

APPENDICES

1. Member List of the Study Team

(1) First Field Survey

Name	Assignment	Organization
Fuyuki SAGARA	Team Leader	Japan International Corporation Agency
Kazunari NOGAMI	Chief Consultant/ Power Supply Planning 1	Yachiyo Engineering Co., Ltd.
Masatsugu KOMIYA	Deputy Chief Consultant/ Power Supply Planning 2	Yachiyo Engineering Co., Ltd.
Kenji SAKEMURA	Substation Planning	West Japan Engineering Consultants, Inc.
Masayuki TAMAI	Transmission Planning	Yachiyo Engineering Co., Ltd.
Tatsunari HAYASHI	Power Flow Analysis	West Japan Engineering Consultants, Inc.
Yasuo Horigome	Facility Planning	Yachiyo Engineering Co., Ltd.
Kyohei KUROHANE	Procurement Planning/ Cost Estimation	Yachiyo Engineering Co., Ltd.
Takeshi OMURA	Social and Environmental Considerations	Yachiyo Engineering Co., Ltd.

(2) Second Field Survey

Name	Assignment	Organization
Masatsugu KOMIYA	Chief Consultant/ Power Supply Planning 1	Yachiyo Engineering Co., Ltd.
Masayuki TAMAI	Transmission Planning	Yachiyo Engineering Co., Ltd.

2. Study Schedule

(1) First Field Study Schedule (Jan. to Feb. in 2014)

No.	Date	Day	Contents of Survey				Accommodation	
			Official Members	Consultant Members				Environmental & Social Considerations Group
				Chief consultant Group	Substation Group	Transmission Group		
			Nogami, Komiya	Sakemura, Horigome, Hayashi	Tamai, Kurohane (Horigome)	Omura		
1	11 Jan.	Sat.		• Trip {Narita 12:25→Frankfurt 16:40 by JL-407}			Frankfurt	
2	12 Jan.	Sun.		• Trip {Frankfurt 13:50→Akura 19:35 by LH-566}			Accra	
3	13 Jan.	Mon.		<ul style="list-style-type: none"> • 9:00 Courtesy call to JICA Ghana Office, explanation and discussion of the schedule of the field survey and project contents • 10:30 Courtesy call to Ministry of Energy and Petroleum (MoEP), explanation of the schedule of the field survey • 13:00 Courtesy call to Ghana Grid Company Ltd. (GRIDCo) (explanation and discussion of IC/R, the schedule of the field survey, the Grant scheme, the facilities on Ghanaian side, the methodology of the site survey, etc., requested contents, equipment policy and confirmation of the capacity and related enhancement plans), Site survey (Environmental research of the targeted substations) • 16:00 Courtesy call to Electricity Company of Ghana Ltd. (ECG) 			Accra	
4	14 Jan.	Tue.		<ul style="list-style-type: none"> • Meeting with GRIDCo • Site survey (Environmental research of the targeted Transmission line route) 			Accra	
5	15 Jan.	Wed.		<ul style="list-style-type: none"> • Site survey (Graphic Road Primary Substation) • 161kV Transmission line route survey (Branch point - Graphic Road Primary Substation: Approx. 4km) • Tamai, Horigome Trip {Narita 12:25→Frankfurt 16:40 by JL-407} 			Accra Tamai, Horigome: Frankfurt	
6	16 Jan.	Thu.		<ul style="list-style-type: none"> • Site survey (ECG Project Office) • 161kV Transmission line route survey (Branch point - Graphic Road Primary Substation: Approx. 4km) • Tamai, Horigome Trip {Frankfurt 13:50→Accra 19:35 by LH-566} • Komiya Trip {Narita 12:25→Frankfurt 16:40 by JL-407} 			Accra Komiya: Frankfurt	
7	17 Jan.	Fri.		<ul style="list-style-type: none"> • Meeting with GRIDCo • Komiya Trip {Frankfurt 13:50→Accra 19:35 by LH-566} 		Survey of Environmental & Social Considerations	Accra	
8	18 Jan.	Sat.	• Trip {Narita 22:00→Dubai 5:00 by JL-5095}	<ul style="list-style-type: none"> • Site survey (Graphic Road Primary Substation) • 161kV Transmission line route survey (Branch point - Graphic Road Primary Substation: Approx. 4km) 			Accra JICA: on Flight	
9	19 Jan.	Sun.	<ul style="list-style-type: none"> • Trip {Dubai 07:25→Accra 12:25 by EK-787} • Survey Team discussions 	• Study Team discussions, arrangement of collected data			Accra	
10	20 Jan.	Mon.	<ul style="list-style-type: none"> • 8:30 Meeting with JICA Ghana office • 10:00 Courtesy call to Ministry of Finance (MoF) • 11:00 Courtesy call to permanent secretary of MoEP • 12:00 Courtesy call to ECG • 14:30 Courtesy call to GRIDCo, explanation and discussion of the Grant scheme, scope of work on Ghanaian side and overall schedule, etc. (with ECG) 				Accra	
11	21 Jan.	Tue.	<ul style="list-style-type: none"> • Explanation and discussion of the requested contents, the Grant scheme, scope of work on Ghanaian side • Site survey 			• Survey of Environmental & Social Considerations	Accra	
12	22 Jan.	Wed.	<ul style="list-style-type: none"> • 9:00 Submission and discussion of the draft M/D • 14:00 Visit to other donors and the relative agencies • Site survey 		<ul style="list-style-type: none"> • Site survey (Graphic Road Primary Substation) • 161kV Transmission line route survey (Accra Central BSP Substation – Avenor Primary Substation: Approx. 4km) 		Accra	

No.	Date	Day	Contents of Survey				Accommodation
			Official Members	Consultant Members			
				Chief consultant Group	Substation Group	Transmission Group	
			Nogami, Komiya	Sakemura, Horigome, Hayashi	Tamai, Kurohane (Horigome)	Omura	
13	23 Jan.	Thu.	<ul style="list-style-type: none"> 9:00 Discussion of and corrections to the draft M/D 15:00 Signing of the M/D (MoF, MoEP, GRIDCo) Komiya Trip {Accra 21:30 → Frankfurt 05:20+1 by LH-567} 	<ul style="list-style-type: none"> Site survey (Graphic Road Primary Substation) 161kV Transmission line route survey (Accra central BSP Substation - Avenor Primary Substation: Approx. 4km) Meeting with Local contractors on Environmental & Social Considerations and Topographic & Geological investigation 			Komiya: on Flight Accra
14	24 Jan.	Fri.	<ul style="list-style-type: none"> 11:00 Report to Embassy of Japan (EoJ) 14:00 Report to JICA Ghana office JICA Trip {Accra 18:35→Dubai 06:20+1 by EK-788} Komiya Trip {→Frankfurt 05:20 by LH-567} Komiya Trip {Frankfurt 20:25→Narita 15:55+1 by JL-408} 	<ul style="list-style-type: none"> Site survey (Accra central BSP Substation, Avenor Primary Substation and Other substations) 161kV Transmission line route survey (Accra central BSP Substation - Avenor Primary Substation: Approx. 4km) 			Komiya: Frankfurt JICA: on Flight Accra
15	25 Jan.	Sat.	<ul style="list-style-type: none"> Trip {Dubai 06:20 by EK-788} Trip {Dubai 2:55→Narita 17:20+1 by JL-5096} 	<ul style="list-style-type: none"> Site survey (Accra central BSP Substation and Avenor Primary Substation) Site survey (Other substation) Komiya Trip {→Narita 15:55 by JL-408} 	<ul style="list-style-type: none"> 161kV Transmission line route survey (Mallam BSP Substation - Proposed A4 BSP Substation: Approx. 15km) 		Komiya: on Flight JICA: Dubai Accra
16	26 Jan.	Sun.	<ul style="list-style-type: none"> Trip {→Narita 17:20 by JL-5096} 	<ul style="list-style-type: none"> Study Team discussions, arrangement of collected data 			Accra
17	27 Jan.	Mon.		<ul style="list-style-type: none"> Site survey (Achimota BSP Substation and Mallam BSP Substation) Site survey (Other Substations) 	<ul style="list-style-type: none"> 161kV Transmission line route survey (Accra central BSP Substation - Avenor Primary Substation: Approx. 4km) Signing with Local contractor on Topographic & Geological investigation 		Accra
18	28 Jan.	Tue.		<ul style="list-style-type: none"> Site survey (Achimota BSP Substation and Mallam BSP Substation) Arrangement of collected data 			Accra
19	29 Jan.	Wed.		<ul style="list-style-type: none"> Site survey (Mallam BSP Substation and Proposed A4 BSP Substation) Site survey (Other Substations) 	<ul style="list-style-type: none"> 161kV Transmission line route survey (Accra central BSP Substation - Avenor Primary Substation: Approx. 4km) 		Accra
20	30 Jan.	Thu.		<ul style="list-style-type: none"> Site survey (G Primary Substation) Arrangement of collected data 	<ul style="list-style-type: none"> Signing with Local contractor on Environmental & Social Considerations Study of custom clearance and local market survey 		Accra
21	31 Jan.	Fri.		<ul style="list-style-type: none"> Visit to MoEP and survey of power sector structural reform Survey of power supply and demand (MoEP) 	<ul style="list-style-type: none"> Visit to GRIDCo and discussion Visit to ECG and discussion 		Accra
22	1 Feb.	Sat.		<ul style="list-style-type: none"> Site survey (Supplementary survey), Local Market survey of equipment and material 			Accra
23	2 Feb.	Sun.		<ul style="list-style-type: none"> Preparation of Field Report Study Team discussions, arrangement of collected data 			Accra
24	3 Feb.	Mon.		<ul style="list-style-type: none"> Visit to ECG and discussion Preparation of Field Report Collection of supplementary documents and data 			Accra
25	4 Feb.	Tue.		<ul style="list-style-type: none"> Preparation of Field Report Collection of supplementary documents and data 			Accra

No.	Date	Day	Contents of Survey				Accommodation	
			Official Members	Consultant Members				Environmental & Social Considerations Group
				Chief consultant Group	Substation Group	Transmission Group		
			Nogami, Komiya	Sakemura, Horigome, Hayashi	Tamai, Kurohane (Horigome)	Omura		
26	5 Feb.	Wed.		<ul style="list-style-type: none"> • Preparation of Field Report • Collection of supplementary documents and data • Local market survey 			Accra	
27	6 Feb.	Thu.		<ul style="list-style-type: none"> • 161kV Transmission line route survey (with GRIDCo) • Visit to GRIDCo and discussion • Preparation of Field Report • Collection of supplementary documents and data 			Accra	
28	7 Feb.	Fri.		<ul style="list-style-type: none"> • Visit to ECG and discussion • Preparation of Field Report 			Accra	
29	8 Feb.	Sat.		<ul style="list-style-type: none"> • Preparation of Field Report • Study Team discussions, arrangement of collected data 			Accra	
30	9 Feb.	Sun.		<ul style="list-style-type: none"> • Preparation of Field Report • Study Team discussions, arrangement of collected data 			Accra	
31	10 Feb.	Mon.		<ul style="list-style-type: none"> • Site survey (Achimota BSP Substation, Mallam BSP Substation and A3 BSP Substation) • Acquisition of approval for the Field Report by GRIDCo • Obtaining the survey report on topographic and geological investigation 			Accra	
32	11 Feb.	Tue.		<ul style="list-style-type: none"> • Acquisition of approval for the Field Report by ECG • Preparation of Survey Report 			Accra	
33	12 Feb.	Wed.		<ul style="list-style-type: none"> • Preparation of Survey Report • Collection of National Development Plan and Socioeconomic conditions • Survey of harbor and transportation route • Discussion of income/expenditure and electrical tariff 			Accra	
34	13 Feb.	Thu.		<ul style="list-style-type: none"> • Preparation of Survey Report 			Accra	
35	14 Feb.	Fri.		<ul style="list-style-type: none"> • Preparation of Survey Report 			Accra	
36	15 Feb.	Sat.		<ul style="list-style-type: none"> • Site survey (Supplementary survey), Study Team discussions and arrangement of collected data 			Accra	
37	16 Feb.	Sun.		<ul style="list-style-type: none"> • Site survey (Supplementary survey), Study Team discussions and arrangement of collected data 			Accra	
38	17 Feb.	Mon.		<ul style="list-style-type: none"> • Report to JICA Ghana Office • Trip{ Accra 21:30→Frankfurt 05:20+1 by LH-567} 			Accra	
39	18 Feb.	Tue.		<ul style="list-style-type: none"> • Trip{→Frankfurt 05:20 by LH-567} • Trip{ Frankfurt 20:25→Narita 15:55+1 by JL-408} 			on Flight	
40	19 Feb.	Wed.		<ul style="list-style-type: none"> • Trip{→Narita 15:55 by JL-408} 				

(2) Second Field Study Schedule (Feb. in 2015)

No.	Date	Day	Contents of Survey		Accommodation
			Official Members	Consultant Members (Komiya, Tamai)	
1	21 Feb.	Sat.		• Tamai Trip {Narita 12:25→Frankfurt 16:40 by JL-407}	Frankfurt
2	22 Feb.	Sun.		• Tamai Trip {Frankfurt 14:20→Accra 19:55 by LH-566}	Accra
3	23 Feb.	Mon.		• Site survey • Komiya Trip {Yangon 19:50→Bangkok 21:45 by TG-306} • Komiya Trip {Bangkok 23:40→Frankfurt 05:30 by TG-920}	Accra Komiya: on Flight
4	24 Feb.	Tue.		• Courtesy call and submission of the Preparatory Survey Report to JICA Ghana Office • Courtesy call and submission of the Preparatory Survey Report to MoP • Courtesy call and submission of the Preparatory Survey Report to MoF • Courtesy call and submission of the Preparatory Survey Report to GRIDCo • Courtesy call and submission of the Preparatory Survey Report to ECG • Komiya Trip {→Frankfurt 05:30 by TG-920} • Komiya Trip {Frankfurt 14:20→Accra 19:55+1 by LH-566}	Accra
5	25 Feb.	Wed.		• Explanation/discussion on the Preparatory Survey Report and the draft M/D with MoF, GRIDCo and ECG (Explanation of and discussion on Technical Specifications) • Submission and discussion of the draft M/D	Accra
6	26 Feb.	Thu.		• Explanation/discussion on the Preparatory Survey Report and the draft M/D with MoP • Site survey	Accra
7	27 Feb.	Fri.		• Signing of the M/D • Report to JICA Ghana office • Trip {Accra 21:55→Frankfurt 05:20+1 by LH-567}	Accra
8	28 Feb.	Sat.		• Trip {→Frankfurt 05:20 by LH-567} • Trip {Frankfurt 19:10→Narita 14:40+1 by JL-408}	on Flight
9	1 Mar.	Sun.		• Trip {→Narita 14:40 by JL-408}	

【Remarks】 (Alphabetical order)

ECG	: Electricity Company of Ghana
EoJ	: Embassy of Japan
EPA	: Environmental Protection Agency
GRIDCo	: Ghana Grid Company
JICA	: Japan International Cooperation Agency
MoF	: Ministry of Finance
MoP (MoEP)	: Ministry of Power (Ministry of Energy and Petroleum)

3. List of Parties Concerned in the Recipient Country

Ministry of Finance (MOF)

Mr. Kwadwo Awua-Peasah	Director of External Resources Mobilization-Bilateral
Mr. Florian Assenga	Senior Human Resources Officer
Mr. Tulimbumi Abel	Legal Officer
Mr. David M. A. Quist	Head of Cooperation
Mr. Edward Obiri-Yeboah	Assistant Economics Officer
Ms. Matilda M. Annor	Economics Officer

Ministry of Energy and Petroleum (MOEP) (at the First Field Survey)

Prof. Thomas Mba Akabzaa	Chief Director
Ing. Stephen Kwakye Doku	Director of Power
Mr. Solomon Adjetejey	Deputy Director of Power

Ministry of Power (MoP)

Ing. Stephen K. Doku	Director, Generation & Transmission
Ing. Chris K. Anaglo-Mawunegbloe	Deputy Director, Power

Ghana Grid Co. Ltd (GRIDCo), Head Office

Ing. William Amuna	Chief Executive
Ing. Ebenezer Kofi Essienyi	Manager of Design and Standards
Mr. Suraj O. Amadu	Advisor, Engineering & Operations
Mr. Isoyor Kubih	Senior Electrical Engineer
Mr. Vincent Boachie	Manager of Special Project
Mr. Rasheed Baisie	Assistant Electrical Engineer Planning
Mr. Kassim Abubalkar	Principal Engineer
Mr. Benjamin Ntsin	Manager of Power System Planning
Mr. Abdul Samed Ibrahim	Senior Electrical Engineer
Mr. Martin Kodjo	Principal Geodetic Engineer
Mr. Fredrick Okang	Principal Electrical Engineer
Mr. Kwame O. Boadi	Senior Electrical Officer

Ghana Grid Co. Ltd (GRIDCo), Achimota BSP

Mr. M. Kjug	Regional Engineer
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Electricity Company of Ghana (ECG), Head Office

Mr. William Hutton-Mensah	Managing Director
Ing. Tetteh A. Okyne	Director of Operations

Mr. S. Boakye Appiah	Director of Network
Mr. Julius Kwame Kpekpena	Director of Engineering
Mr. Kwadwo Ayensu Obeng	Div. Manager Planning
Mr. Stephen Akuoku	Economist
Mr. Alex Boamah	Deputy Manager of National AC Control Program

Electricity Company of Ghana (ECG), Project Office

Mr. Godfred Mensah	Ag. General Manager of System Planning
Mr. Osei Yaw Adofo	General Manager of Design
Mr. Samuel Odame	General Manager Sub-transmission
Mr. David Asiedu	Assistant Electrical Engineer of Design
Mr. Frank Antwi Boakye	Electrical Engineer
Mr. Abass B. Wilson	Senior Geodetic Engineer

Electricity Company of Ghana (ECG), Substation G

Mr. Kamuah Hammond	Control Operation
Mr. Kurt Festus Prange	Control Operation

The World Bank Ghana Office

Mr. Carol Litwin, Senior Energy Specialist	Senior Energy Specialist
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Agency of France for Development

Ms. Mareva Bernard-Herve	Project Officer
Mr. Marianne Klarsfeld	Project Officer

Embassy of Japan in Ghana

Mr. Noriaki Sadamoto	First Secretary
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JICA Ghana Office

Mr. Koji Makino	Chief Representative
Mr. Hiroshi Sumiyoshi	Senior Resident Representative
Mr. Tsutomu Tanaka	Senior Resident Representative
Mr. Hajime Usukura	Assistant Resident Representative
Mr. Osamu Sakurai	Project Formulation Advisor
Mr. Hiroki Tazawa	Assistant Representative (Economic Infrastructure Development)
Mr. Tomonari Takeuchi	Representative
Mr. Toshihide Kanaya	Project Formation Advisor
Mr. Joshua Biliwi Mabe	Programme Officer (Infrastructure Sector)

**Minutes of Discussions
on the Preparatory Survey
on the Project for Power Supply to Accra Central
in the Republic of Ghana
(First Field Survey)**

In response to the request from the Government of the Republic of Ghana (hereinafter referred to as "Ghana"), the Japan International Cooperation Agency (hereinafter referred to as "JICA"), in consultation with the Government of Japan, decided to conduct a Preparatory Survey (hereinafter referred to as "the Survey") on the Project for Power Supply to Accra Central (hereinafter referred to as "the Project").

JICA sent to Ghana the Preparatory Survey Team (hereinafter referred to as "the Team") headed by Mr. Fuyuki Sagara, Advisor, Energy and Mining Division 1, Industrial Development and Public Policy Department, JICA, to conduct the first field survey and the Team is scheduled to stay in the country from 12th January to 17th February, 2014.

The Team held discussions with the concerned officials of Ghana and conducted a field survey in Ghana.

In the course of the discussions, both sides have confirmed the main items described in the attached sheets hereto. The Team will proceed with further study and prepare the preparatory survey report.

