

**PREPARATORY SURVEY REPORT**  
**ON**  
**THE PROJECT FOR CONSTRUCTION OF**  
**ADDITIONAL CLASSROOMS FOR PRIMARY**  
**SCHOOLS (PHASE II)**  
**IN**  
**THE FEDERAL REPUBLIC OF NIGERIA**  
**FINAL REPORT**

**JULY 2010**

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

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**YACHIYO ENGINEERING CO., LTD.**

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## **PREFACE**

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey on the Project for Construction of Additional Classrooms for Primary Schools (Phase II) of Federal Republic of Nigeria, and organized a survey team headed by Mr. Tetsuo YATSU of Yachiyo Engineering Co., Ltd. between September 2009 to June 2010.

The survey team held a series of discussion with the officials concerned of the Government of Nigeria, and conducted a field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Nigeria for their close cooperation extended to the survey team.

July 2010

Ms. Nobuko KAYASHIMA  
Director General,  
Human Development Department,  
Japan International Cooperation Agency (JICA)

## SUMMARY

### (1) Outline of the Country

The Federal Republic of Nigeria (hereinafter referred to as "Nigeria") is by far the most populated country in Africa with a population of 140,000,542 (2007 census) over a national land area of 924,000 km<sup>2</sup>. With a GDP per capita of US\$ 1,128 (PPP), Nigeria is ranked 158<sup>th</sup> among 177 countries in terms of the "Human Development Index (HDI) 2005" of the United Nations Development Programme. The World Bank estimates Nigeria's GDI per capita (2007) to be US\$ 920.

From an administrative point of view, Nigeria comprises 36 states and the Federal Capital Territory (FCT) and there is a total of 774 local government areas (LGAs).

In his inaugural economic policy statement in 1999, President Obasanjo of the former government defined Nigeria's economic system as a private sector-led free market economy which is humane and open to the public. The policy aimed at revitalising Nigeria's economy to create new employment opportunities through economic growth in order to improve the standard of living of the general public.

President Yar'Adua who replaced President Obasanjo in May, 2007 adopted the Seven Point Agenda for economic development, prioritising such issues as ① power and energy, ② food security, ③ land reform, ④ education and human capital development, ⑤ national security and energy security, ⑥ wealth creation and ⑦ transport and infrastructure development.

Nigeria is the fifth largest oil producing country (2006) among OPEC members and its average annual oil revenues substantially increased from US\$ 15 billion for 2000 through 2003 to US\$ 36 billion for 2005 through 2008 due to the price hike of crude oil. Despite the remarkable economic growth in recent years, the GDI per capita of US\$ 920 (World Bank data for 2007) is still low.

Primary (agriculture), secondary (mining and manufacturing) and tertiary (service) industries account for 33%, 39% and 28% of the country's industrial output respectively. The oil sector accounts for some 20% of the GDP and some 90% of the export revenue. The agricultural sector accounts for some 40% of the GDP, reflecting the fact that small farmers form a large majority of the population. World Bank statistics for 2007 show that Nigeria had an annual economic growth rate of 5.9% and a price inflation rate of 5.1%. The total trade values were some US\$ 66.2 billion for exports and some US\$ 49.6 billion for imports.

## (2) Background of the Project

Nigeria's net enrolment rate for primary education of approximately 63% is still low compared to neighbouring countries and the National Economic Empowerment Development Strategy (NEEDS) 2003 - 2007 identified the capacity building of people, including the consolidation of education, to be an important pillar of the development strategy. The 10 Year Strategic Plan formulated in 2007 by the Federal Ministry of Education calls for "the improvement of physical infrastructure" as a priority target.

The Government of Nigeria has been making active efforts to increase the number of schools and classrooms and Japan has been contributing to these efforts through the Project for the Construction of Additional Classrooms for Primary Schools, featuring Niger, Plateau and Kaduna States. In three stages, 490 classrooms at 70 schools, 13 principal's offices, 382 toilet cubicles and 19 wells have been constructed, alleviating the desperate shortage of classrooms. Despite such progress, however there is still a substantial shortage of primary school classrooms throughout the country, especially in remote states. Under these circumstances, the Government of Nigeria made a request to the Government of Japan for the provision of grant aid for the construction of some 1,200 classrooms in six states suffering an acute classroom shortage. These states are Kano, Katsina, Ebonyi, Oyo, Borno and Adamawa. In general, the enrolment ratio for primary education in these states is lower than the national average and the average number of pupils per class is 60 - 85 which is far above the standard class size of 40 pupils in Nigeria, making the urgent construction of new classrooms a matter of necessity.

## (3) Outline of the Study Findings and Project Contents

In response to this request, the Government of Japan conducted a preliminary study for the Project for the Construction of Additional Classrooms for Primary Schools Phase II and this study confirmed the extreme shortage of primary school classrooms in these states. At the time of this preliminary study, the Nigerian side added Gombe State to the scope of the Project to feature 2,341 classrooms of 313 primary schools in seven stages. Meanwhile, the Preliminary Study Team found that the technical level of local construction companies would pose more than expected problems for the application of the Grant Aid for Community Empowerment Scheme.

The present study has been conducted with a view to alleviating the classroom shortage at primary schools in Nigeria based on the local specifications and design while assuming the application of the JICA's Grant Aid for Community Empowerment Scheme newly created in FY 2006. The primary objectives of the Study are the selection of the target primary schools of the Project, basic design, formulation of a project implementation plan, estimation of the project cost and compilation of

reference materials for the preparation of the tender documents. Experimental construction work (involving the construction of two school buildings of the three classroom type) was conducted during the study period to find possible solutions to identified problems for the application of the Grant Aid for Community Empowerment Scheme.

Following its return to Japan, the Study Team compiled the following basic framework for the Project based on the field survey findings and results of consultations with the Nigerian side.

#### Contents and Scale of the Planned Facilities (Buildings)

Name of Facility	Structural Details	Type of Facility	Total Floor Area (m <sup>2</sup> )		
			Per Building	No. of Buildings	Total
Classroom Building	<ul style="list-style-type: none"> <li>• Structure: reinforced concrete</li> <li>• No. of stories: single story</li> <li>• Walls: block masonry with mortar and paint finish</li> <li>• Floor: mortar with trowel finish</li> <li>• Roof: long aluminium sheets</li> </ul>	Classroom	216.0 m <sup>2</sup> ~ 360.0 m <sup>2</sup>	71	20,664 m <sup>2</sup>
Toilet Building	<ul style="list-style-type: none"> <li>• Structure: concrete block masonry</li> <li>• Walls: mortar and paint finish</li> <li>• Roof: long aluminium sheets</li> </ul>	Toilets	13.0 m <sup>2</sup> ~ 19.5 m <sup>2</sup>	55	884.0 m <sup>2</sup>
Total					21,548 m <sup>2</sup>

#### Contents and Scale of the Planned Facilities (Furniture)

Type	Material	Type of Facility	Quantity (Sets)	Remarks
Furniture/ Fixtures	Two seater wood	Pupils' desks and chairs	5,740	40 pupils/classroom
	Wood	Teachers' desks and chairs	287	One set/classroom
	Plywood with frame	Blackboard	287	Blackboard paint finish
	Plywood with frame	Noticeboard	287	Paint finish

#### (4) Project Period and Estimated Project Cost

##### **Nondisclosure of cost information**

The principal expenses to be borne by the Nigerian side will be the land preparation cost, repair cost of access roads to the construction sites and bank commission for the opening of the project account. The project period is likely to be some 20.0 months from the tender to the completion of the construction work.

**Present Conditions of the Target Schools of the Project and Contents and Scale of the Japanese Assistance**

STATE UNIVERSAL BASIC EDUCATION BOARD (SUBEB), KANO					Classroom Building					Toilet House				Furniture			
No.	Name of Schools	LGA	Pupil's Total 2008/2009	Existing Classroom	Type of Classroom			TOTAL of Classroom	Floor Area TOTAL (m2)	Type of Booth		TOTAL of Booth	Floor Area TOTAL (m2)	Table & Bench 20.0	Desk & Chair 1.0	Notice Board 1.0	Black board 1.0
					3 216.0	4 288.0	5 360.0			4 13.0	6 19.5						
15	BICHI KANTI P.S	Bichi	1,230	8	2	0	3	21	1,512.0	2	2	20	65.0	420	21	21	21
16	BADUME S/MODEL	Bichi	678	9	0	2	0	8	576.0	2	0	8	26.0	160	8	8	8
41	DANBATTA KANTI P.S	Danbatta	604	4	1	2	0	11	792.0	1	1	10	32.5	220	11	11	11
20	KWA P.S	Dawakin Tofa	563	8	2	0	0	6	432.0	0	1	6	19.5	120	6	6	6
19	TUMFAFI P.S	Dawakin Tofa	989	12	1	0	2	13	936.0	0	2	12	39.0	260	13	13	13
18	JALLI P.S	Dawakin Tofa	470	6	2	0	0	6	432.0	0	1	6	19.5	120	6	6	6
33	DOGWA SPECIAL	Doguwa	801	6	0	1	2	14	1,008.0	2	1	14	45.5	280	14	14	14
32	TAGWAYE P.S	Doguwa	708	7	1	2	0	11	792.0	1	1	10	32.5	220	11	11	11
8	NATSUGUNNE P.S	Fagge	604	9	2	0	0	6	432.0	0	1	6	19.5	120	6	6	6
23	ZAKIRAI YAMMA P.S	Gabasawa	689	6	1	2	0	11	792.0	1	1	10	32.5	220	11	11	11
7	AMARYAWA P.S	Gaya	983	6	0	1	3	19	1,368.0	0	3	18	58.5	380	19	19	19
39	ZANGO P.S	Gezawa	605	7	0	2	0	8	576.0	2	0	8	26.0	160	8	8	8
40	DANMADANHO P.S	Gezawa	515	6	1	1	0	7	504.0	0	1	6	19.5	140	7	7	7
36	T/GARU P.S	Gwarzo	954	11	2	0	0	6	432.0	0	1	6	19.5	120	6	6	6
30	BALAN P.S	Kabo	799	8	2	0	0	6	432.0	0	1	6	19.5	120	6	6	6
12	T/KAYA	Karaye	749	5	0	1	2	14	1,008.0	2	1	14	45.5	280	14	14	14
14	YOLA Z/GARI	Karaye	566	6	0	2	0	8	576.0	2	0	8	26.0	160	8	8	8
11	KUMBUGAWA P.S	Karaye	440	6	0	0	1	5	360.0	1	0	4	13.0	100	5	5	5
43	FASSI "A" P.S	Kibiya	768	7	0	3	0	12	864.0	0	2	12	39.0	240	12	12	12
49	BUREMAWA	Kiru	518	8	0	0	1	5	360.0	1	0	4	13.0	100	5	5	5
22	KUMBOTSO SPS	Kumbotso	1,093	9	0	1	1	9	648.0	2	0	8	26.0	180	9	9	9
48	ALKALAWA P.S	Kura	888	6	0	4	0	16	1,152.0	1	2	16	52.0	320	16	16	16
27	CHINKOSO TUDU	Madobi	345	4	0	0	1	5	360.0	1	0	4	13.0	100	5	5	5
26	KWANKWASO P.S	Madobi	833	12	0	1	1	9	648.0	2	0	8	26.0	180	9	9	9
3	RANO DAWAKI SPS	Rano	608	5	0	0	2	10	720.0	1	1	10	32.5	200	10	10	10
4	RURUM SCIENCE	Rano	843	10	1	2	0	11	792.0	1	1	10	32.5	220	11	11	11
5	RUWAN KANYA	Rano	311	4	0	1	0	4	288.0	1	0	4	13.0	80	4	4	4
28	KADANA P.S	Rogo	319	4	0	1	0	4	288.0	1	0	4	13.0	80	4	4	4
38	INDABO CENTRAL	Wudil	981	8	1	1	2	17	1,224.0	1	2	16	52.0	340	17	17	17
50	LAMB SCIENCE	Toffa	1,155	18	0	0	1	5	360.0	1	0	4	13.0	100	5	5	5
<b>TOTAL</b>					<b>19</b>	<b>30</b>	<b>22</b>	<b>287</b>	<b>20,664.0</b>	<b>29</b>	<b>26</b>	<b>272</b>	<b>884.0</b>	<b>5,740</b>	<b>287</b>	<b>287</b>	<b>287</b>
					<b>71</b>			<b>287</b>	<b>20,664.0</b>	<b>55</b>		<b>272</b>	<b>884.0</b>				
					<b>57</b>	<b>120</b>	<b>110</b>	<b>classroom</b>		<b>116</b>	<b>156</b>	<b>booth</b>					

## (5) Project Evaluation

The government body responsible for the Project on the Nigerian side will be the Universal Basic Education Commission (UBEC) while the State Universal Basic Education Board (SUBEB) in each target state will be responsible for coordination and collaboration with the local government which has jurisdiction over each project site.

In Nigeria, the Local Government Education Authority (LGEA) of each local government is in charge of basic education and its primary responsibilities are the assignment/transfer of teachers and everyday school management. It may provide a small amount of the maintenance cost towards the construction and repair of classrooms but no annual budget is formalised. The LGEA is headed by the Education Secretary and has four sections responsible for primary education, personnel affairs, planning and finance respectively.

Against this background, 30 target schools of the Project have a total of 536 teachers for Year 2008/2009. This means that the teacher-pupil ratio at these schools is an average of 40.3 pupils which is almost equivalent to the national standard. The number of existing classrooms at these schools of 225 will increase to 512 when the Project has been completed (225 existing classrooms + 287 new classrooms). Even though the number of classrooms will increase, the retaining of the present number of teachers will produce a teacher-classroom ratio of 1.04 teachers/classroom, making the recruitment of new teachers unnecessary. As the Project consists of the construction of additional classrooms on existing school premises, the operating expenses, including salaries and benefits for teachers, will continue to be paid by each LGEA.

Because of the nature of the Project, i.e. the construction of additional classrooms at existing primary schools, and the prospect of both teachers and the maintenance cost being adequately met as described above, it is reasonable to judge that the newly constructed facilities (classrooms and toilets) will be properly used in the years to come.

The Project is expected to produce the following direct and indirect effects.

- ① Direct effects: improvement of the educational environment
  - i) 287 new classrooms will be constructed at the 30 target schools, providing safe and clean classrooms for some 21,600 pupils.
  - ii) The average number of pupils per classroom at the 30 target schools will be 42.2 pupils, expanding the educational opportunity for many more local children.

iii) A maintenance manual will be prepared under the soft component of the Project, strengthening the operation and maintenance system for school facilities.

② Indirect effects

i) With the newly constructed hygienic toilets, the hygiene environment at each target school will be improved.

ii) The construction of classrooms equipped with appropriate educational furniture will enable efficient and effective teaching.

As the Project is expected to achieve great benefits as described above with no operation or maintenance problems, its implementation under Japan's grant aid scheme is judged to be highly appropriate.



# CONTENTS

Preface	
Summary	
Contents	
Location Map / Perspective	
List of Figures & Tables	
Abbreviations	
Chapter 1. Background of the Project .....	1- 1
1-1 Background of Japanese Assistance .....	1- 1
1-1-1 Background of the Request .....	1- 1
1-1-2 Contents of the Request and Their Modifications .....	1- 2
1-1-3 Requested Components .....	1- 4
1-2 Natural Conditions .....	1- 4
1-2-1 Temperature and Rainfall .....	1- 5
1-2-2 Wind Direction and Wind Velocity .....	1- 6
1-2-3 Earthquakes and Other Natural Disasters .....	1- 6
1-3 Environmental Consideration .....	1- 7
Chapter 2. Contents of the Project .....	2- 1
2-1 Basic Concept of the Project .....	2- 1
2-1-1 Higher Goal and Project Goal .....	2- 1
2-1-1-1 Higher Goal .....	2- 1
2-1-1-2 Project Goals .....	2- 1
2-1-2 Outline of the Project .....	2- 1
2-1-2-1 Current Conditions and Problems in the Sector .....	2- 1
2-1-2-2 Project components .....	2- 2
2-2 Outline Design of the Japanese Assistance .....	2- 3
2-2-1 Design Policy .....	2- 3
2-2-1-1 Basic Policy .....	2- 3
2-2-1-2 Policy regarding Natural Conditions and Construction Conditions .....	2- 3
2-2-1-3 Policy regarding Social Conditions .....	2- 4
2-2-1-4 Policy regarding the Construction Situation and Utilization of Local Contractors and Materials .....	2- 5
2-2-1-5 Utilization of local consultants .....	2- 9
2-2-1-6 Policy regarding Operation and Maintenance Capacity of the Implementing Agency .....	2- 9

2-2-1-7	Policy regarding Setting of the Facilities Grade and Cost Reduction.....	2- 9
2-2-1-8	Policy regarding Construction Method, Procurement Method and Implementation Schedule .....	2-10
2-2-2	Basic Plan (Construction Plan / Equipment Plan) .....	2-11
2-2-2-1	Basic Plan.....	2-11
2-2-2-2	Basic Plan (Construction Plan / Equipment Plan).....	2-13
2-2-3	Outline Design Drawing.....	2-22
2-2-4	Implementation Plan.....	2-38
2-2-4-1	Implementation Policy .....	2-38
2-2-4-2	Implementation Conditions.....	2-44
2-2-4-3	Scope of Works .....	2-47
2-2-4-4	Consultant Supervision .....	2-48
2-2-4-5	Quality Control Plan .....	2-49
2-2-4-6	Procurement Plan .....	2-51
2-2-4-7	Soft Component (Technical Assistance) Plan .....	2-52
2-2-4-8	Implementation Schedule.....	2-58
2-2-4-9	Trial Construction Plan .....	2-61
2-3	Obligations of Recipient Country.....	2-73
2-3-1	General Items .....	2-73
2-3-2	Special Remarks .....	2-74
2-4	Project Operation Plan .....	2-74
2-4-1	Competent Agencies on the Nigerian Side.....	2-74
2-4-2	Maintenance of Facilities .....	2-74
2-5	Project Cost Estimation.....	2-75
2-5-1	Initial Cost Estimation.....	2-75
2-5-1-1	Cost Burden on the Nigerian Side.....	2-75
2-5-1-2	Estimation Conditions.....	2-76
2-5-2	Operation and Maintenance Cost .....	2-76
2-6	Other Relevant Issues.....	2-76
Chapter 3. Project Evaluation.....		3- 1
3-1	Preconditions for the Project .....	3- 1
3-1-1	Preconditions for Project Implementation.....	3- 1
3-1-2	Preconditions and External Factors for the Successful Completion of the Project .....	3- 1
3-2	Project Evaluation .....	3- 2
3-2-1	Relevance .....	3- 2
3-2-1-1	Type and Number of Beneficiaries .....	3- 2
3-2-1-2	Urgency.....	3- 2
3-2-1-3	Maintenance Capacity.....	3- 2

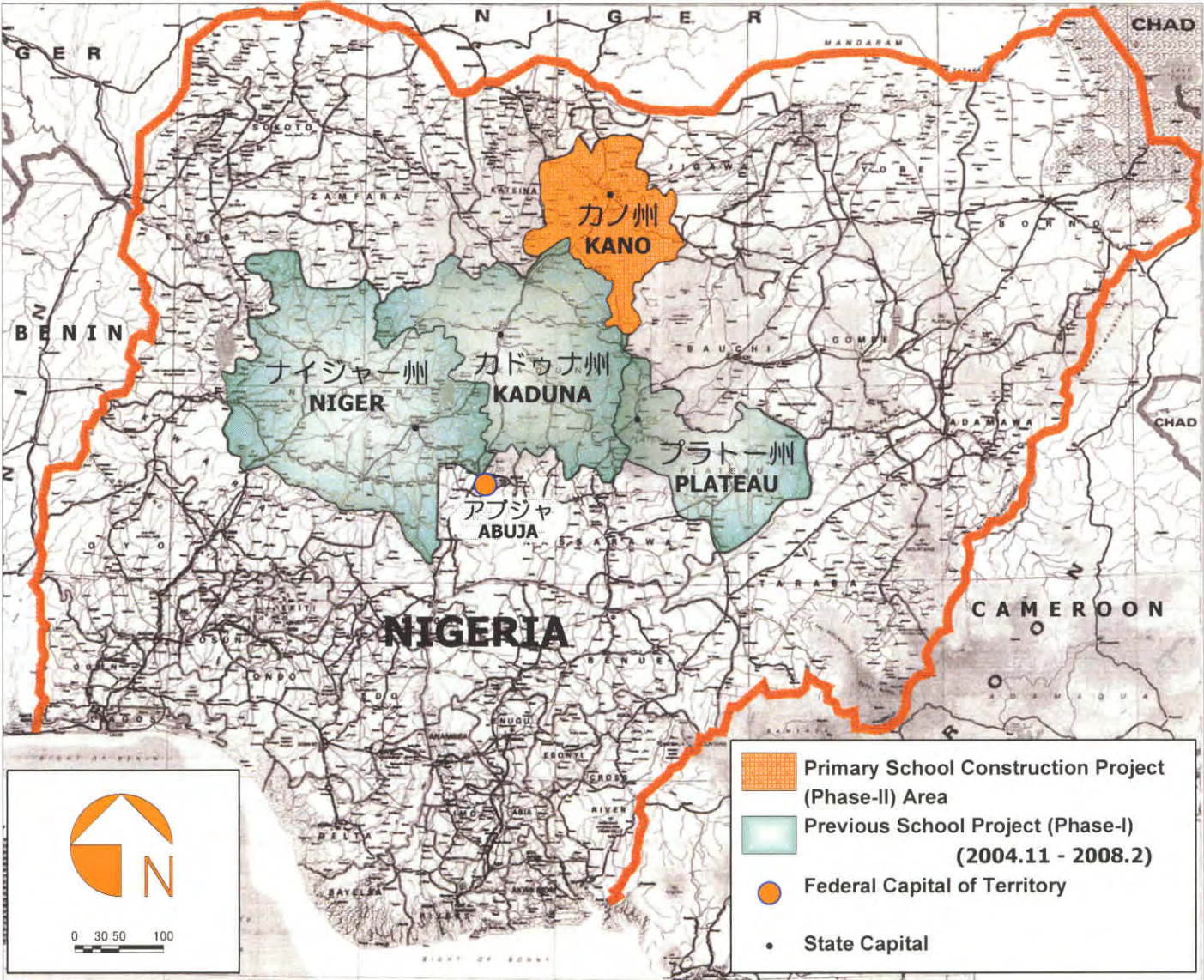
3-2-1-4 Profitability of the Project.....	3- 2
3-2-1-5 Environmental and Social Considerations .....	3- 2
3-2-1-6 Feasibility of Project Implementation Under Japan's Grant Aid Scheme .....	3- 3
3-2-2 Effectiveness.....	3- 3
3-2-2-1 Quantitative Effects.....	3- 3
3-2-2-2 Qualitative Effects.....	3- 3

## Appendices

1. Member List of the Study Team
2. Study Schedule
3. List of Parties Concerned in the Nigeria
4. Minutes of Discussions (M/D)
5. Soft Component (Technical Assistance) Plan
6. Other Relevant Data (Soil Investigation Data)



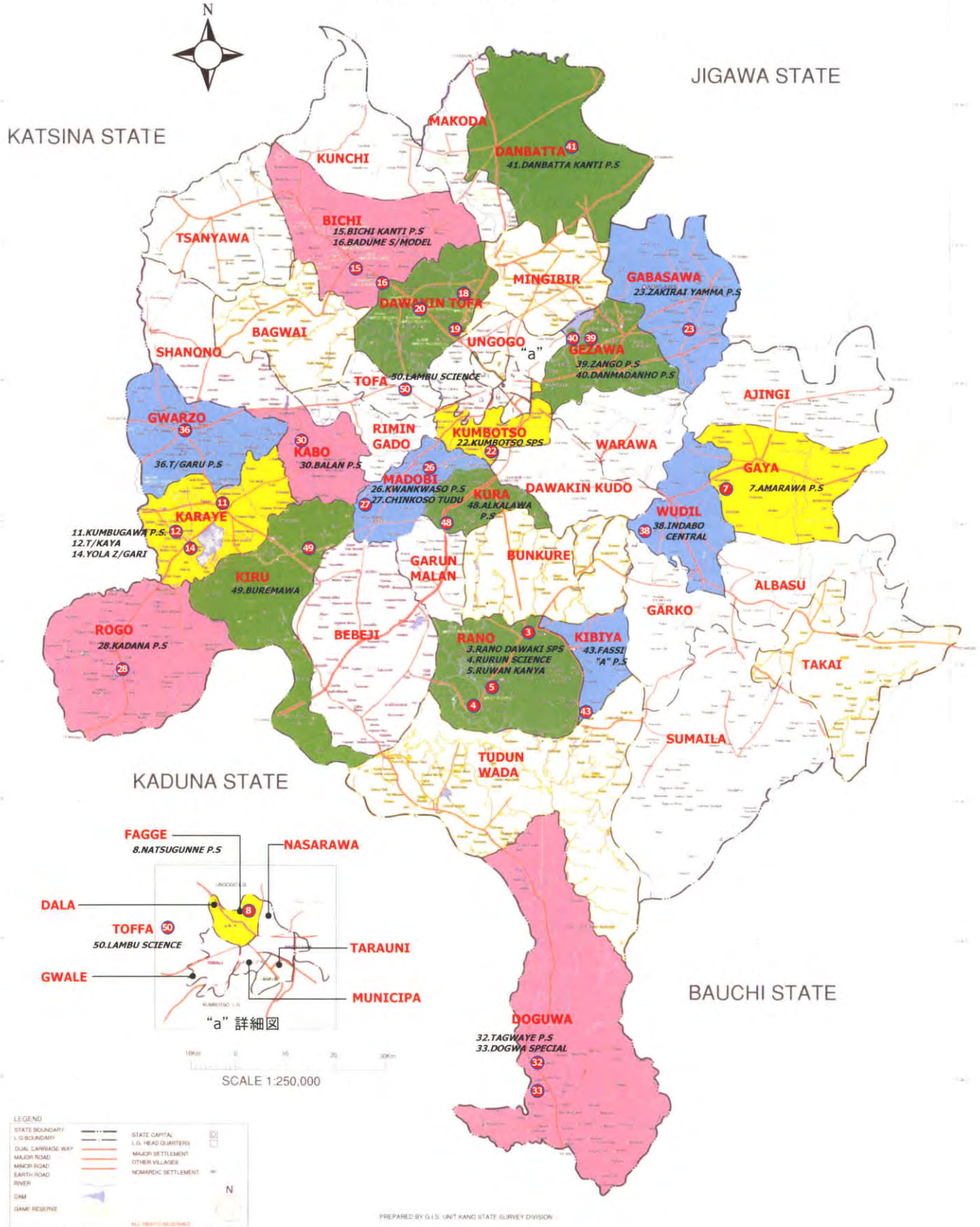
ナイジェリア連邦共和国  
Federal Republic of Nigeria



