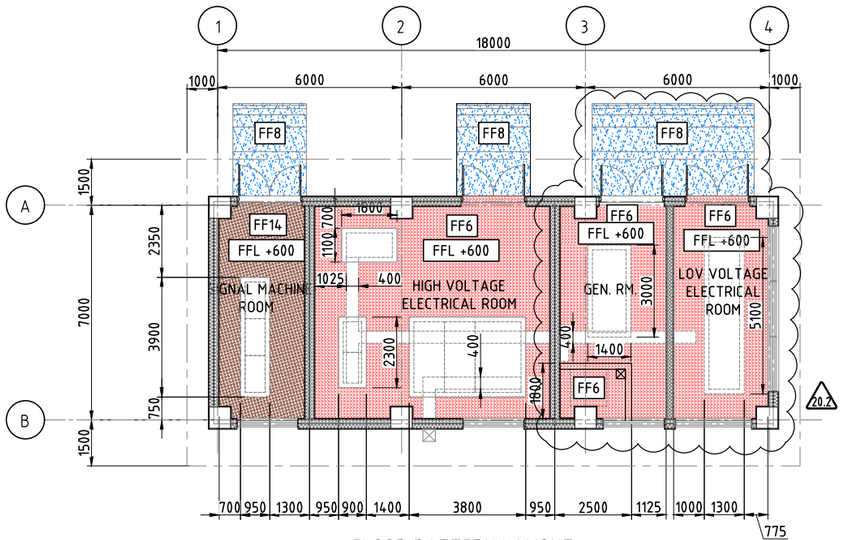
ELECTRICAL BUILDING PLAN
SCALE 1:100



ROOF PLAN
SCALE 1:100



REFLECTED CEILING PLAN
SCALE 1:100



FLOOR PATTERN LAYOUT
SCALE 1:100

LEGEND:

- SUSPENDED LED LAMP,3920 LM, 32 WATTS
- LIGHT SWITCH

SYMBOL	TYPE	TYPE OF MATERIALS
	FF6	SELF-LEVELLING EPOXY PAINT WITH HARDENER
	FF14	ACCESS FLOORING(ANTI-STATIC RAISED FLOOR SYSTEM) INCLUDE DUST-PROOF EPOXY WITH 500X500 CARPET TILE
	FF8	WASHOUT PEBBLE FINISH

NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE IN COORDINATING THE REFLECTED CEILING PLANS WITH: ELECTRICAL LIGHTING SYSTEMS AND COMMUNICATIONS DRAWINGS, MECHANICAL SUPPLIES AND RETURNS EXHAUST DRAWINGS, AIR- CONDITIONING DRAWINGS, FIRE PROTECTION DRAWINGS, FIRE DETECTION AND ALARM DRAWINGS, OR ANY OTHER UTILITY DRAWINGS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT ON ANY OMISSIONS OR INCONSISTENCIES. A SHOP DRAWING SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW THAT INCLUDES ALL ARCHITECTURAL, AND BUILDING SYSTEM ELEMENTS WITH METHOD STATEMENTS BEFORE IMPLEMENTATION.
2. IF A CEILING TILE MODULE IS USED, THE LOCATION OF LIGHTING FIXTURES, SPRINKLER HEADS, MECHANICAL VENTILATION DIFFUSERS, CEILING MOUNTED AIR-CONDITIONING, HEAT AND SMOKE DETECTORS SHALL BE AT THE CENTER OF EACH TILE - UNLESS NOTED OTHERWISE.
3. THE CONTRACTOR SHALL VERIFY CEILING ACCESS PANEL LOCATIONS AS IT MAY VARY PER REQUIREMENT OF DIFFERENT UTILITY DISCIPLINES.
4. ALL UTILITY AND SERVICES INVOLVE WITH THE REFLECTED CEILING PLAN SHALL BE COORDINATED FOR FURTHER REVIEW DURING CONSTRUCTION PHASE.
5. FOR GENERAL NOTES AND LEGEND, REFERE TO DRAWINGS MCRP-DWG-DEP-AR-3011 TO 3012 AND MCRP-DWG-TRC-ST-4001 TO 4004.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
7. ELEVATION +0.00m = +108.75m ABOVE MEAN SEA LEVEL/DEPOT TOP OF RAIL/FGL.

SCALE 1:100

ISSUED FOR CONSTRUCTION

Yoshio Maeda
GCR Project Manager (N2)
17 August 2020

VERSIONS	DATE	DESCRIPTION
30	14 AUG 2020	ISSUE FOR DETAILED DESIGN

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO., LTD.
KATAHIRA & ENGINEERS INTERNATIONAL
PACIFIC CONSULTANTS CO., LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO., LTD.
TONICHI ENGINEERING CONSULTANTS INC.
TOKYO METRO CO., LTD

TITLE	JDT	SMEC
DESIGNER	K. YANAGI	A. GISALA
CHECK	K. SUZUKI	A. ALLI
TEAM LEADER	K. KUSANAGI	W. FRENCKEN
P. MANAGER	Y. MAEDA	R. YUZON JR.

MALOLOS-CLARK RAILWAY PROJECT (MCRP)

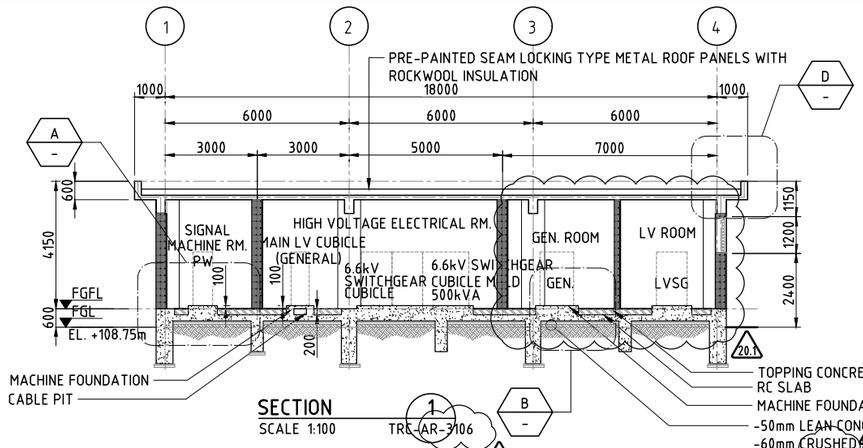
PACKAGE CP N-05 : DETAILED DESIGN

MCRP-NORTH DEPOT-TRAINING CENTER ARCHITECTURAL-ELECTRICAL BLDNG FLOOR PLANS, FLOOR PATTERN LAYOUT

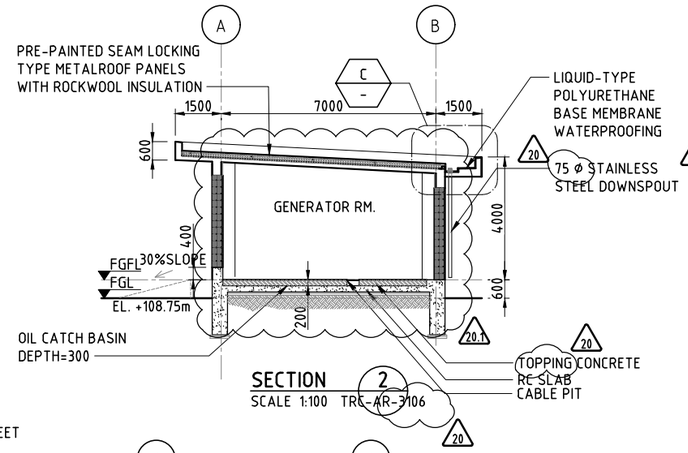
DATE	AUGUST 2020
SCALE	AS SHOWN IN A1
SHEET No.	
DRG No.	MCRP-DWG-TRC-AR-3106
DRG S.	REV 30

GBB No. 25

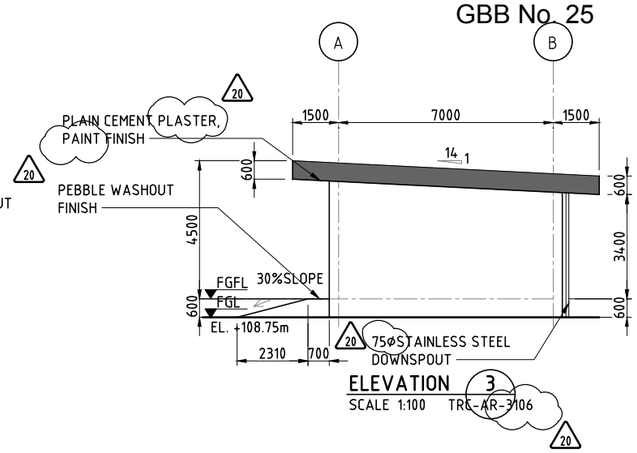
WVR-711



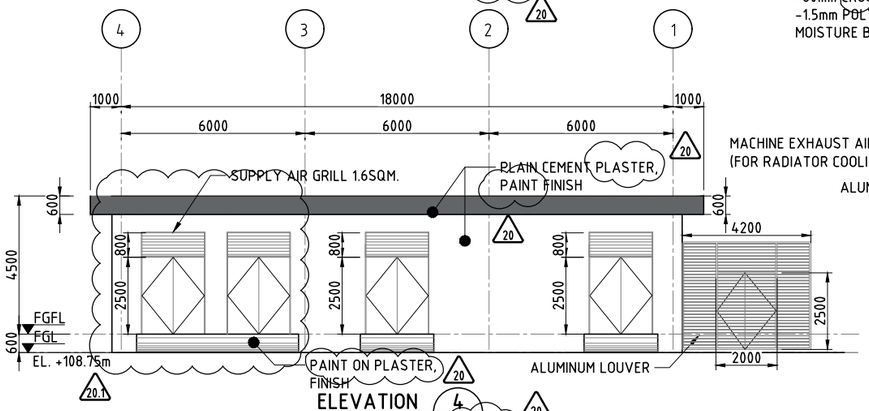
SECTION 1
SCALE 1:100 TRC-AR-3106



SECTION 2
SCALE 1:100 TRC-AR-3106



ELEVATION 3
SCALE 1:100 TRC-AR-3106



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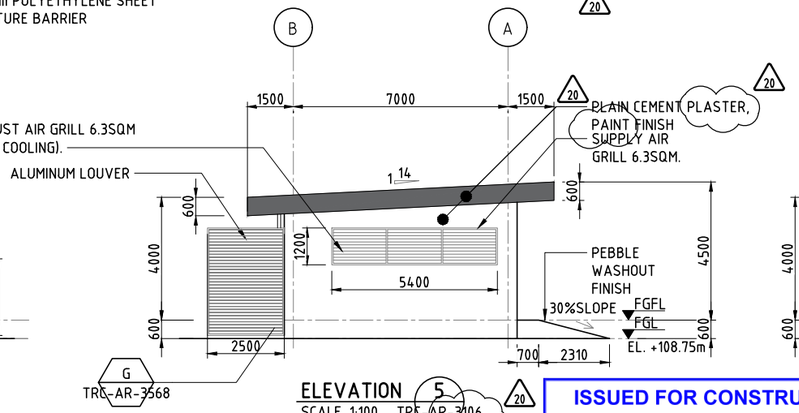
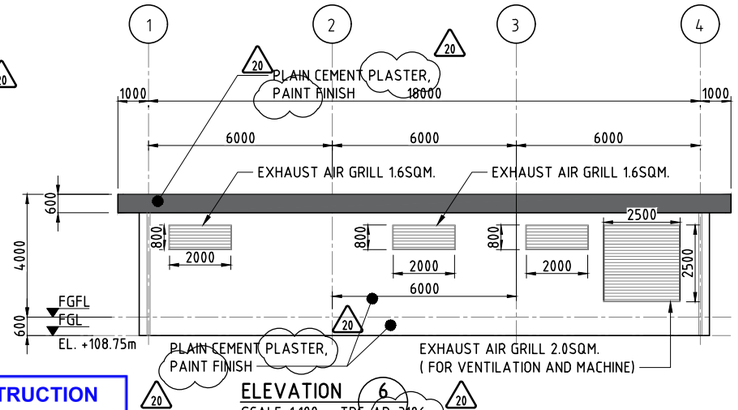


G
TRC-AR-3568

ELEVATION 5
SCALE 1:100 TRC-AR-3106



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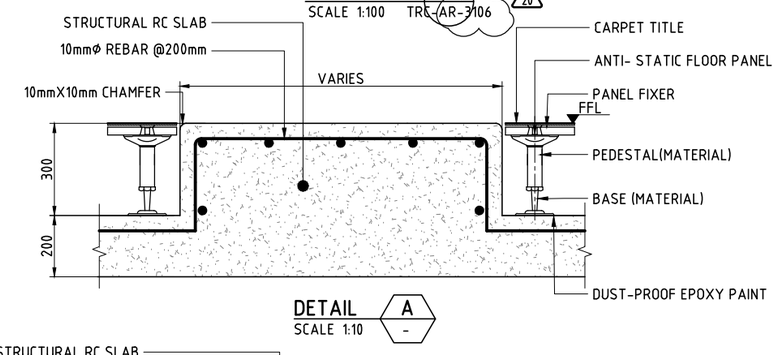
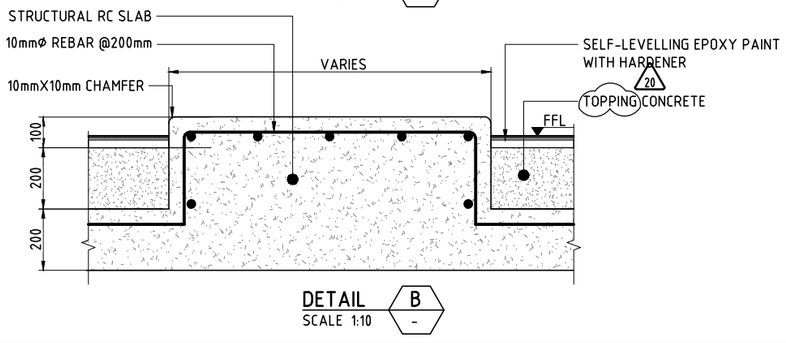
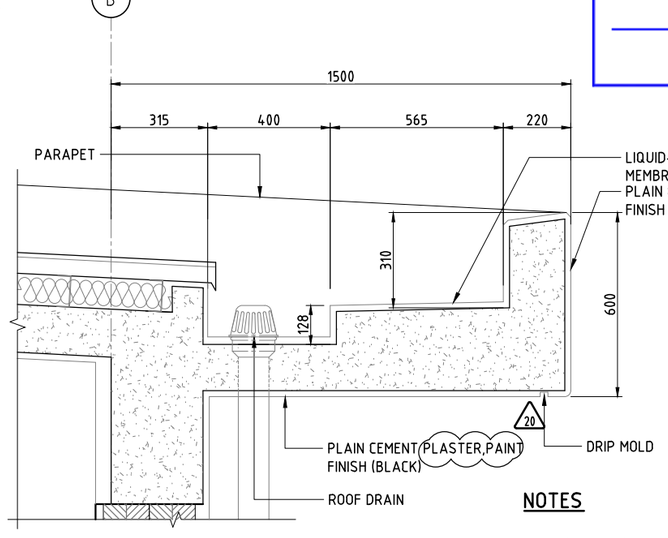
SCALE 1:100 TRC-AR-3106



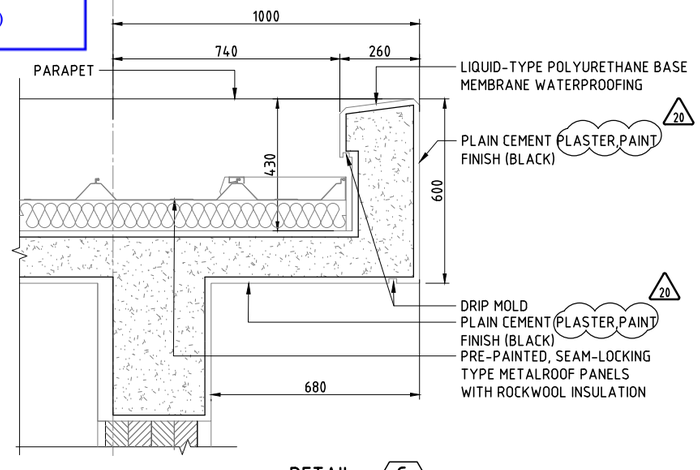
DETAIL A
SCALE 1:10



DETAIL B
SCALE 1:10



DETAIL C
SCALE 1:10



DETAIL C
SCALE 1:10

ISSUED FOR CONSTRUCTION

Yoshio Maeda
GCR Project Manager (N2)
17 August 2020

NOTES

1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWINGS MCRP-DWG-DEP-AR-3011 TO 3012 AND MCRP-DWG-TRC-ST-4001 TO 4004.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
3. ELEVATION +0.00 = +108.75m ABOVE MEAN SEA LEVEL/DEPOT TOP OF RAIL/FGL.

SCALE 1:100

VERSIONS	DATE	DESCRIPTION
30	14 AUG 2020	ISSUE FOR DETAILED DESIGN

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

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KATAHIRA & ENGINEERS INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS INC.
PACIFIC CONSULTANTS CO., LTD.
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TITLE	JDT	SMEC
DESIGNER	K. YANAGI	A. GISALA
CHECK	K. SUZUKI	A. ALLI
TEAM LEADER	K. KUSANAGI	W. FRENCKEN
P. MANAGER	Y. MAEDA	R. YUZON JR.