Accra, Ghana
23rd January, 2014

相良 冬木

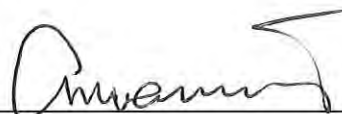
Mr. Fuyuki Sagara
Leader
Preparatory Survey Team
Japan International Cooperation Agency



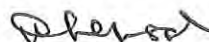
Prof. Thomas Mba Akabzaa
Chief Director
Ministry of Energy and Petroleum



Mr. Kwadwo Awua-Peasah
Director
External Resources Mobilization-Bilateral
Ministry of Finance



Mr. William Amuna
Chief Executive
Ghana Grid Company Limited



Mr. William Hutton-Mensah
Managing Director
Electricity Company of Ghana Limited

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve and reinforce the power supply to the central area of Accra in Ghana by constructing new Bulk Supply Point (BSP) with associated transmission lines and equipment.

2. Title of the Project

The title of the project is revised as “The Project for Reinforcement of Power Supply to Accra Central”.

3. Project Site

The Project sites are located as shown in Annex-1.

Accra Central BSP will be located in the site of existing Graphic Road Primary Substation.

4. Responsible and Implementing Organizations

- (1) The responsible ministry is the Ministry of Energy and Petroleum (MoEP).
- (2) The implementing agency is Ghana Grid Company Limited (GRIDCo).
- (3) The relevant organization is Electricity Company of Ghana Limited (ECG).
- (4) The organization structures of MoEP, GRIDCo and ECG are shown in Annex-2, Annex-3 and Annex-4.

5. Items Targeted in the Project

- (1) As the result of discussions, the components to be targeted in the Project have been identified as follows;

Components	Capacity
Procurement and Installation Work 1. Accra Central BSP (1) 161 / 34.5 kV Transformers (2) 161 kV Gas Insulated Switchgears (GIS) <ol style="list-style-type: none"> 1) Incoming Feeders (Outdoor Type) 2) Transformers Feeders (Outdoor Type) 3) Bus Coupling (Outdoor Type) 4) Bus System (Double Bus Type) (Outdoor Type) 5) Voltage Transformers (Outdoor Type) (3) 33 kV GISs (Double Bus Type) (Indoor Type) (4) SCADA System	125MVA×3units 2 sets 3 sets 1 set 1 set 2 set 1 lot 1 set
2. 161kV Transmission Line from the Avenor Branch Point to Accra Central BSP (1 Circuit for Achimota Line and 1 circuit for Mallam Line) (1) 161 kV Overhead Line (ACSR, TERN, twin bundle or equivalent) (2) 161 kV Underground Cable (XLPE Cable, Copper, 1,600 mm ²)	2.75 km 0.4 km
Procurement Work 3. Underground cable for 33 kV Sub transmission Line between Station D and Station E for the decommissioning part (XLPE, Al, 630 mm ² , 3 cores or equivalent) 4. Maintenance Tools for the Equipment of the Project 5. Spare Parts for the Equipment of the Project	Approx. 4-6 km × 2 Circuits 1 lot 1 lot
Construction Work 6. Foundation for the Equipment of the Project (Gas Insulated Switchgears, Transformers, Towers for 161 kV Transmission Line) 7. Building for a control room of Accra Central BSP	1 set 1 building

- (2) The Team will study further the appropriateness of each component and technical specifications from the viewpoint of necessity and relevance as Japan's Grant Aid scheme, and will compile the findings into the preparatory survey report for the project appraisal process of the Government of Japan.
- (3) In addition to the above mentioned components, the Ghana side strongly requested installation of 161 kV transmission line between A4 BSP (Pokuase BSP) and Mallam BSP, though the construction of A4 BSP has not been committed yet. The Ghana side also requested procurement of 3 circuits of 161 kV transmission line (Approx. 25 km) between Volta BSP and Achimota BSP as an alternative. However both sides confirmed that those additional components were not to be covered by the Project because of the relevancy of the Japan's Grant Aid scheme and constraints of the Preparatory Survey scope.
- (4) The Team strongly recommended that those upgrading works for 161kV mentioned in (3) above be undertaken by the Ghana side as soon as possible. The Team also took note those proposals by the Ghana side and will report to the relevant authorities of Japan for consideration of future support.

6. Japan's Grant Aid Scheme

- (1) The Ghana side has understood Japan's Grant Aid Scheme explained by the Team as described in Annex-5 and Annex-6.
- (2) The Ghana side will take the necessary measures, as described in Annex-7, for smooth implementation of the Project.

7. Environmental and Social Considerations

- (1) The Team explained JICA's Guidelines for Environmental and Social Considerations to the Ghana side and the Ghana side agreed to comply with the guidelines. The Ghana side will take necessary measures of the environmental and social consideration for the Project in accordance with both the JICA's guidelines and related environmental regulations of Ghana.
- (2) The Ghana side shall complete Environmental Impact Assessment and obtain Environmental Permit for the Project until July, 2014.
- (3) The Ghana side shall carry out the stakeholder meetings for the project area and shall report the result to the Team by 15th February, 2014.

8. Schedule of the Study

- (1) The Team will proceed with further studies until 17th February, 2014.
- (2) JICA will prepare the draft report of the Preparatory Survey and dispatch a team to Ghana in order to explain its contents to the Ghana side in May 2014.

9. Other Relevant Issues

- (1) Collaboration with relevant agencies/organizations

GRIDCo, as the implementing agency of the Project, shall coordinate closely with the relevant agencies/organizations for smooth implementation of the Project. Especially, GRIDCo shall coordinate with ECG to ensure the appropriate connection between the Project components and the existing distribution system. ECG shall also cooperate with GRIDCo and provide GRIDCo with the necessary information on the distribution components targeted in the Project in timely manner.

After completion of the Project, distribution components provided under the Project shall be transferred to ECG in accordance with its mandate.

- FW* (2) Obligations/Undertakings of the Ghana side for the Project

- 1) The Ghana side shall schedule power outages required for installation work of the Project and carry out them in timely manner. The Ghana side shall also manage any issue concerning the power outages, including related procedures, compensation and grievances from customers.
- 2) The Ghana side shall decommission and remove the existing towers, including their foundations, of 33 kV sub-transmission line between Primary Station D and E along the route for 161 kV transmission line of the Project before the commencement of the installation work covered by the Japanese side. The Ghana side shall also decommission and remove the existing 33 kV terminal poles, capacitor banks, Ring Main Unit, cables and any existing facility within the area before the commencement of the installation work of Accra Central BSP covered by the Japanese side.
- 3) The Ghana side shall secure a temporary storage yard (Approx. 5,000 m²) for the Project within the lot of ECG Project Office. The Ghana side shall also prepare an access point at ~~ECG Project Office, where construction vehicles go through to the route of 161 kV~~ transmission line of the Project along the railway for their installation.
- 4) The Ghana side shall obtain permit for the implementation of the Project to enter the business establishments where the 161 kV towers of the Project will be located. The Ghana side shall also obtain permit for 161 kV transmission lines of the Project to go across the public road from concerned authorities.
- 5) The Ghana side shall install 33 kV underground cables to be procured by the Japanese side for the section between Primary Station D and E, immediately after the cables are delivered to the Project site.

(3) Questionnaire requested by the Team to the Ghana side

The Ghana side shall answer the questionnaire requested by the Team by 31st January, 2014. Especially, the evidence which shows the implementation agency can use the targeted sites and routs for the Project shall be submitted to the Team by 31st January, 2014.

(4) Training Course in Japan

GRIDCo requested the Team that the GRIDCo's staff to be involved in the Project be able to participate in technical training in Japan in order to enhance their capacity of the operation and maintenance of GIS substation as well as transmission system. ECG also requested the Team to consider that ECG staff be able to attend the JICA's training course for distribution system.

The Team explained that the Project would provide the On - the - Job Training of GIS operation during the installation work. The Team also took note those requests for training in Japan and will report them to relevant authorities in Japan. The Team also recommended both organizations to discuss with the JICA Ghana Office on the application process for the JICA's training courses.

(End)

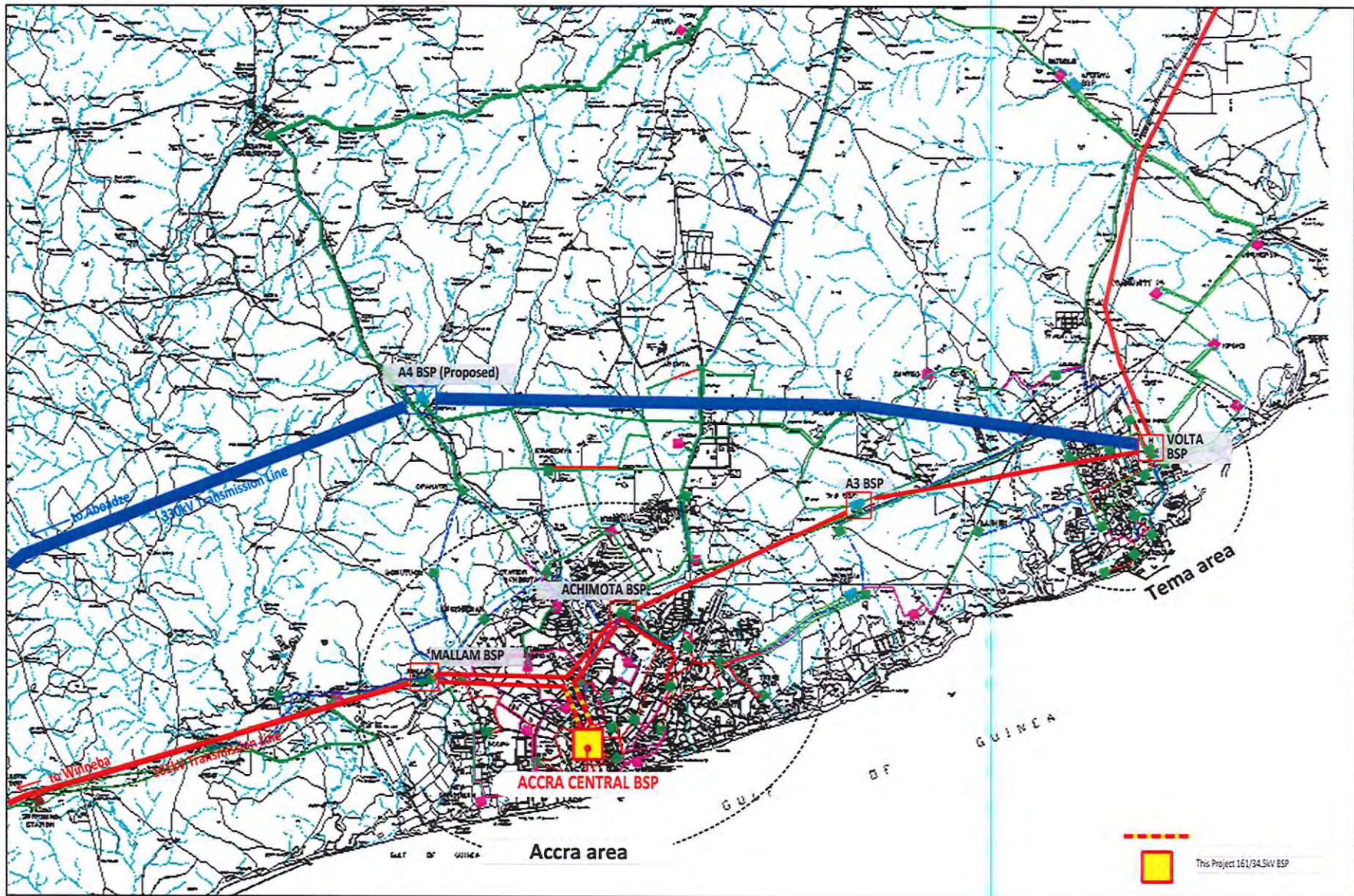
<List of Annex>

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|---------|--|
| Annex-1 | Location of the Project Sites |
| Annex-2 | Organization Structure of Ministry of Energy and Petroleum |
| Annex-3 | Organization Structure of Ghana Grid Company Limited |
| Annex-4 | Organization Structure of Electricity Company of Ghana Limited |
| Annex-5 | Japan's Grant Aid |
| Annex-6 | Flow Chart of Japan's Grant Aid Procedures |
| Annex-7 | Major Undertakings to be taken by Each Government |

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LOCATION OF THE PROJECT SITES



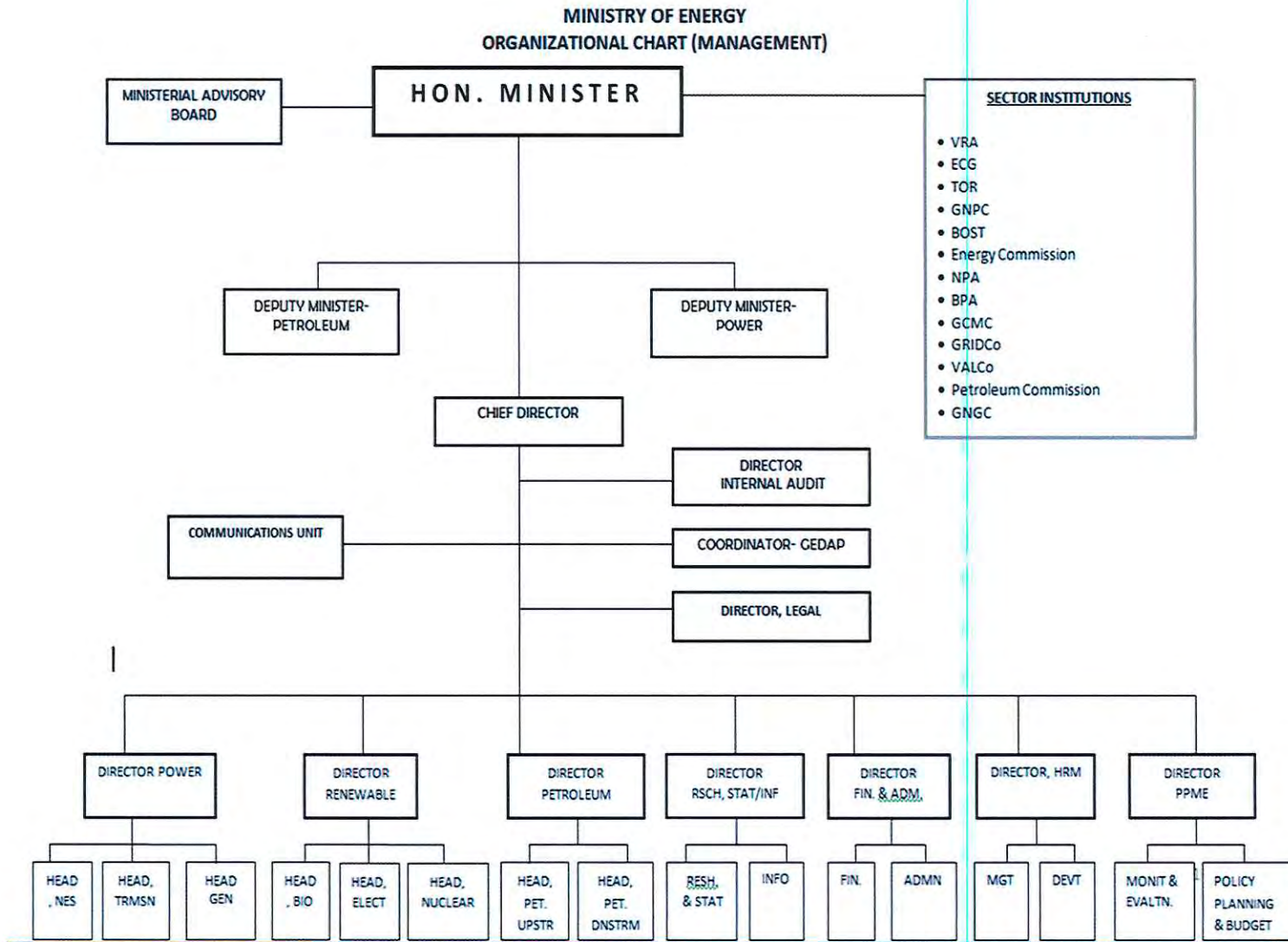
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Handwritten notes: "to Tema" and "to Winneba" with arrows pointing towards the respective directions on the map.

FA

ORGANIZATION STRUCTURE OF MINISTRY OF ENERGY AND PETROLEUM



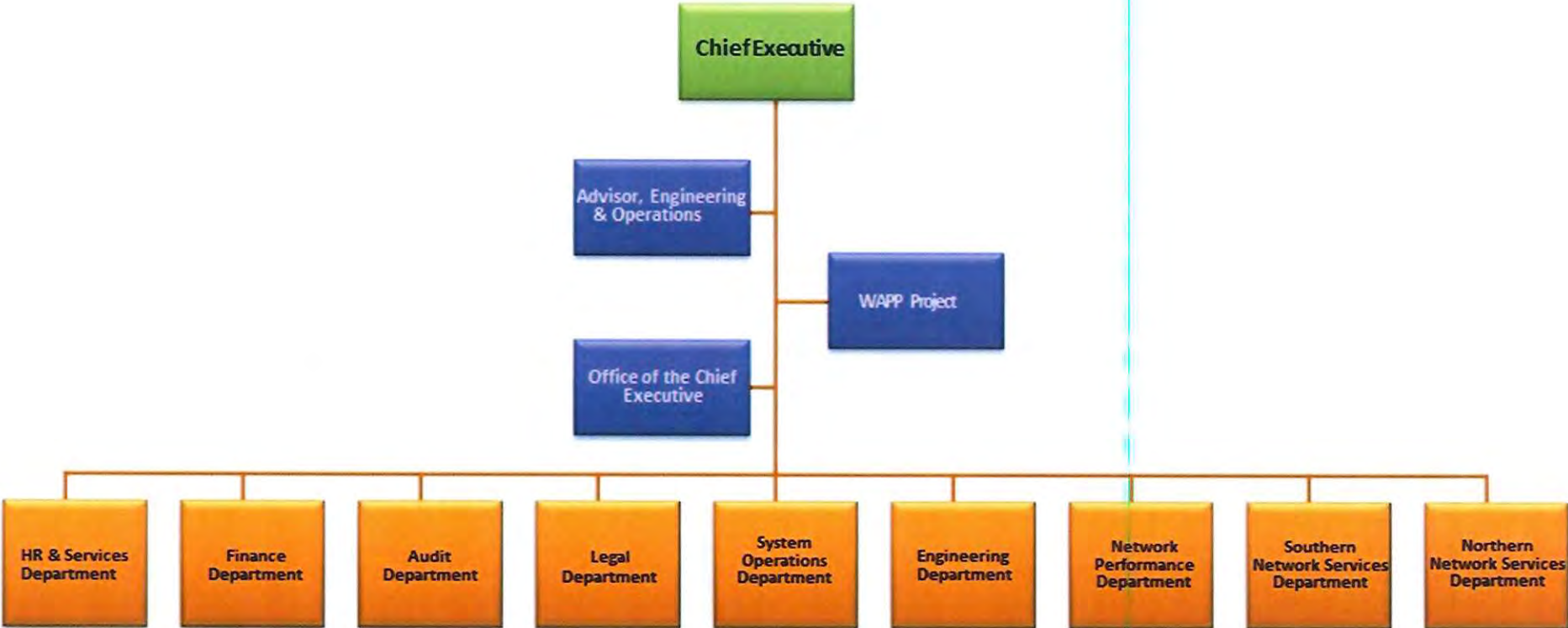
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PL unit

