【添付資料】

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A-3 関係者（面会者）リスト

A-4 討議議事録（M/D）

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A-8 課税項目および免税措置調査報告書および免税情報シート

A-1　調査団員リスト

添付-1 調査団員リスト

(1) 第一次現地調査（概略設計調査）

No.	氏名	担当業務	所属
1	上石　博人	総括	JICA 産業開発・公共政策部 資源・エネルギーグループ第二チーム　課長
2	森本　泰介	計画管理	JICA 産業開発・公共政策部 資源・エネルギーグループ第二チーム　調査役
3	不二葦　教治	業務主任／変電計画	八千代エンジニヤリング株式会社
4	藤田　和夫	変電設備	八千代エンジニヤリング株式会社
5	木下　信行	系統計画/保護制御	八千代エンジニヤリング株式会社
6	玉井　昌幸	据付計画	八千代エンジニヤリング株式会社
7	宍戸　智	調達計画/積算	八千代エンジニヤリング株式会社
8	車田　輝雄	施設計画	八千代エンジニヤリング株式会社
9	小田　幸司	施設計画（2）	八千代エンジニヤリング株式会社

(2) 第二次現地調査（協力準備調査報告書の説明及び協議）

No.	氏名	担当業務	所属
3	不二葦　教治	業務主任／変電計画	八千代エンジニヤリング株式会社
4	藤田　和夫	変電設備	八千代エンジニヤリング株式会社
6	玉井　昌幸	据付計画	八千代エンジニヤリング株式会社
7	宍戸　智	調達計画/積算	八千代エンジニヤリング株式会社

A-2　調査行程

添付-2 調査行程

第 1 次現地調査日程

No.	月日 (曜日)	調査内容					宿泊地
		官ベース	コンサルタント				
		上石/森本	不二輦	木下	玉井/藤田/宍戸	小田/車田	
1	7 月 30 日 (日)		移動 {ｱﾃﾞｲｽ-ｱﾌﾞｼﾞｬ}		移動 {東京-ﾛﾝﾄﾞﾝ}		ｱﾌﾞｼﾞｬ (不二輦) 機内
2	7 月 31 日 (月)		① 表敬訪問 JICA ナイジェリア事務所		移動 {ﾛﾝﾄﾞﾝ-ｱﾌﾞｼﾞｬ} ① 表敬訪問 JICA ナイジェリア事務所		ｱﾌﾞｼﾞｬ
3	8 月 1 日 (火)		① 表敬訪問 ナイジェリア送電公社(TCN)・本社、連邦電力・公共事業住宅省 (FMPWH) ● 要請内容の確認並びに無償資金協力の仕組みの確認 ● 質問票の提出と説明及び便宜供与に係る協議 ● 他ドナーの支援状況の確認 ● 上位開発計画		同左		ｱﾌﾞｼﾞｬ
4	8 月 2 日 (水)		① 現地再委託先との協議 ② TCN との協議 ● 質問票の提出と説明及び便宜供与に係る協議 ● 需要予測調査 ● コンポーネントと仕様 ● 移動式変電氏及び鉄道公社敷地の借用 移動 {ｱﾌﾞｼﾞｬ-ﾗｺﾞｽ}		同左		ﾗｺﾞｽ
5	8 月 3 日 (木)		① 表敬訪問 TCN ラゴス支店 ● 要請内容の確認並びに無償資金協力の仕組みの確認 ● 質問票の提出と説明及び便宜供与に係る協議 ② アカンバ変電所		同左		ﾗｺﾞｽ

No.	月日 (曜日)	調査内容					宿泊地
		官ベース	コンサルタント				
		上石/森本	不二輿	木下	玉井/藤田/宍戸	小田/車田	
			調査 ● 既設設備、仕様 ● 用地 ● 据付計画 ● 需要予測調査 ③ アパパロード変電所調査 ● 既設設備、仕様 ● 用地 ● 据付計画				
6	8月4日 (金)		① TV 会議 ● 積算ガイダンス ② 概算事業費の積算		同左		ﾗｺﾞｽ
7	8月5日 (土)		① アパパロード変電所調査継続 ② アパパロード変電所の配置検討		同左		ﾗｺﾞｽ
8	8月6日 (日)		① 現地調査結果の作成	移動｛東京-ﾛﾝﾄﾞﾝ｝	① 現地調査結果の作成		機内（木下） ﾗｺﾞｽ
9	8月7日 (月)		① アパパロード変電所調査継続	移動｛ﾛﾝﾄﾞﾝ-ﾗｺﾞｽ｝	① アパパロード変電所調査継続		ﾗｺﾞｽ
10	8月8日 (火)		① アカンバ変電所調査継続	同左	同左		ﾗｺﾞｽ
11	8月9日 (水)		① アパパロード変電所調査継続	同左	同左		ﾗｺﾞｽ
12	8月10日 (木)		① TV 会議 ● 対処方針会議 ② 食料品工場 ● 電力需給調査	① TV 会議 ● 対処方針会議 ②アパパロード変電所調査継続	同左		ﾗｺﾞｽ
13	8月11日 (金)		① 現地調査結果の作成 ② EKEDC 訪問 ③ JETRO 訪問	① アジャ変電所調査 ② EKEDC 訪問 ③ JETRO 訪問	同左		ﾗｺﾞｽ
14	8月12		① アパパロード変	同左	同左	移動(東	ﾗｺﾞｽ

No.	月日 (曜日)	調査内容					宿泊地
		官ベース	コンサルタント				
		上石/森本	不二輩	木下	玉井/藤田/宍戸	小田/車田	
	日 (土)		変電所調査継続 ② アカンバ変電所調査継続			京ードﾞﾊﾞｲ)	機内（小田/車田）
15	8月13日 (日)	移動 (東京ーｱﾌﾞﾀﾞﾋﾞ)	① 現地調査結果概要の作成	同左	同左	移動(ﾄﾞﾊﾞｲーﾗｺﾞｽ)	機内（上石/森本） ﾗｺﾞｽ
16	8月14日 (月)	移動 (ｱﾌﾞﾀﾞﾋﾞ-ﾗｺﾞｽ) ① アカンバ変電所調査 ② アパパロード変電所調査	①アカンバ変電所調査継続 ②アパパロード変電所調査継続	同左	同左	同左	ﾗｺﾞｽ
17	8月15日 (火)	移動 (ﾗｺﾞｽーｱﾌﾞｼﾞｬ) ① FMPWH表敬訪問 ② 連邦予算国家計画省表敬訪問	同左	同左	① 再委託先との協議・現場確認（測量、地質調査）	同左	ｱﾌﾞｼﾞｬ（上石/森本/不二輩/木下） ﾗｺﾞｽ
18	8月16日 (水)	① 協議議事録（案）に係る協議	同左	同左	①海軍基地訪問 ● 電力需給調査 ②製粉工場訪問 ●電力需給調査	再委託先と価格交渉	同上
19	8月17日 (木)	① 協議議事録（案）に係る協議	同左	同左	①港湾局訪問 ●電力需給調査	再委託先と価格交渉後契約	同上
20	8月18日 (金)	① 協議議事録署名 移動 (ｱﾌﾞｼﾞｬｰﾌﾗﾝｸﾌﾙﾄ)	同左	同左	①ティンカンアイランド訪問 ●電力需給調査	①アパパロード及びアカンバ変電所調査継続	機内（上石/森本） ｱﾌﾞｼﾞｬ（不二輩/木下） ﾗｺﾞｽ
21	8月19日 (土)	移動 ｛ﾌﾗﾝｸﾌﾙﾄー東京｝	① 現地調査結果概要の作成	同左	①現地調査結果概要の作成	同左	帰国（上石/森本） ｱﾌﾞｼﾞｬ（不二輩/木下） ﾗｺﾞｽ
22	8月20日 (日)		① 現地調査結果概要の作成	同左	移動(ﾗｺﾞｽーｱﾌﾞｼﾞｬ)	移動(ｱﾌﾞｼﾞｬｰﾄﾞﾊﾞｲ)	帰国（上石/森本） ｱﾌﾞｼﾞｬ 機内（小田/車

No.	月日(曜日)	調査内容					宿泊地
		官ベース	コンサルタント				
		上石/森本	不二葦	木下	玉井/藤田/宍戸	小田/車田	
							田）
23	8月21日(月)		① フィールドレポートの作成	同左	同左	移動｛ﾄﾊﾞｲｰ東京｝	ｱﾌﾞｼﾞｬ帰国（小田/車田）
24	8月22日(火)		① フィールドレポートの作成	同左	同左		ｱﾌﾞｼﾞｬ
25	8月23日(水)		① TCN とフィールドレポートの協議	同左	同左		ｱﾌﾞｼﾞｬ
26	8月24日(木)		① TCN とフィールドレポートの協議	同左	同左		ｱﾌﾞｼﾞｬ
27	8月25日(金)		① TCN とフィールドレポートの調印 ② 帰国挨拶（JICA ナイジェリア事務所、連邦電力・公共事業・住宅省(FMPWH)、ナイジェリア送電公社(TCN)・本社）	同左	同左		ｱﾌﾞｼﾞｬ
28	8月26日(土)		移動｛ｱﾌﾞｼﾞｬｰﾊﾟﾘ｝	① 収集資料の整理	同左		機内（不二葦） ｱﾌﾞｼﾞｬ
29	8月27日(日)		移動｛ﾊﾟﾘ–東京｝	移動｛ｱﾌﾞｼﾞｬｰﾛﾝﾄﾞﾝ｝	同左		機内
30	8月28日(月)		移動（ﾊﾟﾘ-東京）	移動｛ﾛﾝﾄﾞﾝ・–東京｝	同左		帰国

追加現地調査 1（税調査）日程

No.	月日(曜日)	調査内容		宿泊地
		官ベース	コンサルタント	
			不二葦	
1	9月19日(火)		移動｛ﾊﾟﾘ-ﾗｺﾞｽ｝	ラゴス
2	9月20日(水)		① 税調査	ラゴス
3	9月21日(木)		② 税調査	ラゴス
4	9月22日(金)		① 税調査	ラゴス
15	9月23日(土)		移動｛ﾗｺﾞｽ-ﾌﾘｰﾀｳﾝ｝	フリータウン

追加現地調査 2（税調査）日程

No.	月日(曜日)	調査内容		宿泊地
		官ベース	コンサルタント	
			不二蕞	
1	11 月 18 日(土)		移動｛ﾀﾞｶｰﾙ-ﾛﾒ-ﾗｺﾞｽ｝	ラゴス
2	11 月 19 日(日)		① 税調査	ラゴス
3	11 月 20 日(月)		① 税調査 移動｛ﾗｺﾞｽ-ﾊﾟﾘ｝	機内
4	11 月 21 日(火)		移動｛ﾗｺﾞｽ-ﾊﾟﾘ｝ 移動｛ﾊﾟﾘ-東京｝	機内
15	11 月 22 日(水)		移動｛ﾊﾟﾘ-東京｝	帰国

第二次現地調査（ドラフト説明調査）日程

No.	月日(曜日)	調査内容		宿泊地
		官ベース	コンサルタント	
			不二蕞、藤田、玉井、宍戸	
1	12 月 3 日(日)		移動｛東京-ﾛﾝﾄﾞﾝ｝ 移動｛ﾛﾝﾄﾞﾝ―ｱﾌﾞｼﾞｬ｝	アブジャ
2	12 月 4 日(月)		移動｛ｱﾌﾞｼﾞｬ着｝ ① 表敬訪問（JICA ナイジェリア事務所、連邦電力・公共事業・住宅省(FMPWH)、ナイジェリア送電公社(TCN)・本社） ② TCN へ協力準備調査報告書(案)、機材仕様書(案)を提出・説明	アブジャ
3	12 月 5 日(火)		① 表敬訪問（連邦予算国家計画省（FMBNP）、連邦外務省（FMFA）） ② TCN へ協力準備調査報告書(案)、機材仕様書(案)を説明	アブジャ
4	12 月 6 日(水)		① TCN へ協力準備調査報告書(案)、機材仕様書(案)を説明 ② MD の協議（先方負事項）	アブジャ
5	12 月 7 日(木)		① TCN へ協力準備調査報告書(案)、機材仕様書(案)を説明 ② MD の協議（免税手続き）	アブジャ
6	12 月 8 日(金)		① TCN へ協力準備調査報告書(案)、機材仕様書(案)を説明 ② MD 協議・署名 ③ 在ナイジェリア日本大使館への報告 ④ JICA ナイジェリア事務所への報告	アブジャ
7	12 月 9 日(土)		移動｛ｱﾌﾞｼﾞｬ-ﾗｺﾞｽ｝	官：機内 ラゴス
8	12 月 10 日(日)		資料整理	ラゴス
9	12 月 11 日(月)		① プロジェクトサイトの現況確認（アパパロード変電所、移動式変電所設置予定地）	ラゴス
10	12 月 12 日(火)		① プロジェクトサイトの現況確認（アカンバ変電所、資機材置場） ② 新規案件候補サイトの調査	ラゴス
11	12 月 13 日(水)		① 新規案件候補サイトの調査 移動｛ﾗｺﾞｽ-ｱﾌﾞｼﾞｬ｝	アブジャ
12	12 月 14		① 帰国挨拶（JICA ナイジェリア事務所、連邦電力・	アブジャ

No.	月日(曜日)	調査内容		宿泊地
		官ベース	コンサルタント	
			不二葦、藤田、玉井、宍戸	
	日(木)		公共事業・住宅省(FMPWH)、ナイジェリア送電公社(TCN)・本社）	
13	12 月 15 日(金)		移動｛ｱﾌﾞｼﾞｬｰﾛﾝﾄﾞﾝ｝	ロンドン
14	12 月 16 日(土)		移動｛ﾛﾝﾄﾞﾝ-東京｝	機内
15	12 月 17 日(日)		移動｛・–東京｝	帰国

A-3　関係者（面会者）リスト

添付-3 関係者(面会者)リスト

所属及び氏名	職位
連邦予算・国家計画省	
Federal Ministry of Budget and National Planning	
Mr. Lanre Adekanye	Deputy Director
連邦電力・公共事業・住宅省	
Federal Ministry of Power, Works and Housing (FMPWH)	
Mr. Louis O. N. Edozien	Permanent Secretary (Power)
Engr. Katampe Sarah	Assistant director, Transmission Service Department
Engr. Philip Okpanafe	Chief Engineer, Power
ナイジェリア送電会社（本社）	
Transmission Company of Nigeria (Corporate Headquarters)	
Mr. Usman Gur Muhammed	Interim MD/CEO
Engr. T. O. Uwah	Head, Transmission Service provider
Engr. Adewumi G. Victor	General Manager (Maintenance &Field Service)
Engr. Shehu Abba Aliyu	General Manager (System Planning & Development)
Mr. J. I. Dodo	Head (Legal)
Engr. Adekola Mathew Ajibade	Manager (JICA Project)
ナイジェリア送電会社（アカンバ変電所）	
Transmission Company of Nigeria (Akangba substation)	
Engr. A. O. Dim	Assistant General Manager
Engr. Tony Dim	Manager
EKO 配電会社	
EKO Electricity Distribution PLC	
Engr. Ovie O. Adjekpiyede	H.O.G (Network Planning Group)
Engr. Ashok Saraf	Chief Tech. Off.
ナイジェリア港湾局	
Nigeria Ports Authority	
Engr. G.S. Kefas	Chief Port Engineer
Engr. R. A. Danbatta	Chief Port Engineer

製粉工場

Flour Mills of Nigeria Plc

Engr. Festus Omotoyinbo	Head, Technical Division

日本貿易振興機構（ラゴス事務所）

Japan External Trade Organization (JETRO)

宮崎 拓	所長
山村 千晴	所員

在ナイジェリア日本大使館

Embassy of Japan in Nigeria

Mr. Mitsuhiro INAMURA	Head of Development Cooperation, First Secretary
Mr. Hiroki OGAWA	First Secretary

JICA ナイジェリア事務所

JICA Nigeria Office

中村 浩孝	所長
奥村 真紀子	次長
小出 拓己	企画調査員

A-4　討議議事録（M/D）

(1) 第 1 次現地調査 M/D

(2) 第 2 次現地調査 M/D

(1) 第1次現地調査 M/D

Minutes of Discussions
on the Preparatory Survey for the Project for
Emergency Rehabilitation of Lagos Transmission Substation

In response to the request from the Government of Federal Republic of Nigeria (hereinafter referred to as "Nigeria"), Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") of the Project for Emergency Rehabilitation of Lagos Transmission Substation (hereinafter referred to as "the Project") to Nigeria, headed by Hiroto KAMIISHI, Director of Energy and Mining Group, Industrial Development and Public Policy Department, JICA, from 14th to 18th, August 2017. The Team held a series of discussions with the officials of the Government of Nigeria and conducted a field survey. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Abuja, 18th August, 2017

Hiroto Kamiishi
Leader
Preparatory Survey Team
Japan International Cooperation Agency

Japan

Afolabi John Oladele
Director
Transmission Services
The Federal Ministry of Power, Works and Housing
Nigeria

Usman Gur Mohammed
Interim Managing Director / CEO
Transmission Company of Nigeria
Nigeria

Witness

Eloho Samuel
Director
International Cooperation Department
Ministry of Budget and National Planning
Nigeria

ATTACHMENT

1. Objective of the Project

The objective of the Project is to achieve reliable and stable supply of the electricity by rehabilitation and reinforcement of the substation in Lagos, thereby contributing economic growth in Lagos.

2. Title of the Preparatory Survey

Both sides confirmed the title of the Preparatory Survey as "the Preparatory Survey for the Project for Emergency Rehabilitation of Lagos Transmission Substation".

3. Project site

Both sides confirmed that the site of the Project is in Lagos, which is shown in Annex 1.

4. Responsible authority for the Project

Both sides confirmed the authorities responsible for the Project are as follows:

4-1. The Transmission Company of Nigeria will be the executing agency for the Project (hereinafter referred to as "the Executing Agency"). The Executing Agency shall coordinate with all the relevant authorities to ensure smooth implementation of the Project and ensure that the undertakings for the Project shall be managed by relevant authorities properly and on time. The organization chart is shown in Annex 2.

4-2. The line ministry of the Executing Agency is the Federal Ministry of Power, Works and Housing. The Federal Ministry of Power, Works and Housing shall be responsible for supervising the Executing Agency on behalf of the Government of Nigeria.

5. Items requested by the Government of Nigeria

5-1. As a result of discussions, both sides confirmed that the main items requested by the Government of Nigeria are as follows:

(A) Procurement and Installation

132kV GIS

33kV GIS

Control panels

Transformers

Ground transformers
Capacitor bank
Low voltage facilities
Substation grounding facility
(B) Procurement
Maintenance Tools for the Equipment to be installed
Spare parts for the Equipment to be installed
(C) Training
Basic training of operation and maintenance on installed equipment

5-2. JICA will assess the feasibility of the above requested items through the survey and will report the findings to the Government of Japan. The final scope of the Project will be decided by the Government of Japan.

6. Procedures and Basic Principles of Japanese Grant

6-1. The Nigeria side agreed that the procedures and basic principles of Japanese Grant as described in Annex 3 shall be applied to the Project.
As for the monitoring of the implementation of the Project, JICA requires Nigeria side to submit the Project Monitoring Report, the form of which is attached as Annex 4.

6-2. The Nigeria side agreed to take the necessary measures, as described in Annex 5, for smooth implementation of the Project. The contents of the Annex 5 will be elaborated and refined during the Preparatory Survey and be agreed in the mission dispatched for explanation of the Draft Preparatory Survey Report.
The contents of Annex 5 will be updated as the Preparatory Survey progresses, and eventually, will be used as an attachment to the Grant Agreement.

7. Schedule of the Survey

7-1. The Team will proceed with further survey in Nigeria until 27th August.

7-2. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Nigeria in order to explain its contents around early December 2017.

7-3. If the contents of the draft Preparatory Survey Report is accepted and the undertakings for the Project are fully agreed by the Nigeria side, JICA will finalize the Preparatory Survey Report and send it to Nigeria around February 2018.

7-4. The above schedule is tentative and subject to change.

8. Environmental and Social Considerations

8-1. The Nigeria side confirmed to give due environmental and social considerations before and during implementation, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010).

8-2. The Project is categorized as "C" from the following considerations:
The project is likely to have minimal adverse impact on the environment under the JICA guidelines for environmental and social considerations (April 2010).

8-3. For the Project that will result in involuntary resettlement, the Nigeria side confirmed to prepare a Resettlement Action Plan (RAP)/Abbreviated Resettlement Action Plan (ARAP) and make it available to the public. In addition, the Nigeria side confirmed to provide the affected people with sufficient compensation and/or support in accordance with RAP/ARAP, which is consistent with JICA Guidelines for Environmental and Social Considerations (April, 2010), in a timely manner.

9. Other Relevant Issues

9.1 Status of the Survey

The Team explained that the purpose of the Survey is to collect necessary information for evaluating the relevance, appropriateness and urgency of the Project and for analyzing power system in Lagos, and also to identify the issues to be cleared for implementation of the Project. The Nigeria side has agreed to share all necessary information and data with the Team.

9.2 Counterpart Personnel

The Team requested for the Nigeria side that necessary number of counterpart personnel shall be assigned to the Team and necessary arrangements with related organizations be made during the Survey and implementation stage in Nigeria. The Nigeria side has agreed to it.

9.3 Office Space

The Team requested the Nigeria side that necessary arrangement of office space for the Team during the Survey in Nigeria. The Nigeria side agreed to arrange it.

9.4 Questionnaire

The Nigeria side shall answer to the Questionnaire submitted by the Team in English with relevant documents by 18th August.

9.5 Safety Consideration during the Project

The Team requested the Nigeria side to make the necessary arrangements to secure

the safety of persons concerned with the project at the project sites. The Nigeria side agreed to it.

9.6 Exemption of customs duties, internal taxes and other fiscal levies

Both sides confirmed that customs duties, internal taxes and other fiscal levies which may be imposed in Nigeria with respect to the purchase of the products and/or the services be exempted. Both sides also confirmed that the tax exemption procedure in Nigeria as Annex 6 as recognition at the present moment.

The contents of Annex 6 will be updated as the Preparatory Survey progresses, and eventually will be used in the implementation stage.

9.7 Tentative Schedule of the Project

The Team explained to the Nigeria side that the tentative schedule of the Project is as attached as Annex 7.

9.8 Components of the Project

Nigeria side requested that capacity of transformers installed in Apapa Road substation should cover the future demand in the area. The team explained the installation of capacitor bank may be less needed referring the fact that the power factor observed in Apapa Road substation has been within the appropriate range. The team explained an initial technical finding that the activation of the second circuit of Akangba – Apapa Road transmission line, by "T-off" connecting with the second Akangaba – Ojo transmission line, may improve the reliability of the power system. Both sides confirmed that components of the Project will be examined and discussed during the Preparatory Survey.

9.9 Securing mobile transformer(s)

The team, recognizing the importance of shortening the power outage time in the Apapa Road area, requested Nigeria side to install the mobile transformer(s) by Nigeria side during the construction period. Nigeria side confirmed they will secure the transformer(s) which is/are owned by TCN. Nigeria side also confirmed they will consult to Nigeria Railway Corporation (hereinafter referred to as "NRC") to secure the land owned by NRC to install the mobile transformer(s) during the implementation stage.

9.10 Budgetary measures of Nigeria side

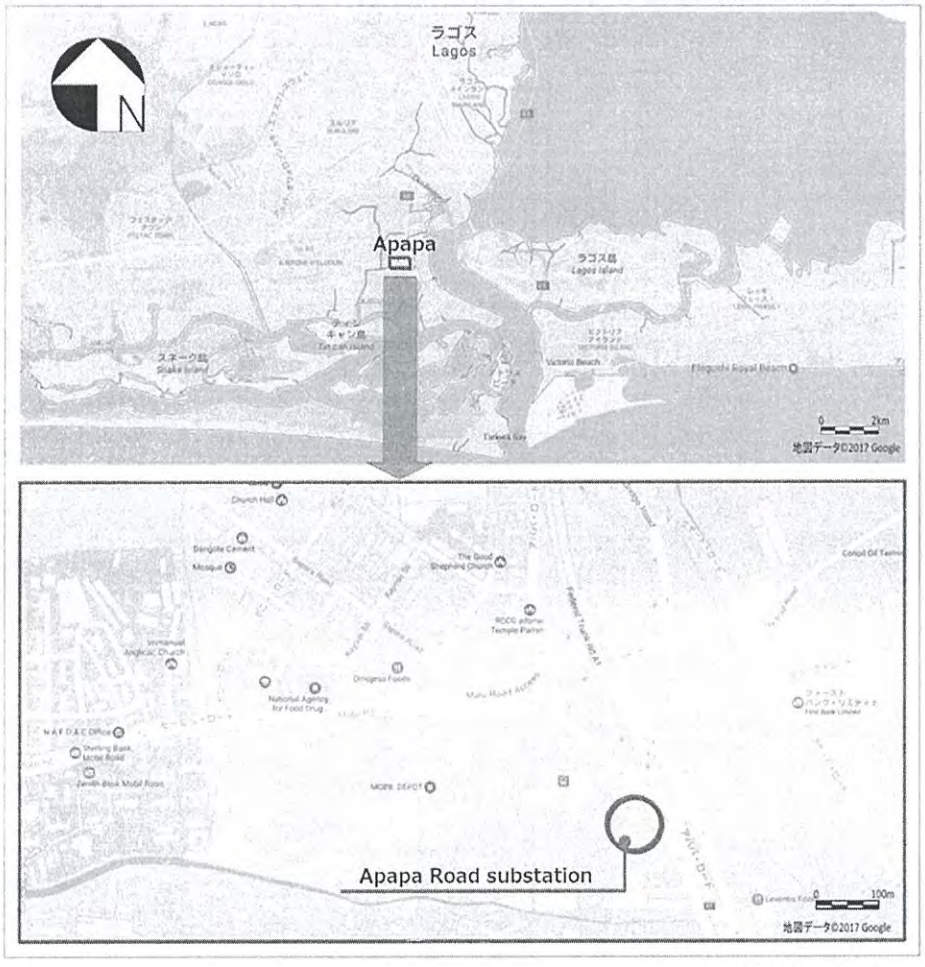
The team explained the estimated cost covered by Nigeria side will be notified in the 2nd Preparatory Survey which is scheduled around early December 2017. Nigeria side confirmed they will secure the necessary budget accordingly.

Annex 1 Project Site
Annex 2 Organization Chart of Transmission Company of Nigeria
Annex 3 Japanese Grant
Annex 4 Project Monitoring Report
Annex 5 Major Undertakings to be taken by the Government of Nigeria
Annex 6 Tax exemption procedures in Nigeria
Annex 7 Tentative Schedule of the Project

Annex 1 Project Site

■ Nigeria map

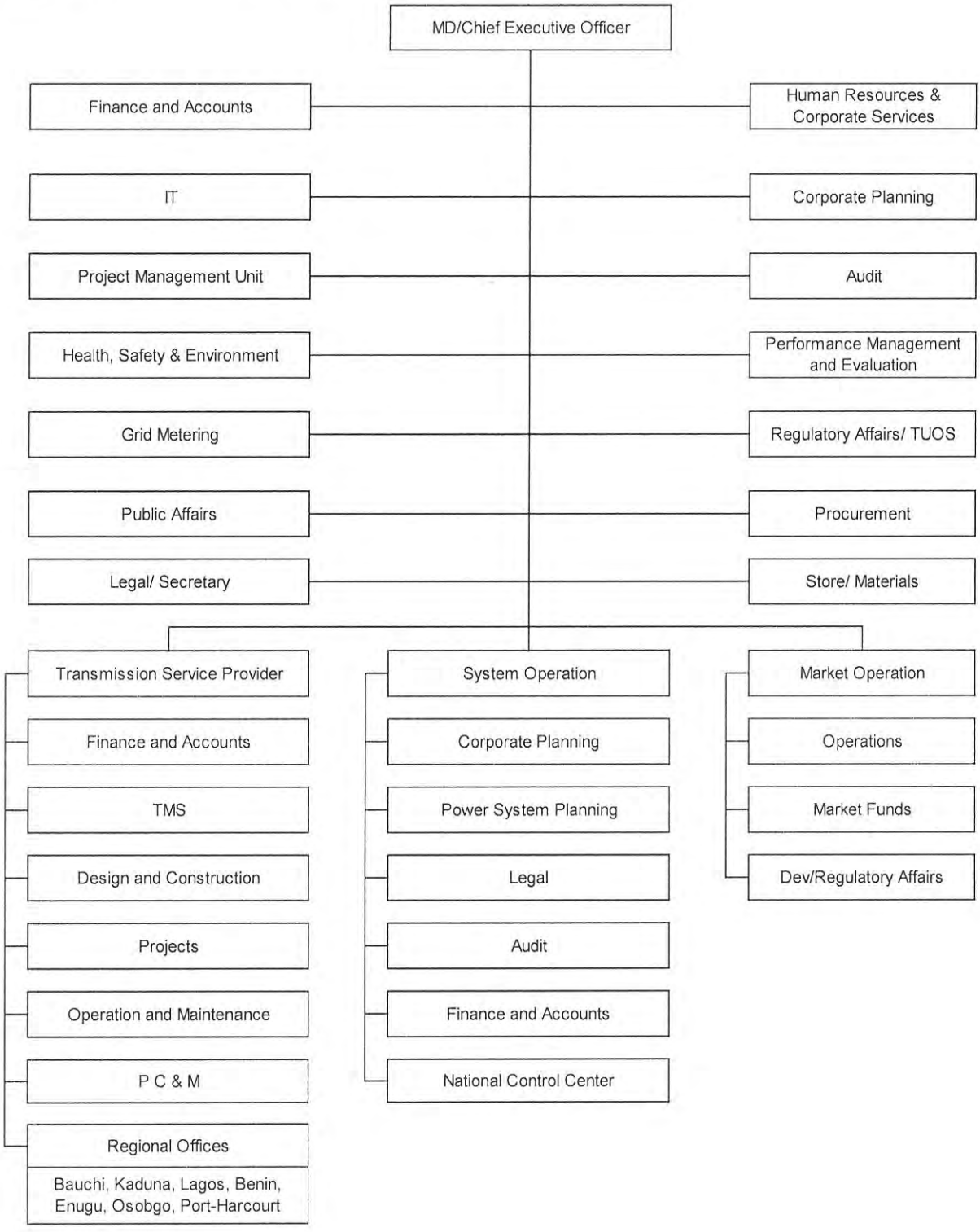
■ Africa map



■ Project site

Location map of project site

Annex 2 Organization Chart of Transmission Company of Nigeria



Annex 3

JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as "the Recipient") to purchase the products and/or 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. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as "Project Grants").

1. Procedures of Project Grants

Project Grants are conducted through following procedures (See "PROCEDURES OF JAPANESE GRANT" for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as "the Survey") conducted by JICA

(2) Appraisal

-Appraisal by the government of Japan (hereinafter referred to as "GOJ") and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as "the G/A")

-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as "the B/A")

-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as "the Bank") to receive the grant

Construction works/procurement

-Implementation of the project (hereinafter referred to as "the Project") on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the 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 necessary for the implementation of the Project.
- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant 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 an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take 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 executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

(2) Selection of Consultants

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

(3) Result of the Survey

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

3. Basic Principles of Project Grants

(1) Implementation Stage

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 singed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the "General Terms and Conditions for Japanese Grant (January 2016)."

2) Banking Arrangements (B/A) (See "Financial Flow of Japanese Grant (A/P Type)" for details)

a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.

b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

4) 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 to continue to work on the Project's implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by

using the Project Monitoring Report (PMR).

8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.

b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.

2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

PROCEDURES OF JAPANESE GRANT

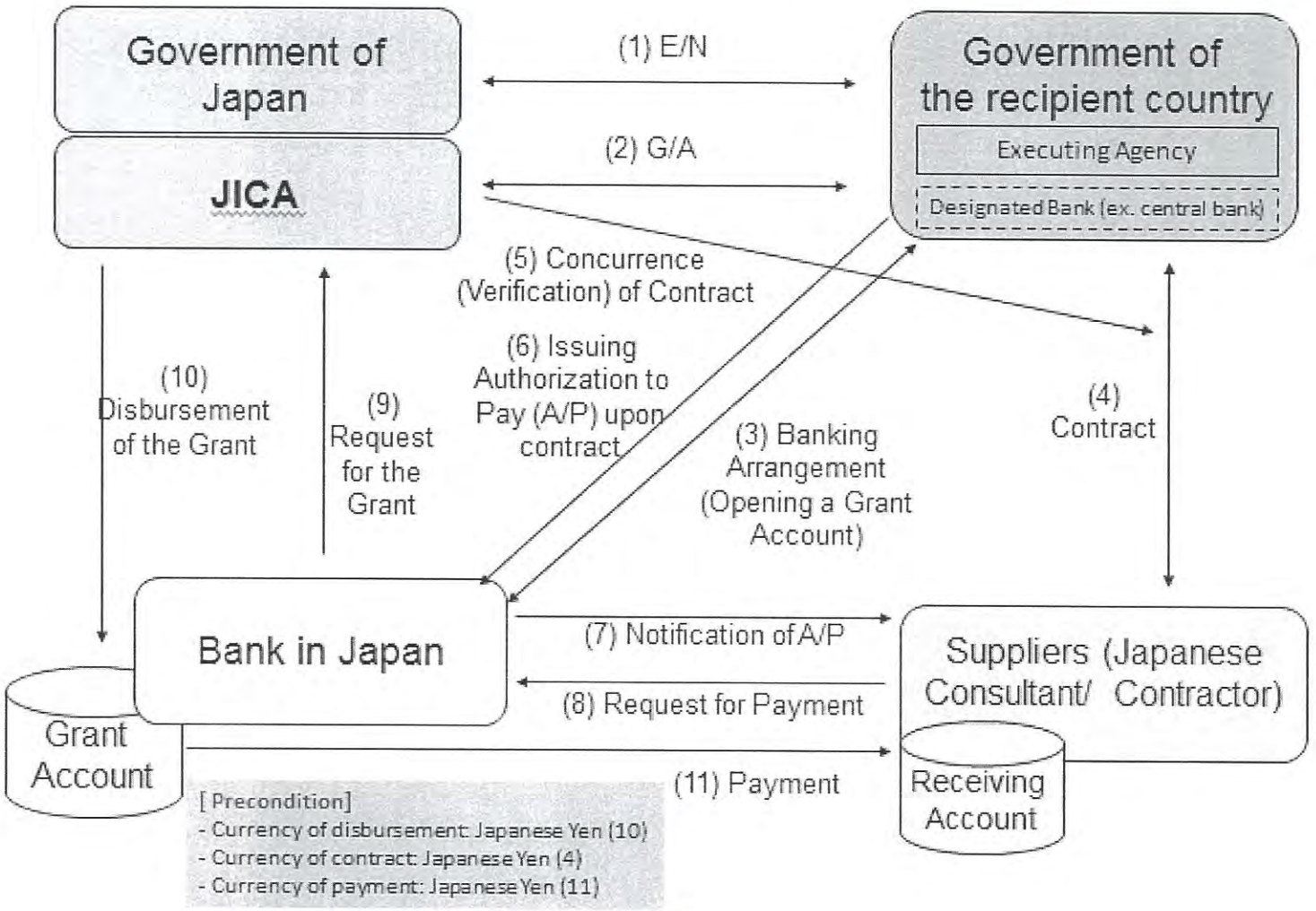
Stage	Procedures	Remarks	Recipient Government	Japanese Government	JICA	Consultants	Contractors	Agent Bank
Official Request	Request for grants through diplomatic channel	Request shall be submitted before appraisal stage.	x	x				
1. Preparation	(1) Preparatory Survey Preparation of outline design and cost estimate		x		x	x		
2. Appraisal	(2)Preparatory Survey Explanation of draft outline design, including cost estimate, undertakings, etc.		x		x	x		
	(3)Agreement on conditions for implementation	Conditions will be explained with the draft notes (E/N) and Grant Agreement (G/A) which will be signed before approval by Japanese government.	x	x (E/N)	x (G/A)			
	(4) Approval by the Japanese cabinet			x				
3. Implementation	(5) Exchange of Notes (E/N)		x	x				
	(6) Signing of Grant Agreement (G/A)		x		x			
	(7) Banking Arrangement (B/A)	Need to be informed to JICA	x					x
	(8) Contracting with consultant and issuance of Authorization to Pay (A/P)	Concurrence by JICA is required	x			x		x
	(9) Detail design (D/D)		x			x		
	(10) Preparation of bidding documents	Concurrence by JICA is required	x			x		
	(11) Bidding	Concurrence by JICA is required	x			x	x	
	(12) Contracting with contractor/supplier and issuance of A/P	Concurrence by JICA is required	x				x	x
	(13) Construction works/procurement	Concurrence by JICA is required for major modification of design and amendment of contracts.	x			x	x	
	(14) Completion certificate		x			x	x	
4. Ex-post monitoring & evaluation	(15) Ex-post monitoring	To be implemented generally after 1, 3, 10 years of completion, subject to change	x		x			
	(16) Ex-post evaluation	To be implemented basically after 3 years of completion	x		x			

notes:

1. Project Monitoring Report and Report for Project Completion shall be submitted to JICA as agreed in the G/A.

2. Concurrence by JICA is required for allocation of grant for remaining amount and/or contingencies as agreed in the G/A.

Financial Flow of Japanese Grant (A/P Type)



Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX
20XX, Month

Organizational Information

Signer of the G/A (Recipient)	Person in Charge (Designation) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	Person in Charge (Designation) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Line Ministry	Person in Charge (Designation) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____

General Information:

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

1: Project Description

1-1 Project Objective

1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr)	Target (Yr)
Qualitative indicators to measure the attainment of project objectives		

2: Details of the Project

2-1 Location

Components	Original *(proposed in the outline design)*	Actual
1.		

2-2 Scope of the work

Components	Original* *(proposed in the outline design)*	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

Items	Original		Actual
	(proposed in the outline design)	*(at the time of signing the Grant Agreement)*	

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations

See Attachment 2.

2-4-2 Activities

See Attachment 3.

2-4-3 Report on RD

See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components			Cost (Million Yen)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components			Cost (1,000 Taka)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual

	1.			

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original *(at the time of outline design)* name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):
Actual *(PMR)*

2-7 Environmental and Social Impacts

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original *(at the time of outline design)*

Actual *(PMR)*

3-2 **Budgetary Arrangement**
- Required O&M cost and actual budget allocation for O&M

Original *(at the time of outline design)*
Actual *(PMR)*

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

Assessment of Potential Risks *(at the time of outline design)*

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low

	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
Actual Situation and Countermeasures	
(PMR)	

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

1. Project Location Map
2. Specific obligations of the Recipient which will not be funded with the Grant
3. Monthly Report submitted by the Consultant

Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
- Contractor's Main Staff List

4. Check list for the Contract (including Record of Amendment of the Contract/ Agreement and Schedule of Payment)
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final)only)
8. Pictures (by JPEG style by CD-R) (PMR (final)only)
9. Equipment List (PMR (final)only)
10. Drawing (PMR (final)only)
11. Report on RD (After project)

Annex 5

Major Undertakings to be taken by the Government of Nigeria

1. Specific obligations of the Government of Nigeria which will not be funded with the Grant

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost*	Ref.
1	To open bank account (B/A)	within 1 month after the signing of the G/A	MBNP		
2	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the consultant	within 1 month after the signing of the contract	MBNP		
3	To secure necessary budget for the removal and demolition of existing equipment and facilities at Apapa Road substation	Before the signing of E/A	TCN		
4	To secure a mobile substation in working condition	before notice of the bidding document	TCN		
5	To secure and clear the following lands 1) project sites (Apapa Road Substation)	before notice of the bidding document	TCN		
6	To obtain the planning, zoning, building permit	before notice of the bidding document	TCN		
7	To clear, level and reclaim the following sites 1) leveling and reclaiming the sites (Apapa Road Substation)	before notice of the bidding document	TCN		
8	To submit Project Monitoring Report (with the result of Detail Design)	before preparation of bidding documents	TCN		

(B/A: Banking Arrangement, A/P: Authorization to pay, MBNP: Ministry of Budget and National Planning Finance)

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost*	Ref.
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Supplier(s)	within 1 month after the signing of the contract(s)	MBNP		
2	To bear the following commissions to a bank in Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	MBNP		
	2) Payment commission for A/P	every payment	MBNP		
3	To ensure prompt unloading and customs clearance at ports of disembarkation in recipient country and to assist the Supplier(s) with internal transportation therein	during the Project	TCN		
4	To accord Japanese nationals and/or physical persons of third countries 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 country of the Recipient and stay therein for the performance of their work	during the Project	TCN		
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect	during the Project	FMF		

	to the purchase of the products and/or the services be exempted				
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	TCN		
7	1) To submit Project Monitoring Report after each work under the contract(s) such as shipping, hand over, installation and operational training	within one month after completion of each work	TCN		
	2) To submit Project Monitoring Report (final)	within one month after signing of Certificate of Completion for the works under the contract(s)	TCN		
8	To submit a report concerning completion of the Project	within six months after completion of the Project	TCN		
9	To take necessary measure for safety construction - traffic control - rope off	during the construction	TCN		

(FMF:Federal Ministry of Finance)

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost*	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection	After completion of the construction	TCN		

* The Estimated Cost will be discussed in the next survey scheduled in December 2017.

Annex 6
Tax exemption procedure in Nigeria

(1) Fiscal levies and taxes with respect to the corporate income（Corporate tax）

A. Tax Basic Information (name, percentage, how to calculate, basis law)

(1) Corporate Income Tax

1) Tax rate and calculation method

(a) There shall be levied and paid for each year of assessment in respect of total profits of every company, tax at the rate of thirty kobo for every naira in case of "Standard Profit".

- Definition of Standard Profit
  Standard Profit means - in the case of every company other than a Nigerian company and as respects any year of assessment commencing on 1st January 1989,
  (i) the amount of fifteen per cent of the turnover of the company for that year being turnover attributed to any part of the operations of the company carried out in Nigeria; or
  (ii) the amount of six million naira, whichever is greater.

(b) There shall, as from the assessment year commencing on 1st January, 1989 be levied and paid a special levy of fifteen per sent on excess profits of every company including banks and for the purpose of this section.

- Definition of Excess Profit
  "Excess profits" means the difference between total profits as computed in accordance with section 31of this Act and standard profits as calculated in accordance with the previsions of (a) (i) or (ii) of this section.

2) Basis law

Companies Income Tax Act CAP.60 LFN:1990

B Tax Exemption Procedure(procedure, application authority, required time)

To be filled out later (survey in progress)

C Other remarks

(2) Fiscal levies and taxes on their personal income（Personal income tax）

A. Tax Basic Information (name, percentage, how to calculate, basis law)

(1) Personal Income Tax

1) Tax rate and calculation method

0.5% of taxable income

2) Basis law

Personal Income Tax Act No.104,1993

B Tax Exemption Procedure(procedure, application authority, required time)

To be filled out later (survey in progress)

C Other remarks

(3) Indirect taxes such as Value added tax（VAT）

A. Tax Basic Information (name, percentage, how to calculate, basis law)

(1) Value Added Tax

1) Tax rate and calculation method

5% of taxable value

2) Basis law
Value Added Tax Act 1993 No.102,1993

B Tax Exemption Procedure(procedure, application authority, required time)
To be filled out later (survey in progress)

C Other remarks

(4) Duties and related fiscal charges with respect to the import and/or re-export of materials and equipment (Customs)

A. Tax Basic Information (name, percentage, how to calculate, basis law)
(1) Customs duties and excise duties imposed by Nigeria
1) Rate of tax
As shown in the attachment "CET_tariff"
2) Basis law
Customs and Excise Management Act,CAP84,1990

(2) Other duties and fiscal levies
1) Port Development Levy : 7% of the duties payable
2) ECOWAS Community Levy : 0.5%
3) Comprehensive Import Supervision Scheme Charge : 1% of the F.O.B value of imports
4) Statistical Tax : 1%

B Tax Exemption Procedure(procedure, application authority, required time)
To be filled out later (survey in progress)

C Other remarks

(5) Other taxes

A. Tax Basic Information (name, parentage, how to calculate)

B Tax Exemption Procedure(procedure, application authority, required time)

C Other remarks

Annex 7

Tentative Schedule of the Project

Year / Steps	2017					2018											2019			2020			2021		
	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	・・・	12	1	・・・	12	1	・・・	12
1st Preperatory Survey (Present Stage)	△																									
Examination (Developing outline design, Estimation, Undertakings etc.)																										
2nd Preperatory Survey (Explanation of Draft Preparatory Survey Report)					△																					
Cabinet meeting/approval							△																			
E/N, G/A									△																	
Construction supervision contract										△																
Detailed design																										
Tender/contract																										
Construction schedule (Procurement, Installation, Test and Inspection)																		2 or 3 years								

(2) 第2次現地調査 M/D

Minutes of Discussions
on the Preparatory Survey for the Project
for Emergency Rehabilitation and Reinforcement of
Lagos Transmission Substations
(Explanation on Draft Preparatory Survey Report)

With reference to the minutes of discussions signed between the Federal Ministry of Power, Works and Housing (hereinafter referred to as "FMPWH"), Transmission Company of Nigeria (hereinafter referred to as "TCN") and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on 18th August 2017 and in response to the request from the Government of Federal Republic of Nigeria (hereinafter referred to as "Nigeria") dated 3rd May 2017, JICA dispatched the Preparatory Survey Team (hereinafter referred to as "the Team") for the explanation of Draft Preparatory Survey Report (hereinafter referred to as "the Draft Report") for the Project for Emergency Rehabilitation and Reinforcement of Lagos Transmission Substations (hereinafter referred to as "the Project"), headed by Makiko Okumura, Senior Representative of JICA Nigeria Office from 4th to 8th December 2017.

