Amhara National Regional State Education Bureau
Federal Democratic Republic of Ethiopia

PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR
CONSTRUCTION OF SECONDARY SCHOOLS
IN AMHARA REGION
IN
THE FEDERAL DEMOCRATIC
REPUBLIC OF ETHIOPIA

JULY 2011

JAPAN INTERNATIONAL COOPERATION AGENCY

MOHRI, ARCHITECT & ASSOCIATES, INC.

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey on “the Project for Construction of Secondary Schools in Amhara Region in the Federal Democratic Republic of Ethiopia” and entrust the said survey to Mohri, Architect & Associates, Inc.

The survey team held a series of discussions with the officials concerned of the Government of Ethiopia, and conducted 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 Ethiopia for their close cooperation extended to the survey team.

July, 2011

Nobuko Kayashima
Director General,
Human Development Department
Japan International Cooperation Agency

Summary

1. Outline of the Country

The Federal Democratic Republic of Ethiopia (hereinafter referred to as “Ethiopia”) is a republic of 1.104 million km^2 with a population of approximately 82.82 million (World Bank, 2009). Its population is the second largest amongst Sub-Sahara African nations. It is an in-land country bordered by Somalia on the east, by Sudan on the west, by Kenya on the south, by Eritrea on the north and also by Djibouti on the southeast. The Ethiopian Highland and other plateaus occupy the majority of the land, and those vary from 1,500 to 4,000 m above sea level. Ethiopia belongs to the tropical region however, the climate differs from one place to another. Addis Ababa, the capital city of Ethiopia, is located at 2,400 m above sea level, and the average annual temperature is 16C. The seasons in Ethiopia are mainly defined by a rainy season and a dry season. Furthermore, the former is divided into two: a small rainy season from January to April, and a main rainy season from June to September. During the main rainy season, the average annual rainfall becomes 3 to 11 times more than that during the small rainy season. Similarly, it becomes 5 to 12 times more than that of the dry season. Also, the rainfall increases as the height above sea level goes higher. The average annual rainfall in the highland is over 1,800 mm. The target areas of the Project are between 1,500 to 3,000 m above sea level, and the topography varies among the respective sites.

The main industry of Ethiopia is agriculture which provides 85 % of the employment. The GNI per capita of Ethiopia is 330 USD (2009), and 45 % of it is agricultural industry. The Ethiopian economy heavily relies on the primary industry. The major export items are coffee and oil seeds which are prone to be affected by the global market and the climate.

2. Background and Outline of the Project

The Government of Ethiopia has introduced the Education Sector Development Program (ESDP), which has been carried out since 1997. As the result of the Program, primary school Gross Enrollment Ratio (GER) has remarkably improved from 41.8 % (1997/98) to 94% (2008/09) while that of secondary school has improved from 8.8 % to 38.1% for G9-G10 and 6.0 % for G11-G12. However, regional and gender disparities of GER is a critical issue. Also, due to the rapid increase of access for primary schools, a lack of adequate teachers and classrooms, quality of education (school operation and lessons), and access to secondary education have become problematic.

In Amhara, which is a target region of the Project, primary school GER is 98.4% (2008/09) while general secondary school (compulsory education) GER is 38.4% (2008/09). One of the

reasons for this significant problem is the lack of schools as well as lack of classrooms. There are 1,703 primary schools at which G8 are able to attend, while there are only 211 secondary schools at which G9 can do so in Amhara Region (2008/09). According to the Standards of secondary schools in this Region, Pupil Section Ratio (PSR) 1:40 should be the target whereas the actual situation is 1:67 (General Secondary: G9-10) and 1:56 (Preparatory Secondary: G11-12) in 2008/09. Furthermore, approximately 44% of secondary schools are implementing double shift schooling in 2009/10. Therefore, there is much room for improvement in terms of access and learning environments.

Under the above-mentioned circumstances, a Grant Aid to construct primary and secondary schools was requested to Japan by the Government of Ethiopia initially.

Through the site surveys and the discussions with the Amhara National Regional State Education Bureau (AREB), it was agreed that the Project will focus on the secondary schools due to emerging needs. Also it was agreed the Project would cover new school construction (8 schools), additional classroom construction and construction of libraries for the existing schools (9 schools) in eight target cities.