Federal Republic of Nigeria and Location of Project Site



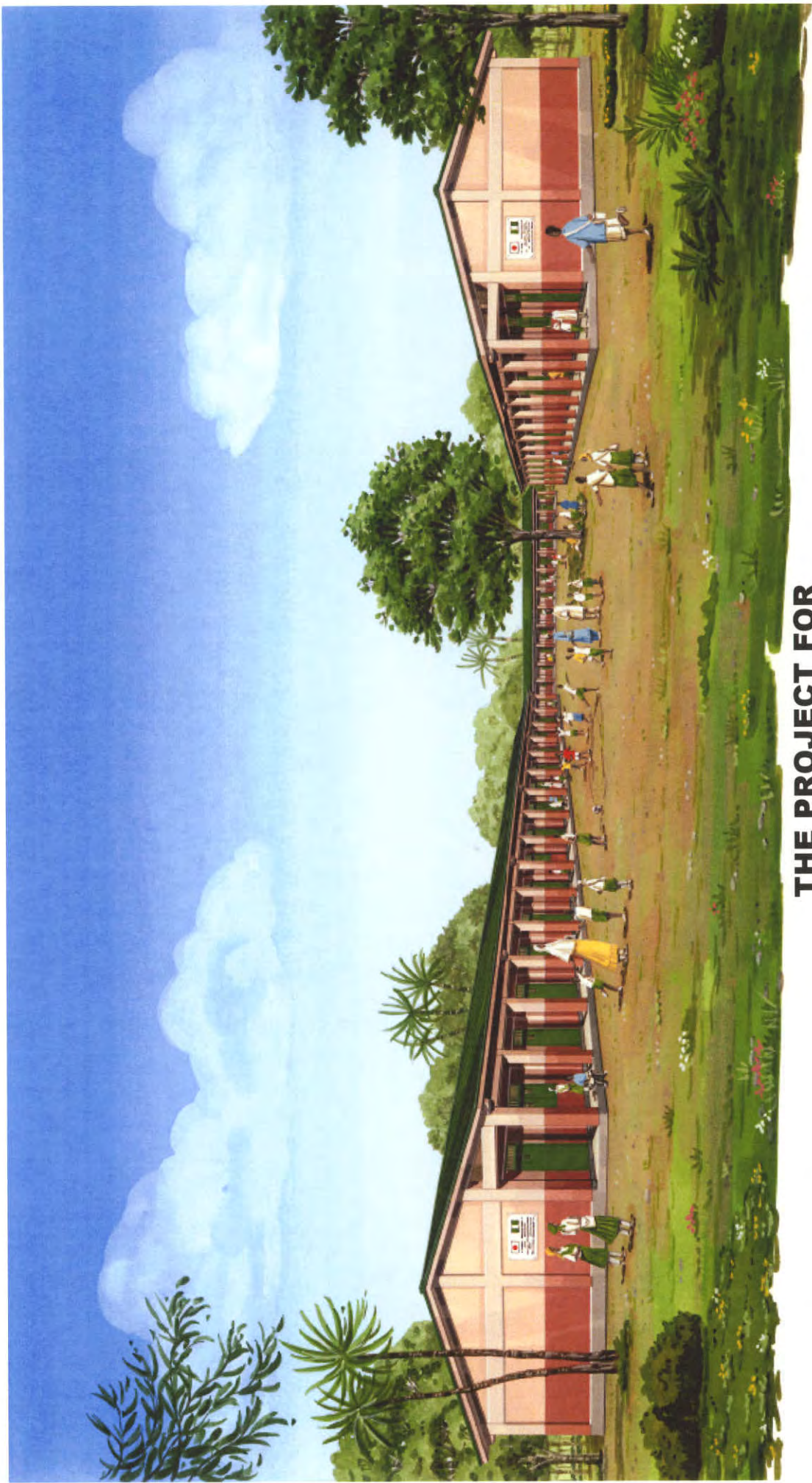
# KANO STATE



**Note**  
P.S : Primary School  
SPS : State Primary School

**Site Location Map**  
(30 School in 20 Local Government Area )





**THE PROJECT FOR  
CONSTRUCTION OF ADDITIONAL CLASSROOMS FOR PRIMARY SCHOOLS (PHASE-II)  
IN  
THE FEDERAL REPUBLIC OF NIGERIA**

## LIST OF FIGURES & TABLES

### (Figures)

Fig. 2- 1	Project Classroom Floor Plan (3-classroom type) .....	2-13
Fig. 2- 2	Toilet Prototype (boys 2 booth, girls 2 booth) .....	2-14
Fig. 2- 3	Cross Section .....	2-15
Fig. 2- 4	Floor Plans of the Classroom Blocks.....	2-16
Fig. 2- 5	Elevation (3-classroom type).....	2-17
Fig. 2- 6	Types of Foundations.....	2-21
Fig. 2- 7	Project Implementation Setup.....	2-39
Fig. 2- 8	Implementation Setup for Tender .....	2-40
Fig. 2- 9	Implementation Setup during Construction Supervision.....	2-41
Fig. 2-10	Consultant Implementation Setup during Construction Supervision.....	2-42
Fig. 2-11	Contractor Selection Flow .....	2-42
Fig. 2-12	Application and Approval Procedure for Tax Exemption.....	2-52
Fig. 2-13	Basic Layout Drawing (No. 42: Bagauda Primary School, Bebeji LGA) .....	2-62
Fig. 2-14	Basic Layout Drawing (No. 47: Kawaji Jigiriya Primary School, Nassarawa LGA).....	2-62
Fig. 2-15	Ground Floor Plan for School (Classroom) Building (Common).....	2-63
Fig. 2-16	Site Elevation (Common) .....	2-63
Fig. 2-17	Detailed Drawings for Steel Frame Truss, Concrete Truss and Roof Sections.....	2-64

### (Tables)

Table 1- 1	List and Details of the Subject Schools.....	1- 3
Table 1- 2	Climate Zones of Nigeria .....	1- 4
Table 1- 3	Maximum and Minimum Temperatures in Kano State .....	1- 5
Table 1- 4	Rainfall and Number of Rainy Days in Kano State .....	1- 6
Table 1- 5	Mean Wind Velocity in Kano State .....	1- 6
Table 1- 6	State of Waterborne Epidemics in Kano State.....	1- 7
Table 2- 1	Project Components in Each Target School .....	2- 2
Table 2- 2	Procurement Sources of Main Construction Materials .....	2- 6
Table 2- 3	Design Criteria and Guidelines .....	2-11
Table 2- 4	Comparison of Design Criteria and Guidelines .....	2-12
Table 2- 5	Number of Toilets by Type in the Project.....	2-14
Table 2- 6	Number of Classrooms by Type in the Project.....	2-16
Table 2- 7	Finishing Plan.....	2-17
Table 2- 8	Furniture Specifications and Quantities .....	2-18

Table 2- 9	Scope of Work .....	2-47
Table 2-10	Main Quality Control Plan .....	2-50
Table 2-11	Procurement Sources of Equipment and Materials, etc.....	2-51
Table 2-12	Technical Guidance Schedule .....	2-57
Table 2-13	Project Implementation Schedule.....	2-59
Table 2-14	Public Holidays in Nigeria in 2010 .....	2-61
Table 2-15	Scoring Results for Envelope A .....	2-66
Table 2-16	Process of Trial Construction and Problems Encountered .....	2-68
Table 2-17	Cost Burden on the Nigerian Side .....	2-75
Table 2-18	Operation and Maintenance Costs for the Project Facilities .....	2-76



## ABBREVIATIONS

AfDB	African Development Bank
CWIQ	Cluster Welfare Indicator Questionnaire
DFID	Department for International Development (UK)
EFA	Education for All
EMIS	Education Management Information System
ESSPIN	Education Sector Support Plan in Nigeria (by DFID)
FCT	Federal Capital of Territory
FIRS	Federal Inland Revenue Service
FTI	First Truck Initiative
ETF	Education Trust Fund
FMOE	Federal Ministry of Education
IDA	International Development Association
KOICA	Korean International Cooperation Agency
LEAP	Literacy Enhancement Assistance Program (USAID)
LGA	Local Government Area
LGEA	Local Government Education Authority
MDG	Millennium Development Goal
NCE	National Certificate of Education
NEEDS	National Empowerment Economic Development Strategy
NERDC	Nigerian Educational Research & Development Center
NPC	National Planning Commission
NPEC	National Primary Education Commission
NTI	National Teachers' Institute
PEP	Primary Education Project
PTA	Parents and Teachers Association
PTTP	Pivotal Teacher Training Programme
RUWASA	Rural Water Supply & Sanitation Agency
SBMC	School Based Management Committee
SESP	State Education Sector Project
SME	State Ministry of Education
SUBEB	State Universal Basic Education Board
UBE	Universal Basic Education (Plan)
UBEC	Universal Basic Education Commission
UBE-IF	UBE-Intervention Fund
UNICEF	United Nations Children's Fund
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPC	Universal Primary Completion
UPE	Universal Primary Education (Programme)
USAID	United States Agency for International Development
VAT	Value Added Tax
VPF	Virtual Poverty Fund
WB	World Bank

# **Chapter 1 Background of Project**

## **Chapter 1. Background of the Project**

### **1-1 Background of Japanese Assistance**

#### **1-1-1 Background of the Request**

Nigeria's primary education enrolment rate of approximately 63% is still low compared to neighbouring countries and the National Economic Empowerment and Development Strategy (NEEDS) 2003 - 2007 identified the capacity building of the people, including the consolidation of education, as an important pillar of the development strategy. The 10<sup>th</sup> Year Strategic Plan formulated in 2007 by the Federal Ministry of Education calls for "the improvement of physical infrastructure for education" as a priority target.

The Government of Nigeria has been making active efforts to increase the number of schools and classrooms and Japan has been contributing to these efforts through the Project for the Construction of Additional Classrooms for Primary Schools, featuring Niger, Plateau and Kaduna States. In three stages, 490 classrooms at 70 schools, 13 principal's offices, 382 toilet cubicles and 19 wells have been constructed, alleviating the desperate shortage of classrooms. Despite such progress, however, there is still a substantial shortage of primary school classrooms throughout the country, especially in remote states. Under these circumstances, the Government of Nigeria made a request to the Government of Japan for the provision of grant aid for the construction of some 1,200 classrooms in six states suffering an acute classroom shortage. These states are Kano, Katsina, Ebonyi, Oyo, Borno and Adamawa. In general, the enrolment ratio for primary education in these states is lower than the national average and the average number of pupils per class is 60 - 85 which is far above the standard class size of 40 pupils in Nigeria, making the urgent construction of new classrooms a matter of necessity.

In August, 2008, the Government of Japan conducted a preliminary study for the Project for the Construction of Additional Classrooms for Primary Schools Phase II and this study confirmed the extreme shortage of primary school classrooms in these states. At the time of this preliminary study, the Nigerian side added Gombe State to the scope of the Project to feature 2,341 classrooms of 313 primary schools in seven stages. Meanwhile, the Preliminary Study Team found that the technical level of local construction companies would pose more than expected problems for the application of the Grant Aid for Community Empowerment Scheme.

The present study has been conducted with a view to alleviating the classroom shortage at primary schools in Nigeria based on the local specifications and design while assuming the application of the JICA's Grant Aid for Community Empowerment Scheme newly created in FY 2006. The primary

objectives of the Study are the selection of the target primary schools of the Project, basic design, formulation of a project work execution plan, estimation of the project cost and compilation of reference materials for the preparation of the tender documents. Experimental construction work (involving the construction of two school buildings of the three classroom type) was conducted during the study period to find possible solutions to identified problems for the application of the Grant Aid for Community Empowerment Scheme.

### **1-1-2 Contents of the Request and Their Modifications**

Of the seven states identified at the time of the preliminary study in August, 2008, Kano State was selected as a target state of the Project with reference to the priority criteria and feasible project scale under the Grant Aid for Community Empowerment Scheme. In September, 2009, the revised request for the construction of 375 classrooms at 50 target schools as shown in Table 1-1 was presented by the Nigerian side following a series of consultations on the project contents and grant aid for these 50 schools was agreed in the Minutes of Discussions (M/D).

Table 1- 1 List and Details of the Subject Schools

Kano State Universal Basic Education Board (SUBEB)			No. of Pupils			No. of Teachers			No. of Classrooms		
No.	Name of School	LGA	Male	Female	Total	Male	Female	Total	Existing	No. of Requiring Repair	No. of Requested Classrooms
1	KUNDILA SPECIAL	Tarauni	520	317	837	13	12	25	9	1	5
2	DURMUNAWA	Tarauni	649	593	1,242	23	9	32	6	2	4
3	RANO DAWAKI S.P.S	Rano	346	290	636	15	4	19	7	0	4
4	RURUM SCIENCE	Rano	265	503	768	24	4	28	13	4	2
5	RUWAN KANYA	Rano	155	145	300	6	0	6	2	2	3
6	SHAGOGO CENTRAL P.S	Gaya	291	85	376	28	0	28	6	4	4
7	AMARYAWA P.S	Gaya	352	120	472	17	0	17	6	6	4
8	NATSUGUNNE P.S	Fagge	309	264	573	15	0	15	12	6	16
9	CHAKWADO P.S	Tudun Wada	199	92	291	11	0	11	6	6	2
10	YAMMEDI	Karaye	373	175	548	12	0	12	6	2	3
11	KUMBUGAWA P.S	Karaye	389	120	509	15	1	16	6	3	4
12	T/KAYA	Karaye	578	235	813	16	0	16	4	2	12
13	DEDERI P.S	Karaye	429	359	788	22	0	22	6	2	8
14	YOLA Z/GARI	Karaye	408	157	565	11	0	11	4	2	10
15	BICHI KANTI P.S	Bichi	495	525	1,020	11	11	22	6	0	10
16	BADUME S/MODEL	Bichi	616	121	737	0	0	0	10	0	8
17	YANGWARZO P.S	Bichi	214	121	335	9	0	9	6	2	4
18	JALLI P.S	Dawakin Tofa	334	175	509	12	0	12	8	8	4
19	TUMFAFI P.S	Dawakin Tofa	221	331	552	16	4	20	11	3	2
20	KWA P.S	Dawakin Tofa	401	209	610	15	1	16	7	2	4
21	KUNYA P.S	Mingibir	671	400	1,071	47	4	51	16	6	34
22	KUMBOTSO S.P.S	Kumbotso	605	488	1,093	23	1	24	10	4	17
23	ZAKIRAI YAMMA P.S	Gabasawa	440	249	689	6	5	11	6	0	11
24	TUDUN YOLA P.S	Gwale	320	127	447	9	3	12	4	0	7
25	DUMBULUN P.S	Tsanyawa	572	170	742	14	3	17	10	4	9
26	KWANKWASO P.S	Madobi	696	254	950	16	6	22	16	6	8
27	CHINKOSO TUDU	Madobi	221	86	307	3	0	3	4	0	4
28	KADANA P.S	Rogo	325	90	415	10	0	10	4	2	6
29	GANGARBI P.S	Rogo	240	150	390	10	0	10	5	2	5
30	BALAN P.S	Kabo	369	217	586	18	2	20	11	8	4
31	RIRIWAI SABONLAYI	Doguwa	223	215	438	13	3	16	4	1	7
32	TAGWAYE P.S	Doguwa	363	207	570	15	2	17	8	2	6
33	DOGWA SPECIAL	Doguwa	444	276	720	9	4	13	7	0	4
34	Special Edu.Sch.BULUKIYA	Dala	86	42	128	5	2	7	3	0	8
35	SABUWAR/UNGUWA P.S	Gwarzo	500	220	720	0	0	0	10	8	8
36	T/GARU P.S	Gwarzo	682	727	1,409	50	7	57	14	2	7
37	KURAKU P.S	Shanono	210	107	317	7	0	7	4	0	8
38	INDABO CENTRAL	Wudil	729	196	925	15	2	17	8	4	15
39	ZANGO P.S	Gezawa	278	132	410	10	0	10	7	5	6
40	DANMADANHO P.S	Gezawa	331	178	509	13	0	13	6	0	6
41	DANBATTI KANTI P.S	Danbatta	326	120	446	14	7	21	5	0	6
42	BAGAUDA	Bebeji	669	177	846	11	1	12	6	0	15
43	FASSI "A" P.S	Kibiya	420	174	594	13	0	13	8	2	7
44	DUNDU P.S	Bunkure	346	148	494	13	0	13	2	2	10
45	RAMIN DAKO	Bagwai	294	59	353	0	0	0	2	2	9
46	FAJEWA CENTRAL	Takai	549	235	784	7	1	8	12	12	8
47	KAWAJI/JIGIRYA	Nassarawa	689	659	1,348	15	11	26	12	2	12
48	ALKALAWA P.S	Kura	534	363	897	15	6	21	6	4	6
49	BUREMAWA	Kiru	484	211	695	11	3	14	6	0	6
50	LAMBU SCIENCE	Tofa	861	330	1,191	15	5	20	14	8	3
<b>TOTAL</b>			<b>21,021</b>	<b>11,944</b>	<b>32,965</b>	<b>698</b>	<b>124</b>	<b>822</b>	<b>371</b>	<b>143</b>	<b>375</b>

64% 36% 40.1 pupils/teacher

88.9 pupils/classroom  
(single shift)

S.P.S : State Primary School

S.P : Primary School

### 1-1-3 Requested Components

The M/D signed on 8<sup>th</sup> September, 2009 established the contents of the Japanese assistance for the Project as listed below. The highest priority is given to the construction/introduction of new classrooms and basic furniture while due consideration is given to the construction of a teachers' room, store room and toilets depending on the actual need at individual schools. The construction of a borehole is not included in the scope of the Project.

- (1) Classrooms
- (2) Basic furniture (blackboard, desks and chairs for pupils, notice board and desks and chairs for teachers)
- (3) Teachers' room
- (4) Store room
- (5) Toilets
- (6) Soft component

### 1-2 Natural Conditions

Nigeria has five climate zones of which the geographical distribution and characteristics are outlined in Table 1-2. Kano State is located in the Sudan-Sahel Climate Zone.

Table 1-2 Climate Zones of Nigeria

Climate Zone	Geographical Distribution	Characteristics
① Sahel	North, generally north of 12°N	Annual rainfall: 500 ~ 700 mm
② Sudan-Sahel	South of 12°N, including Abuja, Kaduna and Jos	Annual rainfall: 1,000 mm (1,500 mm at the Jos Plateau)
③ Guinea-Sudan	South of the Niger-Benue Rift and area around the Minna Basin	Annual rainfall: 1,300 ~ 1,500 mm; (1,000 ~ 1,200 mm at the Niger-Benue Rift)
④ Forest Sahel	Roughly between 7°30'N and 6°30'N	Annual rainfall: 1,500 ~ 2,000 mm
⑤ Forest Belt	Roughly south of 6°30'N	Annual rainfall: approx. 2,000 mm (1,500 ~ 2,000 mm west of 5°E; 2,000 ~ 3,000 mm east of 5°E)



A scene of a hamatan in Borno State which lies to the east of Kano State (the target stage of the Project)

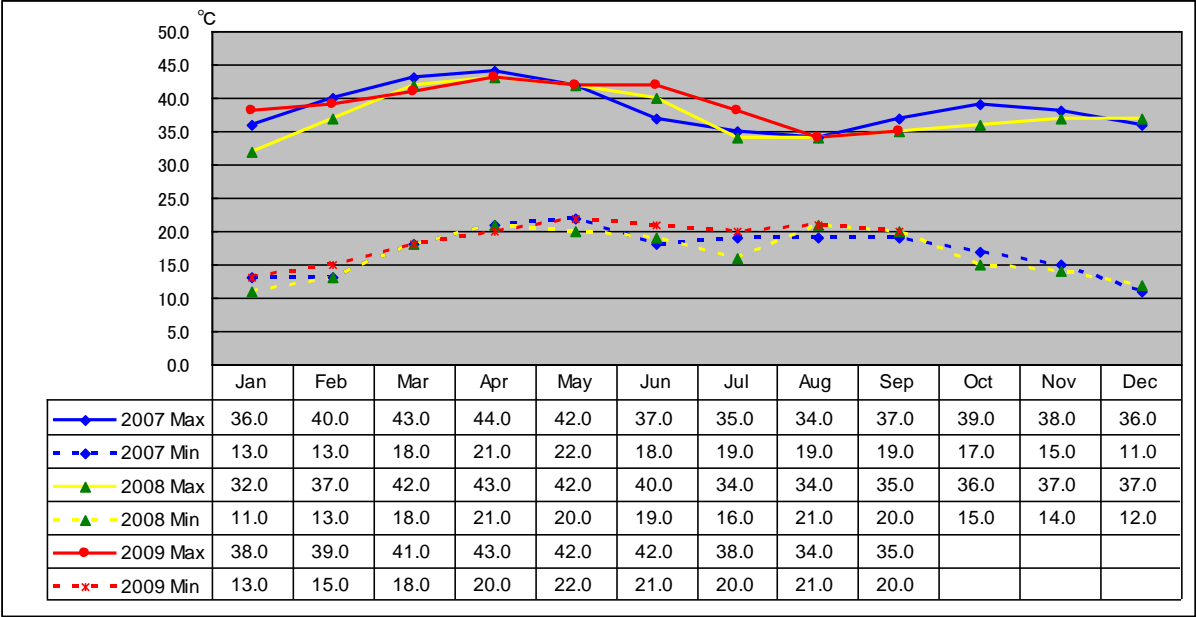
In Nigeria, sand storms called "hamatan" which contain sand dust from the Sahara Desert often rage throughout the country from December to February of the following year. During this period, visibility can be reduced to 200 m and gusty winds of some 30 m/sec can occur, necessitating due consideration for the roof structure, etc. under the Project.

During the rainy season, a south-westerly seasonal wind brings hot humid air from the Gulf of Guinea, frequently producing thunder squalls from the afternoon to evening. As these squalls can be preceded by gusty winds, due consideration is required for the roof structure, etc. as in the case of a hamatan. In the early period of the rainy season, thunderstorms can occur from the small hours until dawn. According to data of the Federal Ministry of Aviation, thunder occurs on an average of some 80 days of the year. During a thunder squall, the state of the atmosphere becomes extremely unstable with constant lightning and thunderbolts.

**1-2-1 Temperature and Rainfall**

Meteorological statistics for the last three years (2007 ~ 2009) show that the maximum temperature in Kano State is 44°C and that the daytime temperature often exceeds 40°C from March through June. The minimum temperature recorded is 11°C and low temperatures occur in December and January. Table 1-3 shows temperature data for Kano State.

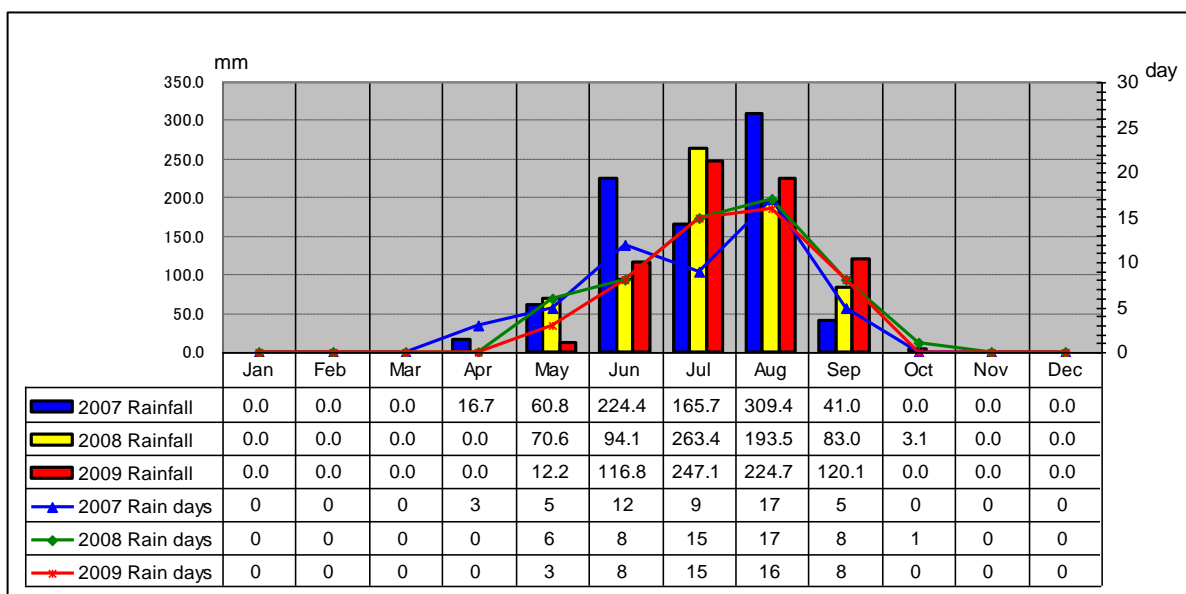
Table 1- 3 Maximum and Minimum Temperatures in Kano State



Observation site: Agricultural Research Station KANO, January, 2007 ~ September, 2009

The annual rainfall at the Agricultural Research Station in Kano State was 817 mm in 2007 and 707 mm in 2008. In general, the dry season lasts from October to April (March) of the following year. During the dry season of 2008, rain was observed on only one day (no rain recorded in 2007), indicating the extremely dry nature of this season. The rainy season lasts from May (June) to September and the monthly rainfall exceeds 200 mm in July and August. Table 1-4 shows the rainfall and number of rainy days in Kano State.

Table 1- 4 Rainfall and Number of Rainy Days in Kano State



Observation site: Agricultural Research Station KANO, January, 2007 ~ September, 2009

### 1-2-2 Wind Direction and Wind Velocity

In Kano State, the mean wind velocity increases from April to June to around 2 m/sec. Table 1-5 shows wind velocity data for Kano State. However, it is necessary for the building design to take into consideration the fact that a wind velocity of some 30 m/sec is observed during a hamatan and also prior to a squall.

Table 1- 5 Mean Wind Velocity in Kano State

Monthly Mean Wind Speed (m.p.s)

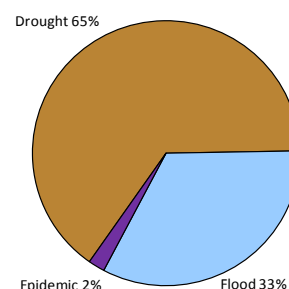
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	1.8	1.6	1.7	2.3	2.2	1.9	1.9	1.3	1.3	1.0	0.8	1.4
2008	1.7	2.0	1.4	1.5	1.9	2.3	1.7	1.2	1.4	0.9	0.9	0.8
2009	1.0	1.8	1.8	2.2	2.1	2.4	2.0	2.3	0.9			

Observation site: Agricultural Research Station KANO, January, 2007 ~ September, 2009

### 1-2-3 Earthquakes and Other Natural Disasters

No records exist in Nigeria on the occurrence of earthquakes or people affected by earthquakes. The biggest natural disaster causing actual damage is drought in the north near the Sahara Desert, accounting for 65% of the reported number of people affected by a (natural) disaster. The flooding of two major rivers, i.e. Benue and Niger, and their tributaries accounts for 33% while epidemics caused by waterborne diseases account for 2%. The state of epidemics in Kano State is outlined in Table 1-6.

Percentage of reported people affected by disaster type



Source: Nigeria Disaster Statistics 1993 ~ 2008



Table 1- 6 State of Waterborne Epidemics in Kano State

- Some 40% of the rural populace have experienced a waterborne disease while 65% have suffered an illness directly caused by poor quality water. 45% of the people diagnosed at health clinics suffer from either malaria or typhoid.
- Number of people suffering from waterborne diseases
  - ① Schistosomiasis: 6,864 men and 3,767 women
  - ② Cholera : 954 men and 98 women
  - ③ Guinea worm : 905 men and 680 women
  - ④ Onchocerciasis : 546 men and 324 women
  - ⑤ Typhoid : 3,733 men and 4,121 women
- The infant mortality rate is 20% and the child (1 - 15 years of age) mortality rate is 15%. These figures mean that as many as 35% of infants and children die before they reach the age of 15. Although there is no clearly established direct causal relationship between waterborne diseases and these mortality figures, the latter indicate the level of hygiene in Kano State.

Source: Kano State Ministry of Health, 2007

### 1-3 Environmental Consideration

The facilities to be constructed under the Project will not use asbestos, formaldehyde or any other substance which is harmful to the human body. Careful consideration will be given during and after the construction period to avoiding any negative impacts on the environment, including, air, water and noise pollution.

## **Chapter 2 Contents of the Project**

## Chapter 2. Contents of the Project

### 2-1 Basic Concept of the Project

#### 2-1-1 Higher Goal and Project Goal

##### 2-1-1-1 Higher Goal

Access to primary education and the quality of primary education in the target state will be improved.

##### 2-1-1-2 Project Goals

(1) Project goals

Through constructing classrooms and other school facilities in Kano State in Nigeria, the Project aims to improve the school attendance environment and access to primary education in the target area.

(2) Anticipated effects of the Project

Primary education facilities will be constructed in the target area.

(3) Project output indicators

Indicator	Standard value (2009)	Target value (2012) [3 years after Project completion]
Number of classrooms in a good environment in the targeted schools	225 classrooms	512 classrooms (including the 287 classrooms to be added in the Project)
Number of pupils per classroom in targeted schools (pupil/classroom)	96.0 pupils/classroom (2.5 times the standard level)	42.2 pupils/classroom (1.06 times the standard level)
Number of pupils in a good learning environment in targeted schools	9,000	20,480 (2.3 times the standard level in 2009)

#### 2-1-2 Outline of the Project

##### 2-1-2-1 Current Conditions and Problems in the Sector

According to SUBEB in Kano State, the number of primary school pupils as of 2007/08 is 1,958,645, and there are 4,136 public primary schools and 21,392 classrooms. The total school attendance rate is 89%. Judging from these figures, the number of pupils per classroom is 91.6, which is 2.3 times the standard level (40 per classroom) and thus well in excess of the school capacity. Furthermore, in terms

of the school attendance environment, considering that most classrooms are in an appalling state, there is an urgent need to build more classrooms and improve conditions.