MALOLOS-CLARK RAILWAY PROJECT (MCRP)

PACKAGE CP N-05 : DETAILED DESIGN

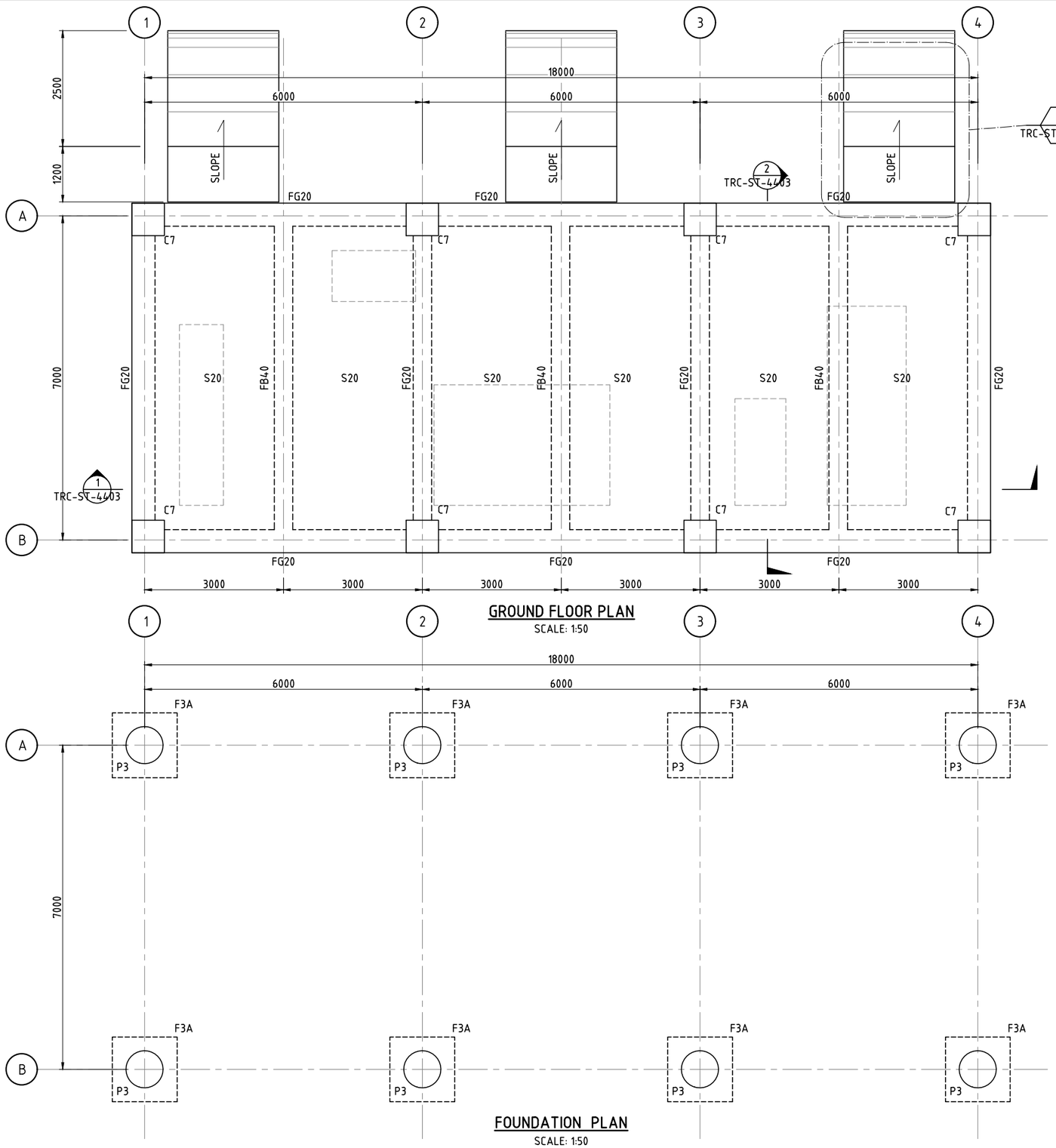
MCRP-NORTH DEPOT-TRAINING CENTER ARCHITECTURAL-ELECTRICAL BLDNG ELEVATIONS AND SECTION

DATE: AUGUST 2020
SCALE: AS SHOWN IN A1
SHEET No.:
DRG No.: MCRP-DWG-TRC-AR-3107
DRG S.:
REV: 30

Last modified by CS626034? / 11 Aug 2020
Filename: V:_Vault\Projects\705194\MCRP\CAD\DWG\22_DEP_Depot\30_TRC_Training Center\05_TRC_AR\MCRP-DWG-TRC-AR-3107

WVR-706

GBB No. 25



GROUND FLOOR PLAN
SCALE: 1:50

FOUNDATION PLAN
SCALE: 1:50

ISSUED FOR CONSTRUCTION

Yoshio Maeda
GCR Project Manager (N2)
17 August 2020

NOTES

UNLESS OTHERWISE NOTED

1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWINGS MCRP-DWG-TRC-ST-4001 TO 4041.
2. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS NOTED OTHERWISE.
3. MINIMUM 28 DAY CHARACTERISTIC CONCRETE ~~COMPRESSIVE STRENGTH, f'_c = 31 MPa~~ FOR SLABS , BEAMS ,COLUMNS AND GIRDER, f'_c = 36 MPa FOR IN-SITU RC PILES
4. TOP OF PILE FGL-1.90m.
5. ELEVATION 0.00=+108.75m ABOVE MEAN SEA LEVEL/DEPOT TOP RAIL/FGL.

SCALE 1:50 0.5 0 1 2

VERSIONS	DATE	DESCRIPTION
30	14 AUG 2020	ISSUE FOR DETAILED DESIGN

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

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KATAHIRA & ENGINEERS INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS INC.
PACIFIC CONSULTANTS CO., LTD.
TOKYO METRO CO., LTD

TITLE	JDT	SMEC
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CHECK	H. KISHI	R. TEMPLO
TEAM LEADER	K. KUSANAGI	W. FRENCKEN
P. MANAGER	Y. MAEDA	R. YUZON JR.

MALOLOS-CLARK RAILWAY PROJECT (MCRP)

PACKAGE CP N-05 : DETAILED DESIGN

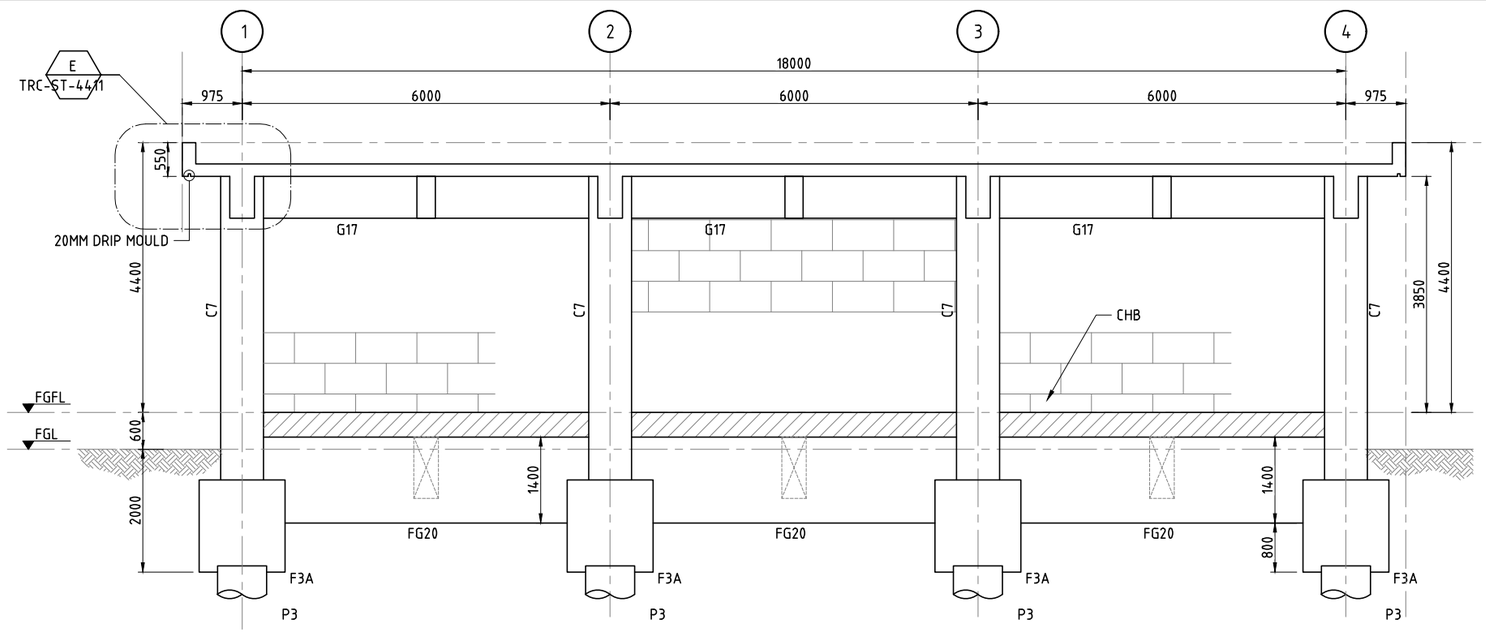
MCRP-NORTH DEPOT-TRAINING CENTER FOUNDATION AND GROUND FLOOR PLAN ELECTRICAL BUILDING

DATE: AUGUST 2020
SCALE: AS SHOWN IN A1
SHEET No.:
DRG No.: MCRP-DWG-TRC-ST-4401
DRG S.:
REV: 30

Last modified by AA6260152 / 17 Aug 2020
Filename: V:_Vault\Projects\705194\MCRP\CAD\DWG\22_DEP_Depot\30_TRC_Training Center\06_TRC-ST\MCRP-DWG-TRC-ST-4401

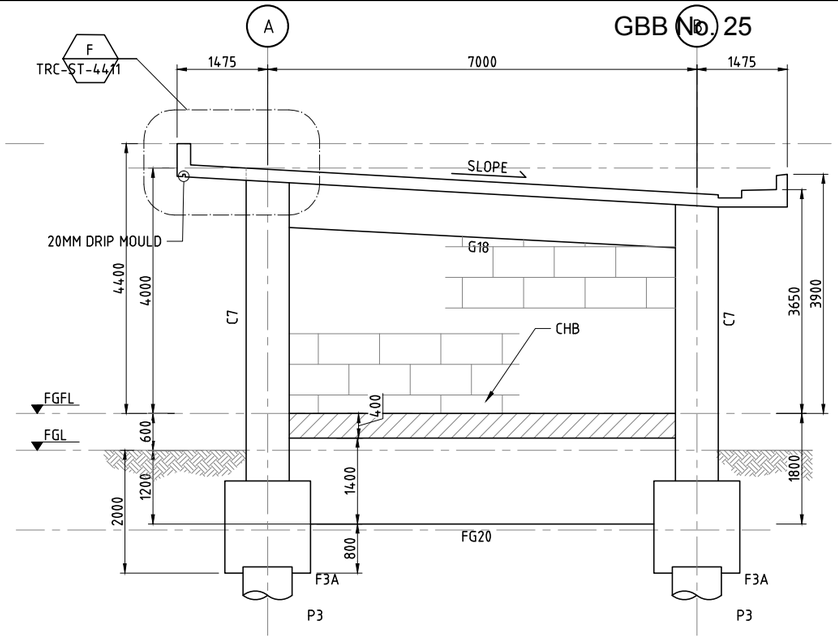
WVR-706

GBB No. 25



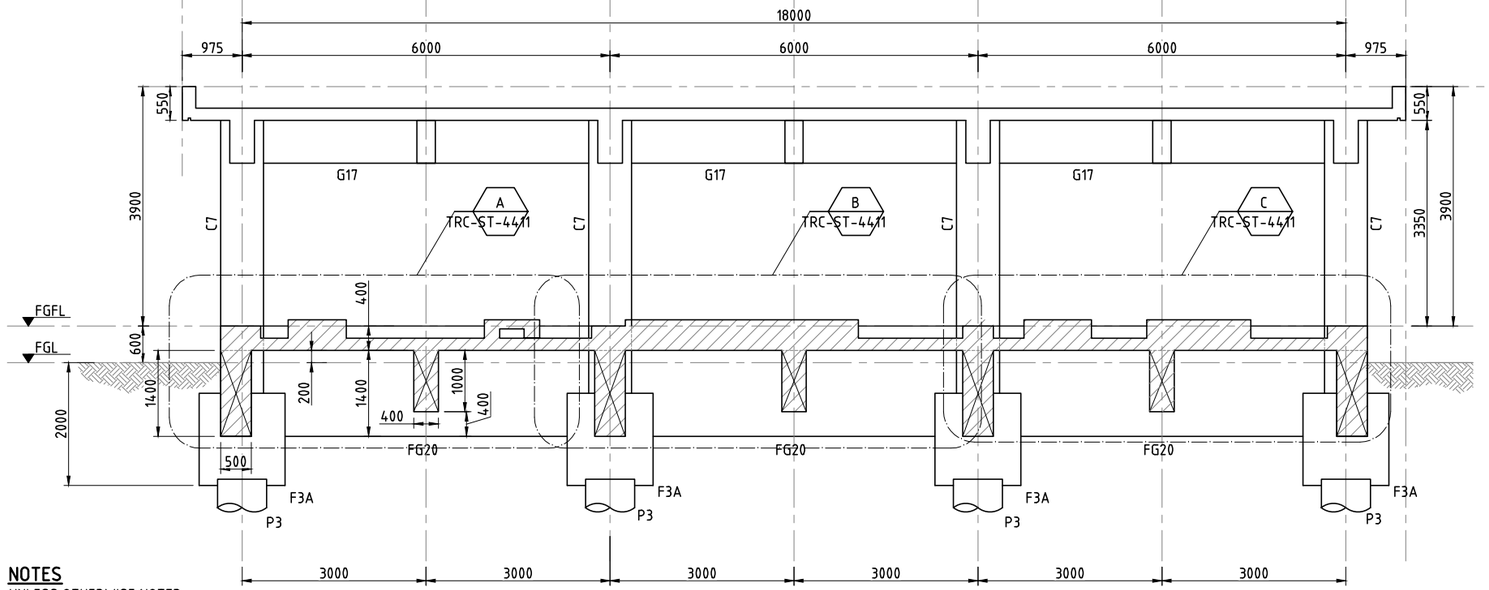
FRAME ELEVATION ALONG GRID A

SCALE: 1:50

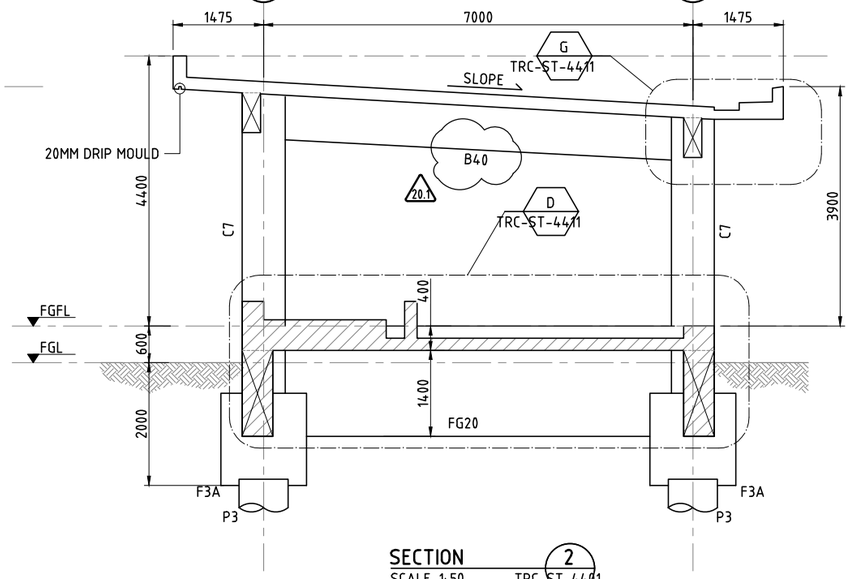


FRAME ELEVATION ALONG GRID 1

SCALE: 1:50



SECTION 1
SCALE 1:50 TRC-ST-4401



SECTION 2
SCALE 1:50 TRC-ST-4401

NOTES

UNLESS OTHERWISE NOTED

1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWINGS MCRP-DWG-TRC-ST-4001 TO 4041.
2. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS NOTED OTHERWISE.
3. MINIMUM 28 DAY CHARACTERISTIC CONCRETE COMPRESSIVE STRENGTH, f`c = 31 MPa FOR SLABS , BEAMS ,COLUMNS AND GIRDER.
4. FGL=110.25m, EL.=108.75m
5. ELEVATION 0.00=+108.75m ABOVE MEAN SEA LEVEL/DEPOT TOP RAIL/FGL.

SCALE 1:50 0.5 0 1 2

ISSUED FOR CONSTRUCTION

Yoshio Maeda
GCR Project Manager (N2)
17 August 2020

VERSIONS	DATE	DESCRIPTION
30	14 AUG 2020	ISSUE FOR DETAILED DESIGN

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

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KATAHIRA & ENGINEERS INTERNATIONAL
PACIFIC CONSULTANTS CO., LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO., LTD.
TONICHI ENGINEERING CONSULTANTS INC.
TOKYO METRO CO., LTD

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CHECK	H. KISHI	R. TEMPLO
TEAM LEADER	K. KUSANAGI	W. FRENCKEN
P. MANAGER	Y. MAEDA	R. YUZON JR.

MALOLOS-CLARK RAILWAY PROJECT (MCRP)

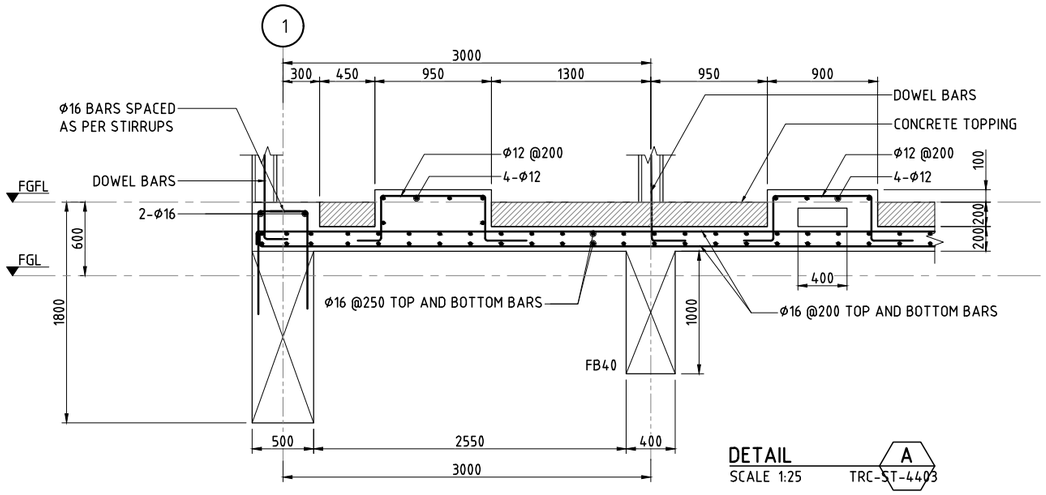
PACKAGE CP N-05 : DETAILED DESIGN

MCRP-NORTH DEPOT-TRAINING CENTER
ELEVATIONS
ELECTRICAL BUILDING

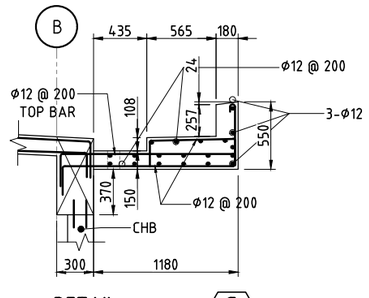
DATE	AUGUST 2020
SCALE	AS SHOWN IN A1
SHEET No.	
DRG No.	MCRP-DWG-TRC-ST-4403
DRG S.	REV 30

Last modified by JA6260296 / 17 Aug 2020
Filename: V:_Vault\Projects\705119A\MCRP\CAD\DWG\22_DEP_Depot\30_TRC_Training Center\06_TRC-ST\MCRP-DWG-TRC-ST-4403