PA

ORGANIZATION STRUCTURE OF GHANA GRID COMPANY LIMITED

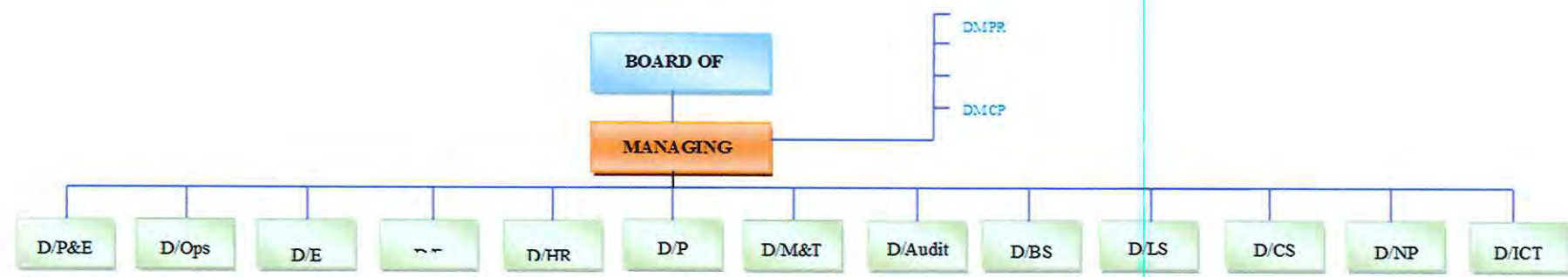
- 9 -



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FA

ORGANIZATION STRUCTURE OF ELECTRICITY COMPANY OF GHANA LIMITED



- 7 -

- | | | | | | |
|------|---|-------------------------------------|-----|---|---------------------------------------|
| D | - | Director | BS | - | Board Secretariat |
| P&E | - | Premises & Estates | LS | - | Legal Services |
| Ops | - | Operations | CS | - | Customer Services |
| E | - | Engineering | NP | - | Network Projects |
| F | - | Finance | ICT | - | Information Communications Technology |
| HR | - | Human Resources | DM | - | Divisional Manager |
| P | - | Procurement | CP | - | Corporate Planning |
| M&T | - | Materials and Transport | PR | - | Public Relation |
| RAGA | - | Regulatory and Governmental Affairs | | | |

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JAPAN'S GRANT AID

Based on the new JICA law entered into effect on October 1, 2008, JICA is designated as the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
 - The Survey conducted by JICA
- Appraisal & Approval
 - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
 - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
 - Agreement concluded between JICA and a recipient country
- Implementation
 - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA
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JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex-7.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

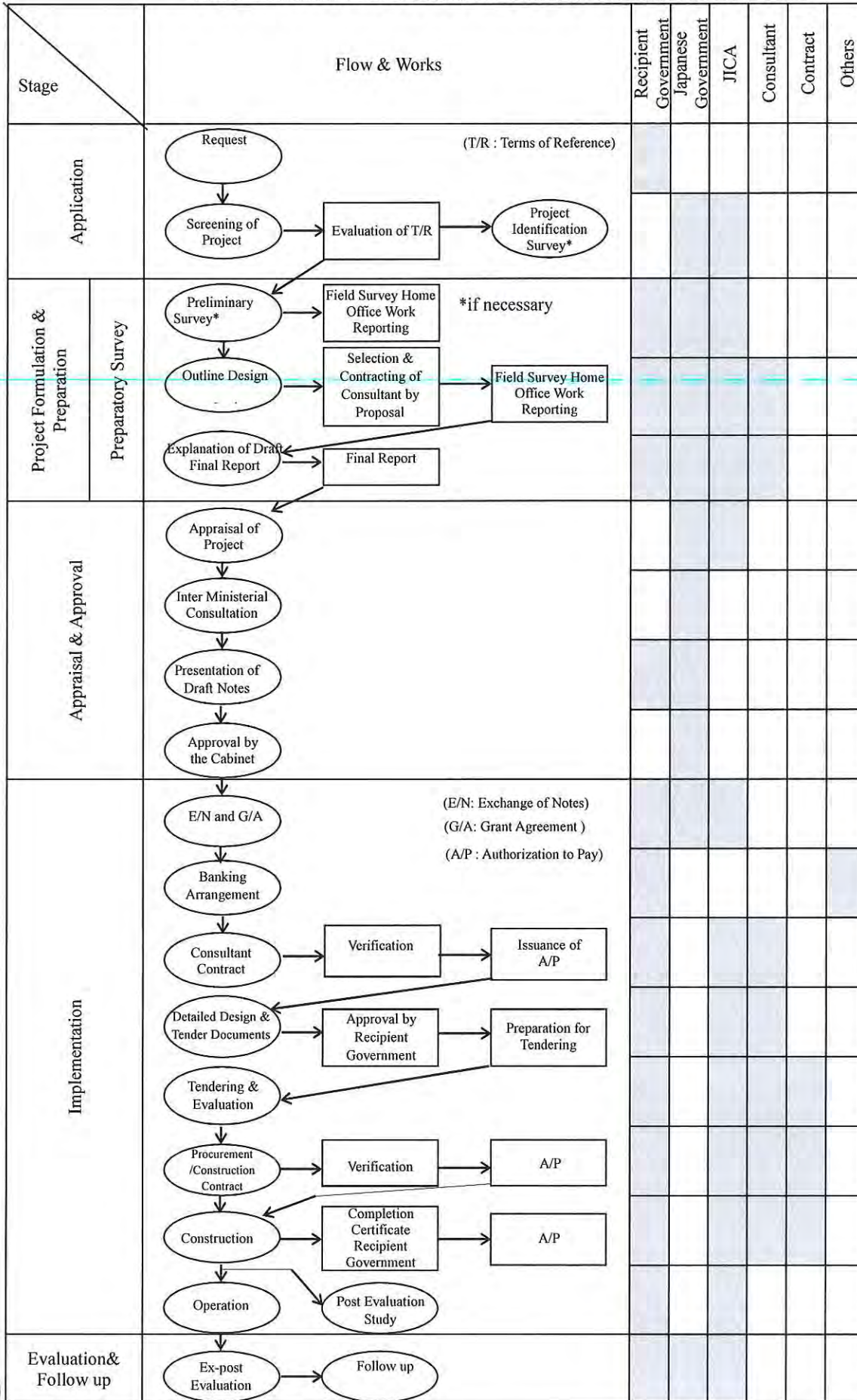
The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

(End)

FLOW CHART OF JAPAN'S GRANT AID PROCEDURES



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Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure lots of land necessary for the implementation of the Project and to clear the sites;		●
2	To construct the following facilities		
	1) The building	●	
	2) The gates and fences in and around the site		●
	3) The parking lot	●	
	4) The road within the site	●	
	5) The road outside the site (including Access road)		●
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the sites		
	1) Electricity		
	a. The distributing power line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)		●
	b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
4	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the Products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted		●
6	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To ensure that the Facilities and the products be maintained and used properly and effectively for the implementation of the Project		●
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
10	To give due environmental and social consideration in the implementation of the Project.		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

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5. Drawings

The outline design drawings of the Project are described below:

No.	Title
E-01	Single Line Diagram for Accra Central BSP Substation
A-03	Site Plan
E-02	Equipment layout of Graphic Road Substation
T-01	161 kV T/L Route Map (1) – (9)
T-02	Outline of Tower (1) – (3)
A-04	Control Building BF Plan
A-05	Control Building GF Plan
A-06	Control Building 1F, 2F Plan
A-07	Control Building RF, RF2 Plan
A-08	Control Building Section (1)
A-09	Control Building Section (2)
A-10	Control Building Elevation (1)
A-11	Control Building Elevation (2)
A-12	Transformer Platform BF Plan
A-13	Transformer Platform GF Plan
A-14	Transformer Platform Section (1)
A-15	Transformer Platform Section (2)
A-16	Cable Culvert (4) Plan
A-17	Cable Culvert (4) Section
A-18	TR-GIS Section, Culvert (1) Section
A-19	GIS BF Plan
A-20	GIS GF Plan

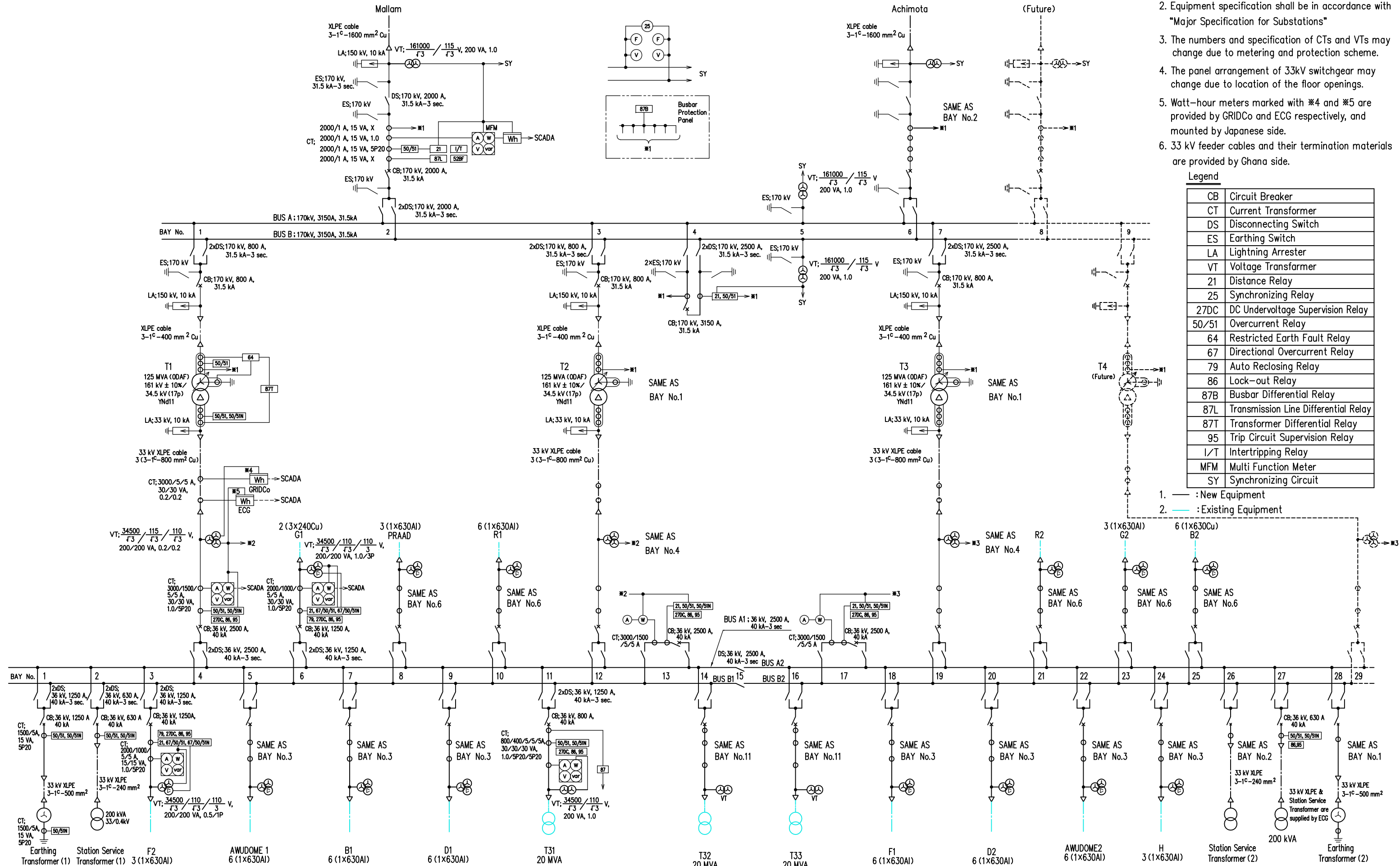
Note;

1. The future extension equipment is shown as broken lines.
2. Equipment specification shall be in accordance with "Major Specification for Substations"
3. The numbers and specification of CTs and VTs may change due to metering and protection scheme.
4. The panel arrangement of 33kV switchgear may change due to location of the floor openings.
5. Watt-hour meters marked with #4 and #5 are provided by GRIDCo and ECG respectively, and mounted by Japanese side.
6. 33 kV feeder cables and their termination materials are provided by Ghana side.

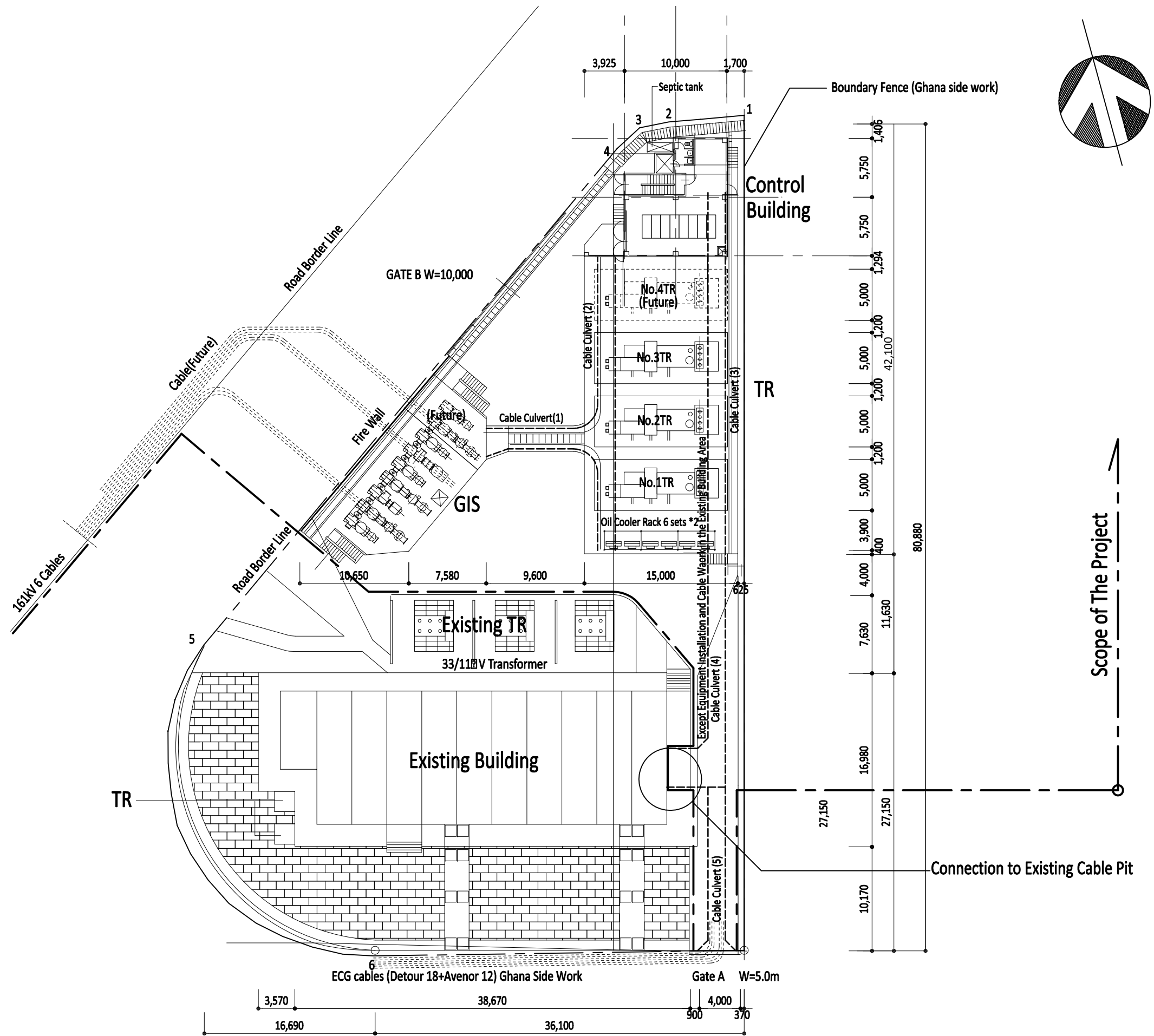
Legend

CB	Circuit Breaker
CT	Current Transformer
DS	Disconnecting Switch
ES	Earthing Switch
LA	Lightning Arrester
VT	Voltage Transformer
21	Distance Relay
25	Synchronizing Relay
27DC	DC Undervoltage Supervision Relay
50/51	Overcurrent Relay
64	Restricted Earth Fault Relay
67	Directional Overcurrent Relay
79	Auto Reclosing Relay
86	Lock-out Relay
87B	Busbar Differential Relay
87L	Transmission Line Differential Relay
87T	Transformer Differential Relay
95	Trip Circuit Supervision Relay
I/T	Intertripping Relay
MFM	Multi Function Meter
SY	Synchronizing Circuit

1. — : New Equipment
2. - - - : Existing Equipment



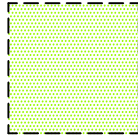
Facility List	
1.	Control Building
	BF Cable Pit, Water Tank, Pump
	GF Control Room(1), Control Office (1)
	1F Control Room(2), Battery Room
	2F Control Room(3), Control Office (2)
	RF Transformer, Air-con unit
2.	GIS
	BF Cable Pit
	GF GIS 3sets, space for future
	Fire wall for GIS
3.	Trans
	BF Mechanical Pit,
	BF Cable Culvert (2), (3)
	GF Transformer No.1,2,3& Space No.4
	Oil cooler Rack
4.	Cable Culvert (1)
	BF Cable Culvert (1) GIS-TR
5.	Cable Culvert (4)
	BF Cable Culvert (4) TR-Existing Building
	BF Cable Culvert (5) Existing 33kV cable
6.	Gate B
	W=10m full open gate