As a result of the discussions, both sides agreed on the main items described in the attached sheets.

Abuja, 8th December 2017

Makiko Okumura
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Anthony Umuenyen
Deputy Director
Transmission Services
The Federal Ministry of Power, Works and Housing
Nigeria

Usman Gur Mohammed
Interim Managing Director / CEO
Transmission Company of Nigeria
Nigeria

Witness

Eloho Samuel
Director
International Cooperation Department
Ministry of Budget and National Planning
Nigeria

ATTACHEMENT

1. Objective of the Project

   The objective of the Project is to achieve reliable and stable supply of the electricity by rehabilitation and reinforcement of the substations in Lagos, thereby contributing sustainable economic and social development in Lagos.

2. Title of the Preparatory Survey

   Both sides confirmed the title of the Preparatory Survey as "the Preparatory Survey for the Project for Emergency Rehabilitation and Reinforcement of Lagos Transmission Substations".

3. Project site

   Both sides confirmed that the sites of the Project are in Lagos, which is shown in Annex 1.

4. Responsible authority for the Project

   Both sides confirmed the authorities responsible for the Project are as follows:

   4-1. TCN will be the executing agency for the Project (hereinafter referred to as "the Executing Agency"). The Executing Agency shall coordinate with all the relevant authorities to ensure smooth implementation of the Project and ensure that the undertakings for the Project shall be taken care by relevant authorities properly and on time. The organization chart is shown in Annex 2.

   4-2. The line ministry of the Executing Agency is FMPWH. FMPWH shall be responsible for supervising the Executing Agency. FMPWH shall also be responsible for securing exemption of all taxes, customs duties and fiscal levies imposed in Nigeria related to the implementation of the Project.

   4-3. Ministry of Budget and National Planning is an agency responsible for managing the Japanese Grant Aid Projects.

5. Contents of the Draft Report

   After the explanation of the contents of the Draft Report by the Team, the Nigeria side agreed to its contents.

6. Cost estimates

   Both sides confirmed that the cost estimates including the contingency described in

the Draft Report is provisional and will be examined further by the Government of Japan for its approval. The contingency would cover the additional cost against natural disaster, unexpected natural conditions, etc.

7. Confidentiality of the cost estimates and technical specifications
Both sides confirmed that the cost estimates and technical specifications in the Draft Report should never be duplicated or disclosed to any third parties until all the contracts under the Project are concluded.

8. Procedures and Basic Principles of Japanese Grant
The Nigeria side agreed that the procedures and basic principles of Japanese Grant as described in Annex 3 shall be applied to the Project. In addition, the Nigeria side agreed to take necessary measures according to the procedures.

9. Timeline for the project implementation
The Team explained to the Nigeria side that the expected timeline for the project implementation is as attached in Annex 4.

10. Expected outcomes and indicators
Both sides agreed that key indicators for expected outcomes are as follows. The Nigeria side will be responsible for the achievement of agreed key indicators targeted in year 2023 and shall monitor the progress based on those indicators.
[Quantitative indicators]

Indicator	Base Value (2017)	Target Value (2024) (3years after commissioning)
Electric energy at receiving end at Apapa Road Substation (GWh)	119	212
Times of power failure per one consumer (times /year)*1	132	80
Accumulated time of power failure per one consumer (time/year)*1	1,228	400

Note: *1 Excluding the causes by upper systems than Akangba Substation (including power shortage of power stations)

[Qualitative indicators]

Economic and social development is promoted in the surrounding area.

11. Undertakings of the Project

Both sides confirmed the undertakings of the Project as described in Annex 5. Both sides also confirmed that the Annex 5 will be used as an attachment of Grant Agreement (hereinafter referred to as "G/A").

11-1. Exemption of customes duties, internal taxes and other fiscal levies

Such customs duties, internal taxes and other fiscal levies including Value Added Tax (hereinafter referred to as "VAT"), commercial tax, income tax and corporate tax which may be imposed in Nigeria with respect to the purchase of the products and/or the services shall be exempted. FMPWH will take necessary action to ensure the exemption, through sending letters to Federal Ministry of Finance and other relevant authorities to have order(s) on the exemption and instruct all relevant agencies and offices to follow it. Such procedure can start just after the signing of Exchange of Notes (hereinafter referred to as "E/N") and G/A utilizing list(s) of equipment and its cost estimation, instead of actual invoice.

11-2. Budget to be secured by Nigeria side

The Nigeria side assured to take necessary measures and coordination including allocation of necessary budget which are preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage.

11-3. Safety Consideration during the Project

The Team requested the Nigeria side to make necessary arrangements to secure safety of persons concerned with the Project. Both sides also confirmed the necessary arrangements and estimated cost regarding police officers to be hired by Nigeria side in accordance with the safety regulation of JICA. The Nigeria side agreed with it as Annex 9.

11-4. Securing a mobile transformer

Recognizing importance to shorten the power outage time in the Apapa Road area, the Team requested Nigeria side to install a mobile transformer by Nigeria side during the construction period. Nigeria side confirmed TCN will secure the transformer which is owned by TCN. Nigeria side also confirmed TCN will secure the land to install the mobile transformer during the implementation stage.

12. Monitoring during the implementation

The Project will be monitored by the Executing Agency and reported to JICA by using the form of Project Monitoring Report (hereinafter referred to as "PMR") attached as Annex 6. The timing of submission of the PMR is described in Annex 5.

13. Project completion

Both sides confirmed that the project completes when all the facilities constructed and equipments procured by the grant are in operation. The completion of the Project will be reported to JICA promptly, but in any event not later than six months after completion of the Project.

14. Ex-Post Evaluation

JICA will conduct ex-post evaluation after three (3) years from the project completion, in principle, with respect to five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, Sustainability). The result of the evaluation will be publicized. The Nigeria side is required to provide necessary support for the data collection.

15. Schedule of the Study

JICA will finalize the Preparatory Survey Report based on the confirmed items. The report will be sent to the Nigeria side around February 2018.

16. Environmental Guidelines and Environmental Category

The Team explained that 'JICA Guidelines for Environmental and Social Considerations (April 2010)' (hereinafter referred to as "the Guidelines") is applicable for the Project. The Project is categorized as C because the Project is likely to have minimal adverse impact on the environment under the Guidelines.

17. Other Relevant Issues

17-1. Disclosure of Information

Both sides confirmed that the Preparatory Survey Report from which project cost is excluded will be disclosed to the public after completion of the Preparatory Survey. The comprehensive report including the project cost will be disclosed to the public after all the contracts under the Project are concluded.

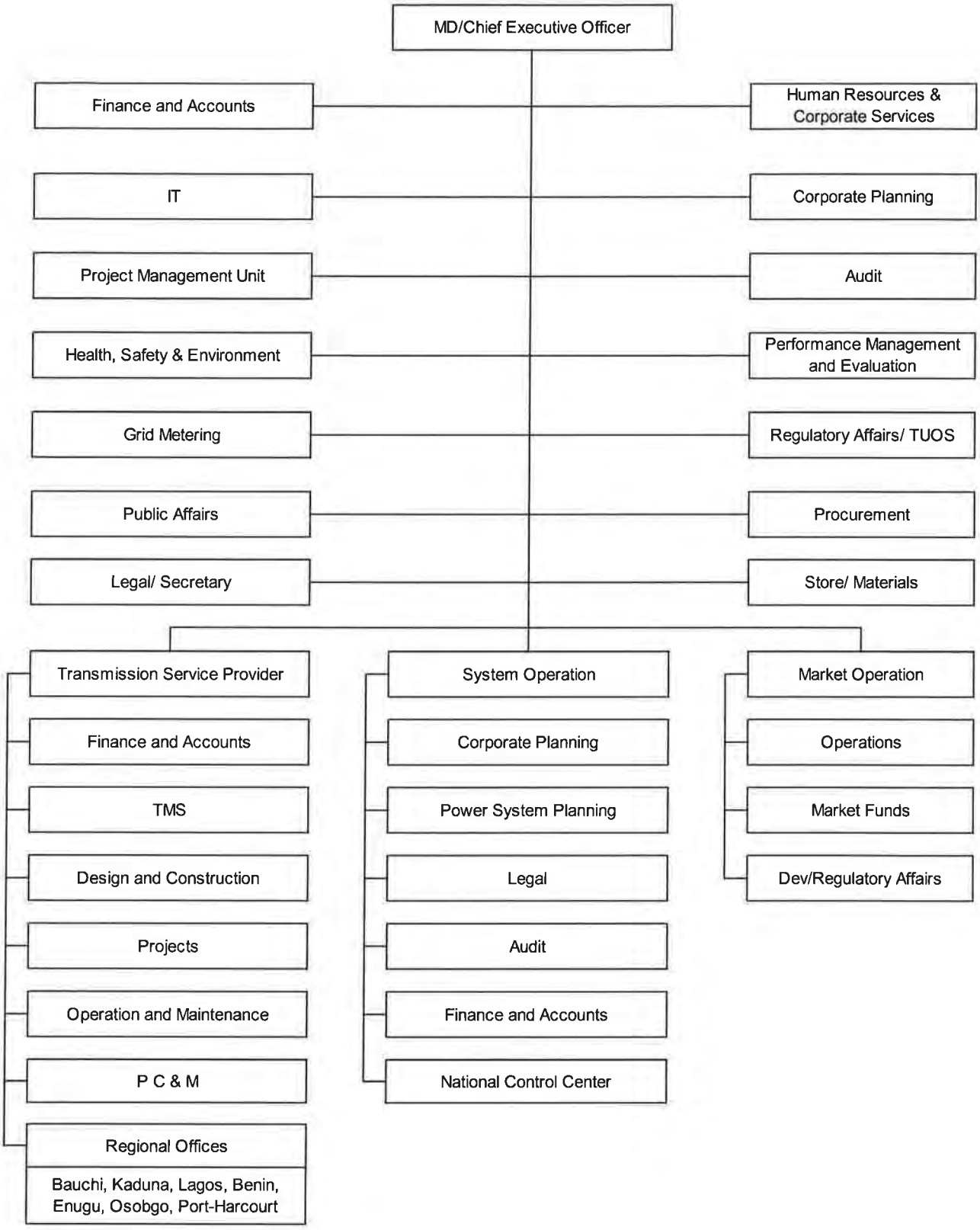
Annex 1 Project Site
Annex 2 Organization Chart
Annex 3 Japanese Grant
Annex 4 Project Implementation Schedule
Annex 5 Major Undertakings to be taken by the Government of Nigeria
Annex 6 Project Monitoring Report (template)
Annex 7 Budget to be secured by Nigeria side
Annex 8 Tax Exemption Procedure
Annex 9 Necessary Arrangements and Estimated Cost regarding Police Officers

Annex 1 Project Site

Africa map

Nigeria map

Annex 2 Organization Chart of Transmission Company of Nigeria



Annex 3

JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as "the Recipient") to purchase the products and/or 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. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as "Project Grants").

1. Procedures of Project Grants

Project Grants are conducted through following procedures (See "PROCEDURES OF JAPANESE GRANT" for details):

(1) Preparation

- The Preparatory Survey (hereinafter referred to as "the Survey") conducted by JICA

(2) Appraisal

-Appraisal by the government of Japan (hereinafter referred to as "GOJ") and JICA, and Approval by the Japanese Cabinet

(3) Implementation

Exchange of Notes

-The Notes exchanged between the GOJ and the government of the Recipient

Grant Agreement (hereinafter referred to as "the G/A")

-Agreement concluded between JICA and the Recipient

Banking Arrangement (hereinafter referred to as "the B/A")

-Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as "the Bank") to receive the grant

Construction works/procurement

-Implementation of the project (hereinafter referred to as "the Project") on the basis of the G/A

(4) Ex-post Monitoring and Evaluation

-Monitoring and evaluation at post-implementation stage

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the 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 necessary for the implementation of the Project.
- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant 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 an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take 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 executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

(2) Selection of Consultants

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

(3) Result of the Survey

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

3. Basic Principles of Project Grants

(1) Implementation Stage

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 singed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the "General Terms and Conditions for Japanese Grant (January 2016)."

2) Banking Arrangements (B/A) (See "Financial Flow of Japanese Grant (A/P Type)" for details)

a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.

b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

4) 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 to continue to work on the Project's implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by

using the Project Monitoring Report (PMR).

8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.

b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.

2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

Annex 3

Attachment 1

PROCEDURES OF JAPANESE GRANT

Stage	Procedures	Remarks	Recipient Government	Japanese Government	JICA	Consultants	Contractors	Agent Bank
Official Request	Request for grants through diplomatic channel	Request shall be submitted before appraisal stage.	x	x				
1. Preparation	(1) Preparatory Survey Preparation of outline design and cost estimate		x		x	x		
2. Appraisal	(2)Preparatory Survey Explanation of draft outline design, including cost estimate, undertakings, etc.		x		x	x		
	(3)Agreement on conditions for implementation	Conditions will be explained with the draft notes (E/N) and Grant Agreement (G/A) which will be signed before approval by Japanese government.	x	x (E/N)	x (G/A)			
	(4) Approval by the Japanese cabinet			x				
3. Implementation	(5) Exchange of Notes (E/N)		x	x				
	(6) Signing of Grant Agreement (G/A)		x		x			
	(7) Banking Arrangement (B/A)	Need to be informed to JICA	x					x
	(8) Contracting with consultant and issuance of Authorization to Pay (A/P)	Concurrence by JICA is required	x			x		x
	(9) Detail design (D/D)		x			x		
	(10) Preparation of bidding documents	Concurrence by JICA is required	x			x		
	(11) Bidding	Concurrence by JICA is required	x			x	x	
	(12) Contracting with contractor/supplier and issuance of A/P	Concurrence by JICA is required	x				x	x
	(13) Construction works/procurement	Concurrence by JICA is required for major modification of design and amendment of contracts.	x			x	x	
	(14) Completion certificate		x			x	x	
4. Ex-post monitoring & evaluation	(15) Ex-post monitoring	To be implemented generally after 1, 3, 10 years of completion, subject to change	x		x			
	(16) Ex-post evaluation	To be implemented basically after 3 years of completion	x		x			

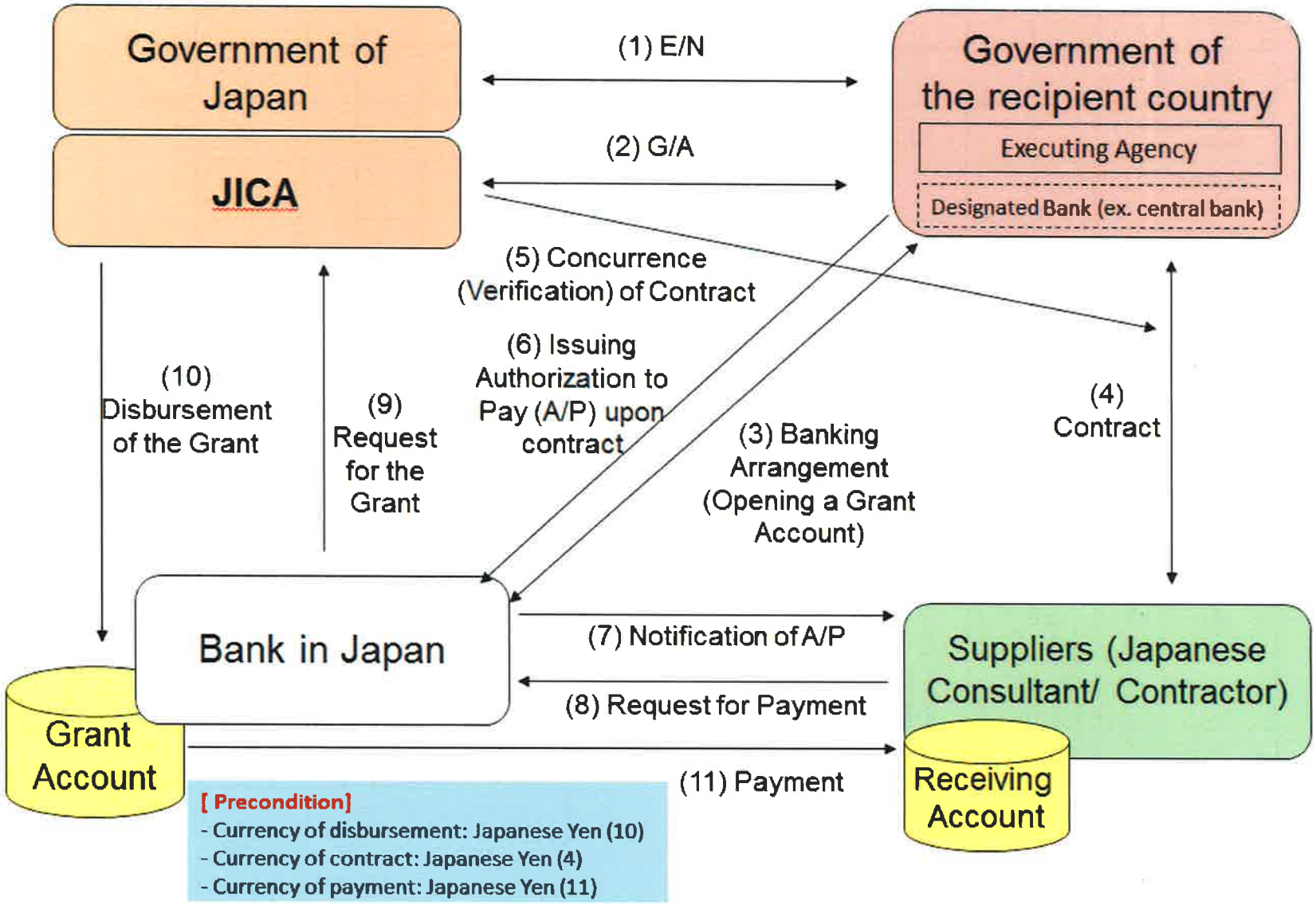
notes:

1. Project Monitoring Report and Report for Project Completion shall be submitted to JICA as agreed in the G/A.

2. Concurrence by JICA is required for allocation of grant for remaining amount and/or contingencies as agreed in the G/A.

Attachment 2

Financial Flow of Japanese Grant (A/P Type)



Annex 5 Major Undertakings to be taken by the Government of Nigeria

1. Specific obligations of the Government of Nigeria which will not be funded with the Grant

(1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost (US$)
1	To open bank account (B/A)	within 1 month after the signing of the G/A	FMPWH	3,000
2	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the consultant	within 1 month after the signing of the contract	FMPWH	3,000
3	To secure land for a mobile substation, demolition of concrete wall next to ApapaRoad substation	before preparation of bidding document	TCN	51,000
4	To transport a mobile substation to the premises	before notice of the bidding document	TCN	9,000
5	To remove obstacles inside Apapa Road substation (containers, vehicles, foundations, kiosks, tree, etc.)	before notice of the bidding document	TCN	40,000
6	To obtain the planning, zoning, building permit of the Project	before notice of the bidding document	TCN	
7	To relocate existing 33kV and 11kV cables at Apapa Road substation (Power outage occurs)	before notice of the bidding document	TCN	20,000
8	To secure temporary storage yard in the railway territory next to Apapa Road substation	before notice of the bidding document	TCN	13,000
9	To submit Project Monitoring Report (with the result of Detail Design)	before preparation of bidding documents	TCN	
10	To secure guardsmen for a mobile substation	before notice of the bidding document	TCN	18,000
11	To secure armed police officer to protect Japanese supervisors	whenever Japanese supervisors are in Nigeria	TCN	2,000

(B/A: Banking Arrangement, A/P: Authorization to pay, MBNP: Ministry of Budget and National Planning Finance)

(2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost (US$)
1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Supplier(s)	within 1 month after the signing of the contract(s)	FMPWH	
2	To bear the following commissions to a bank in Japan for the banking services based upon the B/A			24,000
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	FMPWH	
	2) Payment commission for A/P	every payment	FMPWH	
3	To ensure prompt unloading and customs clearance at ports of disembarkation in recipient country and to assist the Supplier(s)	during the Project	TCN	

	with internal transportation therein			
4	To accord Japanese nationals and/or physical persons of third countries 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 country of the Recipient and stay therein for the performance of their work	during the Project	TCN	
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and/or the services be exempted Federal Ministry of Finance shall issue an order regarding the exemption and instruct all agencies and offices to follow the order	during the Project	FMPWH	
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	TCN	
7	1) To submit Project Monitoring Report after each work under the contract(s) such as shipping, hand over, installation and operational training	within one month after completion of each work	TCN	
	2) To submit Project Monitoring Report (final)	within one month after signing of Certificate of Completion for the works under the contract(s)	TCN	
8	To submit a report concerning completion of the Project	within six months after completion of the Project	TCN	
9	Disconnection of 132kV lines (Akangba-Apapa Road and Ijora-Apapa Road) by screwing off the jumper wire (Power outage occurs)	during the Project	TCN	1,000
10	Connection switching and operation from existing substation to a mobile substation at Apapa Road substation (Power outage occurs)	during the Project	TCN	10,000
11	Removal of existing earthing transformers at Apapa Road substation	during the Project	TCN	16,000
12	Removal of existing emergency generator and enclosure at Apapa Road substation	during the Project	TCN	16,000
13	Demolition of concrete fire walls around 132/33kv transformers. Removal of a 132/33kv transformers, temporary 132kv switching equipment, switchgeras and control house at Apapa Road substation	during the Project	TCN	55,000
14	Changing-over from a mobile substation to new facilities of Apapa Road substation in coordination with EKEDC	during the Project	TCN	10,000
15	Transportation of a mobile substation and construction new wall at Apapa Road substation	during the Project	TCN	23,000
16	Procurement of 6 units of Watt-Hour meter for dealing with distribution companies at Apapa Road substation	during the Project	TCN	6,000
17	Procurement and installation of new 33kV cables and cable joints	during the Project	TCN	146,000

	for the connection of new facilities of Apapa Road substation and distribution substation (EKEDC)			
18	Bush clearing and site levelling at Akangba substation	during the Project	TCN	45,000
19	Changing-over "T" branch of 132kv lines (Akangba-Ojo 1) and connection of 132kv lines conductors at Akangba substation	during the Project	TCN	9,000
20	To secure guardsmen for a mobile substation	before notice of the bidding document	TCN	74,000
21	To secure armed police officer to protect Japanese supervisors	whenever Japanese supervisors are in Nigeria	TCN	87,000
22	To take necessary measure for safety construction - traffic control - rope off	during the construction	TCN	
23	Payment of Taxes (CISS and ETLS)	during the construction	FMPWH	205,000

(FMF:Federal Ministry of Finance)

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost (US$)
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection	After completion of the construction	TCN	127,000 /year

2. Other obligations of the Government of Nigeria funded with the Grant

This page is closed due to the confidentiality

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX
20XX, Month

Organizational Information

Signer of the G/A (Recipient)	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:
Executing Agency	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:
Line Ministry	Person in Charge (Designation) Contacts Address: Phone/FAX: Email:

General Information:

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

1: Project Description	

1-1 Project Objective

1-2 Project Rationale

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

1-3 Indicators for measurement of "Effectiveness"

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr)	Target (Yr)
Qualitative indicators to measure the attainment of project objectives		

2: Details of the Project

2-1 Location

Components	Original *(proposed in the outline design)*	Actual
1.		

2-2 Scope of the work

Components	Original* *(proposed in the outline design)*	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)

2-3 Implementation Schedule

Items	Original		Actual
	(proposed in the outline design)	*(at the time of signing the Grant Agreement)*	

Reasons for any changes of the schedule, and their effects on the project (if any)

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations

See Attachment 2.

2-4-2 Activities

See Attachment 3.

2-4-3 Report on RD

See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components			Cost (Million Yen)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components			Cost (1,000 Taka)	
	Original *(proposed in the outline design)*	Actual *(in case of any modification)*	Original[1),2)] *(proposed in the outline design)*	Actual
	1.			

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

2-6 Executing Agency

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original *(at the time of outline design)* name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):
Actual *(PMR)*

2-7 Environmental and Social Impacts

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

3: Operation and Maintenance (O&M)

3-1 Physical Arrangement

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

Original *(at the time of outline design)*
Actual *(PMR)*

3-2 Budgetary Arrangement

- Required O&M cost and actual budget allocation for O&M

Original *(at the time of outline design)*

Actual *(PMR)*

4: Potential Risks and Mitigation Measures

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

Assessment of Potential Risks *(at the time of outline design)*

Potential Risks	**Assessment**
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
	Contingency Plan (if applicable):
Actual Situation and Countermeasures	

(PMR)

5: Evaluation and Monitoring Plan (after the work completion)

5-1 Overall evaluation

Please describe your overall evaluation on the project.

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan of the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment

1. Project Location Map
2. Specific obligations of the Recipient which will not be funded with the Grant
3. Monthly Report submitted by the Consultant

Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
- Contractor's Main Staff List

4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
5. Environmental Monitoring Form / Social Monitoring Form
6. Monitoring sheet on price of specified materials (Quarterly)
7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final)only)
8. Pictures (by JPEG style by CD-R) (PMR (final)only)
9. Equipment List (PMR (final)only)
10. Drawing (PMR (final)only)
11. Report on RD (After project)

Annex 7

Budget to be secured by Nigeria side

(Tentative Schedule of Expenditure of Major Undertakings to be taken by Nigeria side)

(Unit:US$)

No.	Item	Total	2018	2019	2020	2021	2022	Term
1	**Apapa Road substation**							
1)	Secure land for a mobile substation, demolition of concrete wall	51,000	51,000					
2)	Transportation of a mobile substation	9,000	9,000					
3)	Removal of obstacles inside substation (containers, vehicles, foundations, kiosks, tree, etc.)	40,000	40,000					(1) Before the Tender
4)	Relocation of existing 33kv and 11kv cables, it includes outage	20,000	20,000					
5)	Secure temporary storage yard in the railway territory next to ApapaRoad substation	13,000	13,000					
6)	Disconnection of 132kv lines (Akangba-Apapa Road and Ijora-Apapa Road) by screwing off the jumper wire, it includes outage	1,000		500		500		
7)	Connection switching and operation from existing substation to a mobile substation, it includes outage	10,000		10,000				
8)	Removal of existing earthing transformers	16,000		16,000				
9)	Removal of existing emergency generator and enclosure	16,000		16,000				
10)	Demolition of concrete fire walls around 132/33kv transformers. Removal of a 132/33kv transformers, temporary 132kv switching equipment, switchgeras and control house	55,000		27,500	27,500			(2) During the Project Implementation
11)	Changing-over from a mobile substation to new substation	10,000				10,000		
12)	Transportation of a mobile substation and construction new wall	23,000				5,750	17,250	
13)	Procurement of 6 units of Watt-Hour meter for dealing with distribution companies	6,000				6,000		
14)	Procurement and installation of new 33kV cables and cable joints for the connection with distribution substation (EKEDC)	146,000				146,000		
15)	Employment of guardsmen for a mobile substation	92,000	17,800	23,700	23,700	23,700	3,100	(1) Before the Tender & (2) During the Project Implementation
16)	Armed mobile policemen for guard for Japanese supervisors	88,100	1,600	15,000	30,000	39,000	2,500	
2	**Akangba Substation**							
1)	Bush clearing and site levelling	45,000			45,000			(2) During the Project Implementation
2)	Changing-over "T" branch of 132kv lines (Akangba-Ojo 1) and connection of 132kv lines conductors	9,000			9,000			
3	**Payment of commission for Banking Arrangement (B/A) and Authorization to Pay (A/P)**	30,000	7,920	7,360	7,360	7,360		(1) Before the Tender & (2) During the Project Implementation
4	**Payment of Taxes (CISS and ETLS)**	205,000		46,000	112,000	47,000		
Total		885,100	160,320	162,060	254,560	285,310	22,850	

(Note)

Exchange rate: 1US$=Yen112.83

Annex 8 Tax Exemption Procedure

Sheet 1 Tax with respect to corporate income (Corporate Tax)

Items	Type of exemption	Applicable Law	rate(%)	How to calculate	Necessary Information
Companies income tax (CIT)	Be exempted	Companies Income Tax Act, Cap C21 LFN 2004 (CITA)	30%	For Nigerian companies, tax is levied on all taxable profits of the entity. However, for non-resident companies, tax is levied on the taxable profits attributable to its fixed base in Nigeria. In arriving at the taxable profit, the following should be noted: - The entity would be allowed to deduct from its revenue, recurring expenses which were incurred wholly, reasonably, exclusively and necessarily for the purpose of generating its Nigerian revenue. - The losses incurred in prior years as well as capital allowances claimable on the acquisition of capital expenditure may also be claimed.	**Organization in charge :** The Presidency ; The Federal Ministry of Finance ; The Federal Inland Revenue Service (FIRS) **Procedure :** The entity would be required to present a written application to the Presidency through the Federal Ministry of Finance. In the application, the entity would provide: - details of the project being undertaken in Nigeria; - specific justification for the exemption; and - any other relevant supporting document. After review of the application, the Presidency would make a decision and communicate same to applying entity **Duration :** One - six months
Tertiary Education Tax (TET)	Be exempted	Tertiary Education Trust Fund (Establishment, etc.) Act, 2011 (TETFA)	2%	Tertiary education tax is charged at 2% of the assessable profit of a company, as computed under the provisions of Companies Income Tax Act. Assessable profit is the adjustment of accounting profit (PBT) by non-taxable income and disallowable expenses but before adjusting capital allowances and brought forward losses. It should be noted that non-resident companies are ordinarily not liable to TET.	A CIT exemption could be extended to cover TET exemption. However, for purpose of clarity, it is advised that a TET exemption is also requested alongside a CIT exemption.

Sheet 2 Tax with respect to personal income (Personal Income Tax)

Items	Type of exemption	Applicable Law	rate(%)	How to calculate	Necessary Information
Personal Income tax	Be exempted	Personal Income Tax Act, Cap P10, LFN 2004, as amended (PITA)	The PIT rate is on a graduated scale. Details of the tax rates and related income tax bands are provided below: - First NGN 300,000 @ 7% - Next NGN 300,000 @ 11% - Next NGN 500,000 @ 15% - Next NGN 500,000 @ 19% - Next NGN 1,600,000 @ 21% - Above NGN 3,200,000 @ 24%	In arriving at the taxable income of an taxable individual, PITA grants Consolidated Relief Allowances (CRA) before arriving at the taxable income subjected to the applicable tax rates. The CRA is dependent on the annual income level of the tax payer. It is defined as the higher of N200,000 or 1% of gross income, plus 20% of gross income. This implies that employees with annual emolument of NGN 20million or less will have a CRA equal to NGN 200,000 plus 20% of gross income while those individuals with annual income above NGN 20,000,000 have CRA equal to 21% of their gross income. In addition to the CRA, the following social contributions are exempted from personal inome tax in arriving at the taxable income of individuals: - Pension contributions to a Nigerian pension scheme; - National Housing Fund contributions; - National Health Insurance Scheme contributions; - Premiums paid for life assurance; and - Interest paid on mortgage loan.	**Organization in charge :** The Federal Ministry of finance ; The relevant SBIR (States Board of Internal Revenue) at the states where the employees would be tax resident **Procedure :** The entity would be required to write to the Minister of Finance with details of the project being undertaken in Nigeria and specific justification for the exemption of the employees from personal income tax **Duration :** One to six months

(Sheet3) indirect tax etc (such as VAT, Commercial Tax)

Items	Type of exemption	Applicable Law	rate(%)	How to calculate	Necessary Information
Value Added Tax to be paid by entity on its purchases (Input VAT)	Be exempted or reimbursed in case exemption process is delayed	Value Added Tax Act, Cap V1, LFN 2004, as amended (VATA)	5%	VAT is chargeable on the supply of taxable goods and services or importation of all goods and services except those specifically listed in the First Schedule to the VATA i.e. the items listed as exempt or the items listed as zero rated.	**Organization in charge :** The Federal Ministry of Finance ; The Federal Inland Revenue Service **Procedure :** The entity could write to the Minister of Finance with details of the project being undertaken in Nigeria and specific justification for the exemption. Where the Minister is of the opinion that the circumstances are such as to render it expedient that such an exemption should be granted, the Minister may exempt the entity from paying VAT on purchases or imports. The Minister is required to ensure the notice for exemption is gazetted. **Duration :** One - Six months

(Sheet4) Duties etc.

Items	Type of exemption	Applicable Law	rate(%)	How to calculate	Necessary Information
Import Duty	Be exempted or reimbursed (in case exemption process is delayed)	- The 2015 - 2019 ECOWAS Common External Tariff ; - The Customs, Excise, Tariff, etc (Consolidation) Act No 4, 1995, as amended (CETA)	The rate to be applied is based on tariff classification of item being imported	Rate * CIF value of item being imported	Organization in charge : The Federal Ministry of Finance;The Nigeria Customs Service Procedure : There are 2 ways to obtain duty exemption (1) Under the Temporary importation (TI) regime or (2) Under the total duty exemption regime o Temporary importation: Under the TI regime, an enitity, directly or vide a 3PL could apply to the NCS (Nigeria Customs Service) to import goods into the country under the temporary import procedure. In this case, entity or the the 3PL would require the following documents whilst declaring the items for import (i.e. before begininning importation of the item): - A bank guarantee from a reputable bank - Hire agreement or evidence of ownership - Details of project where items would be deployed - Technical manuals describing the items to be imported - Covering Letter to NCS applying for TI approval - A copy of the entity's and or 3PL's tax clearance certificate (or exemption status) for the past 3 years Under the TI regime, items may remain in the country for a maximum of two years (i.e. an initial period of one year and two possible extensions for six months each), after which the guarantee would be released o Total exemption An entity engaged in power transmission could apply for duty exemption pursuant to the provisions of CETA (Customs, Excise, Tariff etc (Consolidation) Act) and the concessions provided under the 2016 FPM (Fiscal Policy Measures). The entity would be required to submit a formal application to the Minister of Finance vide the ministry relevant to the item being imported to benefit from the concessions. The following are the documents required for a duty waiver application: - Evidence of Registration with the Corporate Affairs Commission (Where applicable) - The Memorandum of Understanding duly signed by the Minister of Finance or Minister of state for Budget and National planning between the donor agency and the Federal Government of Nigeria - A proforma invoice indicating the value of imported items - Other supporting documents which may be requested by the Ministry of finance Where the Minister is of the opinion that the circumstances are such as to render it expedient that such an exemption should be granted, the Minister would exempt JCo (Japanese Comnapy) from import duties on items related to the project. Notwithstanding the foregoing, items imported from the ECOWAS region under the aegis of the ETLS shall be duly and quota free. The supplier would need to ensure it has oblain the relevant ETLS certificate (supporting the claim that the items have originated from the ECOWAS region) for the items being imported. Duration : Three - Twelve months
Port development levy (Surcharges)	Be exempted or reimbursed (in case exemption process is delayed)	General Nigerian import guidelines	7%	Rate * import duty	Organization in charge : The Nigeria Customs Service Procedure : Please refer to our comments around the temporary import regime in the procedure section of the import duty coloumn Under the TI regime, it is common practice for the Nigeria Customs Service to grant full exemption from surcharge payments. However, there are occasions where the Nigeria Customs Service excludes the surcharge (port charges) on the basis that the amount relates to a service charge for activities carried out on imported items and not actual taxes or levies. Either of these possibilities may be encountered in practice and may vary in application from one Nigeria Customs Service office to another. Meanwhile, please note that companies intending to claim this exemption are required to obtain a bank guarantee from a local bank and there would be ancillary bank charges for obtaining a bank guarantee from a local bank and these charges vary from bank to bank. Under the total exemption regime, the entity is required to submit a formal request to the responsible Ministry of the Project together with a proforma invoice indicating the value of imported items for the payment of CISS instead of the entity. Duration : One - three months

Comprehensive Import Supervision Scheme (CISS)	To be paid by responsible Ministry or implementing Agency directly	General Nigerian import guidelines	1%	Rate * FOB value of imported item	**Organization in charge :** The Nigeria Customs Service **Procedure :** Please refer to our comments around the temporary import regime in the procedure section of the import duty coloumn Under the TI regime, it is common practice for the Nigeria Customs Service to grant full exemption from CISS fees However, there are occasions where the Nigeria Customs Service excludes the CISS fees on the basis that the amount relates to a service charge for activities carried out on imported items and not actual taxes or levies Either of these possibilities may be encountered in practice and may vary in application from one Nigeria Customs Service office to another Meanwhile, please note that companies intending to claim this exemption are required to obtain a bank guarantee from a local bank and there would be ancillary bank charges for obtaining a bank guarantee from a local bank and these charges vary from bank to bank Under the total exemption regime, the entity is required to submit a formal request to the responsible Ministry of the Project together with a proforma invoice indicating the value of imported items for the payment of CISS instead of the entity **Duration :** One - three months
ECOWAS Trade Liberalisation Scheme (ETLS) levy	To be paid by responsible Ministry or implementing Agency directly	ECOWAS Regulations	0.5%	0.5% * CIF value of imported item	**Organization in charge :** The Nigeria Customs Service **Procedure :** Under the TI regime, it is common practice for the Nigeria Customs Service to grant full exemption from ETLS fees However, please note that companies intending to claim this exemption are required to obtain a bank guarantee from a local bank and there would be ancillary bank charges for obtaining a bank guarantee from a local bank and these charges vary from bank to bank Under the total exemption regime, the entity is required to submit a formal request to the responsible Ministry of the Project together with a proforma invoice indicating the value of imported items for the payment of ETLS instead of the entity **Duration :** N/A
VAT	Be exempted or reimbursed in case exemption process is delayed	Value Added Tax Act, Cap V1, LFN 2004, as amended (VATA)	5%	Rate * summation of the CIF value of costs of imported item, and all taxes, duties and levies paid/payable outside or by reason of importation into Nigeria	**Organization in charge :** The Federal Ministry of Finance ; The Federal Inland Revenue Service **Procedure :** The entity could write to the Minister of Finance with details of the project being undertaken in Nigeria and specific justification for the exemption Where the Minister is of the opinion that the circumstances are such as to render it expedient that such an exemption should be granted, the Minister may exempt the entity from paying VAT on imports The Minister is required to ensure the notice for exemption is gazetted **Duration :** One - Six months

(Sheet 5) Other taxes and levies

Items	Type of exemption	Applicable Law	rate(%)	How to calculate	Necessary Information
Withholding tax deducted from the entity's income	Be exempted	Companies Income Tax Act, Cap C21 LFN 2004 (CITA)	5%	WHT is deducted at the specified rate for payments to vendors or contractors	**Organization in charge :** The Presidency The Federal Ministry of Finance The Federal Inland Revenue Service **Procedure :** Companies Income tax exemption automatically exempts an entity from suffering WHT exemption. **Duration :** One to Six months
Withholding tax to be deducted by entity when paying its suppliers or vendors	Be exempted	Companies Income Tax Act, Cap C21 LFN 2004 (CITA) and the Personal Income Tax Act, Cap P10, LFN 2004, as amended (PITA)	5% or 10%	WHT is computed on the income earned by the supplier.	**Organization in charge :** The Federal Inland Revenue Service **Procedure :** There are no specific mechanisms for obtaining exemptions from deducting WHT upon payment to suppliers. However, an entity may write to FIRS (attaching supporting documents of its projects in Nigeria and importantly, an exemption letter from the Presidency from CIT liability) seeking exemptions from WHT obligations. **Duration :** One to Two months

Annex 9 Necessary Arrangements and Estimated Cost regarding Police Officers

1. Arrangement of Police officers

1) Arrangement of Police officers for Japanese supplier

TCN shall hire Police officers at his own expense for Japanese supplier during construction. Number of Police officers shall be two at minimum for the escort from one Japanese to four Japanese.

Driver (△)	1	2	2	2
Japanese supplier (○)	1	2	3	4
Police officers (●)	2	2	2	2
Number of car	1	2	2	2

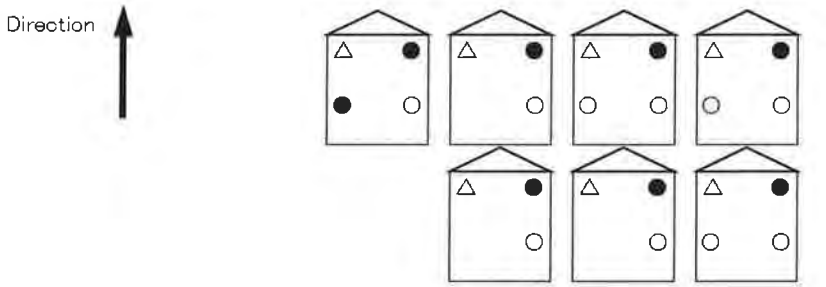


Figure 9-1 Arrangement of Police officers for Japanese supplier

2) Arrangement of Police officers for Japanese consultant
TCN shall hire Police officers at his own expense for Japanese consultant during construction. Number of Police officers shall be two at minimum for the escort from one Japanese to four Japanese.

Driver (△)	1	2	2	2
Japanese consultant (○)	1	2	3	4
Police officers (●)	2	2	2	2
Number of car	1	2	2	2

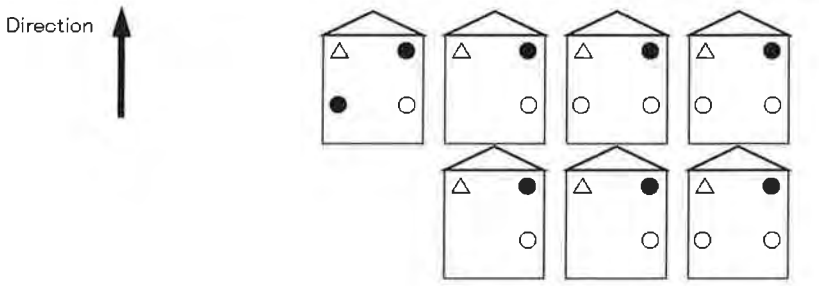


Figure 9-2 Arrangement of Police officers for Japanese consultant

2. Estimated cost regarding Police Officers

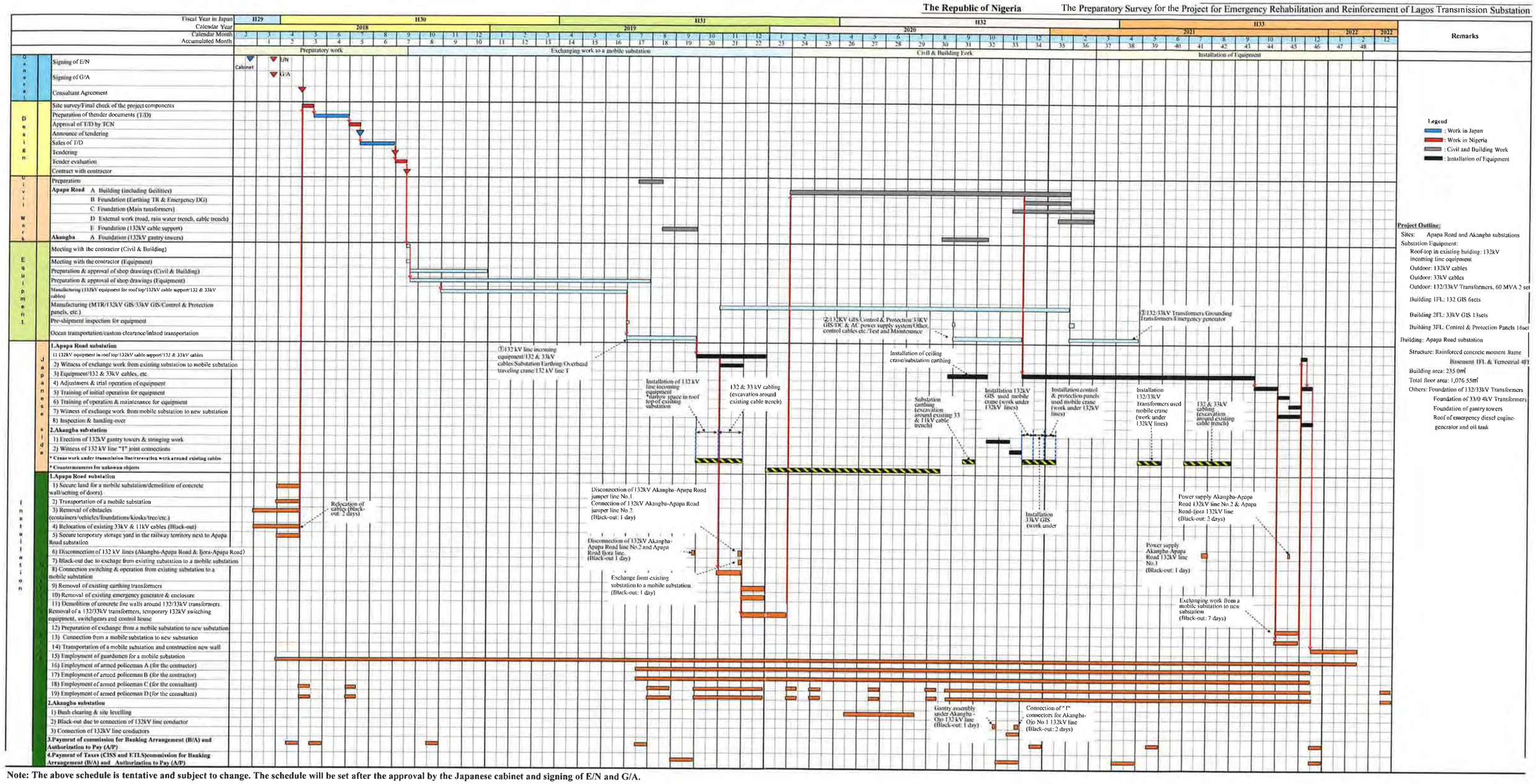
The estimated cost of Police Officers is NGN 26,860,000.