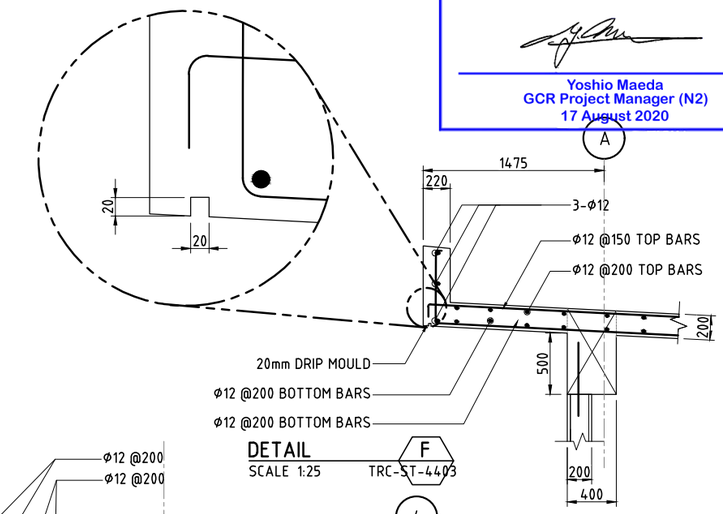
W\VR-706



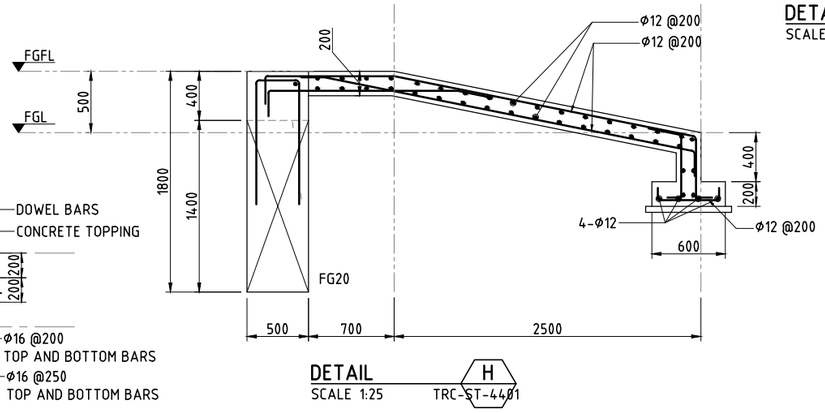
DETAIL A
SCALE 1:25 TRC-ST-4403



DETAIL G
SCALE 1:25 TRC-ST-4403



DETAIL F
SCALE 1:25 TRC-ST-4403



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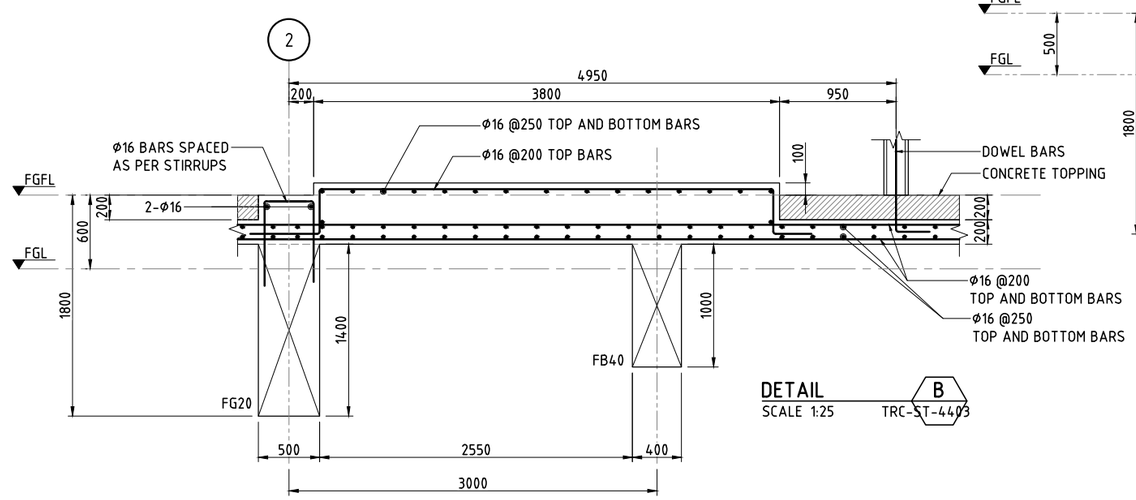
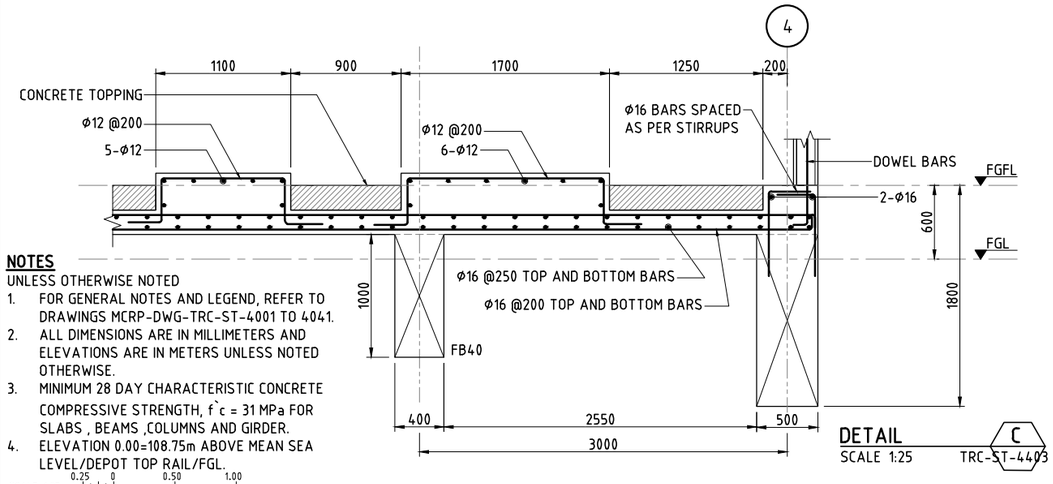
SCALE 1:25 TRC-ST-4401



DETAIL B
SCALE 1:25 TRC-ST-4403

DETAIL E
SCALE 1:25 TRC-ST-4403



DETAIL C
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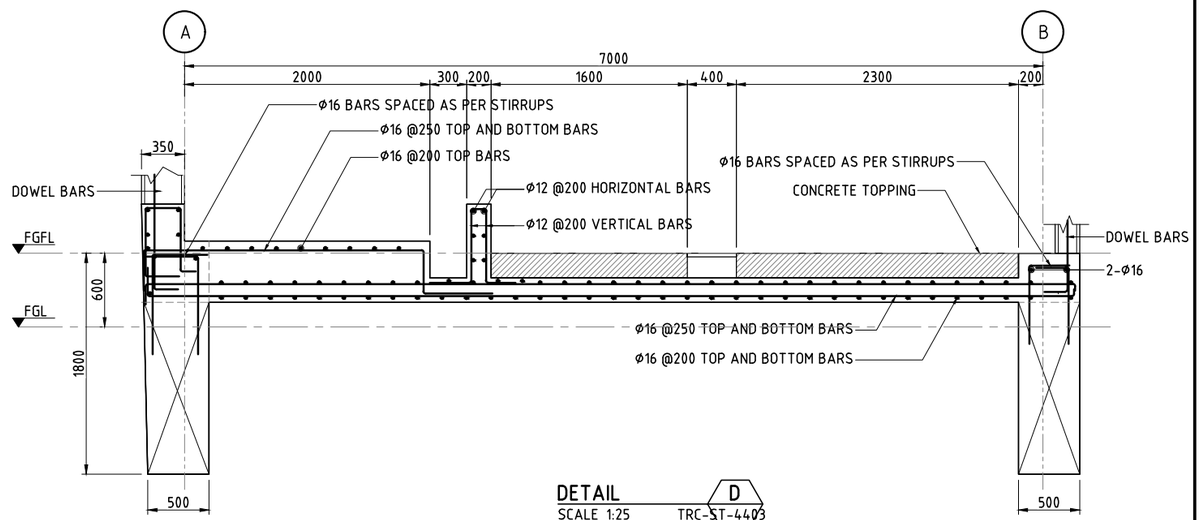


DETAIL D
SCALE 1:25 TRC-ST-4403

NOTES
UNLESS OTHERWISE NOTED
1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWINGS MCRP-DWG-TRC-ST-4001 TO 4041.
2. ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS UNLESS NOTED OTHERWISE.
3. MINIMUM 28 DAY CHARACTERISTIC CONCRETE COMPRESSIVE STRENGTH, f`c = 31 MPa FOR SLABS , BEAMS ,COLUMNS AND GIRDER.
4. ELEVATION 0.00=108.75m ABOVE MEAN SEA LEVEL/DEPOT TOP RAIL/FGL.

SCALE 1:25 0.25 0 0.50 1.00

GRR No. 25
ISSUED FOR CONSTRUCTION
Yoshio Maeda
GCR Project Manager (N2)
17 August 2020

VERSIONS	DATE	DESCRIPTION
30	14 AUG 2020	ISSUE FOR DETAILED DESIGN

DEPARTMENT OF TRANSPORTATION (DOTr)
PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)
ORIENTAL CONSULTANTS GLOBAL CO., LTD.
KATAHIRA & ENGINEERS INTERNATIONAL
PACIFIC CONSULTANTS CO., LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO., LTD.
TONICHI ENGINEERING CONSULTANTS INC.
TOKYO METRO CO., LTD

TITLE	JDT	SMEC
DESIGNER	Y. HONDA	A. SALANGA
CHECK	H. KISHI	R. TEMPLO
TEAM LEADER	K. KUSANAGI	W. FRENCKEN
P. MANAGER	Y. MAEDA	R. YUZON JR.

MALOLOS-CLARK RAILWAY PROJECT (MCRP)

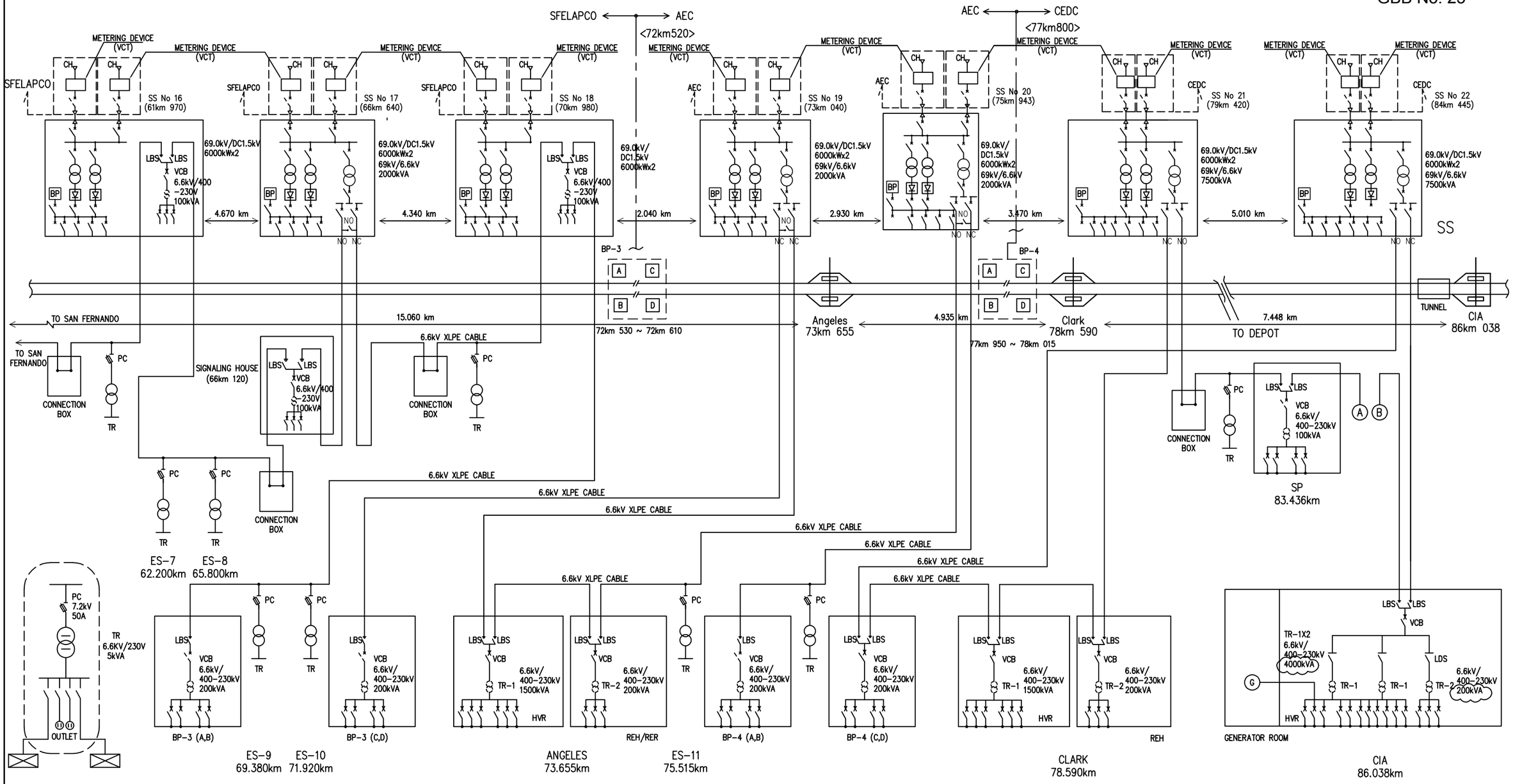
PACKAGE CP N-05 : DETAILED DESIGN

MCRP-NORTH DEPOT-TRAINING CENTER SECTION DETAILS ELECTRICAL BUILDING

DATE: AUGUST 2020
SCALE: AS SHOWN IN A1
SHEET No.:
DRG No.: MCRP-DWG-TRC-ST-4411
DRG S.:
REV: 30

Last modified by SS6200307 / 17 Aug 2020
Filename V:_Vault\Projects\7051194\MCRP\CAD\DWG\22_DEP_Depot\30_TRC_Training Center\06_TRC-ST\MCRP-DWG-TRC-ST-4411

GBB No. 25



NOTE :

SS	:	SUBSTATION
HVR	:	HIGH VOLTAGE RECEIVING ROOM
REH	:	RAILWAY ELECTRIC HOUSE
RER	:	RAILWAY ELECTRIC ROOM
— · —		BOUNDARY
———		6.6kV XLPE CVT
A~D		BATTERY POST
PC	:	CUTOUT SWITCH WITH FUSE

TR TRANSFORMER FOR COMMUNICATION SIGNALING
TR-1 BUILDING TR
TR-2 COMMUNICATION SIGNALING TR
ES EMERGENCY STAIRCASE

REMARKS : FOR THE LOCATION, TO BE INFORMED LATER

FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
00	02 MAR 2021	ISSUED FOR REFERENCE
01	24 JUN 2021	RESISTOR CHANGED TO BP & SS NO 1 TO SS NO 22 CHAINED REVISED
02	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)
PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)
ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS, INC.
PACIFIC CONSULTANTS CO.,LTD.
Tokyo Metro Co.,Ltd.

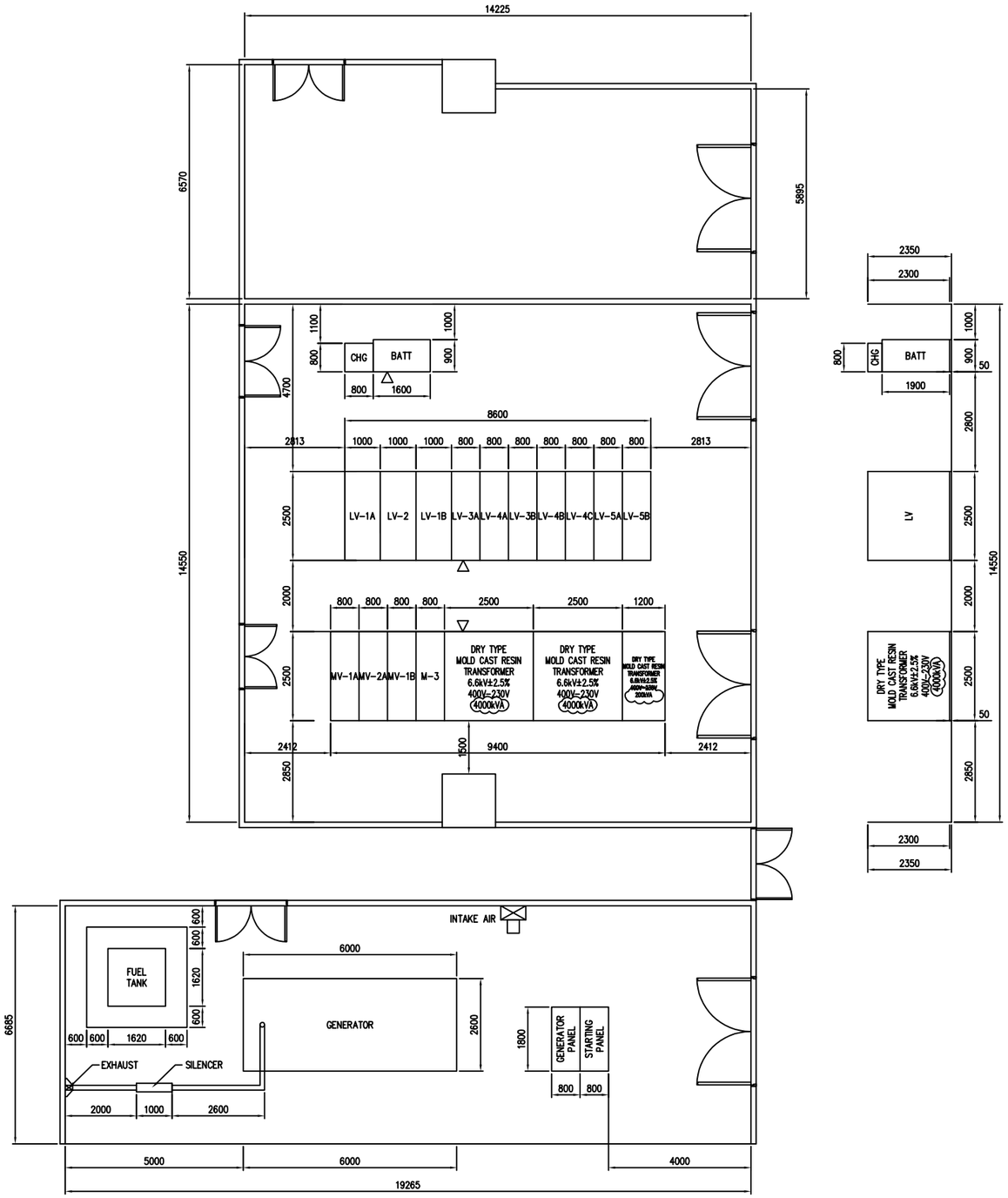
TITLE	JDT	SMEC
DESIGNER	K.MORIYAMA	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

Package CP NS–01 : Bidding Documents

6.6kV POWER SUPPLY SCHEMATIC DIAGRAM
2/2

DATE	21 JUNE 2019
SCALE	NONE
SHEET No.	4 OF 20
DRG No.	MCRP-DWG-PDS-0004
DRG S.	–
REV	02



FOR REFERENCE

1 ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1:150

VERSIONS	DATE	DESCRIPTION
00	02 MAR 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

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JICA DESIGN TEAM (JDT)

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JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS, INC.
PACIFIC CONSULTANTS CO.,LTD.
Tokyo Metro Co.,Ltd.