Furthermore, the standard design for classroom construction in Nigeria offers poor durability, low execution accuracy and poor quality. As a result, even if new classrooms are constructed, walls start cracking, roofs start leaking, and roofs are damaged or destroyed by strong winds within three or four years.

## 2-1-2-2 Project components

In order to achieve the above targets, the Project aims to increase the number of classrooms, procure and install classroom furniture and fixtures (pupils' desks and chairs, teachers' desks and chairs, blackboards and notice boards), and build toilets in existing primary schools in Kano State. Table 2-1 shows the contents of each components in each target school.

Table 2- 1 Project Components in Each Target School

STATE UNIVERSAL BASIC EDUCATION BOARD (SUBEB), KANO					Classroom Building				Toilet House				Furniture				
No.	Name of Schools	LGA	Pupil's Total 2008/2009	Existing Classroom	Type of Classroom			TOTAL of Classroom	Floor Area TOTAL (m <sup>2</sup> )	Type of Booth		TOTAL of Booth	Floor Area TOTAL (m <sup>2</sup> )	Table & Bench	Desk & Chair	Notice Board	Black board
					3	4	5			4	6						
15	BICHI KANTI P.S	Bichi	1,230	8	2	0	3	21	1,512.0	2	2	20	65.0	420	21	21	21
16	BADUME S/MODEL	Bichi	678	9	0	2	0	8	576.0	2	0	8	26.0	160	8	8	8
41	DANBATTAKANTI P.S	Danbatta	604	4	1	2	0	11	792.0	1	1	10	32.5	220	11	11	11
20	KWA P.S	Dawakin Tofa	563	8	2	0	0	6	432.0	0	1	6	19.5	120	6	6	6
19	TUMFAFI P.S	Dawakin Tofa	989	12	1	0	2	13	936.0	0	2	12	39.0	260	13	13	13
18	JALLI P.S	Dawakin Tofa	470	6	2	0	0	6	432.0	0	1	6	19.5	120	6	6	6
33	DOGWA SPECIAL	Doguwa	801	6	0	1	2	14	1,008.0	2	1	14	45.5	280	14	14	14
32	TAGWAYE P.S	Doguwa	708	7	1	2	0	11	792.0	1	1	10	32.5	220	11	11	11
8	NATSUGUNNE P.S	Fagge	604	9	2	0	0	6	432.0	0	1	6	19.5	120	6	6	6
23	ZAKIRAI YAMMA P.S	Gabasawa	689	6	1	2	0	11	792.0	1	1	10	32.5	220	11	11	11
7	AMARYAWA P.S	Gaya	983	6	0	1	3	19	1,368.0	0	3	18	58.5	380	19	19	19
39	ZANGO P.S	Gezawa	605	7	0	2	0	8	576.0	2	0	8	26.0	160	8	8	8
40	DANMADANHO P.S	Gezawa	515	6	1	1	0	7	504.0	0	1	6	19.5	140	7	7	7
36	T/GARU P.S	Gwarzo	954	11	2	0	0	6	432.0	0	1	6	19.5	120	6	6	6
30	BALAN P.S	Kabo	799	8	2	0	0	6	432.0	0	1	6	19.5	120	6	6	6
12	T/KAYA	Karaye	749	5	0	1	2	14	1,008.0	2	1	14	45.5	280	14	14	14
14	YOLA Z/GARI	Karaye	566	6	0	2	0	8	576.0	2	0	8	26.0	160	8	8	8
11	KUMBUGAWA P.S	Karaye	440	6	0	0	1	5	360.0	1	0	4	13.0	100	5	5	5
43	FASSI "A" P.S	Kibiya	768	7	0	3	0	12	864.0	0	2	12	39.0	240	12	12	12
49	BUREMAWA	Kiru	518	8	0	0	1	5	360.0	1	0	4	13.0	100	5	5	5
22	KUMBOTSO SPS	Kumbotso	1,093	9	0	1	1	9	648.0	2	0	8	26.0	180	9	9	9
48	ALKALAWA P.S	Kura	888	6	0	4	0	16	1,152.0	1	2	16	52.0	320	16	16	16
27	CHINKOSO TUDU	Madobi	345	4	0	0	1	5	360.0	1	0	4	13.0	100	5	5	5
26	KWANKWASO P.S	Madobi	833	12	0	1	1	9	648.0	2	0	8	26.0	180	9	9	9
3	RANO DAWAKI SPS	Rano	608	5	0	0	2	10	720.0	1	1	10	32.5	200	10	10	10
4	RURUM SCIENCE	Rano	843	10	1	2	0	11	792.0	1	1	10	32.5	220	11	11	11
5	RUWAN KANYA	Rano	311	4	0	1	0	4	288.0	1	0	4	13.0	80	4	4	4
28	KADANA P.S	Rogo	319	4	0	1	0	4	288.0	1	0	4	13.0	80	4	4	4
38	INDABO CENTRAL	Wudil	981	8	1	1	2	17	1,224.0	1	2	16	52.0	340	17	17	17
50	LAMB SCIENCE	Toffa	1,155	18	0	0	1	5	360.0	1	0	4	13.0	100	5	5	5
<b>TOTAL</b>					<b>19</b>	<b>30</b>	<b>22</b>	<b>287</b>	<b>20,664.0</b>	<b>29</b>	<b>26</b>	<b>272</b>	<b>884.0</b>	<b>5,740</b>	<b>287</b>	<b>287</b>	<b>287</b>
					<b>71</b>					<b>55</b>							
					<b>57</b>	<b>120</b>	<b>110</b>	<b>classroom</b>		<b>116</b>	<b>156</b>	<b>booth</b>					

## **2-2 Outline Design of the Japanese Assistance**

### **2-2-1 Design Policy**

#### **2-2-1-1 Basic Policy**

In the primary education sector in Kano State, improvements will be made as far as is feasible based on current conditions assuming the top priority to be the construction of classrooms in schools which face the greatest shortages. Moreover, the facilities design and construction plan shall be compiled in conformance with the local natural conditions, construction situation and Japan's Grant Aid Scheme for Community Empowerment. Furthermore, effort will be made to secure the minimum construction cost while seeking ease of maintenance and durability.

Based on those considerations, the basic policy of facilities design shall be as follows.

- (1) Strive to cut costs while paying attention to ease of maintenance and durability.
- (2) Adopt design that fits with the local materials, construction methods and technologies.
- (3) Give consideration to ventilation of classrooms and durability with respect to strong winds.
- (4) Give consideration to the incorporation of natural light and insulation against intense solar rays and heat.
- (5) Standardize designs in order to shorten the construction period and reduce costs.

#### **2-2-1-2 Policy regarding Natural Conditions and Construction Conditions**

The design policy regarding natural conditions in the Project shall be as follows.

- The rainy season in Nigeria usually lasts from May to October, but the months of heaviest rain are July and August when approximately 65% of the annual rainfall is concentrated (707mm in 2008). Moreover, since strong winds and gusts are frequently observed prior to rainfall during the rainy season, there have been numerous cases of galvanized sheets roofs being damaged or destroyed. Accordingly, concerning the strength and method of fixing and joining of trusses, purlines, sheathing roof boards and roof materials, it will be necessary to show ample consideration in design and construction methods to ensure sufficient resistance to strong winds.
- Concerning wooden parts such as trusses and purlines in existing schools, since termite damage can be seen in many areas, wooden members shall be termite-proofed before being used.
- In order to mitigate radiated heat and the sound of falling rain inside classrooms, durable plywood panel (12mm) will be placed under the aluminum roofing sheet roof materials.

- Concerning classroom ceilings, most existing schools have wooden ceilings, however, these are frequently damaged by bat droppings and rain leaks from roofs. Therefore, from the viewpoints of improving ease of work and reducing costs, no ceilings will be fitted in the Project.
- Concerning fixtures such as doors and windows, steel fixtures shall be adopted in consideration of frequent opening/closing due to wind gusts before rainfall and sand storms (hamatan) and for prevention of unlawful entry and burglary. Moreover, considering that windows need to be closed for lessons during the rainy season, fenestellas shall be fitted above windows and doors to let in more natural light.

The design policies with respect to the necessary construction conditions in the Project are as follows.

- At existing schools, due to the frequency of opening and closing of doors and windows, the fact that windows and doors are made of heavy steel, and the fact that wooden frames do not have enough thickness to provide sufficient strength, door and window hinges are not strong enough and many hinge weld sections are broken or temporarily repaired. In the Project, hinges that can withstand the said frequency of use and weight of door and window structures shall be adopted.
- The newer existing schools adopt terrazzo in-situ polished floors as the UBEC standard specifications, however, this type of finishing is one of the more difficult types. Moreover, judging from actually applied floors, it appears that little consideration has been given to the selection of the chip type, surface scrubbing is slipshod, and little attention has been paid to evenness and fits with walls and edges. In addition, this method does not have good cost effectiveness in the given environment. Therefore, in the Project, mortar trowel finish floor of 30mm is deemed to be appropriate.
- Concerning the painting of classroom walls, considering that the degree of staining varies according to the height that can be reached by children's hands, two-toning shall be adopted using darker colors.

### **2-2-1-3 Policy regarding Social Conditions**

Kano State is located in the north of Nigeria and is an area of active industrial activity. Approximately 75% of the population here is engaged in agriculture, and most households in the target school areas in the Project earn a living from agriculture. Accordingly, the people here do not have much regular cash income and generally belong to the impoverished class. The schools have PTA organizations, however, they have little funding and there is no obligatory collection of fees, etc. Furthermore, SUBEB and LGEAs do not provide adequate budget allocations for maintenance work. In view of these conditions, in the Project, highly durable materials which enable maintenance costs to be reduced, materials which

can be procured locally, and construction methods which enable the local people to conduct repairs and maintenance shall be adopted.

#### **2-2-1-4 Policy regarding the Construction Situation and Utilization of Local Contractors and Materials**

##### (1) Basic Policy

All construction materials can be procured on the domestic market if imports are taken into account. In particular, since there is no need to import construction materials from third countries, all the construction materials needed in the Project shall be procured locally. Moreover, assuming that the construction methods (wood structure, reinforced concrete block masonry, reinforced concrete frame method) usually adopted in Nigeria are used in the Project, it should be possible to procure building materials of satisfactory quality in Kano State (the Project target area) or surrounding states (Kaduna, Plateau) including the metropolitan region. However, since it is predicted that difficulty will arise in securing materials of the quantities required in the Project at the same time, it will be necessary to compile a construction plan and procurement plan which give consideration to available quantities on the market.

The major construction materials to be used in the Project works are as follows.

- Concerning cement, there are three private cement factories in Nigeria, and two of these (Dangote and Ashaka) make good quality cement. However, there are no cement factories around Kano State. Therefore, the good quality cement which is manufactured at the said two factories and is available on the local market shall be procured.
- Concerning reinforcing bars, there are three private reinforcing bar factories, however, two of these manufacture irregular shaped steel and iron bars from imported ingots. The other company is located in Kano State and manufactures reinforcing bars from scrap iron. All of these companies manufacture products of satisfactory quality. In Kano State, the reinforcing bars made by these factories are available on the local market and can be procured, however, since stocks are limited in some retailers, it will be necessary to compile a procurement plan in advance. The diameter of irregular shaped reinforcing bars in Nigeria comprises 8mm, 10mm, 12mm and 14mm, while bars of 16mm and more are also available but have to be imported from China, Ukraine and India, etc. Accordingly, in the Project, it will be necessary to decide the diameter of reinforcing bars upon taking these conditions into account.
- Concerning sand and crushed stones for making concrete, since it is difficult to procure concrete outside of the metropolitan area and major cities (Lagos), job-mixed concrete made with simple mixers (engine-driven) on site is used. As for sand, this can be obtained from

rivers in Kano State, while crushed stones can be procured in Kano State and Kaduna State. The locally available sand and crushed stones possess satisfactory quality and entail no major problems in use. However, when using sand, it will be necessary to confirm and test salt levels and so on in advance.

- Concerning the water supply for works, since the targeted schools have great difficulty obtaining water, it will be impossible to secure the water supply required for the works on site (at schools). Therefore, it will be necessary to procure and transport the necessary quantities by tank lorry, etc. from nearby towns and villages or LGA. When using such water, it will also be necessary to conduct inspections to confirm the water quality (salt content, etc.) and make sure there are no impurities.
- Plants which mold the long sheet aluminum plate (thickness 0.55mm) used for roofs exist in Kano State, neighboring Kaduna State and Borno State to the northeast, and plates can be directly procured from such plants. These materials are common types which have been used in SUBEB prototype and first-stage primary schools in Kano State, and they shall also be used as roofing materials in the Project.
- The steel cage materials (angles, C-shaped steel, etc.) used in roof trusses are not produced in Nigeria. Accordingly, it will be necessary to procure imported materials already on the local market or to import materials. Therefore, members and materials that are easy to obtain or procure in consideration of this point shall be adopted in the facilities design. Furthermore, steel cage processing and assembly plants are located in Kano City.
- Concerning steel doors and windows, these can be procured in Kano State and from neighboring Kaduna. The plants here have previously supplied steel doors and windows to SUBEB prototype and first-stage primary schools.

Table 2-2 shows the main procurement sources of the main construction materials.

Table 2- 2 Procurement Sources of Main Construction Materials

Item	Country of procurement			Remarks
	Nigeria			
	Abuja	Kano	Neighboring states	
Cement	○	○		
Reinforcing bars	○	△	Katsina, Cogi	φ16mm or larger needs to be imported from China, Ukraine and India, etc.
Concrete blocks	○	○		
Form materials	○	○		
Steel cage	○	△	Katsina, Delta	Made in China, Ukraine and India, etc.
Long sheet aluminum	○	○	Kaduna, Borno	
Paint	○	○		
Steel fittings	○	△	Kaduna	
Wooden furniture	○	○		
Glass	○	○		

Legend: ○: Procurement is easy △: Available on market but quantities and sizes are a problem



(2) Policy regarding equipment and materials transport and geographical characteristics

The Project target area of Kano State is located 450 km or roughly six hours by road from the capital Abuja (there are also a number of flights between Abuja and Kano every day). Moreover, the Project target schools are located in 20 out of the 44 LGAs in Kano State, and the furthest target school from the center of Kano City is situated up to three hours away. On average the target schools are separated from the state capital by around one hour. Most of the target schools are situated just off arterial roads and are easy to reach. Meanwhile, since some of the proposed building sites are located to the rear of existing school buildings making it difficult to transport materials by large vehicles, it will be necessary to consider establishing stockyards nearby and to transport materials in small and medium-sized vehicles.

(3) Securing of materials storage areas

Belonging to the Sudan-Sahel region, Kano state has its rainy season between May and September in normal years. In particular, July and August are characterized by a lot of rainfall and wind gusts. Accordingly, it will be vital to carefully plan the transport of works materials during the rainy season, especially to schools in hilly areas where access roads are narrow. Specifically, it will be necessary to carry in materials such as cement, aggregate, reinforcing bars and formwork, etc. and to secure banked storage areas of sufficient height and area before the rainy season starts in May.

(4) Utilization of local construction companies

Due to the impact of the Lehman shock in the United States, private investment projects for the construction of office buildings, hotels, shopping malls and high-class housing, etc. in and around the capital Abuja have had to be suspended, and there are currently hardly any new investment projects in progress. Similarly, projects for construction of detached houses and high-class apartments, etc. along arterial roads in suburban areas have also been suspended. There is also a dearth of public sector works projects. Having said that, numerous projects for basic infrastructure development, for example, widening of arterial roads between the capital and regional cities, are currently in progress. In these circumstances, on looking from a technical viewpoint at the sites where works have been suspended or postponed, contractors in the capital region are deemed to possess adequate construction and execution technology.

Meanwhile, the Project target area of Kano City, despite being the industrial center in the north of the country, does not have an entirely prosperous economy. There are currently no major private or public investment projects in progress, however, construction of new plants is advancing on the outskirts. Road projects including construction of new roads and widening of existing ones are being commonly executed in the same way as in the capital Abuja. Also, many primary

school construction projects ordered by SUBEB, DFID, KOICA and international agencies and donors such as the World Bank can be seen in Kano and surrounding states. These construction projects are being implemented by contractors based in Kano State and surrounding states, however, the number of operators who possess construction and execution technology of a certain level is limited.

There are approximately 25 construction companies which are based in the capital Abuja. The top ten companies, which include German and other foreign-affiliated firms, conduct large-scale private and public sector works, whereas it is thought that around 15 companies on the intermediate level can participate in the tender for works on the scale proposed in the Project. Meanwhile, in the state capital Kano, there are around 15 major construction companies, and around 10 of these are registered with SUBEB and have experience of SUBEB primary school projects. According to SUBEB's information and experience, four or five of these companies possess ample construction and execution technology and can be utilized in the Project. There are also some construction companies in LGAs, however, they have no experience of receiving and executing orders from international aid agencies, and not many of them possess adequate execution capacity. Therefore, when selecting contractors for the Project, it is desirable to conduct a designated competitive tender with participation largely from contractors which possess a certain degree of construction and execution capacity in the capital Abuja, Kano and surrounding states.

Contractors which possess a certain degree of construction and execution capacity in the capital Abuja, Kano and surrounding states shall be utilized for the Project works, and the tender may be divided into four or five lots with each lot comprising six to eight schools (sites). Construction companies shall be allowed to participate in multiple lots according to their size, however, works shall not be awarded in excess of a company's execution capacity.

(5) Utilization of local labor

In the project target area of Kano State, since agriculture is the primary industry around most of the target schools, it is possible to recruit simple laborers within the LGAs. However, since it is hard to find skilled workers with construction expertise, it will be necessary to recruit personnel who possess a certain level of skill and expertise or who have worked on private and public works projects or works ordered by international aid agencies in Kano and other state capitals. Therefore, in the Project, ordinary laborers will be recruited in the LGA area while skilled workers who belong to construction companies will be utilized.

Engineers for supervising the overall works will be procured in the capital Abuja or the state capital Kano and dispatched to each site in order to ensure that quality is secured and implementation schedules are adhered to.

#### **2-2-1-5 Utilization of local consultants**

In Nigeria, the number of general construction consultants is limited, however, there are numerous small-scale consultants and it is possible to secure engineers of a certain level who are able to supervise sites. However, since no quality monitoring criteria are established and high technical capacity and supervision capacity cannot be anticipated in Nigeria, a Japanese consultant shall be utilized in order to provide thorough technical guidance and ensure the required quality level and implementation schedule are secured.

#### **2-2-1-6 Policy regarding Operation and Maintenance Capacity of the Implementing Agency**

The agency responsible for implementation of the main body of the Project will be the Universal Basic Education Commission (UBEC), while the implementing agency will be Kano State Universal Education Board (SUBEB). Following the completion of the Project facilities, UBEC and SUBEB will divide roles for the maintenance and operation of the facilities. Moreover, when handing over the facilities, it will be necessary to explain and transfer the maintenance methods and guidelines and thereby strengthen the operation and maintenance capacity on the local side.

#### **2-2-1-7 Policy regarding Setting of the Facilities Grade and Cost Reduction**

Based on criteria and standard design specifications such as the Nigerian Building Code 2007, the State Building Regulation in each state, the Minimum Standards for Planning of Basic Education Infrastructure 2006, the Guidance Building Manual 2004, and the Nigerian Industrial Standard (NIS), the minimum grade which satisfies the necessary functions and provides durability shall be secured. Concerning the structure of facilities, the local standard reinforced concrete structure shall be adopted; finishing shall comprise the locally common mortar trowel finish on floors and concrete blocks with mortar trowel finish and painting on walls; and roof structures shall comprise steel frame truss structure made from sheathing roof board (plywood panel) and asphalt roofing and aluminum roofing sheet.

## **2-2-1-8 Policy regarding Construction Method, Procurement Method and Implementation Schedule**

The concept regarding construction methods, procurement methods and implementation schedule shall be as follows.

- In the first primary school construction project, reinforced brick structures were adopted, however, production areas of burned bricks are limited and bricks are apt to become damaged and cracked during loading, transportation (by truck) and unloading. Moreover, because local contractors have little concept of face masonry, it is hard to secure quality in work execution. Considering these points, in the Project, reinforced concrete structures, which are common in Nigeria, shall be adopted for buildings, while concrete blocks with mortar finish and painting shall be adopted for walls.
- In the first primary school construction project, wooden trusses were adopted as roof structures, however, due to insufficient drying of the timber normally available in Nigeria, this tends to warp, crack and deform following work and roof trusses frequently become deformed as a result. Furthermore, since the timber generally available on the local market is no longer than 3m, it is necessary to join members together using iron hardware. In order to procure the timber pieces of 4m or more which are needed for wood trusses, it is necessary to make special orders for timber directly cut from forests and this tends to be costly. Therefore, in the Project, steel frame trusses made from steel members which are easy to procure and provide uniform quality shall be adopted. In recent times, steel frame trusses have become the mainstream in school construction projects ordered by SUBEB.
- When selecting contractors, since it is necessary to select contractors who possess certain levels of construction and execution technology in order to secure good work quality and adherence to execution schedules, the choice becomes limited to reputable companies in the capital Abuja and the state capital Kano. In the PQ subscription and review stage, it will be possible to gauge contents to a certain extent through interviewing and visiting numerous contractors, however, it will be difficult to conduct detailed review of all applying companies regarding their work achievements, organization, human resources, construction machinery on hand, business condition and so on. Accordingly, designated competitive tender shall be adopted to select the contractors for the Project.
- Concerning the works implementation schedule, considering that July and August have the heaviest and most frequent rainfall throughout the year, it will be necessary to compile an implementation schedule which doesn't entail civil works such as excavation and backfilling during this period.

## 2-2-2 Basic Plan (Construction Plan / Equipment Plan)

### 2-2-2-1 Basic Plan

#### (1) Layout plan

As is indicated in the attached basic layout plan, the target schools are located a little apart from the LGA centers and are surrounded by farmland. The boundary points and boundary lines of schools grounds are not clearly indicated in some places. Generally speaking, the school grounds are spacious and flat, so they offer no impediment to the construction of additional classroom blocks. Moreover, since there is no need to implement large-scale land creation works or to demolish existing school buildings and structures, it will be possible to immediately commence the construction works at the implementation stage. However, at some schools, since crops are cultivated on the school grounds and there is not enough room to secure temporary yards, it will be necessary to coordinate matters with the schools before commencing the main body of the works.

#### (2) Building plan and design

##### 1) Basic policy

The Project facilities shall comprise the education environment and functions required of primary schools through constructing enough classrooms to relieve overcrowding in excess of the UBEC standard of 40 pupils per classroom. Moreover, the scale of facilities shall be set considering the current number of pupils and assuming single-shift lessons as adopted at most primary schools in Nigeria. Moreover, since population statistics and school districts are not set in the target areas and it is difficult to make forecasts of future pupil numbers, the required numbers of classrooms shall be calculated from the existing number of pupils.

##### 2) Design criteria and guidelines

In Nigeria, it is necessary to design the Project facilities according to the following design criteria and guidelines.

Table 2- 3 Design Criteria and Guidelines

	Design criteria and guidelines	Source
1	National Building Code 2006	Ministry of Housing and Urban Development
2	State Building Regulations	State government
3	Minimum Standard for Planning of Basic Education Infrastructure (2006)	Universal Basic Education Commission
4	A Guidance Building Manual Self-Help Basic Education Project 2004	Universal Basic Education Commission
5	Nigeria Industrial Standard	Ministry of Industrial
6	British Standard - Code of Practice	U.K.

When it comes to applying these design criteria and guidelines, state law requires that building permission needs to be applied for and obtained in both public and private works. However, in the case of the Project, since the target works entail the addition of classroom blocks to existing schools, it has been confirmed that there will be no need to apply for building permission.

### 3) Key points of design criteria and guidelines

The key points of the UBEC (Universal Basic Education Commission) Minimum Standard for Planning of Basic Education Infrastructure (2006) and its application to the Project are as indicated below.

Table 2- 4 Comparison of Design Criteria and Guidelines

		Minimum Standard for Planning of Basic Education Infrastructure (2006)	First Primary School Construction Project (Niger, Plateau and Kaduna States)	Second Primary School Construction Project (this project: Kano State)
Classrooms	Area	<ul style="list-style-type: none"> <li>▪ Primary schools</li> <li>40 pupils/class</li> <li>8m×7m=56m<sup>2</sup></li> <li>1.4m<sup>2</sup>/pupil</li> </ul>	<ul style="list-style-type: none"> <li>▪ Primary schools</li> <li>45 pupils/class</li> <li>8m×7m=56m<sup>2</sup></li> <li>1.24m<sup>2</sup>/pupil</li> </ul>	<ul style="list-style-type: none"> <li>▪ Primary schools</li> <li>40 pupils/class</li> <li>8m×7m=56m<sup>2</sup></li> <li>1.4m<sup>2</sup>/pupil</li> </ul>
	Floors	No particular provisions	2.8m	2.8m
Desks and chairs		No particular provisions. However, provisions exist concerning the type of materials.	Twin desks and chairs for pupils: 23 sets, principal's desk and chair: 1 set	Twin desks and chairs for pupils: 20 sets, teacher's desk and chair: 1 set
Corridor width		No particular provisions.	2m	2m
Type of foundations		Continuous footing	Continuous footing	Independent footing
Roof structure		Wooden truss	Wooden truss	RC and steel frame truss
Type of roof materials		Aluminum roofing sheet (thickness 0.55mm)	Aluminum roofing sheet (thickness 0.55mm) + Plywood panel (thickness 12mm) + asphalt roofing sheet	Aluminum roofing sheet (thickness 0.55mm) + Plywood panel (thickness 12mm) + asphalt roofing sheet
Type of ceiling materials		Hardboard	None	None
Type of floor materials		Terrazzo	Concrete direct finishing	Mortar trowel finish (30mm)
Toilets		1 per classroom (1 booth each for boys and girls)	Per 2 classrooms: 1 boys' booth 1 girls' booth Septic tank, infiltration tank	Per 2 classrooms: 1 boys' booth 1 girls' booth Septic tank, infiltration tank
Water supply		Installation of deep well	Install according to the level of impoverishment (19 sites)	Do not install
Electrical equipment		No particular provisions.	Do not install	Do not install
First floor level		No particular provisions.	GL+400mm	GL +400mm

**2-2-2-2 Basic Plan (Construction Plan / Equipment Plan)**

The Project facilities are planned as described in the following paragraphs based on discussions with UBEC and SUBEB upon referring to the UBEC Minimum Standard for Planning of Basic Education Infrastructure (2006) and the facilities plan in the SUBEB prototype and first primary school construction project.

(1) Classroom plan

According to the above guidelines, classroom dimensions are prescribed as 8m×7m = 56m<sup>2</sup>, working out as 1.4m<sup>2</sup>/pupil assuming 40 pupils per classroom, and the same dimensions are given for both urban and rural areas. Meanwhile, in the first primary school construction project, due to the large numbers of pupils in the target schools, the level of crowding was 0.9m<sup>2</sup>/pupil even though most of the schools adopted a two-shift system. Therefore, in order to fully realize the standard level of 1.4m<sup>2</sup>/pupil, an extremely large number of classrooms would have been needed, and it was finally decided to aim for 1.24m<sup>2</sup>/pupil in order to mitigate crowding.

In the Project target schools, many schools have switched from the two-shift system to the single shift system for improvement of the learning environment under guidance from UBEC/SUBEB, and the level of crowding in large schools has reached 9.9 times the standard level (for single shift schools) in some cases. In view of this situation, the criteria of the construction guidelines shall be adopted in the Project too. Fig. 2-1 below shows the standard classroom and furniture layout in Nigeria.