Table 9-1 Estimated cost regarding Police Officers

	Police Officer's Daily Alowance				Administrative Charge			
	Numbers of Police officers	Unit price of Daily allowance (NGN/ person)	Days	Subtotal of Daily allowance (NGN)	Unit price (NGN/ month)	Months	Subtotal (NGN)	Grand total (NGN)
Japanese supplier	2	5,000	900	9,000,000	200,000	31	6,200,000	
Japanese consultant	2	5,000	666	6,660,000	200,000	25	5,000,000	
Total				15,660,000			11,200,000	26,860,000

Annex 4 : Project Implementation Schedule

The Republic of Nigeria The Preparatory Survey for the Project for Emergency Rehabilitation and Reinforcement of Lagos Transmission Substation



Note: The above schedule is tentative and subject to change. The schedule will be set after the approval by the Japanese cabinet and signing of E/N and G/A.

A-5　概略設計図

添付-5. 概略設計図

アパパロード変電所

図面番号	図面名称
AR-01-1	アパパロード変電所　概略配置図
AR-01-2	アパパロード変電所　撤去設備概略配置図
AR-02-1	アパパロード変電所　単線結線図
AR-02-2	アパパロード変電所　単線結線図（変電所補機系統）
AR-03-1	制御棟 1 階　132 kV GIS 配置計画図
AR-03-2	制御棟 M1 階　天井クレーン配置計画図
AR-03-3	制御棟 2 階　33 kV GIS 配置計画図
AR-03-4	制御棟 3 階　制御盤配置計画図

アカンバ変電所

図面番号	図面名称
AK-01	アカンバ変電所　概略配置図

建築図

図面番号	図面名称
AR-A01	制御棟　配置図
AR-A02	制御棟　仕上げ表
AR-A03	制御棟　地階平面図
AR-A04	制御棟　1 階平面図
AR-A05	制御棟　M1 階平面図
AR-A06	制御棟　M 階平面図
AR-A07	制御棟　2 階平面図
AR-A08	制御棟　3 階平面図
AR-A09	制御棟　屋階平面図
AR-A10	制御棟　立面図(1)
AR-A11	制御棟　立面図(2)
AR-A12	制御棟　断面図
AR-A13	制御棟　矩計図(1)
AR-A14	制御棟　矩計図(2)
AR-A15	制御棟　階段平面図
AR-A16	制御棟　階段断面図
AR-A17	制御棟　建具表

構造図

図面番号	図面名称
AR-S01	制御棟　基礎、地階伏図
AR-S02	制御棟　1 階伏図
AR-S03	制御棟　M1 階伏図(1)
AR-S04	制御棟　M1 階伏図(2)
AR-S05	制御棟　M 階伏図
AR-S06	制御棟　2 階伏図
AR-S07	制御棟　3 階伏図
AR-S08	制御棟　屋階伏図
AR-S09	制御棟　軸組図(1)
AR-S10	制御棟　軸組図(2)
AR-S11	制御棟　軸組図(3)
AR-S12	制御棟　基礎梁リスト
AR-S13	制御棟　柱リスト
AR-S14	制御棟　大梁リスト(1)
AR-S15	制御棟　大梁リスト(2)
AR-S16	制御棟　小梁、床、壁リスト
AR-S17	制御棟　雑詳細図
AR-S18	制御棟　ラーメン配筋図

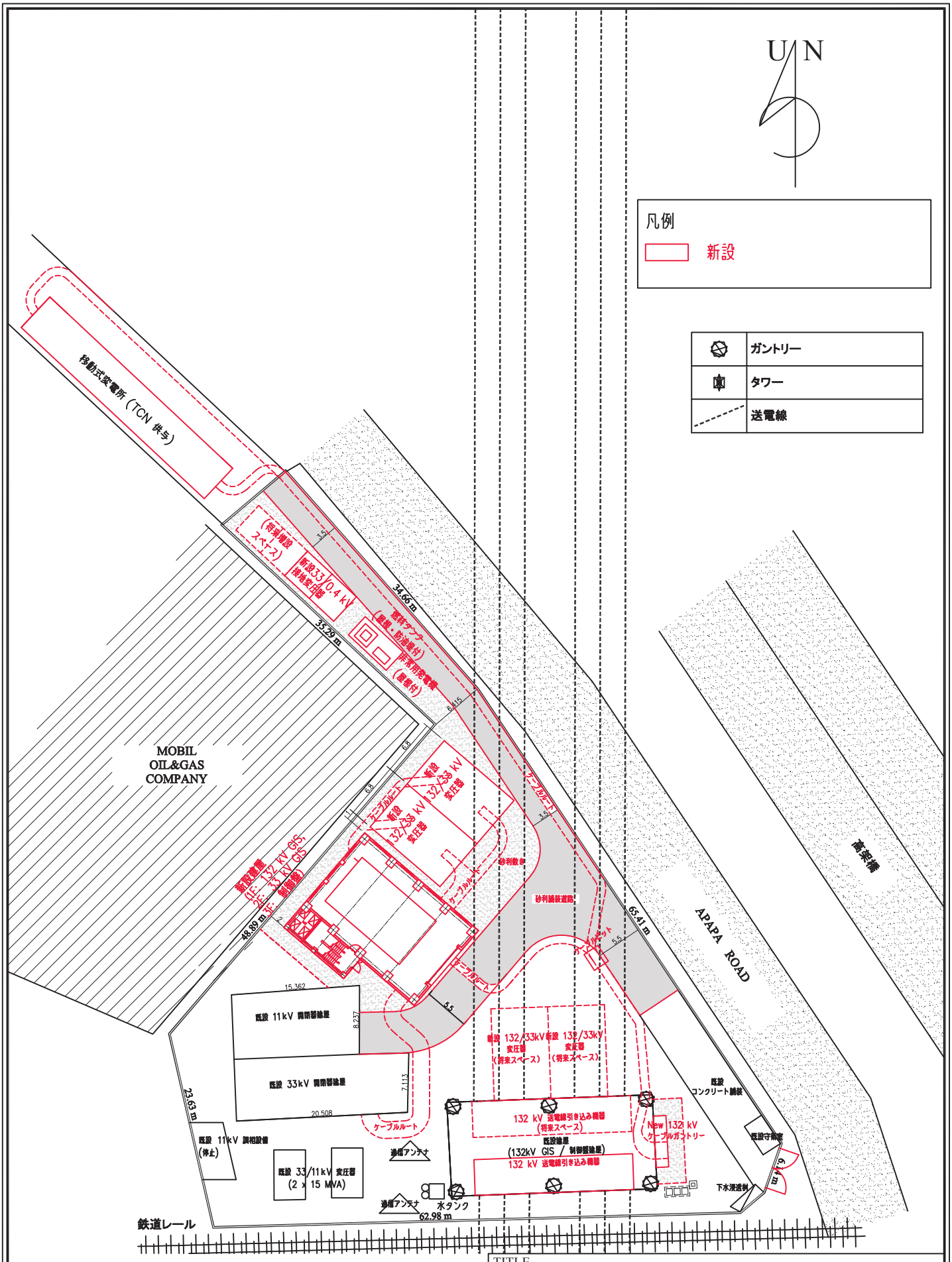
電気建築図

図面番号	図面名称
AR-E01	制御棟　配電計画図
AR-E02	制御棟　地階系統計画図（照明、壁コンセント、防火）
AR-E03	制御棟　1 階系統計画図（照明、壁コンセント、防火）
AR-E04	制御棟　M1 階系統計画図（照明、壁コンセント、防火）
AR-E05	制御棟　M 階系統計画図（照明、壁コンセント、防火）
AR-E06	制御棟　2 階系統計画図（照明、壁コンセント、防火）
AR-E07	制御棟　3 階系統計画図（照明、壁コンセント、防火）
AR-E08	制御棟　照明計画図（階段、データ通信）
AR-E09	制御棟　階段計画図（照明、防火システム）
AR-E10	制御棟　避雷保護計画図

機械建築図

図面番号	図面名称
AR-M01	制御棟　地階排水装置計画図
AR-M02	制御棟　屋外排水装置計画図

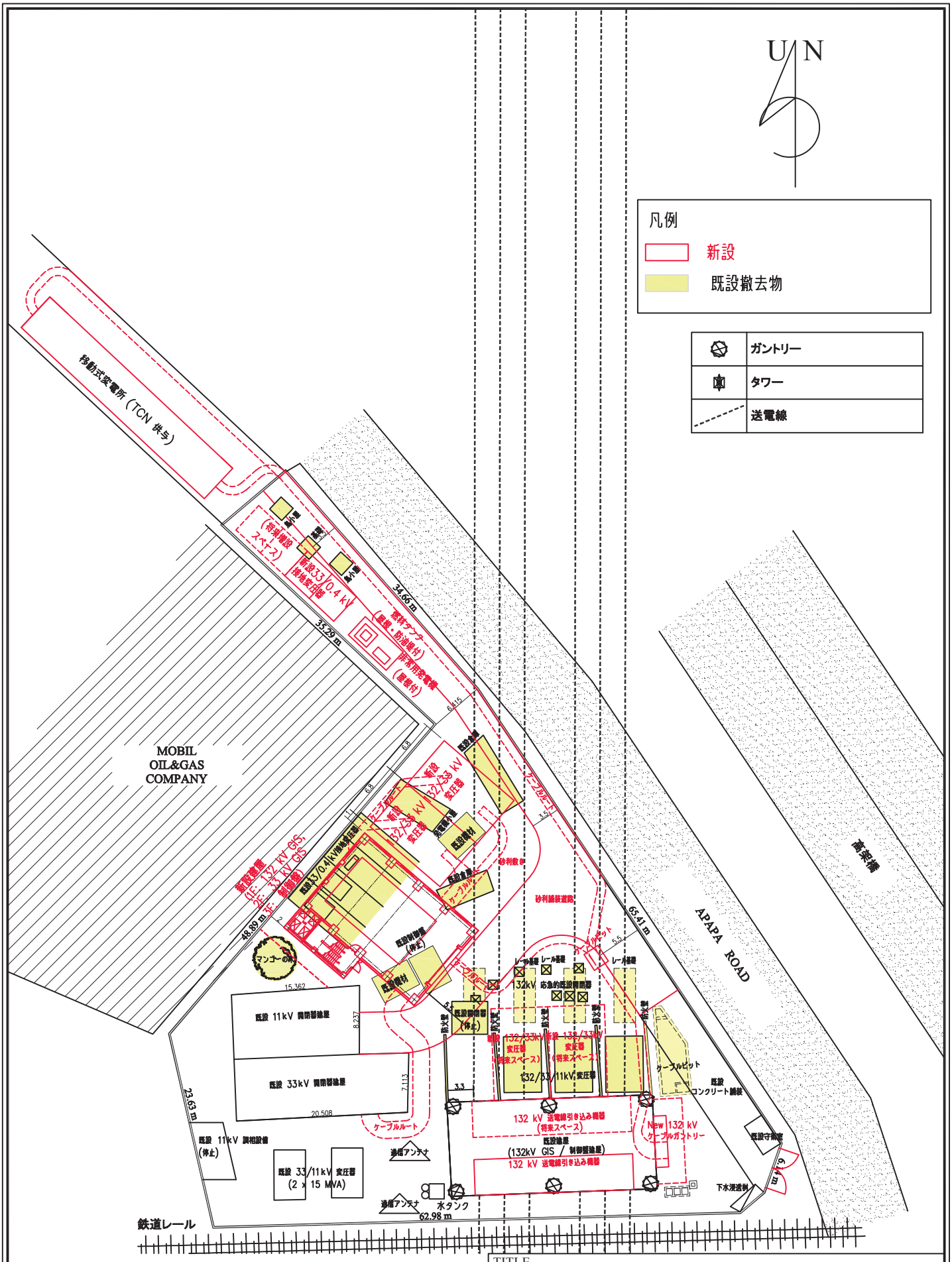
図面番号	図面名称
AR-M03	制御棟　2 階通風装置計画図
AR-M04	制御棟　3 階計画図（冷暖房装置、通風装置）



TITLE

Apapa Road Substation
Plot Plan

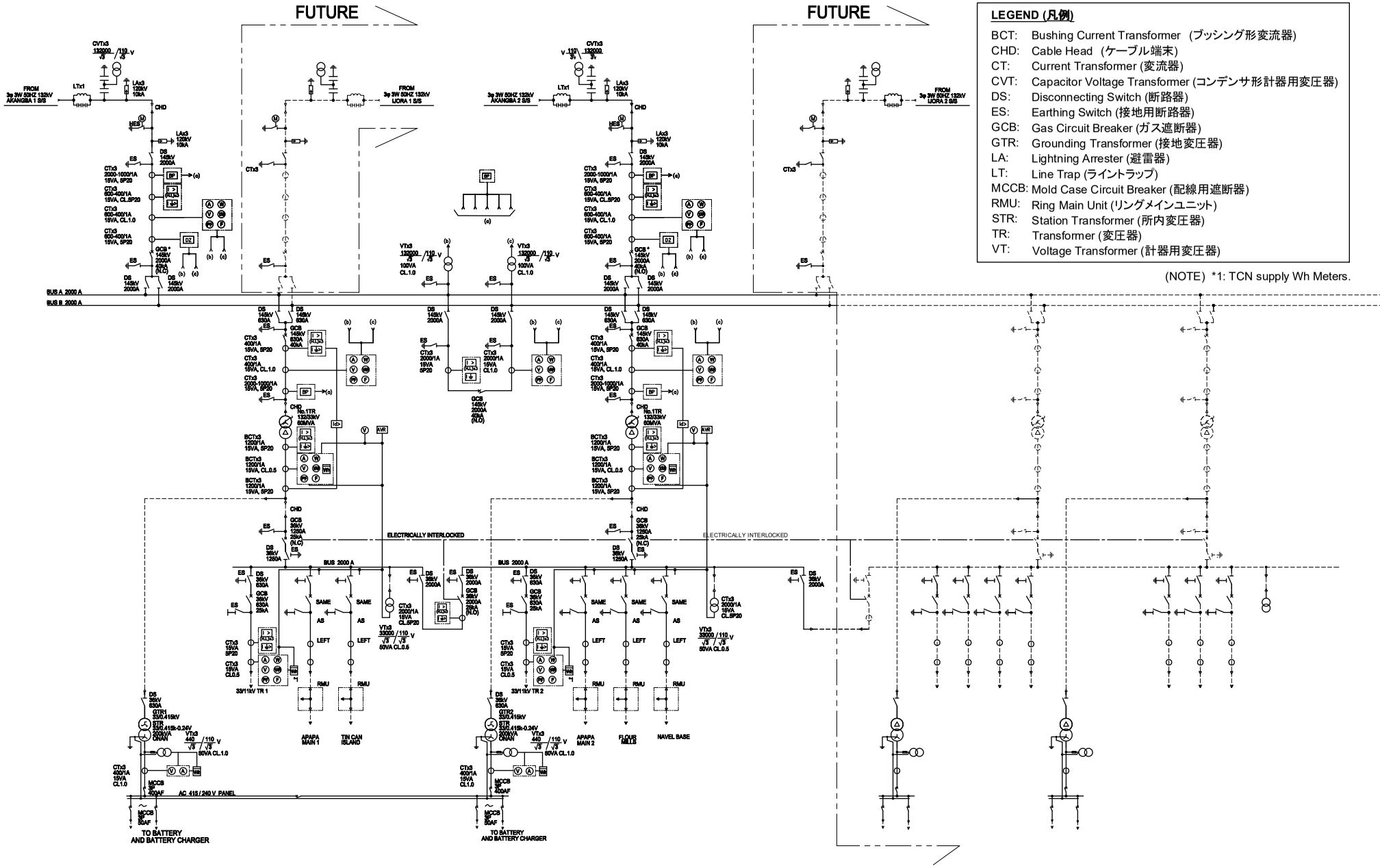
PROJECT	LOCATION	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	****	****	****	feb. 2017	AR-01-1
		CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:600 (if only A4)



TITLE

Apapa Road Substation
Plot Plan with removed material

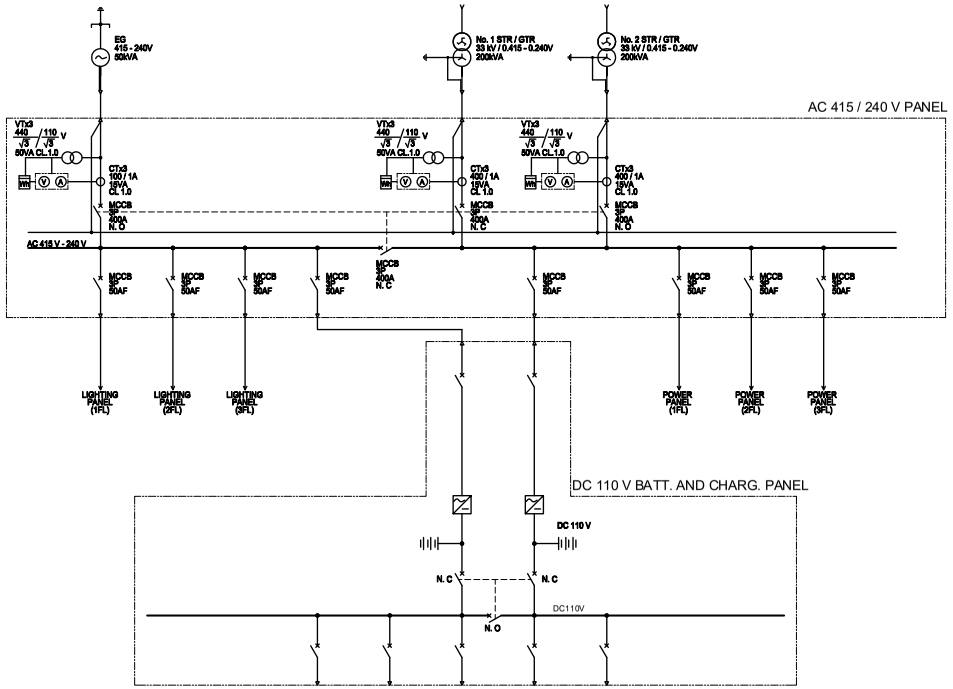
PROJECT	LOCATION	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	****	****	****	feb. 2017	AR-01-2
		CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:600 (if only A4)



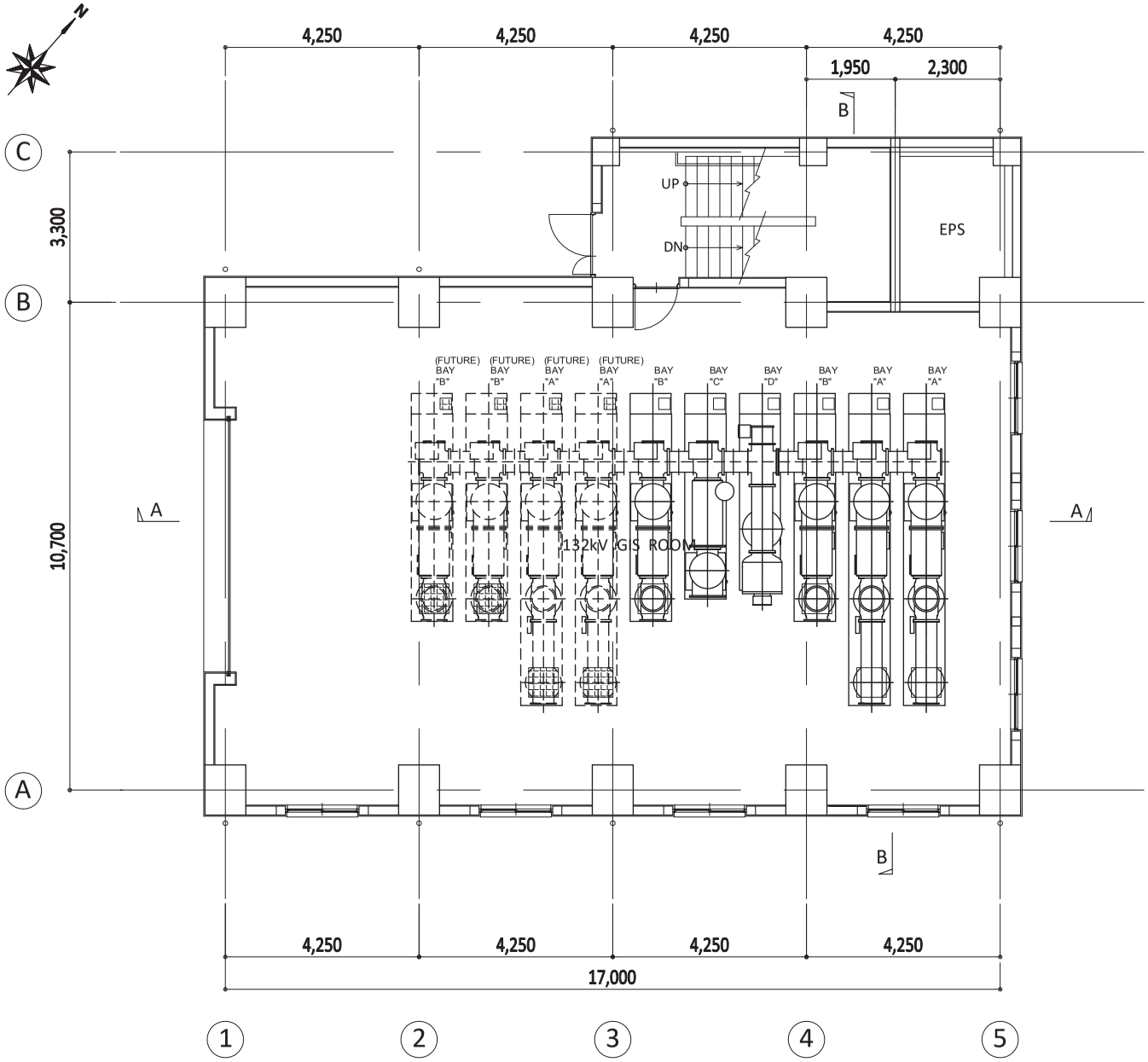
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Apapa Road Substation Single Line Diagram アパパロード変電所 単線結線図					AR-02-1
		CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN					SCALE : (if only A3)

LEGEND (凡例)

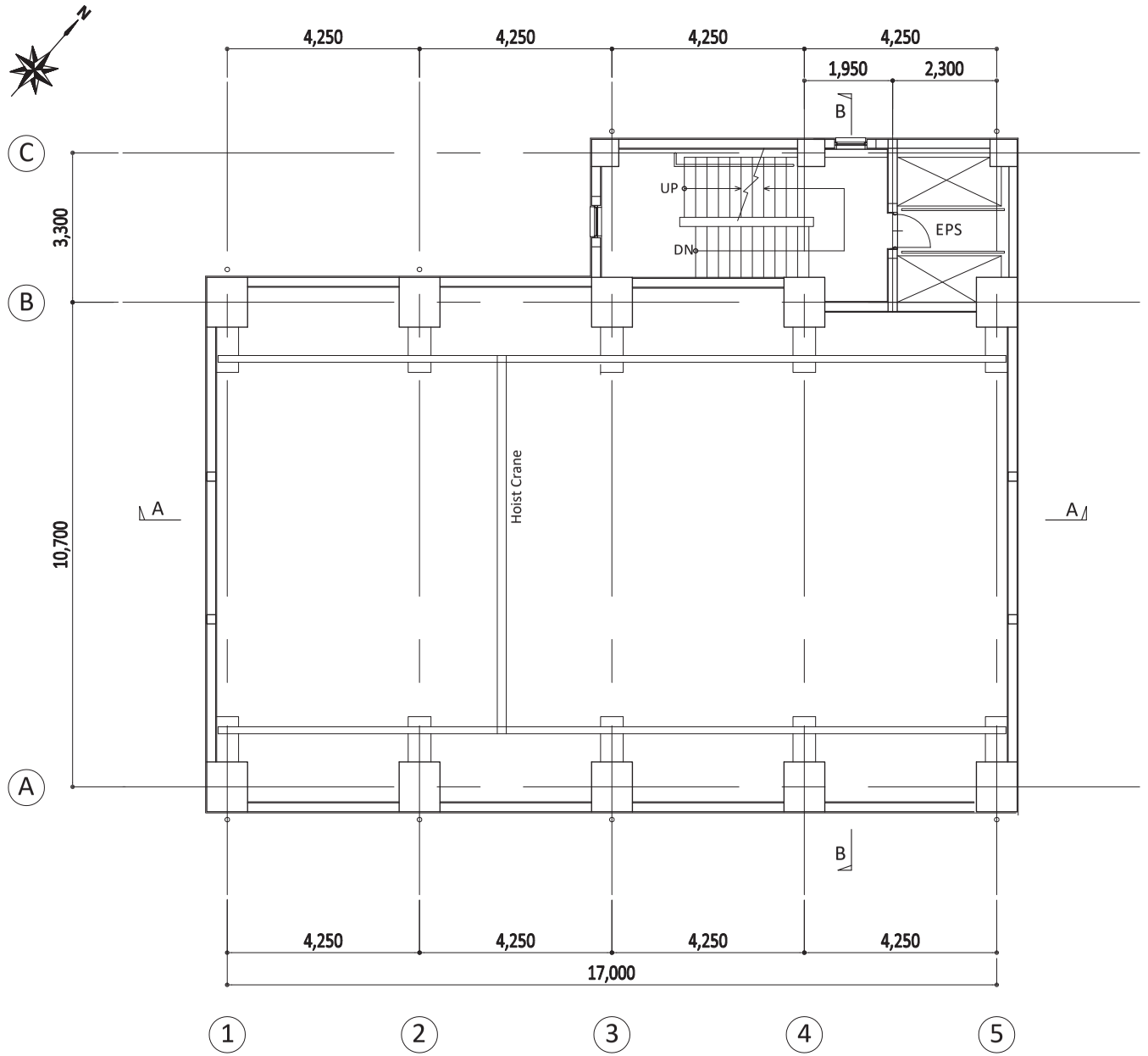
AC:	Alternative Current (交流)
B/D:	Distribution Board (分電盤)
DC:	Direct Current (直流)
EG:	Emergency Generator (非常用発電機)
GTR:	Grounding Transformer (接地変圧器)
MCCB:	Mold Case Circuit Breaker (配線用遮断器)
NC:	Normal Close (常時閉)
NO:	Normal Open (常時開)
STR:	Station Transformer (所内変圧器)



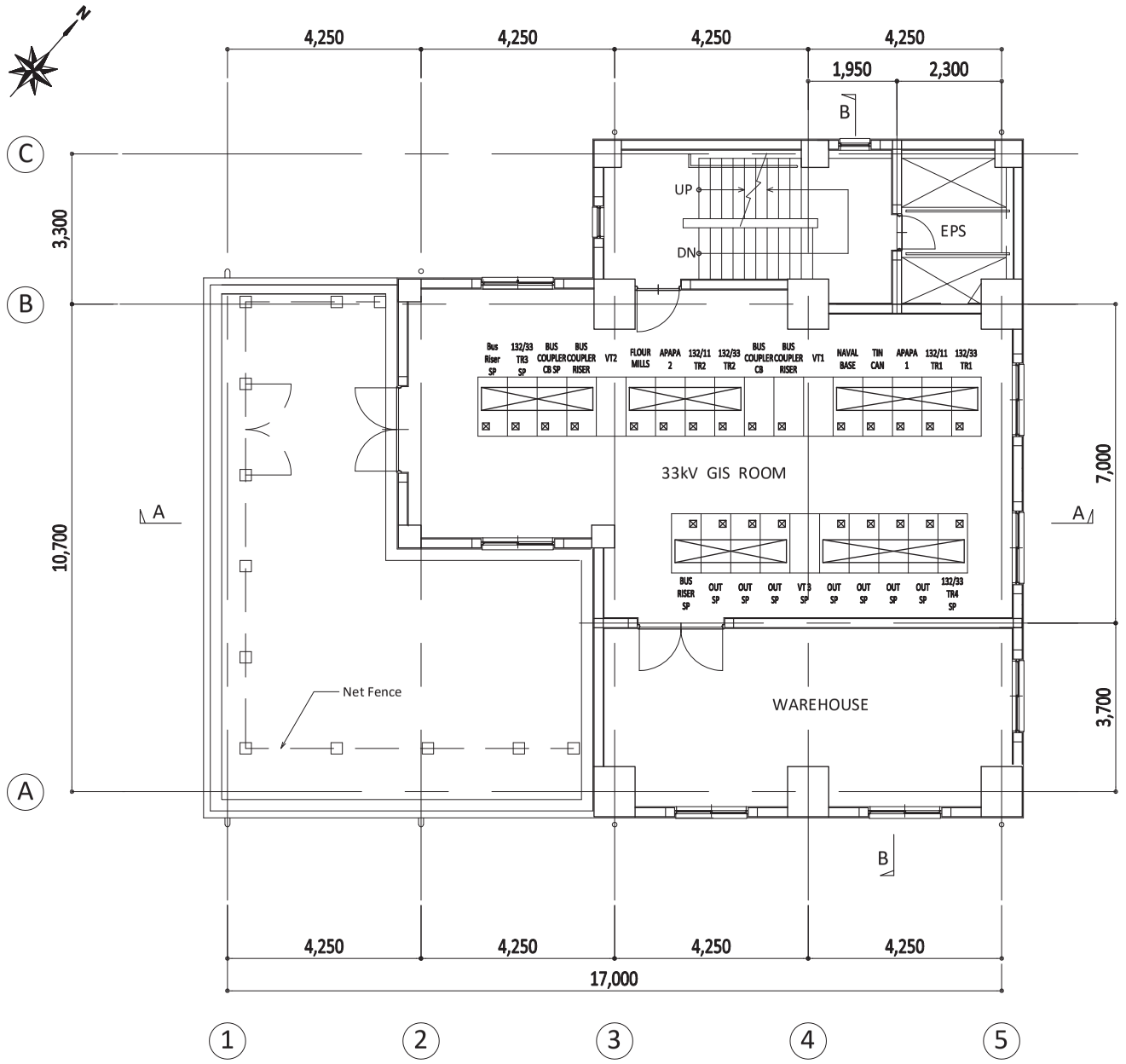
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Apapa Road Substation Single Line Diagram (Station Auxiliary System) アパパロード変電所 単線結線図（所内）					AR-02-2
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : (if only A3)



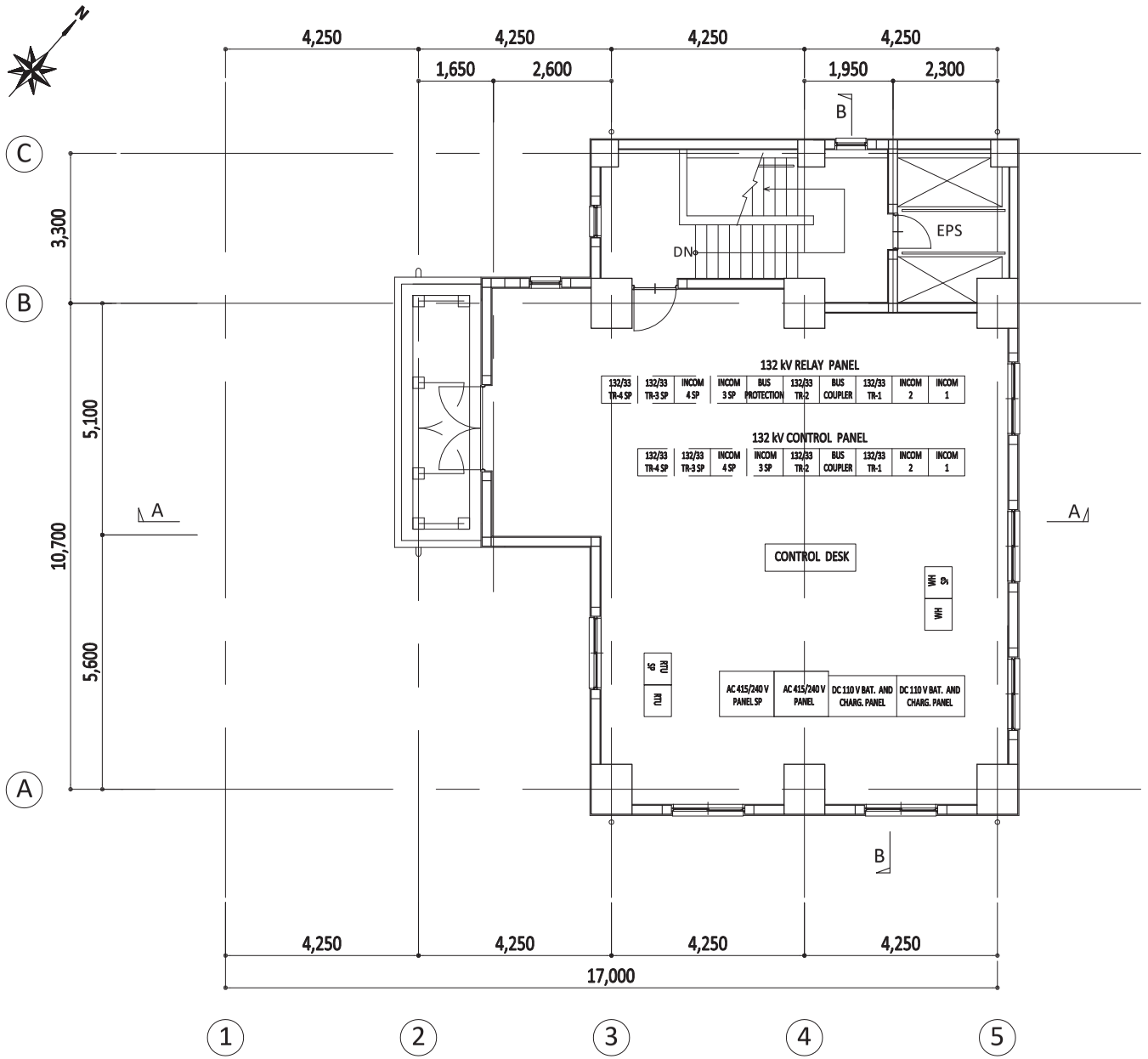
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building 1st Floor 132kV GIS Plan					AR-03-1
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



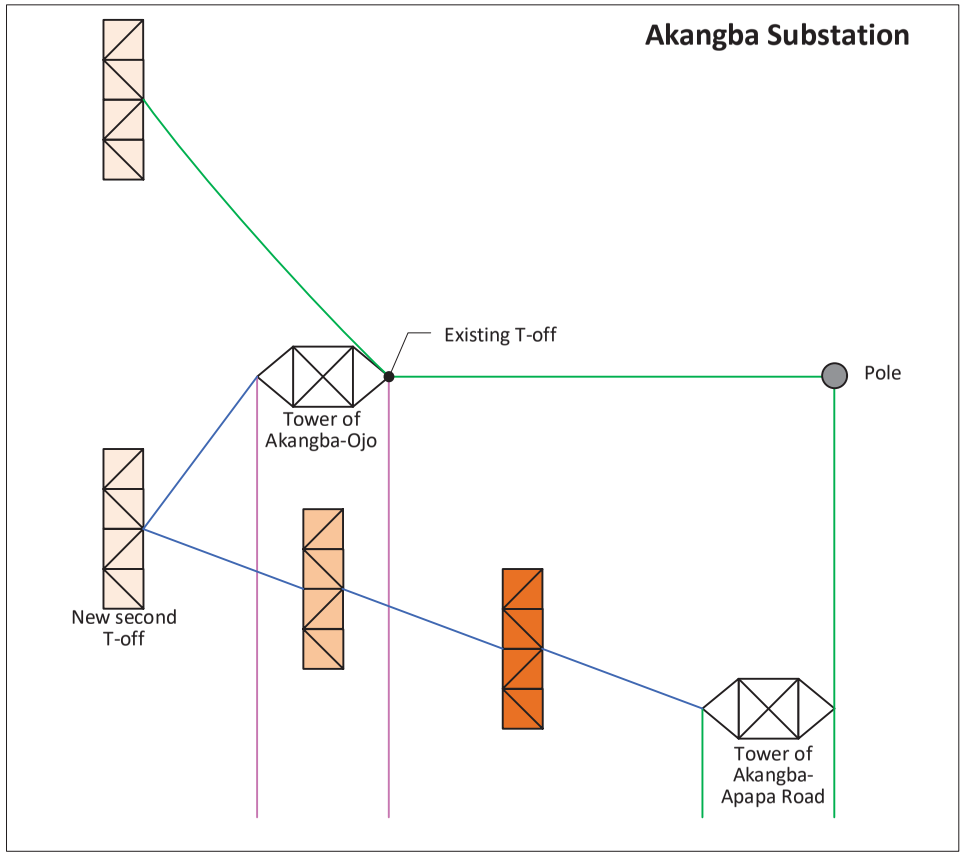
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building Middle 1st Floor Overhead Crane Plan					AR-03-2
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)

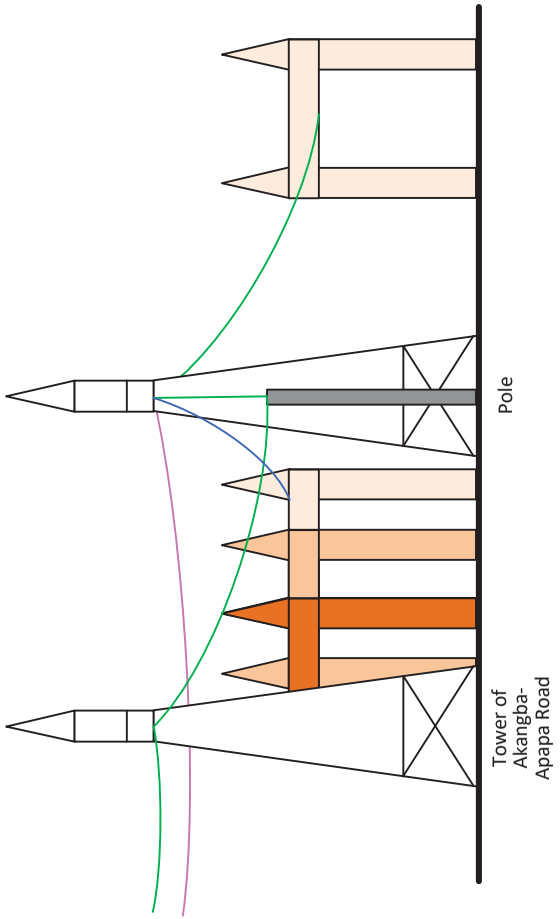


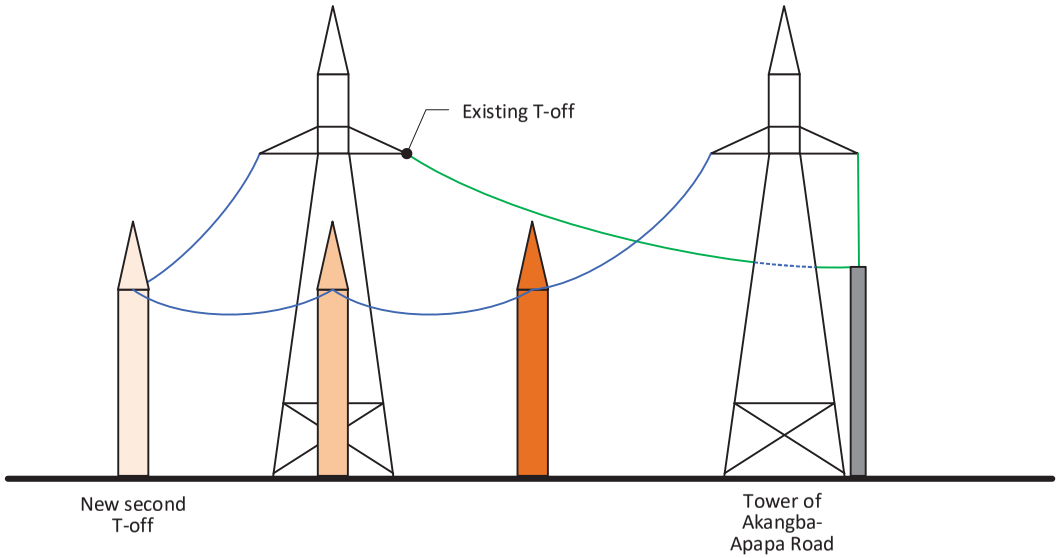
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building 2nd Floor 33kV GIS Plan					AR-03-3
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



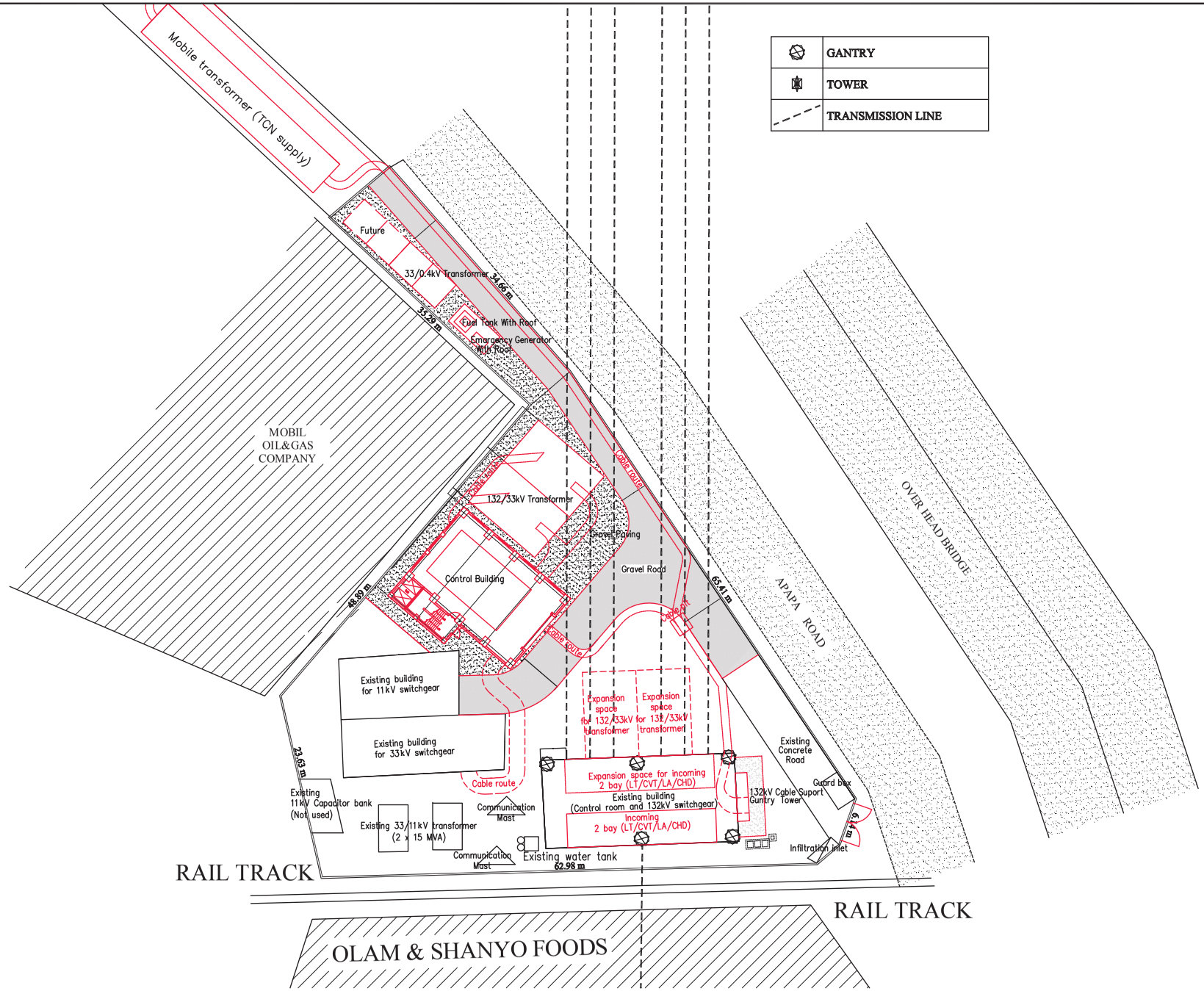
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building 3rd Floor Control Panel Plan					AR-03-4
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)







AK-01 Akangba Substation Plot Plan



PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING SITE PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-A01
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)