Title	Site Plan
DWG. No.	A-03

1:400

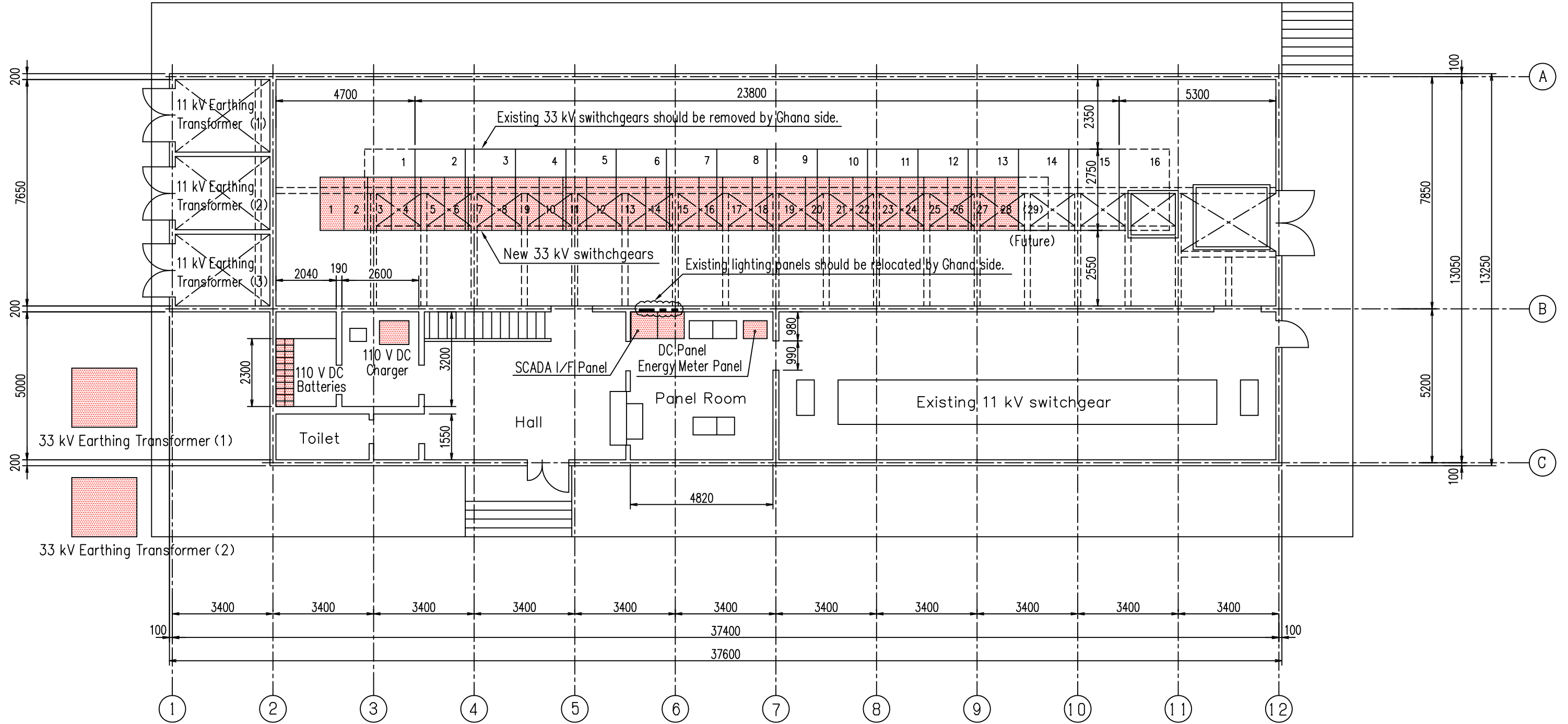
Station Service
Transformer by ECG



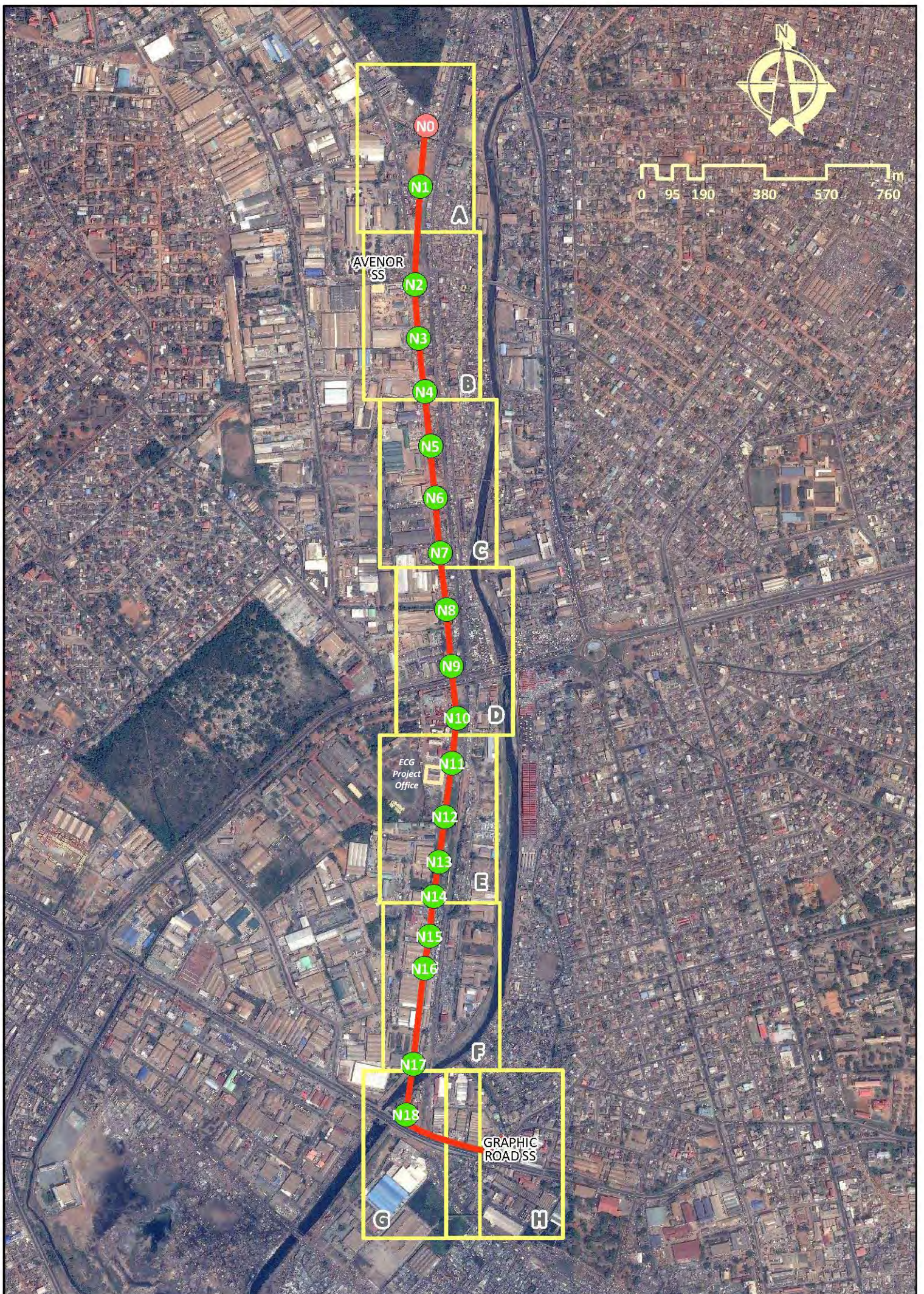
Note :



: Equipment supplied by
Japanese side



Title	EQUIPMENT LAYOUT of GRAPHIC ROAD SUBSTATION	
	DWG. No.	E-02



T01 161kV T/L ROUTE MAP (1)



Mallam BSP

N0 (by Ghana side)

Achimota BSP

808011.32
617975.9

Procurement of
Conductors by
Japanese side.
Installation by
Ghana side.

190.0m

N1
YY
807993.81
617787.02

Procurement and
installation by
Japanese side

310.0m

LEGEND
Tower No.
Tower Type
Latitude
Longitudinal
(WGS_1984_UTM_zone_30N)

T01 161kV T/L ROUTE MAP (2)



310.0m

AVENOR
SS

N2

N2
YY
807976.5
617484.14

160.5m

N3

N3
YY
807988.59
617317.74

160.5m

N4

N4
XX
808007.01
617151.38

B

LEGEND
Tower No.
Tower Type
Latitude
Longitudinal
(WGS_1984_UTM_zone_30N)





165.7m

N8

N8
YY
808075.44
616475.19

150.2m

N9

N9
YY
808089.74
616300.98

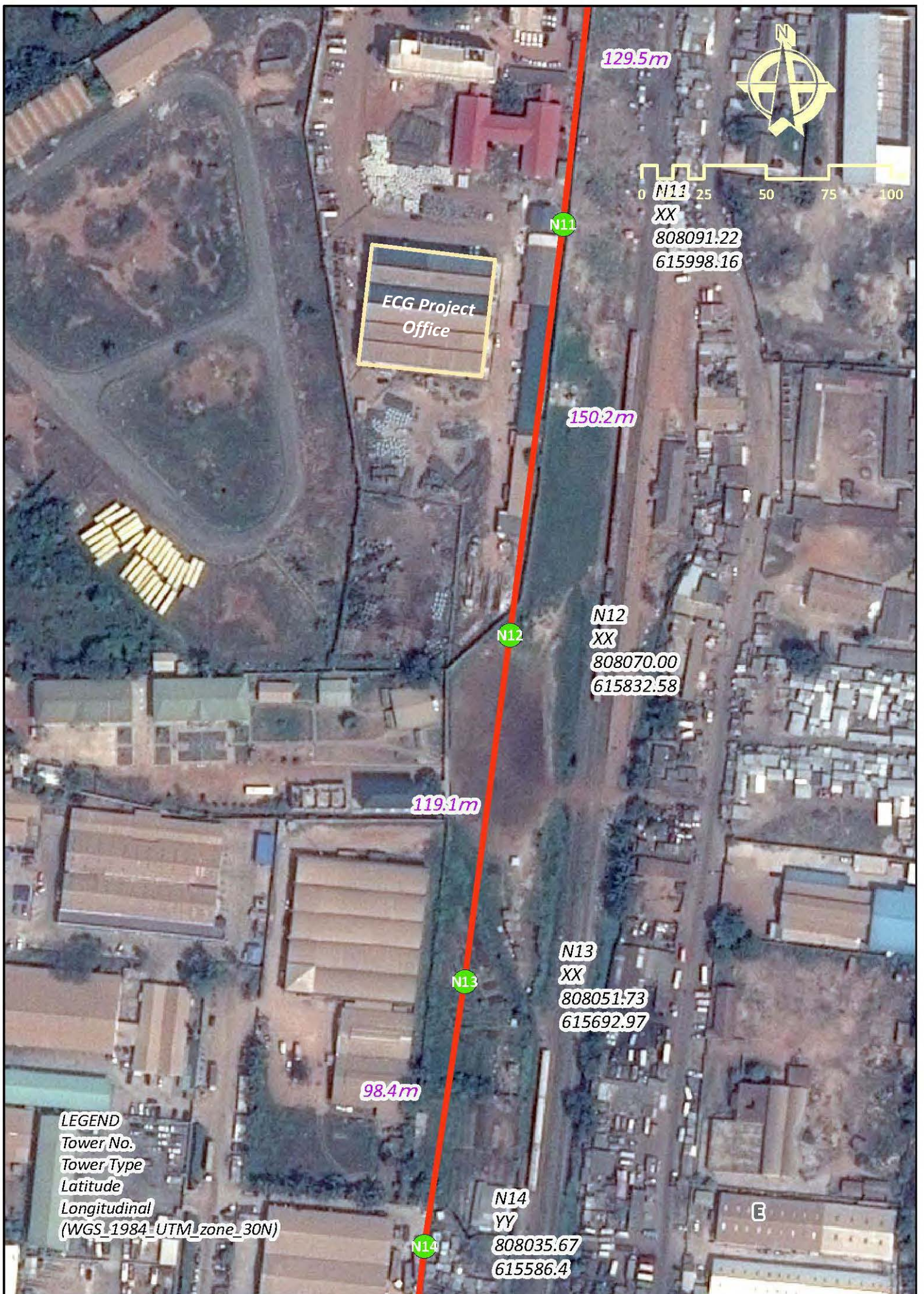
150.2m

N10

N10
YY
808107.25
616139.65

D

LEGEND
Tower No.
Tower Type
Latitude
Longitudinal
(WGS_1984_UTM_zone_30N)





103.0m

N15

N15
YY
808022.17
615462.38

145.0m

N16

N16
YY
808005.68
615362.26

258.0m

N17

N17
YY
807971.81
615065.55

LEGEND

Tower No.
Tower Type
Latitude
Longitudinal
(WGS_1984_UTM_zone_30N)







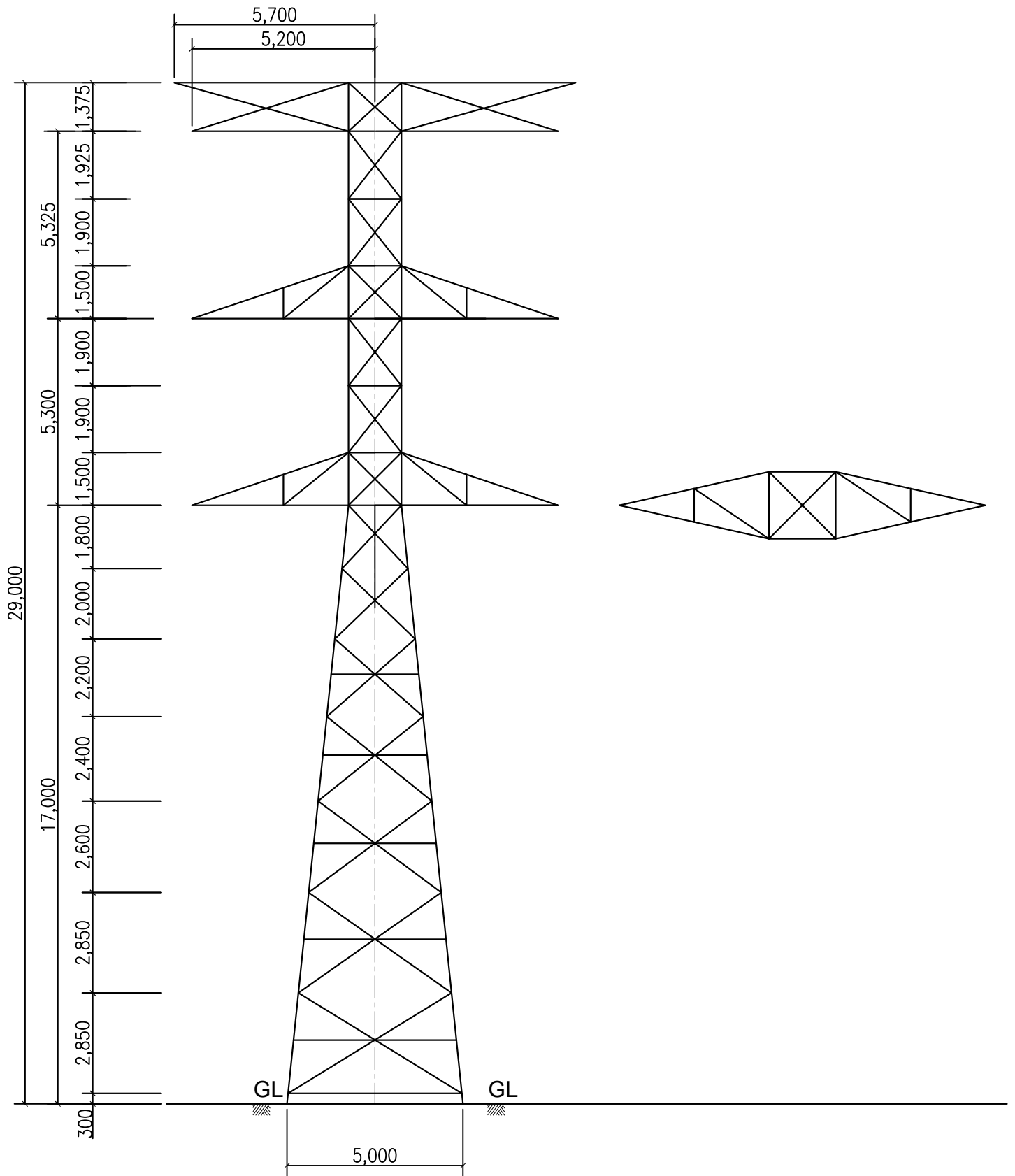
Road crossing
18.0m

GRAPHIC
ROADSS

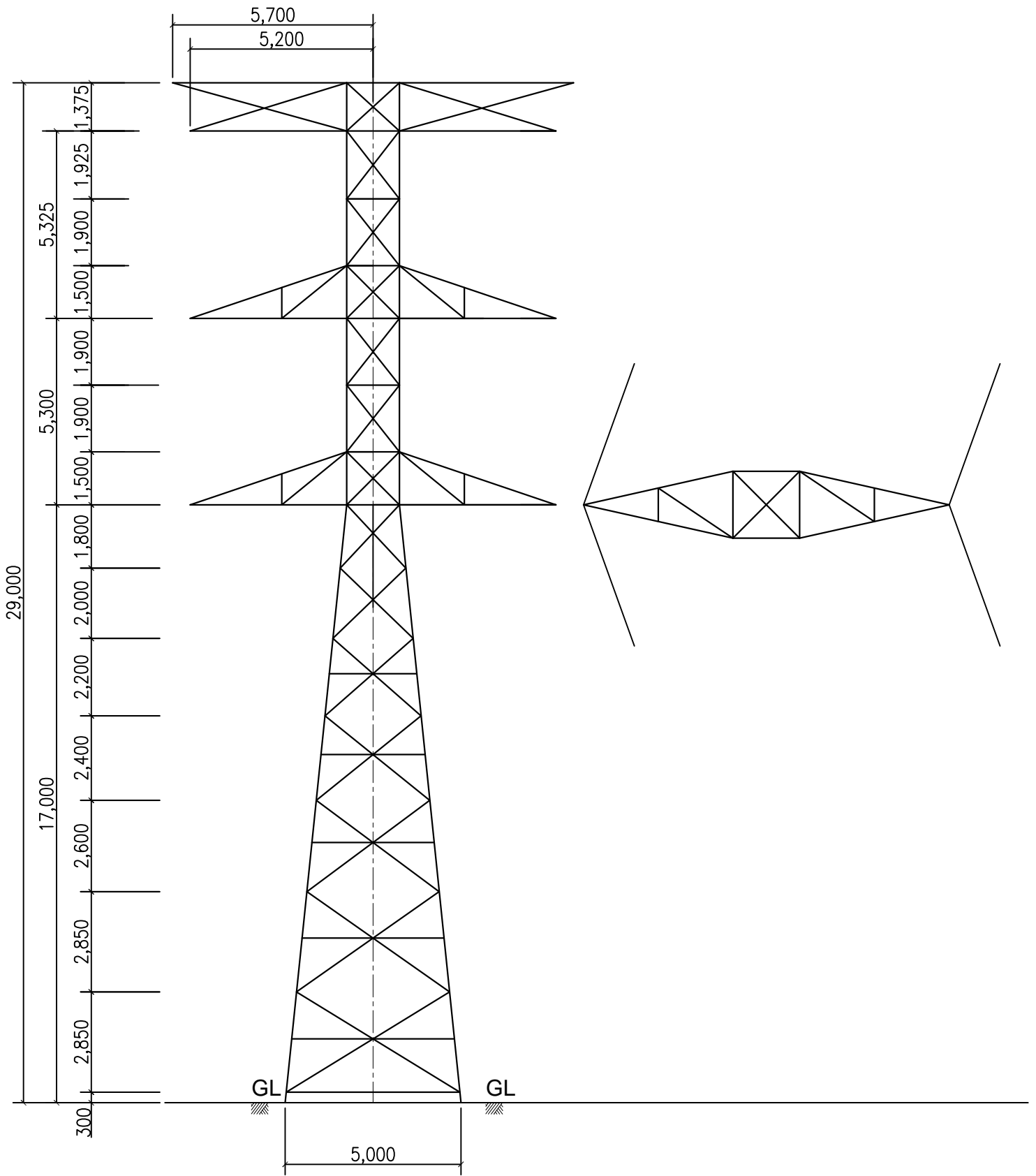
161kV Underground cable
500.0m

LEGEND
Tower No.
Tower Type
Latitude
Longitudinal
(WGS_1984_UTM_zone_30N)