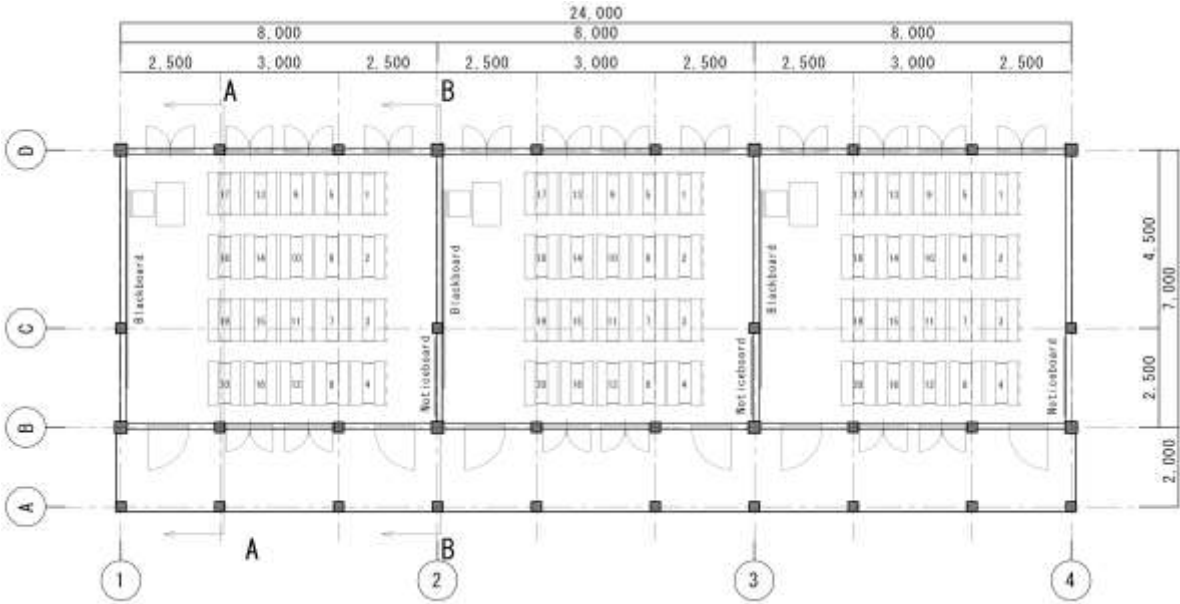


Fig. 2- 1 Typical Classroom Floor Plan (3-classroom type)

As shown in the above figure, each classroom has 20 sets of two seater table and benches (for 40 pupils), one teacher’s desk and chair, one blackboard and one notice board.

(2) Toilet plan

According to the Nigerian Standard, the number of toilet booths is set at one toilet (one booth each for boys and girls) per classroom, however, for the purposes of the Project, one booth each for boys and girls shall be planned for every two classrooms. This is equivalent to approximately one-third the set standard for primary schools in Japan, however, judging from the conditions on the ground, there won’t be any major problems because existing toilets can also be used.

Toilets shall comprise the four-booth type (two booths each for boys and girls) and six-booth type (three booths each for boys and girls), and these shall be combined according to the required numbers in each school. Moreover, the number of toilets prepared in the Project shall be as shown in Table 2-5 below.

Table 2- 5 Number of Toilets by Type in the Project

Toilet type (area)	Number of buildings	Number of booths	Floor area (m <sup>2</sup> )
4-booth type (13.0m <sup>2</sup> )	29	116	377.0
6-booth type (19.5m <sup>2</sup> )	26	156	507.0
<b>Total</b>	<b>55</b>	<b>272</b>	<b>884.0</b>

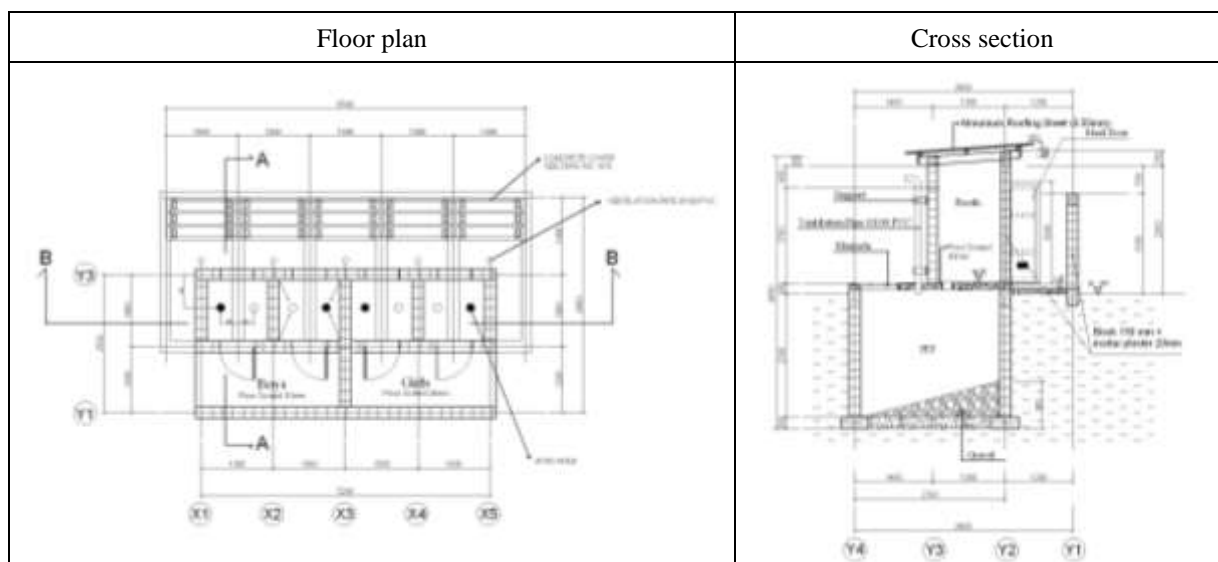


Fig. 2- 2 Toilet Prototype (boys 2 booth, girls 2 booth)

(3) Height plan

Construction guidelines in Nigeria contain no particular stipulations regarding height, however, just in case of unexpected situations such as inundation caused by torrential rain during the rainy



season, floor height shall be set at +30cm aboveground on corridors and +40cm aboveground in classrooms. The height inside classrooms shall be 2.8m from the floor to the bottom chord of the steel frame roof truss.

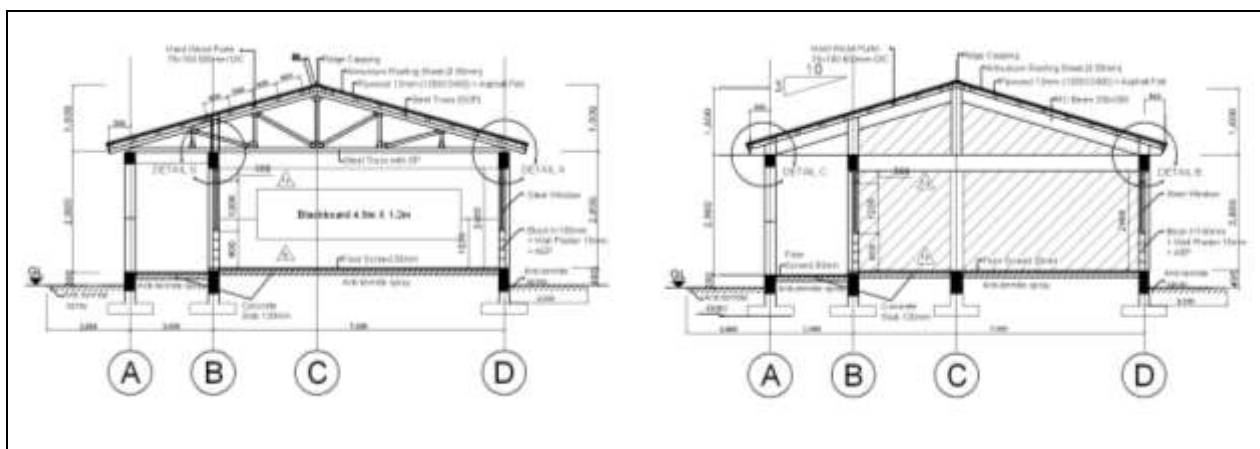


Fig. 2-3 Cross Section

(4) Layout plan of rooms

The school facilities in the Project comprise classroom blocks and toilet blocks. The layout plan has been designed while paying attention to the following points with a view to realizing an efficient and economical layout.

- Side corridor layouts shall be adopted for each prototype, and two entrances from corridors to classrooms shall be provided in order to enable pupils to smoothly enter and exit.
- Through adopting a corridor width of 2.0m to enable pupils to flow smoothly, congestion will be prevented when the pupils enter and leave the classrooms.
- Classroom shape shall be an 8m × 7m rectangle in order to enable desks and chairs to be arranged in an efficient layout and to realize favorable learning environments.

(5) Floor plan according to classroom type

1) Breakdown of classroom types

The following table shows the breakdown of classrooms according to type at the 29 targeted schools in the Project.

Table 2- 6 Number of Classrooms by Type in the Project

Classroom type (floor area)	Number of blocks	Number of classrooms	Floor area (m <sup>2</sup> )
3-classroom type (216m <sup>2</sup> )	19	57	4,104
4-classroom type (288m <sup>2</sup> )	30	120	8,640
5-classroom type (360 m <sup>2</sup> )	22	110	7,920
<b>Total</b>	<b>71</b>	<b>287</b>	<b>20,664</b>

2) Thinking on the type of classrooms

The basic prototypes in the Project will be the 3-classroom type, 4-classroom type and 5-classroom type, and these types shall be used in combination according to the lacking number of classrooms and the shape of the target school sites. For example, when seven classrooms are lacking, the 3-classroom type + 4-classroom type shall be adopted; when 8 classrooms are lacking, two 4-classroom types shall be adopted; when 9 classrooms are lacking, the 4-classroom type + 5-classroom type shall be adopted; and when 10 classrooms are lacking, two 5-classroom types shall be adopted.

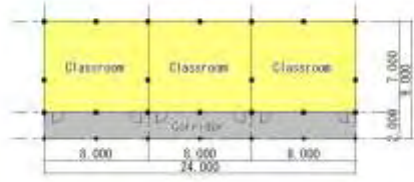
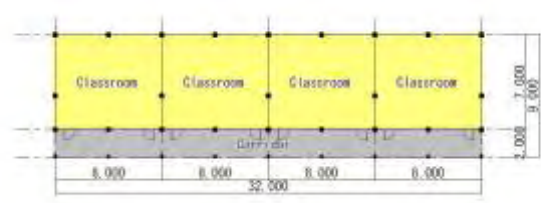

Type	Classrooms (total floor area)	Basic Type Floor Plan
Classrooms	A3 3 (216m <sup>2</sup> )	
	A4 4 (288m <sup>2</sup> )	
	A5 5 (360m <sup>2</sup> )	

Fig. 2- 4 Floor Plans of the Classroom Blocks

### 3) Elevation plan

Construction guidelines in Nigeria contain no particular stipulations regarding height, however, roofs will be fitted to single story corridors with the aims of obstructing direct sunlight during the dry season and stopping rain from blowing inside during the rainy season. Also, roof eaves on the opposite side will protrude by 50cm with the same objective. Walls facing the exterior sides of classrooms will be fitted with steel windows for allowing ventilation and letting in light. These windows will be opened while classrooms are in use, however, they will be closed at times of gusty winds during the rainy season and hamatan during the dry season. Therefore, glass fenestellas measuring H: 0.3m × W: 1.2m will be installed for lighting purposes above the windows. Also, similar fenestellas will be installed above the classroom entrances.



Fig. 2- 5 Elevation (3-classroom type)

### 4) Finishing plan

The finishing of Project facilities will be planned as follows in consideration of local specifications and maintenance after the facilities are finished and handed over.

Table 2- 7 Finishing Plan

Room / Area	Floors	Walls	Ceilings	Roofs
Classrooms	Concrete floor with mortar trowel finish (thickness 30mm)	Concrete block masonry + mortar trowel finish (thickness 30mm) + paint finish	None	Steel frame truss roof with 12mm plywood panel + asphalt roofing + aluminum roofing sheet (0.55mm)
Corridors	Concrete floor with mortar trowel finish (thickness 30mm)	Walls, pillars and beams: concrete + mortar trowel finish (thickness 30mm)	None	
Outside	-	Concrete block masonry + mortar trowel finish (thickness 15mm) + paint finish	-	-

5) Furniture

Based on the standard specifications of the Nigerian Ministry of Education, the following furniture shall be adopted in the Project.

Table 2- 8 Furniture Specifications and Quantities

Contents / Item	Specifications	Quantities Supplied in the Project
Twin desk/chair set for pupils	Wooden tops and frames	5,740 sets
Teacher's desk and chair	Wooden tops and frames	287 sets
Blackboard	Wood (with frame)	287 blackboard
Notice board	Wood (with frame)	287 notice board

(6) Structure and Foundation Plan

1) Outline

- Structures shall be strong enough to withstand gusts during the rainy season, and the locally common reinforced concrete frame structure shall be adopted for roofs.
- Since many of the target schools have had their roofs blown off by wind gusts before, the prescribed method shall be adopted to certainly fix roof trusses to reinforced concrete beams, purlines to plywood panel, and roof sheathing to aluminum roofing sheets.

2) Applicable criteria

Building design criteria in Nigeria are compiled into the National Building Code 2006 and the State Building Regulation based on the BS standard. The BS (British Standard) is basically adopted for structural design of concrete structures, however, Japanese criteria shall also be considered wherever necessary.

3) Structural type of buildings

Primary school structures in Nigeria basically consist of three types, i.e. reinforced concrete structure, reinforced concrete block structure and reinforced brick masonry structure as adopted in the first primary school construction project. The reinforced concrete block structure is generally adopted in SUBEB school construction projects, however, because the local concrete blocks have major problems in terms of strength and quality, it is necessary to improve the mixing ratio and kneading method when actually adopting this approach, although little improvement can be anticipated so long as block quality, etc. is not pursued in general works. Furthermore, concerning the reinforced brick structure that was adopted in the first primary school construction project, burned bricks (the primary materials) are only produced in restricted areas due to the geological characteristics of laterite clay (the raw

material); moreover, since these bricks suffer from frequent damage during loading, transportation and unloading, it has been decided not to adopt them in the Project. Therefore, the reinforced concrete structure (RC frame structure), which is commonly adopted in local buildings, shall also be adopted in the Project. As for the type of foundations, it is planned to use independent type spread foundations, however, the final decision will be made upon reviewing the results of the geological and ground survey conducted in the second field survey.

#### 4) Used materials

The following construction materials which are available on local markets shall be used in the Project.

Concrete	Plain concrete	Concrete slab on grade	Structural concrete
	28-day strengthening $f_c'=15 \text{ N/mm}^2$	28-day strengthening $f_c'=18 \text{ N/mm}^2$	28-day strengthening $f_c'=21 \text{ N/mm}^2$

Reinforcing bars	Standard	Tensile strength
	National Building Code 2006 (Federal Law)	$f_y=420 \text{ N/mm}^2$

Steel cage	Standard	Tensile strength
	BS (British Standard)	$f_y=420 \text{ N/mm}^2$

Moreover, since supply of raw concrete cannot be secured in the Project target area of Kano State, all concrete shall be mixed on-site.

#### 5) Design load

##### ① Live load

National Building Code 2006 (federal law) standards shall be applied as follows for live load in the Project.

Area		Load (SI unit)
1	Classrooms	$2 \text{ KN/m}^2$
2	Corridors	$4 \text{ KN/m}^2$

##### ② Wind load

National Building Code 2006 (federal law) standards are applied for wind load, however, since gusts occur in Kano State and surrounding areas in the north of the country, the following value shall be adopted:

Wind speed =40m/sec

③ Seismic load

National Building Code 2006 (federal law) standards are applied for seismic load. However, since there are no records of past earthquakes in the Project area, seismic load shall not be taken into account in the Project.

6) Foundation plan

① Types of foundations

Building foundations are an important structural part which serves to correctly transmit the building weight to the ground and to protect the superstructure from the effects of uneven settlement and cracking, etc. Foundation works are basically divided into spread foundations and pile foundations. Spread foundations entail installing foundations onto the ground and directly conveying the building load to the ground. Spread foundations can be further divided into independent footing where the foundations are installed under pillars and mat foundations where slabs are placed in the shape of the building. Meanwhile, pile foundations entail hammering concrete or steel piles into the ground and placing the building on top of these in order to support the building weight. In the case of pile foundations, depending on the way in which load is transmitted from the piles to the ground, piles are divided into bearing piles and friction piles. The most efficient and feasible method is selected upon taking into consideration the results of geological survey, the capacity of local contractors and geographical conditions. The most common types of foundations are as follows.

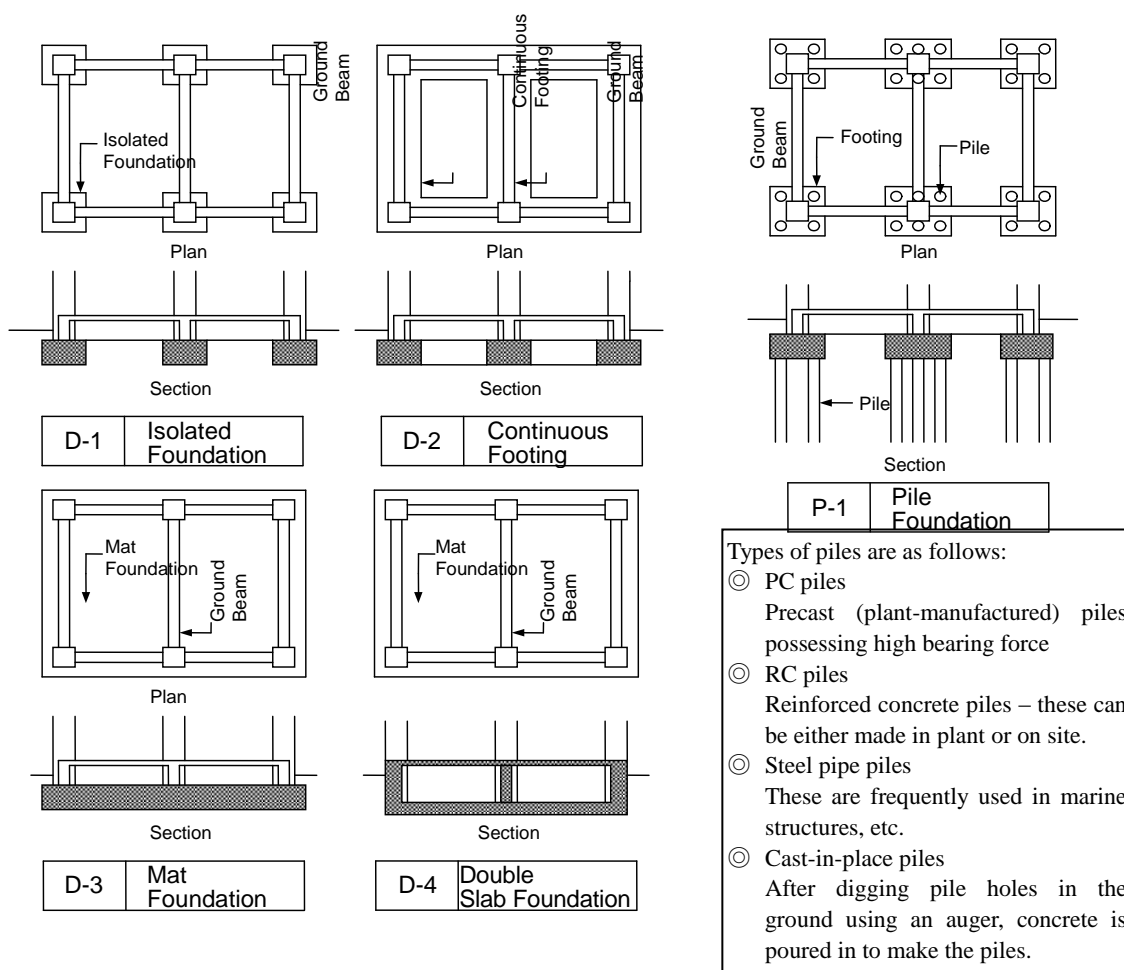


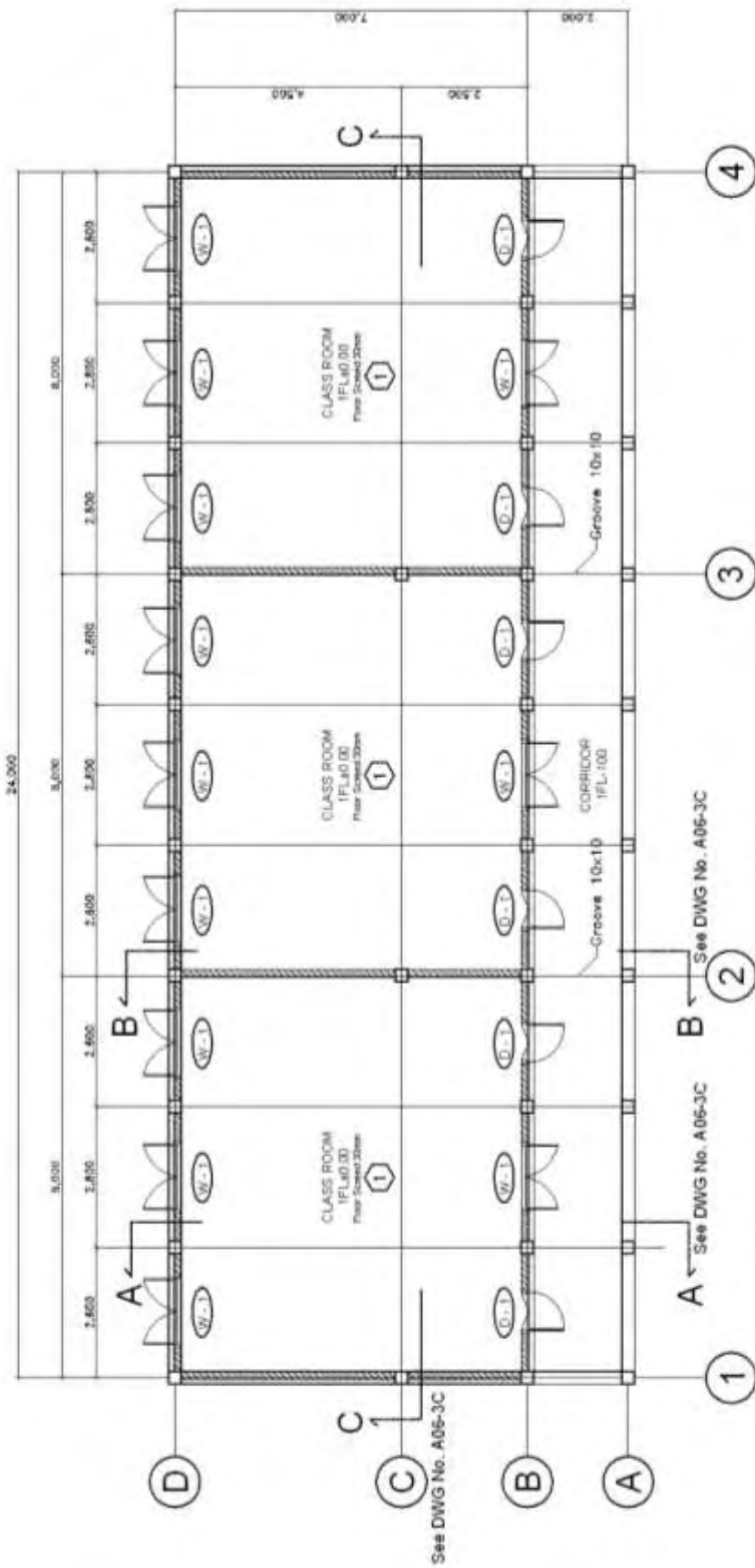
Fig. 2- 6 Types of Foundations

② Ground conditions

When designing piles, it is important to implement geological survey and to conduct appropriate design upon generally considering safety, ease of execution, general applicability, capacity of local contractors and cost, etc. according to the ground conditions. At the Project target schools, since it is judged from SUBEB school construction projects and neighboring buildings that ground conditions are generally good, ground strength is deemed to be sufficient to apply independent footing or spread foundations (i.e. there is no need to adopt pile foundations). Moreover, with a view to raising the accuracy of implementation design, ground will be further surveyed and ascertained in the second site survey in order to accurately grasp the ground and soil conditions.

**2-2-3 Outline Design Drawing**

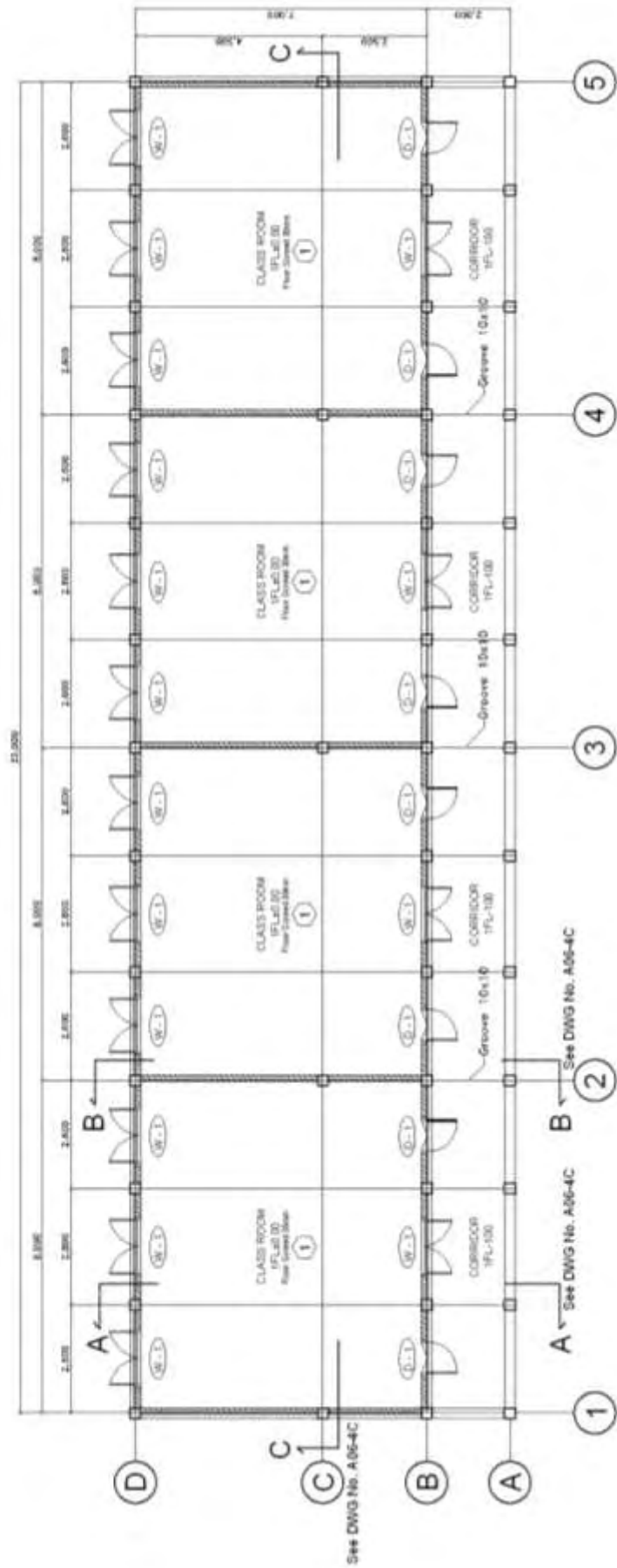




GROUND FLOOR PLAN  
SCALE 1 : 100



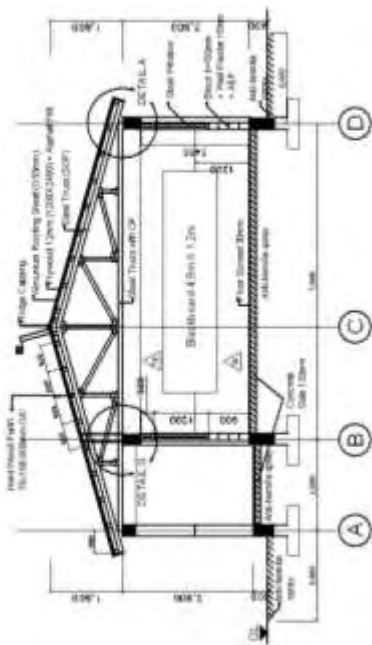




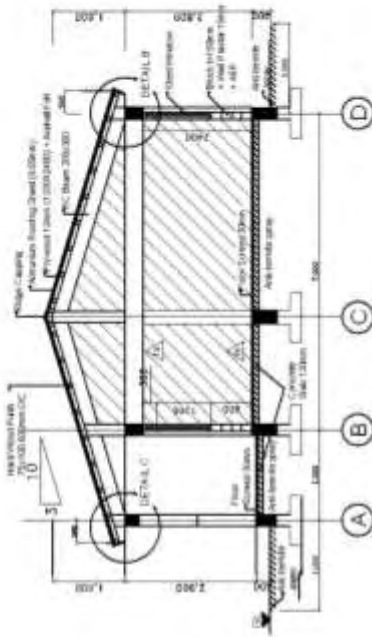
GROUND FLOOR PLAN  
SCALE 1 : 100

Note: IFL-100=GL+400mm





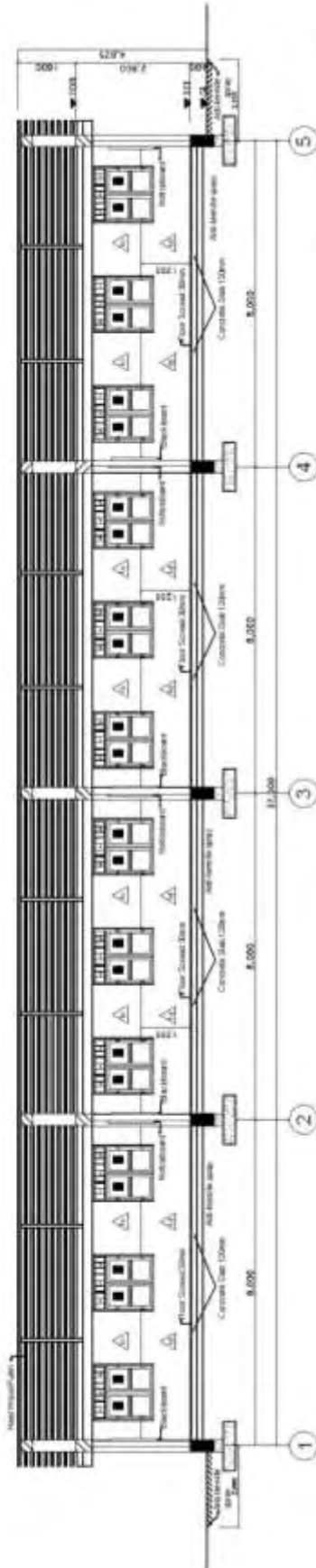
SECTION A-A  
SCALE 1 : 100



SECTION B-B  
SCALE 1 : 100

LEGEND	
	Plaster + Trowel for Light Paint Finish (AEP)
	Plaster + Trowel for Dark Paint Finish (AEP)