EXTERIOR FINISHING SCHEDULE

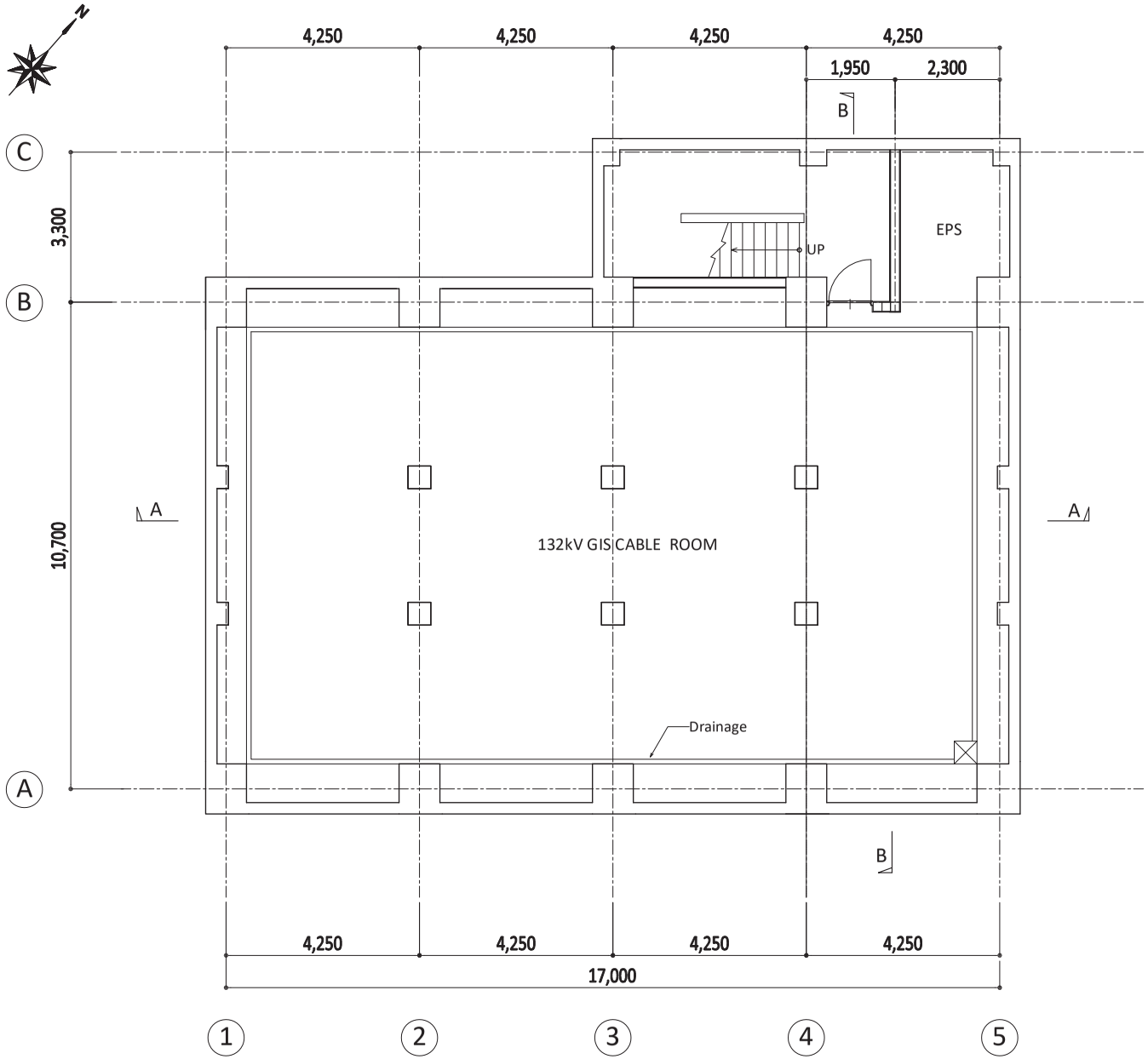
LOCATION	SPECIFICATION
ROOF	CONCRETE STEEL TROWEL ON PROTECTION CONCRETE WITH WELDED WIRE MESH ASPHALT MEMBRANE WATER PROOFING
WALL	PAINT FINISH (A.E.P) ON 150mm THK. CONCRETE BLOCK WITH MORTAR STEEL TROWEL 25mm THK.
COLUMN	FINISH (A.E.P) ON MORTAR STEEL TOROWEL 25mm THK.
BEAM	FINISH (A.E.P) ON MORTAR STEEL TOROWEL 25mm THK.
ROOF DRAIN	CASTIRON ϕ100mm
DOWNSPOUT	PVC PIPE ϕ100
NET FENCE	H=1100

INTERIOR FINISHING SCHEDULE

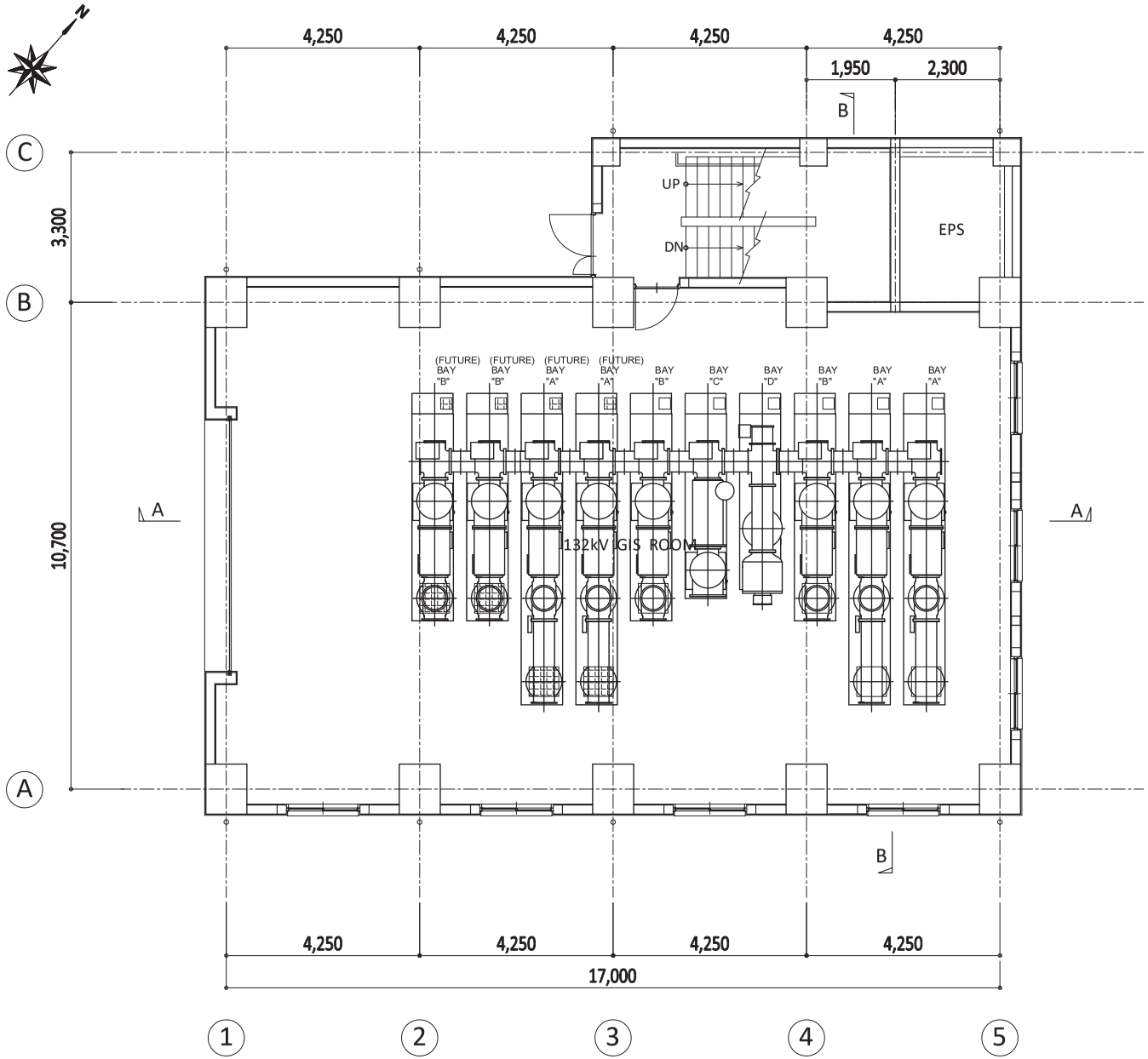
	ROOM NAME	FLOOR	BASEBOARD	WALL	CEILING	REMARKS
BF	132kV GIS CABLE ROOM	ADDTIONAL CONCRETE t=220 STEEL TROWEL FINISH WITH SLOPE 1/200	——	EXPPOSED CONCRETE	EXPOSED CONCRETE	SUMP PIT, DRAINAGE ROOM NAME PLATE
1F	132kV GIS ROOM	DUSTPROOF PAINT ON CONCRETE STEEL TROWEL	MORTAR STEEL TROWEL H=100 ON 200mm THICKNESS CONCRETE BLOCK	PAINT FINISH(E.P) MORTAR STEEL TROWEL 20mm THK. ON 200mm THICKNESS CONCRETE BLOCK	PAINT FINISH(A.E.P) ON EXPOSED CONCRETE	HOIST CRANE 5ton FIRE EXTINGUISHER 2 SET ROOM NAME PLATE
MF	33kV GIS CABLE ROOM	CONCRETE STEEL TROWEL FINISH	DITTO	DITTO	EXPOSED CONCRETE	ROOM NAME PLATE
2F	33kV GIS ROOM	DUSTPROOF PAINT ON CONCRETE STEEL TROWEL	DITTO	DITTO	PAINT FINISH(A.E.P) ON EXPOSED CONCRETE	FIRE EXTINGUISHER 1 SET ROOM NAME PLATE
2F	WERAHOUSE	DITTO	DITTO	DITTO	DITTO	FIRE EXTINGUISHER 1 SET ROOM NAME PLATE
3F	CONTROL ROOM	FREE ACCESS FLOOR H=500 ANTISTATIC VINYL TAILE FINISH	VINYL TAILE H=60	DITTO	COSMETIC GYPSAM BOARD 9.5mm THK. WITH ALUMINUM SUSPENDED FRAME	FIRE EXTINGUISHER 2 SET ROOM NAME PLATE
	STAIRCASE	MORTAR STEEL TROWEL FINISH STEP & RISE : MORTAR STEEL TROWEL	MORTAR STEEL TROWEL H=100 ON 200mm THICKNESS CONCRETE BLOCK	PAINT FINISH(A.E.P) MORTAR STEEL TROWEL 20mm THK. ON 200mm THICKNESS CONCRETE BLOCK	PAINT FINISH(A.E.P) ON EXPOSED CONCRETE	NON SLIP : STAINLESS W=35
	E.P.S	CONCRETE STEEL TROWEL	——	EXPOSED CONCRETE BLOCK	EXPOSED CONCRETE	STEEL HANDRAIL H=1100 ROOM NAME PLATE

A－5－14

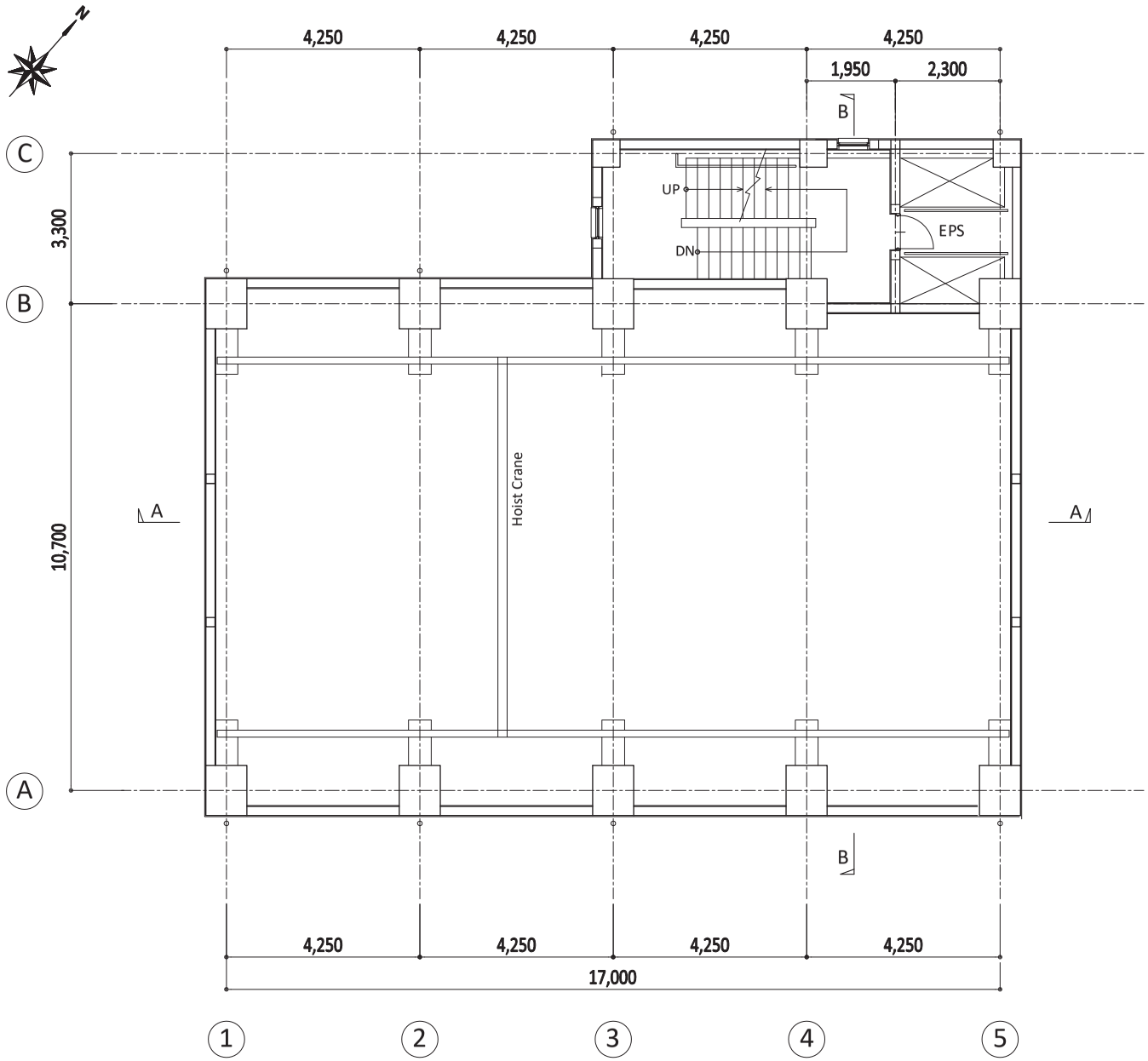
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING FINISHING SCHEDULE	K. FUJII	K. ODA	T. KURUMADA		AR-A02
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : --- (if only A3)



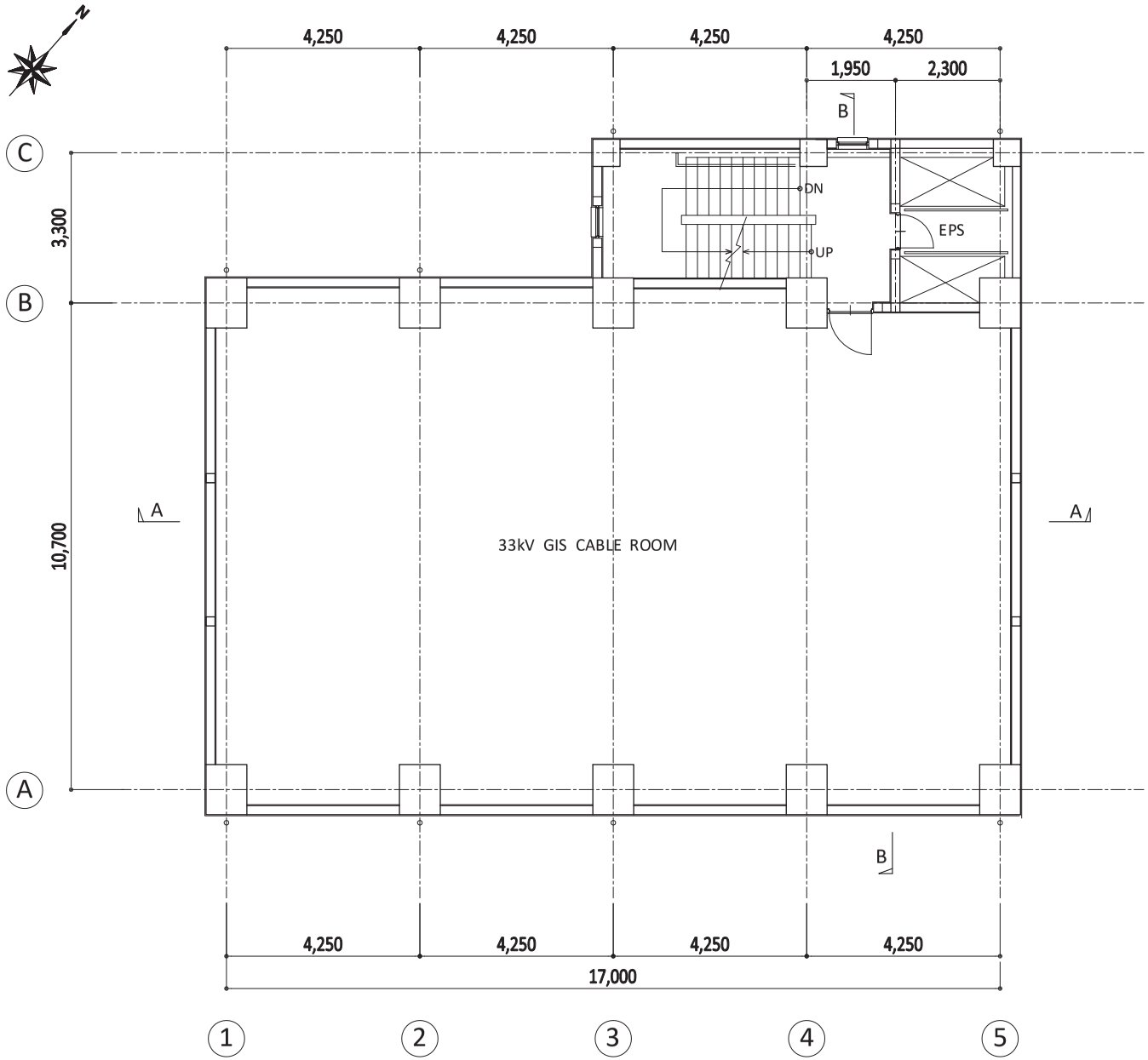
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING BASEMENT FLOOR PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-A03
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



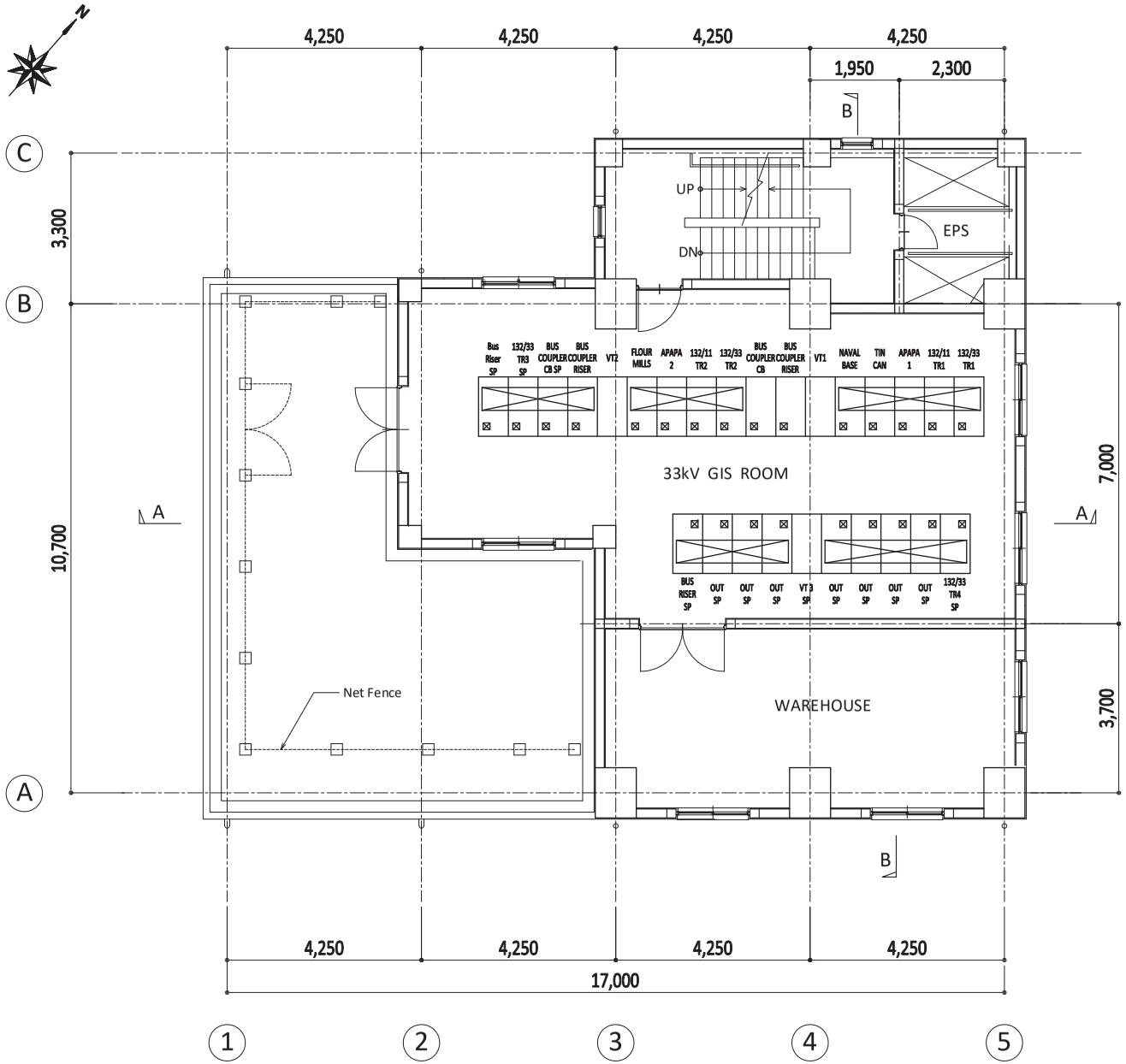
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING 1st FLOOR PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-A04
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



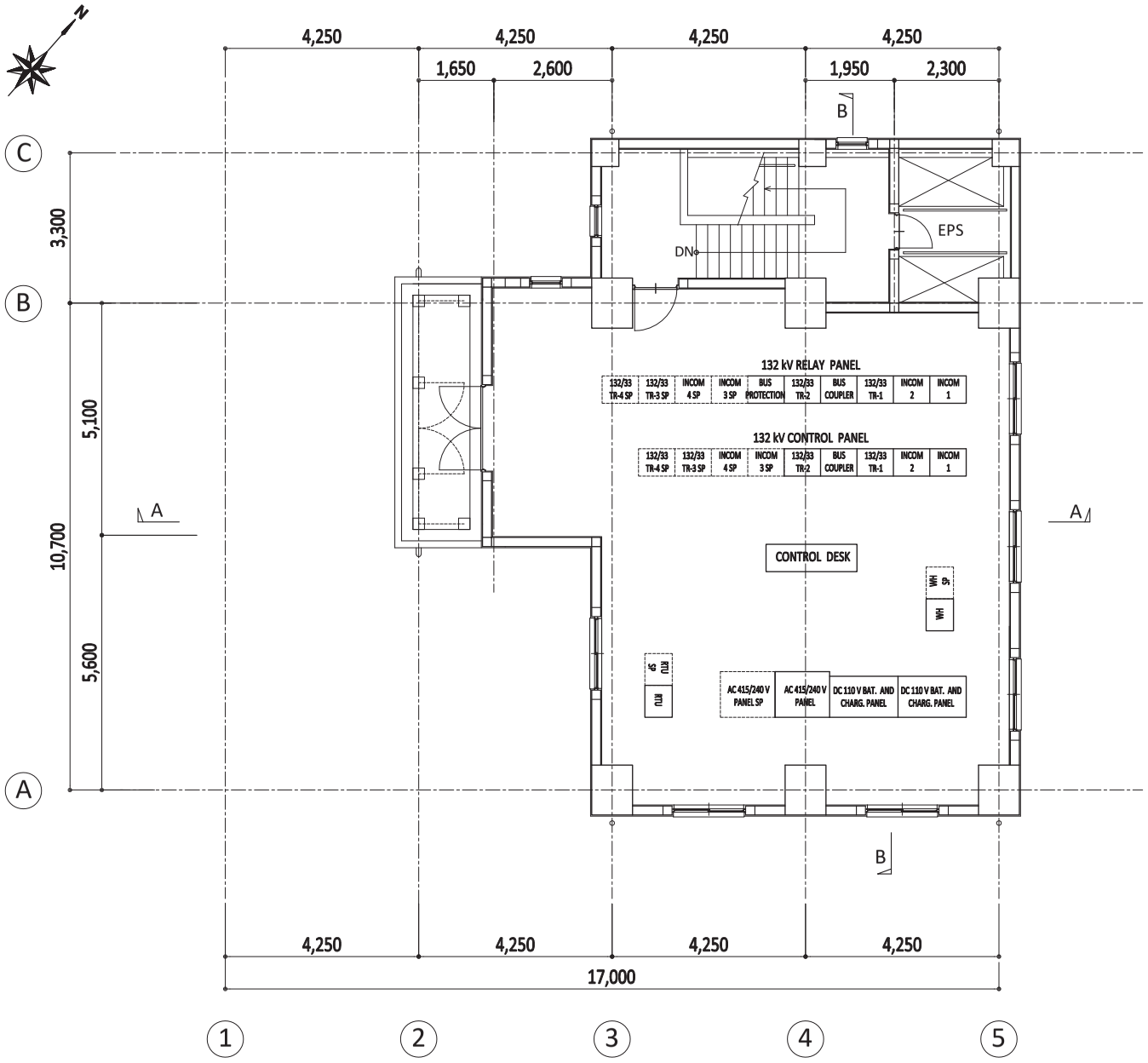
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING MIDDLE 1st FLOOR PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-A05
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



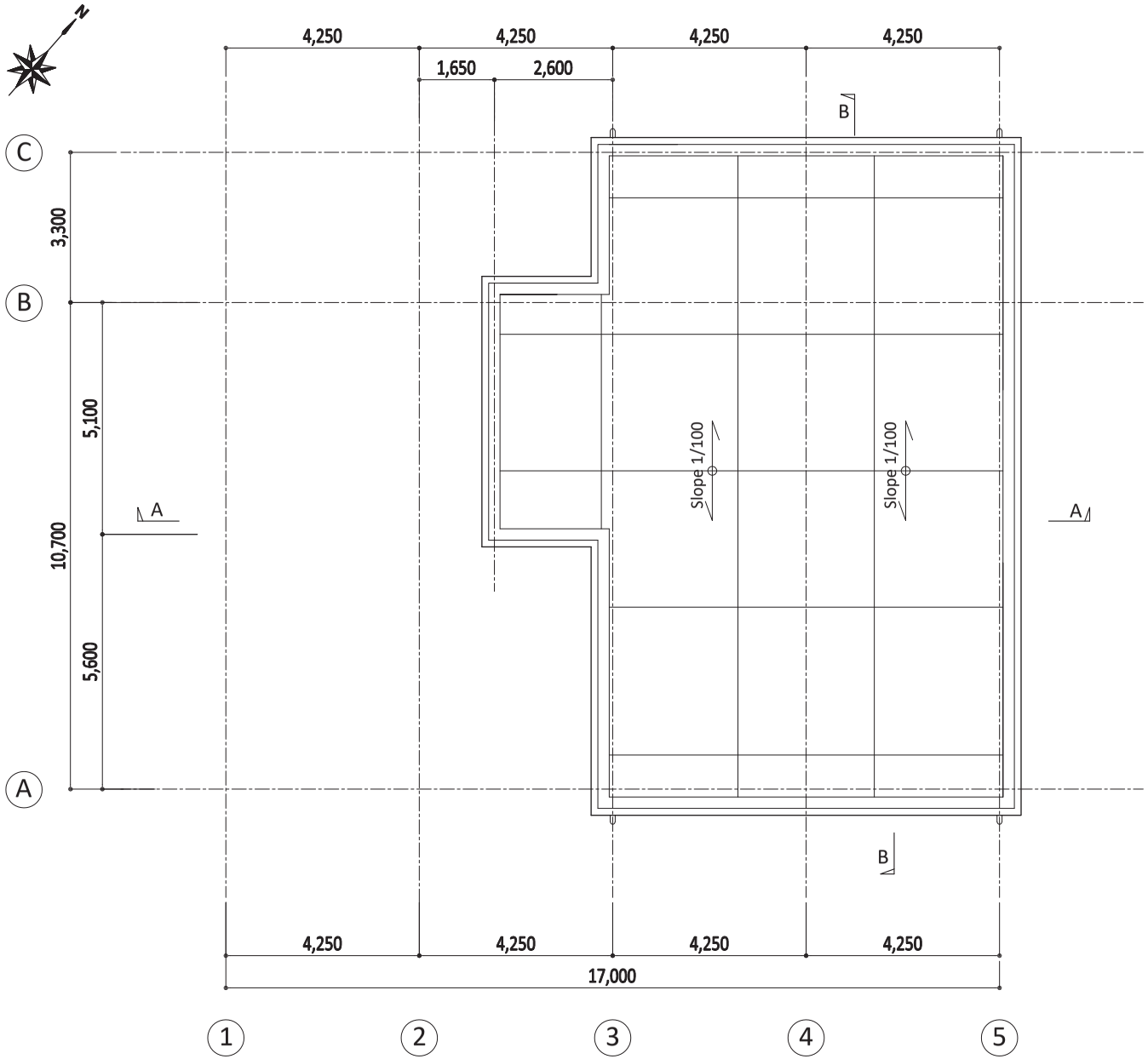
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING MIDDLE FLOOR PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-A06
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



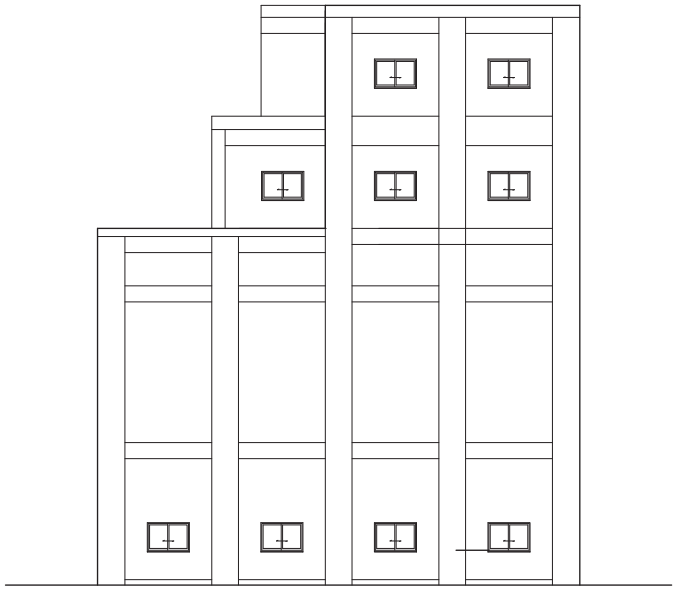
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING 2nd FLOOR PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-A07
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



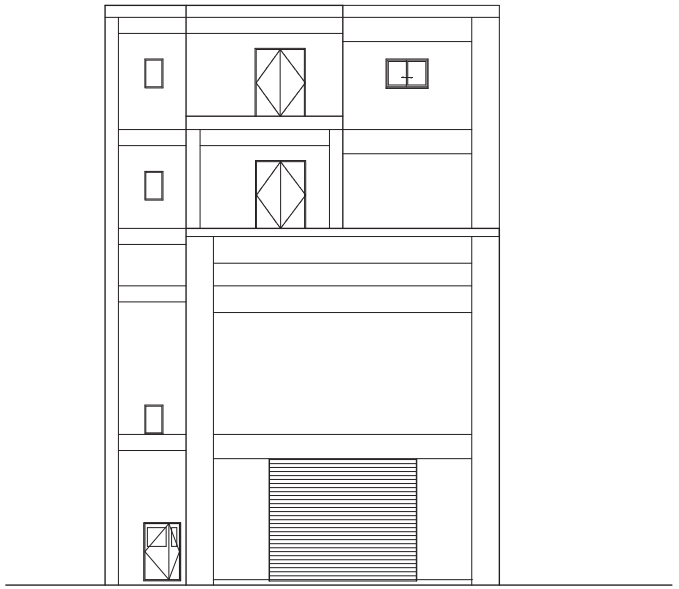
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING 3rd FLOOR PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-A08
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD. TOKYO, JAPAN				SCALE : 1:100 (if only A3)



PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING ROOF PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-A09
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)

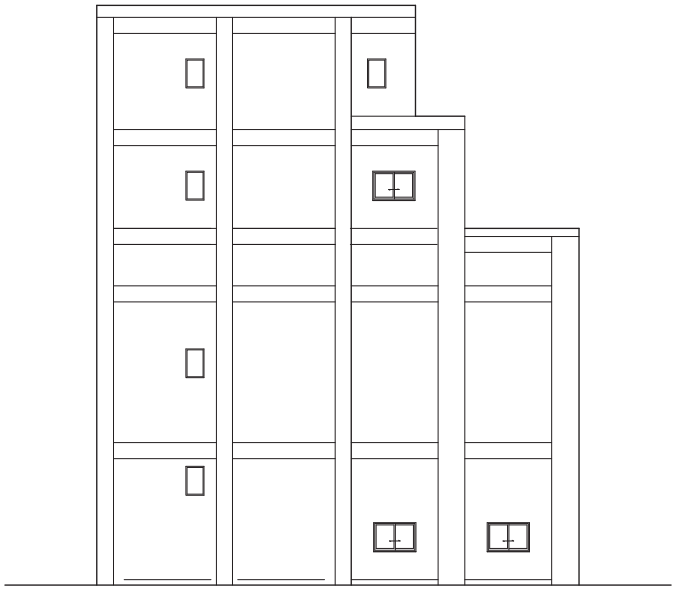


EAST ELEVATION

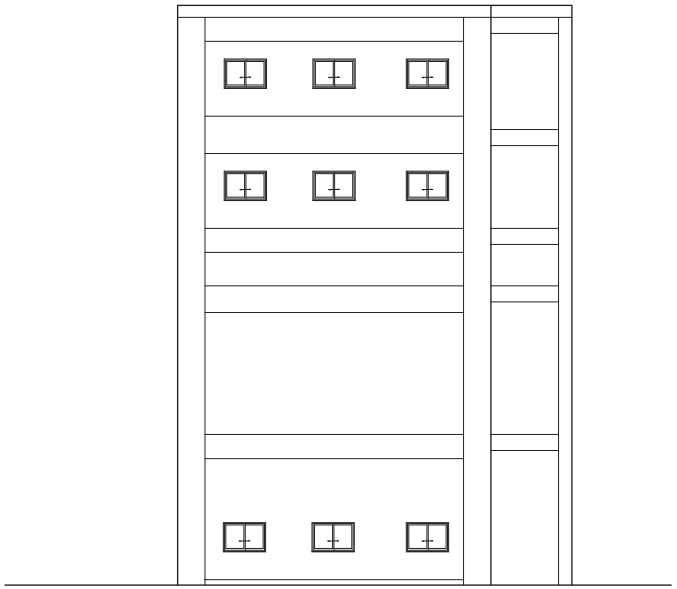


SOUTH ELEVATION

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING ELEVATION-1	K. FUJII	K. ODA	T. KURUMADA		AR-A10
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:200 (if only A3)

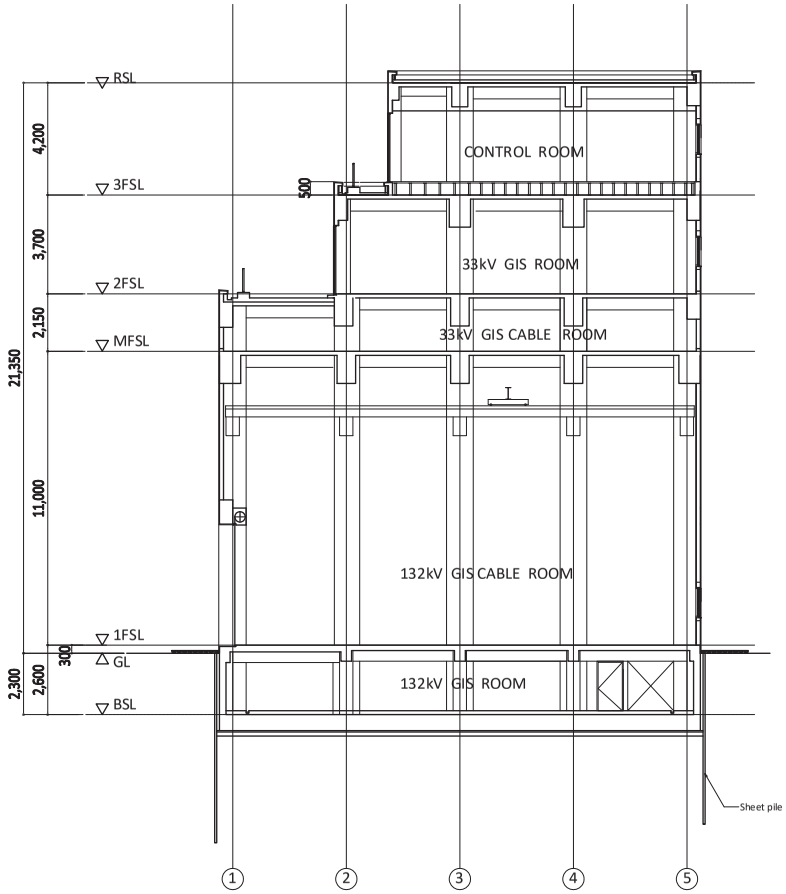


WEST ELEVATION

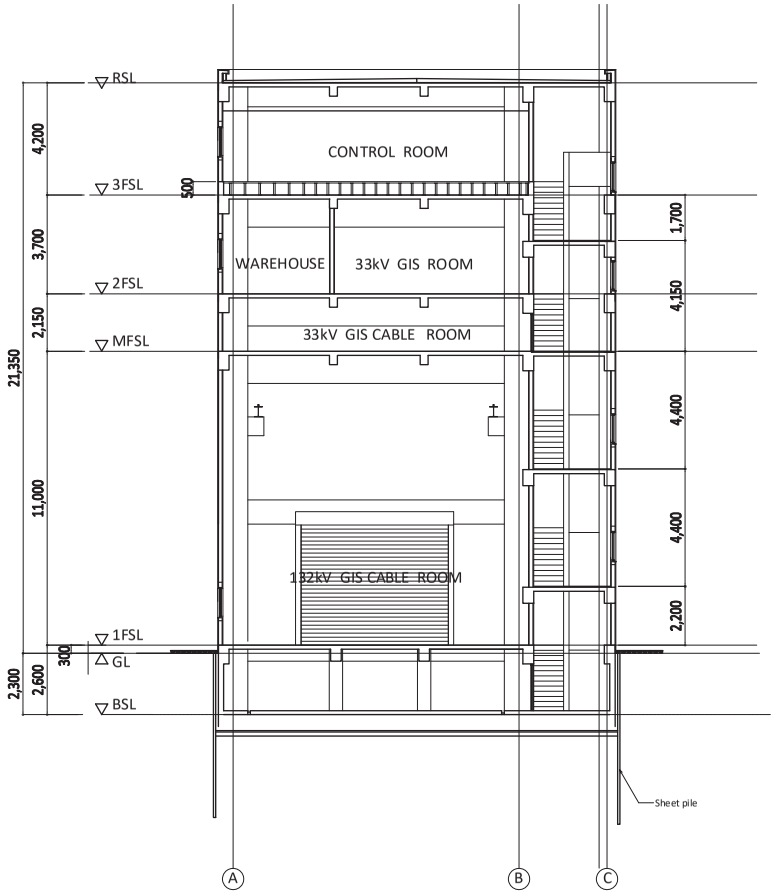


NORTH ELEVATION

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING ELEVATION-2	K. FUJII	K. ODA	T. KURUMADA		AR-A11
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:200 (if only A3)

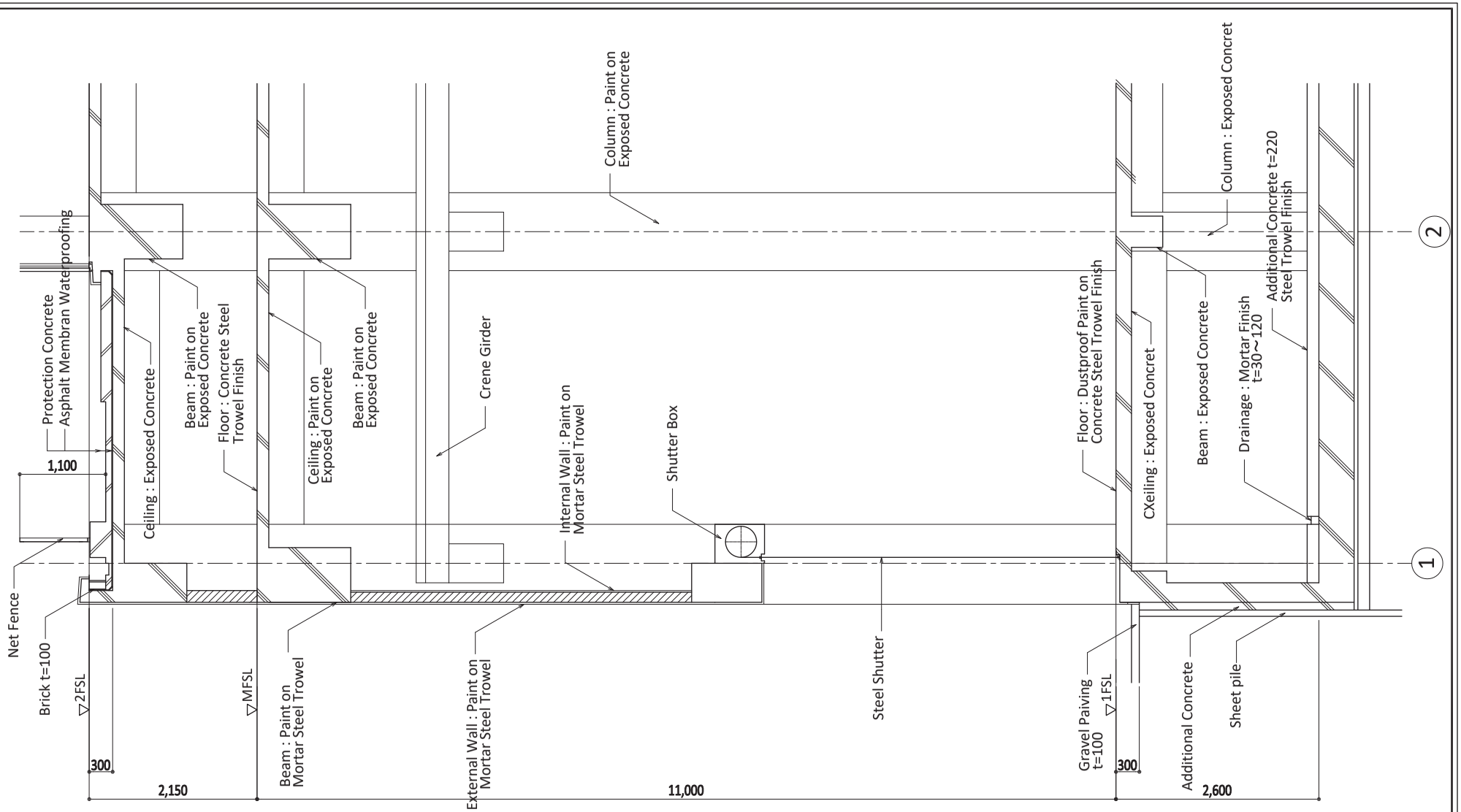


SECTION A－A

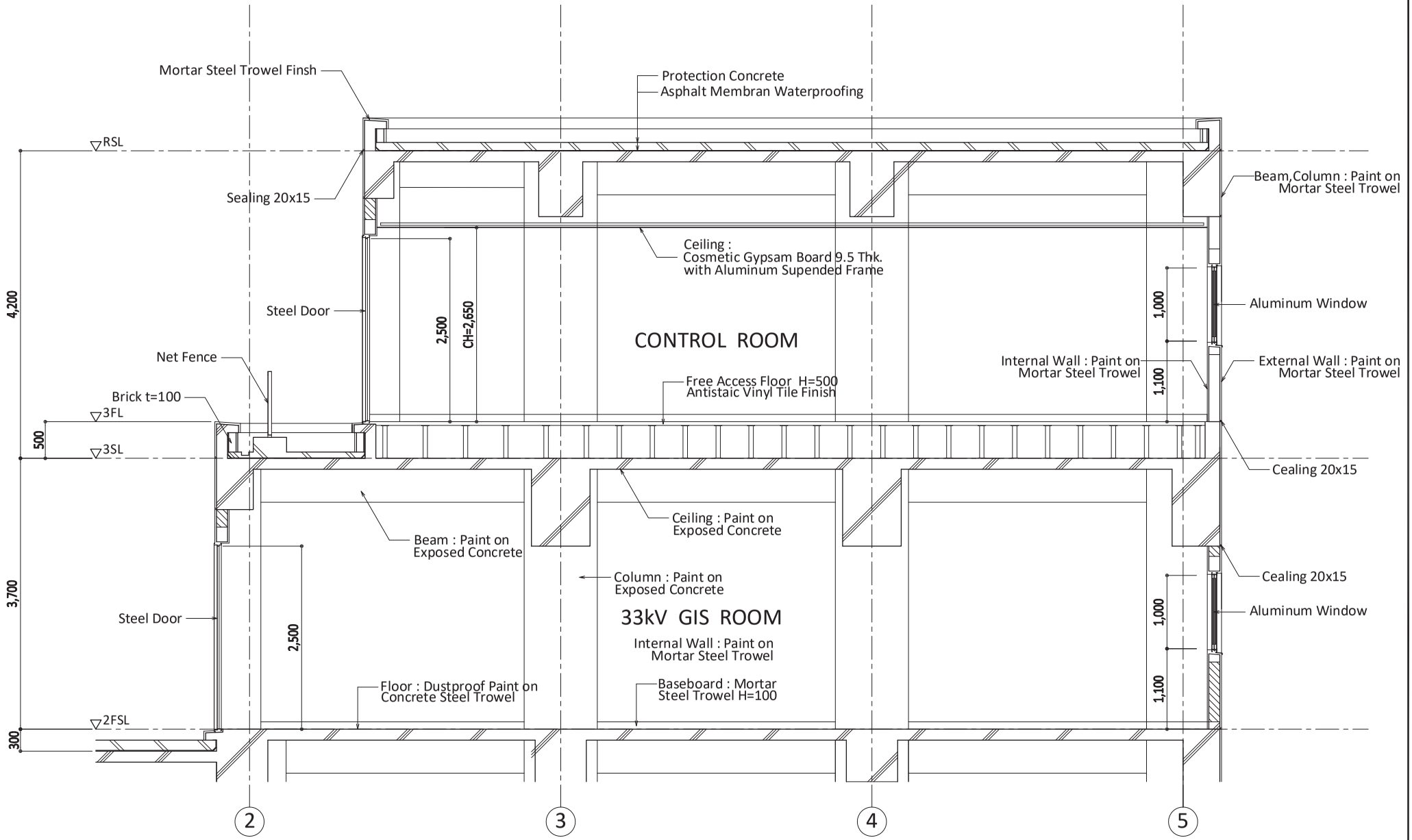


SECTION B－B

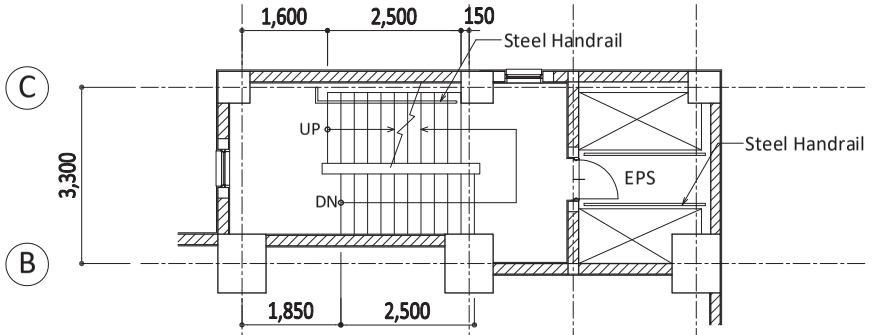
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING SECTION	K. FUJII	K. ODA	T. KURUMADA		AR-A12
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:200 (if only A3)