TITLE	JDT	SMEC
DESIGNER	K. MORIYAMA	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

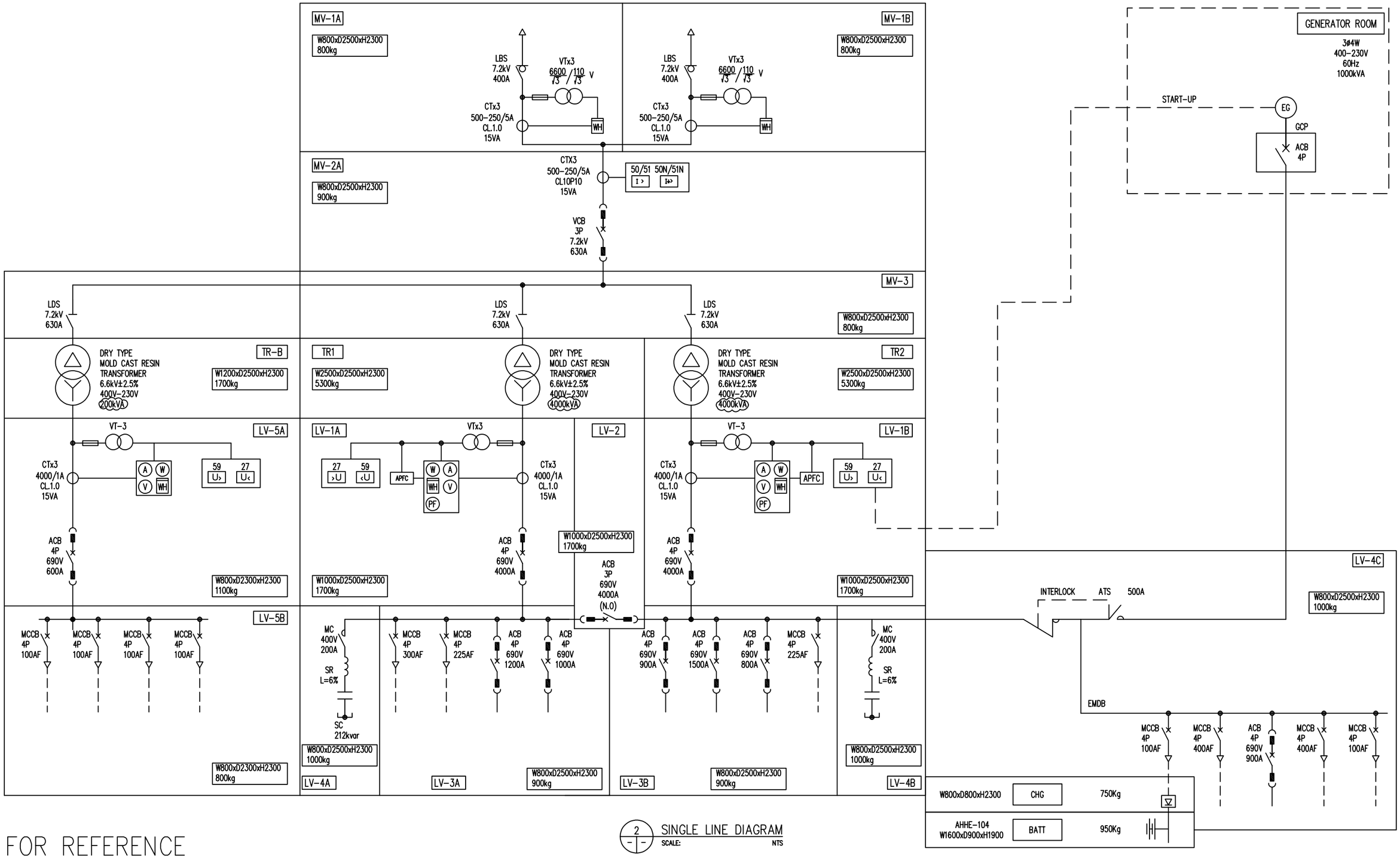
MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

Package CP NS–01 : Bidding Documents

ELECTRICAL ROOM EQUIPMENT LAYOUT IN THE CLARK INTERNATIONAL AIRPORT STATION

DATE	21 JUNE 2019
SCALE	AS SHOWN
SHEET No.	5 OF 20
DRG No.	MCRP–DWG–CIA–PDS–0005
DRG S.	–
REV	01

GBB No. 25



2 SINGLE LINE DIAGRAM
SCALE: NTS

FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
00	02 MAR 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.

JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.

KATAHIRA & ENGINEER INTERNATIONAL

TONICHI ENGINEERING CONSULTANTS, INC.

PACIFIC CONSULTANTS CO.,LTD.

Tokyo Metro Co.,Ltd.

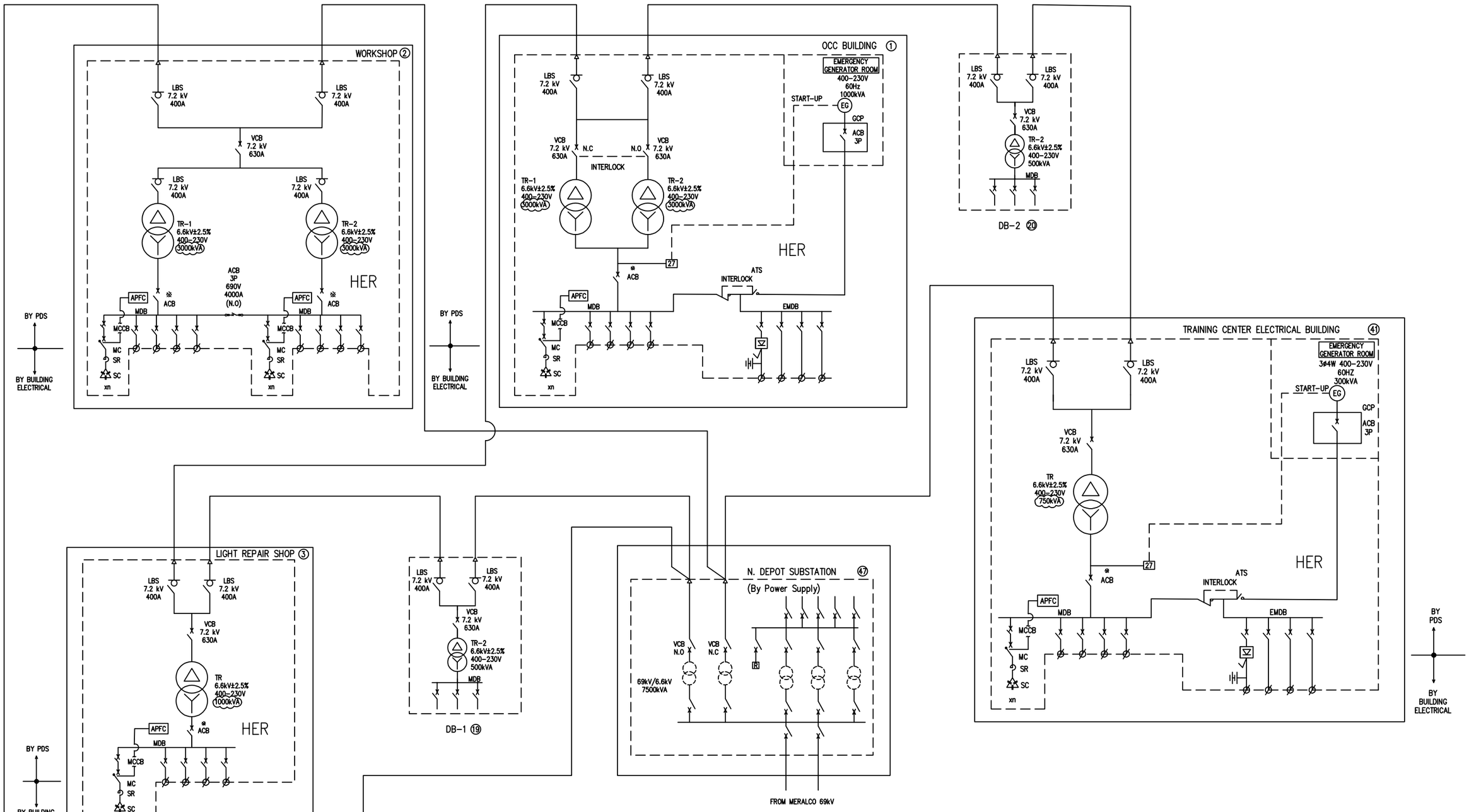
TITLE	JDT	SMEC
DESIGNER	K.MORIYAMA	-
CHECK	T.MATSUMOTO	-
TEAM LEADER	T.ISHIZUKA	-
P. MANAGER	N.KAWAI	-

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT-SOUTH (NSRP-SOUTH)

Package CP NS-01 : Bidding Documents

SINGLE LINE DIAGRAM IN THE CLARK INTERNATIONAL AIRPORT STATION

DATE	21 JUNE 2019
SCALE	NONE
SHEET No.	6 OF 20
DRG No.	MCRP-DWG-CIA-PDS-0006
DRG S.	-
REV	01



VERSIONS	DATE	DESCRIPTION
00	02 MAR 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.

JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.

KATAHIRA & ENGINEER INTERNATIONAL

TONICHI ENGINEERING CONSULTANTS, INC.

PACIFIC CONSULTANTS CO.,LTD.

Tokyo Metro Co.,Ltd.

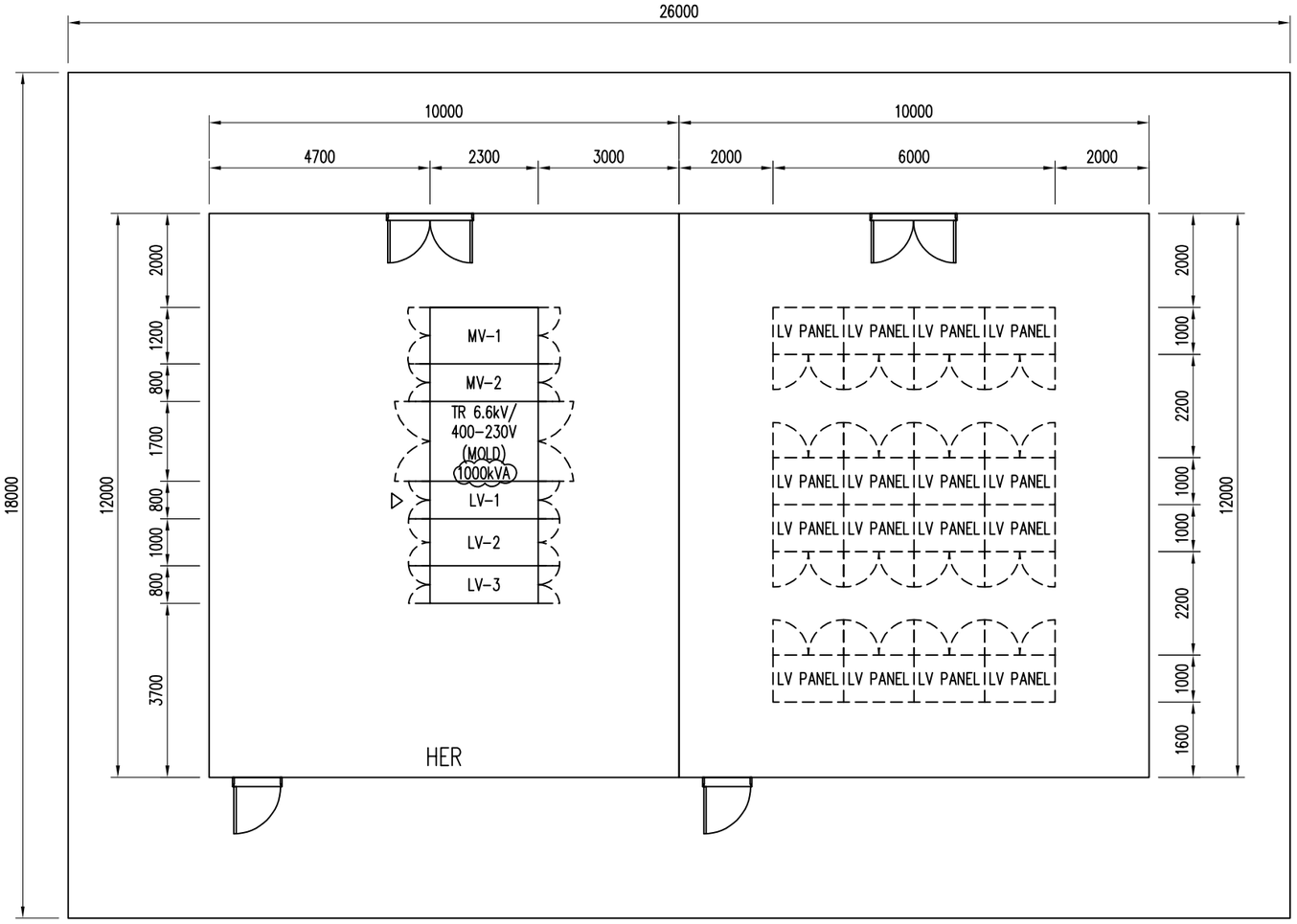
TITLE	JDT	SMEC
DESIGNER	K.MORIYAMA	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

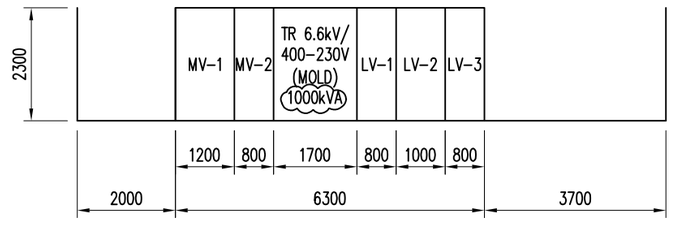
MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

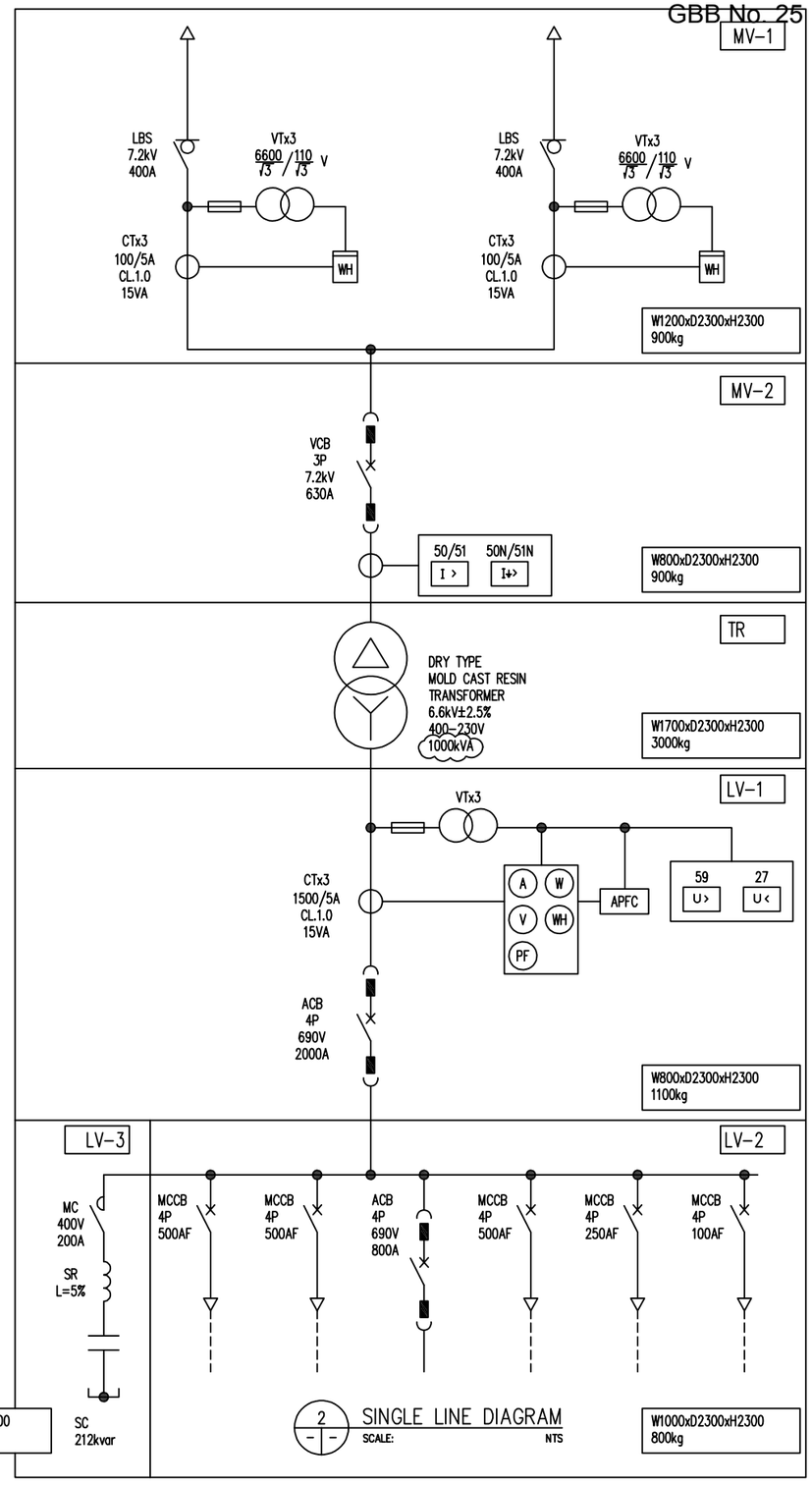
Package CP NS–01 : Bidding Documents

POWER DISTRIBUTION SYSTEM SINGLE LINE DIAGRAM IN THE NORTH DEPOT

DATE 21 JUNE 2019
SCALE NONE
SHEET No. 10 OF 20
DRG No. MCRP-DWG-DEP-PDS-0010
DRG S. –
REV 01







FOR REFERENCE

1 ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1:125

2 SINGLE LINE DIAGRAM
SCALE: NTS

VERSIONS	DATE	DESCRIPTION
00	02 MAR 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)
PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)
ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS, INC.
PACIFIC CONSULTANTS CO.,LTD.
Tokyo Metro Co.,Ltd.