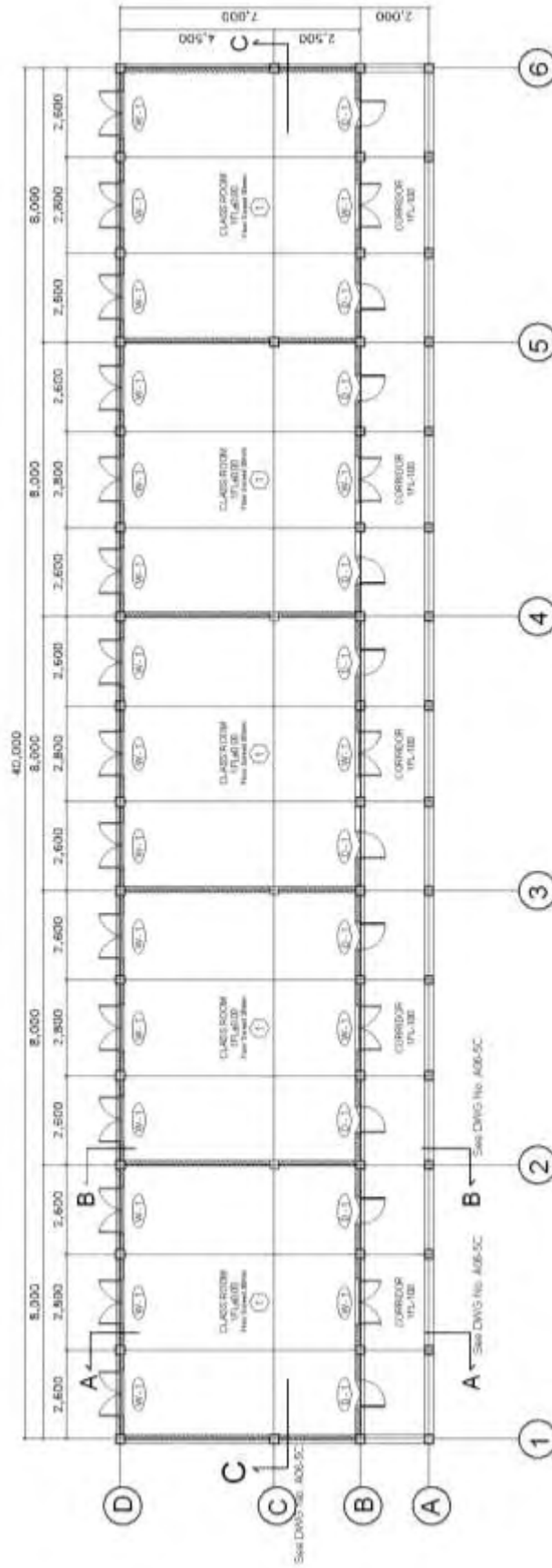
\* Art-termini shall be sprayed to all masonry and filling soil surface



SECTION C-C  
SCALE 1 : 100

LEGEND	
	Wall Plaster (t=15mm) + AEP - Light Color
	Wall Plaster (t=15mm) + AEP - Dark Color

\* Art-termini shall be sprayed to all backfilling and filling soil surface



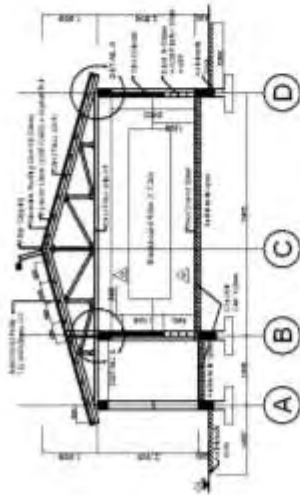
**GROUND FLOOR PLAN**

SCALE 1 : 150

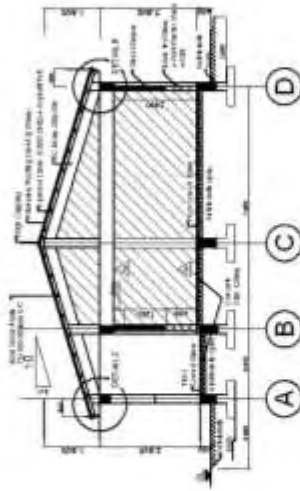
Note: 1FL±0.00=GL+400mm







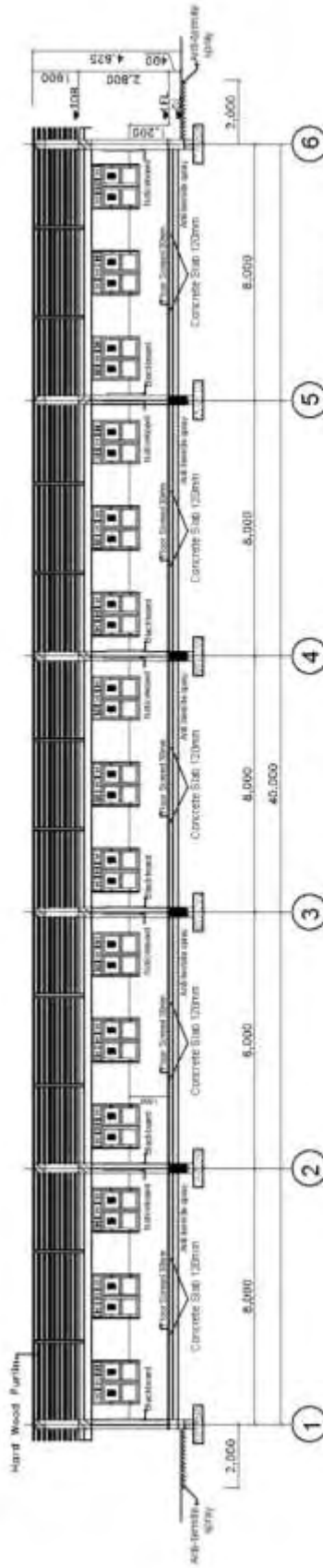
SECTION A-A  
SCALE 1 : 150



SECTION B-B  
SCALE 1 : 150

LEGEND	
	Plaster + Trowel for Light Paint Finish (AEP)
	Plaster + Trowel for Dark Paint Finish (AEP)

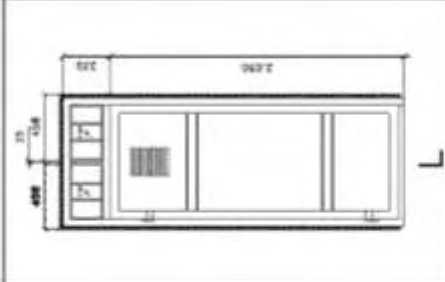
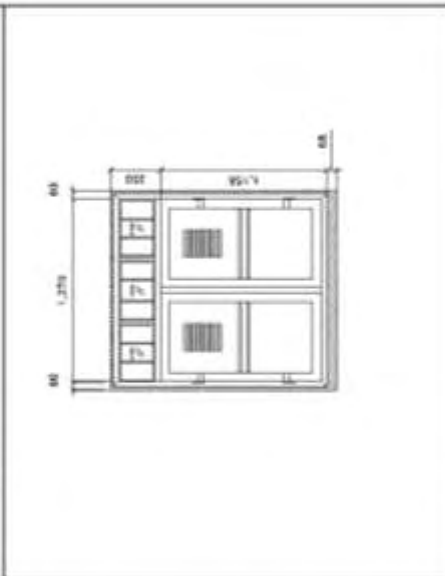
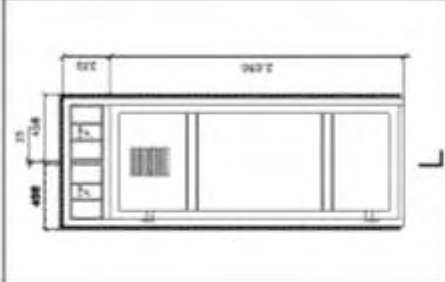
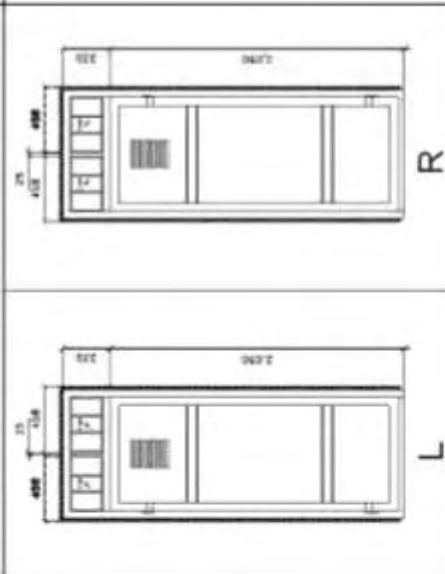
\* Anti-termite shall be sprayed to all backfilling and filling soil surface



SECTION C-C  
SCALE 1 : 150

LEGEND	
	Wall Plaster (t=15mm) + AEP - Light Color
	Wall Plaster (t=15mm) + AEP - Dark Color

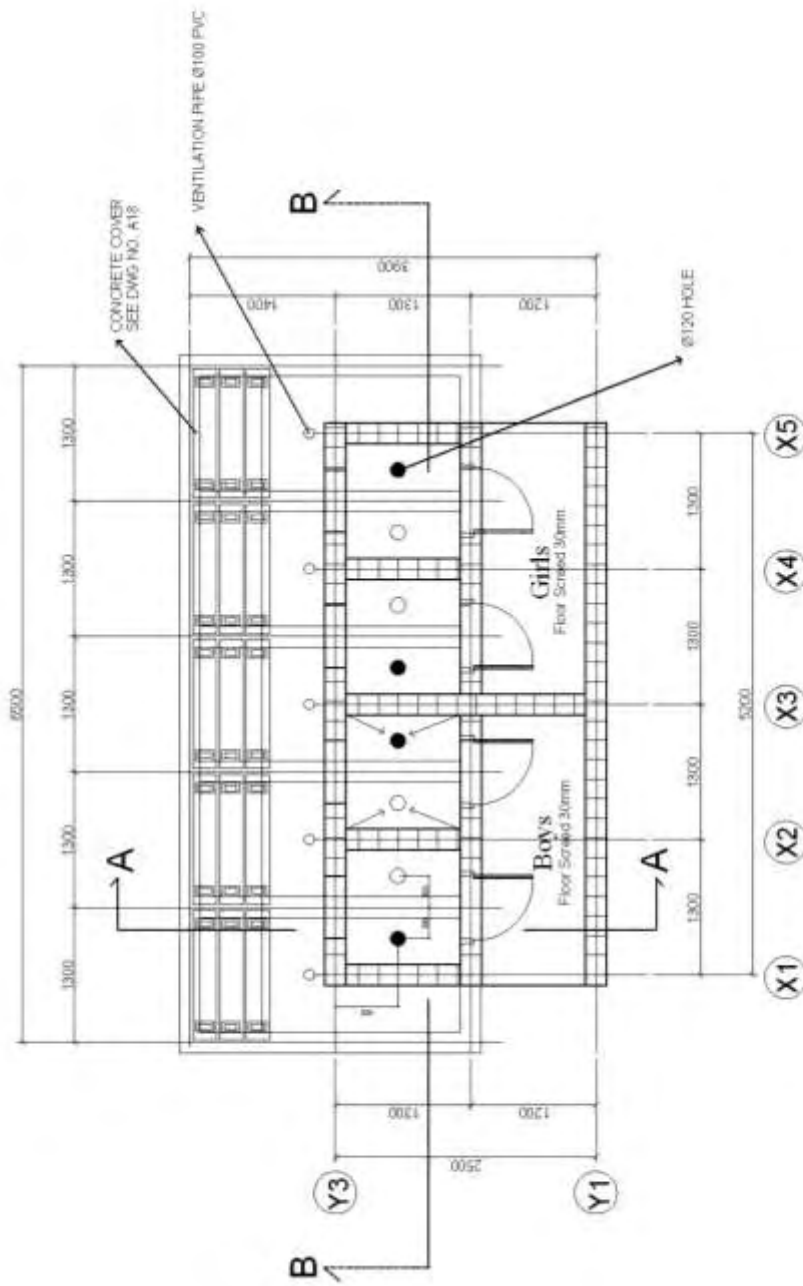
\* Anti-termite shall be sprayed to all backfilling and filling soil surface

Mark		
Size		
Door	Steel Plate	Steel Plate
Frame	Ditto	Ditto
Glass	Float Glass (t=5mm)	Float Glass (t=5mm)
Paint	Synthetic Resin Oil Paint	Synthetic Resin Oil Paint

## DOOR & WINDOW SCHEDULE

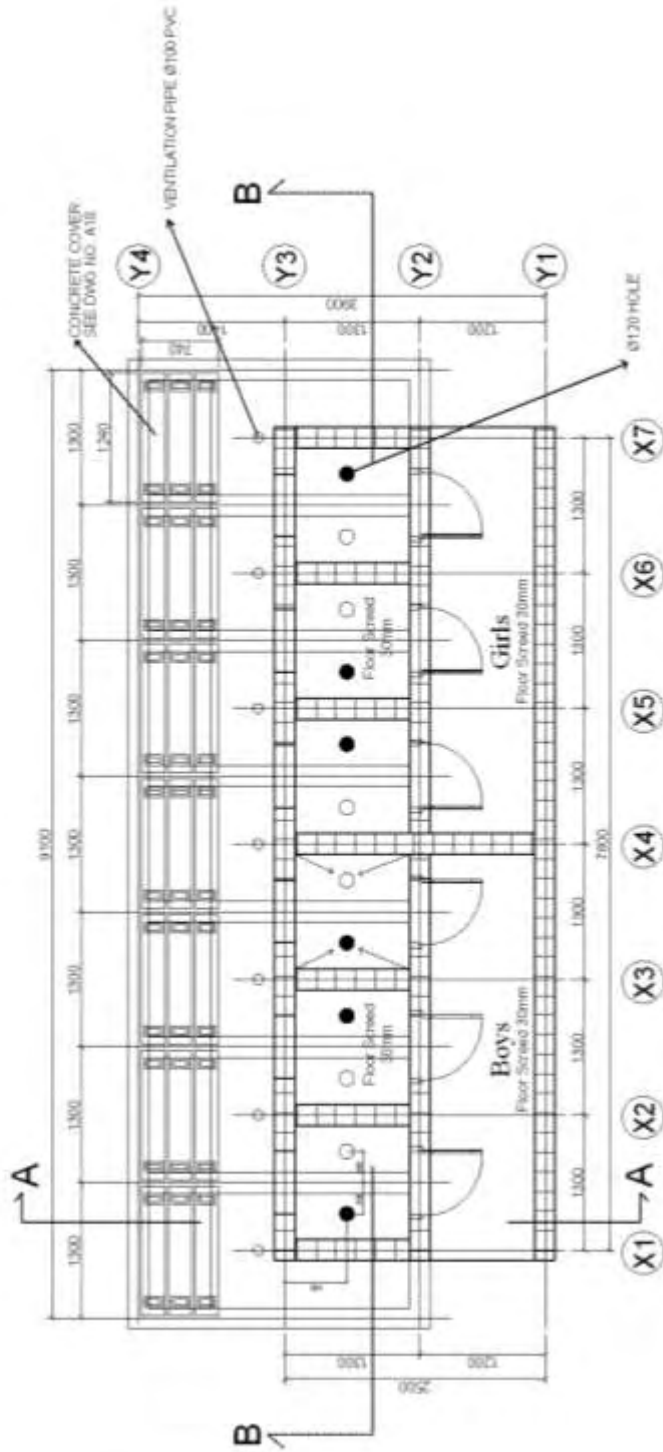
SCALE NTS





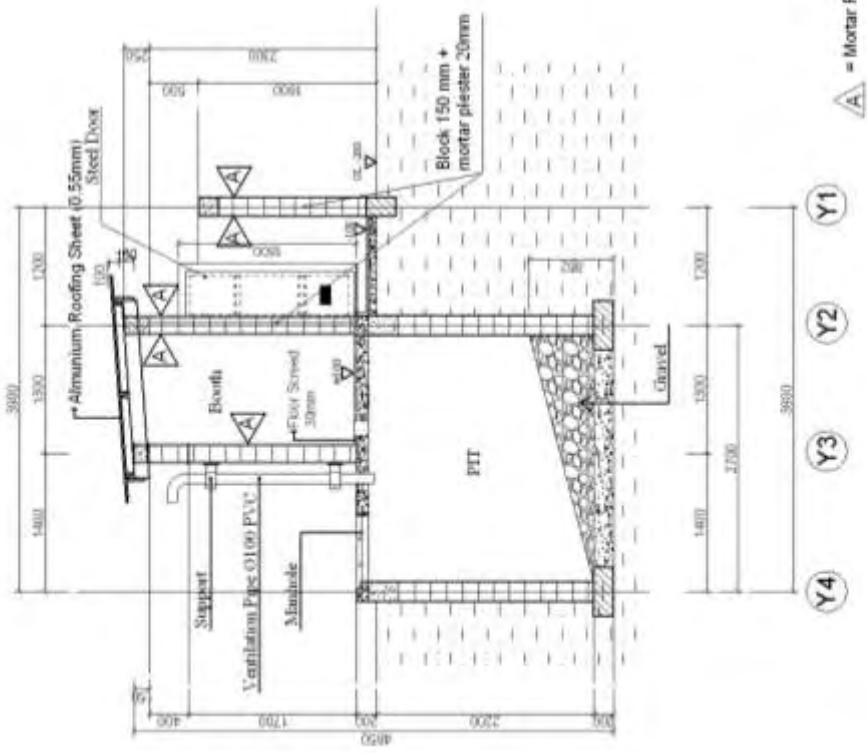
**TOILET PLAN (4 BOOTH TYPE)**

SCALE 1 : 50

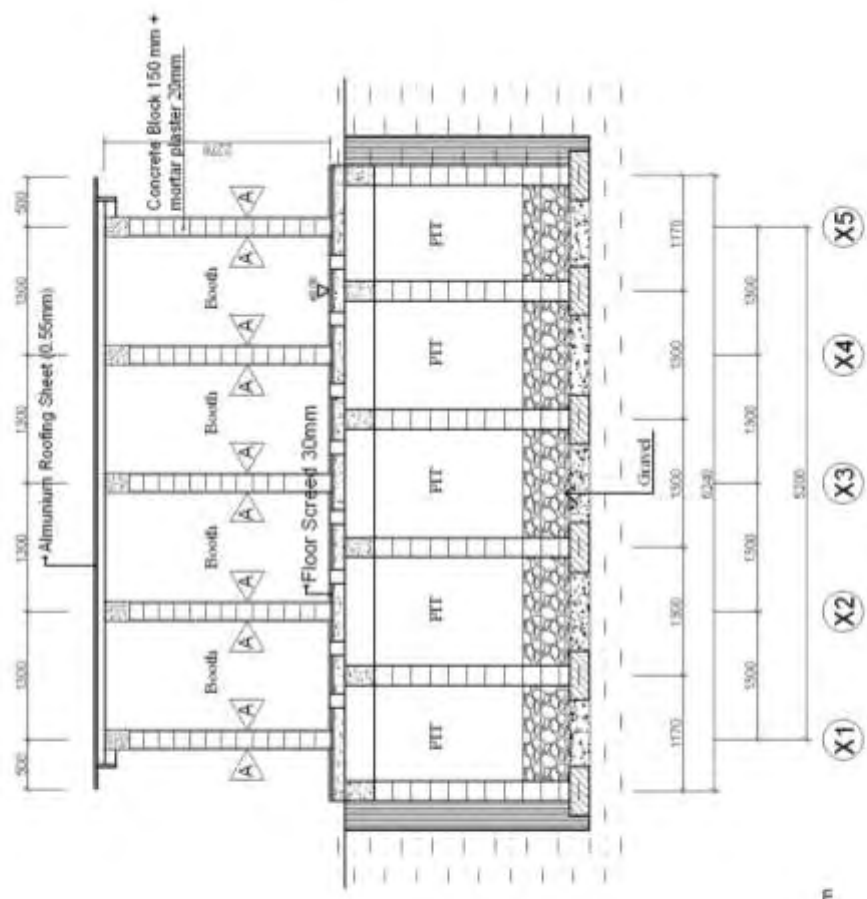


**TOILET PLAN (6 BOOTH TYPE)**

SCALE 1:50



**SECTION A-A (4 BOOTH TYPE)**  
SCALE 1:50



**SECTION B-B (4 BOOTH TYPE)**  
SCALE 1:50



## **2-2-4 Implementation Plan**

### **2-2-4-1 Implementation Policy**

The Project will be implemented based on Japan's Grant Aid Scheme for Community Empowerment. Unlike conventional grant aid, since there is possibility that the main construction works will be implemented by local contractors, it will be necessary to strengthen construction supervision and technical guidance with the help of a Japanese consultant concerning quality control, schedule control and safety control. Accordingly, it will be necessary to build a setup which assumes that local contractors implement the main construction works and that works sites will be divided into numerous lots and contractors based on area.

#### **(1) Implementation Setup**

Following the conclusion of the Exchange of Notes (E/N) and Grant Agreement (G/A) concerning the Community Empowerment Grant for the Project, the Government of Nigeria will entrust selection and contracting of the works consultant and contractors to the Procurement Management Agent. The works supervision consultant and contractors will implement their respective duties upon binding contracts with the Procurement Management Agent.

##### **1) Responsible and implementing agencies**

The responsible and implementing agencies for the Project are the Universal Basic Education Commission (UBEC) and the Kano State Universal Education Board (SUBEB). In Nigeria, the Federal Ministry of Education (FMoE) and UBEC are responsible for formulating education policy and compiling curriculums for primary education. The National Primary Education Council (NEPC) decides minimum required criteria for education facilities, teaching materials, curriculums, desks and chairs, and teacher numbers, etc., while the state boards of education (SUBEB) and local boards of education (LGEA) have jurisdiction over the running of primary education administration. School construction by the government is implemented under four sources of funding, i.e. UBEC and SUBEB funding, the Education Tax Fund, state governments, and local governments.

The Project will be implemented as a Grant Aid Scheme for Community Empowerment undertaking based on the Agent Agreement (A/A) concluded between the Universal Basic Education Commission (UBEC) and the Kano State Universal Basic Education Board (SUBEB) (the responsible and implementing agencies on the Government of Nigeria side) and the Japanese Procurement Management Agent. UBEC and SUBEB will have overall control over the Grant Aid Scheme for Community Empowerment undertaking in Nigeria and will be responsible for ensuring smooth Project implementation as the contract partners



of the Procurement Management Agent. Moreover, the main agencies on the Nigerian Government side (NPC, FMOE) and the Government of Japan (EOJ, JICA office in Nigeria, Procurement Management Agency) will establish an intergovernmental Consulting Committee composed of representatives from each to discuss the items that require coordination and confirmation at government level. Furthermore, a working group will be established by the NPC, FMOE, R&D, JICA Nigeria Office and the Procurement Management Agent, and this will confirm progress and discuss technical confirmation points and so on. The Project implementation setup is indicated below.

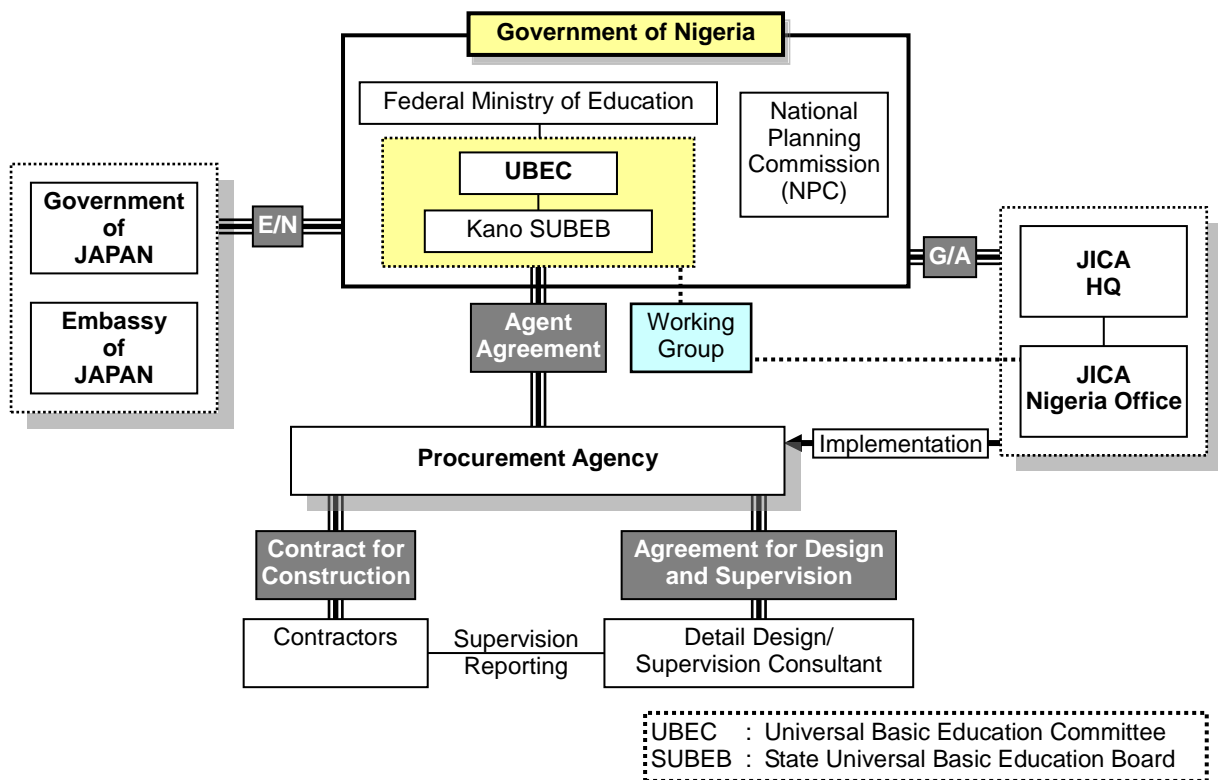


Fig. 2- 7 Project Implementation Setup

2) Procurement Management Agent

① Implementation Contents

It is preferable that the tender documents are prepared by the Japanese consultant, which implemented the outline design study, however, selection of the consultant will be subject to consent by the implementing agency on the Nigerian side. After that, the Procurement Management Agent, which will be recommended to the Nigerian side by the Government of Japan, will implement and execute general supervision to ensure that the Project components are appropriately and smoothly implemented in its capacity as the mandatory of the implementing agency. Also, the Procurement Management Agent will coordinate the tender prequalification review (PQ) and tender

documents, oversee the tender procedure and tender implementation, and supervise implementation of the construction work.

② Implementation setup

The work to be implemented by the Procurement Management Agent in the Project is as indicated below.