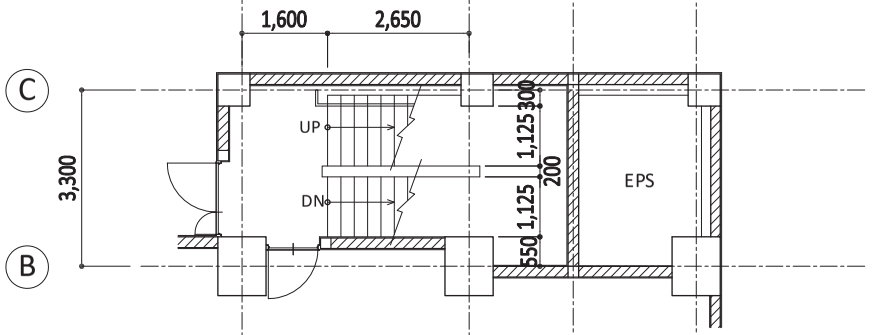
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING DETAIL SECTION-1	K. FUJII	K. ODA	T. KURUMADA		AR-A13
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:50 (if only A3)



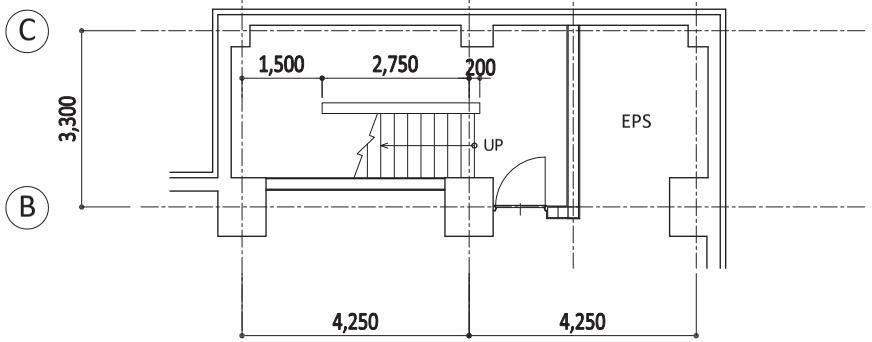
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING DETAIL SECTION-2	K. FUJII	K. ODA	T. KURUMADA		AR-A14
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:50 (if only A3)



Middle 1st FLOOR PLAN

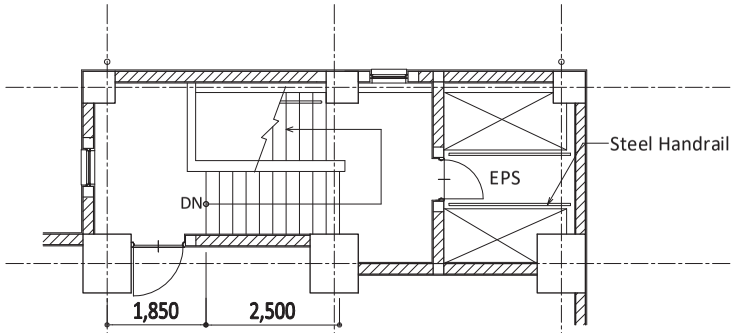


1st FLOOR PLAN

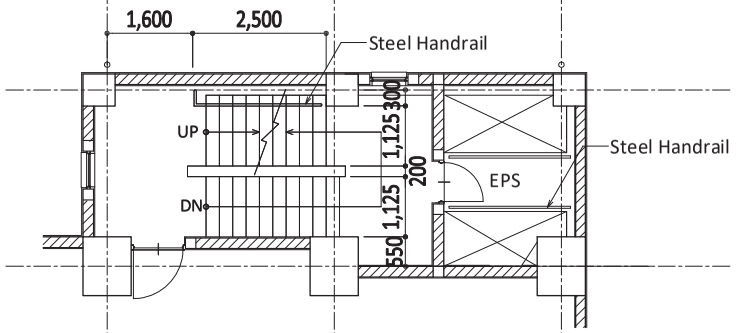


3 4 5

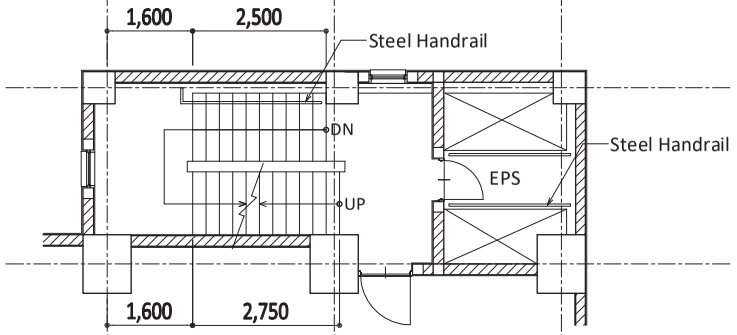
BEASEMENT FLOOR PLAN



3rd FLOOR PLAN



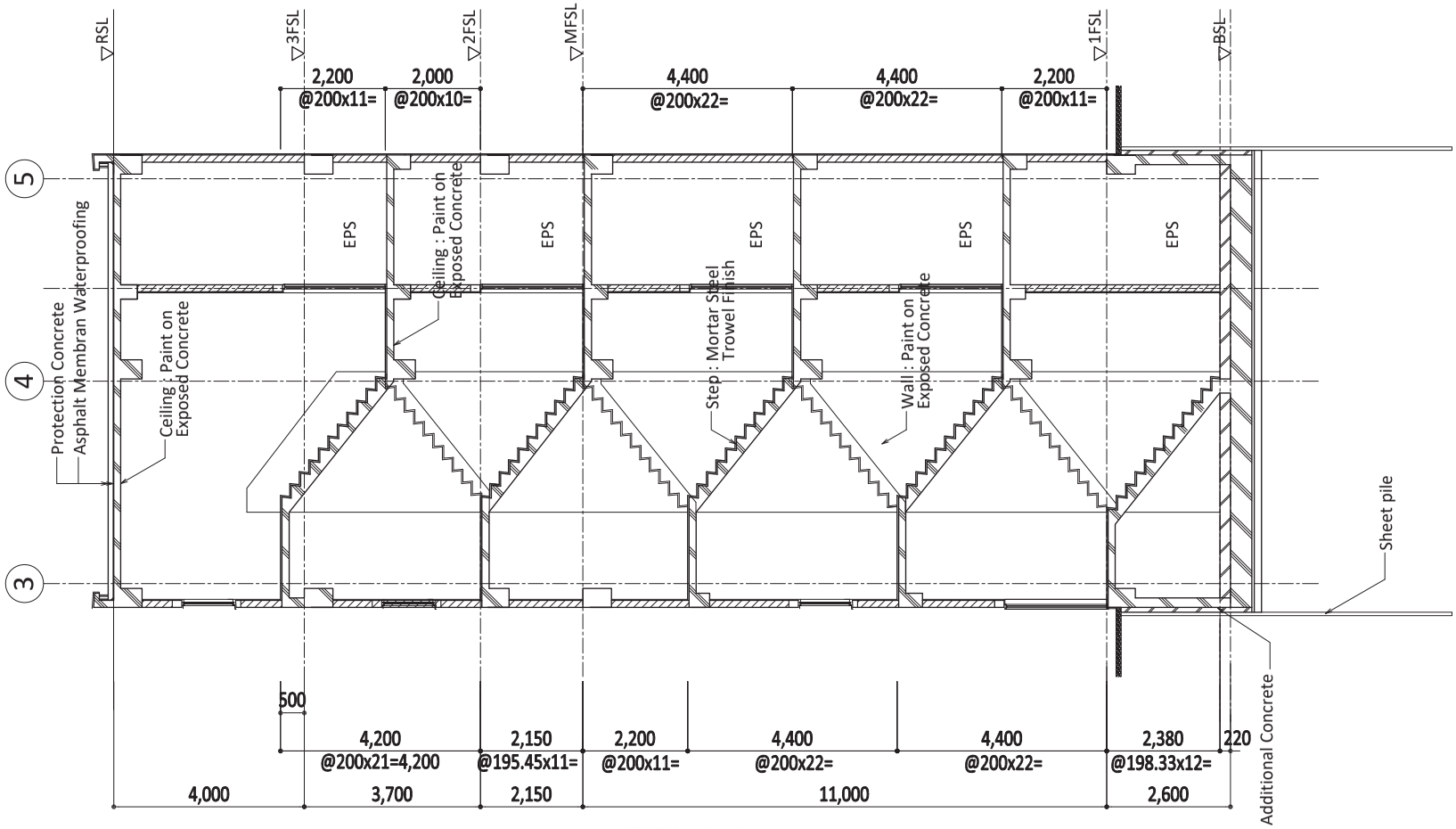
2nd FLOOR PLAN



3 4 5

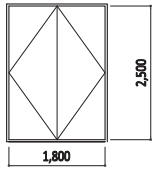
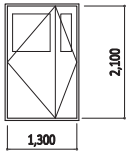
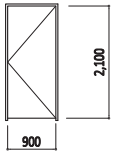
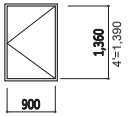
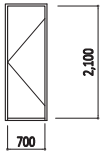
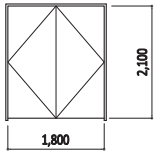
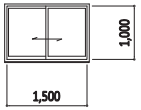
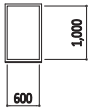
MIDDLE FLOOR PLAN

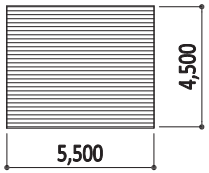
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING STAIR PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-A15
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



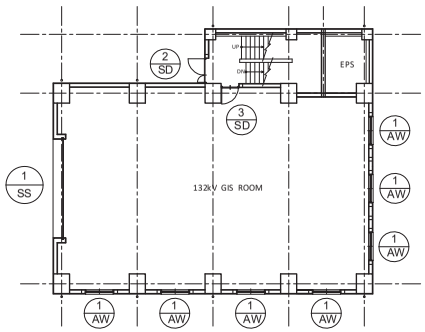
SECTION A – A

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING DETAIL SECTION OF STAIR	K. FUJII	K. ODA	T. KURUMADA		AR-A16
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)

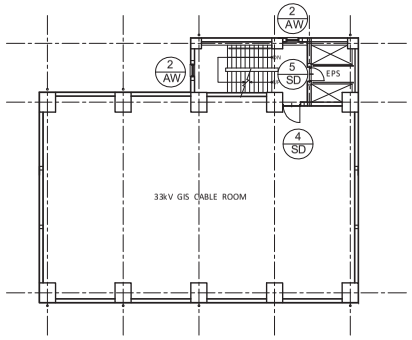
SYMBOL & Qty.	1 SD X 2	2 SD X 1	3 SD X 4	4 SD X 1	4' SD X 1	5 SD X 4	6 SD X 1	1 AW X 19	2 AW X 8
ELEVATION									
TYPE	DOUBLE SWING DOOR	DOUBLE SWING DOOR	SINGLE SWING DOOR	SINGLE SWING DOOR		SINGLE SWING DOOR	DOUBLE SWING DOOR	SLIDING WINDOW	FIXED WINDOW
MATERIAL & FINISH	STEEL PAINT(OP)	STEEL PAINT(OP)	STEEL PAINT(OP)	STEEL PAINT(OP)		STEEL PAINT(OP)	STEEL PAINT(OP)	ALUMINUM ·ELECTRO COLOR	ALUMINUM ·ELECTRO COLOR
GLASS								CLEAR GLASS t=5	CLEAR GLASS t=5
HARDWEAR	HINGE, LEVER HANDLE, STOPPER DOOR CLOSER, CYLINDER LOCK	HINGE, LEVER HANDLE, STOPPER DOOR CLOSER, CYLINDER LOCK	HINGE, LEVER HANDLE, STOPPER DOOR CLOSER, CYLINDER LOCK	HINGE, LEVER HANDLE, STOPPER DOOR CLOSER, CYLINDER LOCK		HINGE, LEVER HANDLE, STOPPER DOOR CLOSER, CYLINDER LOCK	HINGE, LEVER HANDLE, STOPPER DOOR CLOSER, CYLINDER LOCK		
REMARK									

SYMBOL & Qty.	1 SS X 1
ELEVATION	
TYPE	STEEL SHUTTER (ELECTRIC)
MATERIAL & FINISH	STEEL PAINT(OP)
GLASS	
HARDWEAR	STAINLESS GUIDE RAIL, STEEL SHUTTER BOX
REMARK	

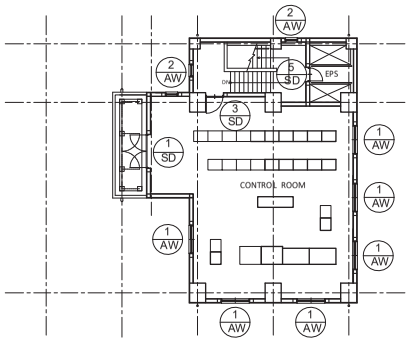
FITTING KEY PLAN S=1/200



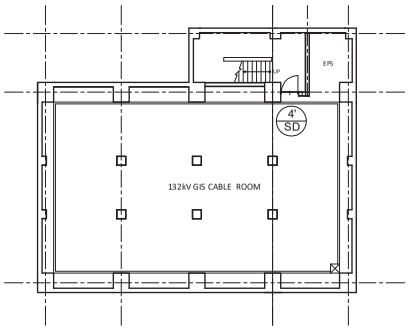
1st FLOOR PLAN



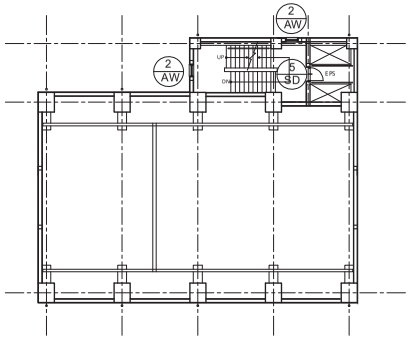
MIDDLE FLOOR PLAN



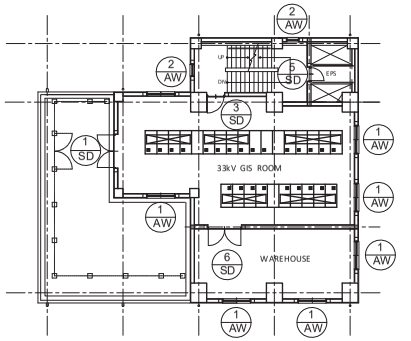
3rd FLOOR PLAN



BASEMENT FLOOR PLAN

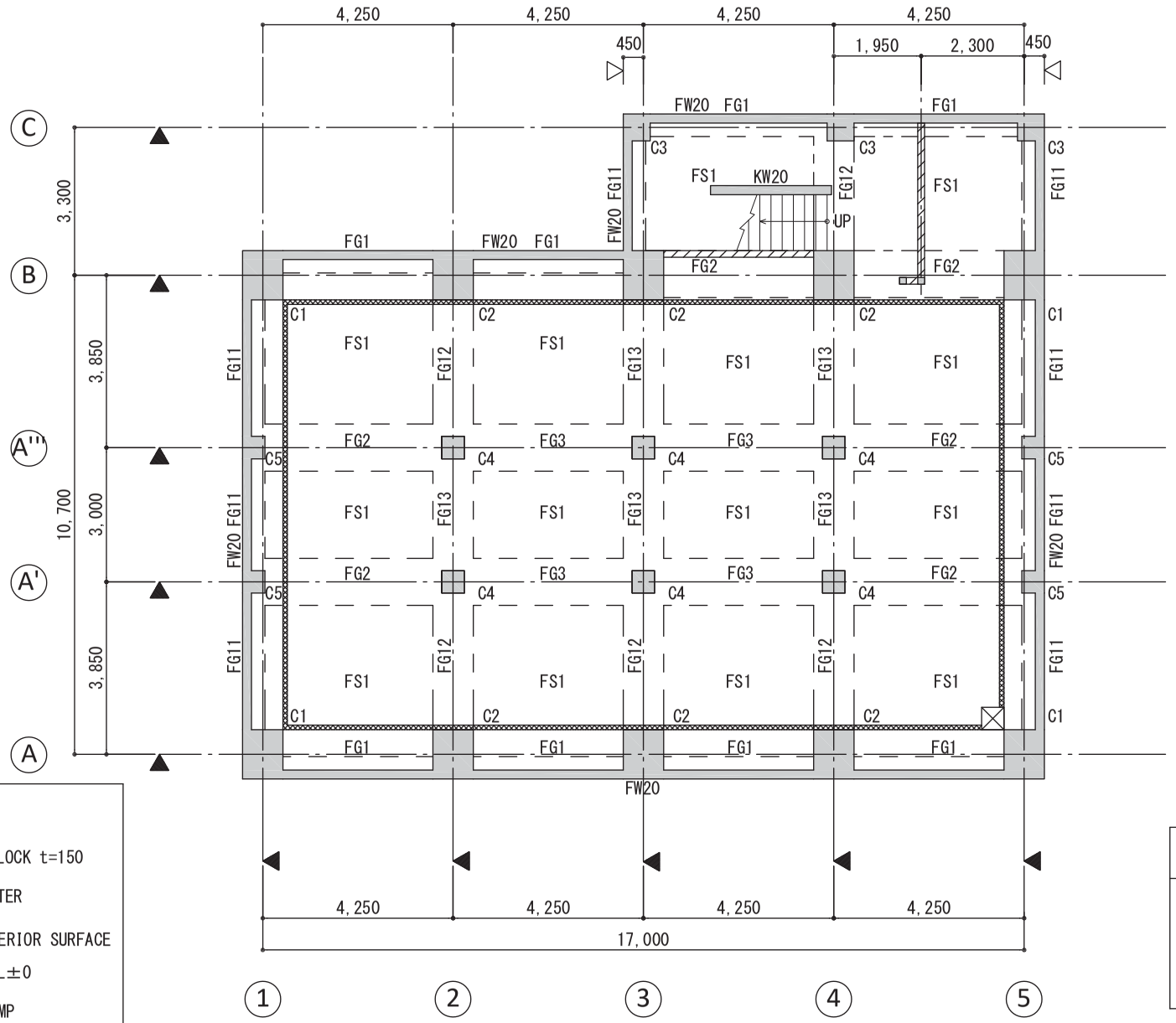


MIDDLE 1st FLOOR PLAN



2nd FLOOR PLAN

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING FITTING SCHEDULE	K. FUJII	K. ODA	T. KURUMADA		AR-A17
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



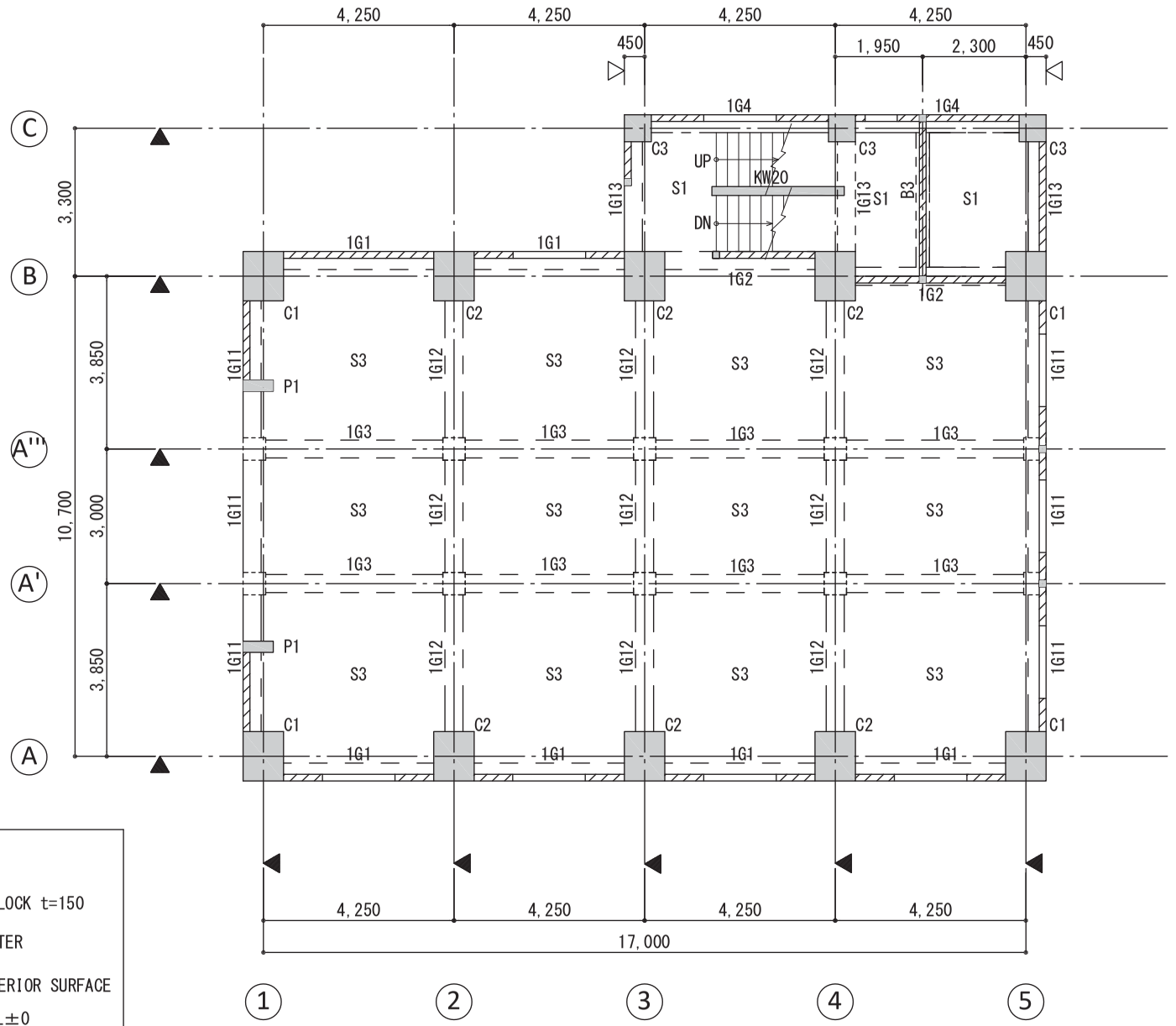
GENERAL NOTES

1) CONCRETE BLOCK t=150
2) COLUMN CENTER
   COLUMN EXTERIOR SURFACE
3) SLAB UPPER BED BFSL±0
4) SHALLOW SUMP
5) DRAINAGE

USED MATERIAL	
CONCRETE	Fc24
RE-BAR	SD345 (D19, D22, D25)
	SD295 (D10, D12, D16)

FOUNDATION&UNDERGROUND FLOOR FRAMING PLAN S=1/100

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING FOUNDATION&UNDERGROUND FLOOR FRAMING PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-S01
		CONSULTANTS : YACHIYO ENGINEERING CO., LTD. TOKYO, JAPAN					SCALE : 1:100 (if only A3)



GENERAL NOTES

1) CONCRETE BLOCK t=150

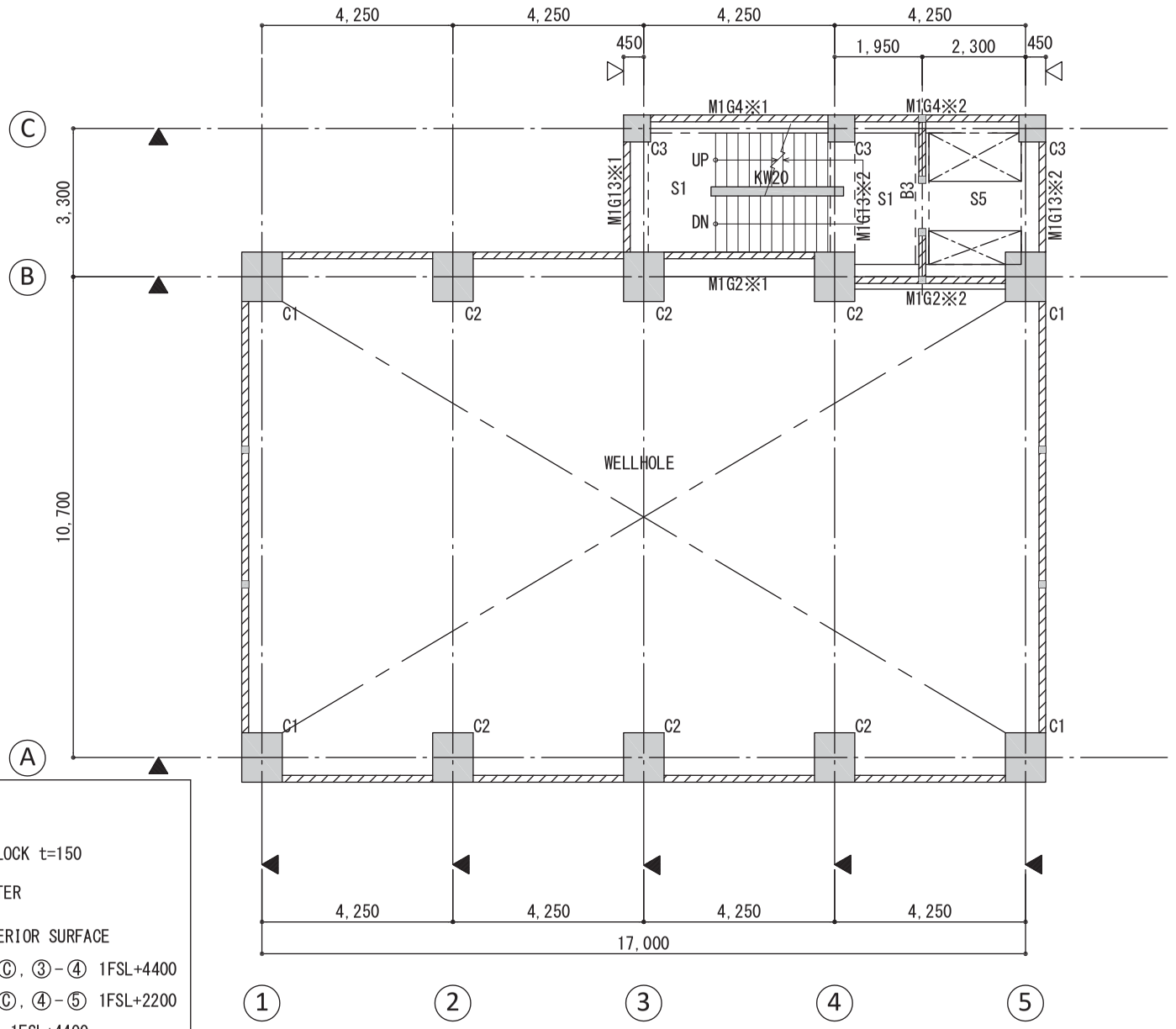
2) COLUMN CENTER

COLUMN EXTERIOR SURFACE

3) SLAB UPPER BED 1FSL±0

1st FLOOR FRAMING PLAN S=1/100

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING 1st FLOOR FRAMING PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-S02
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



GENERAL NOTES

1) CONCRETE BLOCK t=150

2) COLUMN CENTER

COLUMN EXTERIOR SURFACE

3) SLAB UPPER BED Ⓑ-Ⓒ, ③-④ 1FSL+4400

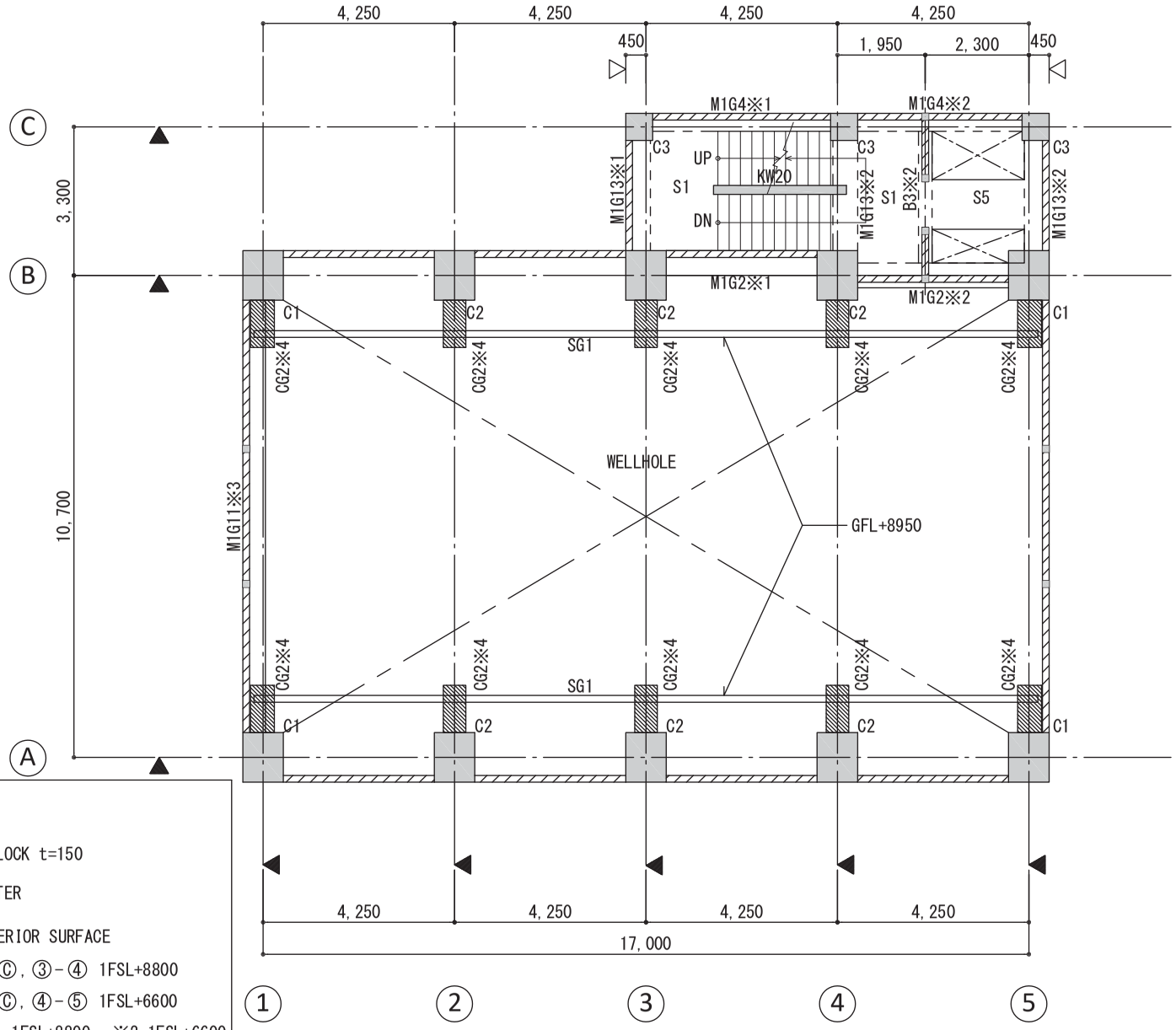
Ⓑ-Ⓒ, ④-⑤ 1FSL+2200

4) FRAME UPPER BED ※1 1FSL+4400

※2 1FSL+2200

MIDDLE'1st FLOOR FRAMING PLAN S=1/100

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING MIDDOLE'1st FLOOR FRAMING PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-S03
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



GENERAL NOTES

1) CONCRETE BLOCK t=150

2) COLUMN CENTER

COLUMN EXTERIOR SURFACE

3) SLAB UPPER BED Ⓑ-Ⓒ, ③-④ 1FSL+8800

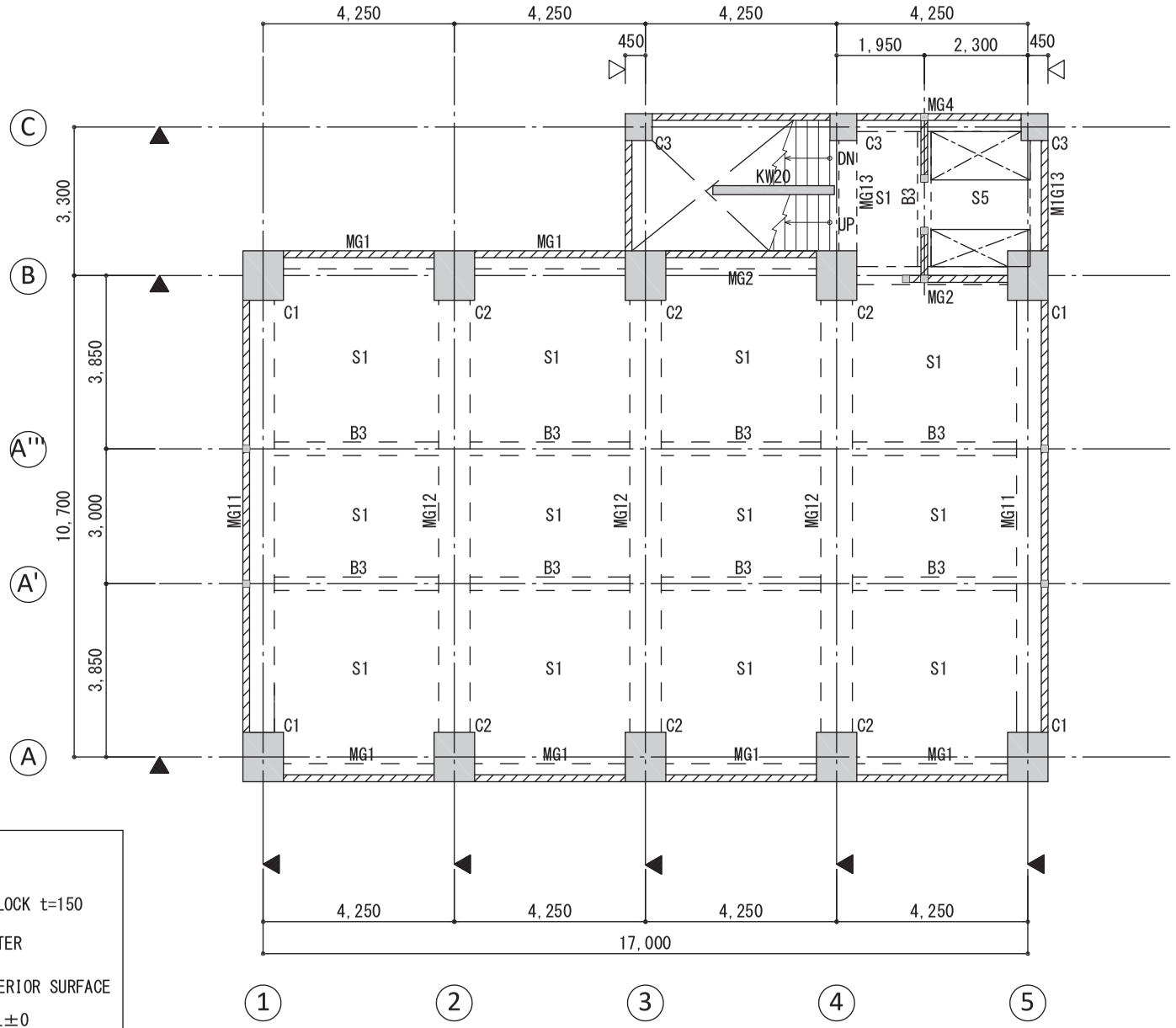
Ⓑ-Ⓒ, ④-⑤ 1FSL+6600

4) FRAME UPPER BED ※1 1FSL+8800 ※2 1FSL+6600

※3 1FSL+5100 ※4 1FSL+8500

MIDDLE 1st FLOOR FRAMING PLAN S=1/100

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING MIDDOLE 1st FLOOR FRAMING PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-S04
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)

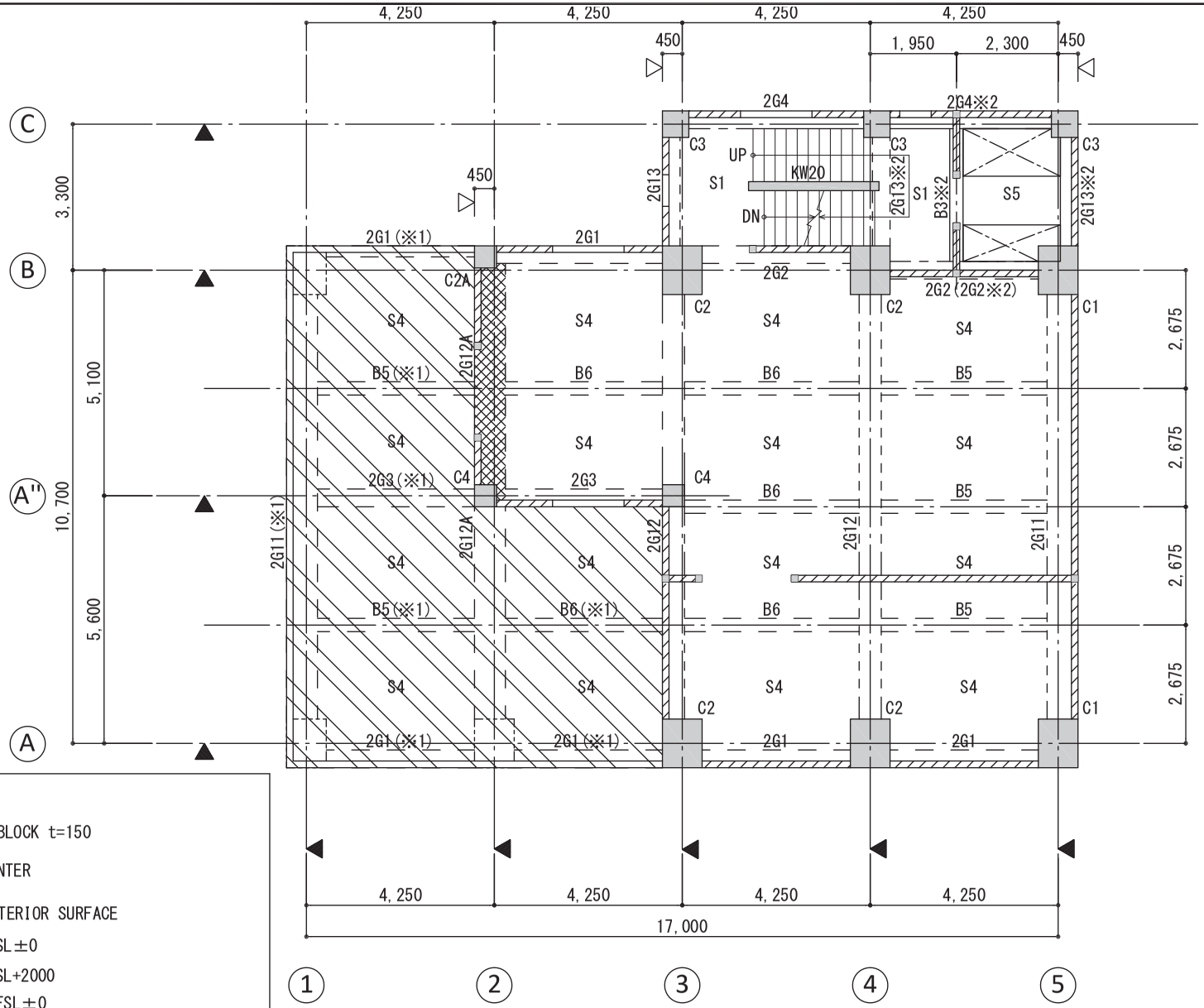


GENERAL NOTES

1) CONCRETE BLOCK t=150
2) COLUMN CENTER
   COLUMN EXTERIOR SURFACE
3) SLAB UPPER BED MFSL±0
4) FRAME UPPER BED MFSL±0

MIDDOLE FLOOR FRAMING PLAN S=1/100

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING MIDDOLE FLOOR FRAMING PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-S05
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)

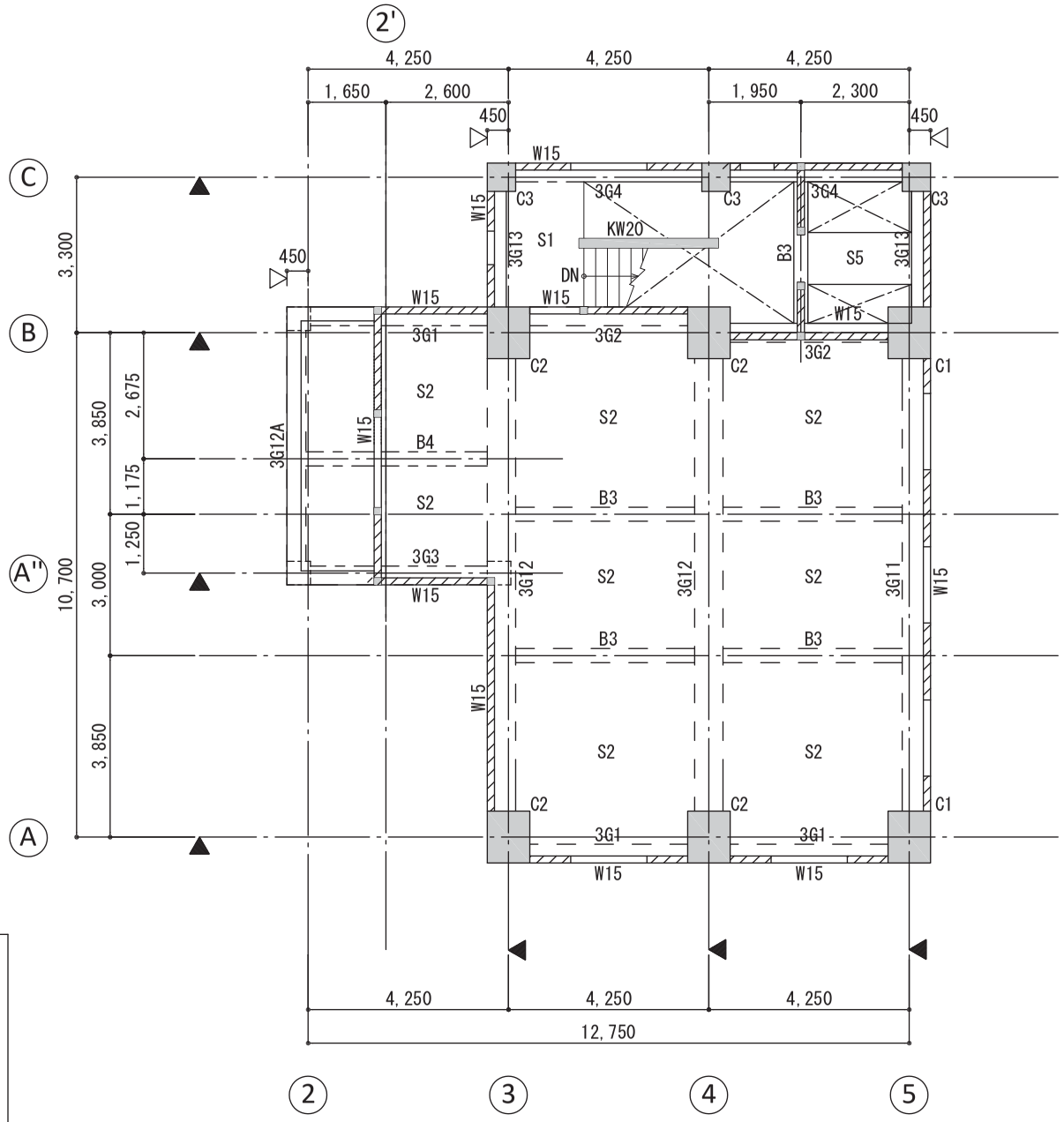


2nd FLOOR FRAMING PLAN S=1/100

GENERAL NOTES

1) CONCRETE BLOCK t=150
2) COLUMN CENTER
COLUMN EXTERIOR SURFACE
3) SLAB UPPER BED 2FSL±0
Ⓑ-Ⓒ, ④-⑤ 2FSL+2000
4) FRAME UPPER BED 2FSL±0
※1 2FSL-150 ※2 2FSL+2000
5) SLAB UPPER BED 2FSL-150
6) INDICATED ADDITIONAL CONCRETE