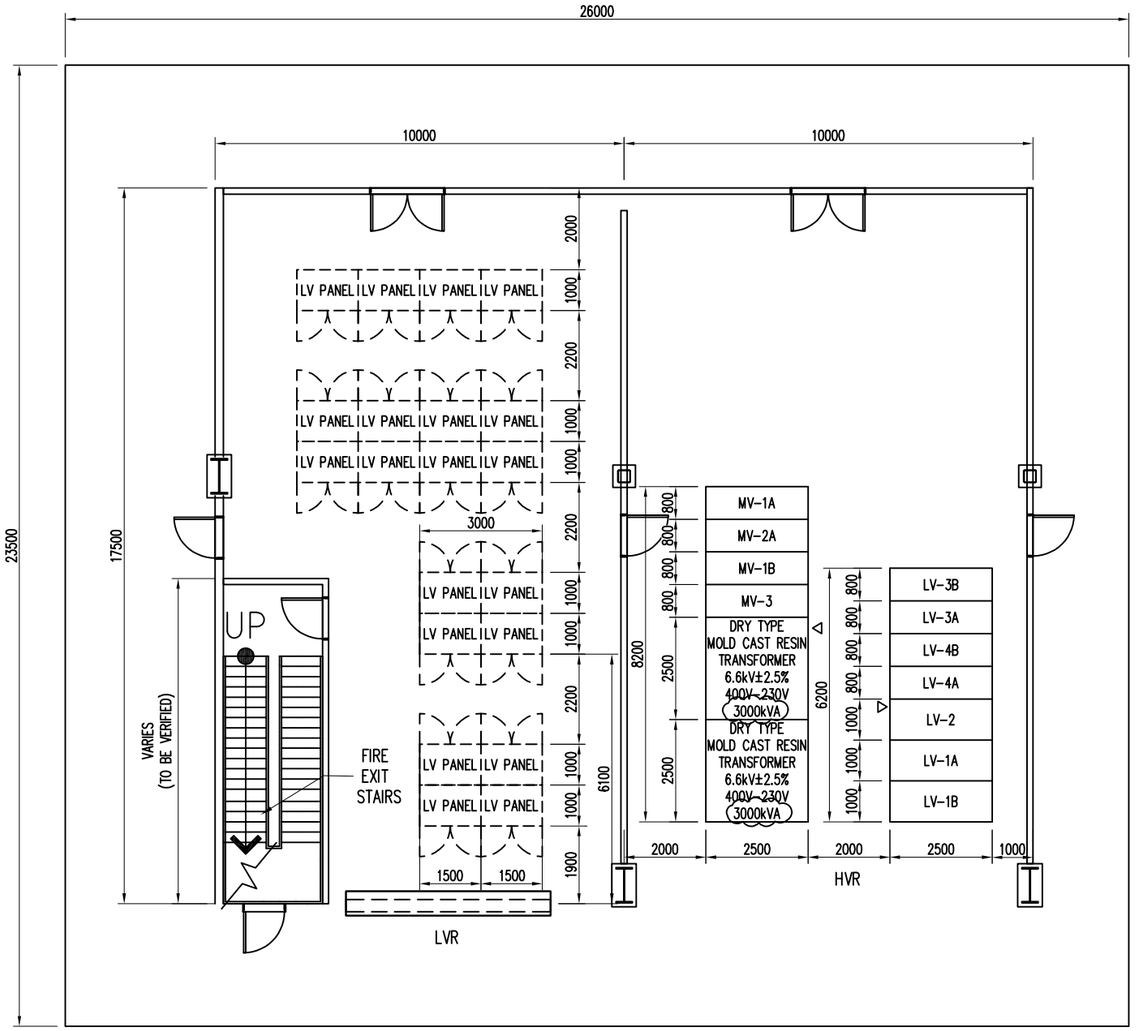
TITLE	JDT	SMEC
DESIGNER	K.MORIYAMA	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

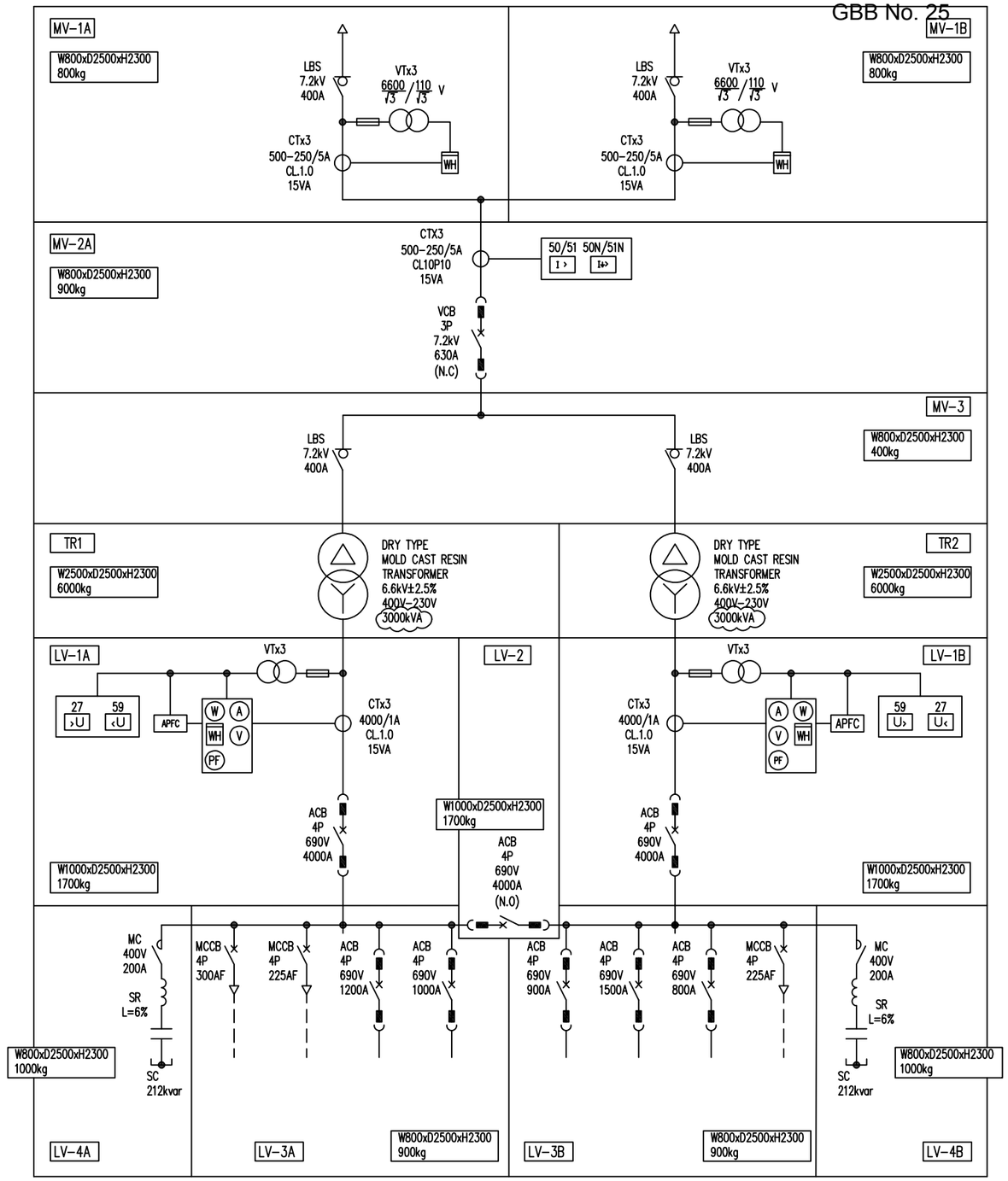
Package CP NS–01 : Bidding Documents

ELECTRICAL ROOM EQUIPMENT LAYOUT AND SINGLE LINE DIAGRAM OF LIGHT REPAIR SHOP IN THE NORTH DEPOT

DATE 21 JUNE 2019
SCALE AS SHOWN
SHEET No. 11 OF 20
DRG No. MCRP–DWG–DEP–PDS–0011
DRG S. –
REV 01



1 HIGH VOLTAGE AND LOW VOLTAGE ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1:120



2 SINGLE LINE DIAGRAM
SCALE: 1:150

FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
00	02 MAR 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)
PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS, INC.
PACIFIC CONSULTANTS CO.,LTD.
Tokyo Metro Co.,Ltd.

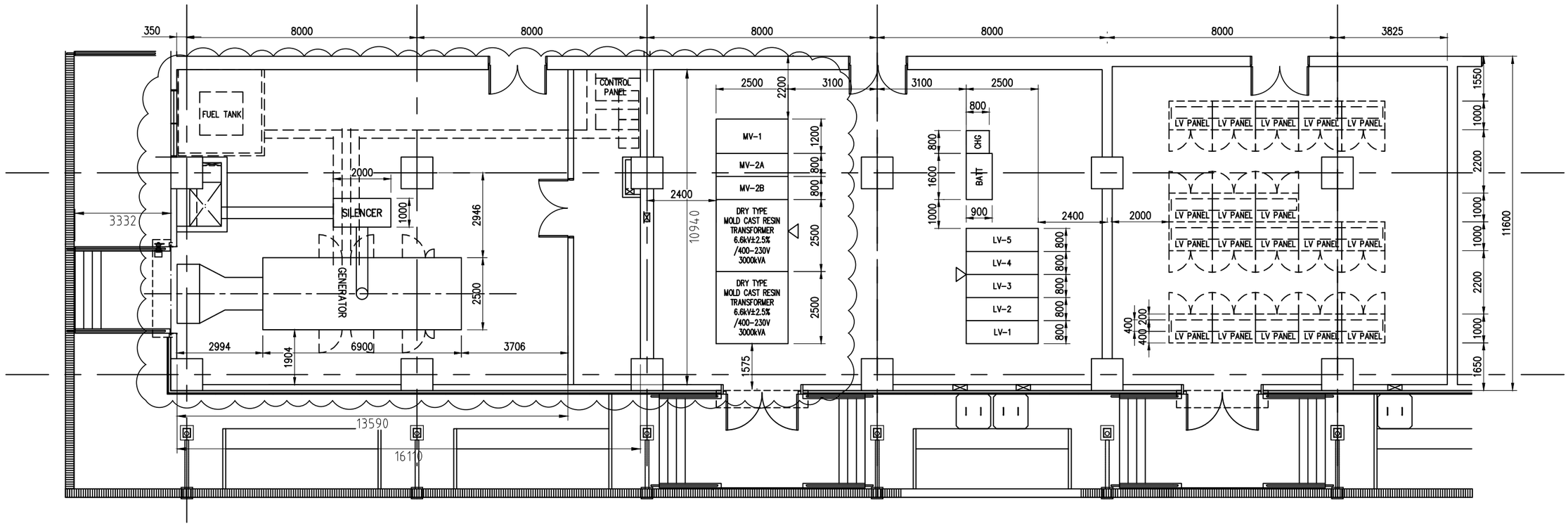
TITLE	JDT	SMEC
DESIGNER	K.MORIYAMA	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

Package CP NS–01 : Bidding Documents

ELECTRICAL ROOM EQUIPMENT LAYOUT AND SINGLE LINE DIAGRAM OF THE WORK SHOP IN THE NORTH DEPOT

DATE	21 JUNE 2019
SCALE	AS SHOWN
SHEET No.	12 OF 20
DRG No.	MCRP–DWG–DEP–PDS–0012
DRG S.	–
REV	01



OCC BUILDING

1 — ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1:150

FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
00	02 MAR 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	GENERATOR ROOM LAYOUT REVISED AND TRANSFORMER SIZE UPDATED

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.

JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.

KATAHIRA & ENGINEER INTERNATIONAL

TONICHI ENGINEERING CONSULTANTS, INC.

PACIFIC CONSULTANTS CO.,LTD.

Tokyo Metro Co.,Ltd.

TITLE	JDT	SMEC
DESIGNER	K. MORIYAMA	
CHECK	T. MATSUMOTO	
TEAM LEADER	T. ISHIZUKA	
P. MANAGER	N. KAWAI	

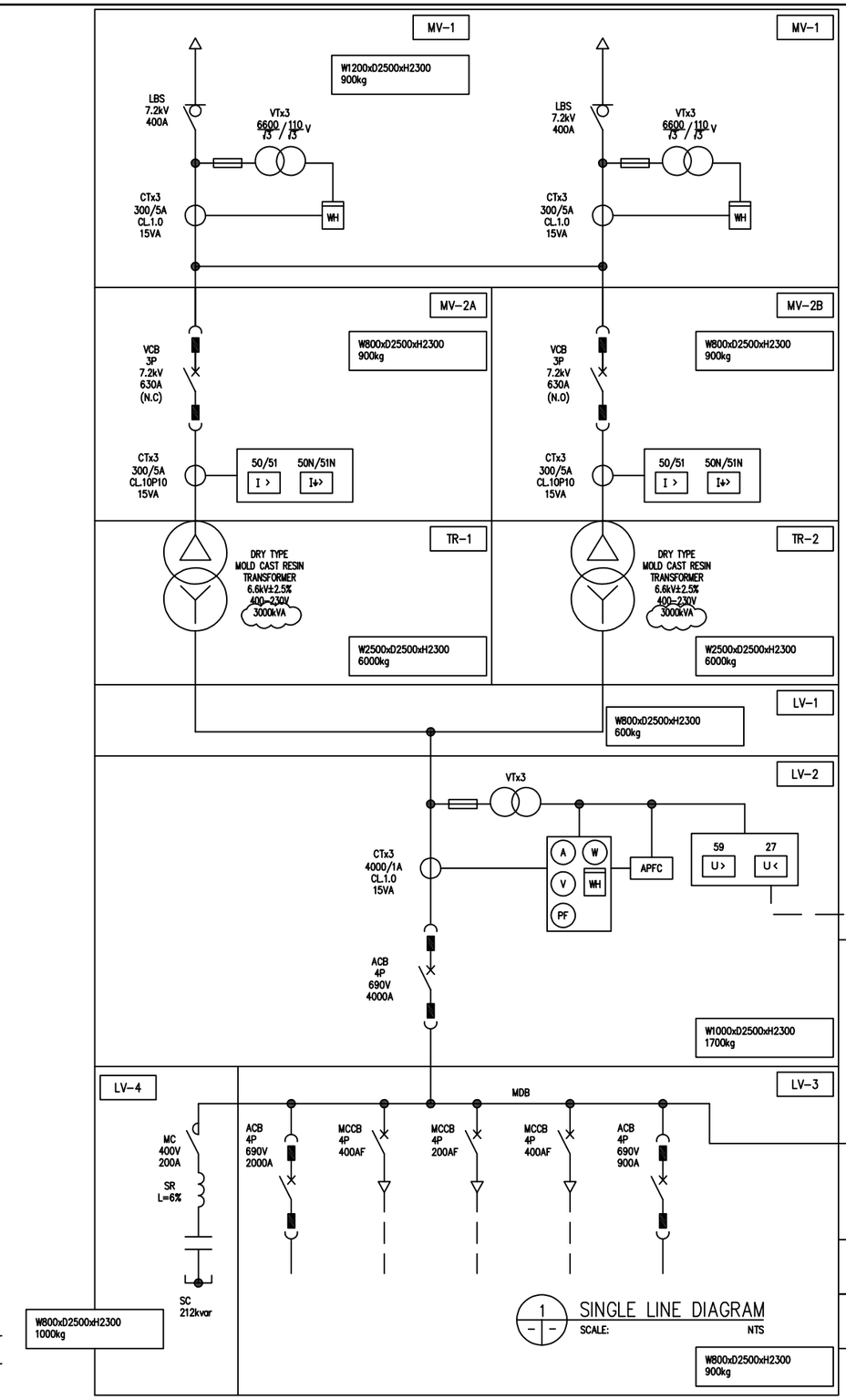
MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

Package CP NS–01 : Bidding Documents

ELECTRICAL ROOM EQUIPMENT LAYOUT IN THE OCC BUILDING

DATE	21 JUNE 2019
SCALE	1:150
SHEET No.	13 OF 20
DRG No.	MCRP–DWG–DEP–PDS–0013
DRG S.	REV 01

GBB No. 25



FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
00	02 MAR 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.

JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.

KATAHIRA & ENGINEER INTERNATIONAL

TONICHI ENGINEERING CONSULTANTS, INC.

PACIFIC CONSULTANTS CO.,LTD.

Tokyo Metro Co.,Ltd.

TITLE	JDT	SMEC
DESIGNER	K.MORIYAMA	-
CHECK	T.MATSUMOTO	-
TEAM LEADER	T.ISHIZUKA	-
P. MANAGER	N.KAWAI	-

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT-SOUTH (NSRP-SOUTH)