Implementation design period (tender procedure period)	Construction supervision period
<p>Assuming that the tender meeting will be staged in Nigeria, it is desirable that the Procurement Management Agent sets up its local office in the capital Abuja. Moreover, the Supervisor will carry out spot supervision work during the signing of contracts and approval by the client when the office is opened. Furthermore, regarding the work concerning the Procurement Management Agent contract, bank arrangements, account opening and local office establishment, the Assistant Supervisor, who will be permanently stationed in Nigeria, will prepare the contract documents, distribute the tender documents and conduct the tender, evaluation and contracting work.</p> <p>Due to the construction situation in Nigeria, since it is forecast that there will be numerous tender lots, a local contract and fund manager and office staff will be employed as assistant personnel. Also, since it will be necessary to appropriately implement the technical Q&amp;A work concerning the tender documents and the technical proposal and evaluation of the bidding contractors, the Japanese consultant will assist the technical work (see Fig. 2-8 Implementation Setup for the Tender).</p>	<p>The Procurement Management Agent will conduct general supervision during the construction period, however, it will mainly be concerned with fund management while the Japanese consultant will conduct the technical supervision. Accordingly, it will retain an office in the capital Abuja so that the Supervisor can witness the start of works and oversee the completion inspections and office closure, etc. The permanently stationed Assistant Supervisor will conduct fund management, however, local support personnel will also be employed to manage funds and staff the office and thereby ensure the smooth implementation of fund management work (see Fig. 2-9 Implementation Setup during Construction Supervision).</p>

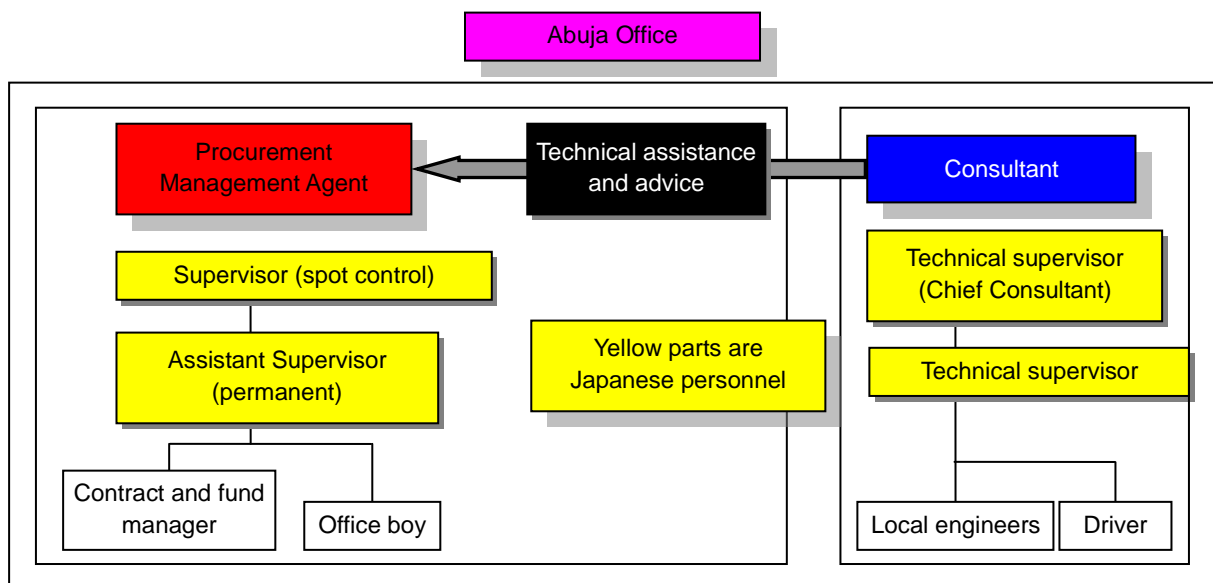


Fig. 2- 8 Implementation Setup for Tender

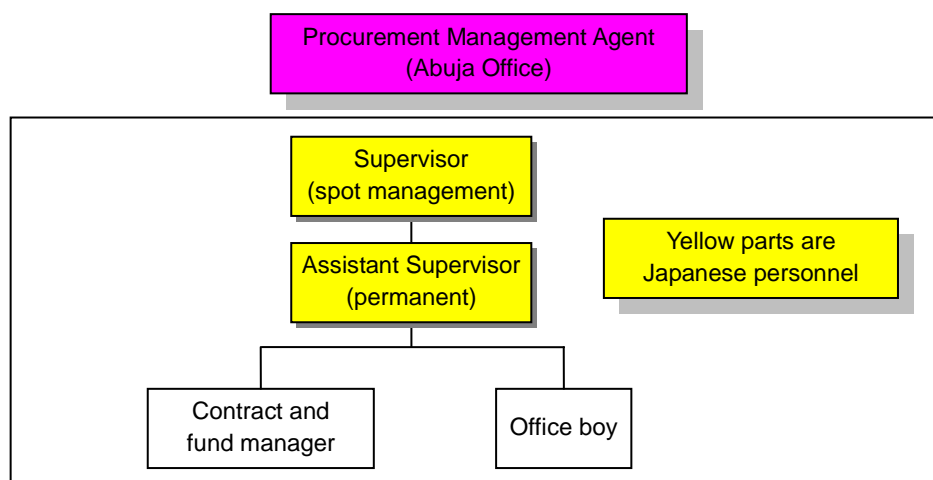


Fig. 2- 9 Implementation Setup during Construction Supervision

### 3) Construction supervision consultant

#### ① Implementation contents

In its capacity as the construction supervision consultant, the Consultant will implement technical assistance of the tender work performed by the Procurement Management Agent and also supervise the works. In addition to supervising the quality of works execution, the implementation schedule and safety of works, etc., the Consultant will assess and evaluate the works progress made by the contractors and report the contents to the Procurement Management Agent each month.

#### ② Implementation setup

Implementation design period (tender procedure period)	Construction supervision period
<p>The Consultant will set up its office in the office of the Procurement Management Agent and will conduct technical assistance of the tender work including the prequalification review (PQ) and tender implemented by the Procurement Management Agent. For this purpose, the Technical Supervisor (work supervisor) and permanently stationed technician will conduct spot assistance during preparation and approval of the tender documents and approval of the contracts. Moreover, in order to assist the Japanese technical supervisors (including the permanently stationed technician), local engineers will be recruited to expedite work. Moreover, the Japanese technicians will handle the Q&amp;A work in Nigeria, while the local technicians will handle the work on the ground.</p>	<p>The 30 target schools in the Project are dotted around 20 out of 44 LGAs in Kano State, and they are located between 30 minutes to 3 hours from the state capital. Therefore, the sites will be reached by car during the construction supervision, however, this traveling will require a lot of time. Moreover, since local contractors do not possess completely satisfactory construction capacity and technical capacity, Japanese technical supervisor and local technical supervisors will be assigned. Concerning the supervision setup, a supervision office will be established in the state capital Kano. In addition to supervising the construction work at the 30 target primary schools in the 20 LGAs, it will act as a liaison office with the Procurement Management Agent. Accordingly, the Japanese technical supervisor will be stationed during the overall works period, and he will be assisted by 1 local chief engineer, 15 supervising technicians (1 for every 2 sites), 1 estimator, driver and office boy. Under this setup, quality, schedule and safety control will be carried out. (See Fig. 2-10 for the consultant implementation setup during construction supervision).</p>

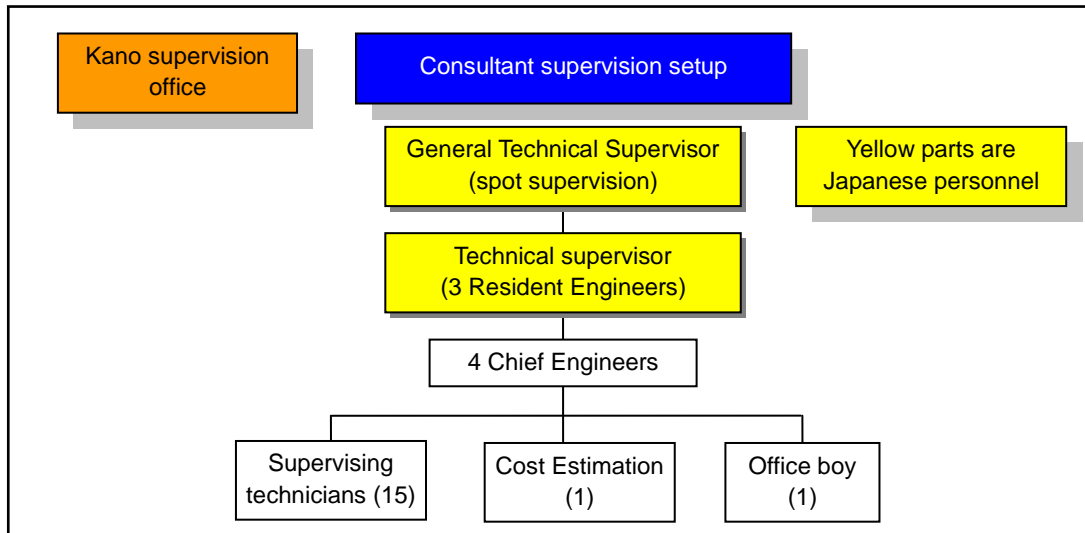


Fig. 2-10 Consultant Implementation Setup during Construction Supervision

#### 4) Contractors

The flow for selection of contractors in the Project will be as follows.

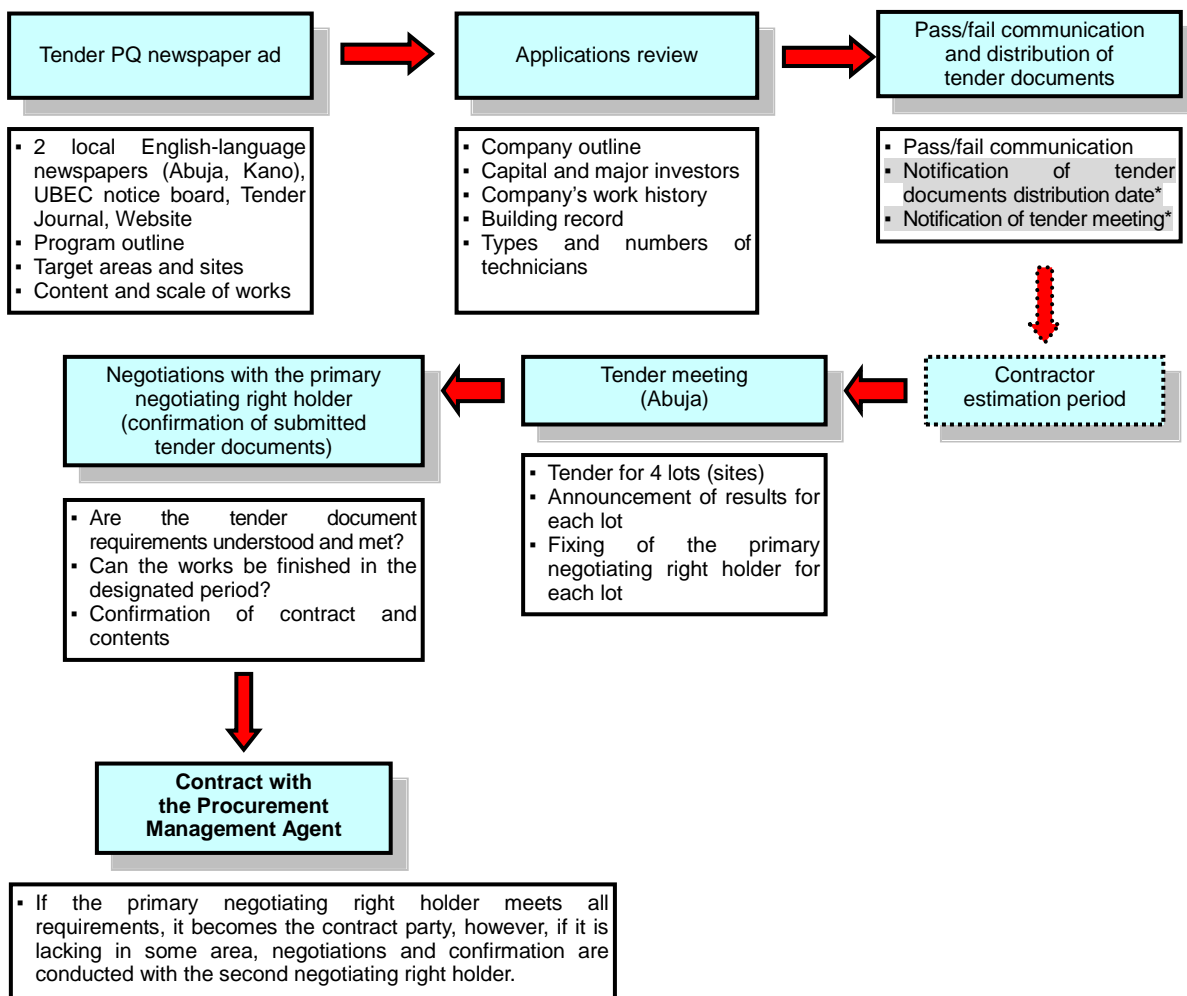


Fig. 2-11 Contractor Selection Flow

Contractors are able to bid for multiple lots (sites), however, they cannot bind contracts exceeding their permissible scope (past performance) based on the size of the company and work projects currently in progress, etc.

(2) Tender Method

The Project facilities shall basically be planned assuming construction methods, building specifications, equipment and materials generally applied in Nigeria, so local contractors will be able to handle the works. Contractors will be selected via a process of general competitive tender or designated competitive tender also open to local operators, and they will execute the works. Moreover, considering that the target schools (sites) are scattered over 20 LGAs in Kano State, the works will be divided into the appropriate number of lots upon fully considering the geographical conditions and the work capacity of the contractors. Moreover, considering that the 30 target sites in 20 LGAs are between 30 minutes to around three hours from the state capital, the target LGAs shall be divided into four blocks and the target sites into four lots (the number of tenders) of 6-8 schools each in order to ensure the most efficient and economical construction supervision. Construction firms may take part in multiple lots according to their scale and scope of capacity, however, the maximum shall be two lots. Incidentally, since the procurement and installation of furniture will be included in the building works, a separate tender for furniture only will not be conducted.

(3) Works Supervision

Since the Project will be implemented as a single undertaking of Japan's Grant Aid Scheme for Community Empowerment targeting 30 schools in 20 LGAs, it will be necessary to build a construction supervision setup to secure a certain grade of quality, schedule and safety control at all 29 schools (sites). Moreover, the Procurement Management Agent will supervise the overall Project, while the Japanese consultant will implement technical construction supervision.

(4) Form of Public Works Ordering in Nigeria

1) Tender and works contract procedures

Advertisement, tender and contract procedures for public works projects in Nigeria are implemented according to the tender regulations of each agency, ministry and state, however, the Government of Nigeria has no special rules or regulations. Accordingly, the tender and contract procedures for the Project shall be implemented while referring to past projects ordered by UBEC and SUBEB, the advertisement, tender and contract procedures implemented by international agencies, and other cases of Japan's Grant Aid Scheme for Community Empowerment in recent years.

## 2) Contract method

The main works contracting methods adopted in Nigeria are the BQ contract method based on the works quantities and the lump-sum contract method. For the Project, the lump-sum approach shall be adopted. As for the contract currency, the contract payment can be made either in local currency or foreign currency (US dollars).

### **2-2-4-2 Implementation Conditions**

#### (1) Construction sites

Since the Project construction works will be implemented at target schools spread over 20 LGAs, it will be necessary to conduct process planning assuming sufficient transit time between sites. Moreover, a number of the target schools are located away from arterial roads and can only be reached by narrow bumpy access roads. In addition, since there is frequent heavy rainfall and wind gusts during the rainy season especially in July and August, it is likely that transportation of equipment and materials will be hindered. Accordingly, the construction plan and procurement plan shall be compiled while paying attention to the following points.

##### 1) Timing of materials transportation

In the target area, since the heaviest rain falls during July and August, it shall be planned to transport equipment and materials before this period to ensure that the works schedule isn't affected.

##### 2) Site storage of construction materials

Since the construction sites are located in village communities and the grounds of existing schools, it will be necessary to install temporary fences in order to limit entry by unauthorized personnel. Also, it will be necessary to restrict entry by third parties in the interests of safety and crime prevention. Moreover, because it is forecast that heavy rains during July and August will cause inundations at many of the sites, it will be necessary to show care in the plan for transporting cement, aggregate, reinforcing bars and formwork, etc. and to secure a construction materials storage area through banking ground to sufficient height over a certain area.

#### (2) Materials procurement

The construction equipment and materials to be adopted in the Project contain no items of special specifications, and all items can be procured in Nigeria (although some items have been imported before becoming available on the local market).

- 1) Concerning cement, there are three private cement factories in Nigeria, and two of these make good quality cement. However, since there are no cement factories around the target area, the good quality cement that is manufactured at the said two factories and is available on in Kano State shall be procured.
- 2) Concerning reinforcing bars, there are three private reinforcing bar factories, however, two of these manufacture irregular shaped steel and iron bars from imported ingots. The other company is located in Kano State and manufactures similar reinforcing bars from scrap iron. All of these companies manufacture products of satisfactory quality. In Kano State, the reinforcing bars made by these factories are available on the local market and shall be procured. The diameter of irregular shaped reinforcing bars in Nigeria comprises 8mm, 10mm, 12mm and 14mm, while bars of 16mm and more are also available but have to be imported from China, Ukraine and India, etc. Accordingly, in the Project, it will be necessary to decide the diameter of reinforcing bars upon taking these conditions into account.
- 3) Concerning sand and crushed stones for making concrete, since it is difficult to procure concrete outside of the metropolitan area and major cities, job-mixed concrete made with simple mixers (diesel engine-driven) on site is used. As for sand, this can be obtained from rivers in Kano State, while crushed stones can be procured in Kano State and Kaduna State. The locally available sand and crushed stones possess satisfactory quality and entail no major problems in use. However, when using sand, it will be necessary to confirm and test salt levels and so on in advance.
- 4) Plants which mold the long sheet aluminum (thickness 0.55mm) used for roofs exist in Kano State, neighboring Kaduna State and Borno State to the northeast, and plates can be directly procured from such plants. These types of materials have also been used in SUBEB school prototypes and the first primary school construction project, and they have a proven record.
- 5) The steel cage materials used in roof trusses are not produced in Nigeria. Accordingly, it will be necessary to procure imported materials already on the local market or to import materials according to the required quantities and sizes, and attention will need to be given to this point when conducting the Project design. Furthermore, steel cage processing and assembly plants are located in Kano City.
- 6) Concerning steel doors and windows, these can be procured in Kano State and from neighboring Kaduna State. The plants here have previously supplied steel doors and windows to SUBEB prototype and first-stage primary schools.

### (3) Safety control

Since the Project target sites are located in a farming region, it is likely that ordinary farm workers having little knowledge of construction work will be recruited from the surrounding areas. Moreover, in the event where people are injured on sites, since conditions are not favorable for carrying to hospital, it will be necessary to display ample care regarding safety control. For this reason, it will be necessary to raise safety awareness among locally employed workers and to establish a safety control setup.

Specific contents are described below.

- 1) Give mobile phones to the local site supervisors on each site and establish and advertise emergency communications networks embracing the Japanese staff, Nigerian staff, hospitals and police, etc.
- 2) Encourage morning assemblies for confirming each day's work contents and giving safety advice.
- 3) Conduct thorough site patrols at the start and end of work, and make sure that the work environment including scaffolding, supports and handrails, etc. is safe.
- 4) During poor weather, since deterioration of access routes can cause slippage, falling and toppling, etc., implement inspections on access routes and keep them in good condition.
- 5) At the target schools, since the works will be carried out on existing school grounds while lessons are in progress, erect temporary fences in order to clarify the separation of traffic lines between school officials and works areas.
- 6) Always keep first aid boxes on hand in site offices.
- 7) Since there are curious children, assign guards to important points.



### 2-2-4-3 Scope of Works

The Project will be implemented under the Government of Japan's Grant Aid Scheme, and Table 2-9 shows the major undertakings to be taken by the Japanese side and the implementing agencies on the Nigerian side.

Table 2-9 Scope of Work

No.	Item	Japan	Nigeria	Remarks
1	To secure land		●	
2	To clear, level and reclaim the sites when needed		●	
3	To construct gates and fences in and around the sites		●	
4	To construct the parking lots	N/A		
5	To construct roads			
	1) Within the sites	N/A		
	2) Outside the sites (access roads)		●	
6	To construct the buildings	●		
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities			
	1) Electricity			
	a. The distributing lines to the site		N/A	
	b. The drop wiring and internal wiring within the site	N/A		
	c. The main circuit breakers and transformer	N/A		
	2) Water supply			
	a. The city water distribution mains to the sites		●	
	b. The supply system within the sites (receiving and elevated tanks)		●	
	3) Drainage			
	a. The city drainage mains (for storm, sewer and others)		●	
	b. Septic tanks	●		
	4) Furniture			
	a. Desks and chairs (for teachers and pupils)	●		
	b. Other general furniture		●	
8	*Customs procedures (where necessary)			
	1) Marine (air) transportation of products related to the construction works to the recipient country (*)	N/A		
	2) Customs duties and clearance of the products at the port of disembarkation (*)		N/A	
	3) Internal transportation from the port of disembarkation to the project sites (*)	N/A	N/A	
9	Tax measures (VAT)		●	
10	Maintenance (*)		●	
11	Works costs not included in the Grant Aid (*)		●	

●: Show the division of responsibility concerning these items.

#### **2-2-4-4 Consultant Supervision**

##### (1) Local consultant

General consulting companies are limited in Nigeria, however, there are numerous small consulting firms and it is possible to secure technicians with sufficient capacity to conduct site supervision. However, quality control standards for consultants to use in routine work are not established, and the local consultants do not possess great supervision experience or technical capacity. In these conditions, it is necessary to utilize a Japanese consultant for implementing technical guidance and to supervise quality, schedule and safety control, etc. Moreover, at the start of the works, technical supervisors belonging to the local consultant will be assembled in order to provide guidance on construction supervision points and methods, reasons for securing quality and methods of filling out supervision documents and forms, and to unify the construction supervision methods.

##### (2) Implementation Setup

###### 1) Implementation design period (tender period)

The Procurement Management Agent will conduct the tender procedure, however, since it will be necessary to receive and answer technical questions on the tender contents and appropriately evaluate the technical proposals of tenderers, the Japanese consultant will assist in the technical affairs. Therefore, the Japanese consultant will be dispatched for the start of the tender and the evaluation period.

###### 2) Construction supervision period

During the construction period, the consultant will implement the necessary site guidance and technical guidance focusing on quality supervision, schedule supervision and safety supervision, etc. Also, it will report on the works progress and contents to the Procurement Management Agent and Nigerian government. Also, when technical problems arise, it will propose methods for discussion, examination and resolution.

###### 3) Construction supervision setup

A supervision office will be established in the capital Kano City. As well as supervising works on the 30 target sites, this office will act as a liaison point with the Procurement Management Agent. Accordingly, three Japanese technical supervisors shall be permanently assigned during the total works period, and they shall be assisted by local personnel comprising one chief technician, 15 technical supervisors (one for every two sites), one estimator, driver and office boy to ensure that quality, schedule and safety control are thoroughly implemented.

## 2-2-4-5 Quality Control Plan

### (1) Basic Policy

The supervision consultant will need to confirm the progress of procurement and construction works, check the amount of progress made each month for reporting to the Procurement Management Agent to ensure that the works are completed on time with the level of quality stipulated in the contract documents. Also, it will need to supervise and guide the work of the construction companies to ensure that safety is upheld on sites.

In Nigeria, there are no quality control standards for construction supervision, and supervision guidelines and criteria do not exist. Since there are no facilities for implementing concrete compression tests and reinforcing bar tensile strength tests in the target LGAs, it will be necessary to use facilities at Kano University, etc. for these activities. Furthermore, since technical guidance to contractors on site is also an important issue, it will be necessary to establish control criteria and conduct technology transfer based on Japanese quality control criteria in seminars, etc. held on the building sites as much as possible.

### (2) Quality Supervision Items

Since the Project facilities are planned according to commonly adopted construction methods, specifications and equipment and materials in Nigeria, quality control will be implemented according to the following contents and items.

#### 1) Checking of construction works shop drawings and specifications of equipment and materials

Prior to the construction works, contractors will be required to submit shop drawings for the works, and the contents will be confirmed. Also, in order to definitely secure good quality, specifications and certificates of purchase will be required for the materials carried onto sites.

#### 2) Equipment and materials manufacturing and production sites will be observed, or inspection results will be checked. When necessary, implement on-the-spot inspections of construction materials production/assembly plants in order to confirm the quality of raw materials and verify quality inspection certificates, etc.

#### 3) Control and confirmation of progress and finishing conditions

On construction sites, technical guidance and on-the-spot inspections will be implemented during the works stage, and thorough repairs will be instructed and implemented if troubles are found. Also, in the progress inspections, work will be checked against the shop drawings.

4) Inspection records

The locally employed consultants will receive guidance in supervision guidelines and will be required to leave inspection records according to each work member and area according to the stage of execution, and efficient but sure supervision will be realized. Table 2-10 shows the main quality control items.

Table 2-10 Main Quality Control Plan

Works	Control Item	Test (Inspection) Method	Test Frequency
Ground works	Bearing force	Portable simple penetration test	Each works site
Earthworks	Compaction	Visual inspection	All foundation bases
	Incoming soil quality inspection (as required)	Particle size test	1 earth quarry
Formwork	Completed amount	Dimensions inspection, photographs	All members
	Materials inspection	Plate thickness, material quality, deformation	All members
	Assembly inspection	Visual inspection (gaps, reinforcing materials, spacers)	All members
Reinforcing bar work	Tensile strength	Tensile strength test	Each size, once
	Quality in general	Mill sheet	Each size, once
	Bar arrangement inspection	Number and diameter of bars, interval between bars, length of joints, fixing length, covered thickness	Before concrete placement, all parts
Concrete work	Aggregate grade	Sieve test	Once
	Test mixing	Mixing, water-cement ratio, compression strength, slump and salt concentration test	Implement once for each contract lot
	Compression strength	Compressive strength test	Once for each placed part (such as base, under ground beams, columns, beams and floor for each six (6) peaces means 7days and 28 days compressive strength test shall be confirmed.
	Slump	Slump test	Once each placing day
	Fine aggregate chloride content	Chloride content measurement (Quantab test)	Each placing
	Steel cage work	Steel, bolts	Mill sheet
	Manufacturing test	Measurement and visual inspection	All members
	Fitting accuracy	Measurement	Each truss
Masonry work	Brick quality	Plant inspection	Once
Fixtures work	Fixture quality	Visual inspection, measurement	When carrying in
Furniture/Equipment	Furniture quality	Visual inspection, measurement	When carrying in

### (3) Schedule Control

The contractors will compare progress with the implementation schedule decided in the contract every month in order to adhere to the delivery deadline given in the contract. In cases where delays are predicted, the contractors will be prompted and required to present a plan of countermeasures, and guidance will be provided to ensure that the works and equipment delivery are completed within the contract period. The comparison of the planned schedule and actual progress will mainly be carried out according to the following items.

- ① Confirmation of works performance (construction equipment and materials procurement situation and works progress)
- ② Confirmation of equipment and materials delivery (construction equipment and materials, and fixtures)
- ③ Confirmation of temporary installation works and construction machinery preparations (where necessary)
- ④ Confirmation of numbers of engineers, skilled workers and laborers, etc.

#### 2-2-4-6 Procurement Plan

Since the procurement of equipment and materials required for Project implementation will be included in the works contracts, it will be carried out based on the contracts between the Procurement Management Agent and the contractors. The construction of facilities includes the building structures and the procurement and installation of furniture, and the Study has proved that the necessary equipment and materials can be procured on the local market.

Table 2-11 shows the procurement sources of equipment and materials.

Table 2-11 Procurement Sources of Equipment and Materials, etc.

Item	Producing Country			Remarks
	Nigeria	Japan	Third Country	
[Materials]				
Portland cement	○			
Concrete aggregate	○			
Reinforcing bars	○			φ16mm or larger needs to be imported from China, Ukraine and India, etc.
Concrete blocks	○			
Timber and forms	○			
General steel materials	○			Made in China, Ukraine and India, etc.
Steel fixtures	○			
Paint	○			
Aluminum roofing sheet	○			
Furniture	○			
Asphalt roofing	○			
Glass	○			

The construction equipment and materials to be adopted in the Project contain no items of special specifications, and all items can be procured in Nigeria (although some items have been imported before becoming available on the local market). Moreover, since value added tax (VAT) has been introduced in Nigeria, it is necessary to undertake the procedure for tax exemption.