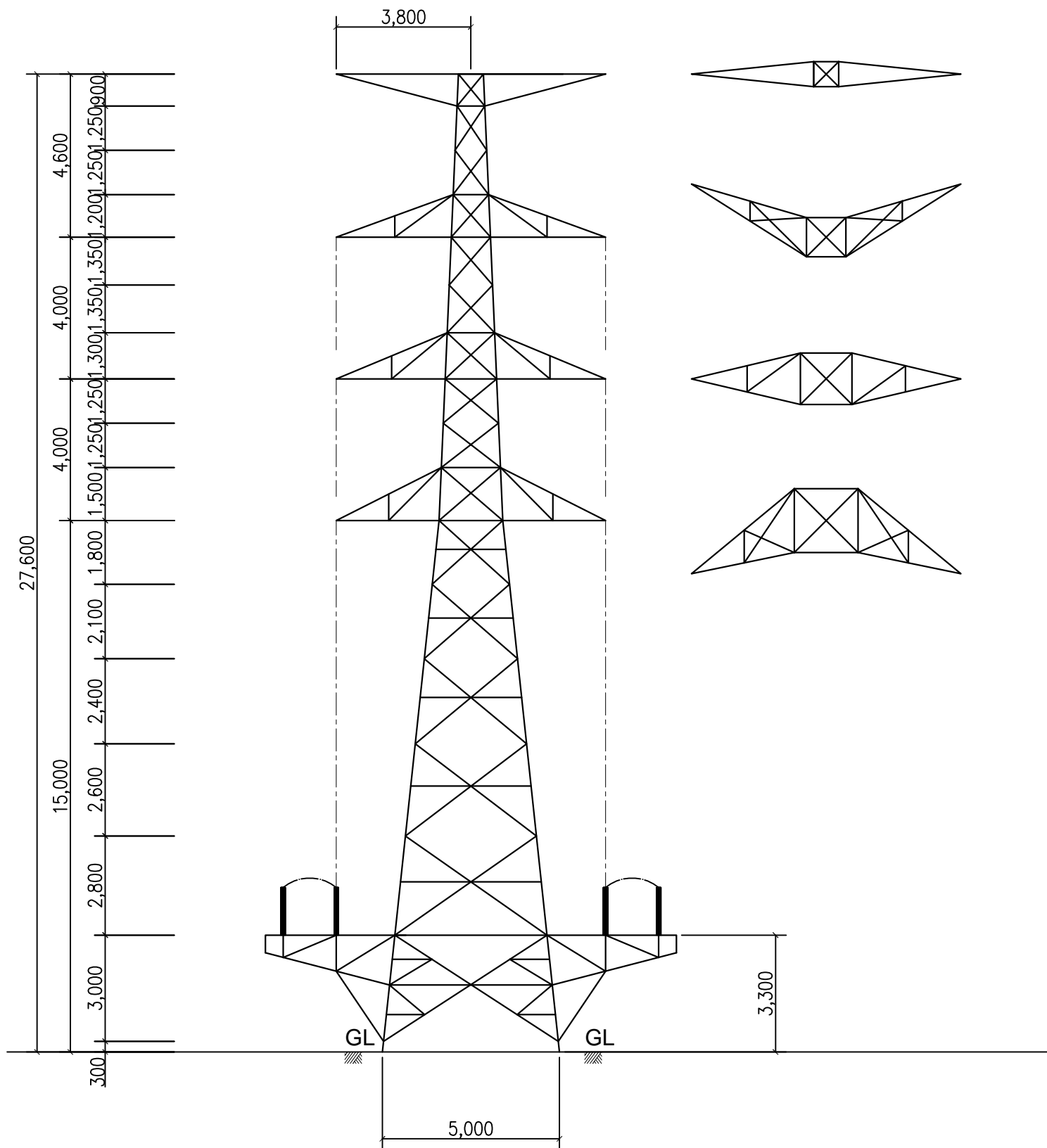
H



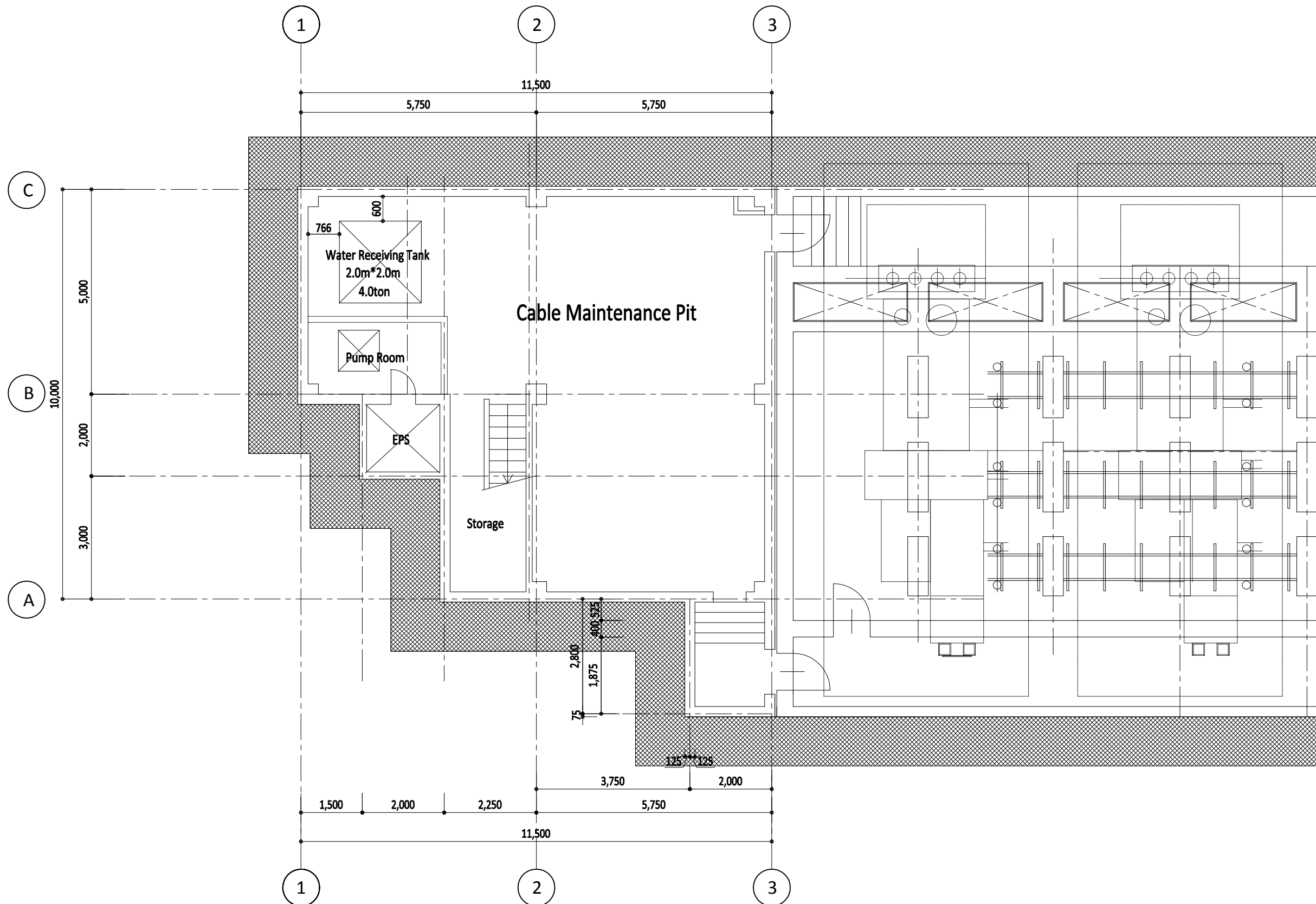
T-02 鉄塔外形図(1)懸垂型(XX)
 T-02 OUTLINE OF TOWER(1) SUSPENSION TYPE(XX)



T-02 鉄塔外形図(2)耐張型(Y Y)
 T-02 OUTLINE OF TOWER(2) TENTION TYPE(Y Y)

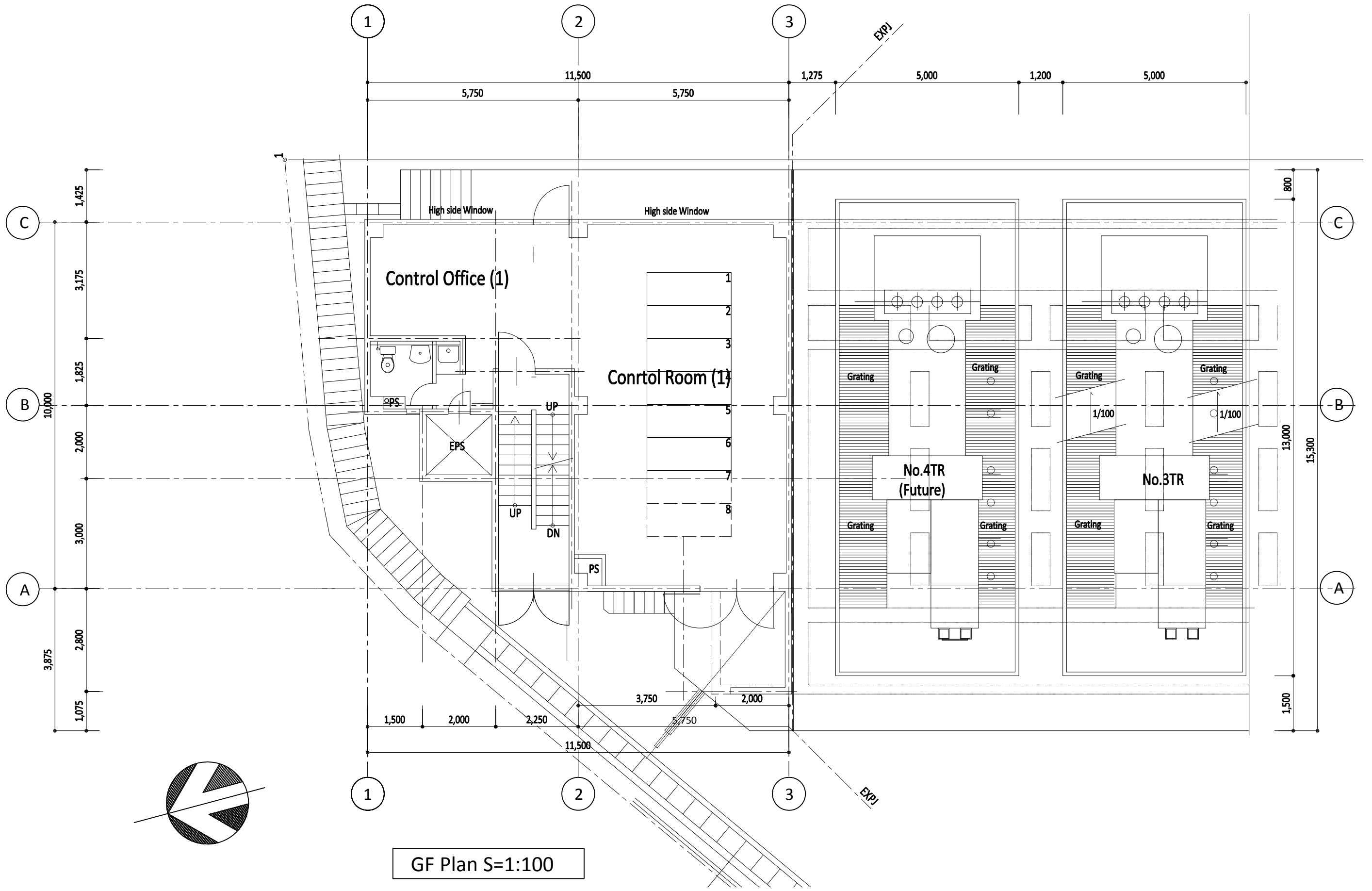


T-02 鉄塔外形図(3)ケーブル引留型(ZZ)
 T-02 OUTLINE OF TOWER(3)CABLE TERMINATION TYPE(ZZ)



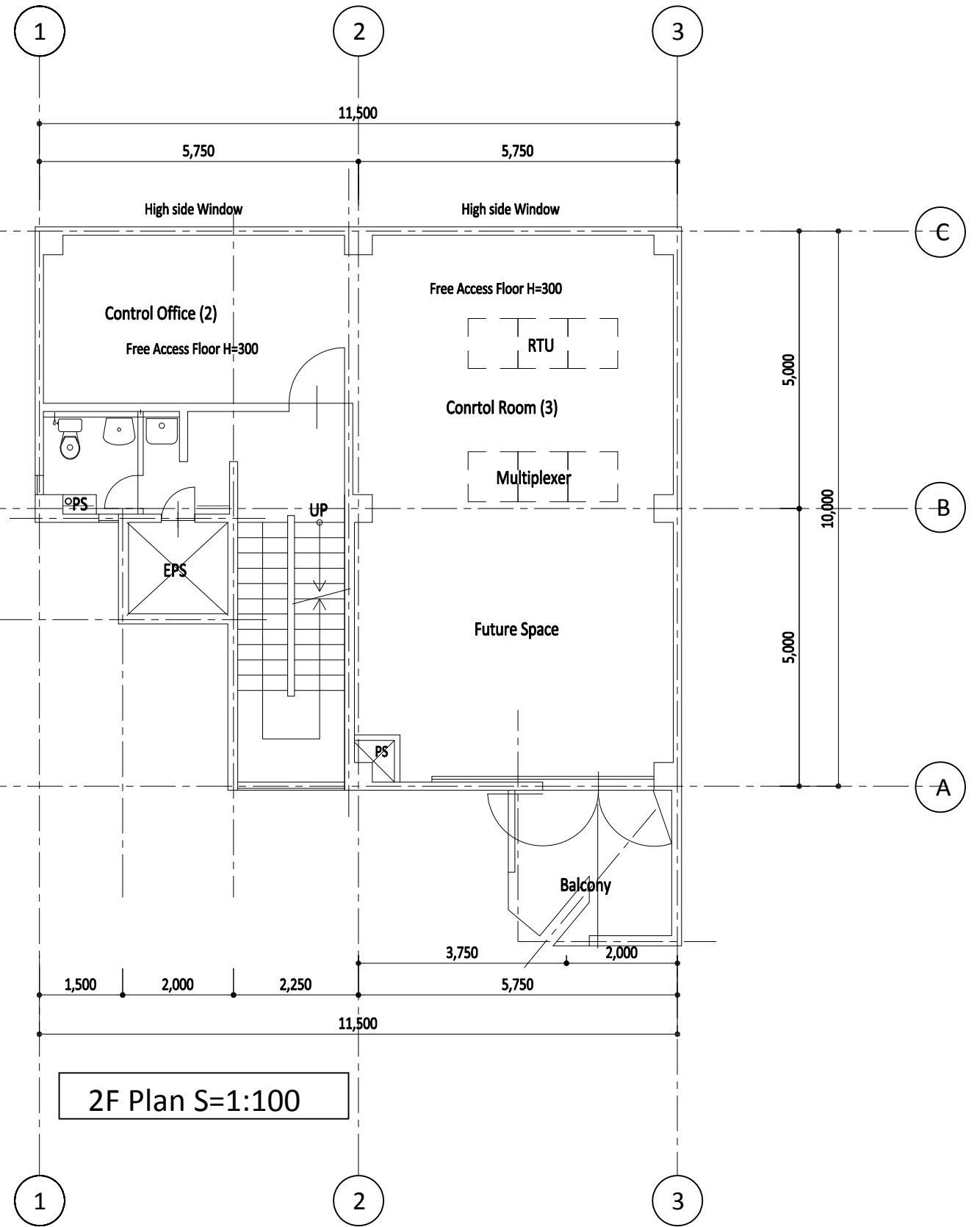
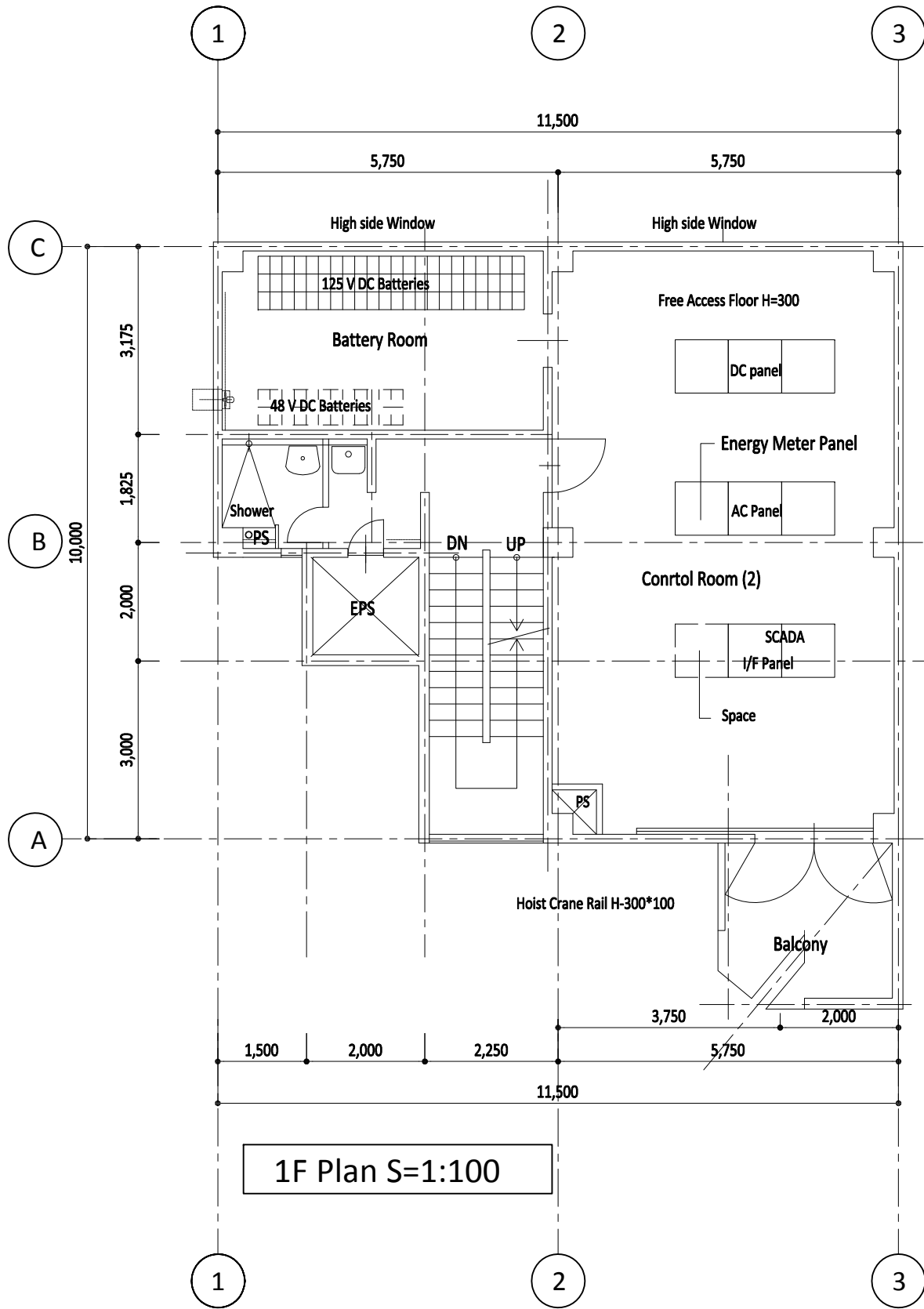
BF Plan S=1:100