Package CP NS-01 : Bidding Documents

SINGLE LINE DIAGRAM OF THE OCC BUILDING IN THE NORTH DEPOT

DATE 21 JUNE 2019

SCALE AS SHOWN

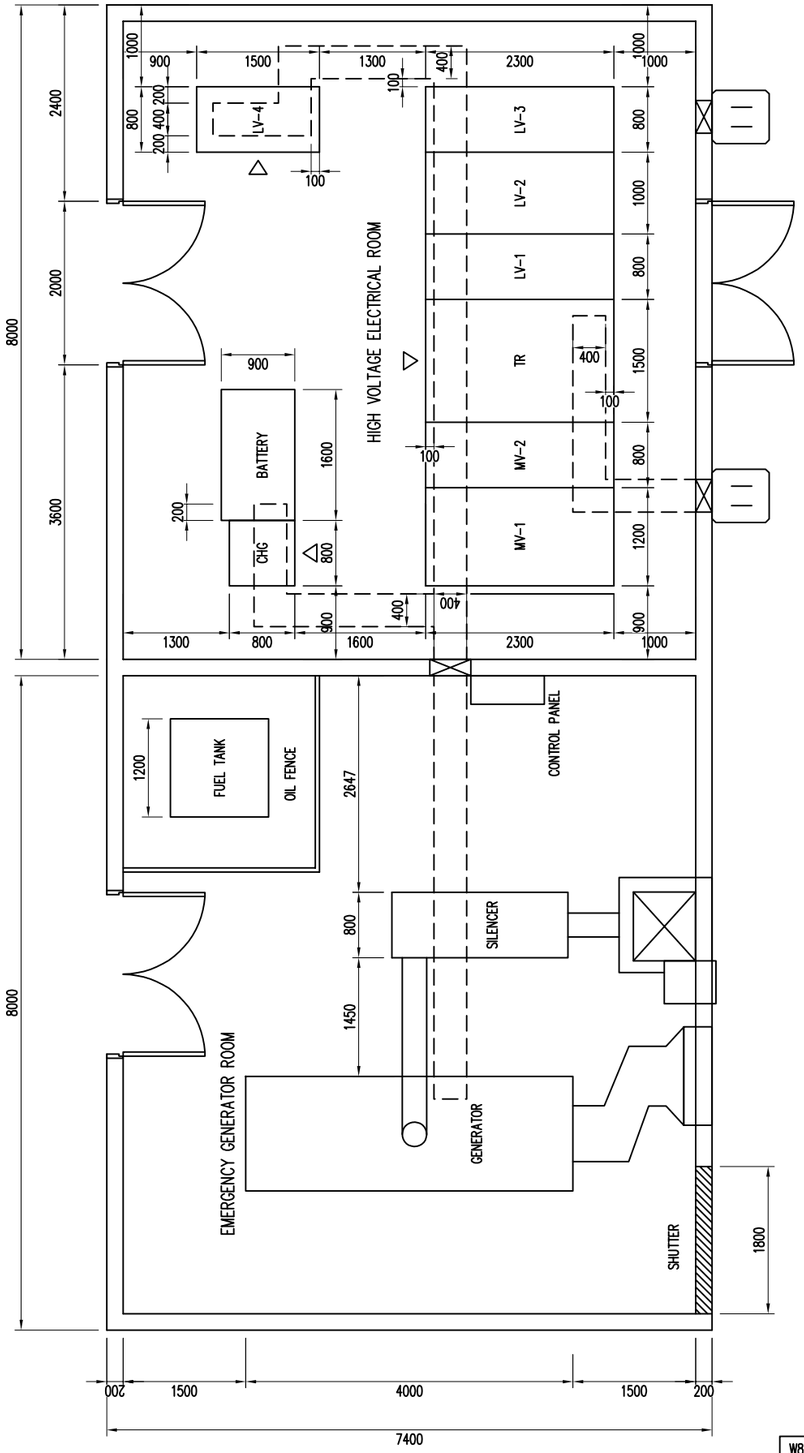
SHEET No. 14 OF 20

DRG No. MCRP-DWG-DEP-PDS-0014

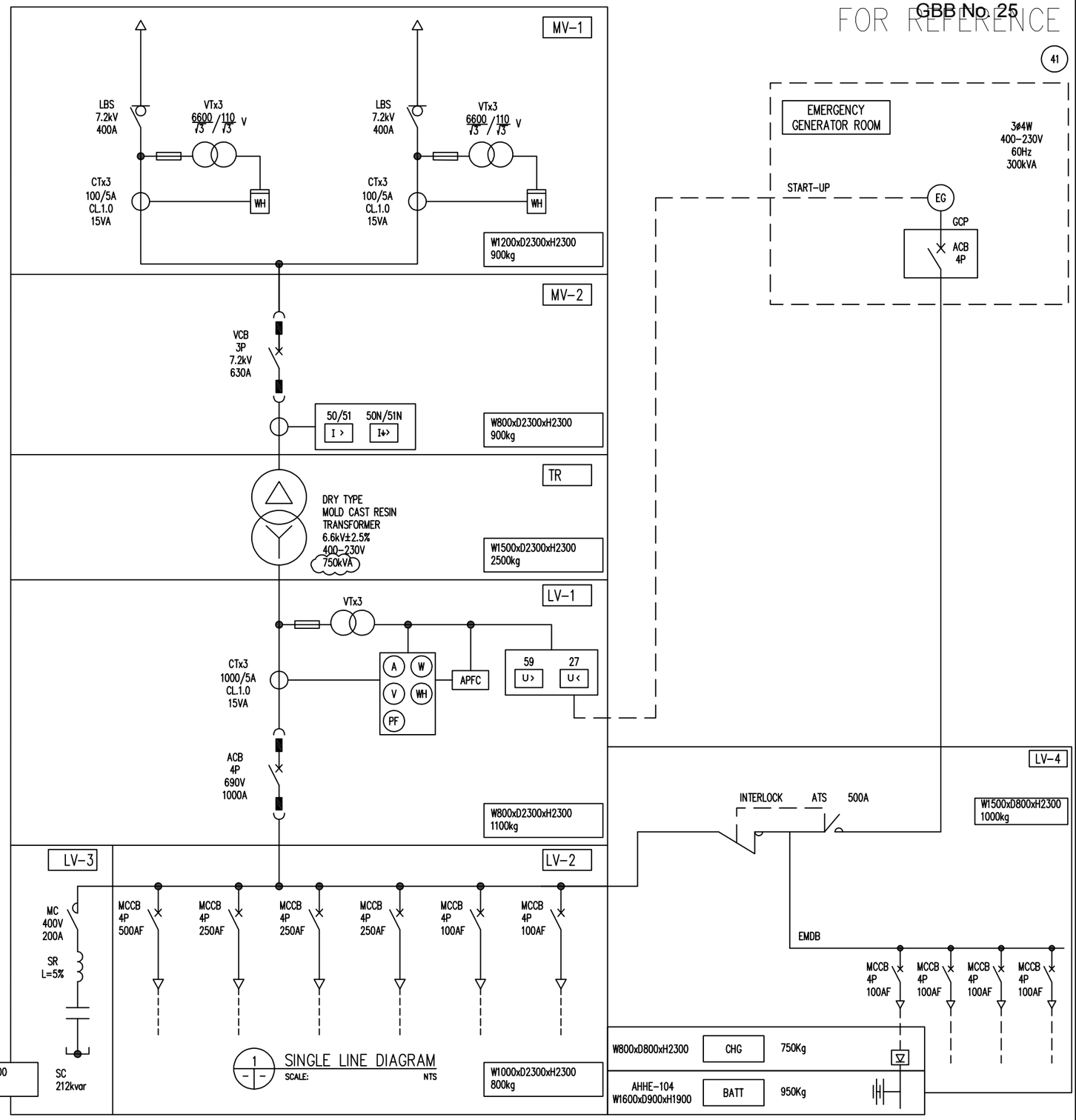
DRG S. - REV 01

GBB No. 25

FOR REFERENCE



1 EMERGENCY GENERATOR ROOM & HIGH VOLTAGE ELECTRICAL ROOM
SCALE: 1:75



1 SINGLE LINE DIAGRAM
SCALE: NTS

VERSIONS	DATE	DESCRIPTION
00	02 MAR 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS, INC.
PACIFIC CONSULTANTS CO.,LTD.
Tokyo Metro Co.,Ltd.

TITLE	JDT	SMEC
DESIGNER	K.MORIYAMA	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

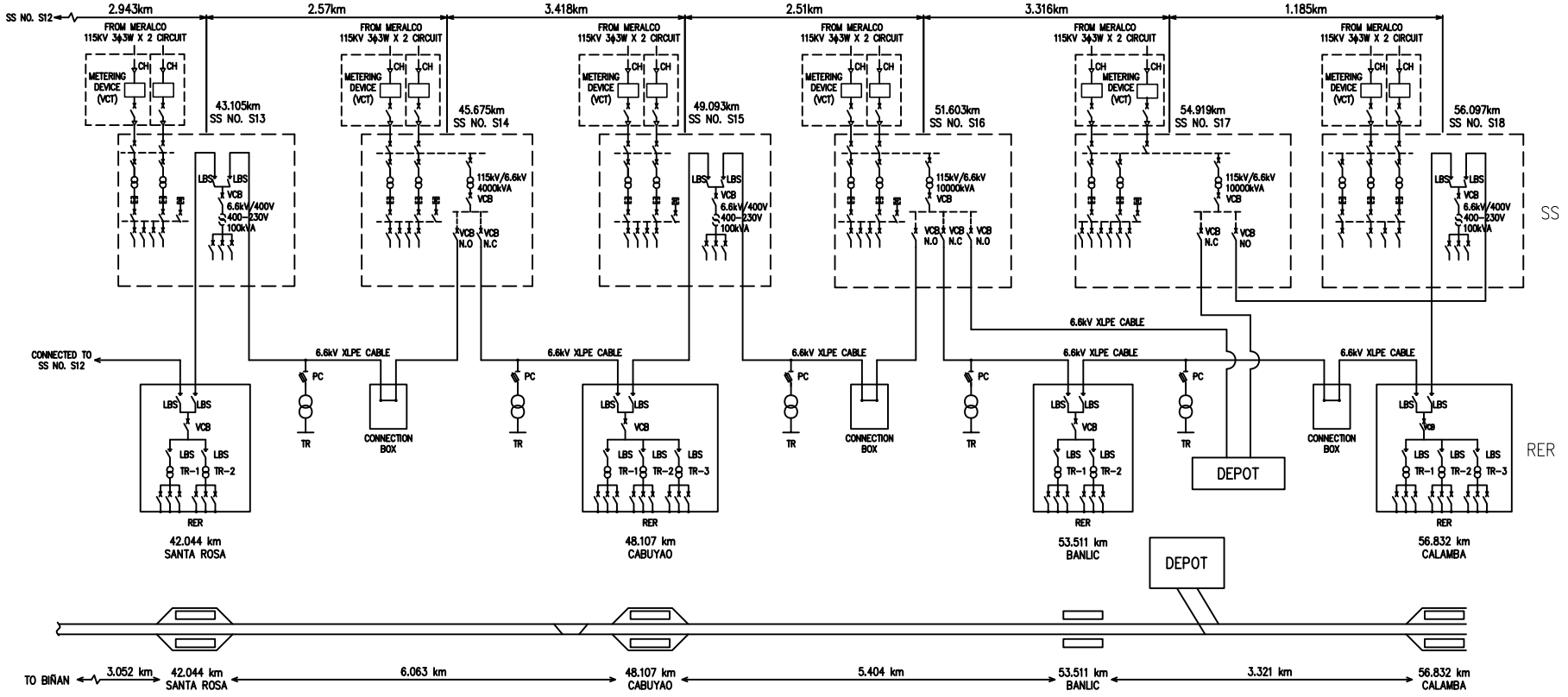
MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT-SOUTH (NSRP-SOUTH)

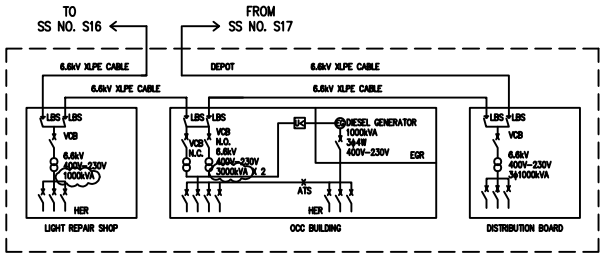
Package CP NS-01 : Bidding Documents

ELECTRICAL ROOM EQUIPMENT LAYOUT AND SINGLE LINE DIAGRAM IN TRAINING CENTER ELECTRICAL BUILDING

DATE	21 JUNE 2019
SCALE	AS SHOWN
SHEET No.	15 OF 20
DRG No.	MCRP-DWG-DEP-PDS-0015
DRG S.	–
REV	01

GBB No. 25





TR-1 : BUILDING
TR-2 : COMMUNICATION & SIGNALING
TR-3 : CONCESSION

NOTE :
BOUNDARY
SS : SUBSTATION
RER : RAILWAY ELECTRIC ROOM
6.6kV XLPE CABLE
TR : TRANSFORMER FOR MAINTENANCE
PC : CUTOUT SWITCH WITH FUSE

FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
01	25 MAY 2021	GENERAL UPDATE
02	24 JUNE 2021	SANTA ROSA STATION REVISED & SS NO.18 CHAINAGE REVISED
03	25 AUG 2021	TRANSFORMER SIZE REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)
PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS, INC.
PACIFIC CONSULTANTS CO.,LTD.
Tokyo Metro Co.,Ltd.

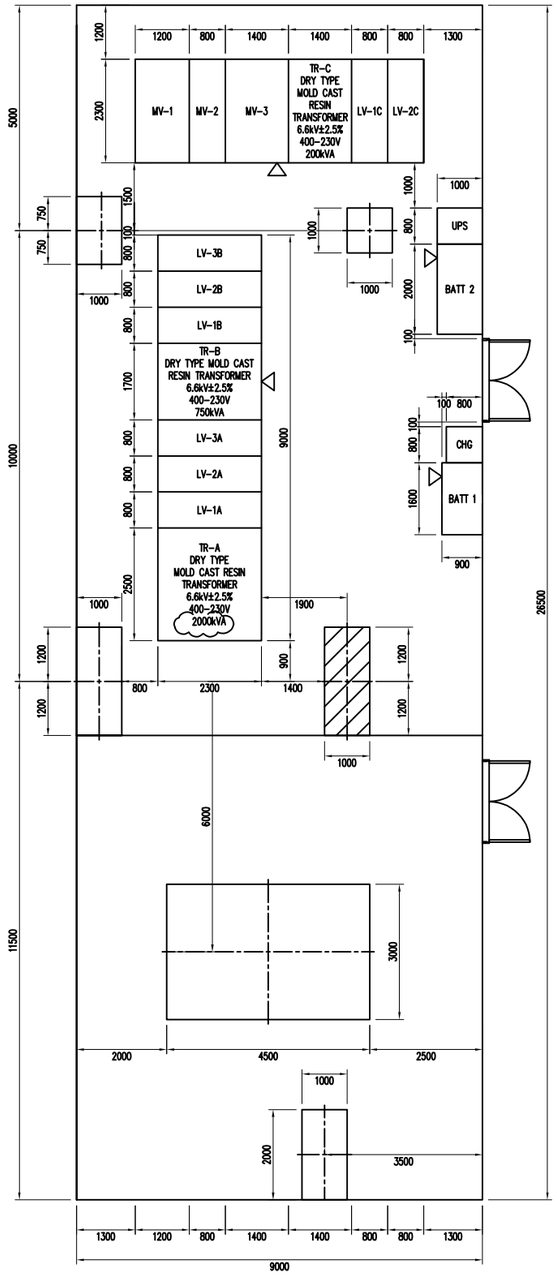
TITLE	JDT	SMEC
DESIGNER	M.OGIKUBO	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT-SOUTH (NSRP-SOUTH)

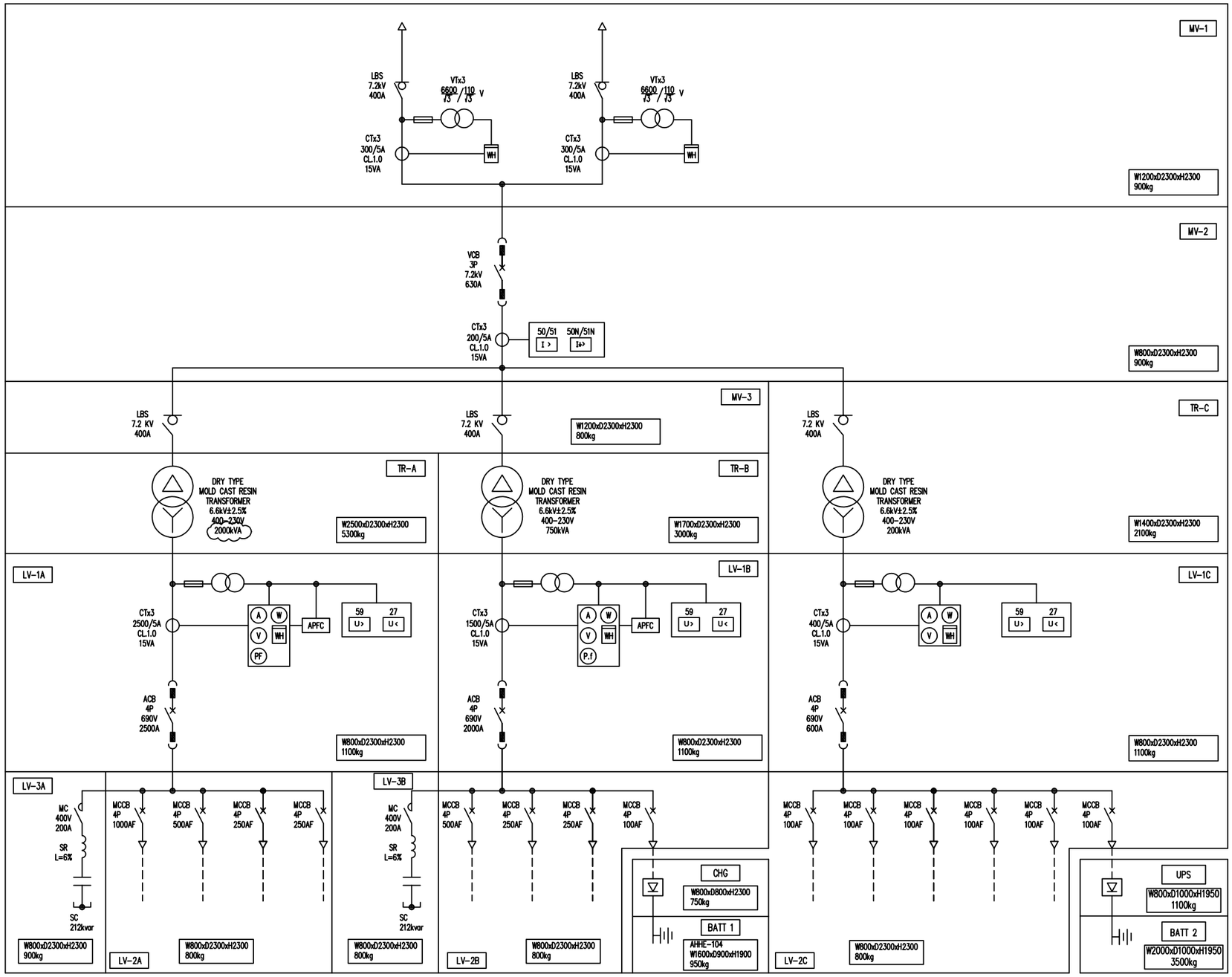
Package CP NS-01 : Bidding Documents

6.6kV POWER SUPPLY SCHEMATIC DIAGRAM
4/4

DATE: 08 APRIL 2021
SCALE: NONE
SHEET No.: 6 OF 25
DRG No.: NSRP-DWG-PDS-0006
DRG S.: –
REV: 03



1 ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1:100



2 SINGLE LINE DIAGRAM
SCALE: NTS

FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
00	25 MAY 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZE REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)
PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)
ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS, INC.
PACIFIC CONSULTANTS CO.,LTD.
Tokyo Metro Co.,Ltd.

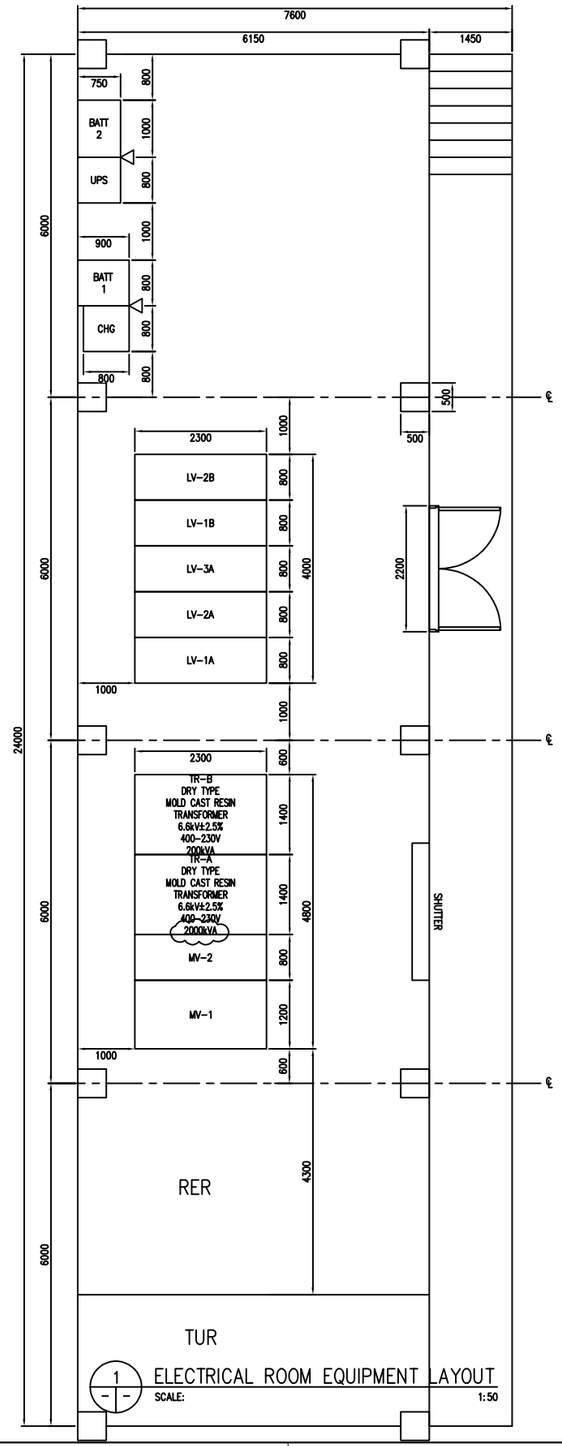
TITLE	JDT	SMEC
DESIGNER	I.SHIMIZU	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

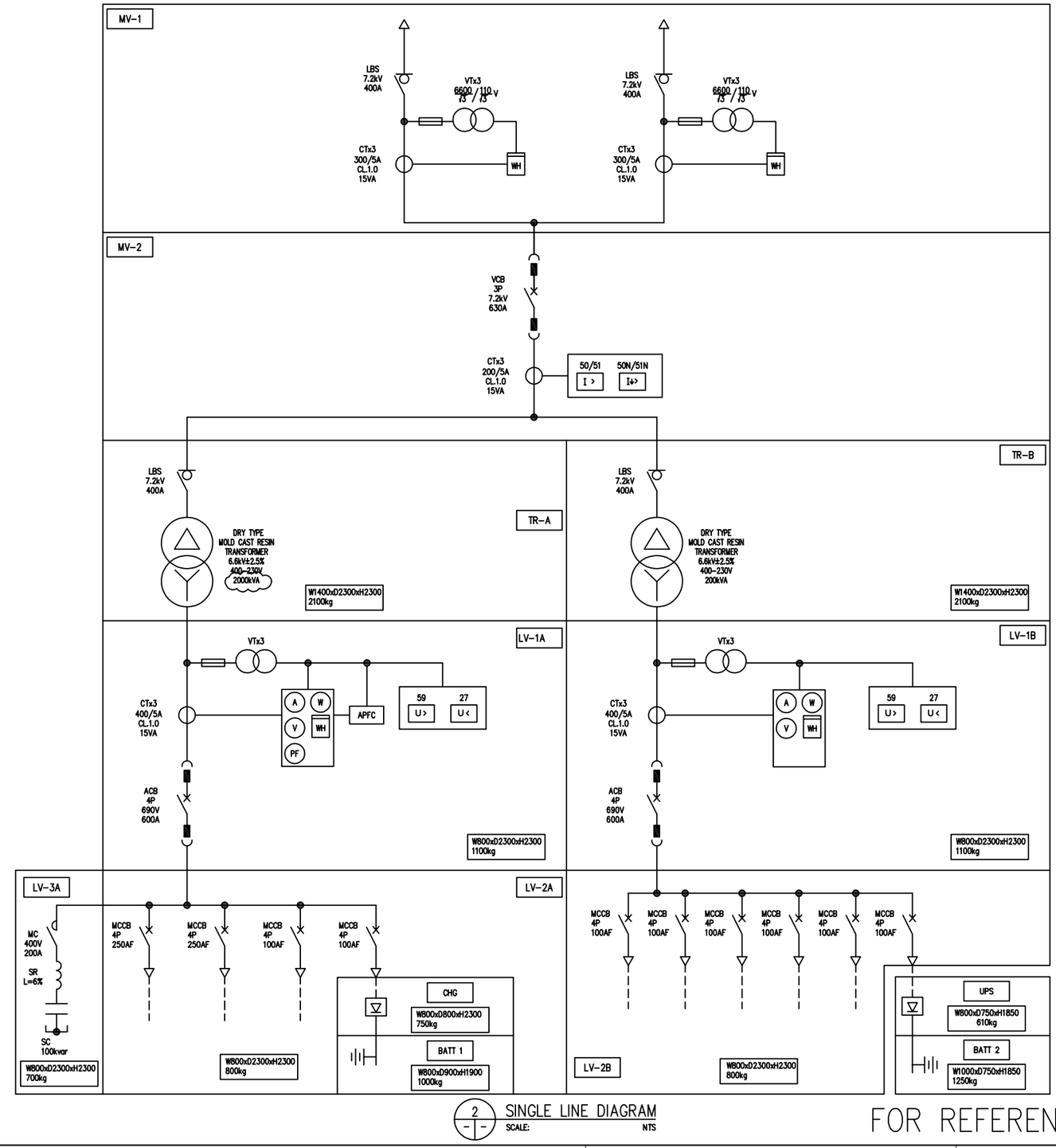
Package CP NS–01 : Bidding Documents

RAILWAY ELECTRICAL ROOM EQUIPMENT LAYOUT AND SINGLE LINE DIAGRAM IN THE BLUMENTRITT

DATE	08 APRIL 2021
SCALE	AS SHOWN
SHEET No.	7 OF 25
DRG No.	NSRP–DWG–BLU–PDS–0007
DRG S.	–
REV	01



1 ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1:50



2 SINGLE LINE DIAGRAM
SCALE: NTS

FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
00	25 MAY 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZE REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)
PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
PACIFIC CONSULTANTS CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
TONICHI ENGINEERING CONSULTANTS, INC.
Tokyo Metro Co.,Ltd.