Since VAT is applied to goods and services, in the Project, it will be necessary to apply for exemption procedures upon first compiling a master list and so on. In the first primary school construction project, since it took roughly three months in order to obtain approval for tax exemption, it will be necessary to promptly advance procedures through UBEC and NPC to ensure that the overall schedule is not affected. Moreover, concerning the tax exemption procedure, see Fig. 2-12 Application and Approval Procedure for Tax Exemption.

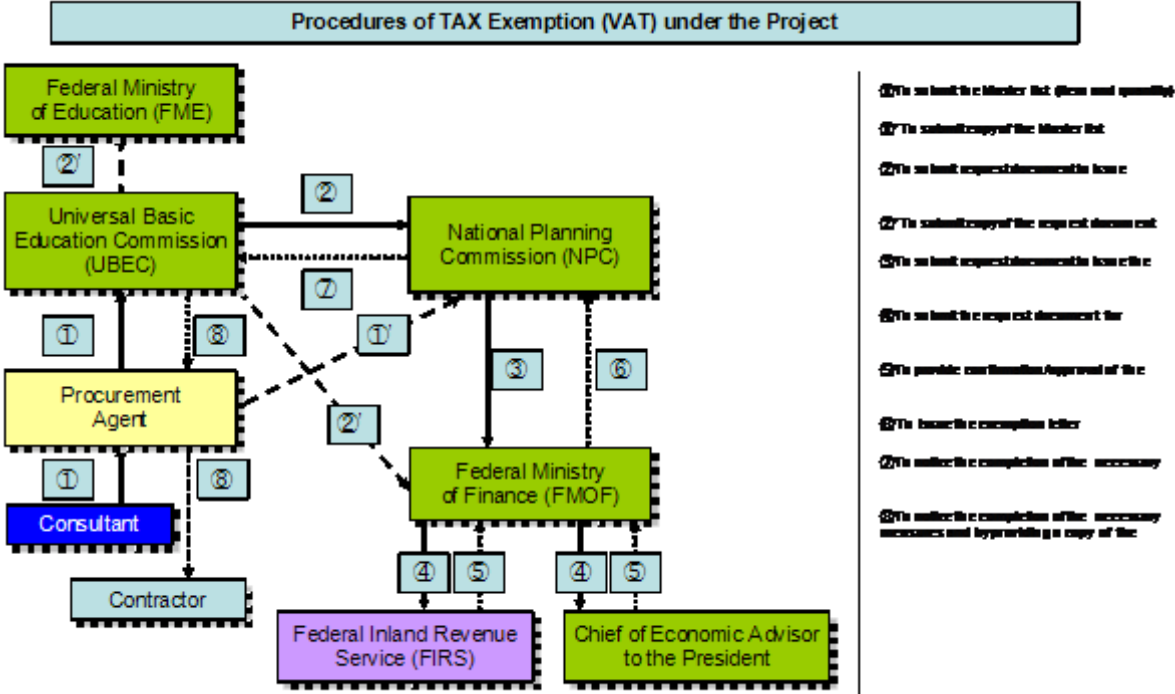


Fig. 2-12 Application and Approval Procedure for Tax Exemption

**2-2-4-7 Soft Component (Technical Assistance) Plan**

(1) Background of the plan

On surveying the 50 requested schools, one of the biggest problems found was the absence of customs geared to using and maintaining public facilities with care. Unless the local side is educated about the importance of conducting routine cleaning and maintenance activities, it is highly likely that the facilities constructed in the project will quickly become damaged and deteriorated within a few years of construction. Also, it is necessary to introduce the technology

for treating sludge from toilet pits. Furthermore, in Nigeria where it isn't possible to fully secure the necessary budget for maintaining school facilities, it is essential to have participation and support from the local communities and PTAs.

Meanwhile, within the state boards of education (SUBEB), the Planning, Statistics and Research Departments are in charge of facilities maintenance, while the observers who belong to the local boards of education (LGEAs) are best positioned to monitor school management at the grassroots level. Utilizing this opportunity, it will be very important for the sustained maintenance of the Project facilities to improve the capacity of these personnel and to strengthen the monitoring and guidance setup after facilities are built and commissioned.

## (2) Soft Component Target

The soft component will be implemented with the aim of imparting a sense of ownership towards the facilities among the pupils, who will be the direct beneficiaries of the Project, and the community leaders, teachers and principals, etc. who will be responsible for maintaining them. In doing so, it is intended to build the foundation for conducting the ongoing maintenance of the Project facilities. Also, a manual will be compiled in order to enable the administrative side (SUBEB and LGEAs) to effectively and efficiently implement monitoring and guidance activities.

## (3) Soft Component Outputs

The soft component will generate the following outputs.

- 1) A sense of ownership, i.e. the willingness to take the initiative in maintaining the Project facilities, will be nurtured among the community leaders, teachers and principals, etc. who will be responsible for actual facilities maintenance.
- 2) The pupils who study at the project schools will realize that the classrooms, desks and chairs, etc. should be treated with care for their own sake and the sake of pupils coming later, and they will learn to clean these school facilities by themselves.
- 3) The setups will be established whereby the SUBEB and LGEAs will implement monitoring and guidance on the maintenance of facilities following construction.
- 4) Technology will be disseminated concerning the treatment of sludge from toilet pits and maintenance of facilities, i.e. activities which require know-how and technology.
- 5) Maintenance manuals will be compiled for schools, while maintenance guidance and monitoring manuals will be compiled for SUBEB and LGEAs.

#### (4) Confirmation of Achievement of Outputs

Confirmation and evaluation of the level of achievement of outputs will be implemented by interview survey and questionnaire survey at the following two points: ① following implementation of the soft component, and ② a number of years after the soft component.

- Conduct a questionnaire survey of the pupils who are the direct beneficiaries.
- Conduct interview surveys of the principals, teachers and community leaders.

#### (5) Soft Component Activities (Inputs)

The following activities will be implemented as the soft component in order to achieve the above targets.

##### 1) Review and correction of the soft component implementation guidelines

Prior to the discussions with the Nigerian side, review and correct the guidelines that were prepared for the first primary school construction project, and modify them according to the actual conditions.

##### 2) Explanation to the local counterpart agencies

Using the above guidelines, the consultant will explain to the Project counterparts, i.e. UBEC (Universal Basic Education Commission) and SUBEB (State Universal Basic Education Board), about the aim and targets of the soft component, the implementation contents, and the schedule of activities. In doing so, the local side will gain thorough understanding of the schedule activities and a start will be made on developing a sense of ownership regarding the maintenance of schools.

##### 3) Establishment of a local task force

Moreover, in order to effectively and efficiently implement the soft component activities, it is indispensable to have facilitators in charge of actual work and promotion activities to help the local personnel gain a smooth understanding while listening to the wishes of the Japanese side. Also, from the viewpoint of ensuring sustainability, it will be important for SUBEB, which will conduct monitoring and guidance of the maintenance activities following construction, to take an active role in the soft component. This local taskforce will be established primarily around the SUBEB Planning, Statistics and Research Department, which will be the counterpart during Project implementation. The task force will comprise five or six members including the manager of the Planning, Statistics and Research Department, the SUBEB facilities maintenance officer, the SUBEB education statistics expert, representative of the LGEA in charge of the model schools, and the observer, etc. Furthermore, the facilitator who will chair the following orientation and workshops and give



explanations while listening to the wishes of the Japanese consultants will appoint the leader of the task force.

4) Decision of the model schools and implementation schedule

Model schools for implementing preliminary maintenance activities will be selected out of the 30 target schools. The construction schedule for the model schools will be controlled so that they can go into service earlier than the other target schools. Since the 30 target schools cover such a wide area, workshops as described below will be implemented at the model schools upon dividing the state into two districts. Moreover, the model schools shall be selected in consideration of the ability and willingness of the principals and community leaders and to ensure that the practical activities at the schools can be carried out efficiently and effectively. Moreover, in order to enhance the project sustainability and improve the capacity of personnel at SUBEB and other schools in Kano State, the soft component shall be geared to encouraging participation and self help. Accordingly, in the first mission (discussions), the taskforce shall be established and assignments given; then the Nigerian counterparts will be encouraged to advance the work; and a single package will be compiled in the final mission.

5) Orientation for the target primary schools

The target schools will be informed that they have been targeted and will hear explanations about the contents of facilities to be constructed, the construction schedule, and the general content and schedule of the facilities maintenance workshops. At the same time, a start will be made on deepening awareness about the importance of facilities maintenance.

6) Preparation of a primary school maintenance manual

Hold discussions with the local taskforce, the model school principals and community leaders, and examine and analyze the way in which school facilities maintenance can be improved following completion of the model schools while improving their problem awareness. In order to raise the awareness of the counterparts, the local task force will be encouraged to correct the manual based on the format provided by the consultant while adding their own ideas, and in doing so a sense of ownership will be fostered. The consultant side will add its own comments to the draft manual and offer guidance. In addition to the maintenance manual, illustrated posters clearly showing each maintenance activity will be prepared for the pupils.

7) Actual maintenance activities in the model schools

Based on the said maintenance manual, the teachers, pupils, PTA and community leaders will be encouraged to take the initiative in implementing maintenance activities with a view to improving the schools.

8) Workshop preparation and implementation

- In order to spread the maintenance activities at the model schools to the other target schools, principals and community leaders from nearby target schools will be invited to the model schools to take part in workshops. The principals and community leaders from each school will observe the maintenance activities at the model schools, receive training and take part in discussions.
- The workshop will be staged by SUBEB and led by the local facilitators while the other taskforce members will cooperate in their capacity as moderators. The Japanese consultants will conduct the overall supervision and guidance.
- The workshop training menu, necessary teaching materials and equipment, schedule and division of duties will be decided in consultation with the task force.
- The local taskforce will make the preparations for the workshops.
- Following implementation of the workshops, a review meeting will be held with the local taskforce and a report of the workshops will be prepared.

9) Preparation of the SUBEB facilities maintenance monitoring manual

- A manual will be prepared for monitoring the maintenance activities at the Project schools, and this will also be done while encouraging self help by SUBEB.
- The monitoring manual will be prepared through reviewing the version that was prepared by the consultant in the previous cooperation.
- Based on the corrected monitoring manual, the consultant will hold discussions with the local taskforce and encourage it to show initiative in confirming and compiling the manual. The Japanese consultant will add its own evaluation and comments and give feedback. Then the monitoring manual will be completed.
- Based on the said monitoring manual, the schools will be asked to report on the maintenance condition of facilities every year via the LGEA observer. SUBEB will consolidate the reports from each school and make a general report to the JICA Nigeria office once a year.

(6) Procurement Method of Soft Component Resources

The Japanese consultant will implement general supervision and guidance of the soft component. Meanwhile, in order to ensure smooth implementation and effective and efficient monitoring, it is important that Kano SUBEB and the LGEAs concerned are encouraged to display initiative and self help. Specifically, the head of the Kano SUBEB Planning, Survey and Statistics Department will be appointed as the local facilitator, and he will work to ensure that smooth understanding is realized among the administrative authorities (SUBEB, LGEAs, etc.), principals, teachers, community leaders, pupils, parents and other persons involved with the schools. Moreover, the local taskforce comprising staff of the counterpart SUBEB Planning, Survey and Statistics Department, LGEA officials and observers of the model schools will be established.

(7) Soft Component Implementation Schedule

Table 2-12 Technical Guidance Schedule

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Remarks
Kano State (4 blocks))													Step 1		(Japanese)  (Local Employment)
													1.0 months		

(8) Soft Component Outputs

The following outputs will be generated via implementation of the soft component:

- Draft of the corrected soft component implementation guidelines (consultant)
- Soft component implementation guidelines (consultant, UBEC, SUBEB)
- Facilities maintenance manual (each school)
- Facilities maintenance monitoring manual (SUBEB)

(9) Obligations of the Implementing Agency

- The Nigerian Government shall establish the local taskforce to cooperate with implementation of the soft component. The taskforce will mainly comprise members of the SUBEB Planning, Survey and Statistical Research Department, which will be the counterpart agency during Project implementation.
- When the orientation and workshop are implemented, a facilitator will be assigned from the taskforce to smoothly advance the proceedings.

- SUBEB and UBEC shall be responsible for communicating with and offering guidance to the 30 target schools in Kano State.
- SUBEB shall assemble the 30 target schools to take part in the orientation and workshop.
- Prior to the workshop, the local taskforce shall prepare the primary school maintenance manual while liaising with the consultant.
- Towards the end of the soft component, the local taskforce shall prepare the SUBEB facilities maintenance monitoring manual while liaising with the consultant.
- The maintenance condition of facilities following the soft component shall be monitored. Also, an annual maintenance report shall be compiled and reported to the JICA Nigeria office once a year.

#### **2-2-4-8 Implementation Schedule**

The Project implementation schedule following the E/N will be 4.50 months for the tender work process and 14 months for the construction and procurement process.

As shown below, 4.50 months will be required for the tender work to be implemented by the Procurement Management Agent.

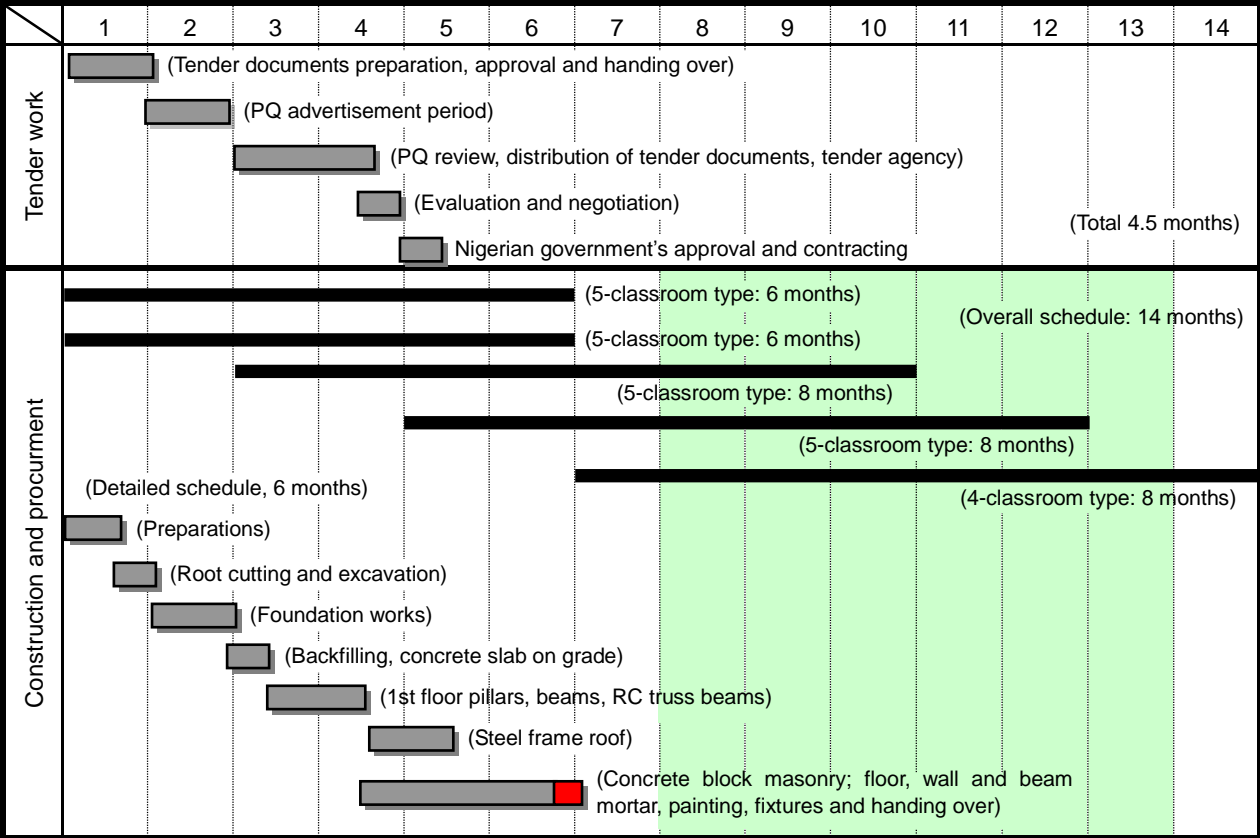
- |  |              |
|--|--------------|
| ① Tender documents preparation, approval and handing over      | : 1.0 month  |
| ② PQ advertisement period (newspaper ads)                      | : 1.0 month  |
| ③ PQ review, tender documents distribution, tender agency      | : 1.5 months |
| ④ Price negotiation  | : 0.5 months |
| ⑤ Approval by the Nigerian government and signing of contracts | : 0.5 months |

As for the construction work schedule, taking into account the construction management capacity of local contractors, the carrying-in of equipment and materials onto sites, the work capacity of laborers, and the rainy season from May to October, 14 months will be required. Regarding the basis for this figure, the largest critical school in the Project is adopted. Since this school will require 21 additional classrooms, the Project will entail construction of three blocks of five classrooms and two blocks of three classrooms. Judging from the capacity of the contractors and taking into account labor, equipment and materials and the economical diversion of forms, etc., it will be difficult to simultaneously commence work on four blocks. Therefore, in the Project, work shall be started on one block at a time at two-month intervals. Moreover, the works period for one block shall be set at six months irrespective of whether blocks are the three-classroom type, the four-classroom type or the

five-classroom type. However, this shall be extended to eight months in cases where the works coincide with the rainy season.

Table 2-13 shows the Project implementation schedule.

Table 2-13 Project Implementation Schedule



(1) Important Points to Consider in Schedule Planning

1) Removal of existing buildings, etc.

There is no need to remove existing structures or obstructions on any of the target sites, and all sites comprise level land. However, since crops are cultivated inside the planned sites at some of the target schools, it will be necessary to coordinate works with the SUBEB/LGAs and schools to ensure that works are not hindered.

2) Preparatory period

A preparatory period has been taken into consideration for procurement of the construction equipment and materials and labor, schedule planning, creation of shop drawings, establishment of equipment and materials stores, workers' accommodation, dormitories and works offices, and confirmation of sites and nearby areas.

3) Groundwork, foundations and first floor concrete slab on grade

Foundation works will comprise excavation, crushed stone foundation, leveling concrete, reinforcing bar arrangement, forms, concrete placement, curing and backfilling and banking, followed by the first floor concrete slab on grade work of reinforcing bars, forms and concrete placement, and it is estimated that this will require around two months.

4) First floor pillars, beams, roof reinforced concrete and truss beam skeleton works

The first floor pillars, beams, roof reinforced concrete and truss beam works will be advanced in that order and will take approximately one month. The roof reinforced concrete truss beams are positioned in the center in the short direction and form oblique concrete beams, however the utmost care will be required because the positioning, etc. is difficult.

5) Roof steel frame truss and roof finishing works

When process 4) above is finished, the steel frame truss will be assembled, and plywood panel (12mm) and asphalt roofing + aluminum roofing sheet (0.55mm) will be placed on top of that, and this work will take approximately one month. The steel frames are heavy and will need to be put in place using cranes, and care will be needed to ensure safety.

6) Concrete block masonry, and mortar application, painting and finishing of floors, walls and beams

As a result of survey and confirmation, the locally produced and manufactured concrete blocks have been found to contain problems in terms of strength and quality, etc. Accordingly, it will be necessary for contractors to make their own blocks or to conduct guidance on quality control at manufacturers. Also, concerning the blend ratio for mortar, since the common local mix is a sparse blend with fluctuating quality, it will be necessary to request contractors to submit construction plans and blend plans in advance and to confirm the contents. This works process will require approximately 2.5 months.

(2) Other Important Points to Consider

There are 15 national holidays and government holidays per year in Nigeria as shown below. Religious holidays will be taken into account in the schedule planning.

Table 2-14 Public Holidays in Nigeria in 2010

No.	Name	Date	Number of Holidays
1.	New Year	January 1	1
2.	Easter	March 21~	1
3.	Democracy Memorial Day	May 29	1
4.	Independence Day	October 1	1
5.	Christmas	December 25~26	2
6.	Ramadan	Different each year	3
7.	Eid al-Adha (Festival of Sacrifice)	Ditto	2
8.	Birthday of Muhammad	Ditto	1
9.	Federal government designated holiday	Ditto	3
Total			15

### 2-2-4-9 Trial Construction Plan

#### (1) Objectives of Trial Construction

The primary objective of the trial construction as part of the Study is the construction of a three classroom type building at two different schools (see Appendix 1 for the site locations) which were selected through consultations and the field study in Nigeria in order to ensure the required quality of the construction work through the implementation of the Project proper in Nigeria under Japan's Grant Aid for Community Empowerment Scheme. Another objective is improvement of the supervisory capability of local consultants. The full range of the objectives of the trial construction are listed below.

- 1) Understanding and verification of the construction capacity (in terms of the technical expertise, financial strength, schedule control and other relevant aspects) of local construction companies and also of the supervisory capacity of local consultants
- 2) Establishment of an appropriate quality level for the construction work in view of the standard capacity of local construction companies
- 3) Establishment of a work supervision plan to reflect the local reality in view of the work supervision procedure and method adopted by local consultants
- 4) Confirmation of the trading conditions for the procurement of equipment and materials by local construction companies and also of the cash flow management capacity, including the method of settling personnel and other costs, of these companies

#### (2) Outline of Trial Construction

The design contents for the trial construction, including the building specifications, are those agreed with the relevant organization in Nigeria for a standard three classroom type building so that the buildings to be constructed are basically identical to those to be constructed under the





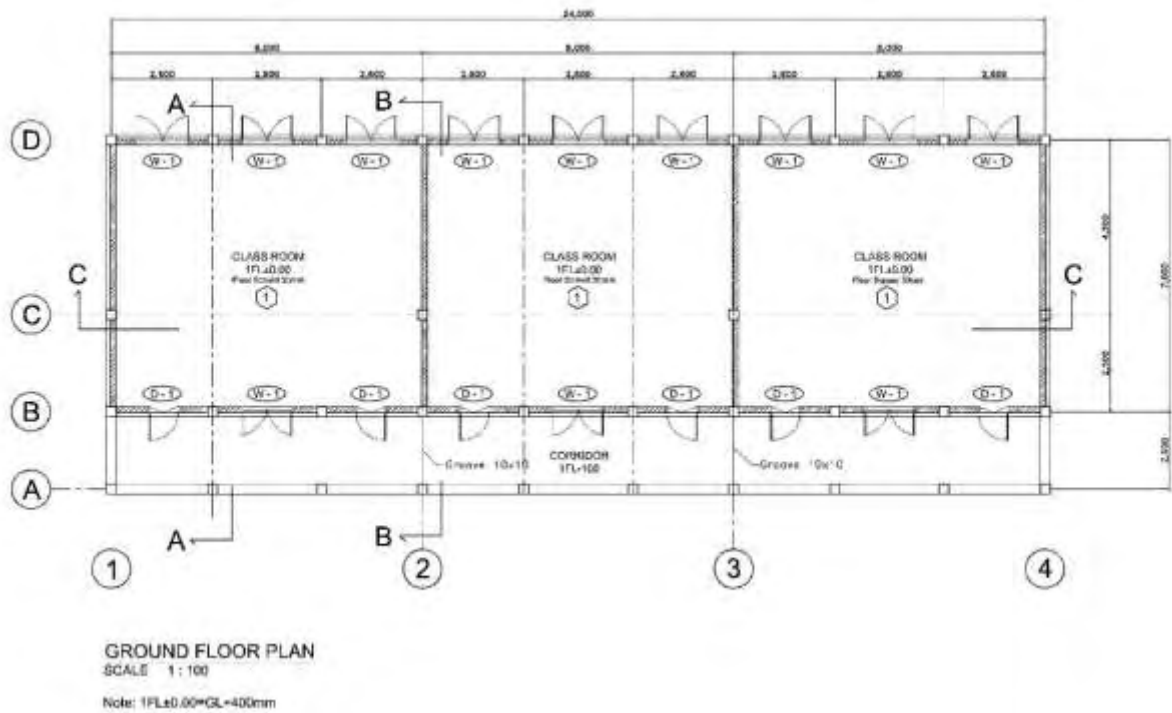


Fig. 2-15 Ground Floor Plan for School (Classroom) Building (Common)

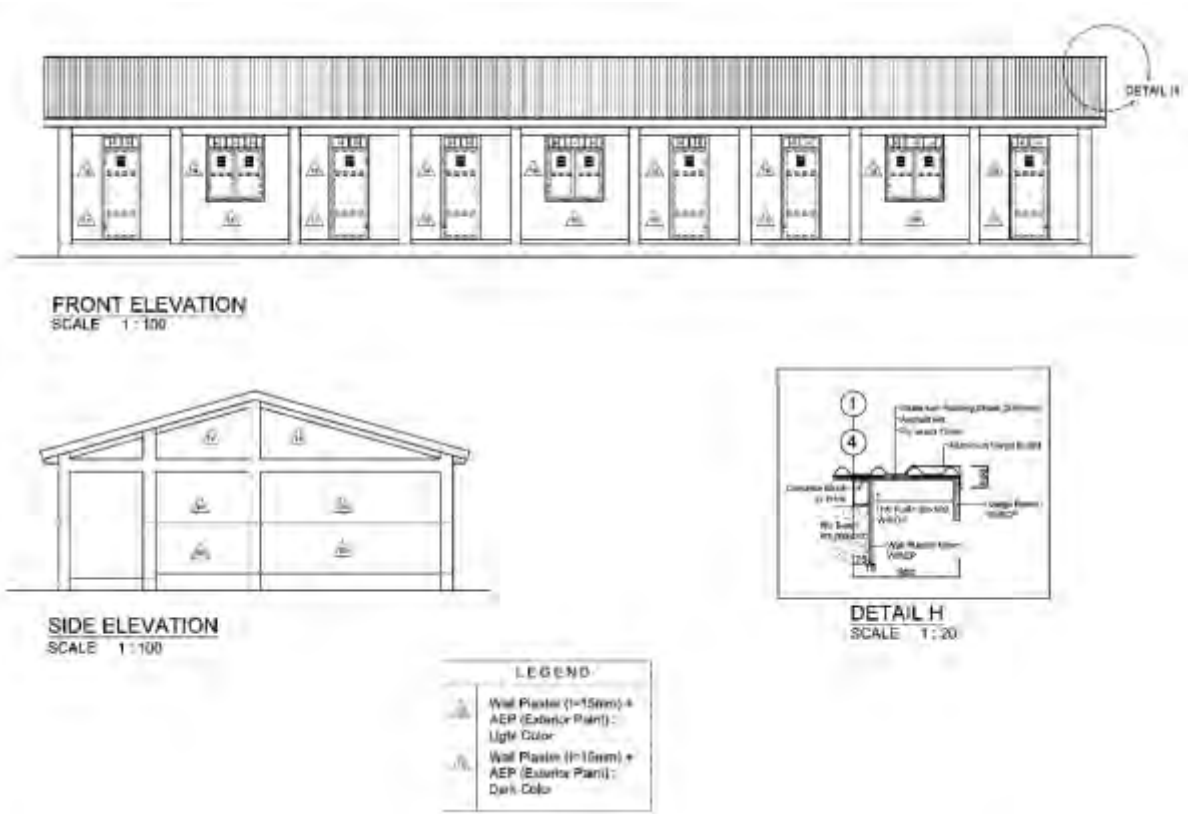


Fig. 2-16 Site Elevation (Common)

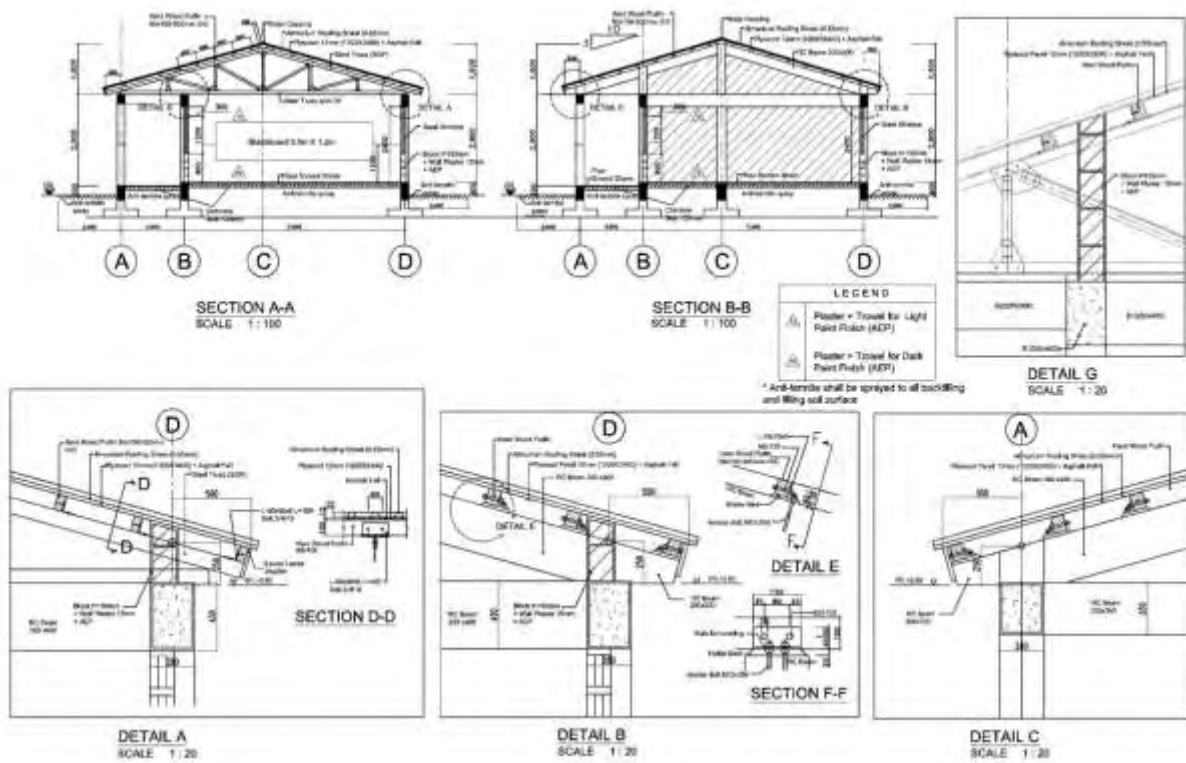


Fig. 2-17 Detailed Drawings for Steel Frame Truss, Concrete Truss and Roof Sections

(3) Selection of Local Construction Companies for Trial Construction

Several matters were taken into consideration for the selection of local construction companies for the trial construction. These were (i) completion of the trial construction during the study period (ending at the end of June, 2010) and (ii) construction process and period required for each three classroom type building. It was realised that the completion of the work would be difficult if the standard procedure for the Grant Aid for Community Empowerment Scheme, involving the public announcement of the PQ in newspapers, screening, distribution of tender documents and estimation and tender, was followed. Based on this realisation, it was decided to adopt the competition estimate method for the trial construction work, inviting five leading companies recommended by the Nigerian side. The criteria for the initial selection of companies to which a request for cost estimation would be made were (i) leading construction company operating in Abuja and (ii) construction company with experience of a grant aid project under the supervision of a Japanese company in the Phase 1 Project. Three leading companies in Kano State were included in the selection based on the following criteria.