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING 2nd FLOOR FRAMING PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-S06
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



3rd FLOOR FRAMING PLAN S=1/100

GENERAL NOTES

1) CONCRETE BLOCK t=150

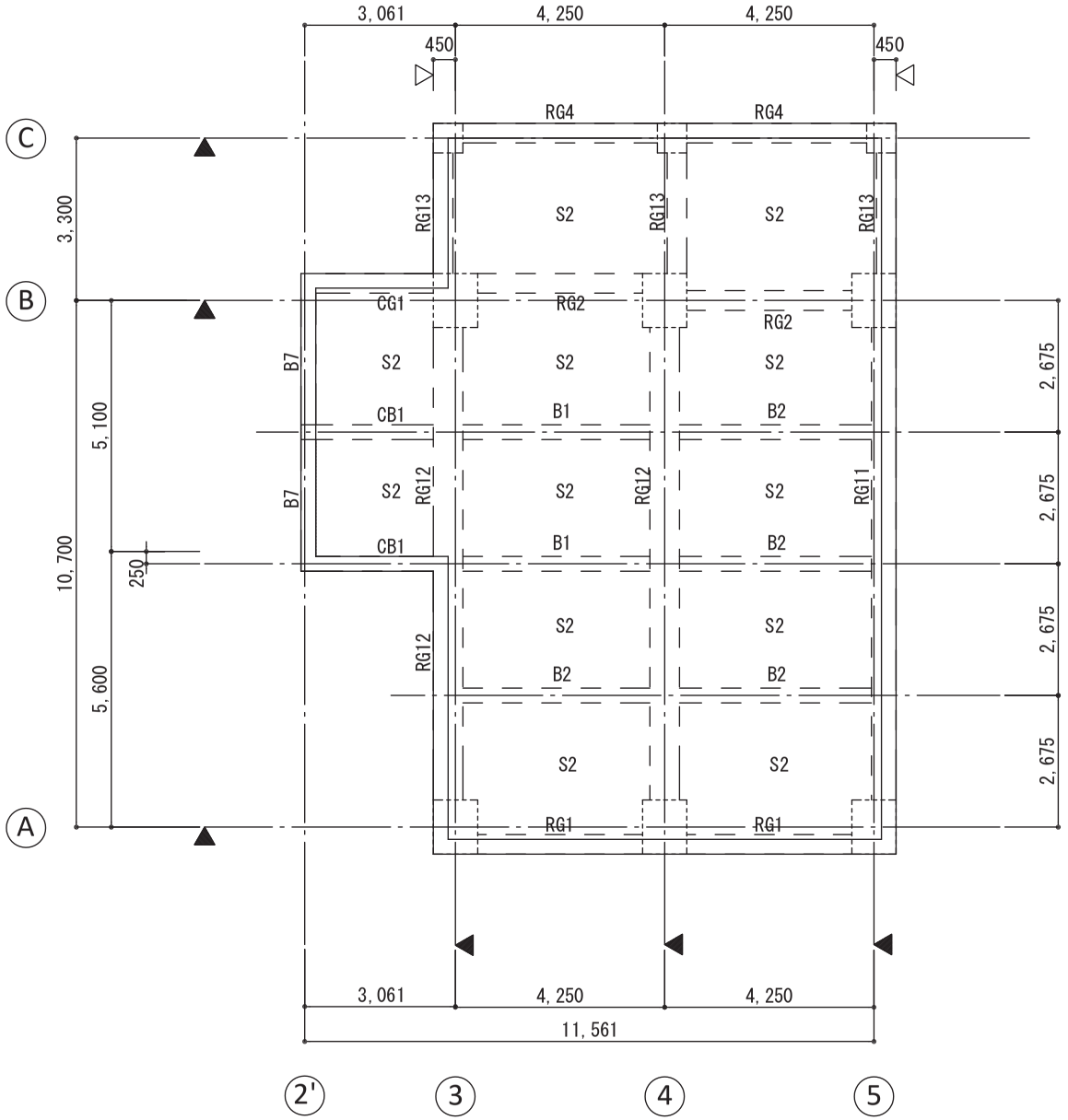
2) COLUMN CENTER

COLUMN EXTERIOR SURFACE

3) SLAB UPPER BED 3FSL±0

4) FRAME UPPER BED 3FSL±0

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING 3rd FLOOR FRAMING PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-S07
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



ROOF FLOOR FRAMING PLAN S=1/100

GENERAL NOTES

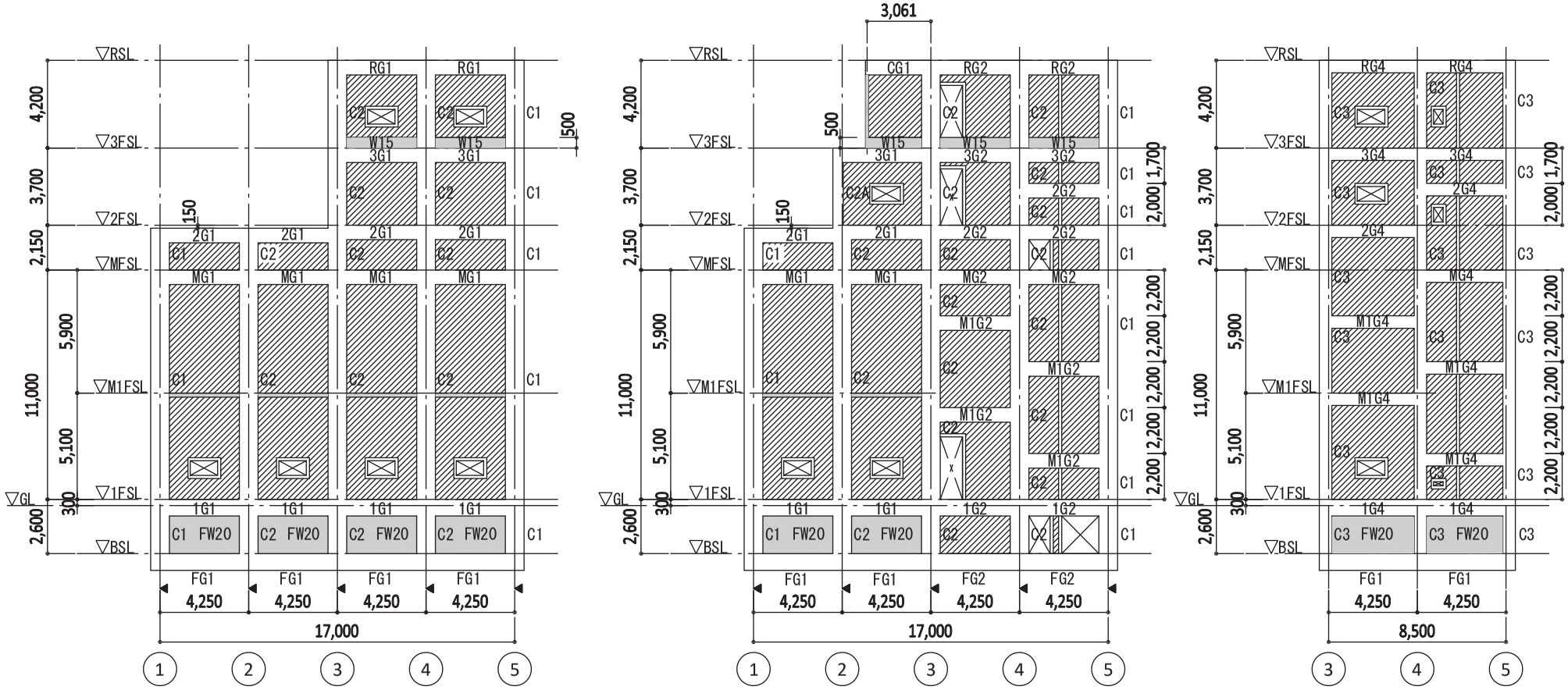
1) ◀ COLUMN CENTER

◁ COLUMN EXTERIOR SURFACE

2) BEAM UPPER BED RFSL±0

3) SLAB UPPER BED RFSL±0

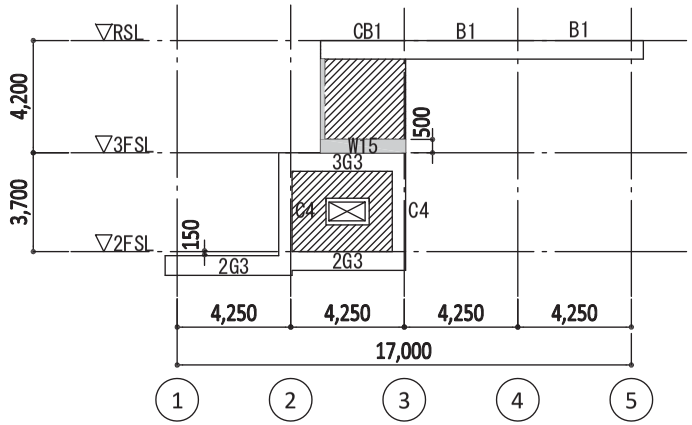
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING ROOF FLOOR FRAMING PLAN	K. FUJII	K. ODA	T. KURUMADA		AR-S08
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



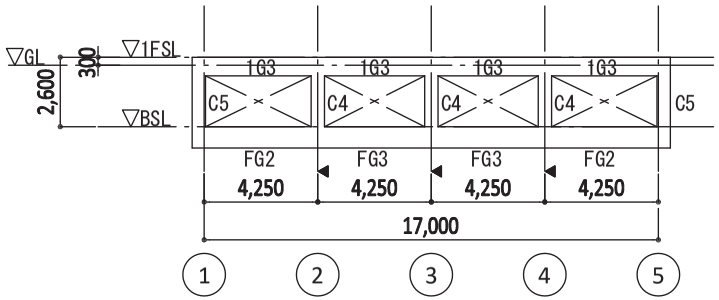
GENERAL NOTES

1) ▨ CONCRETE BLOCK t=150

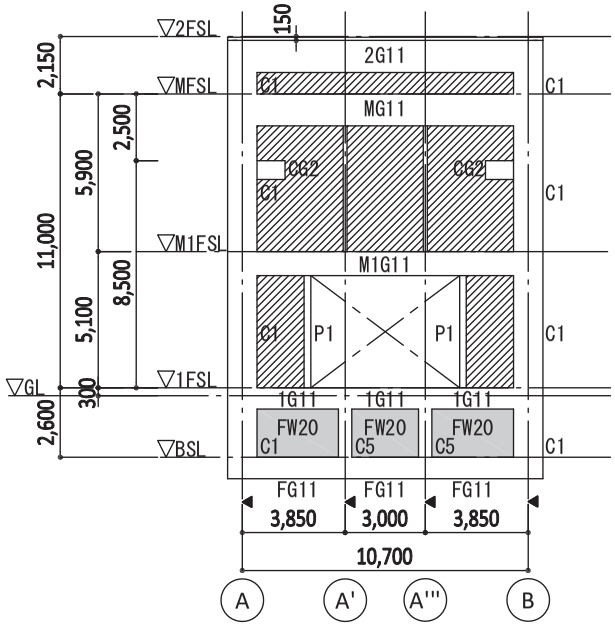
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING FRAMING ELEVATION (1)	K. FUJII	K. ODA	T. KURUMADA		AR-S09
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:200 (if only A3)



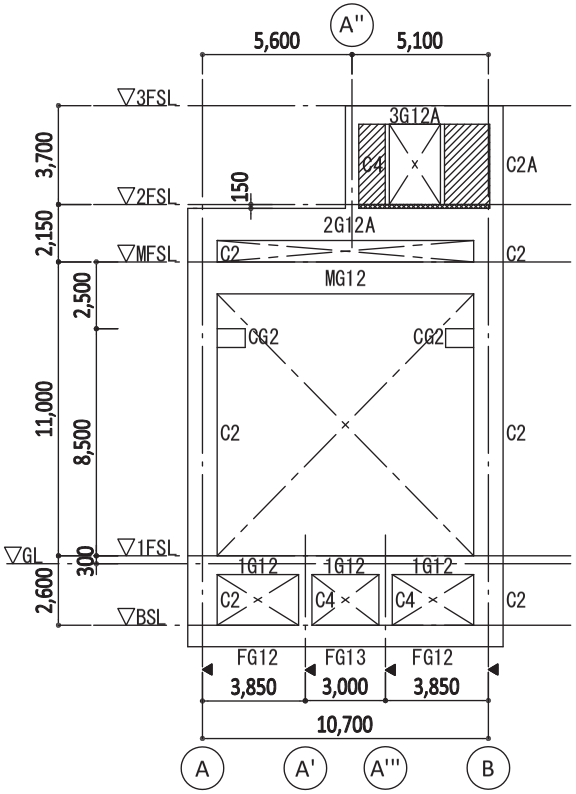
Ⓐ'' LINE FRAMING ELEVATION S=1/200



Ⓐ Ⓐ''' LINE FRAMING ELEVATION S=1/200



① LINE FRAMING ELEVATION S=1/200



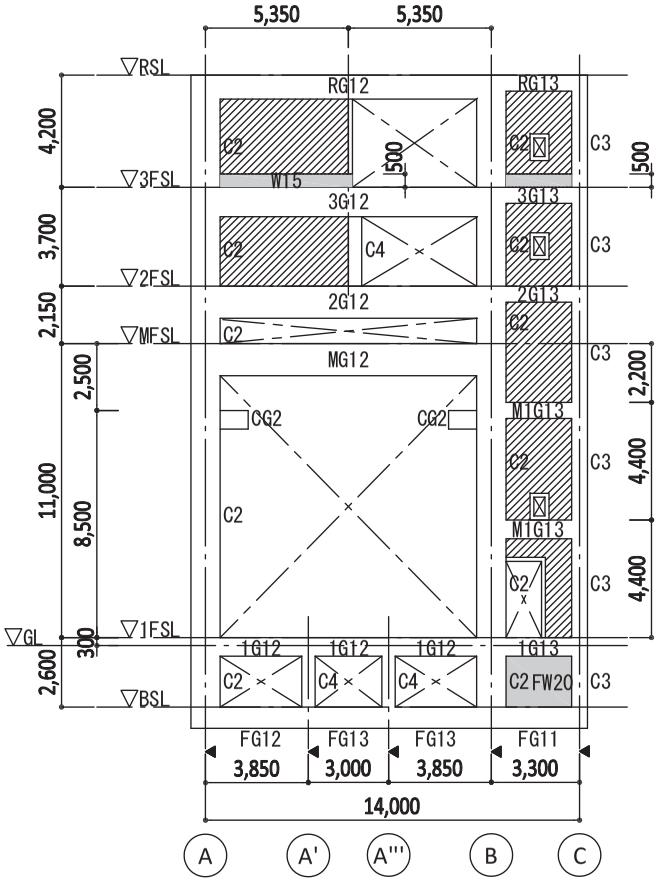
② LINE FRAMING ELEVATION S=1/200

GENERAL NOTES

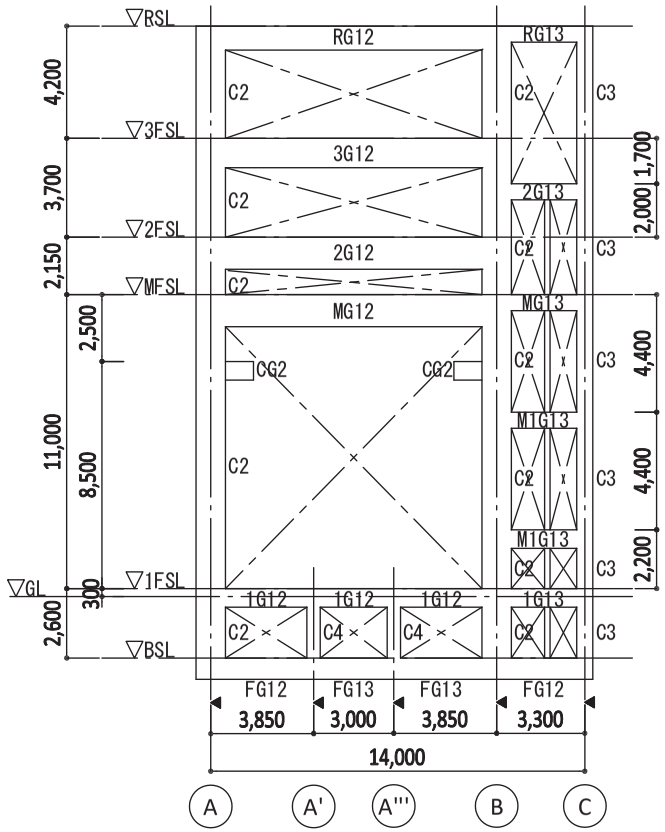
1) CONCRETE BLOCK t=150

2) INDICATED ADDITIONAL CONCRETE

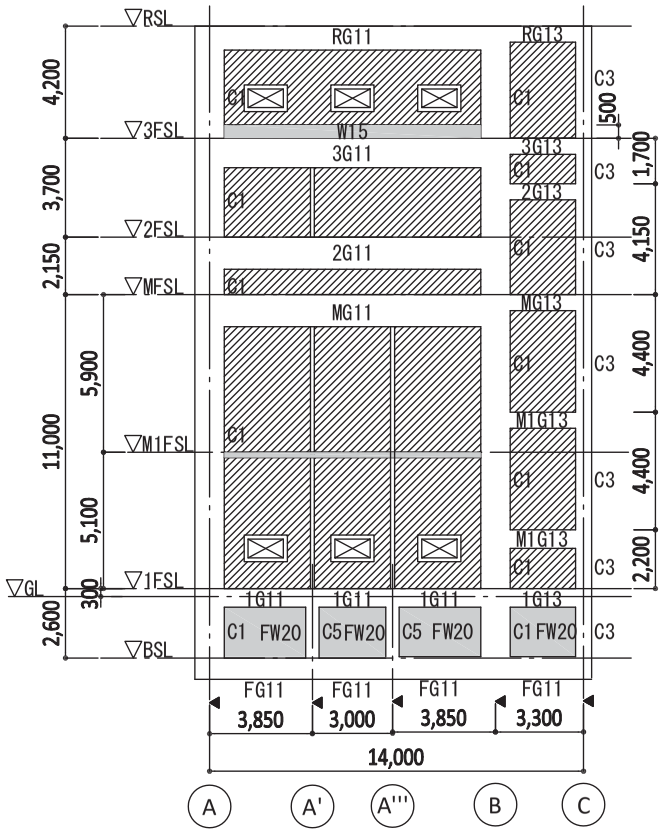
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING FRAMING ELEVATION (2)	K. FUJII	K. ODA	T. KURUMADA		AR-S10
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:200 (if only A3)



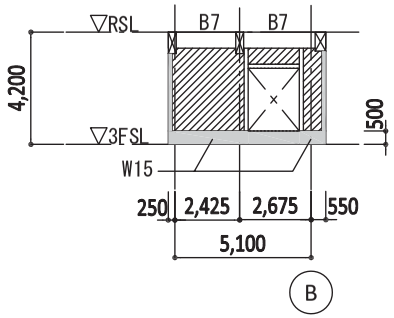
③ LINE FRAMING ELEVATION S=1/200



④ LINE FRAMING ELEVATION S=1/200



⑤ LINE FRAMING ELEVATION S=1/200



2' LINE FRAMING ELEVATION S=1/200

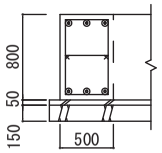
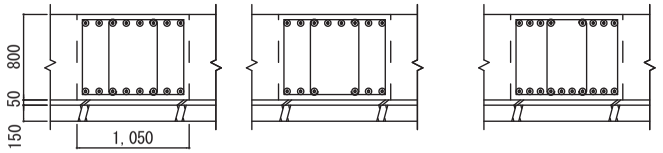
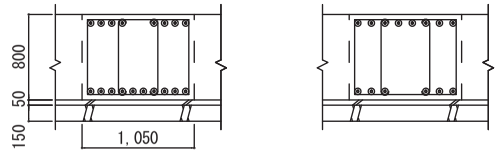
GENERAL NOTES

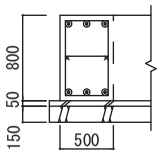
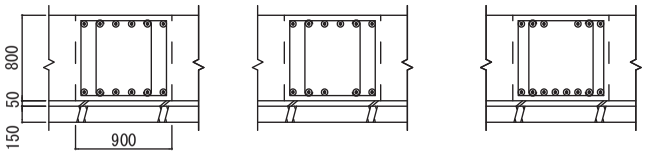
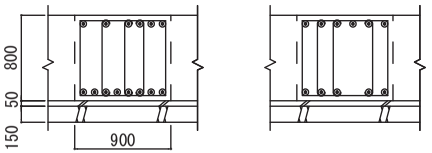
1) ▨ CONCRETE BLOCK t=150

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING FRAMING ELEVATION (3)	K. FUJII	K. ODA	T. KURUMADA		AR-S11
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:200 (if only A3)

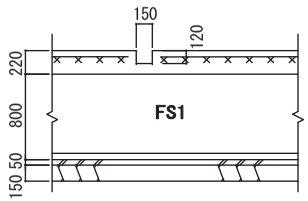
FOUNDATION GIRDER SCHEDULE S=1/50

UNLESS OTHERWISE NOTED
SPREADER D10@1,000

MARK	FG1	FG2			FG3	
POSITION	ALL SEC.	OUTSIDE END	CENTER	INSIDE END	END	CENTER
SECTION (B1F)						
B×D	500x800	1050x800			1050x800	
TOP BARS	3-D25	8-D25	8-D25	8-D25	8-D25	8-D25
BOT. BARS	3-D25	8-D25	6-D25	10-D25	10-D25	6-D25
STIRRUPS	□-D12-@200	(4)□-D12-@200			(4)□-D12-@200	
WEB BARS	2-D12	-			-	

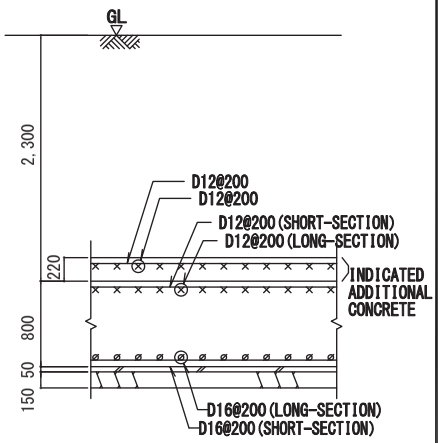
MARK	FG11	FG12			FG13	
POSITION	ALL SEC.	OUTSIDE END	CENTER	INSIDE END	CENTER	END
SECTION (B1F)						
B×D	500x800	900x800			900x800	
TOP BARS	3-D25	6-D25	6-D25	6-D25	6-D25	6-D25
BOT. BARS	3-D25	6-D25	5-D25	8-D25	8-D25	5-D25
STIRRUPS	□-D12-@200	(4)□-D12-@200			(5)□-D12-@200	
WEB BARS	2-D12	-			-	

DRAINAGE

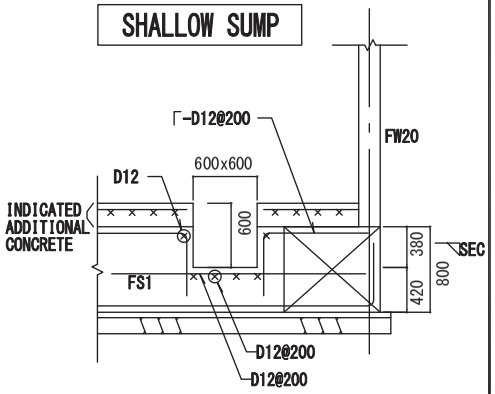


FOUNDATION SCHEDULE S=1/50

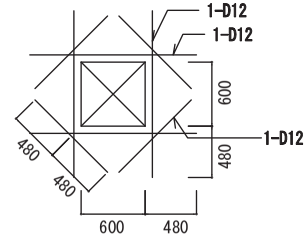
FS1



SHALLOW SUMP

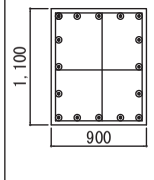
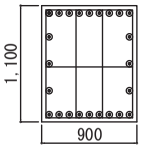
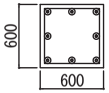
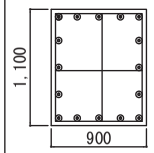
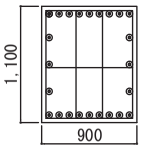
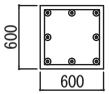
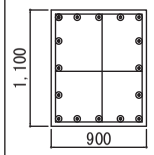
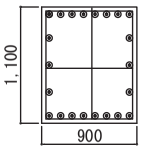
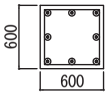
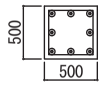
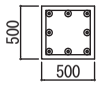


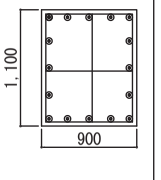
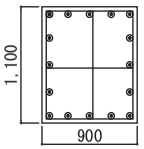
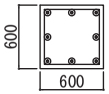
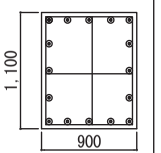
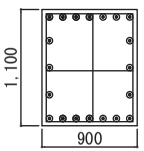
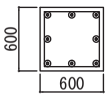
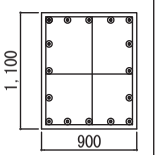
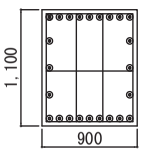
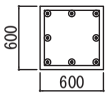
SEC



PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING FOUNDATION GIRDER SCHEDULE	K. FUJII	K. ODA	T. KURUMADA		AR-S12
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:50 (if only A3)

COLUMN SCHEDULE S=1/50

MARK	C1	C2	C3	C4	C5
SECTION (M1F)					
B×D	900x1100	900x1100	600x600		
BARS	16–D25	24–D25	8–D25		
HOOPS	⊞–D12–@100	⊞–D12–@100	□–D12–@100		
REMARKS	–	–	–		
SECTION (1F)					
B×D	900x1100	900x1100	600x600		
BARS	16–D25	24–D25	8–D25		
HOOPS	⊞–D12–@100	⊞–D12–@100	□–D12–@100		
REMARKS	–	–	–		
SECTION (B1F)					
B×D	900x1100	900x1100	600x600	500x500	500x500
BARS	16–D25	24–D25	8–D25	8–D25	8–D25
HOOPS	⊞–D12–@100	⊞–D12–@100	□–D12–@100	□–D12–@100	□–D12–@100
REMARKS	–	–	–	–	–

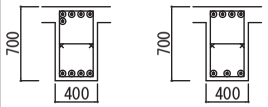
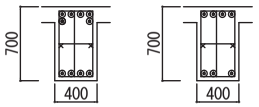
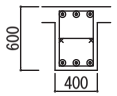
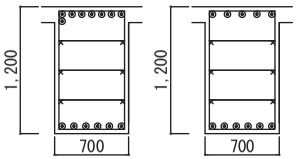
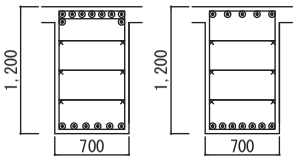
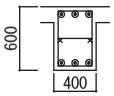
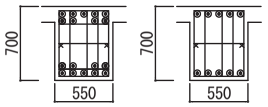
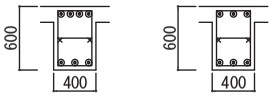
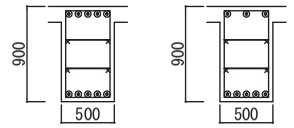
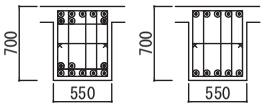
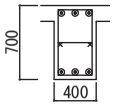
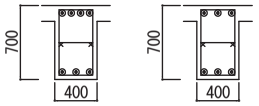
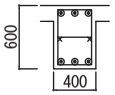
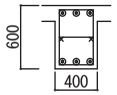
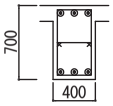
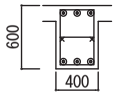
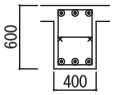
MARK	C1	C2	C2A	C3	C4
SECTION (3F)					
B×D	900x1100	900x1100		600x600	
BARS	16–D25	16–D25		8–D25	
HOOPS	⊞–D12–@100	⊞–D12–@100		□–D12–@100	
REMARKS	–	–		–	
SECTION (2F)					
B×D	900x1100	900x1100	500x500	600x600	500x500
BARS	16–D25	20–D25	8–D25	8–D25	8–D25
HOOPS	⊞–D12–@100	⊞–D12–@100	□–D12–@100	□–D12–@100	□–D12–@100
REMARKS	–	–	–	–	–
SECTION (MF)					
B×D	900x1100	900x1100		600x600	
BARS	16–D25	24–D25		8–D25	
HOOPS	⊞–D12–@100	⊞–D12–@100		□–D12–@100	
REMARKS	–	–		–	

A－5－42

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING COLUMN SCHEDULE	K. FUJII	K. ODA	T. KURUMADA		AR-S13
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:50 (if only A3)

COLUMN SCHEDULE S=1/50

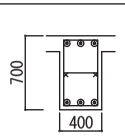
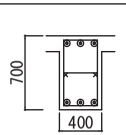
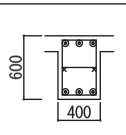
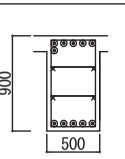
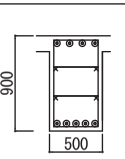
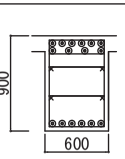
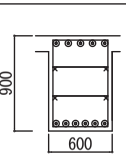
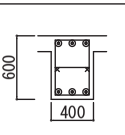
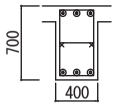
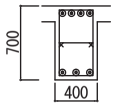
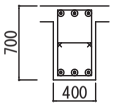
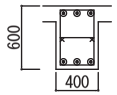
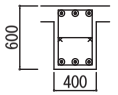
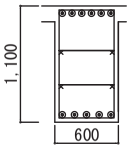
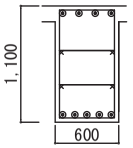
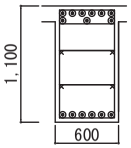
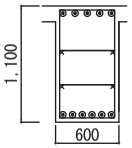
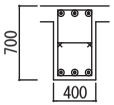
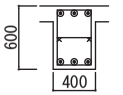
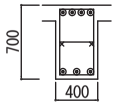
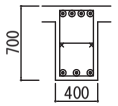
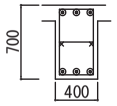
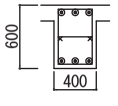
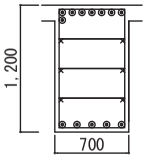
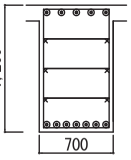
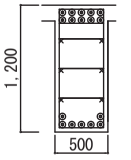
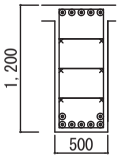
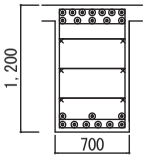
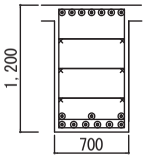
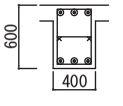
UNLESS OTHERWISE NOTED
SPREADER D10@1,000

MARK	G1		G2		G3	G4	G11		G12		G13	
POSITION	END	CENTER	END	CENTER		ALL SEC.	END	CENTER	END	CENTER	ALL SEC.	
SECTION (MF)												
B×D	400x700		400x700			400x600	700x1200		700x1200		400x600	
TOP BARS	4/1-D25	4-D25	4/2-D25	4-D25		3-D25	7/1-D25	5-D25	7/2-D25	5-D25	3-D25	
BOT. BARS	4-D25	3-D25	4-D25	3-D25		3-D25	6-D25	6-D25	6-D25	7-D25	3-D25	
STIRRUPS	□-D12-@100		◫-D12-@100			□-D12-@200	□-D12-@150		□-D12-@150		□-D12-@200	
WEB BARS	2-D12		2-D12			2-D12	3x2-D12		3x2-D12		2-D12	
POSITION			END	CENTER		END	CENTER	END	CENTER		END	CENTER
SECTION (M1F)												
B×D			550x700			400x600	500x900				550x700	
TOP BARS			5/4-D25	5-D25		4-D25	3-D25	5-D25	3-D25		5/3-D25	5-D25
BOT. BARS			5/4-D25	5-D25		3-D25	3-D25	5-D25	5-D25		5/3-D25	5-D25
STIRRUPS			▥-D12-@100			□-D12-@100	□-D12-@200				▥-D12-@100	
WEB BARS			2-D12			2-D12	2x2-D12				2-D12	
POSITION	ALL SEC.		END	CENTER	ALL SEC.	ALL SEC.	ALL SEC.		ALL SEC.		ALL SEC.	
SECTION (1F)												
B×D	400x700		400x700		400x600	400x600	400x700		400x600		400x600	
TOP BARS	3-D25		4-D25	3-D25	3-D25	3-D25	3-D25		3-D25		3-D25	
BOT. BARS	3-D25		3-D25	3-D25	3-D25	3-D25	3-D25		3-D25		3-D25	
STIRRUPS	□-D12-@200		□-D12-@150		□-D12-@200	□-D12-@200	□-D12-@200		□-D12-@200		□-D12-@150	
WEB BARS	2-D12		2-D12		2-D12	2-D12	2-D12		2-D12		2-D12	

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING COLUMN SCHEDULE(1)	K. FUJII	K. ODA	T. KURUMADA		AR-S14
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:50 (if only A3)

COLUMN SCHEDULE S=1/50

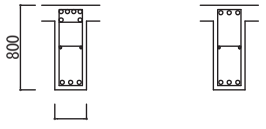
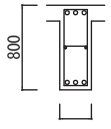
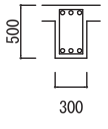
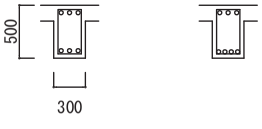
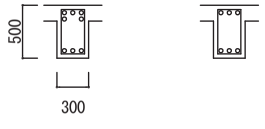
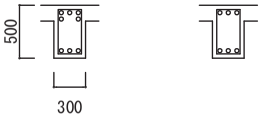
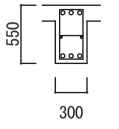
UNLESS OTHERWISE NOTED
SPREADER D10@1,000

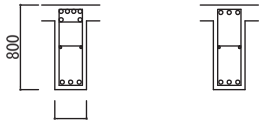
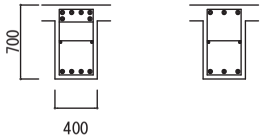
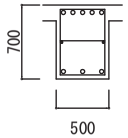
MARK	G1	G2		G3	G4	G11		G12		G12A	G13
POSITION	ALL SEC.	ALL SEC.			ALL SEC.	END	CENTER	END	CENTER		ALL SEC.
SECTION (RF)											
B×D	400x700	400x700			400x600	500x900		600x900			400x600
TOP BARS	3-D25	3-D25			3-D25	5/1-D25	4-D25	6/4-D25	5-D25		3-D25
BOT. BARS	3-D25	3-D25			3-D25	5-D25	5-D25	6-D25	6-D25		3-D25
STIRRUPS	□-D12-@200	□-D12-@200			□-D12-@200	□-D12-@150		□-D12-@150			□-D12-@200
WEB BARS	2-D12	2-D12			2-D12	2x2-D12		2x2-D12			2-D12
POSITION	ALL SEC.	END	CENTER	ALL SEC.	ALL SEC.	END	CENTER	END	CENTER	ALL SEC.	ALL SEC.
SECTION (3F)											
B×D	400x700	400x700		400x600	400x600	600x1100		600x1100		400x700	400x600
TOP BARS	3-D25	4-D25	3-D25	3-D25	3-D25	6-D25	4-D25	6/3-D25	5-D25	3-D25	3-D25
BOT. BARS	3-D25	3-D25	3-D25	3-D25	3-D25	5-D25	5-D25	6-D25	6-D25	3-D25	3-D25
STIRRUPS	□-D12-@200	□-D12-@200		□-D12-@200	□-D12-@200	□-D12-@150		□-D12-@150		□-D12-@200	□-D12-@200
WEB BARS	2-D12	2-D12		2-D12	2-D12	2x2-D12		2x2-D12		2-D12	2-D12
POSITION	ALL SEC.	ALL SEC.		ALL SEC.	ALL SEC.	END	CENTER	END	CENTER	END	CENTER	ALL SEC.
SECTION (2F)												
B×D	400x700	400x700		400x700	400x600	700x1200		500x1200		700x1200	400x600
TOP BARS	4-D25	4-D25		3-D25	3-D25	7/1-D25	5-D25	5/5-D25	5-D25	7/5-D25	7-D25	3-D25
BOT. BARS	3-D25	3-D25		3-D25	3-D25	5-D25	7-D25	5/2-D25	5/2-D25	7/3-D25	7/3-D25	3-D25
STIRRUPS	□-D12-@200	□-D12-@100		□-D12-@200	□-D12-@200	□-D12-@150		□-D12-@150		□-D12-@100		□-D12-@200
WEB BARS	2-D12	2-D12		2-D12	2-D12	3x2-D12		3x2-D12		3x2-D12		2-D12

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING COLUMN SCHEDULE(2)	K. FUJII	K. ODA	T. KURUMADA		AR-S15
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:50 (if only A3)

BEAM SCHEDULE S=1/50

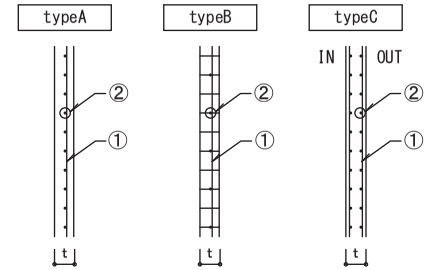
UNLESS OTHERWISE NOTED
SPREADER D10@1,000

MARK	B1		B2	B3	B4		B5		B6		B7
POSITION	CB1 SIDE END	CENTER、B2 SIDE END	ALL SEC.	ALL SEC.	END	CENTER	2、4SIDE END	CENTER、1、5SIDE END	END	CENTER	ALL SEC.
SECTION											
B × D	300x800		300x800	300x500	300x500		300x500		300x500		300x550
TOP BARS	4/2-D22	3-D22	3-D22	3-D22	3-D22	3-D22	3/2-D22	3-D22	3/2-D22	3-D22	3-D22
BOT. BARS	3-D22	3-D22	3-D22	3-D22	3-D22	4-D22	3-D22	3-D22	3-D22	3-D22	3-D22
STIRRUPS	□ -D10-@200		□ -D10-@200	□ -D10-@200	□ -D10-@200		□ -D12-@150		□ -D12-@150		□ -D12-@200
WEB BARS	2-D10		2-D10	-	-		-		-		2-D10

MARK	CB1		CG1		CG2
POSITION	ROOT END	TIP END	ROOT END	TIP END	ALL SEC.
SECTION					
B × D	300x800		400x700		500x700
TOP BARS	4/2-D22	3-D22	4/2-D25	3-D25	5-D22
BOT. BARS	3-D22	3-D22	4-D25	3-D25	3-D22
STIRRUPS	□ -D10-@200		□ -D12-@200		□ -D12-@200
WEB BARS	2-D10		2-D10		2-D10

WALL SCHEDULE

VERTICAL SECTION



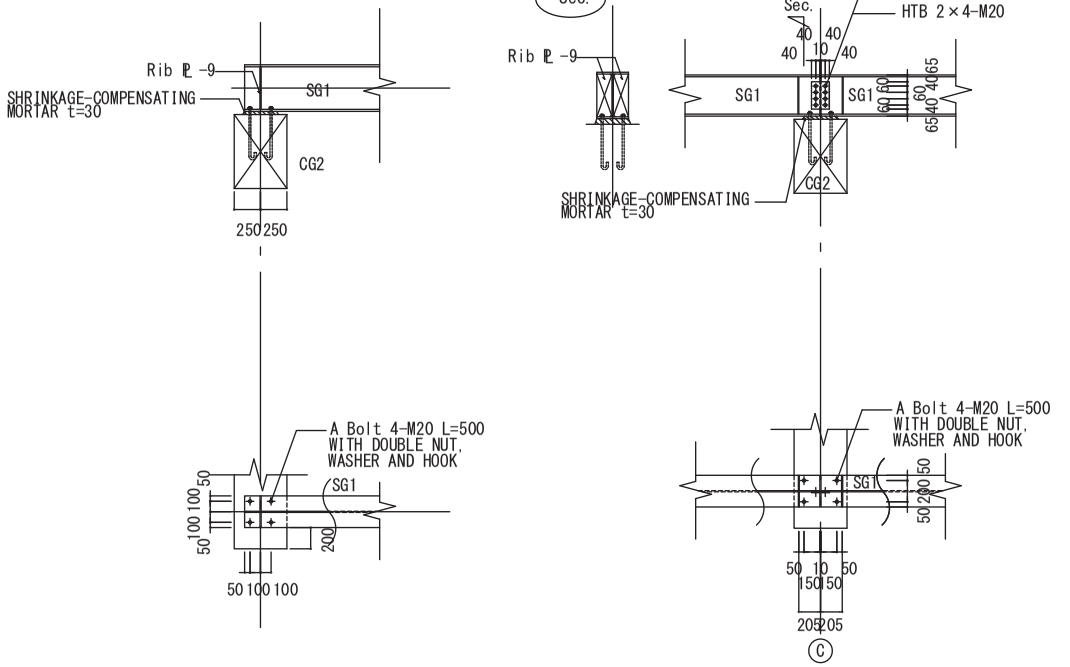
MARK		CB150	FW20	KW20	W15
TYPE		B	C	C	A
t		150	200	200	150
① VERTICAL BARS	IN	D10@400	D12@200	D12@100	D12@150
	OUT	—	D16@200	D12@100	—
② HORIZONTAL BARS	IN	D10@800	D12@200	D12@200	D12@200
	OUT	—	D12@200	D12@200	—
TIE BAR		—	D12@200	D10@200	—

SLAB SCHEDULE

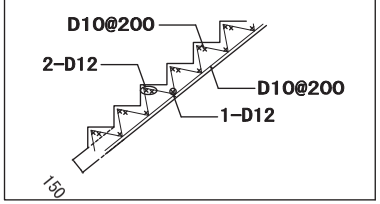
MARK	t		SHORT-SECTION		LONG-SECTION	
			SIDE AREA	CENTER AREA	SIDE AREA	CENTER AREA
S1	150	TOP BARS	D10@200	→	D10@200	→
		BOT. BARS	D10@200	→	D10@200	→
S2	150	TOP BARS	D10+D12@200	→	D10@200	→
		BOT. BARS	D10+D12@200	→	D10@200	→
S3	150	TOP BARS	D12@200	→	D12@200	→
		BOT. BARS	D10+D12@200	→	D10+D12@200	→
S4	150	TOP BARS	D12@150	→	D12@200	→
		BOT. BARS	D12@150	→	D12@200	→
S5	150	TOP BARS	D12@150	→	D12@150	→
		BOT. BARS	D12@150	→	D12@150	→

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING SLAB、BEAM、WALL SCHEDULE	K. FUJII	K. ODA	T. KURUMADA		AR-S16
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:50 (if only A3)

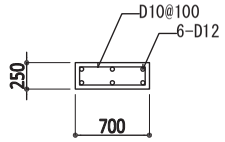
STEEL MEMBER LIST
SG1 H390×300×10×16 (SS400)
Rib PL -9@2000