Title	1:100
	DWG. No.
Control Building BF Plan	A-04

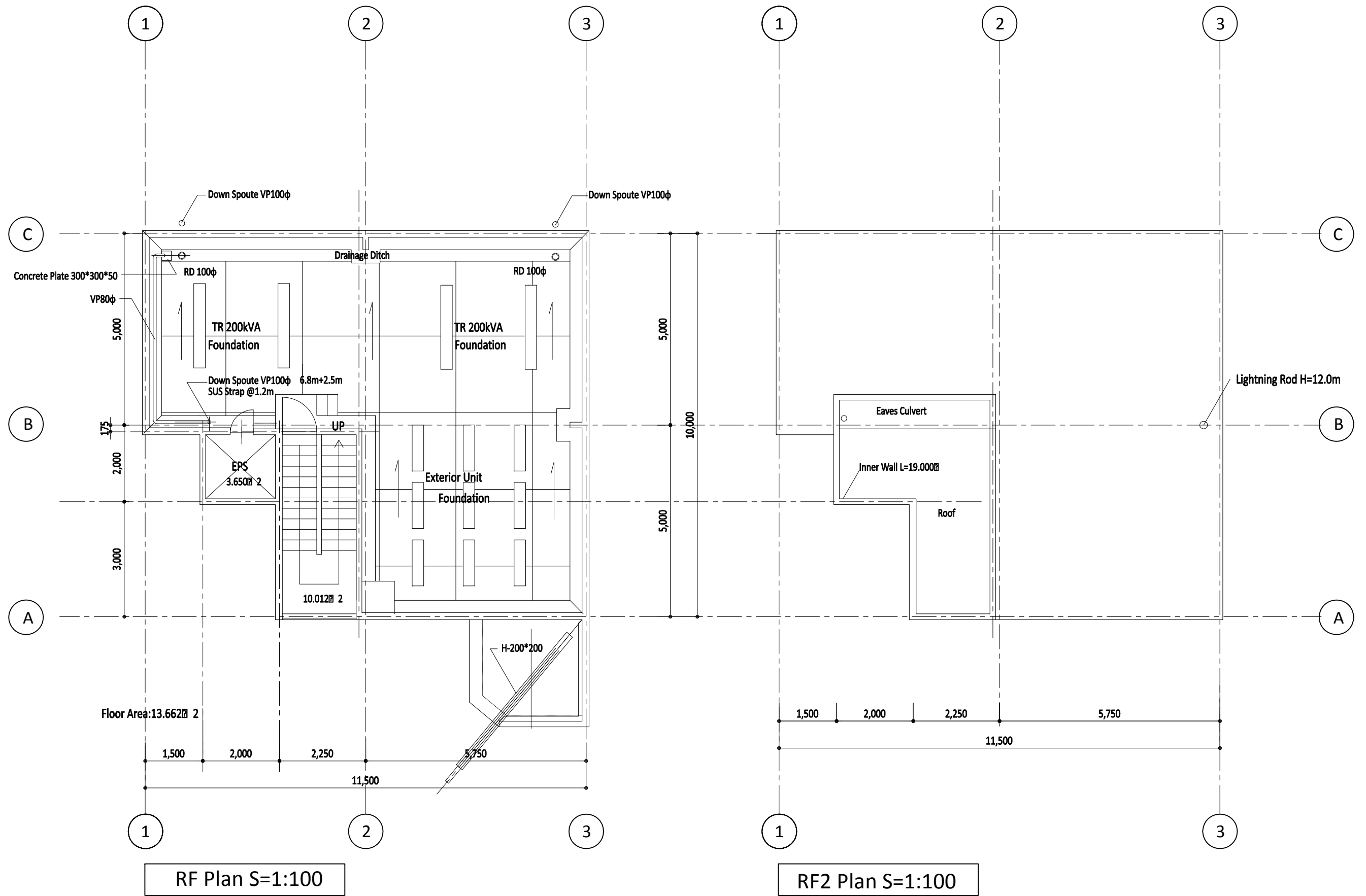


GF Plan S=1:100

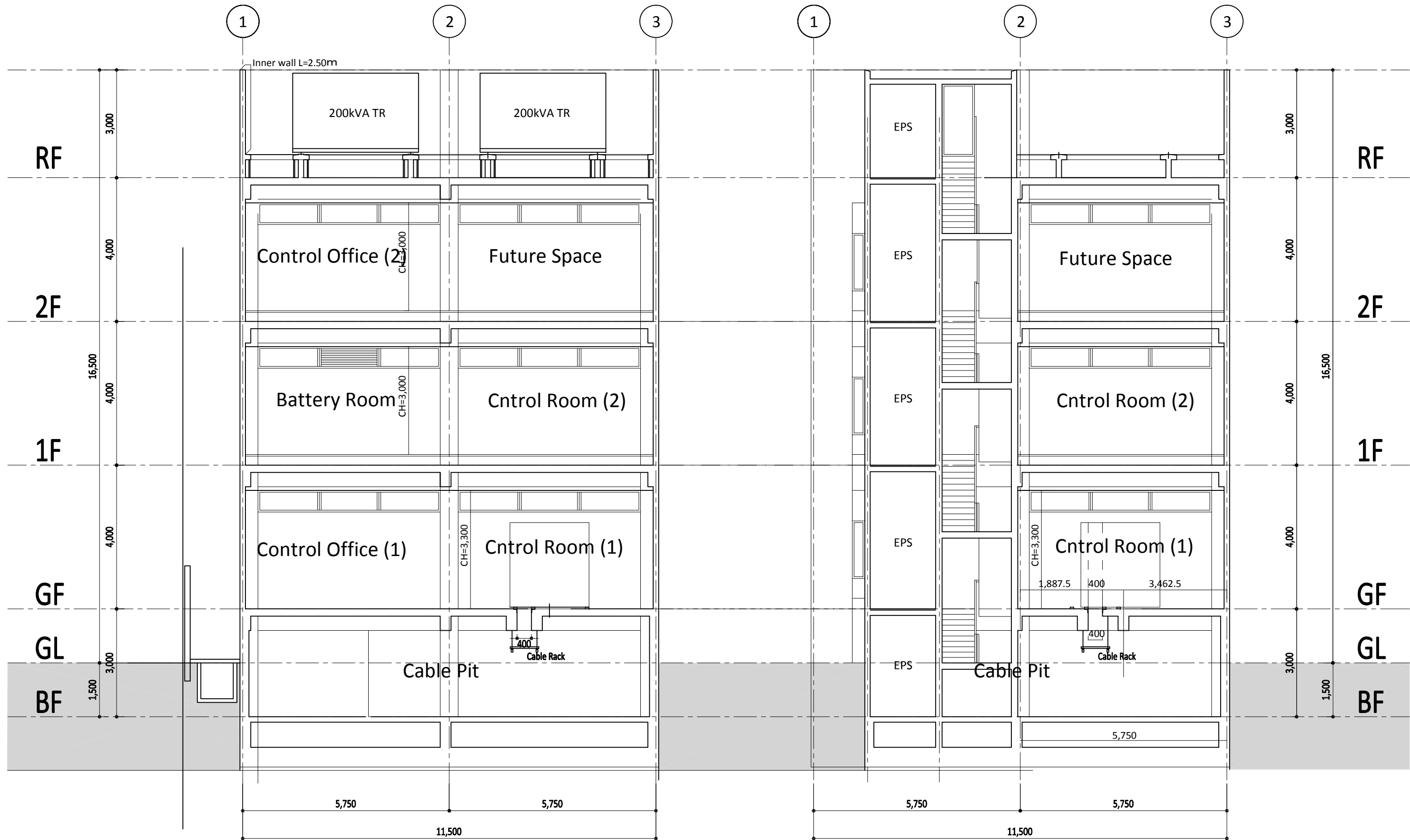
Title	1:100
	DWG. No.
Control Building GF Plan	A-05



Title	1:100
	DWG. No.
Control Building 1F, 2F Plan	A-06



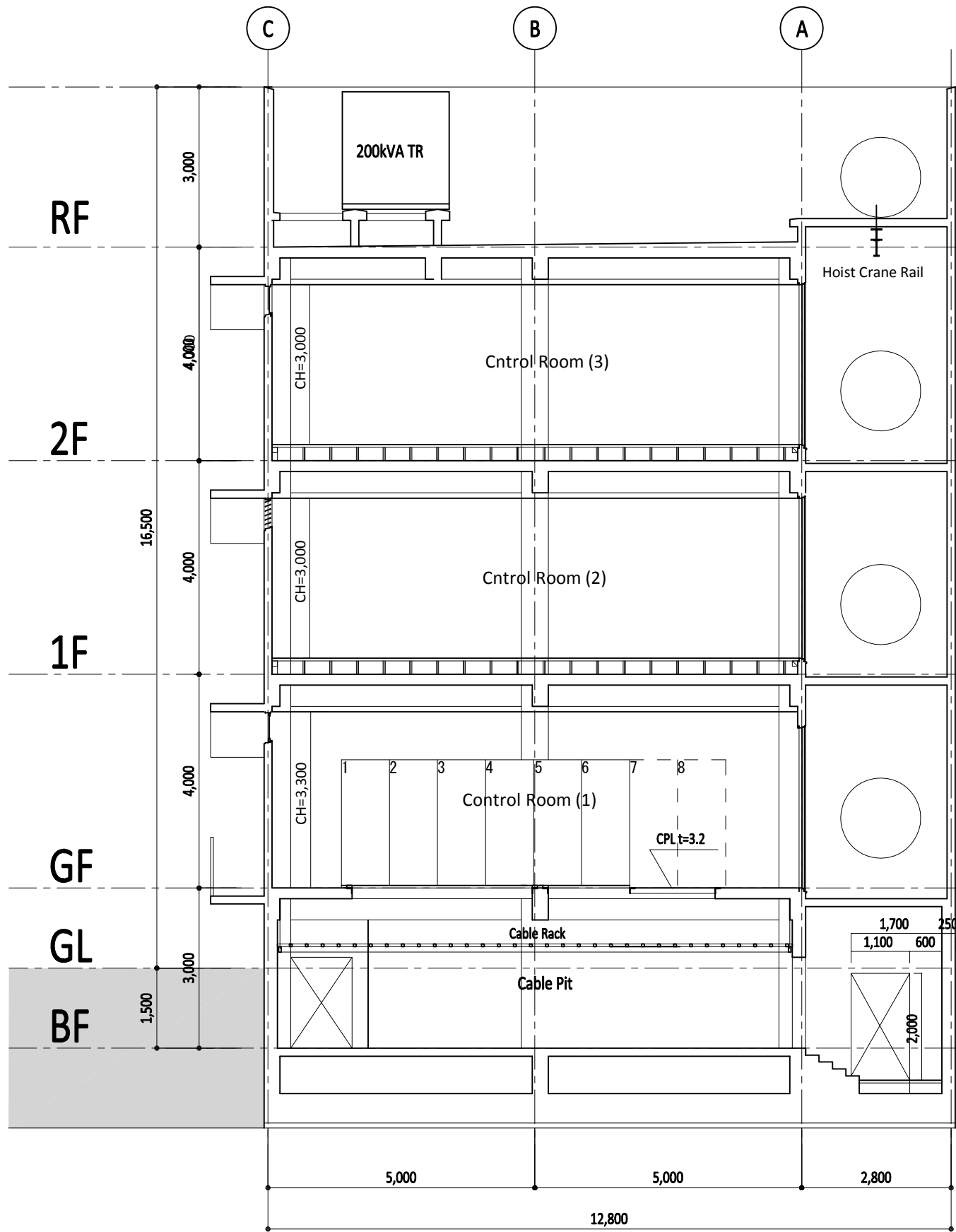
Title	1:100
	DWG. No.
Control Building RF, RF2 Plan	A-07



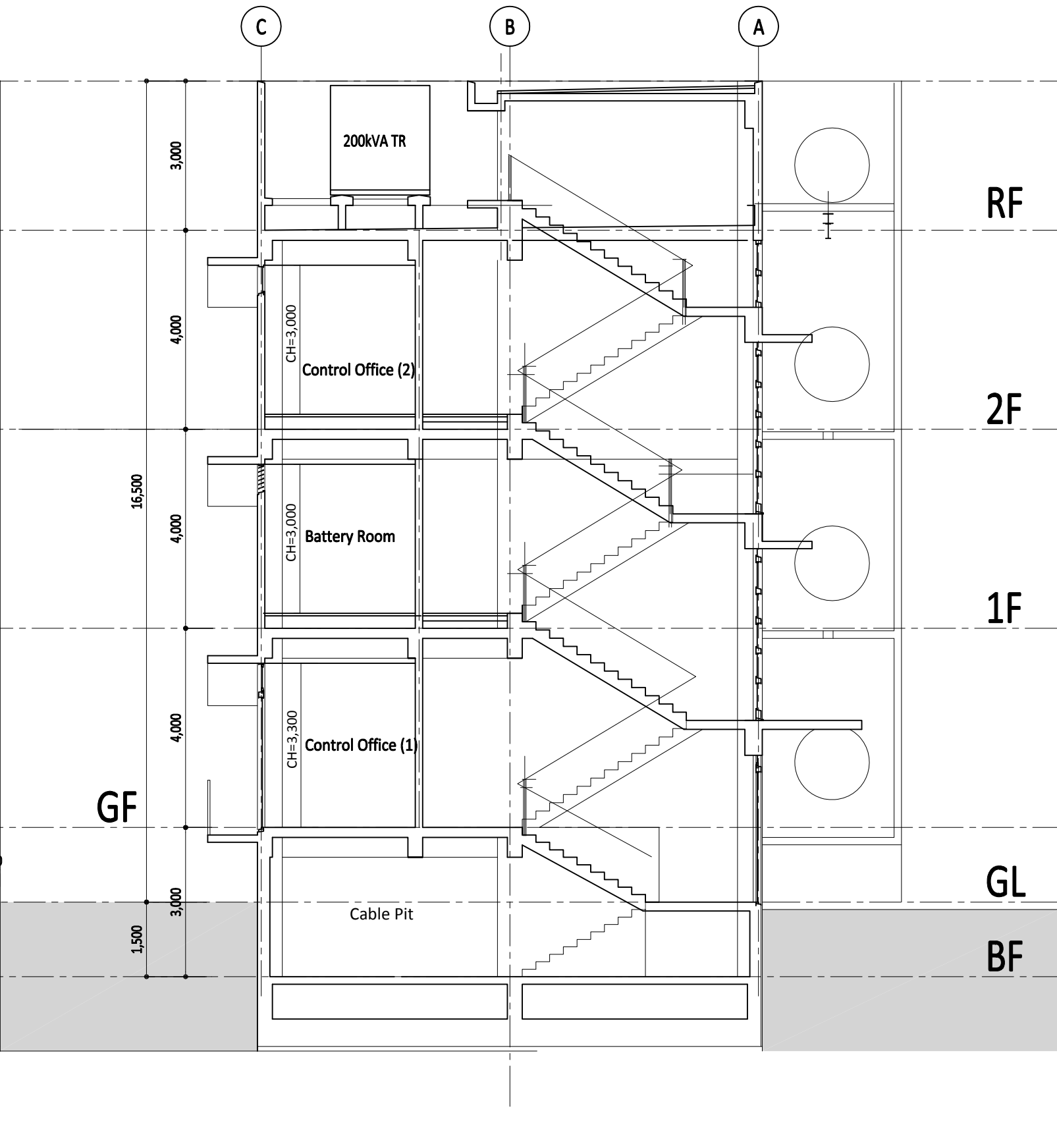
North-South Section 1 S=1:100

North-South Section 2 S=1:100

Title	1:100
	DWG. No.
Control Building SECTION (1)	A-08

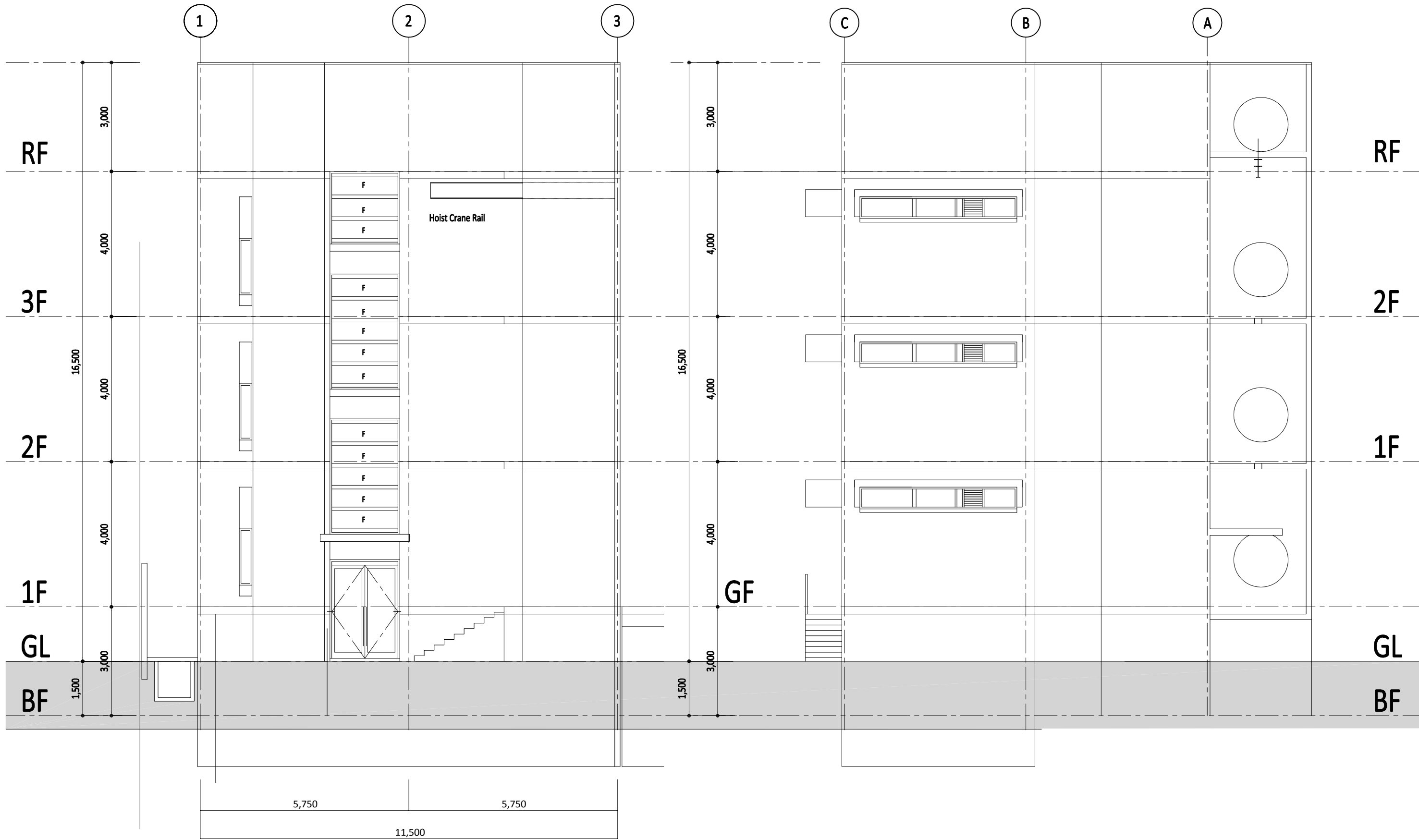


East-West Section 1 S=1:100



East-West Section 2 S=1:100

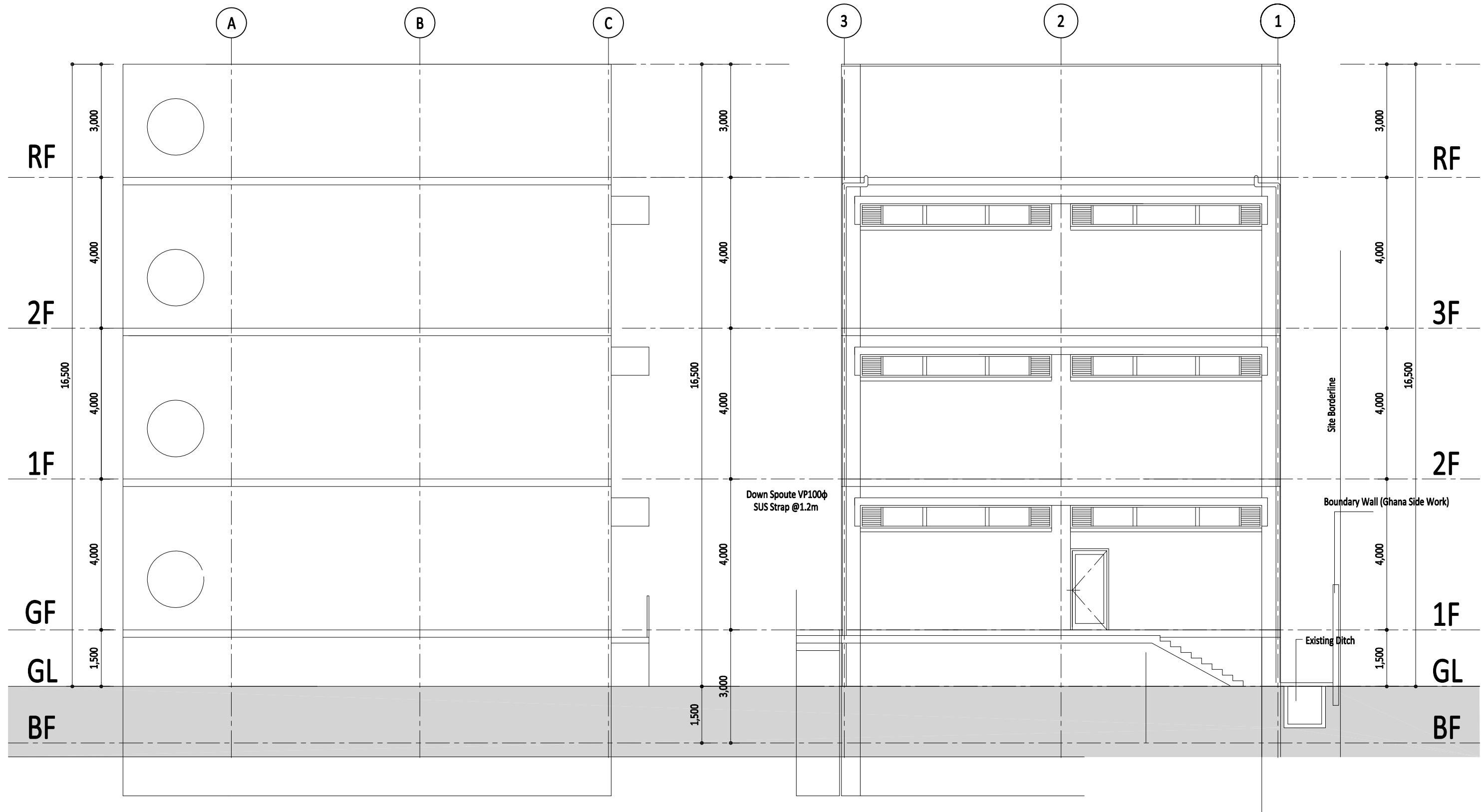
Title		1:100
Control Building SECTION (2)		DWG. No.
		A-09