- 1) Reliable financial and business management base
- 2) Rich experience of building work, preferably school building work, in the past
- 3) Possession of sufficient capable engineers and equipment to successfully conduct the trial construction

- 4) Sufficient capacity to organize and deploy personnel and equipment to complete the work within the designated period

All five companies generally satisfied criterion 1). No financial problems were detected with these companies as there was nothing to suggest that any face funding difficulties. In regard to criteria 2) and 3), interviews with these companies found that they all have sufficient experience, engineers and equipment to conduct the trial construction work. Meanwhile, questions on the state of ongoing construction work were asked during the interviews to ascertain their firm commitment and capability as the proposed trial construction required completion within the designated period in view of the nature of the work.

#### (4) Conditions for Estimation

The request to submit an estimate to the selected companies was accompanied by the following conditions.

- 1) The nature of the estimation for the trial construction is a competition estimate.
- 2) The estimate should be presented after careful examination of the distributed documents and drawings and taking the special instructions into consideration.
- 3) The estimate should be presented in local currency (NGN: Nigerian Naira) or US\$. When each item is shown in NGN, the total in US\$ should be given along with the total in NGN.
- 4) A bid bond (at least 3% of the total estimate) must be submitted together with the estimate.
- 5) The estimate should exclude VAT and a VAT exemption certificate will be provided after signing of the contract.
- 6) The estimate should be presented using the two-envelope method. Envelope A should contain the technical proposal to meet the technical demands while Envelope B should contain the actual bid (estimate). The contents of Envelope A will be evaluated in terms of five items with a full score of 100 points. If the total score after evaluation fails to reach 70 points, Envelope B will be returned to the bidder in question unopened.
- 7) The maximum advance payment is 15% of the amount of the contract. A request for this payment must be accompanied by the advance payment of a security issued by a bank for an equal amount and an invoice. As this money is transferred from Japan, there must be a local bank account which is capable of receiving US\$ transfers. Any company which currently does not have such an account must open one.
- 8) Monthly piecework payment will be made in accordance with the amount of the work conducted each month. However, 5% of this monthly payment will be paid the following month (retention). This payment will be made in US\$ from Japan.

- 9) The company must submit a performance security as part of the contract procedure (at least 10% of the contract amount). This security will be released through a predetermined procedure after successful completion inspection.
- 10) A period of one year from the date of the issue of the handing over certificate after successful completion inspection will be deemed to be the guarantee period. The company which has conducted the trial construction work will conduct any necessary repair of parts which are considered to be defective by the defect inspection.

(5) Review of Submitted Estimates

The five nominated companies were briefed on the scale, requirements and other relevant matters of the trial construction based on the technical specifications and (draft) contract documents. These companies were then requested to submit their own estimates. It was decided to review and score the contents of Envelope A and to open Envelope B containing the actual estimate amount of only those companies scoring 70 points or more for the following evaluation items in relation to Envelope A. Four companies achieved the pass level of 70 points as shown below.

Table 2-15 Scoring Results for Envelope A

No.	Evaluation Item	Full Points	Company			
			A	B	C	D
①	Experience of similar work (Form 4)	25	25	15	12	25
②	Comprehensive planning of work execution (Form 5)	20	17	18	18	19
③	Basic schedule control (Form 6)	20	16	19	16	15
④	Key person for work management (Form 7)	20	18	12	13	19
⑤	Possession of the necessary equipment (Form 8)	15	8	9	11	10
	<b>Total Score</b>	<b>100</b>	<b>84</b>	<b>73</b>	<b>70</b>	<b>88</b>

(6) Cost of Trial Construction

The estimates submitted below show that a company based in Kano quoted a slightly higher cost for the Bagauda Primary School situated some distance from Kano, presumably because of the higher transportation cost of equipment and materials. In contrast, a company based in Abuja quoted a slightly higher cost for the Kawaji Jigiriya Primary School situated in Kano.

In the case of the Project proper, many sites are located further away from urban areas and the construction cost may well be higher than the current estimate given the reason for the higher quotes for the subject schools for trial construction by some companies.

(7) Trial Construction Schedule

The following trial construction schedule was prepared in consideration of the technical and other capacity of local construction companies to be awarded the contract for trial construction.

Type of Work	2010				
	February	March	April	May	June
Signing of the Contract	▼				
Preparatory Work	■				
Temporary Work		■			
Earth Work (Excavation for Foundation, etc.)		■			
Concrete Work		■	■		
Form Work		■	■		
Reinforcing Bar Work		■	■		
Steel Frame Work		■	■		
Concrete Block Work			■		
Roof Work			■	■	
Steel Windows and Doors Work				■	
Mortar and Finishing Work				■	
Painting Work					■
Other Work					■
Completion Inspection and Handing Over					■ ▼

(8) Process of Trial Construction and Points for Future Improvement

Table 2-16 describes the various problems encountered in connection with the trial construction. Even though it cannot be said that the same problems will be encountered by the Project proper, it is safer to assume that these problems represent the average level of construction companies in Nigeria. Based on this assumption, solutions to the likely problems are also described in Table 2-16.


Table 2-16 Process of Trial Construction and Problems Encountered


Item	Problem Encountered in Trial Construction	Solution / Improvement Measure
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Selection of Construction Company</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Selection Criteria and Tender</p> <p>(1) Permission and authorisation</p> <p>(2) Minimum total amount of US\$ 0.3 million for similar work in the last five years</p> <p>(3) Submission of a copied work manual as part of the work execution plan in the technical proposal</p> <p>(4) Listing of equipment required for the Project on the list of equipment currently in possession</p> <p>(5) Tender method</p> <p>(6) Number of copies of Envelope A to be submitted</p>	<p>(1) Reliance on the relevant certificates to ascertain the registration status and tax payment status of each construction company</p> <p>(2) The Project will be divided into four lots and the smallest lot will be Area A. The same or even a higher minimum amount of work in the past will be demanded.</p> <p>(3) Only those contents relevant to the Project in the work execution plan will be scored. Because of the centralised management of multiple sites under the Project, it is essential to fully check the contents of the proposed work execution plan, including the work sequence, material procurement and personnel deployment.</p> <p>(4) The possession of certain types of equipment must be checked and confirmed. These include a crane for assembly of the truss which is difficult to conduct manually, a vibrator (engine-operated) for concrete placing, a concrete tester to ensure the quality of the concrete work and surveying instruments.</p> <p>(5) The tender will be made in two envelopes. Envelope B of only those bidders of which Envelope A has achieved the pass level (70 points or more) will be opened in front of all bidders. Envelope B of those bidders of which Envelope A failed to reach the said level will be returned unopened to the respective bidders. Much time will be allocated to reviewing Envelope A and a second screening will be conducted. When the lowest bid in the first bidding round is less than 10% above the guide price, the relevant bidder will be awarded the right of first negotiation. A more detailed check of the bid amount will follow.</p> <p>(6) Each company must submit two Envelope As (one original and one copy) so that the copy can be used for a bid for a different lot.</p>
	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Contract and Payment</p>	<p>(1) Submission of the advance payment security and performance security when the contents of the contract are agreed</p> <p>(2) Bank account capable of receiving foreign currency payments</p>

Item		Problem Encountered in Trial Construction	Solution / Improvement Measure
Preparatory Work	Work Execution System at the Site	<p>(1) Differences between the tender documents and negotiated contract contents</p> <p>(2) Relationship between the head office and site office</p>	<p>(1) At many companies, the section responsible for the work from bidding to contract signing differs from the section responsible for site management and site work. This can lead to failure of the proper forwarding of the negotiated contract contents from the former to the latter. It is essential for the project manager (PM) to participate in the bidding and contract signing process so that the PM can personally explain the work execution plan.</p> <p>(2) At most companies, orders are placed by the head office to prevent fraudulent fund management by site offices. This could disrupt the smooth procurement of materials, resulting in idle time in the field. There is no firmly established practice of preparatory work at the site and work tends to be conducted on an ad hoc basis.</p>
	Commencement of Site Work	<p>(1) Planning of the temporary work</p> <p>(2) Preparation and approval of the working drawings</p> <p>(3) Submission of samples</p>	<p>(1) Because all of the project sites are located at existing school premises, secured partitioning between the existing buildings and the work site is essential to prevent accidents as clearly indicated in the tender documents. However, such partitioning was not properly erected in the trial construction because of insufficient understanding of the tender documents on the part of the bidding companies and also because of work customs at construction sites in Nigeria. It is, therefore, necessary to clearly indicate the required temporary facilities on the drawings in addition to written instructions.</p> <p>(2) In connection with the tender documents, it was decided based on the decisions of the manufacturers of the equipment for procurement to demand the submission of working drawings for those areas of work for which consultant approval would be necessary. However, these drawings were not adequately submitted. For the Project proper, it is desirable for these drawings to be included in the tender documents instead of asking bidders to provide them. In regard to steel windows and doors, only one local manufacturer in Kaduna State can meet the required specifications. This means that the adoption of certain specifications is tantamount to the appointment of a specific manufacturer. The technical specifications for these items should be carefully presented.</p> <p>(3) While the specification documents and various drawings clearly show the required equipment and materials, the actual samples must be checked to ensure the proper procurement and use of materials meeting the specifications. Especially important are steel windows and doors, timber and paint. It is possible that some companies are slow to submit the required samples, adversely affecting the procurement schedule. The tender documents should list those items for which samples are required and each bidder will be required to provide a plan on the timing of the submission of samples in connection with the schedule control plan. This plan will comprise a key point for bid evaluation.</p>

Item	Problem Encountered in Trial Construction	Solution / Improvement Measure
	(4) Factory inspection	(4) In regard to items to be manufactured at a factory, visits to the manufacturer awarded the order are necessary accompanied by a representative of the local construction company to ensure the proper manufacturing process. This practice is necessary to prevent local construction companies from placing orders to unreliable factories to reduce the cost and receiving unusable products.
Foundation Work	Excavation and Earth Work	<p>(1) Establishment of benchmarks (BM)</p> <p>(1) The establishment of benchmarks (BMs) is important to determine the floor height of the planned facilities. Most local construction companies do not possess a level. Even if <math>GL \pm 0.0</math> is set up at one place, the actual floor height is simply the height from the surface of the foundations. To ensure the proper floor height, the possession of a level must be checked in advance and a high score should be given for its possession.</p> <p>(2) Excavation depth and floor level setting</p> <p>(2) The excavation depth is the depth from the level determined by the finishing stake and this level is similar to the general ground level at the site. The foundations are commonly excavated manually and this does not usually disrupt the ground surface on which the floor level is set. Accordingly, only care is required not to dig too much.</p> <p>(3) Trial mixing of concrete</p> <p>(3) The strength of structural concrete varies depending on the types of aggregates and cement used. When the types of aggregates and cement to be used have been decided, trial mixing should be conducted. As local construction companies are unable to calculate a specified mix formula, this must be conducted by the consultant based on data on the specific gravity of the aggregates and type of cement to be used to be submitted by local construction companies. Using the formula calculated by the consultant, trial mixing should be conducted and six specimens taken to determine their acceptance or rejection based on one week and four week strength. As most companies do not have a strength tester, this testing is likely to be requested to a public laboratory or university laboratory.</p> <p>(4) Marking</p> <p>(4) After placement of the levelling concrete, a reference line, etc. will be marked on its surface to prevent any errors. However, most companies do not even possess such essential tools/equipment for marking as an ink pot and transit. Given the importance of this work to ensure the work precision, the possession of these tools/equipment must be checked when the list of equipment in possession is submitted. Possession should be given a high score.</p>



Item	Problem Encountered in Trial Construction	Solution / Improvement Measure
Reinforcing Bar Work and Form Work	<p>(1) Reinforcing bar bending and assembly</p> <p>(2) Form work</p>  <p>Plywood to make forms</p>	<p>(1) For the trial construction, a bar arrangement drawing was distributed as part of the tender documents. The bidding companies were required to prepare and submit a reinforcing bar bending and assembly drawing using the said bar arrangement drawing. The actual drawings submitted were far from the level demanded by the consultant and the bending work at the site was not very precise. In view of the low ability of local companies to understand drawings, the bar bending and assembly drawing for the Project proper will indicate every bar. In regard to assembly, the thickness of the concrete cover is not very accurate although this depends on the actual skill level of individual workers. Thorough inspection of the bar arrangement is essential.</p> <p>(2) The concept of "form work" is lacking among Nigerian workers even though this may be inevitable given the general state of construction work in Nigeria. It may be appropriate to describe local form work as work to simply prevent the outflow of concrete. The quality of the plywood used as the main form material is poor as the surface peels off after single use as shown in the photograph on the left, making further use of the same plywood impossible.</p>
	Concrete Block Walls	Concrete Blocks and Walls
Beams and Pillars	(1) Beam and pillar work	<p>(1) The main components of the beam and pillar work are reinforcing bar work, form work and concrete placing work. See the foundation work section for the problems and solutions.</p>
Roof Work	Steel Truss	<p>(1) For the processing of structural steel, working drawings are prepared from original drawings to process each member. This work is extremely difficult for local construction companies given their technical capability. While the work is commonly entrusted to a processing company, such company does not necessarily either understand every detail of the required work or possess a full range of processing tools and equipment. The construction company assigned to the Bagauda Primary School has its own steel processing factory in Plateau State.</p>

Item	Problem Encountered in Trial Construction	Solution / Improvement Measure
Purlins, Roof Boards and Roof Sheeting	(2) On-site assembly	(2) The steel members processed at a factory are assembled on site. Those construction companies which do not possess their own crane truck must hire such a truck or employ a specialist company. However, the absolute number of crane trucks in Nigeria is small and hire arrangements may not be smoothly made. Because of the possibility of parallel work in progress at many different sites in the Project proper, rigorous schedule control of the steel assembly work is essential to avoid any unnecessary delay.
	(1) Purlins  (2) Roof boards  (3) Roof sheeting	(1) Purlins are commonly procured in the market but the quality is poor. When procurement is entrusted to a construction company, most bought timber cannot be used due to bending, cracks, warping, uneven measurements and other defects. As these defects considerably affect the ultimate performance of the roof, a suitable method to supervise the work in the Project proper will be required.  (2) Plywood roof boards (12 mm thick) available in the market are used. At the least, their quality is uniform. Screw nails are used to fix the roof boards to the purlins, etc. to achieve a uniform work quality.  (3) Roof sheeting is a long-span aluminium sheet (0.55 m thick). Different manufacturers produce products of similar specifications and quality. Some manufacturers demand full payment in advance and this was a cause of delayed procurement in one case. Such demand presents no problems if the finances of the construction company are strong enough to ensure payment. Given the much larger scale of procurement under the Project proper, intervention for advance payment may be considered depending on the actual procurement sources.
Finishing Work and School Furniture	Painting	(1) The internal and external paint finish for the trial construction was designed to use a single colour paint available in the market. Therefore, no serious problems were encountered with the painting work. There were, however, problems of an uneven finish and excessive reducing of the paint with a solvent as a cost reduction measure by subcontractors appointed by the construction companies to conduct the painting work. As construction companies do not rigorously supervise their subcontractors, painting samples (see photograph) will be produced to prevent an uneven colour and uneven finish.  

Item	Problem Encountered in Trial Construction	Solution / Improvement Measure
School Furniture	<p>(1) Desks and chairs</p> <p>(2) Blackboards and noticeboards</p>	<p>(1) The desks and chairs for the trial construction were either entrusted to a furniture factory or manufactured at the company's own factory depending on the preference of each construction company. However, many products made by furniture factories required extra work to rectify warping, cracking, poor planer finishing and/or an uneven paint finish.</p> <p>(2) As in the case of desks and chairs, those made by furniture factories had a poor finish. Even though the final product quality may depend on the factory and price paid, careful supervision will be necessary for the Project proper so that all of the contracted local companies deliver school furniture of a similar finish and quality.</p>



Completed New School Building  
Kawaji Jigiriya Primary School, Nassarawa LGA



Completed New School Building  
Bagauda Primary School, Bebeji LGA

**2-3 Obligations of Recipient Country**

Following conclusion of the E/N, the Nigerian side shall undertake the following work under cooperation from the responsible agency and implementing agencies.

**2-3-1 General Items**

- (1) Following conclusion of the E/N, promptly open an account with a Japanese bank. The Nigerian side shall bear the cost of opening such an account.
- (2) It shouldn't be necessary to import any of the equipment and materials required in the Project, however, if importing is required, the Nigerian side shall conduct prompt unloading and customs clearance.

- (3) The Nigerian side shall secure the necessary conveniences for entry to Nigeria, stay therein and safety of persons (Japanese and third country nationals) concerned with the Project.
- (4) The Nigerian side shall exempt taxes and tariffs, etc. that would ordinarily be levied in Nigeria on the Project products and services supplied and Japanese nationals.
- (5) The Nigerian side shall properly use and maintain the facilities constructed under Japan's grant aid.
- (6) The Nigerian side shall bear all the other necessary costs for the Project not covered by Japan's grant aid.

### **2-3-2 Special Remarks**

- (1) If contractors require materials store yards and temporary sites for the Project works, the Nigerian side shall provide suitable land and sites free of charge.
- (2) The Nigerian side shall provide free of charge disposal or treatment sites for sediment and construction waste materials generated in the Project works.
- (3) Since the Project involves the additional construction of classrooms at existing schools and does not require new construction sites, environmental impact assessment will not be required.
- (4) In cases where authorizations need to be obtained from landowners and related agencies, these shall be applied for and obtained.

## **2-4 Project Operation Plan**

### **2-4-1 Competent Agencies on the Nigerian Side**

Operation and maintenance of the Project facilities following commissioning will be carried out under the guidance of the Universal Basic Education Commission (UBEC) Secretariat, while Kano State will be responsible for the actual supervision and monitoring. SUBEB in Kano will supervise and monitor the schools in collaboration with the local governments (LGAs) where the target schools are located.

### **2-4-2 Maintenance of Facilities**

As may be gathered from the fact that there are 4,136 primary schools in Kano State, ample budget is not available for maintenance work. In reality, school maintenance in Nigeria is not carried out by the official authorities but rather by the local communities and PTAs. In the Project too, it is assumed that the local communities and PTAs will maintain the Project facilities.

It has been confirmed that the local side has low awareness of the importance and need for repair and maintenance of facilities. Concerning the reasons for this, since government (national and local government) budget measures for maintenance are not appropriately enforced and PTA dues, etc. are not collected, the schools have difficulty raising the necessary funds and they have little choice but to disregard maintenance. Also, numerous problems exist regarding the way in which facilities are used, and there is a lack of care regarding the proper treatment of facilities, which everybody worked so hard to construct. For example, at most schools, roofs are made from galvanized corrugated iron sheets, however, children are seen throwing stones at the roofs for fun. However, because these sheets are so thin, the stones create holes, through which rainwater flows in, and this causes ceiling boards to rot and collapse. In order to remedy such a situation, it is necessary to carry out some kind of moral guidance. In the first primary school construction project, manuals and posters regarding this point were made and enlightenment activities were implemented with respect to the pupils, teachers and communities. As a result, evidence of changing attitudes among pupils and teachers has been seen in subsequent monitoring, and there is a greater awareness of the need to look after facilities.

The counterpart agencies are strongly requesting implementation of the soft component which was also implemented in the first primary school construction project, and the need for this is keenly realized for the sake of ongoing use. Accordingly, soft component implementation shall be planned in the Project. In planning this, the manual and posters, etc. which were prepared in the first primary school construction project will be effectively utilized, while the problems which occurred in the previous project will be identified and remedied.

**2-5 Project Cost Estimation**

**2-5-1 Initial Cost Estimation**

**2-5-1-1 Cost Burden on the Nigerian Side**

The costs to be borne by the Nigerian side will comprise the Table 2-17 shown below.

Table 2-17 Cost Burden on the Nigerian Side

Item	Amount (Naira)	Remarks
(1) Site reclamation cost	1,400,000	Including removal of obstructions, etc.
(2) Access road rehabilitation cost	830,000	
(3) Securing and construction of access roads	350,000	
(4) Bank account establishment commission	1,820,000	(JP¥1,170,000)
<b>Total</b>	<b>4,400,000</b>	<b>(¥2,831,500)</b>

## 2-5-1-2 Estimation Conditions

- (1) Estimation point : November 2009
- (2) Exchange rate : 1 USD = 96.53 yen (TTS mean value from May to October 2009)
- (3) Construction period: May 2010~ December 2011 (including tender work, 20 months)
- (4) Other : The Project will be implemented according to Japan's Grant Aid Scheme for Community Empowerment.

## 2-5-2 Operation and Maintenance Cost

The operation and maintenance cost for the Project facilities is estimated as shown in Table 2-18. However, roof painting costs, etc. will not arise.

Table 2-18 Operation and Maintenance Costs for the Project Facilities

Item	Amount (Naira/year)	Calculation conditions*
(1) Painting of steel doors and windows	345,000	Recoat once every 5 years
(2) Painting of external and internal walls	690,000	Recoat once every 5 years
(3) Termite-proof coating of sheathing boards and purlines	299,000	Recoat once every 5 years
(4) Removal and treatment of toilet septic tanks	265,000	Once every 2 years
(5) Coating of blackboards	138,500	Recoat once every 2 years
<b>Total</b>	<b>1,737,500</b>	

\* This is the total amount for the 2nd to 5th years following completion of the 30 target schools.

The above operation and maintenance costs can probably be reduced even more with cooperation from SUBEB and LGA budgets, and voluntary work and provision of materials, etc. by the PTAs and communities.

## 2-6 Other Relevant Issues

As part of the Project, the Nigerian side will be responsible for land preparation, access road improvement and other matters. Given the facts that all 30 target sites are located at existing school premises and that the new facilities will generally be constructed on flat ground, no major financial burden will be incurred by the Nigerian side. Equally, the work to be conducted by the Nigerian side will have hardly any effect on the overall implementation schedule of the Project.

## **Chapter 3    Project Evaluation**

## **Chapter 3. Project Evaluation**

### **3-1 Preconditions for the Project**

#### **3-1-1 Preconditions for Project Implementation**

All 30 construction sites for the new school and/or toilet buildings under the Project are located on existing school premises. These additional buildings will be constructed using empty space and no new land will be acquired under the Project. As each of the planned construction sites is generally located on flat land, no large-scale land preparation work will be necessary. Moreover, the procedure to apply for building permits, etc. can be omitted because the planned facilities are simply additions to existing schools.

The main undertakings of the Nigerian side under the Project will be ① land preparation and ② improvement of the access road to each school. As explained above, the nature of the planned work, i.e. construction of additional facilities for existing schools, means that neither the scale of the work nor the size of the financial commitment will be large with little effect on the overall implementation schedule of the Project.

#### **3-1-2 Preconditions and External Factors for the Successful Completion of the Project**

The continual use of the new facilities to be constructed under the Project will largely depend on the active participation of the PTA and local community in the school maintenance system. The soft component of the Project is expected to strengthen this system by ensuring good school maintenance led by school staff. The implementation of a programme to strengthen the teaching of science and mathematics at the subject schools following the completion of the new school buildings following the example of the Phase 1 Project will ensure the continuation of effective monitoring and will also stimulate a change of awareness of the need for proper maintenance among all stakeholders.

There are several factors affecting the successful completion of the Project, including ① the absence of a sudden major change of the prices of construction materials, ② absence of political instability, rioting and other social disturbances and ③ absence of a large-scale natural disaster during the project implementation period and thereafter.



## **3-2 Project Evaluation**

### **3-2-1 Relevance**

The Project is judged to be relevant to the spirit and objectives of Japan's grant aid scheme as described below.

#### **3-2-1-1 Type and Number of Beneficiaries**

The direct beneficiaries of the Project will be 21,609 pupils studying at the target schools.

#### **3-2-1-2 Urgency**

At present, the pupil-classroom ratio in Kano State is as high as 91.6 pupils/classroom which is 2.3 times the standard ratio (40 pupils/classroom). The condition of many of the existing classrooms is very poor, making the construction of new classrooms to improve the educational environment an urgent necessity.

#### **3-2-1-3 Maintenance Capacity**

The maintenance of the new buildings in the post-Project period will be supervised by the Kano State Universal Basic Education Board (SUBEB) with the Kano Local Government Education Authority (LGEA) directly conducting the necessary work. With the participation of the PTA of each school and the local community, the continual maintenance and use of the new facilities will be assured.

#### **3-2-1-4 Profitability of the Project**

An education product involving schools will lead to the development of basic education and the fostering of human development, eventually bringing about economic effects and development even though the Project itself does not have any direct financial benefit.

#### **3-2-1-5 Environmental and Social Considerations**

Because the targets are existing schools, the construction work under the Project does not involve any large-scale development activity. The work will be conducted on the premises of each existing school and no adverse impacts on the neighbourhood or local environment are anticipated.

### **3-2-1-6 Feasibility of Project Implementation Under Japan's Grant Aid Scheme**

The Project does not pose any special problems for the application of Japan's Grant Aid for Community Empowerment Scheme. However, the determination of suitable criteria for the selection of local construction companies is necessary, taking their technical and work execution capacities into consideration in view of the selection of excellent companies.

### **3-2-2 Effectiveness**

#### **3-2-2-1 Quantitative Effects**

Indicator	Reference Value (2009)	Target Value (2012)
No. of classrooms in good condition at the target schools	225	512 (including 287 new classrooms to be constructed under the Project)
No. of pupils per classroom at the target schools	96.0	42.2

#### **3-2-2-2 Qualitative Effects**

The construction of hygienic separate toilets for boys and girls will prompt the willingness of local girls to attend school and will improve the overall learning environment at schools.

Based on the above evaluation results, the Project is judged to be highly relevant and effective.