3. Summary of the Survey and the Contents of the Project

In response to the afore-explained request, JICA carried out the Field Survey I from July 11 to July 31, 2010 and Field Survey Ⅱ from November 11 to December 17, 2010. Finally, the plan was drawn up through in-house analysis, and the explanation of the draft report survey from March 27 to April 15, 2011 followed by the explanation of the technical reference for tender document from June 20 to July 1 and from July 9 to July 20, 2011.

3-1. Facility plan and setting class size

The facility contents are shown below.

Newly established school	Classrooms, Chemistry laboratory, Physics laboratory, Biology laboratory, library, IT center, administration office, staff room, resource center, satellite receiver room, mini-media room, janitor room and latrine
Existing school	Library
	Classrooms

Following the Standard of Secondary Education (SSE) as well as the Amhara National Regional State School Construction Standards (ARSCS), a size of forty students per class will be used for the Project.

3-2. Facility components

(1) Newly established schools

As mentioned above, the required facilities to operate secondary schools will be constructed. The maximum number of each classroom will be thirty-two, the requested number from the Ethiopian side, considering effective operational size of the school.

Breakdown of the Newly Established Schools

Zone	Woreda	Site (Kebele)	Planned Components
North Gondar	Gondar	Kebele 18	32 Classrooms and other facilities
Bahir Dar	Bahir Dar	Kebele 14	32 Classrooms and other facilities
South Wollo	Dessie	Boru Selasie K.14	32 Classrooms and other facilities
East Gojjam	Debre Markos	Kebele 3	32 Classrooms and other facilities
North Shoa	Debre Birhan	Kebele 6	32 Classrooms and other facilities
North Wollo	Woldia	Defrega Kibi Kebele	32 Classrooms and other facilities
South Gondar	Debre Tabor	Debre Tabor Eyesus	32 Classrooms and other facilities
West Gojjam	Gonji Kolela	Gonji Kolela	32 Classrooms and other facilities

(2) Existing schools

A new library and additional classrooms will be constructed for the respective existing schools.

In Ethiopia, libraries are considered to be essential to facilitate students' self-study and improve the quality of education. Currently, it is observed that all existing schools are facing critical shortages of library seats. Under this Project, one school located in the center of each of the three Woreda will have a library with a seating capacity of 300 (three schools total), while the remaining schools will have a library with a seating capacity of 150 (six schools total).

Similarly, it was found that all the schools lack classrooms. Under the Project, four classrooms per school will be built.

Breakdown of Existing Schools

Zone	Woreda	School Name	Planned Dimension
Bahir Dar	Bahir Dar	Tana Secondary School	T4:300 seats, T5:4 classrooms
		Ghion Secondary School	T4:150 seats, T5:4 classrooms
		Fasilo Secondary School	T4:150 seats, T5:5 classrooms
North Gondar	Gondar	Fasilo Secondary School	T4:300 seats, T5:4 classrooms
		Edgit Feleg Secondary School	T4:150 seats, T5:4 classrooms
		Azezo Secondary School	T4:150 seats, T5:4 classrooms
South Wollo	Dessie	Hottie Secondary School	T4:300 seats, T5:4 classrooms
		Niguse Michael Secondary School	T4:150 seats, T5:4 classrooms
		Kidame Gebya Secondary School	T4:150 seats, T5:4 classrooms

3-3. School furniture and equipment components

The minimum required furniture for both newly established schools and the existing schools will be provided.

The apparatus for distance learning curriculum, which is indispensable for secondary education in Ethiopia, will be also provided.

3-4. Soft components

The community, led by the PTA, has been already supporting schools both financially and physically through provision of labor for small-scale facility maintenance. The same kind of active support by the community is expected for the facilities constructed by the Project. Thus there is no planned soft component in this Project.