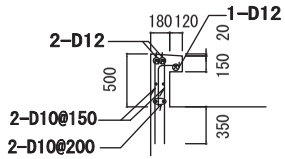
STAIRCASE OF REINFORCED CONCRETE



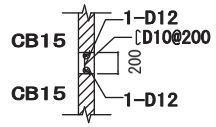
P1



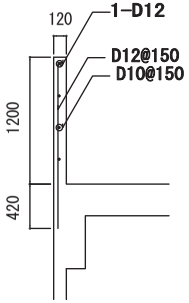
PARAPET



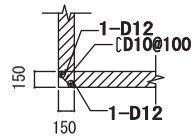
L1



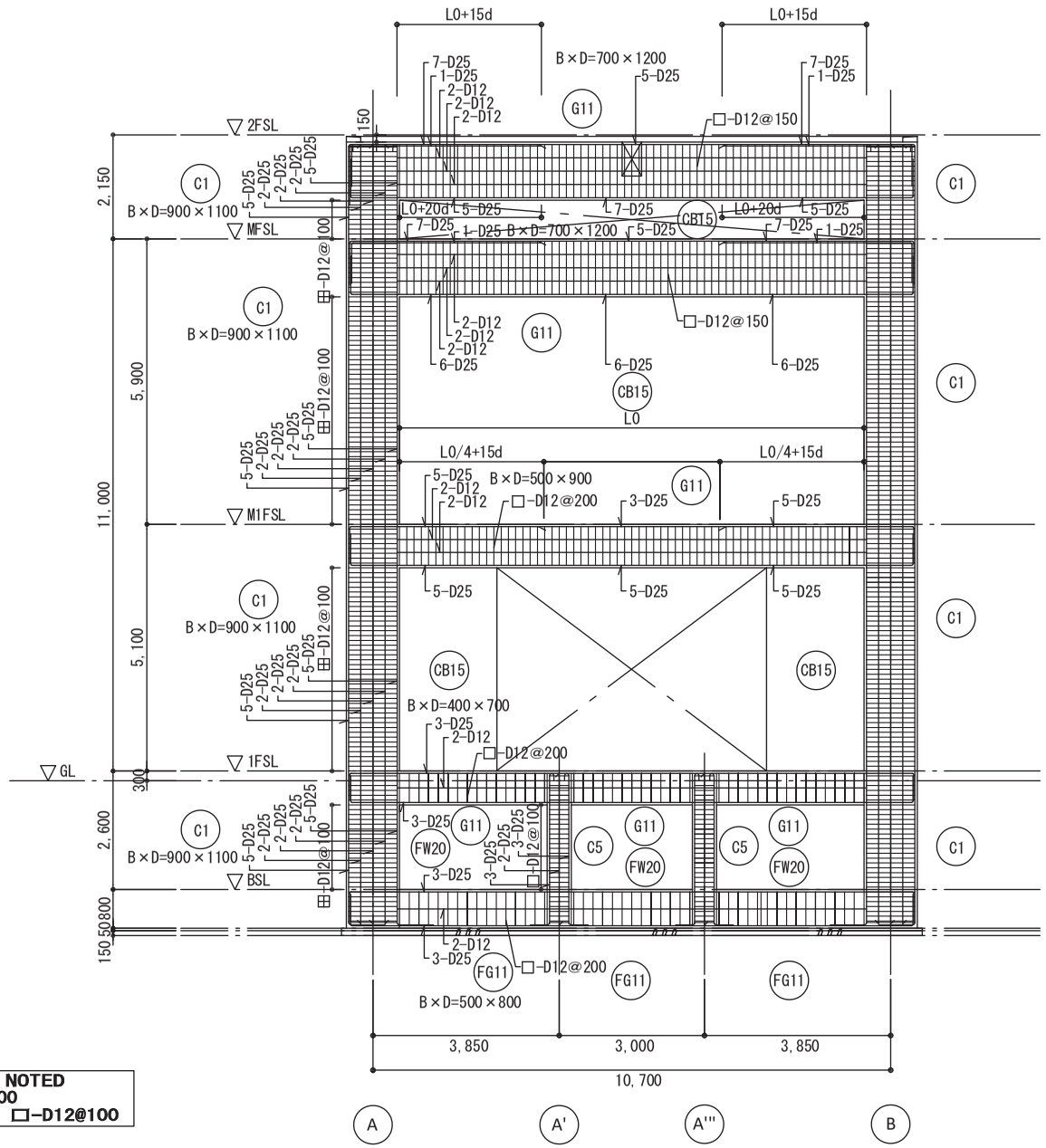
HANDRAIL



STUD



PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING DETAIL OF RUNWAY GIRDER	K. FUJII	K. ODA	T. KURUMADA		AR-S17
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:50 (if only A3)



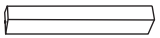
UNLESS OTHERWISE NOTED
1. SPREADER D10@1,000
2. PANEL ZONE HOOP □-D12@100

1 LINE FRAMING DETAIL S=1/100

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	CONTROL BUILDING 1 LINE FRAMING DETAIL	K. FUJII	K. ODA	T. KURUMADA		AR-S18
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)

MAIN FEEDER & POWER SYSTEM	
	DISTRIBUTION BOAD
LIGHTING SYSTEM	
	FL40wx2 SURFACE MOUNT TYPE
	FL40wx2 CEILING EMBEDDED TYPE
	FL40wx1 SURFACE MOUNT TYPE
	FL20wx1 SURFACE MOUNT TYPE (Water Proof Type)
	FL40wx1 CEILING EMBEDDED TYPE
	FL40wx2 SURFACE MOUNT TYPE (Emergency Lighting)
	FL40wx2 CEILING EMBEDDED TYPE (Emergency Lighting)
	FL40wx1 SURFACE MOUNT TYPE (Emergency Lighting)
	FL40wx1 CEILING EMBEDDED TYPE (Emergency Lighting)
	HID 400W DOWN LIGHT
	GUIDE LIGHT
•	LIGHTING SWITCH 1P 15A 1-WAY
•3	LIGHTING SWITCH 1P 15A 3-WAY
•4	LIGHTING SWITCH 1P 15A 4-WAY
FIRE ALARM SYSTEM	
	HEAT DETECTOR
S	SMOKE DETECTOR
	FIRE ALARM INDICATOR
VANTILATION SYSTEM	
	200 W VENTILATOR
•	VENTILATOR SWITCH 1P 15A 1-WAY
SOCKET OUTLET SYSTEM	
	SOCKET OUTLET 2Px2 240V/5A
WIRING	
F	WIRING FP-SHCVV 1.25 x 2
	WIRING IV 2.0mm x2, E2.0 (E25)
	WIRING IV 2.0mm x3, E2.0 (E25)
	WIRING IV 2.0mm x4, E2.0 (E25)
	PULL BOX 200×200×100

LIGHTING FIXTURE SCHEDULE

A	SURFACE MOUNT TYPE
	40W x 2
	
B	CEILING EMBEDDED TYPE
	40W x 2
	
C	SURFACE MOUNT TYPE
	40W x 1
	
D	CEILING EMBEDDED TYPE
	40W x 1
	
E	SURFACE MOUNT TYPE (Water Proof Type)
	FL20W x 1
	
F	400W DOWN LIGHT
	HID 400W
	
G	GUIDE LIGHT
	2W

LEGEND
1.RATED VOLTAGE : 3φ 4W 400V/230V −50Hz
2.STARTER(FLUCRESCENT LANP) : GLOW STARTER
3.POWER FACER : HIGH POWER FACTOR

DISTRIBUTION

3FSL DB

3φ 4W 415V / 240V

MCCB 2P 50/20

MCCB 4P 50AF/50AT

TOTAL 21,820 VA

LOARD NAME	LOAD (VA)	CIRCUIT No.		CIRCUIT No.	LOAD (VA)	LOARD NAME
CONTROL ROOM LIGHTING	940	①	50AF/10AT	②	380	CONTROL ROOM LIGHTING (Emergency Lighting)
STEP & EPS LIGHTING	700	③	50AF/10AT	④	1,500	SPARE
CONTROL ROOM SOCKET OUTLET 1	2,500	⑤	50AF/20AT	⑥	2,500	CONTROL ROOM SOCKET OUTLET 2
SPARE	2,500	⑦	50AF/20AT	⑧	2,500	SPARE
CONTROL ROOM AIR CONDITIONER	8,000	⑨	3φ 3φ 50AF/10AT	⑩	300	CONTROL ROOM VENTILATOR
SUB TOTAL (1)	14,640				7,180	SUB TOTAL (2)

Tr.

E6. 6 (VE18) E8

2FSL DB

3φ 4W 415V / 240V

MCCB 2P 50/20

MCCB 4P 50AF/50AT

TOTAL 14,020 VA

LOARD NAME	LOAD (VA)	CIRCUIT No.		CIRCUIT No.	LOAD (VA)	LOARD NAME
33kV GIS ROOM LIGHTING	430	①	50AF/10AT	②	280	33kV GIS ROOM LIGHTING (Emergency Lighting)
WAREHOUSE & 33kV GIS CABLE ROOM LIGHTING	610	③	50AF/10AT	④	2,500	33kV GIS ROOM SOCKET OUTLET 1
33kV GIS ROOM SOCKET OUTLET 2	2,500	⑤	50AF/20AT	⑥	2,000	WAREHOUSE & 33kV GIS CABLE ROOM SOCKET OUTLET
SPARE	2,500	⑦	50AF/20AT	⑧	2,000	SPARE
33kV GIS ROOM VENTILATOR	600	⑨	3φ 3φ 50AF/10AT	⑩	600	SPARE
SUB TOTAL (1)	6,640				7,380	SUB TOTAL (2)

E6. 6 (VE18) E8

1FSL DB

3φ 4W 415V / 240V

MCCB 2P 50/20

MCCB 4P 50AF/50AT

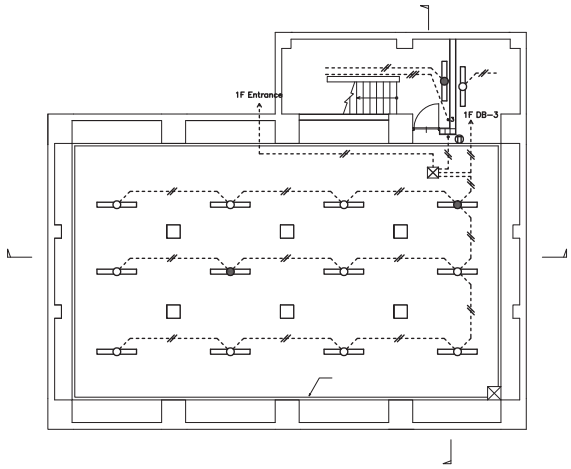
TOTAL 13,520 VA

LOARD NAME	LOAD (VA)	CIRCUIT No.		CIRCUIT No.	LOAD (VA)	LOARD NAME
132kV GIS ROOM LIGHTING	770	①	50AF/10AT	②	280	132kV GIS ROOM LIGHTING (Emergency Lighting)
ENTRANCE & 132kV GIS CABLE ROOM LIGHTING	570	③	50AF/10AT	④	1,000	SPARE
132kV GIS ROOM SOCKET OUTLET 1	2,500	⑤	50AF/20AT	⑥	2,500	132kV GIS ROOM SOCKET OUTLET 2
132kV GIS CABLE ROOM SOCKET OUTLET	1,000	⑦	50AF/20AT	⑧	2,500	SPARE
132kV GIS ROOM LIGHTING (Down Light)	1,200	⑨	3φ 3φ 50AF/10AT	⑩	1,200	132kV GIS ROOM LIGHTING (Down Light)
SUB TOTAL (1)	6,040				7,480	SUB TOTAL (2)

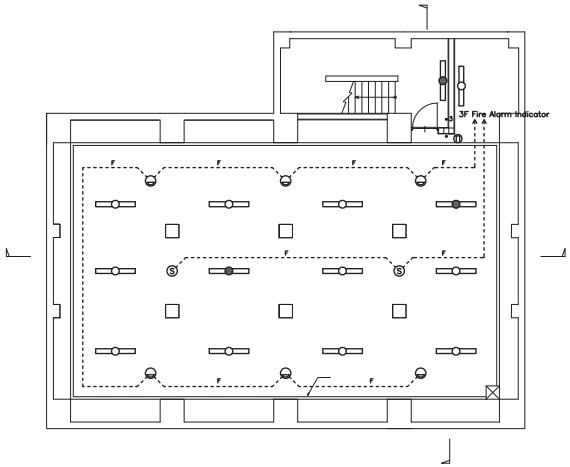
E6. 6 (VE18) E8

*Emergency Lighting means lighting equipment that lights up when a blackout.

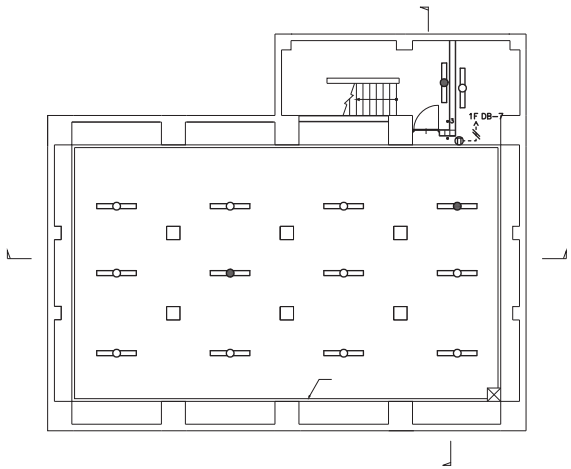
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building 1st Floor 132kV GIS Plan	K. FUJII	K. ODA	T. KURUMADA		AR-E01
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : --- (if only A3)



Lighting

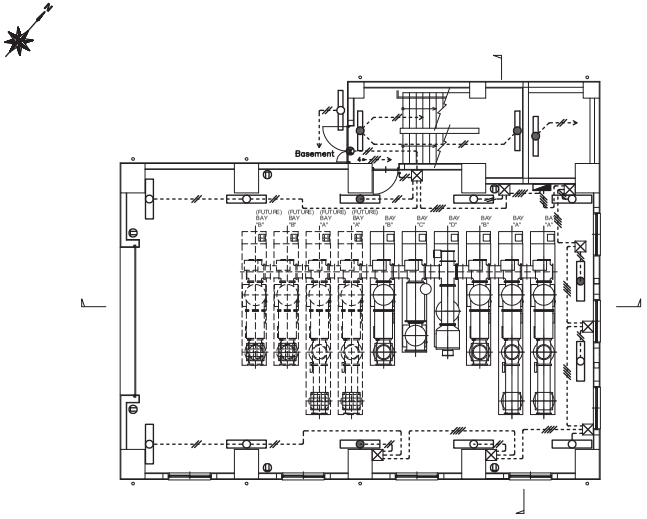


Fire Alarm System



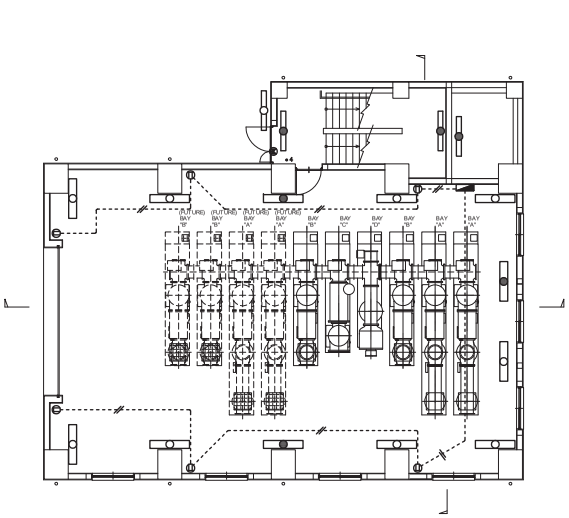
Socket Outlet

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building Lighting, Socket Outlet and Fire Alarm System for Basement	K. FUJII	K. ODA	T. KURUMADA		AR-E02
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:200 (if only A3)

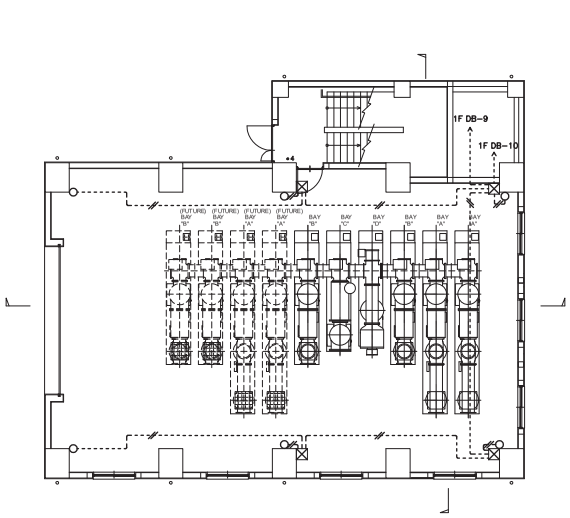


1FL + 2500mm

Lighting

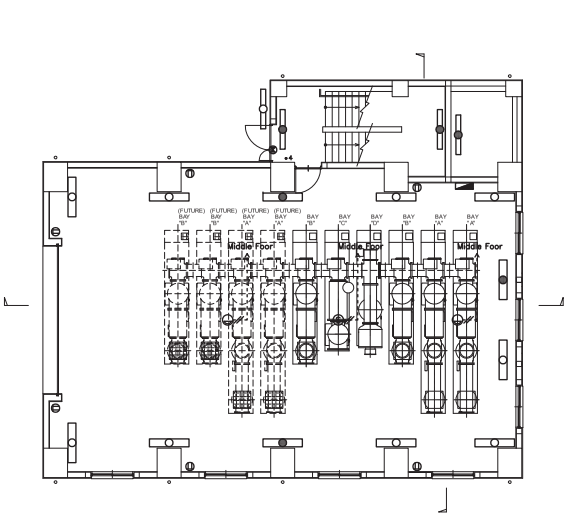


Socket Outlet



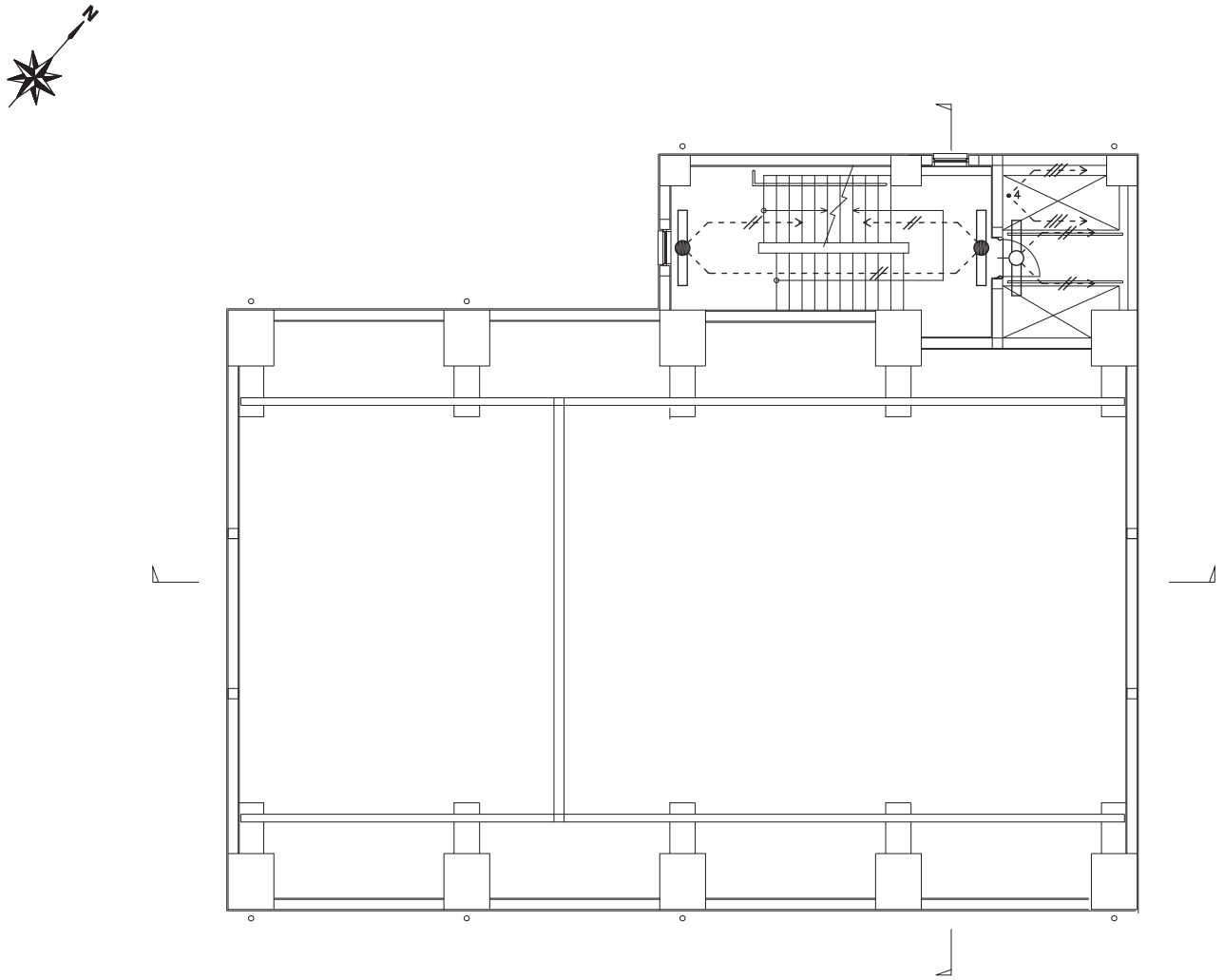
1FL + 5000mm

Lighting

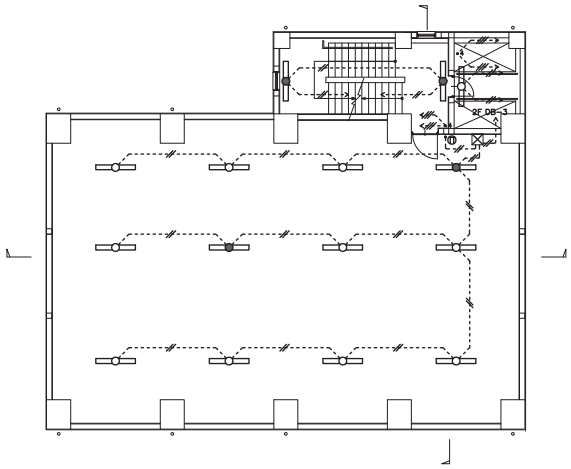


Fire Alarm System

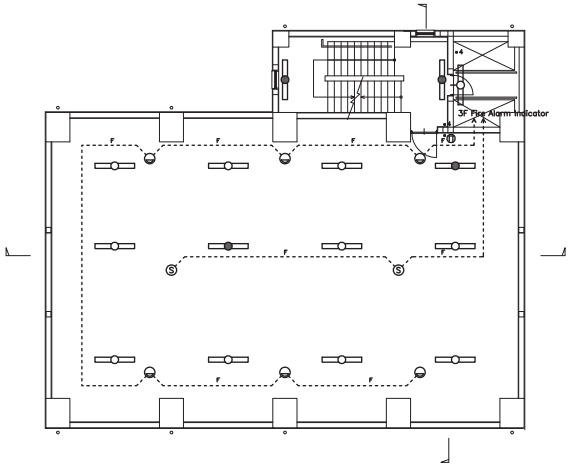
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	**APAPA ROAD SUBSTATION**	**Control Building Lighting, Socket Outlet and Fire Alarm System for 1st Floor**	K. FUJII	K. ODA	T. KURUMADA		**AR-E03**
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : **1:200** (if only A3)



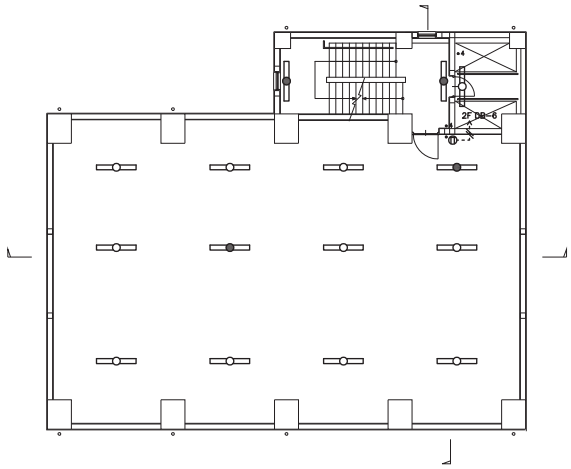
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building Lighting for Middle 1st Floor Plan	K. FUJII	K. ODA	T. KURUMADA		AR-E04
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



Lighting

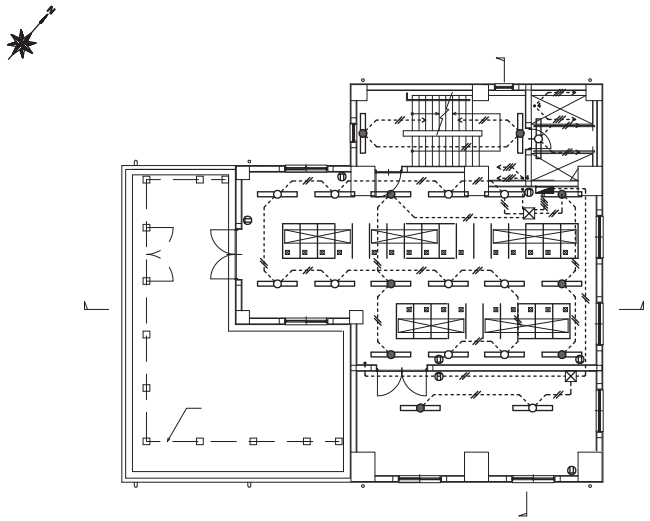


Fire Alarm System

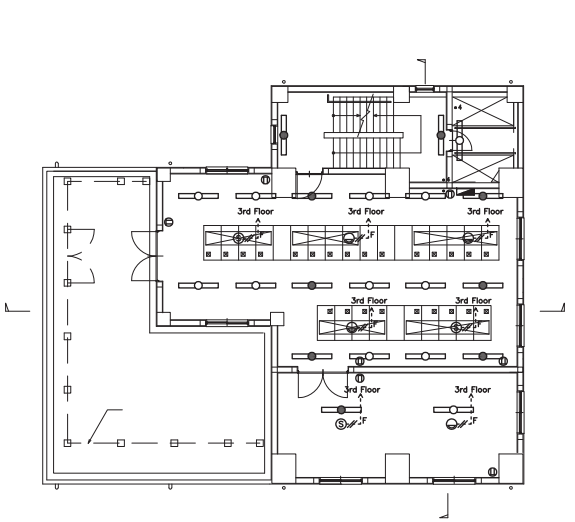


Socket Outlet

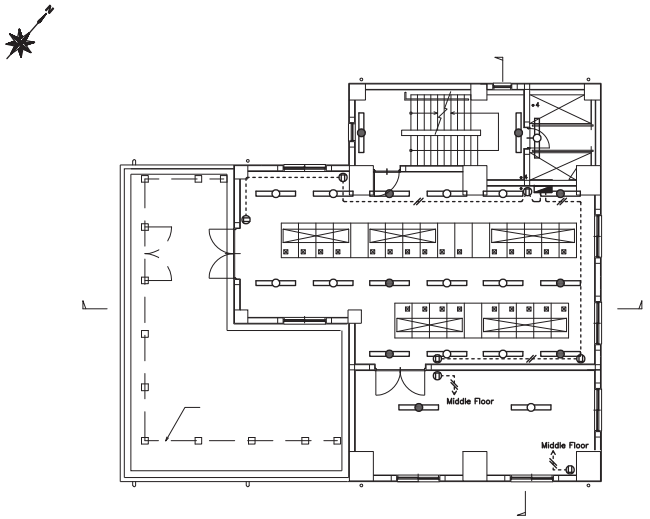
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building Lighting, Socket Outlet and Fire Alarm System for Middle Floor	K. FUJII	K. ODA	T. KURUMADA		AR-E05
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:200 (if only A3)



Lighting

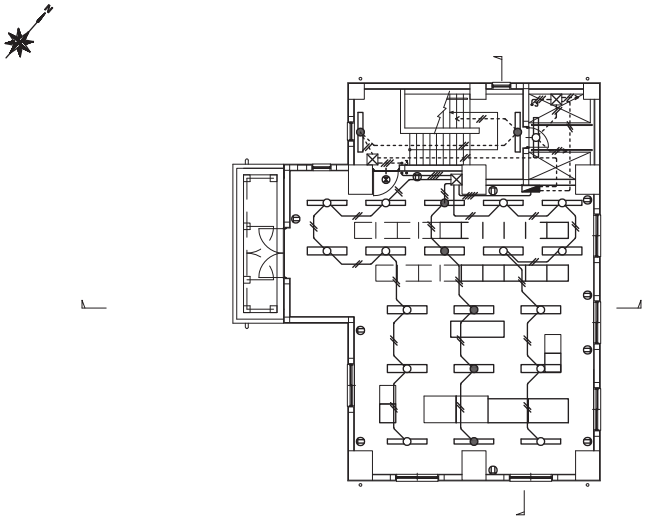


Fire Alarm System

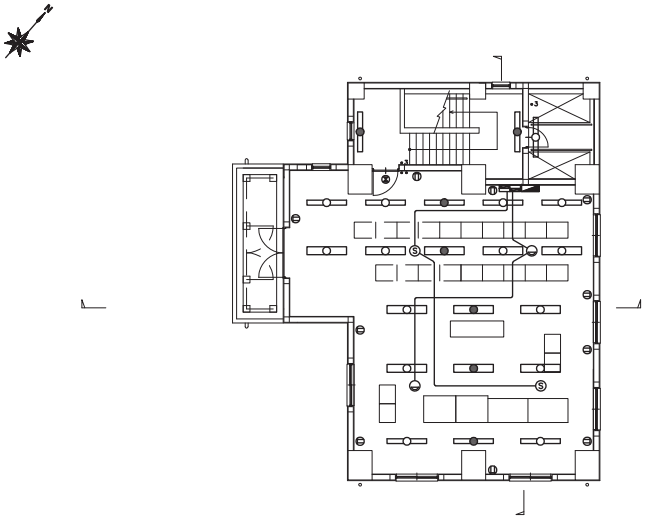


Socket Outlet

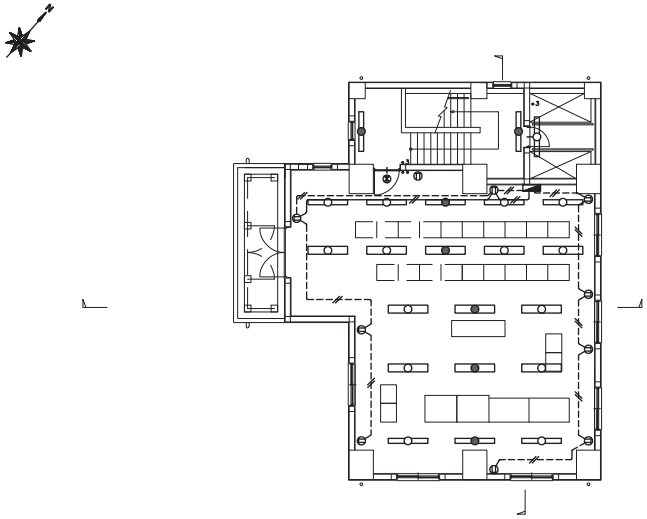
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building Lighting, Socket Outlet and Fire Alarm System for 2nd Floor	K. FUJII	K. ODA	T. KURUMADA		AR-E06
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:200 (if only A3)



Lighting

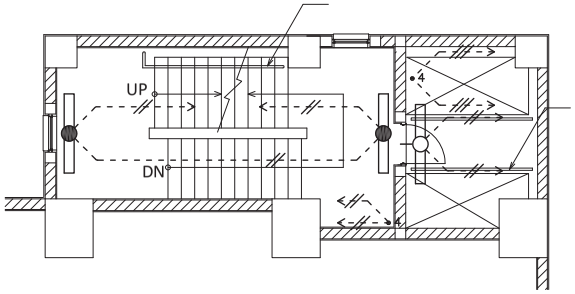


Fire Alarm System

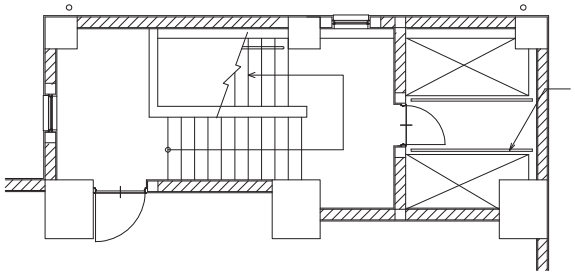


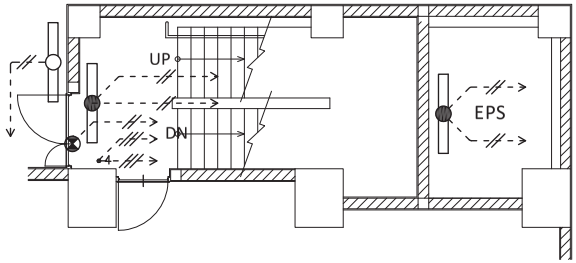
Socket Outlet

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building Lighting, Socket Outlet and Fire Alarm System for 3rd Floor	K. FUJII	K. ODA	T. KURUMADA		AR-E07
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:200 (if only A3)

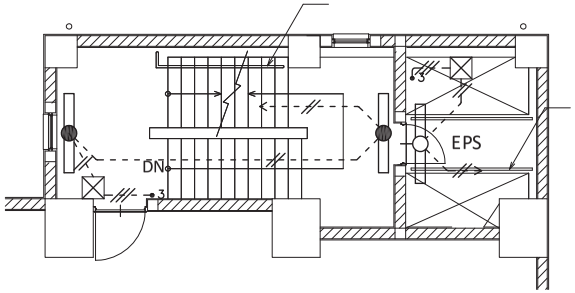


MIDDOLE 1st FLOOR PLAN

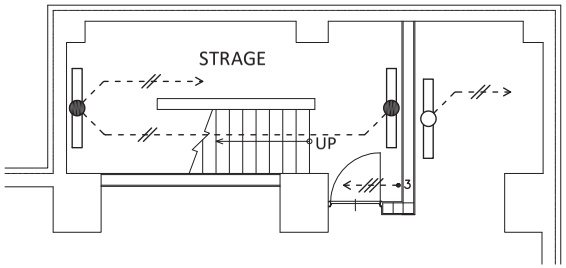




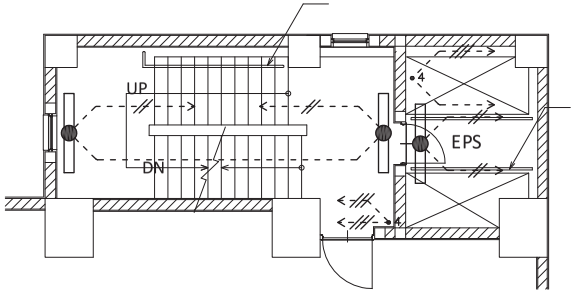
1st FLOOR PLAN



3rd FLOOR PLAN

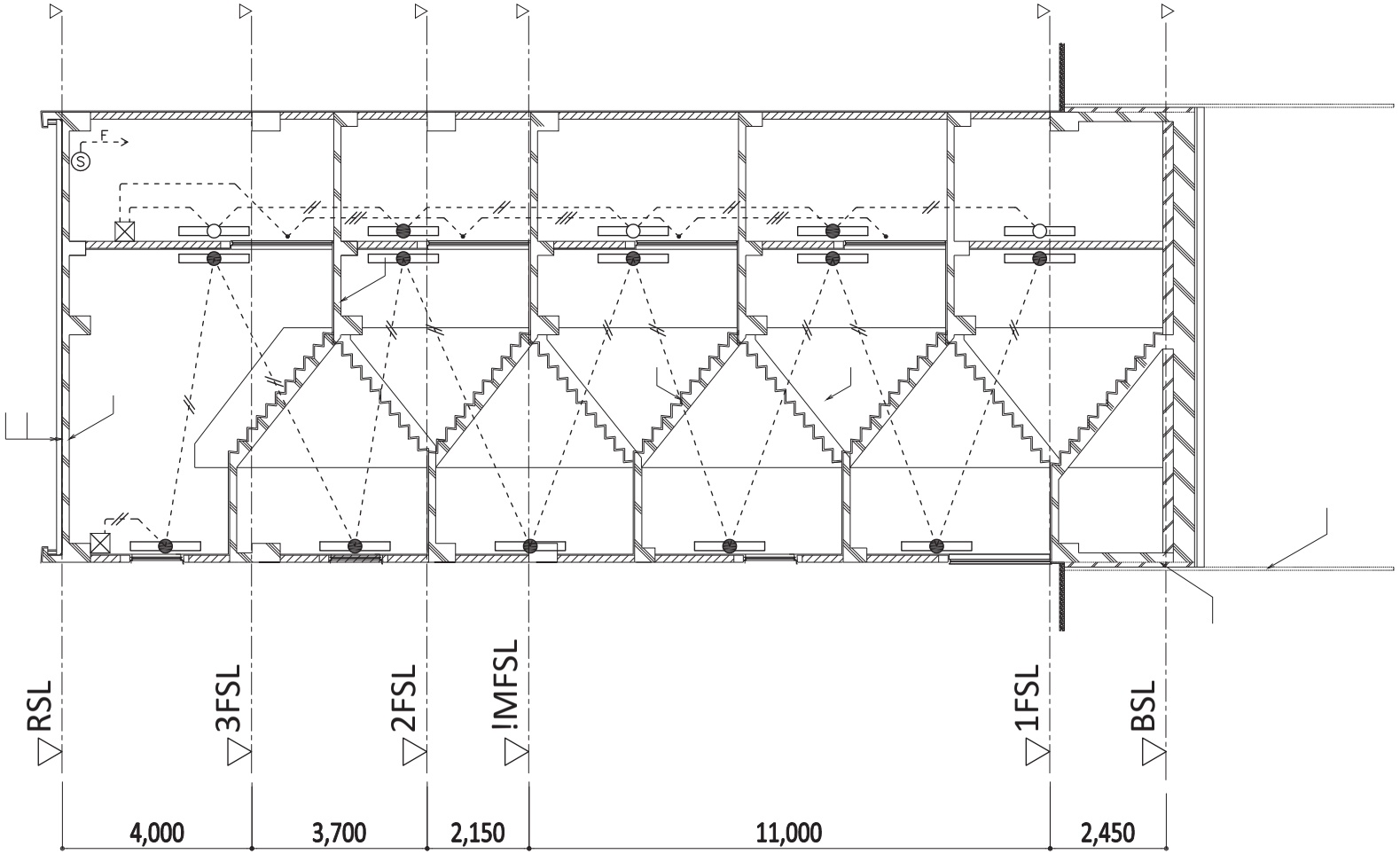


BEASEMENT PLAN

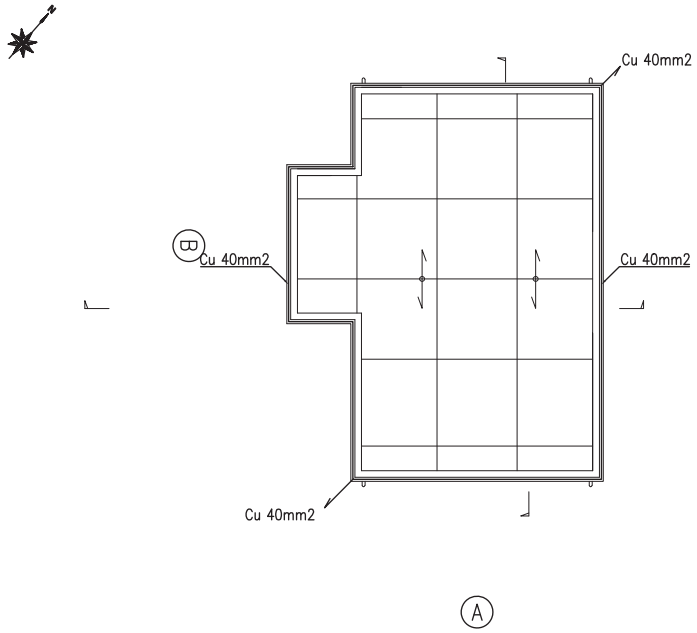


2nd FLOOR PLAN

PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building Lighting for Stair and EPS Plan	K. FUJII	K. ODA	T. KURUMADA		AR-E08
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)

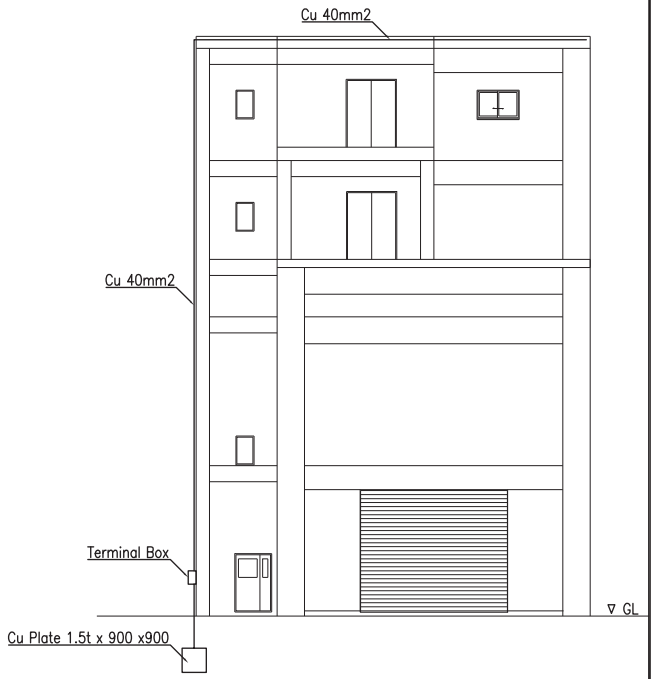


PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building Lighting and Fire Alarm System for Stair Plan	K. FUJII	K. ODA	T. KURUMADA		AR-E09
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