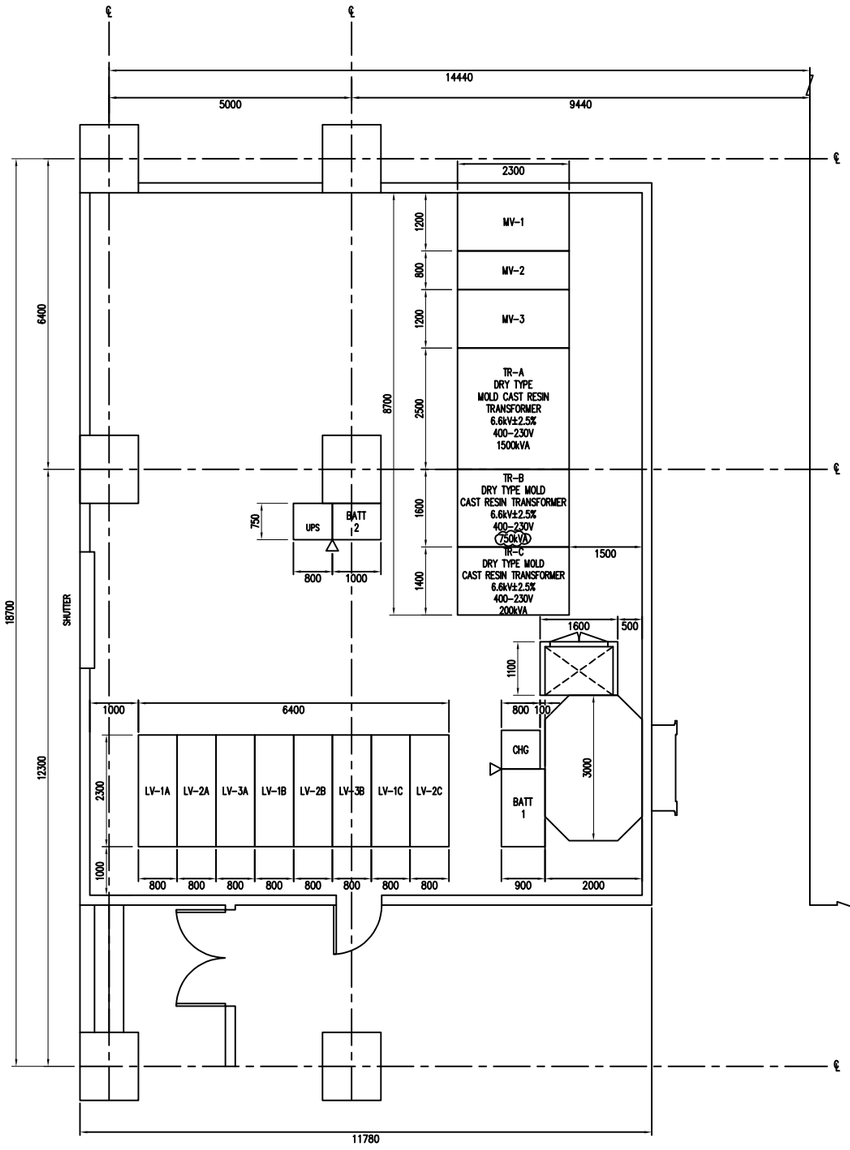
TITLE	JDT	SMEC
DESIGNER	I.SHIMIZU	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT-SOUTH (NSRP-SOUTH)

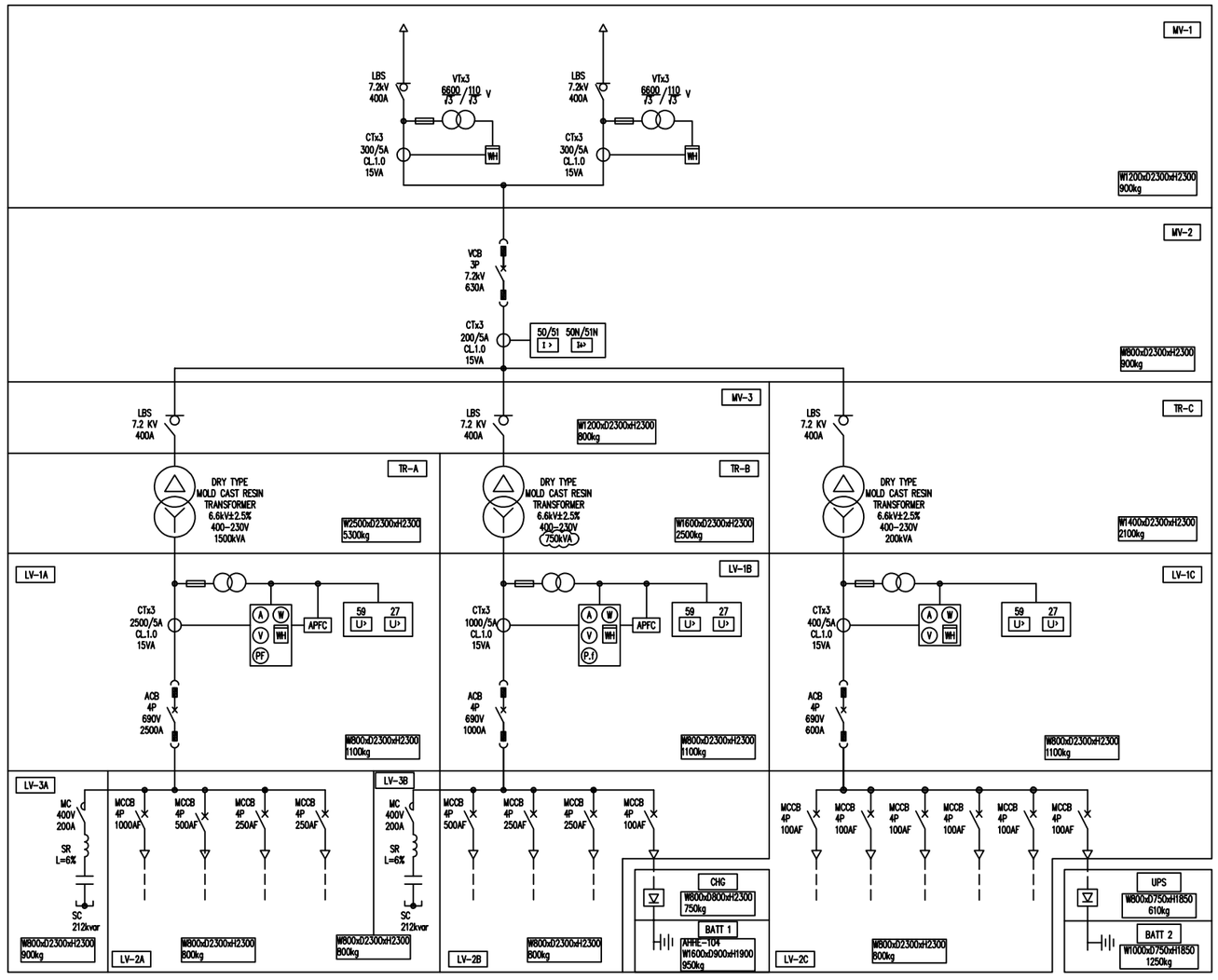
Package CP NS-01 : Bidding Documents

RAILWAY ELECTRICAL ROOM EQUIPMENT LAYOUT AND SINGLE LINE DIAGRAM IN THE FTI STATION

DATE	04 MARCH 2021
SCALE	AS SHOWN
SHEET No.	8 OF 25
DRG No.	NSRP-DWG-FTI-PDS-0008
DRG S.	–
REV	01



1 ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1:100



2 SINGLE LINE DIAGRAM
SCALE: NTS

FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
00	25 MAY 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)
PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)
ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
PACIFIC CONSULTANTS CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
TONICHI ENGINEERING CONSULTANTS, INC.
Tokyo Metro Co.,Ltd.

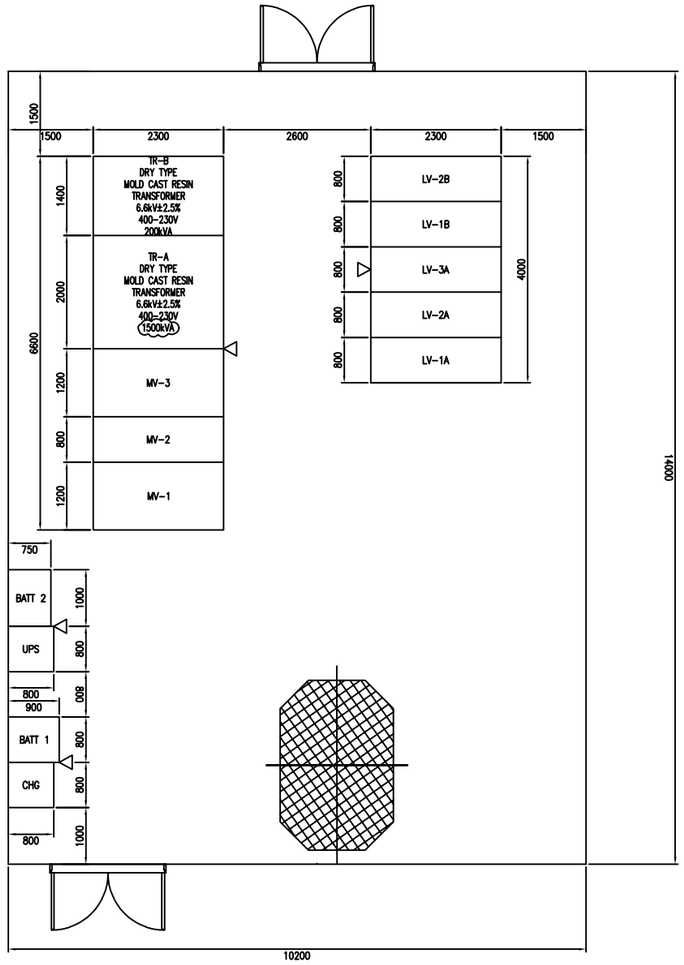
TITLE	JDT	SMEC
DESIGNER	I.SHIMIZU	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

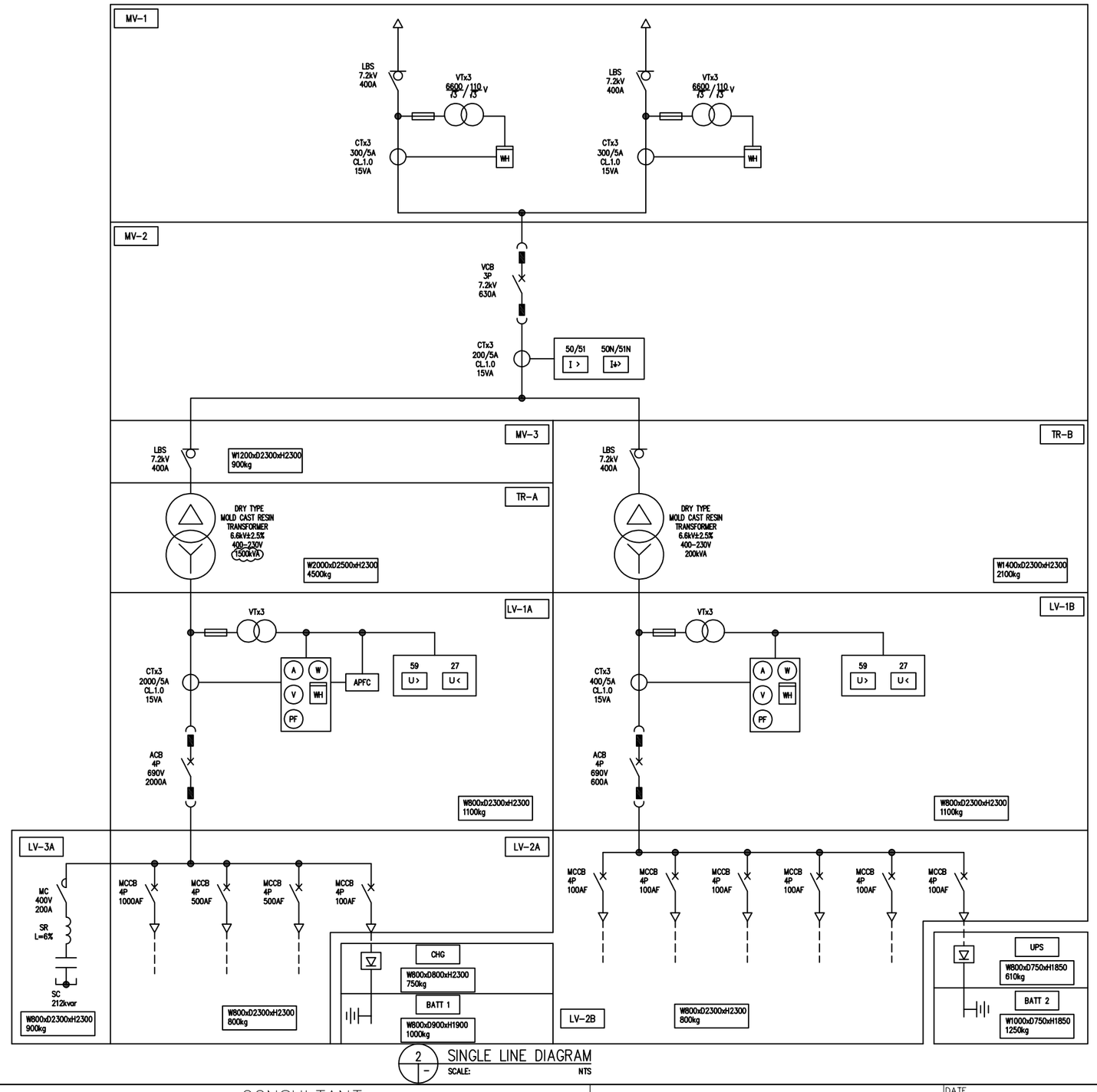
Package CP NS–01 : Bidding Documents

RAILWAY ELECTRICAL ROOM EQUIPMENT LAYOUT AND SINGLE LINE DIAGRAM IN THE BICUTAN

DATE	26 APRIL 2021
SCALE	AS SHOWN
SHEET No.	9 OF 25
DRG No.	NSRP–DWG–BIC–PDS–0009
DRG S.	–
REV	01



1 ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1:50



2 SINGLE LINE DIAGRAM
SCALE: NTS

FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
00	25 MAY 2021	ISSUED FOR REFERENCE
01	25 AUG 2021	TRANSFORMER SIZE REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
PACIFIC CONSULTANTS CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
TONICHI ENGINEERING CONSULTANTS, INC.
Tokyo Metro Co.,Ltd.

TITLE	JDT	SMEC
DESIGNER	I.SHIMIZU	–
CHECK	T.MATSUMOTO	–
TEAM LEADER	T.ISHIZUKA	–
P. MANAGER	N.KAWAI	–

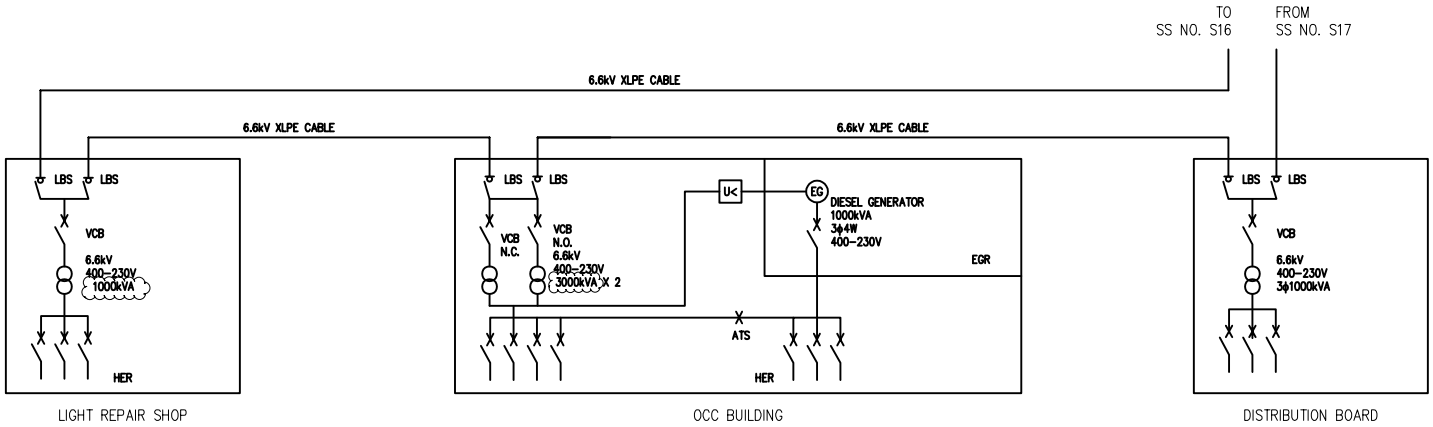
MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

Package CP NS–01 : Bidding Documents

RAILWAY ELECTRICAL ROOM EQUIPMENT LAYOUT AND SINGLE LINE DIAGRAM IN THE SUCAT STATION

DATE: 08 APRIL 2021
SCALE: AS SHOWN
SHEET No.: 10 OF 25
DRG No.: NSRP–DWG–SUC–PDS–0010
DRG S.: –
REV: 01

GBB No. 25



FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
01	25 MAY 2021	CONTENTS CHANGED
02	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)

PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
PACIFIC CONSULTANTS CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
TONICHI ENGINEERING CONSULTANTS, INC.
Tokyo Metro Co.,Ltd.