4. Implementation Schedule and Cost Estimation

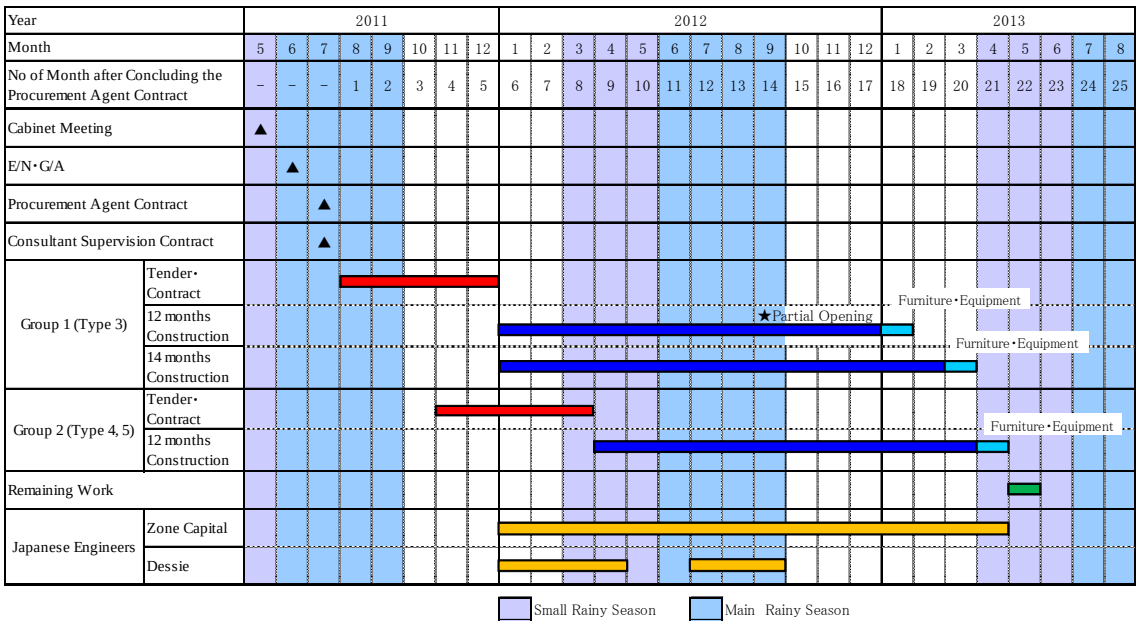
After concluding the Procurement Management Contract and the Consultant Supervision Contract, preparing tender documents to select contractors, conducting tenders and tender evaluation, negotiating the contract, and obtaining those approvals from the concerned parties, construction contracts will be concluded. This process is assumed to take five months.

It is estimated to take nine months to construct the new schools before opening them partially (one-storied buildings). On the other hand, for two-storied and three-storied buildings, the estimated schedule is twelve and fourteen months respectively.

Correspondingly, to construct classrooms and libraries for existing schools, it is estimated to take nine months for one-storied buildings and twelve months for two-storied buildings.

Therefore, the construction work will be divided into two groups: ①new schools and ② existing schools (construction of additional classrooms and libraries). It will take twenty-two months from the time of the contract conclusion till the Construction Supervision Office can be closed down. The defect examination will follow afterwards.

Implementation Schedule



The Project cost to be borne by the Ethiopian side is estimated to be 10,849,000 Birr.

5. Project Evaluation

5-1. Relevance

The Project objective is to expand access and to improve teaching and learning environments in secondary schools in the target areas, which corresponds to the purposes of the Japanese Grant Aid, such as “Basic Human Needs”, including secondary education, and “Human Resource Development”. Also, this Project is expected to contribute to the fulfillment of the ESDP in line with improving access to quality education and expanding school facilities.

On the other hand, it is normal practice for each school under the Project to perform operation and maintenance tasks in which high skills are not required. The implementation of the Project is practicable by the Japanese Grant Aid Scheme.

Additionally, the Project will be able to utilize lessons learned and feedback from the

related Technical Assistance Projects in Ethiopia, and preceding projects under the Japan's Grant Aid Scheme for Community Empowerment implemented in and outside of the country as to manage the Project more efficiently and effectively. It can be noted as a comparative advantage of the Project.

On account of these given justifications, the Project proves to be adequate for the Japanese Grant Aid.