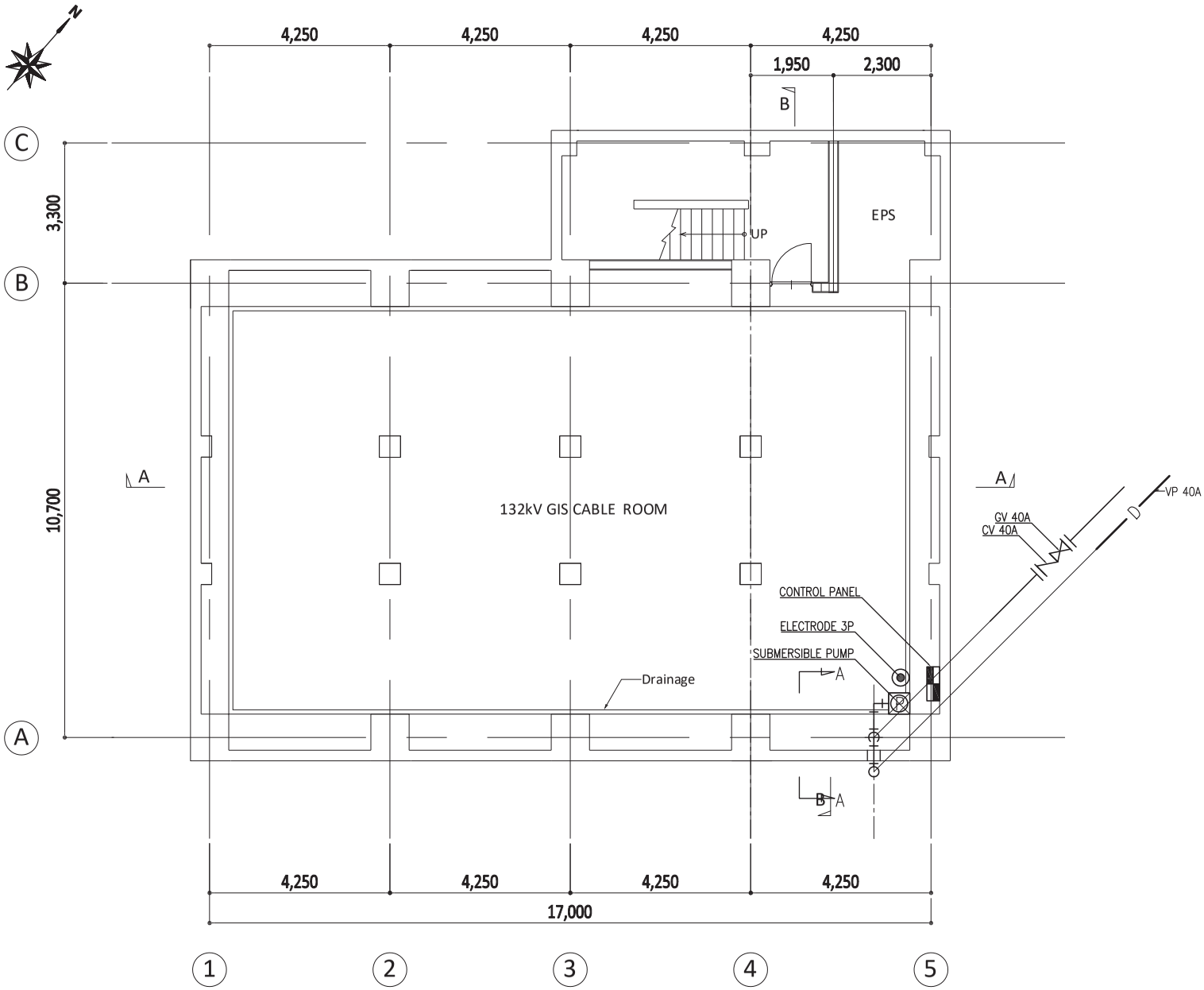
Roof Plan

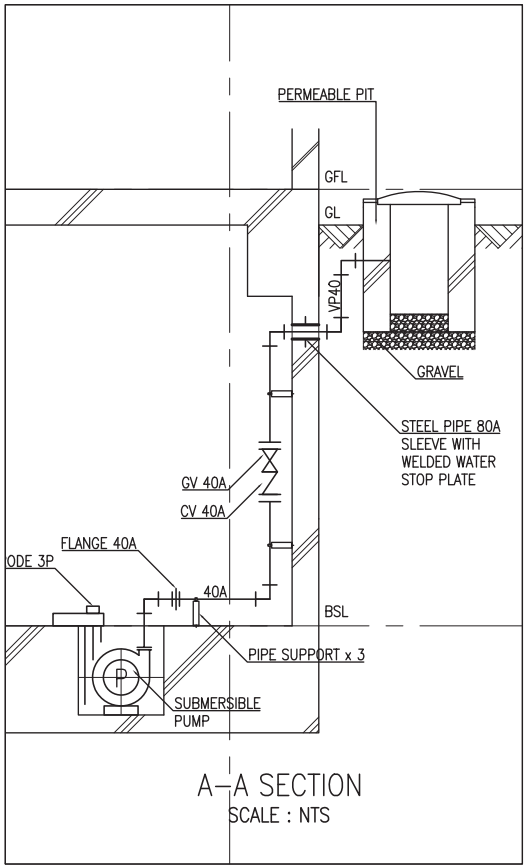
View A



View B

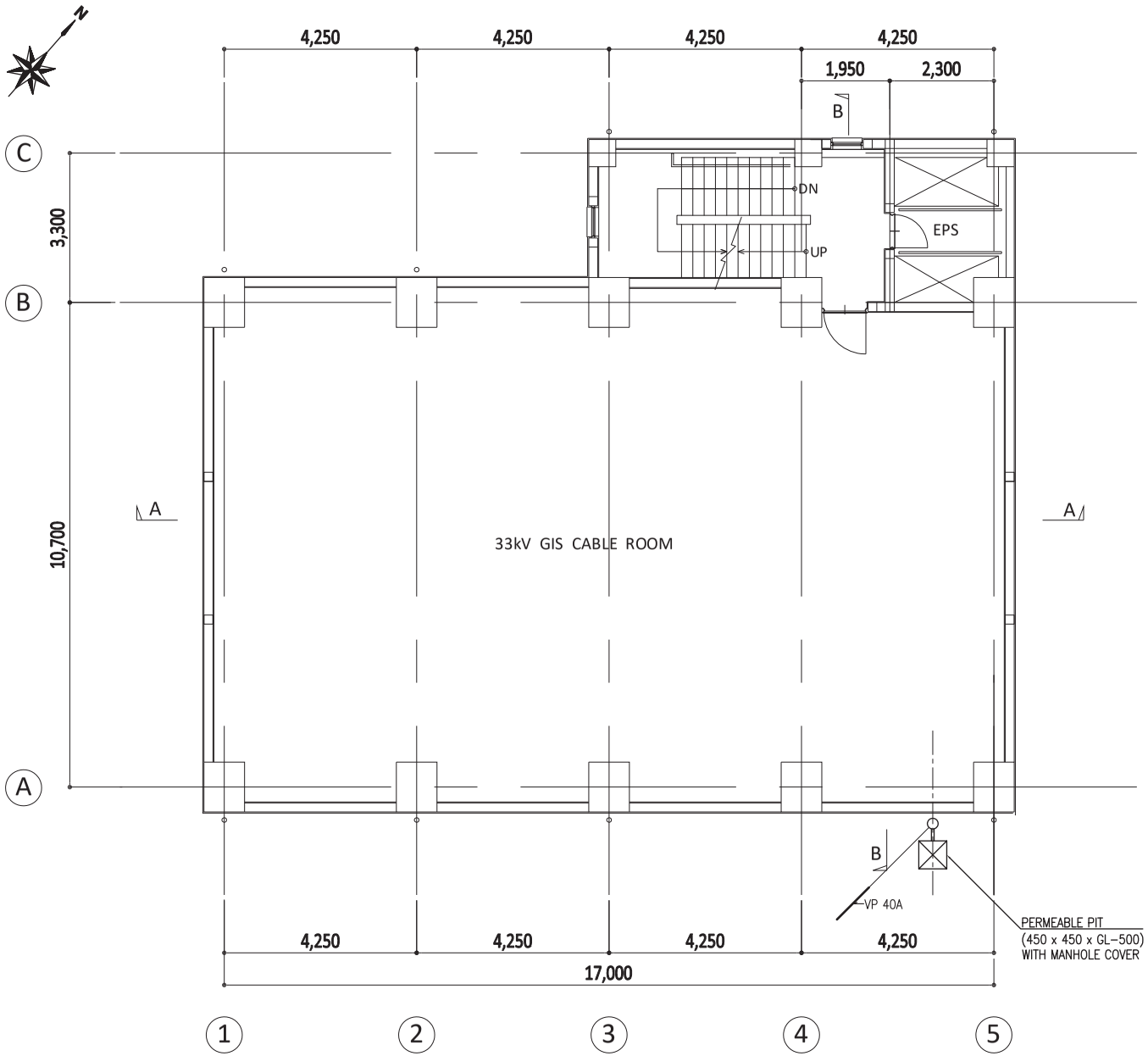
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	**APAPA ROAD SUBSTATION**	**Control Building Lightning Protection**	K. FUJII	K. ODA	T. KURUMADA		**AR-E10**
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : **1:200** (if only A3)



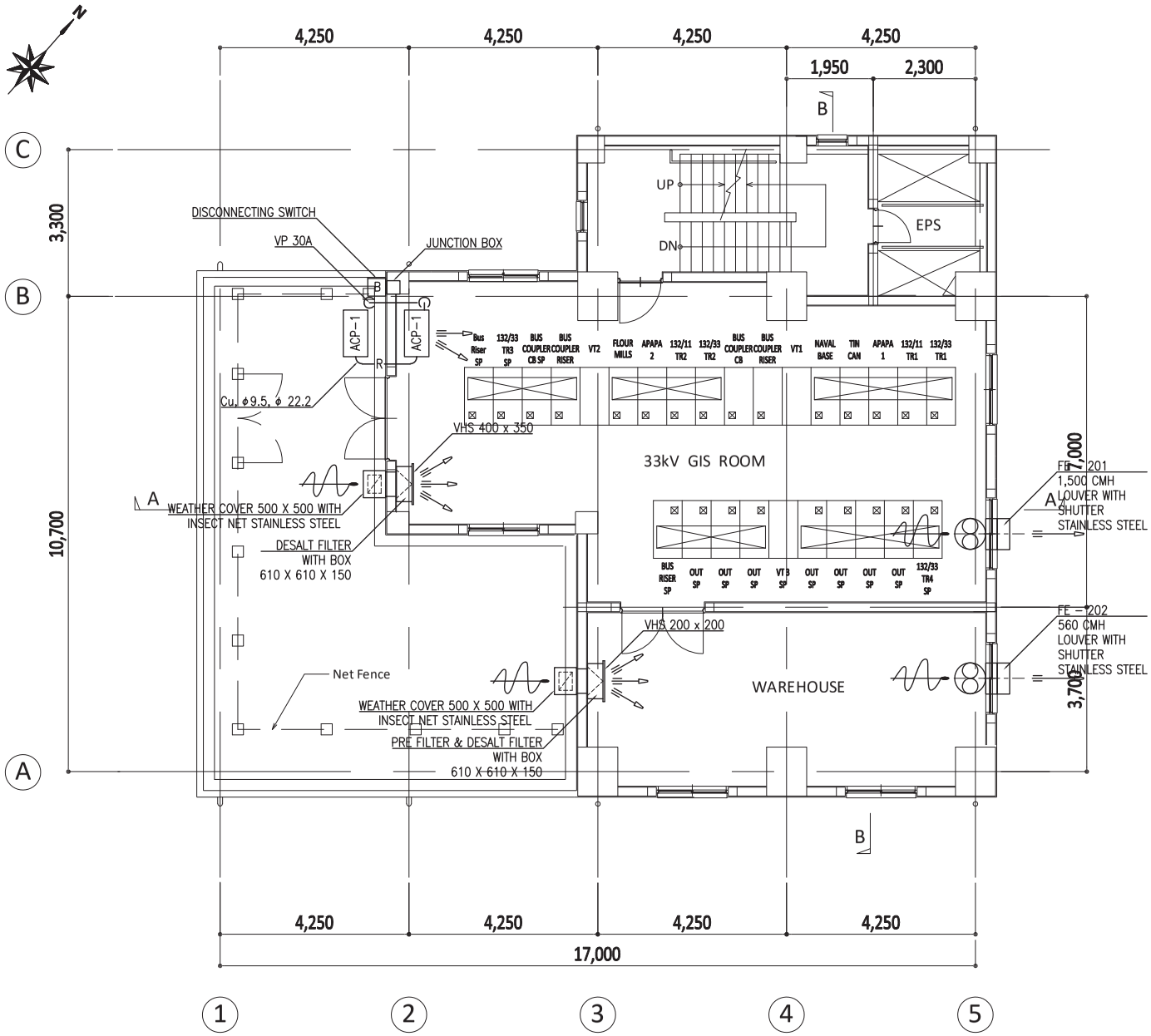


A–A SECTION
SCALE : NTS

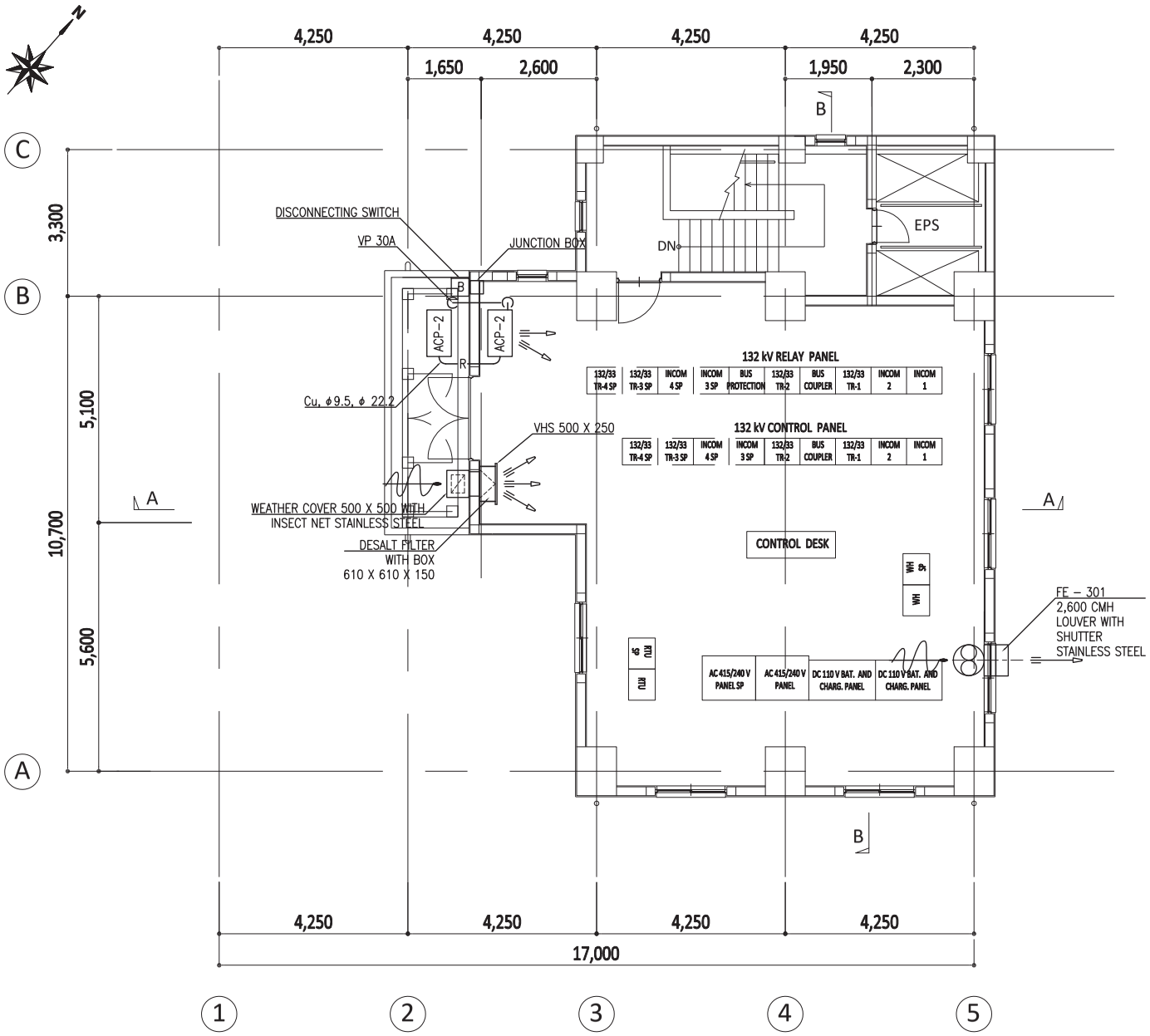
PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	**APAPA ROAD SUBSTATION**	Control Building Drainage System of Basement Plan					**AR-M01**
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : **1:100** (if only A3)



PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	**APAPA ROAD SUBSTATION**	Control Building Drainage System of Outward					**AR-M02**
			CONSULTANTS : yec YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : **1:100** (if only A3)



PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	APAPA ROAD SUBSTATION	Control Building Ventilation System of 2nd Floor					AR-M03
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : 1:100 (if only A3)



PROJECT	LOCATION	TITLE	APPROVED BY :	CHECKED BY :	DESIGNED BY :	DATE :	DRG NO :
THE PROJECT FOR EMERGENCY REHABILITATION AND REINFORCEMENT OF LAGOS TRANSMISSION SUBSTATIONS	**APAPA ROAD SUBSTATION**	Control Building Air Condition and Ventilation System of 3rd Floor					**AR-M04**
			CONSULTANTS : YACHIYO ENGINEERING CO., LTD.TOKYO, JAPAN				SCALE : **1:100** (if only A3)

A-6　地形測量結果図（現地再委託）

TOPOGRAPHIC SURVEY REPORT

APAPA ROAD SUBSTATION LAGOS STATE

SURVEYED AND SUBMITTED

BY

Ψ PENGATE GLOBAL SERVICES LTD

(REGISTERED SURVEYORS)

SURVEYING, & GEOINFORMATICS CONSULTANTS

TEL: - 08038592726 ,07082742542
Email Address:
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PENGATE GLOBAL SERVICES LTD
Kenuj O2 Mall and Champagne Lounge Suite C03,
Near Games Village, Kaura District, Abuja

AUGUST 2017

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APPENDIX A: SAMPLE LIST OF COORDINATES

APPENDIX B: TOPOGRAPHIC MAP OF APAPA ROAD SUBSTATION

1.0 Background

The location of the project site is Apapa Road in the Apapa Local Government Area, Lagos State.

2.0 Introduction

Topographic map is a cartographic representation of the various features of the earth surface at a level of detail or scale intermediate between that of a plan. Within the limits of scale, it shows as accurately as possible the location and shape of both natural and man-made features; the former (natural) including relief, hydrographic features or any features characterizing the subject area; while the later (man-made) including populated places (cities, town, villages etc.), transportation infrastructure (roads, railroads etc.) and other features such as dams, bridges, tunnels etc. The need for three – dimensional geospatial information is inevitable when it comes to the issues of Power Generation and Transmission and allocating site for expansion. Therefore, there is need to provide Topographic Information System for the project site in question.

3.0 Scope of Work.

The scope of work involves Topographical Survey of Apapa Road substation

a. To determine the size and the direction of the boundary line of the substation.
b. To determine the Topography of the terrain.
c. To determine the location of all Towers, Transformers, Gantries, and all the equipment support in the 132 KV and 33 KV switch yards. Also, all buildings and other man – made features in the Sub – station in order to have fair knowledge of the vacant areas within the sub – station.

The objective of the detailed topographic survey of Apapa Substation is to determine the 3D Coordinates (X, Y, and Z) at 10m grid interval within the substation. The survey involves the data capture of all permanent features including roads, control rooms and offices, GIS building 132KV Towers and Gantries, 33KV towers and equipment supports, Transformers, switch yards fire walls. The Topographic detailed survey covers an area of - **3177.818sq**m

Figure 1: Enclosed Boundary of Apapa Road Substation

4.0 Methodology

Differential Global Positioning System was used to observe direct coordinates of points. With the use of a dual frequency, 220 channel Hi-Target GNSS receivers which is capable of tracking the American Satellites-GPS and the Russian Satellites-GLONASS, with centimeter accuracy, data was captured in 3-dimension i.e. X, Y and Z.

Since the control points had been checked and their reliability ensured, the base receiver (also known as Reference) was set on the Control Point. The Rover GPS receiver was switched on and set up. The "survey" icon on the data logger was selected and then the station parameters was set by entering pillar identification value, and the receiver's antenna height through the data logger. The verticality of the tracking rod carrying the rover receiver was ensured by checking the plumb (circular bubble attached to the tracking rod).

The rover was taken to the first boundary point, and all necessary data such as the point identification value and codes were keyed in. The coordinate data were captured in 3-dimension i.e. X, Y and Z. The process was repeated at each boundary pillar until all boundary points were captured. Using the GNSS in the RTK Mode enables the levels to be determined at any arbitrary point within the substation. All data were captured in NIGERIA NATIONAL GRID MINNA DATUM UTM ZONE 31 as required by the Surveyors Council of Nigeria (SURCON) for all survey works in Nigeria.

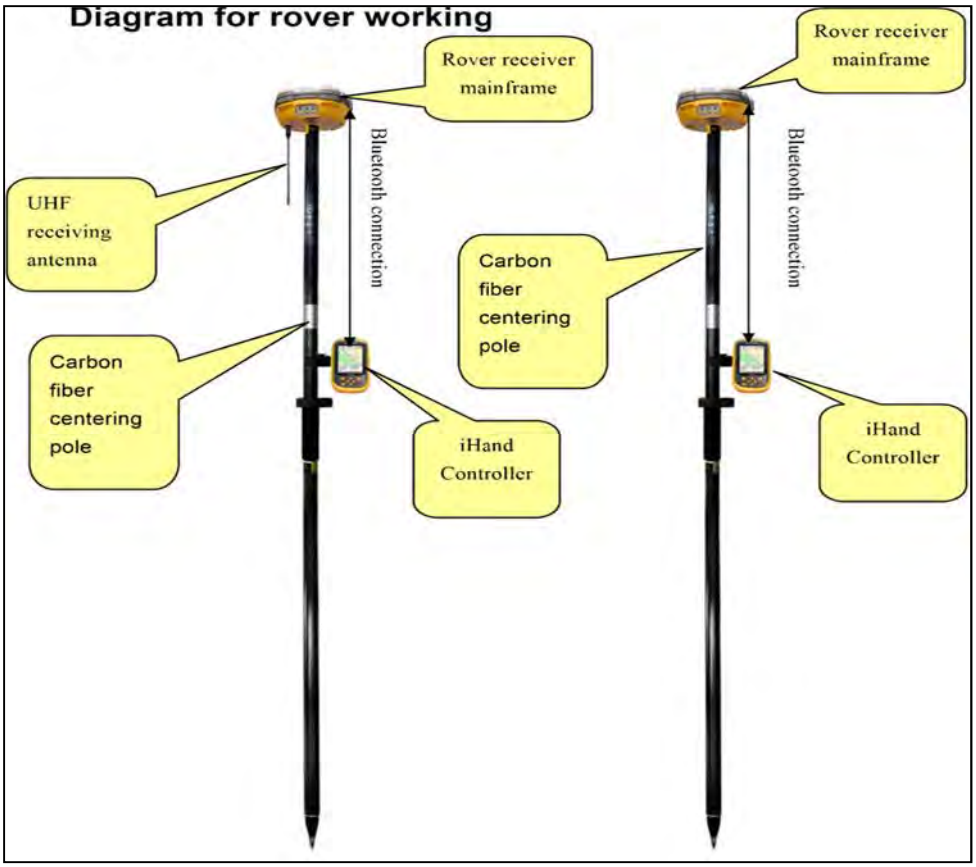


Figure 2: Rover Receiver configuration

5.0 Detailing

Apapa Road Substation is peculiar due to its very limited land space and presence of heavy equipments including GIS control room and 132KV gantry on top of the control building, therefore, detailing of this substation involves the use of Total station and Differential GPS in acquiring spatial data necessary to fix the positions of features in the substation. The instrument was taken to the edges of the features, e.g. road, Transformers, Gantries, Control Panels, Towers, Equipment Supports, etc, to determine their position, shapes and also the topological relationship between the features and the land parcel. Different point identification numbers and codes were used for various features within Akangba Substation.

Figure 3: Detailing and capturing of terrain data.

Figure 4: Detailing of some features on project site.

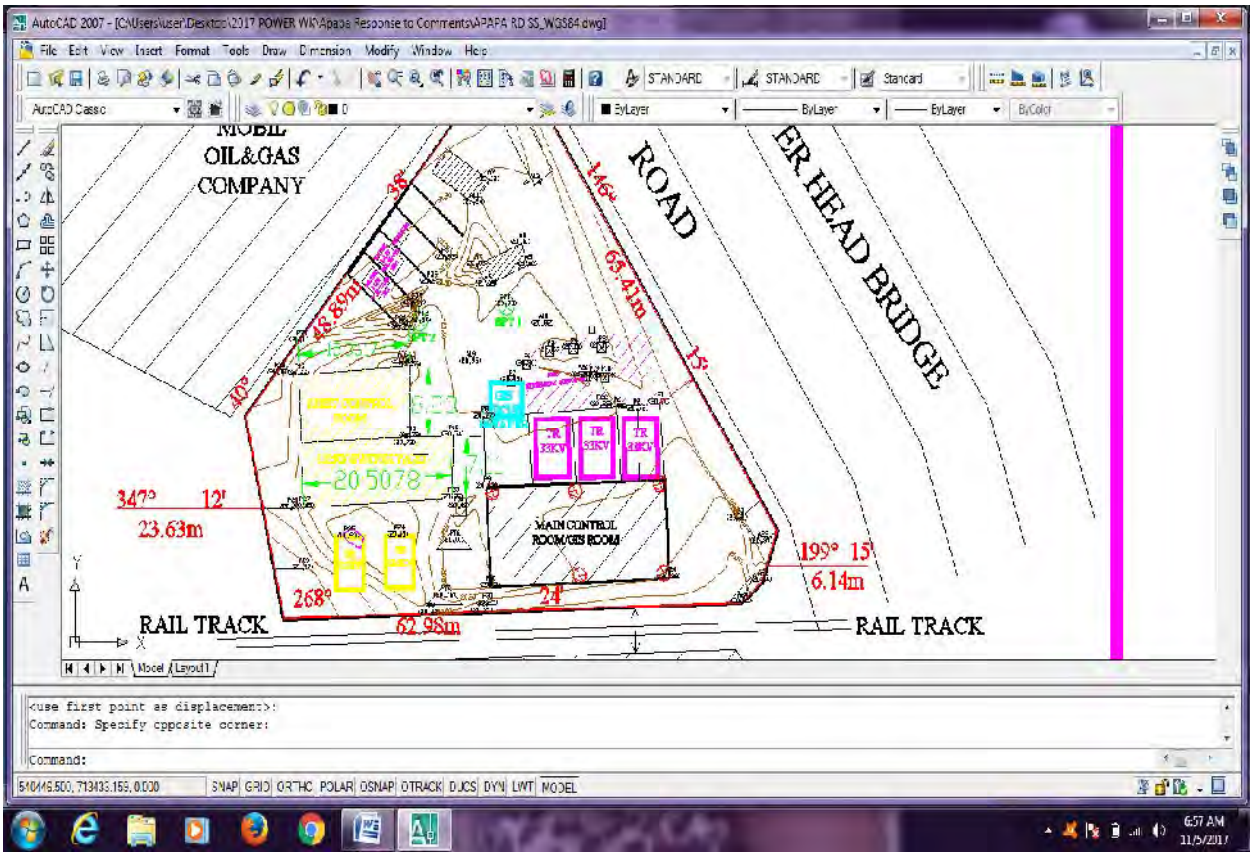
6.0 Conclusion

The survey of the project site was concluded and that the final output (Topographical plan) was satisfactorily okay as a result of the level of accuracy attained and the appropriate observational procedures that were strictly followed. The plan now could be used for various planning purposes, at different levels of required information, in the development efforts within the project area.

APPENDIX A: SAMPLE LIST OF COORDINATES

PID	E	N	H	DESCRIPTION
P1	540535.630	713313.462	20.698	Equip support
P2	540529.663	713312.958	20.817	Equip support
P3	540527.612	713319.803	21.113	33KV EQUIPMENT SUPPORTS
P4	540523.729	713319.628	21.104	33KV EQUIPMENT SUPPORTS
P5	540520.507	713319.362	21.158	33KV EQUIPMENT SUPPORTS
P6	540517.345	713317.812	20.804	33KV EQUIPMENT SUPPORTS
P7	540515.260	713315.971	20.951	33KV EQUIPMENT SUPPORTS
P8	540511.450	713311.822	20.770	GIS CIRCUIT BREAKER
P9	540511.816	713303.722	20.689	GIS CIRCUIT BREAKER
P10	540512.426	713292.479	20.813	MAIN CONTROL ROOM / GIS ROOM
P11	540508.062	713301.454	20.422	
P12	540507.260	713309.643	20.742	132KV SWITCH YARD
P13	540501.349	713309.484	20.778	132KV SWITCH YARD
P14	540501.362	713317.721	20.558	132KV SWITCH YARD
P15	540486.040	713316.618	20.664	132KV SWITCH YARD
P16	540507.361	713297.627	21.004	MAST
P17	540506.099	713291.300	20.764	MAST
P18	540528.220	713316.477	20.763	33KV EQUIPMENT SUPPORTS
P19	540526.546	713316.456	20.827	33KV EQUIPMENT SUPPORTS
P20	540524.974	713316.515	20.782	33KV EQUIPMENT SUPPORTS
P21	540532.583	713312.689	20.724	33KV TRANSFORMER

APPENDIX B: TOPOGRAPHIC MAP OF APAPA ROAD SUBSTATION



TRANSMISSION COMPANY OF NIGERIA
TOPOGRAPHICAL SURVEY
OF
APAPA SUBSTATION, APAPA, LAGOS , LAGOS STATE.
ORIGIN:UTM WGS84 (ZONE 31)
AREA: 3177.818qm

LEGEND

- CROSS SECTIONS
- PROFILES
- CPT AND SPT LOCATION
- GANTRY
- TOWER
- 132 KV TRANSFORMER (TR 132KV)
- 33 KV TRANSFORMER (TR 33KV)
- GIS CIRCUIT BREAKER (GIS CIRCUIT BREAKER)
- TRANSMISSION LINE
- COMMUNICATION MAST
- INDEX CONTOUR (20)

Reference Drawings

Drawing No.:	Title:

☐ Approved ☐ Approved with comments ☐ Not Approved ☐ For Information

Date: _____ Signature/Stamp: _____ Project Consultant

TRANSMISSION COMPANY OF NIGERIA

Japan International Cooperation Agency

YACHIYO ENGINEERING CO.,LTD.
Consulting Engineers & Architects

Best & Crompton Engineering Limited

SURVEYED BY: PENGATE

	Name	Date:	
Prepared:	J.AMAGLO	12.2017	Project: APAPA ROADSIDE SUBSTATION
Drawn:	J.AMAGLO	12.2017	
Checked:	S.ISHOLA	12.2017	Title: TOPOGRAPHIC SURVEY
Approved:			

Project Drawing No. DC-132-XXX-X-X-X

Drawing Detail
Lot :

Revisions No.	Name	Date	Notes / Description
B			
A			
0		12.11.17	First Issue

SCALE: H=1:200 V=1:200 | Contractor's Drawing No. XX-XXX-XXX-X-X-X | Sheet No. 1 | Total Sheet 1

TOPOGRAPHIC SURVEY REPORT

AKANGBA SUBSTATION LAGOS STATE

SURVEYED AND SUBMITTED

BY

Ψ PENGATE GLOBAL SERVICES LTD

(REGISTERED SURVEYORS)

SURVEYING, & GEOINFORMATICS CONSULTANTS

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Near Games Village, Kaura District, Abuja

AUGUST 2017

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Appendices

1.0 Background

The location of the project site is Akangba in the Surulere Local Government Area, Lagos State.

2.0 INTRODUCTION:

Topographical surveying is a three-dimensional (3-D) survey technique. It employs the technique of determining the true position (X, Y) of features (man-made and natural) and the heights of points over a particular area or portion of the earth's surface. The relief or configuration of a terrain are located by measurement and depicted on a topographical map thus explains facts in reality of the ground terrain. Within the limits of scale, it shows as accurately as possible the location and shape of both natural and man-made features

3.0 Scope of Work.

The scope of work involves Topographical Survey of Akangba substation

a. To determine the size and the direction of the boundary line of the substation.
b. To determine the Topography of the terrain.
c. To determine the location of all Towers, Transformers, Gantries, and all the equipment support in the 132 KV and 33 KV switchyards. Also, all buildings and other man-made features in the Substation in order to have a fair knowledge of the vacant areas within the substation.

The objective of the detailed topographic survey is to determine the 3D Coordinates (X, Y, and Z) at 10m grid interval within the substation. The survey involves the data capture of all permanent features including all the existing roads, control rooms and offices, 132KV Towers and Gantries, 33KV towers and equipment supports, Transformers, switchyards and wet areas. The Topographic detailed survey covers an area of approximately 112813.429 square meters.

Figure 1 Enclosed boundary of Akangba Substation Site

4.0 Methodology

Differential Global Positioning System was used to observe direct coordinates of points. With the use of a dual frequency, 220 channel Hi-Target receivers which are capable of tracking the American Satellites-GPS and the Russian Satellites-GLONASS, with centimeter accuracy, data was captured in 3-dimension, i.e., X, Y, and Z.

Since the control points had been checked and their reliability ensured, the base receiver (also known as Reference) was set on the Control Point. The Rover GPS receiver was switched on and set up. The "survey" icon on the data logger was selected, and the station parameters were set to conform to the coordinate system to be used. By entering the pillar identification value and the receiver's antenna height through the data logger, the coordinates as keyed were confirmed by putting the rover pole on the Control Point. The verticality of the tracking rod carrying the rover receiver was ensured by checking the plumb (circular bubble attached to the tracking rod) each time an observation is made.

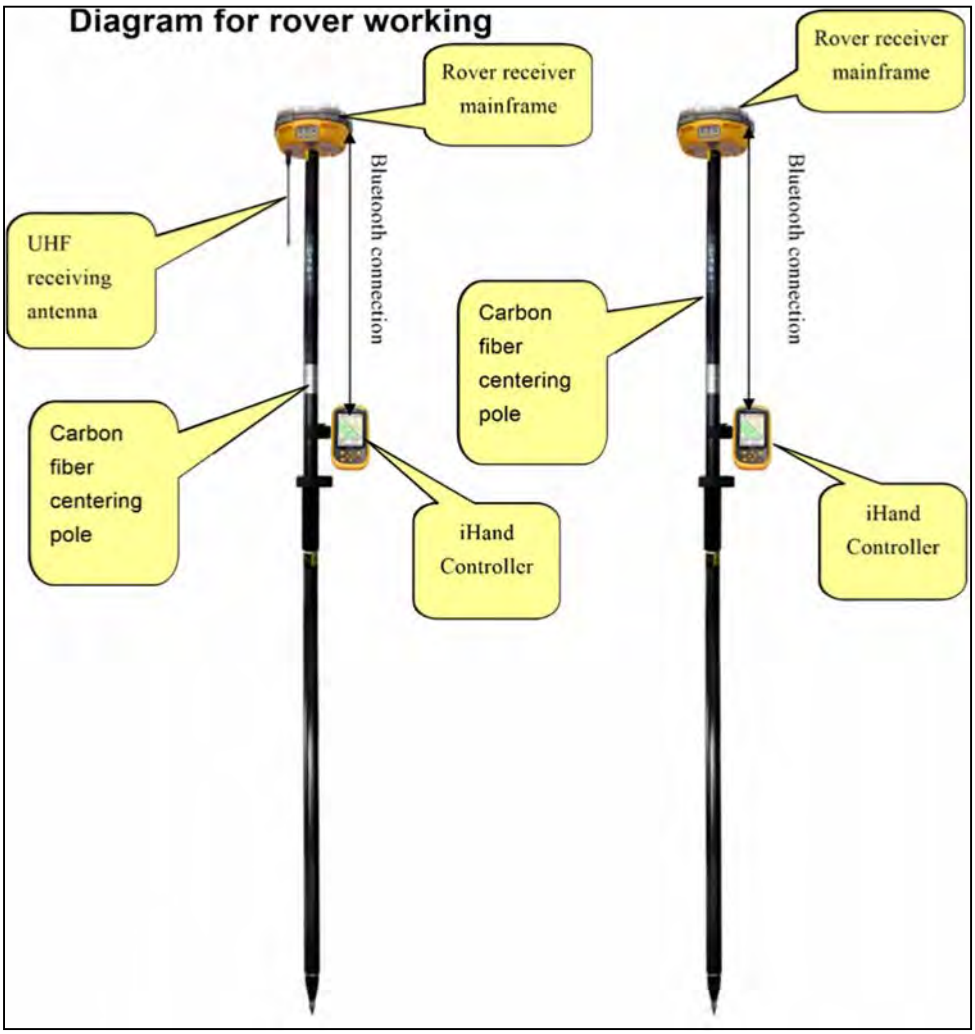


Figure 2: Rover Receiver Configuration

The rover was taken to the first boundary point, and all necessary data such as the point identification value and codes were keyed in, coordinate data were captured in 3-dimension, i.e., X, Y, and Z. The process was repeated at each boundary pillar until all boundary points were captured.

Using the GNSS in the RTK Mode enables the levels to be determined at any arbitrary point within the substation. All data were captured in the NIGERIAN NATIONAL GRID MINNA

DATUM UTM ZONE 31 as required by the Surveyors Council of Nigeria (SURCON) for all survey works in Nigeria.

5.0 DETAILING:

This is the process of acquiring spatial data necessary to fix the positions of features in the project area. The instrument was taken to the edges of the features, e.g., road, transformers, gantries, control panels, towers, equipment supports, etc., to determine their position, shapes and also the topological relationship between the features and the land parcel. Different point identification numbers and codes were used for various features within the Akangba Substation.

Figure 3: Detailing and capturing terrain data.

Figure 4: Detailing of salient features in the project site.

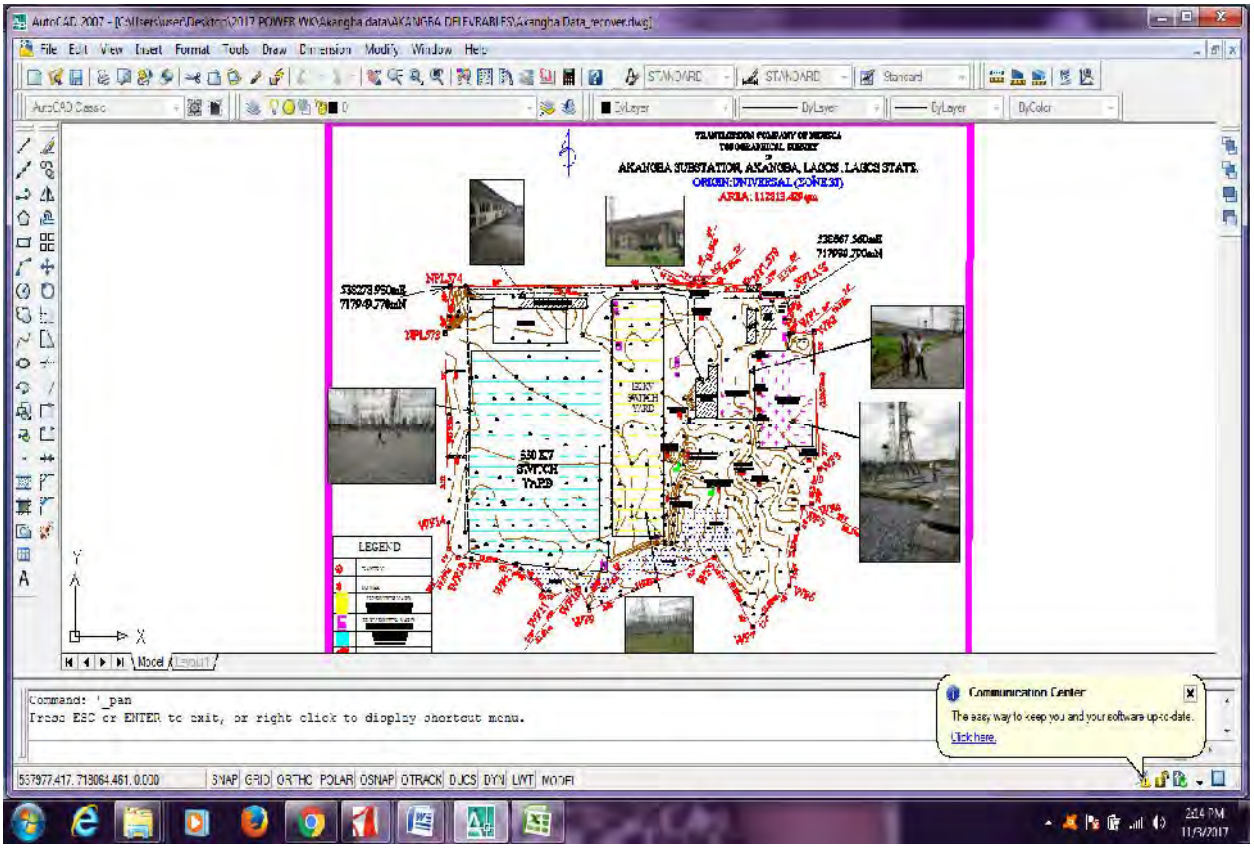
6.0 Conclusion

The survey of the project site was completed, and it is worth mentioning that, by the use of a modern, sophisticated Real Time Kinematic GPS, the survey was completed on a record time.

APPENDIX A: SAMPLE LIST OF COORDINATES

PID	EASTING	NORTHING	HEIGHT	DESCRIPTION
BM	538551.48	717820.23	10.01	
1	538520.54	717820.90	9.74	
2	538540.13	717820.65	9.61	
3	538558.25	717818.97	9.82	
4	538576.46	717818.60	9.73	
5	538595.35	717816.96	9.61	
6	538595.36	717804.39	9.65	
7	538594.11	717790.74	9.24	
8	538572.32	717793.39	9.47	
9	538572.15	717806.49	9.50	
10	538558.62	717807.04	9.56	
11	538558.81	717794.69	9.50	
12	538539.38	717795.18	9.31	
13	538540.19	717807.99	9.54	
14	538520.07	717810.78	9.71	
15	538521.23	717797.92	9.59	
16	538524.74	717784.08	9.41	
17	538539.63	717781.38	9.37	
18	538522.73	717762.44	9.49	
19	538528.75	717762.98	9.37	
20	538537.01	717761.32	8.29	
21	538535.46	717751.84	8.50	
22	538531.64	717749.81	8.94	
23	538527.40	717749.86	9.38	
24	538535.25	717735.87	8.32	
25	538529.44	717734.69	8.81	
26	538520.95	717734.27	9.71	
27	538519.49	717725.50	9.54	
28	538528.59	717725.39	8.67	
29	538527.61	717716.81	8.71	
30	538533.97	717715.56	8.36	
31	538532.62	717709.14	8.50	
32	538526.40	717709.36	9.12	
33	538518.42	717710.20	9.47	
34	538518.77	717706.89	8.86	

APPENDIX B: TOPOGRAPHIC MAP OF AKANGBA SUBSTATION

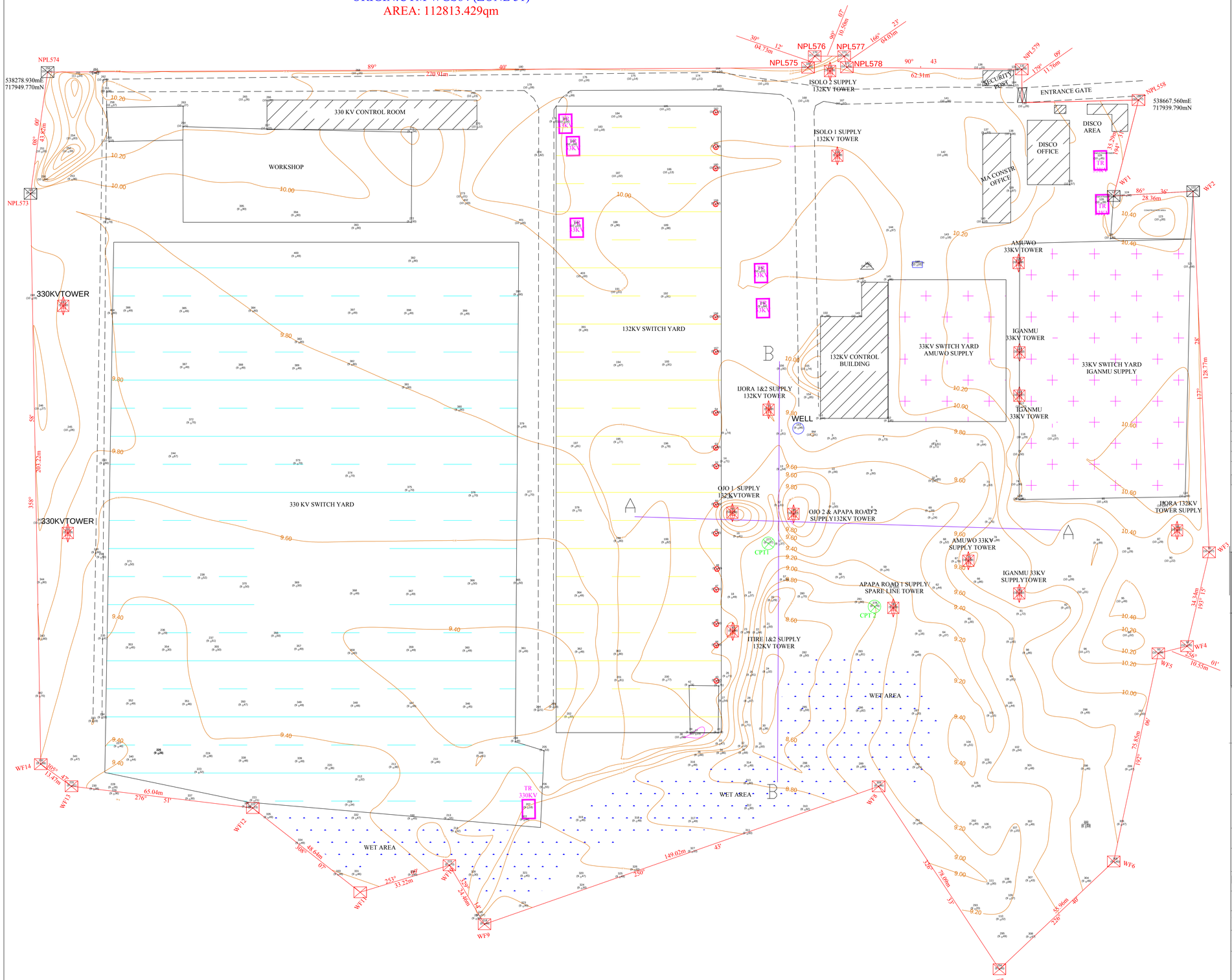


TRANSMISSION COMPANY OF NIGERIA
TOPOGRAPHICAL SURVEY
OF

AKANGBA SUBSTATION, AKANGBA, LAGOS , LAGOS STATE.

ORIGIN:UTM WGS84 (ZONE 31)

AREA: 112813.429qm



LEGEND

- CROSS SECTIONS
- PROFILES
- CPT AND SPT LOCATION
- GANTRY
- TOWER
- TR 132KV — 132 KV TRANSFORMER
- TR 33KV — 33 KV TRANSFORMER
- GIS CIRCUIT BREAKER — GIS CIRCUIT BREAKER
- TRANSMISSION LINE
- COMMUNICATION MAST
- 20 — INDEX CONTOUR
- 132 SWITCH YARD (EQUIPMENT SUPPORTS AND TRANSFORMERS)
- 33 KV SWITCH YARD (EQUIPMENT SUPPORTS)
- 330KV SWITCH YARD (EQUIPMENT SUPPORTS AND TRANSFORMERS)

Reference Drawings

Drawing No.:	Title:

☐ Approved ☐ Approved with comments ☐ Not Approved ☐ For Information

Date: _____ Signature/Stamp: _____ Project Consultant

TRANSMISSION COMPANY OF NIGERIA

Japan International Cooperation Agency

YACHIYO ENGINEERING CO.,LTD. Consulting Engineers & Architects

Best & Crompton Engineering Limited

SURVEYED BY: PENGATE

Project Drawing No. DC-132-XXX-X-X-X

	Name	Date:
Prepared:	J.AMAGLO	12.2017
Drawn:	J.AMAGLO	12.2017
Checked:	S.ISHOLA	12.2017
Approved:		

Drawing Detail
Lot :
Project: AKANGBA SUBSTATION
Title: TOPOGRAPHIC SURVEY

PAPER SIZE: 841mm X 1189mm (A0-SIZE)

Revisions No.	Name	Date	Notes / Description
B			
A			
0		12.11.17	First Issue

SCALE: H=1:500 Contractor's Drawing No. XX-XXX-XXXX-X-X Sheet No. 1 Total Sheet 1