West Elevation S=1:100

North Elevation S=1:100

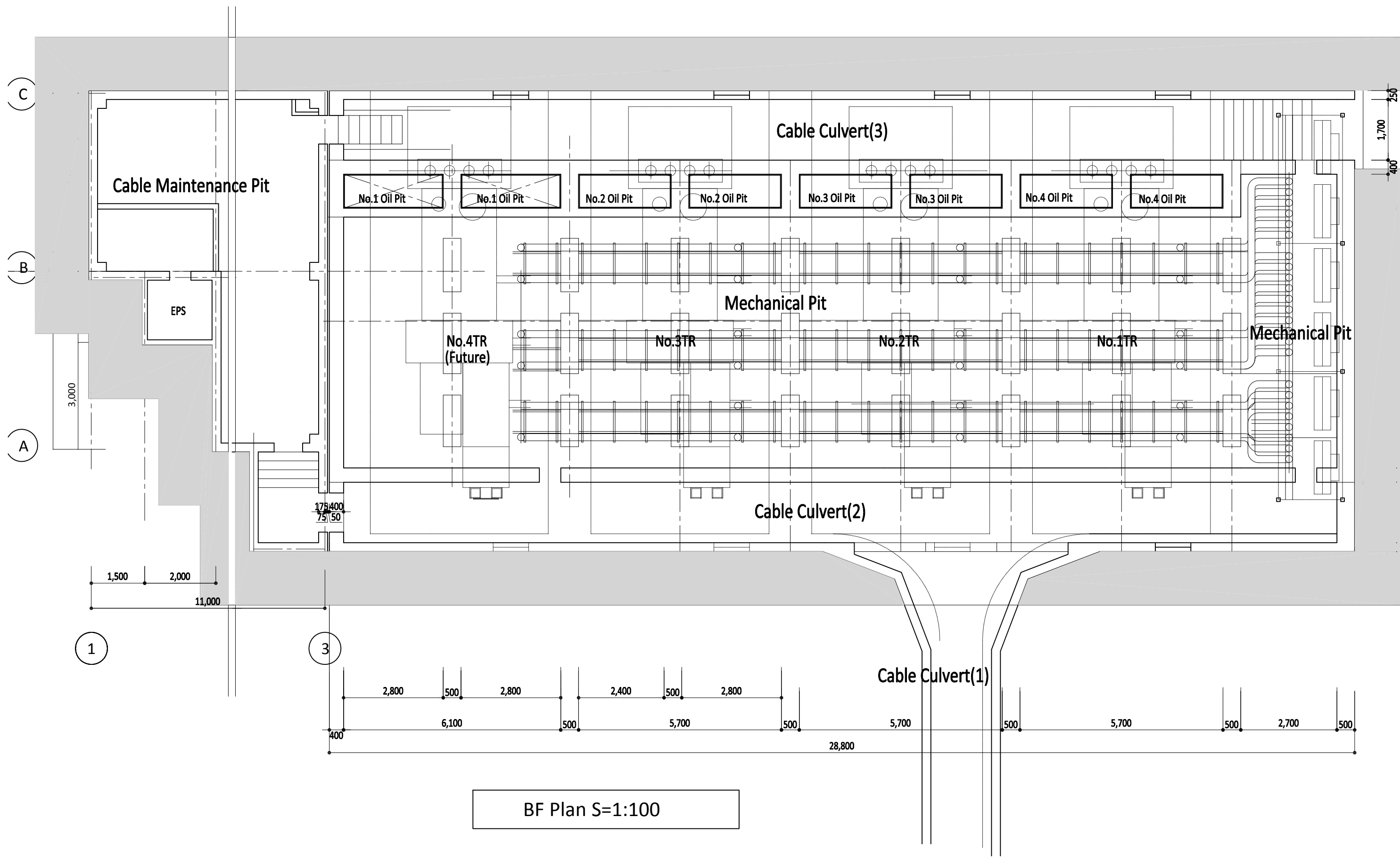
Title	1:100
	DWG. No.
Control Building ELEVATION (1)	A-10



South Elevation S=1:100

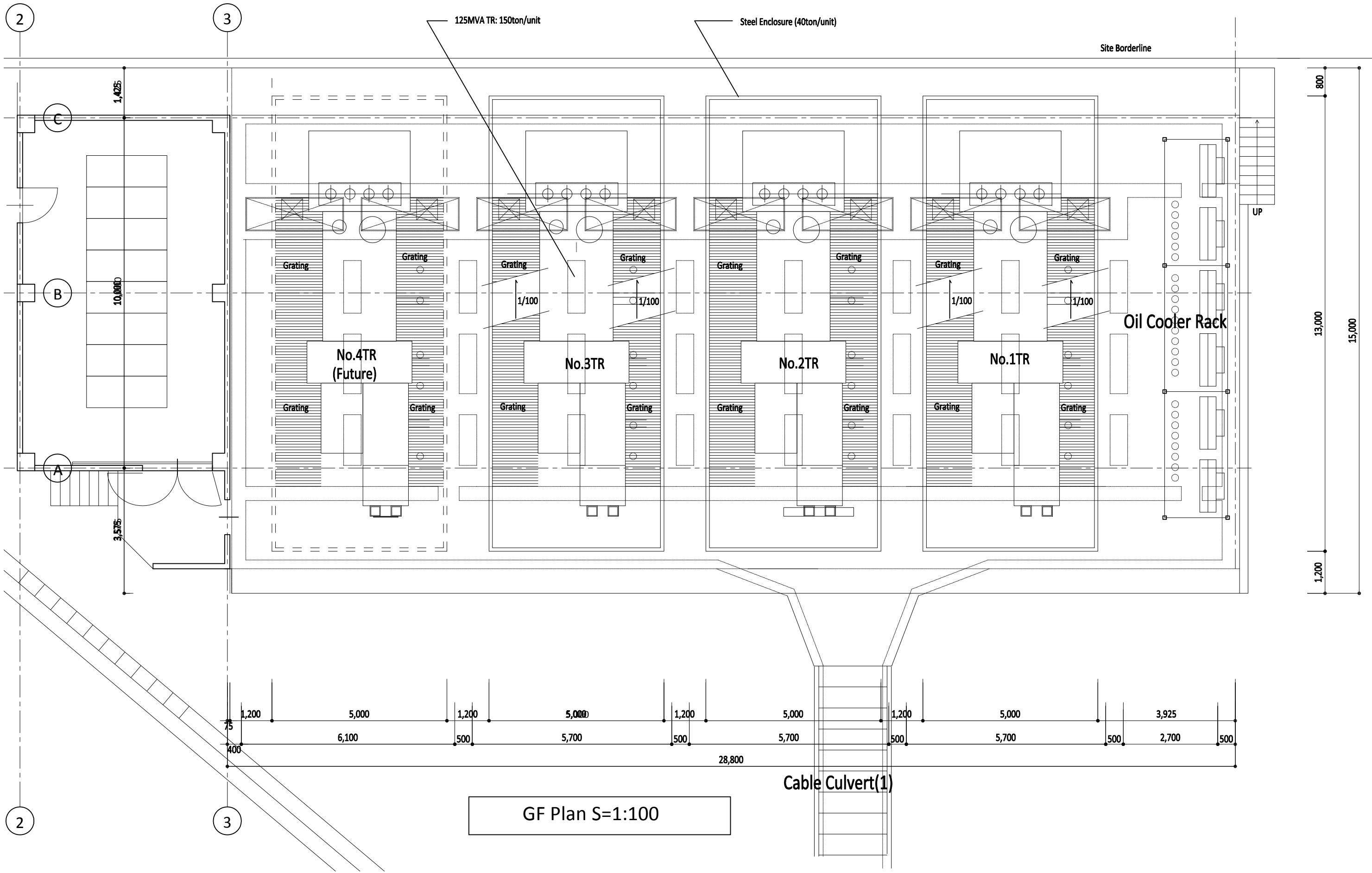
East Elevation S=1:100

Title	1:100
	DWG. No.
Control Building ELEVATION (2)	A-11

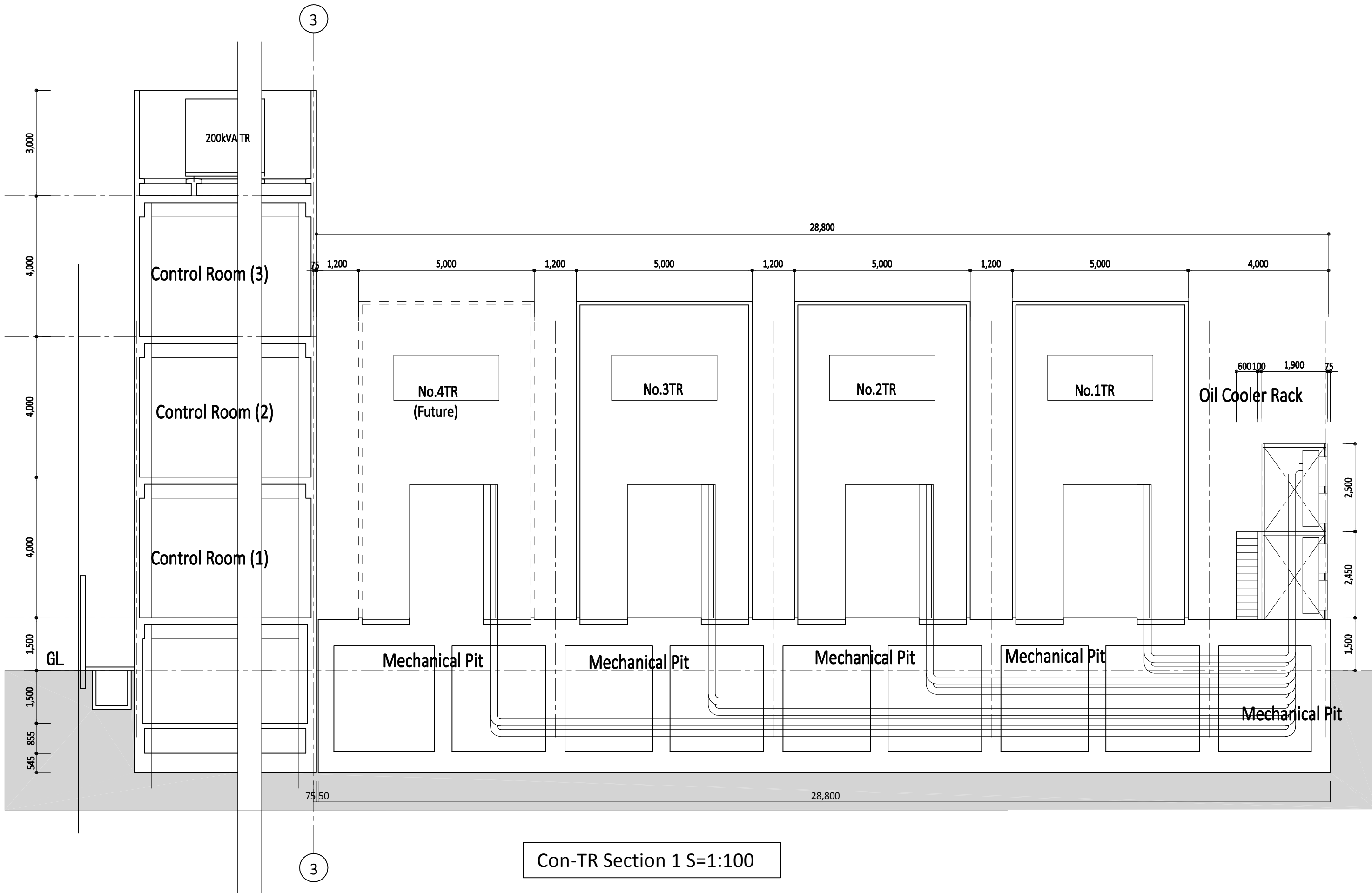


BF Plan S=1:100

Title		1:100
Transformer Platform BF Plan		DWG. No.
		A-12

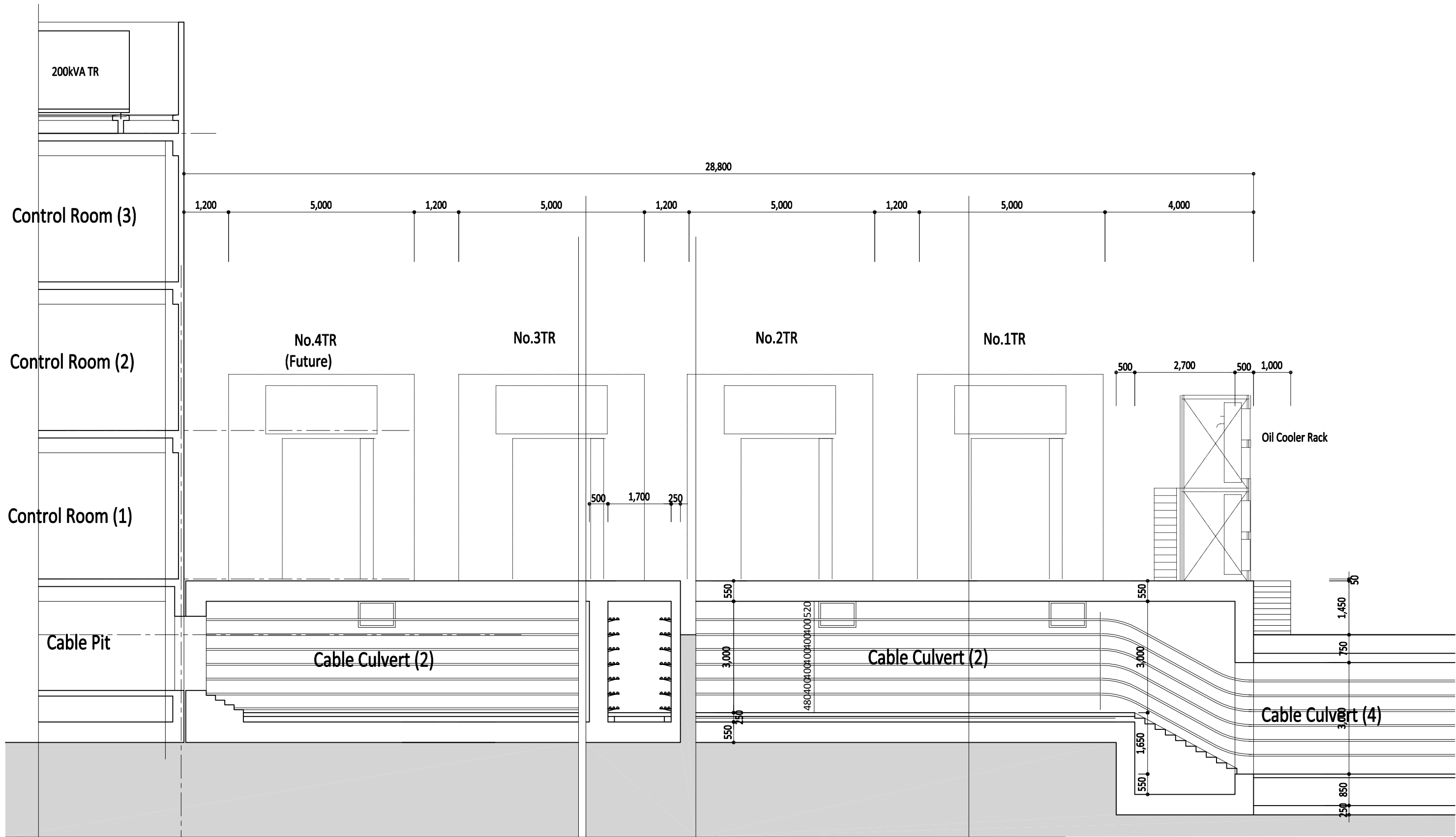


Title	1:100
	DWG. No.
Transformer Platform GF Plan	A-13



Con-TR Section 1 S=1:100

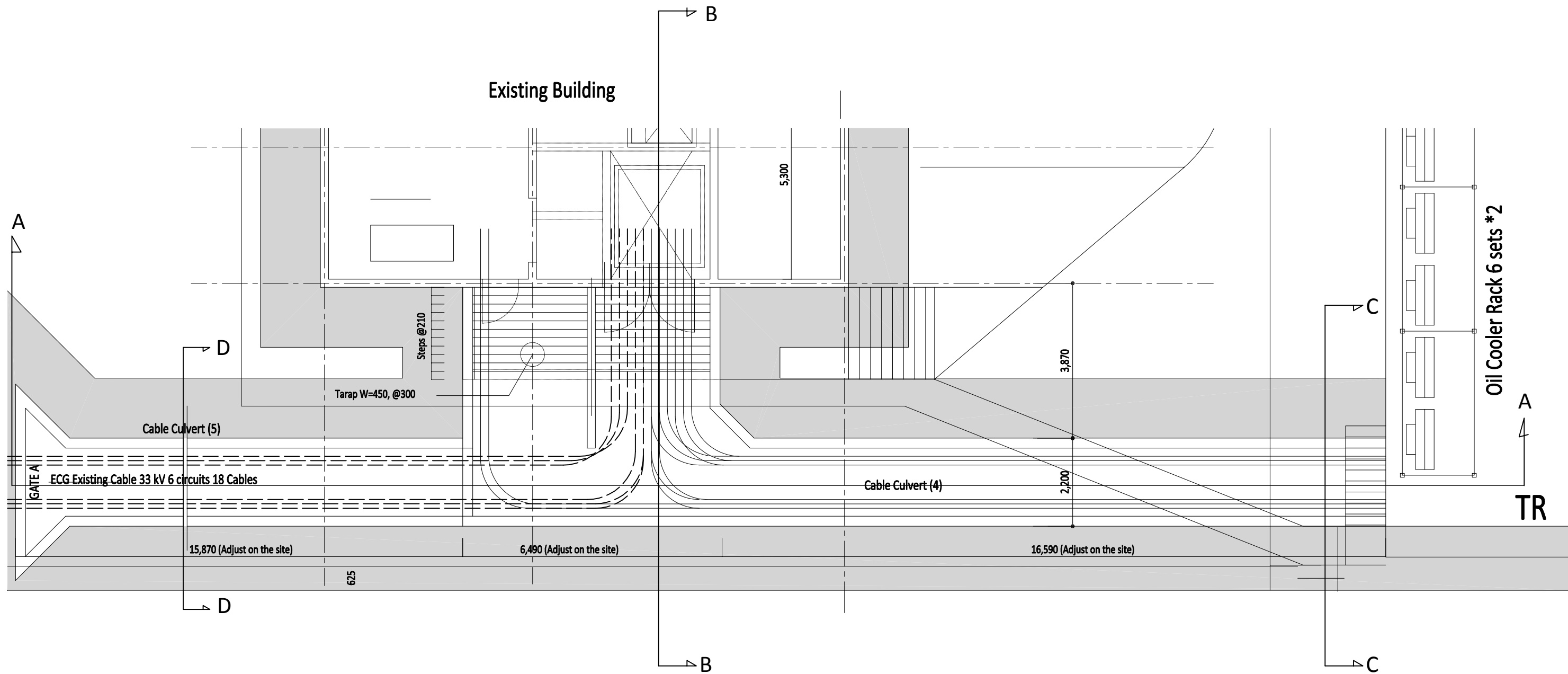
Title	1:100
	DWG. No.
Transformer Platform Section (1)	A-14