5-2. Effectiveness

The expected results of the Project are indicated below. These prove the relevance of implementing the Project and also that it can be expected to be effective.

(1) Quantitative results

Indicators	Baseline data (Year 2010)	Desired value (Year 2017)
Number of students in 8 newly established schools	0	10,240
Average number of students per classroom for the existing 9 schools (currently 24,092 in total)	80 (Total number of classrooms for 9 schools: 301)	71 (Total number of classrooms for 9 schools:337)
Number of students per library seat for the existing schools	43/seat (Total number of seats for 9 schools: 558)	13/seat (Total number of seats for 9 schools: 2,358)

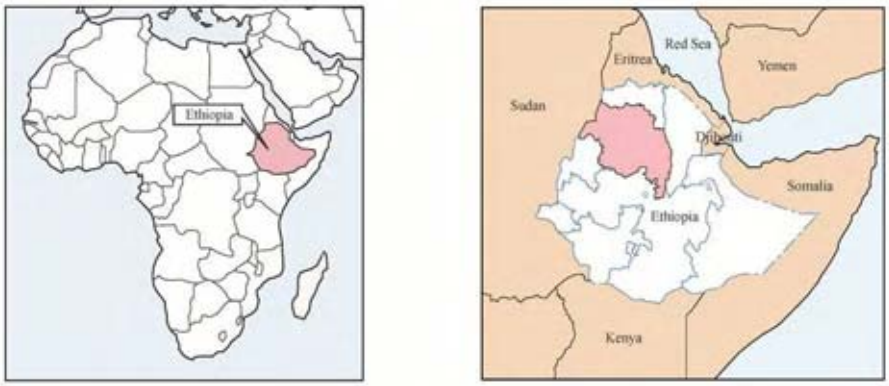
(2) Qualitative results

1) By constructing new schools in eight cities, and consequently increasing the number of secondary schools in the same school catchment areas from 23 to 30, the following are expected to be materialized: commuting distance for the students will be shortened and attendance rate as well as dropout rate will be improved.
2) Through the betterment of the teaching and learning environments as a result of having more schools and classrooms, the situation of double shift schooling, the enrolment ratio and also the ratio of students who go on to the next education stage will be expected to improve.
3) Construction of additional classrooms and libraries for 9 existing schools will lead to the improvement of the quality of education.