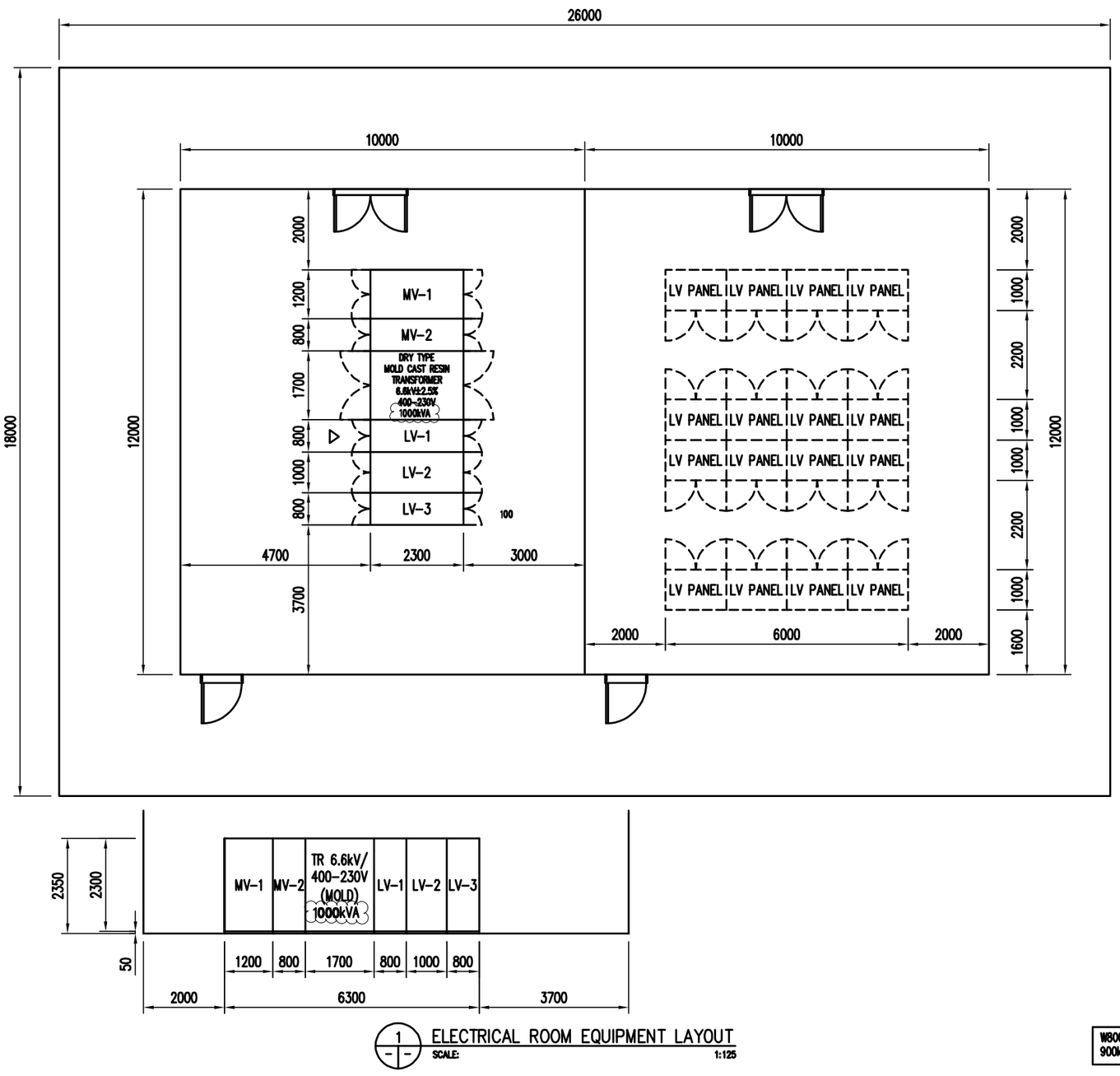
TITLE	JDT	SMEC
DESIGNER	I.SHIMIZU	-
CHECK	T.MATSUMOTO	-
TEAM LEADER	T.ISHIZUKA	-
P. MANAGER	N.KAWAI	-

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

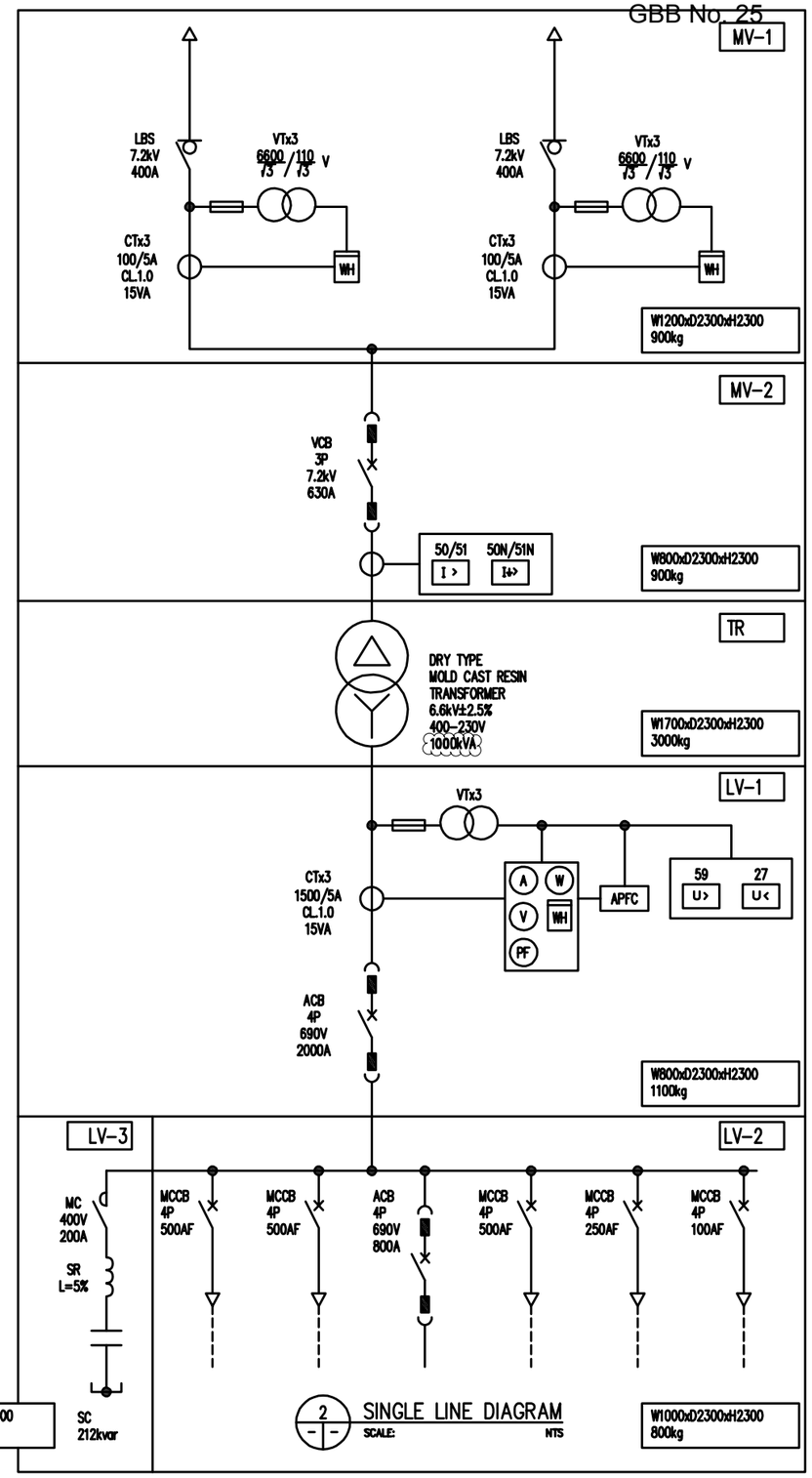
Package CP NS–01 : Bidding Documents

POWER DISTRIBUTION SYSTEM SINGLE LINE DIAGRAM IN THE SOUTH DEPOT

DATE	21 JUNE 2019
SCALE	NONE
SHEET No.	15 OF 25
DRG No.	NSRP–DWG–DEP–PDS–0015
DRG S.	–
REV	02



1 ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1:125



2 SINGLE LINE DIAGRAM
SCALE: NTS

VERSIONS	DATE	DESCRIPTION
01	25 MAY 2021	CONTENTS CHANGED
02	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)
PHILIPPINE NATIONAL RAILWAYS

CONSULTANT

JICA DESIGN TEAM (JDT)

ORIENTAL CONSULTANTS GLOBAL CO.,LTD.
JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
KATAHIRA & ENGINEER INTERNATIONAL
TONICHI ENGINEERING CONSULTANTS, INC.
PACIFIC CONSULTANTS CO.,LTD.
Tokyo Metro Co.,Ltd.

TITLE	JDT	SMEC
DESIGNER	I.SHIMIZU	-
CHECK	T.MATSUMOTO	-
TEAM LEADER	T.ISHIZUKA	-
P. MANAGER	N.KAWAI	-

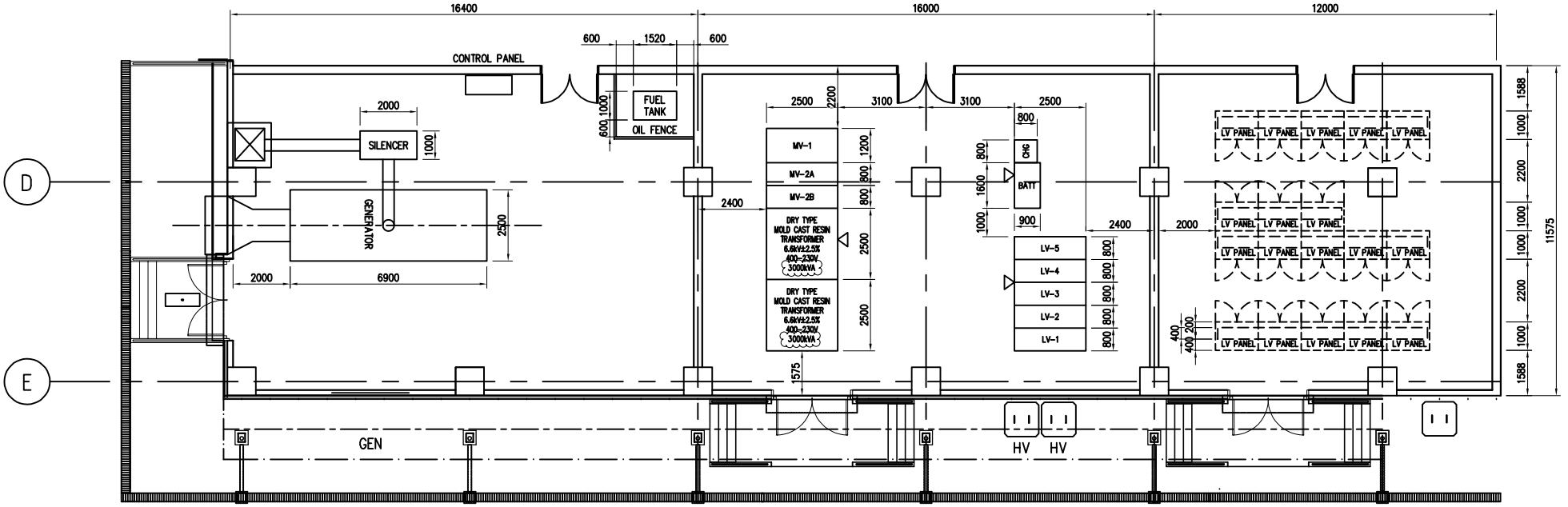
MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT–SOUTH (NSRP–SOUTH)

Package CP NS–01 : Bidding Documents

ELECTRICAL ROOM EQUIPMENT LAYOUT AND SINGLE LINE DIAGRAM OF THE LIGHT REPAIR SHOP IN THE SOUTH DEPOT

DATE	21 JUNE 2019
SCALE	AS SHOWN
SHEET No.	16 OF 25
DRG No.	NSRP–DWG–DEP–PDS–0016
DRG S.	–
REV	02

GBB No. 25



OCC BUILDING

1 ELECTRICAL ROOM EQUIPMENT LAYOUT
SCALE: 1:150

FOR REFERENCE

VERSIONS	DATE	DESCRIPTION
01	25 MAY 2021	CONTENTS CHANGED
02	25 AUG 2021	TRANSFORMER SIZES REVISED

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JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.
TONICHI ENGINEERING CONSULTANTS, INC.
Tokyo Metro Co.,Ltd.

TITLE	JDT	SMEC
DESIGNER	I.SHIMIZU	-
CHECK	T.MATSUMOTO	-
TEAM LEADER	T.ISHIZUKA	-
P. MANAGER	N.KAWAI	-

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT-SOUTH (NSRP-SOUTH)

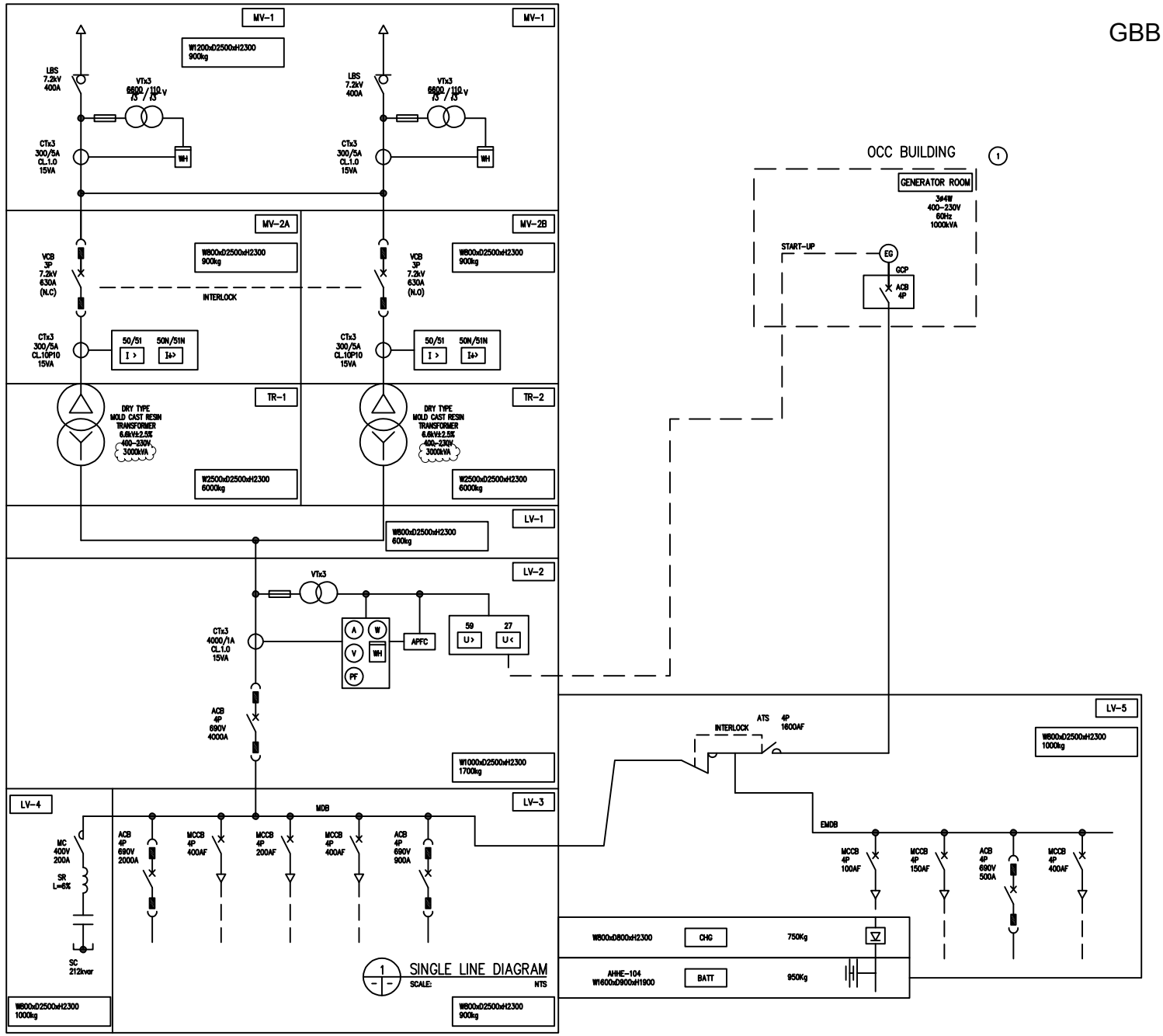
Package CP NS-01 : Bidding Documents

ELECTRICAL ROOM EQUIPMENT LAYOUT OF THE OCC BUILDING IN THE SOUTH DEPOT

DATE 21 JUNE 2019
SCALE AS SHOWN
SHEET No. 17 OF 25
DRG No. NSRP-DWG-DEP-PDS-0017
DRG S. –
REV 02

OCR – LAP49(C:\Users\User\Desktop\MY FILES\to delete\Power Distribution System (PDS)\NSRP Drawings\0017. NSRP-DWG-DEP-PDS-0017 (OCC Building).dwg May-21-21(4:32 pm

GBB No. 25



VERSIONS	DATE	DESCRIPTION
01	25 MAY 2021	CONTENTS CHANGED
02	25 AUG 2021	TRANSFORMER SIZES REVISED

DEPARTMENT OF TRANSPORTATION (DOTr)

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JAPAN INTERNATIONAL CONSULTANTS FOR TRANSPORTATION CO.,LTD.

TONICHI ENGINEERING CONSULTANTS, INC.

Tokyo Metro Co.,Ltd.

TITLE	JDT	SMEC
DESIGNER	I.SHIMIZU	-
CHECK	T.MATSUMOTO	-
TEAM LEADER	T.ISHIZUKA	-
P. MANAGER	N.KAWAI	-

MALOLOS – CLARK RAILWAY PROJECT (MCRP)
NORTH SOUTH RAILWAY PROJECT-SOUTH (NSRP-SOUTH)

Package CP NS-01 : Bidding Documents

SINGLE LINE DIAGRAM OF THE OCC BUILDING IN THE SOUTH DEPOT

DATE	21 JUNE 2019
SCALE	NONE
SHEET No.	18 OF 25
DRG No.	NSRP-DWG-DEP-PDS-0018
DRG S.	–
REV	02

File No.: _john_working\bp tower\adm team\mr. matsumoto\02. working\power supply system drawings\06. substation layout\Tblock (A3).dwg,Jan-4-19 11:44 AM