3

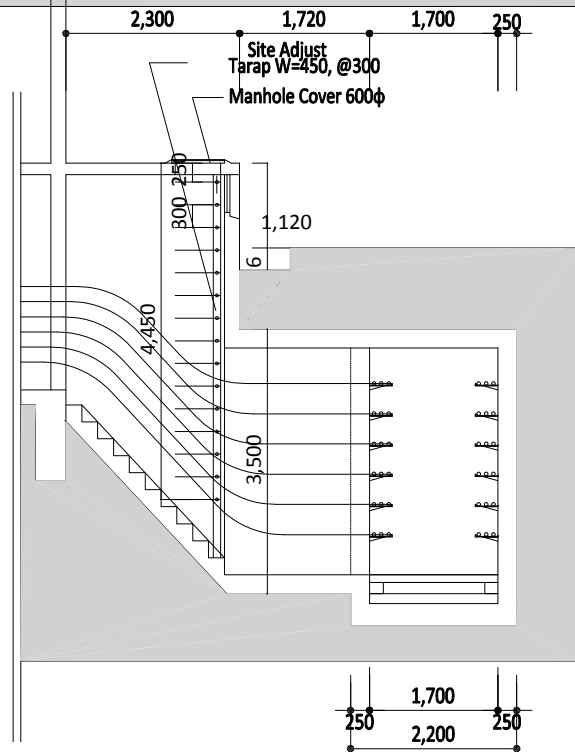
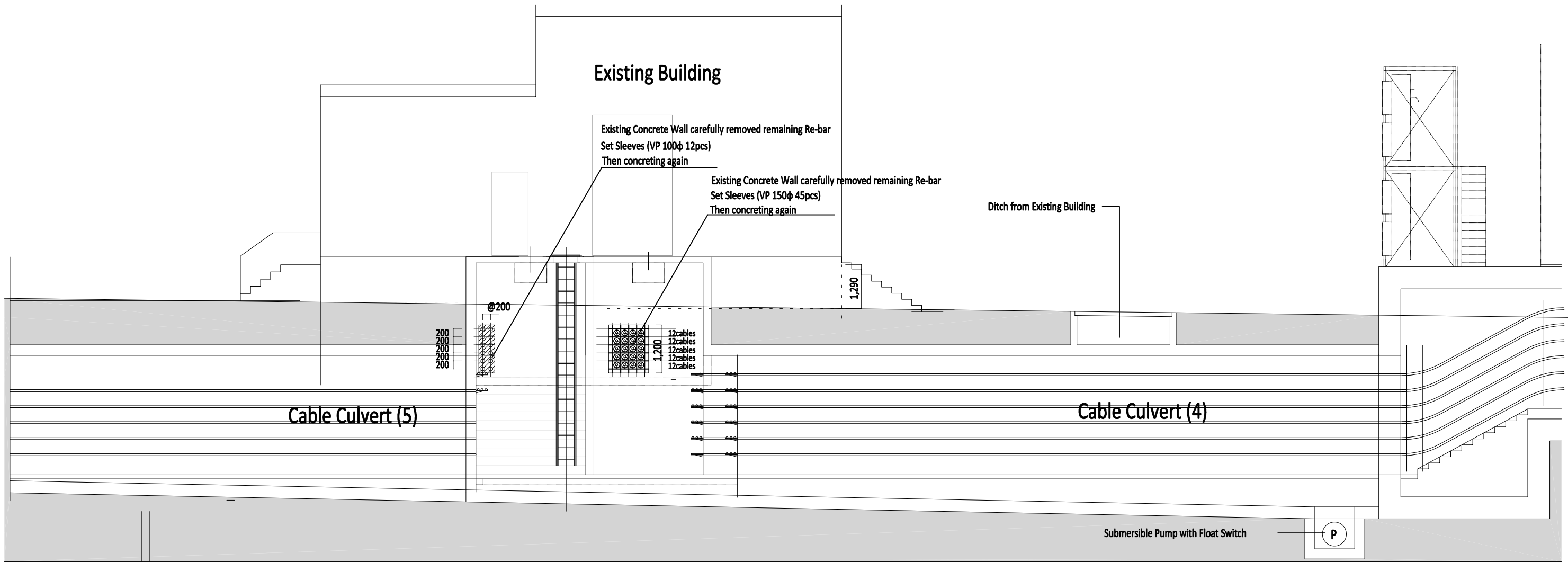
Con-TR Section 2 S=1:100

Title	1:100
	DWG. No.
Transformer Platform Section (2)	A-15



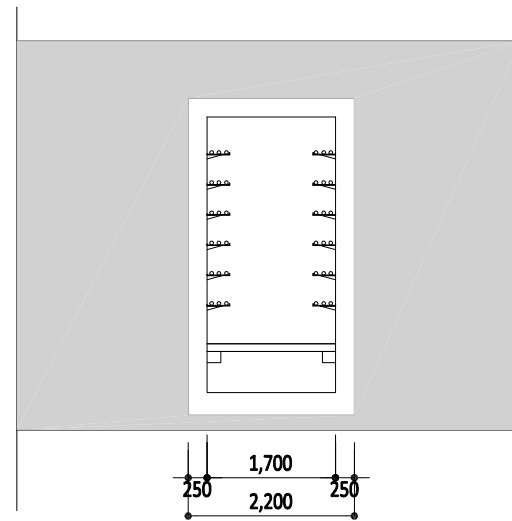
Cable Culvert (4) Plan S=1:100

Title	1:100
	DWG. No.
Cable Culvert (4) Plan	A-16

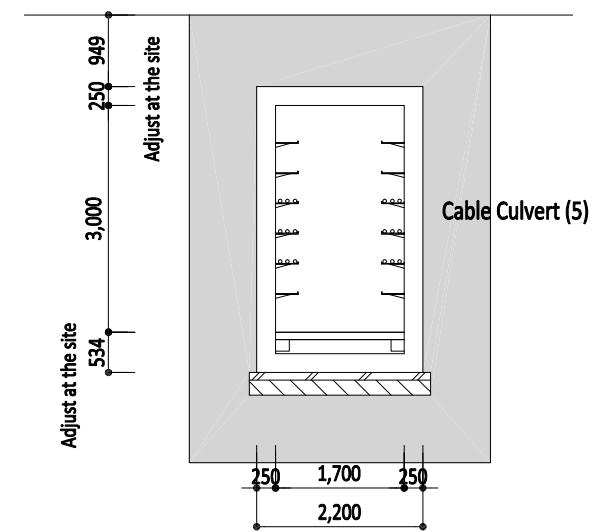


B-B Section S=1:100

Cable Culvert (4) A-A Section S=1:100

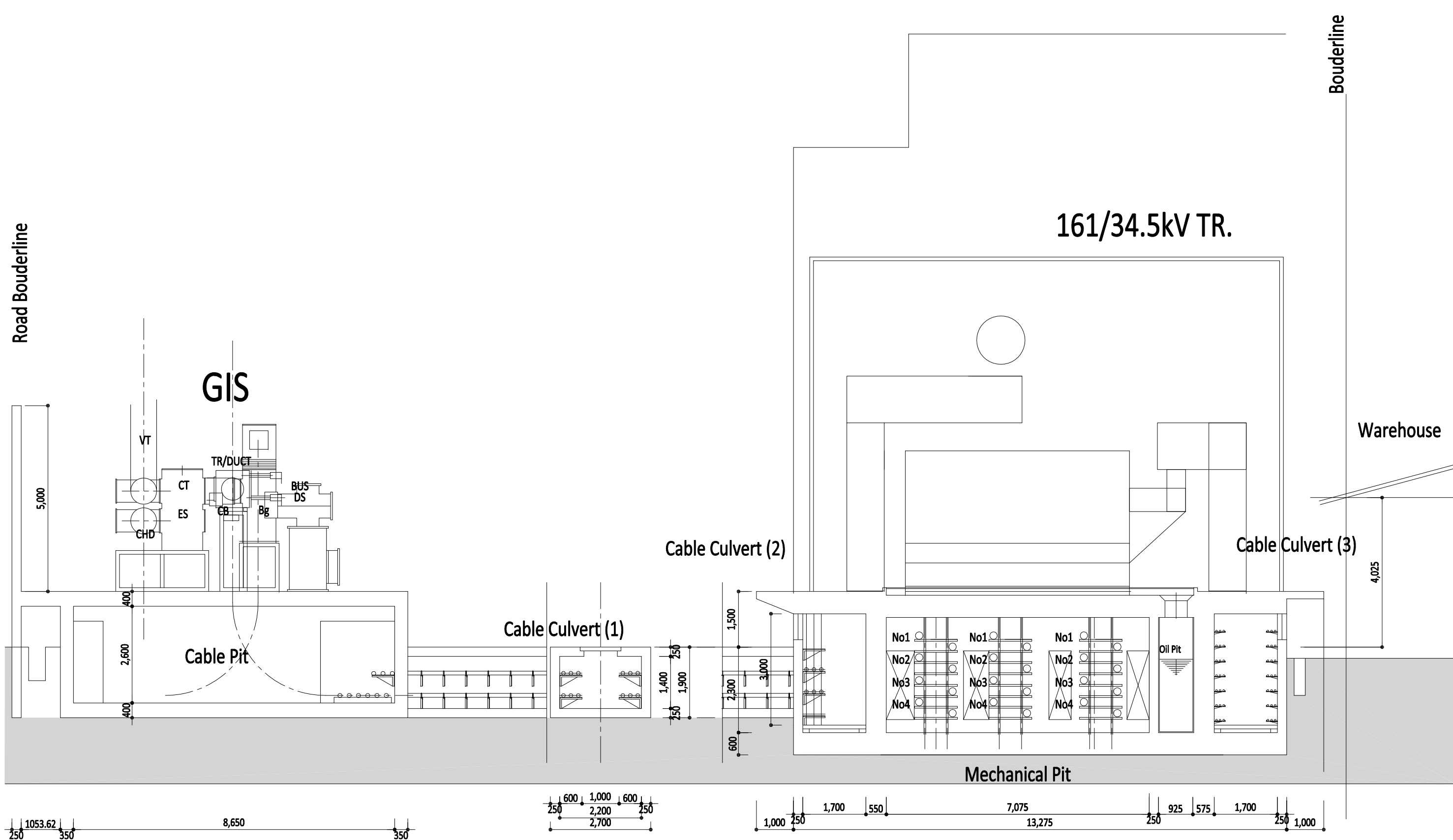


C-C Section S=1:100



D-D Section S=1:100

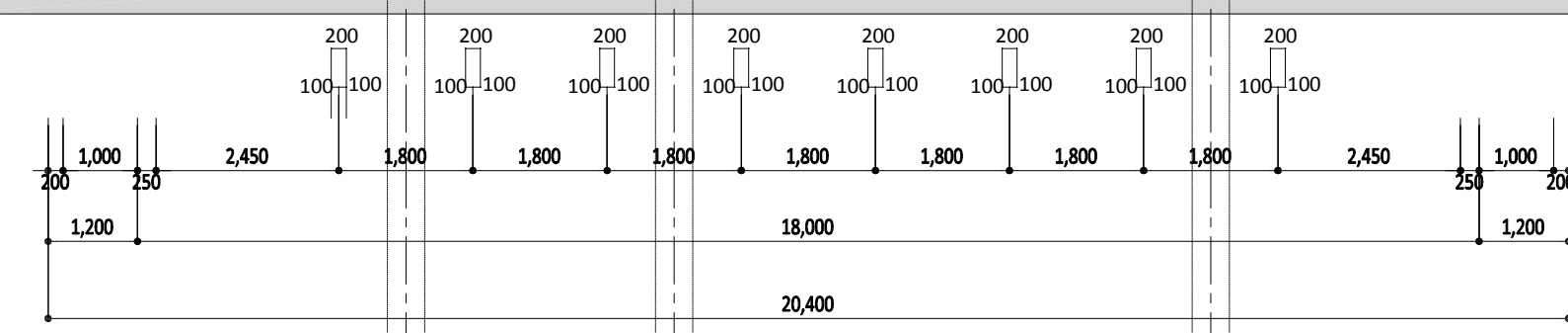
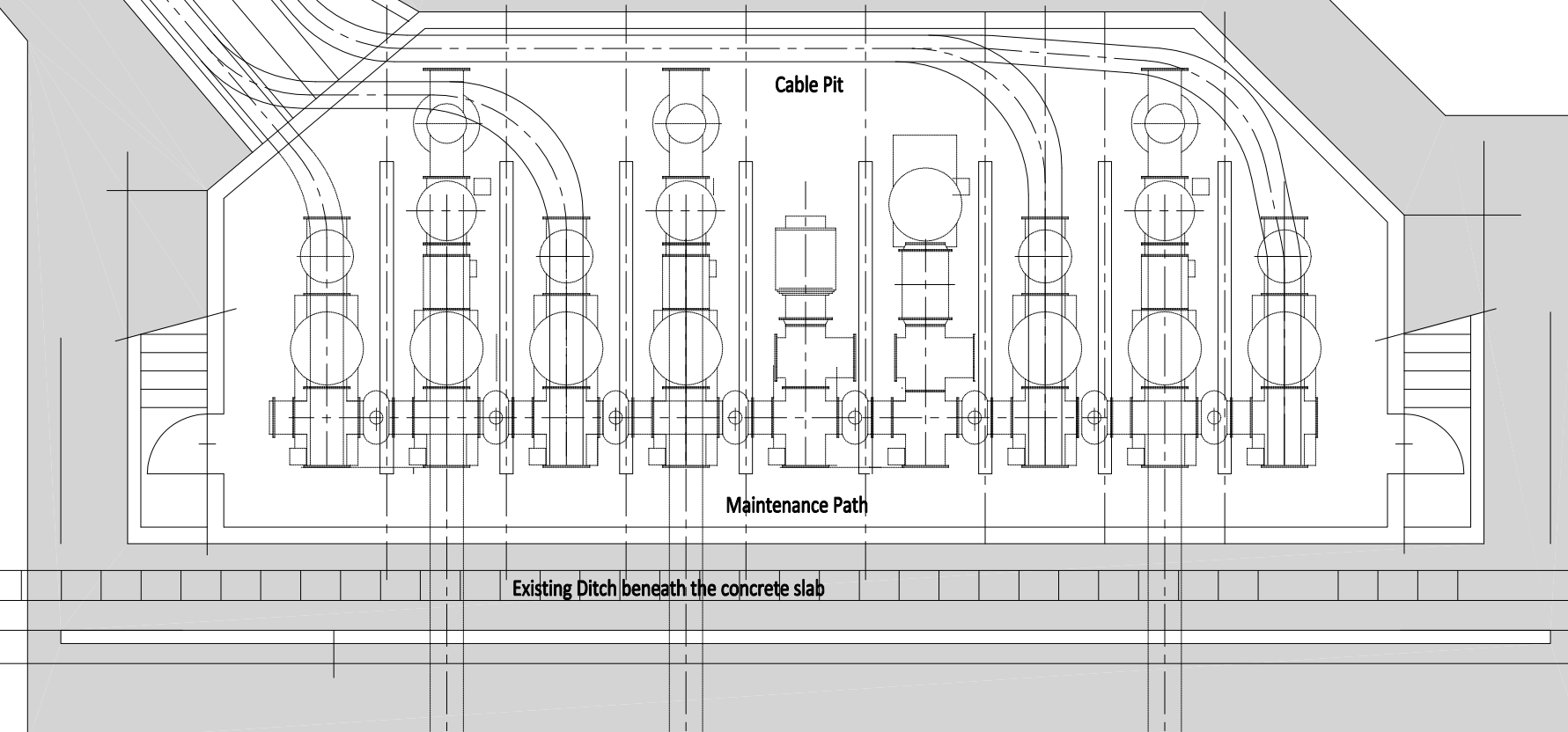
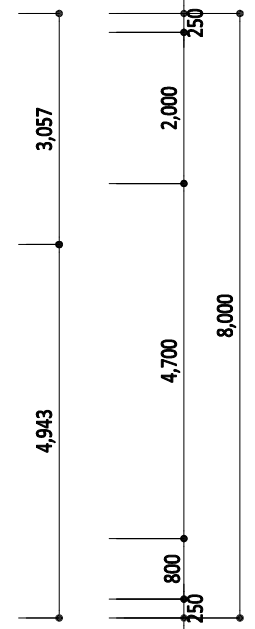
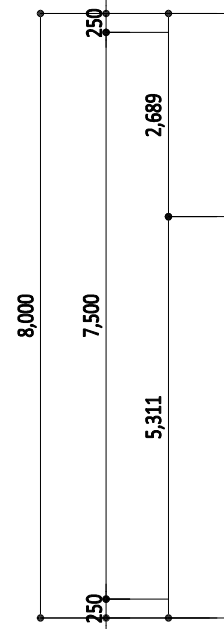
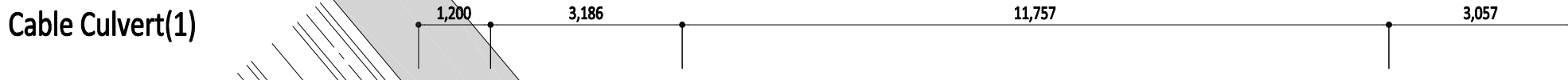
Title	1:100
	DWG. No.
Cable Culvert (4) Section	A-17



GIS-TR Section S=1:100

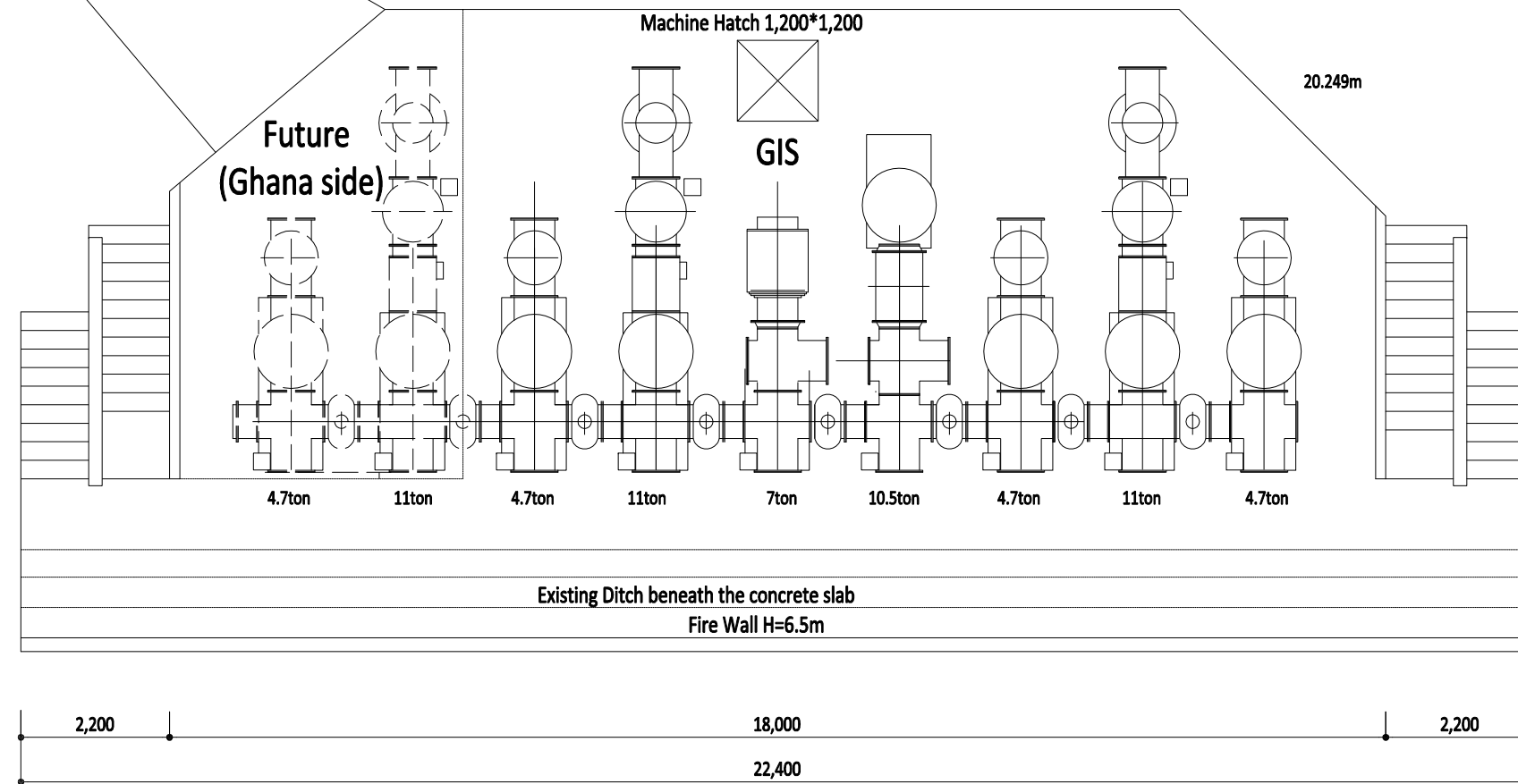
Title	TR-GIS Section, Culvert (1) Section	1:100
		DWG. No.
		A-18

Cable Culvert(1)



GIS BF Plan S=1:100

Title	1:100
	DWG. No.
GIS BF Plan	A-19



GIS GF Plan S=1:100

Title	1:100
	DWG. No.
GIS GF Plan	A-20