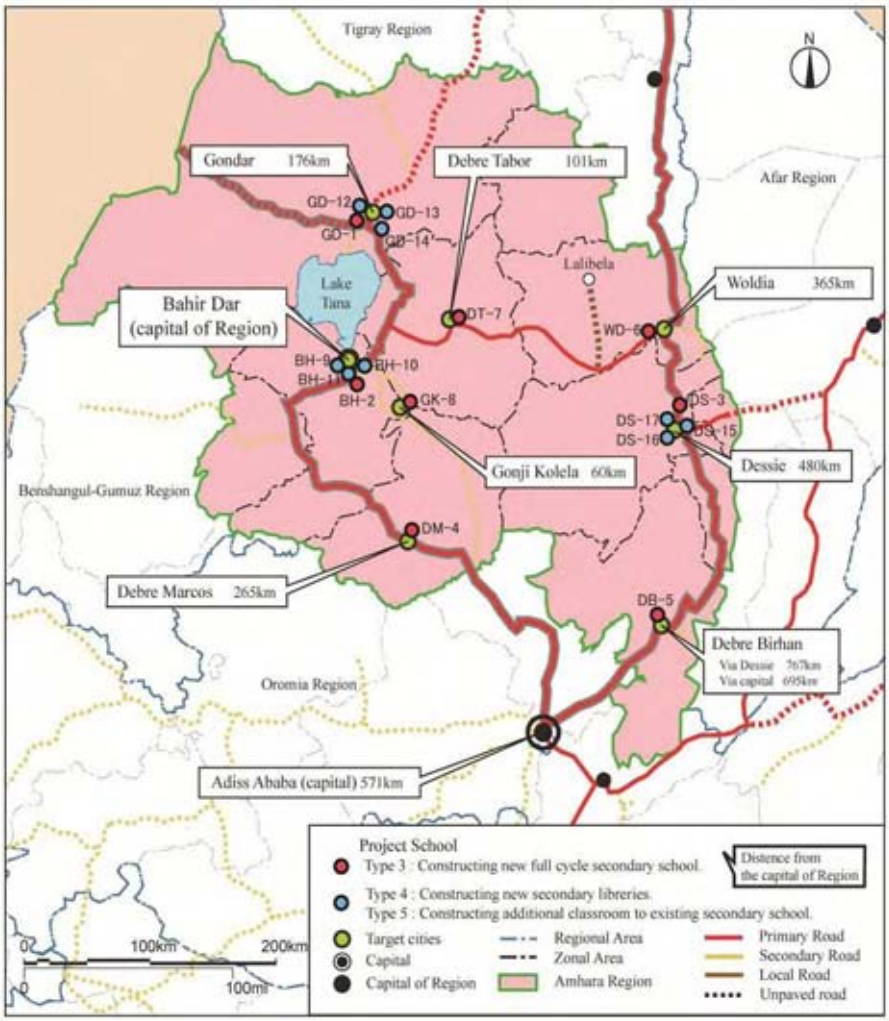
Contents

[Appendices]

Ethiopia Project Site Location Map



Amhara Region Project Site Location Map



Perspective (Existing School: 2-4CR Type)

Perspective (New School)

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Abbreviations

A/M	Agreed Minutes
AREB	Amhara National Regional State Education Bureau
ARSCS	Amhara National Regional State School Construction Standards
BA/BS	Bachelor of Art/Science
BHN	Basic Human Needs
BoFED	Bureau of Finance and Economic Development
BoWUD	Bureau of Works and Urban Development
EBCS	Ethiopia Building Code Standard
EMC	Electro Mechanical Contractor
EMPDA	Educational Materials Production and Distribution Agency
E/N	Exchange of Notes
ESDP	Education Sector Development Program
ETC	Ethiopian Telecommunications Corporation
G/A	Grant Agreement
GDP	Gross Domestic Product
GEQIP	General Education Quality Improvement Programme
GER	Gross Enrollment Ratio
GNI	Gross National Income
JICS	Japan International Cooperation System
MoE	Ministry of Education
MoFED	Ministry of Finance and Economic Development
NGO	Non Governmental Organization
PRSP	Poverty Reduction Strategy Paper
PSR	Pupil Section Ratio
PTA	Parent Teacher Association
PTR	Pupil Teacher Ratio
RC	Reinforced Concrete
SSE	Standards of Secondary Education
WEO	Woreda Education Office

Chapter 1 Background of the Project

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1-1 Background and Outline of the Grant Aid

The Government of Ethiopia has introduced the Education Sector Development Program (ESDP), which was carried out from 1997 to 2001. Currently, the ESDP Ⅳ(2010/11-2014/15) has been implemented. Under the ESDP, universal primary school by 2015, expansion of the access to primary (G1-G8) and secondary (G9-G12) schools, and improvement of the quality of education are to be materialized. In this regard, it is aimed to achieve 109.7 % of the primary school Gross Enrollment Ratio (GER) as well as a student (primary・secondary) to classroom ratio (PSR) of 1:50 by 2009/10. In order to fulfill these goals, 194,748 classrooms for the primary level and 12,191 classrooms for the secondary level needs to be built.

As the result of the Program, primary school GER has remarkably improved from 41.8 % (1997/98) to 79.2% (2005/06), and later to 94% (2008/09) while that of secondary school has improved from 8.8 % to 38.1% for G9-G10 and 6.0 % for G11-G12.

However, regional and gender disparities of GER is a critical issue. Also, due to the rapid increase of access for primary schools, a lack of adequate teachers and classrooms, quality of education (school operation and lessons), and access to secondary education have become problematic.

In Amhara, which is a target region of the Project, primary school GER is 98.4% (2008/09) while general secondary school (compulsory education) GER is 38.4% (2008/09). One of the reasons for this significant problem is the lack of schools as well as lack of classrooms. There are 1,703 primary schools at which G8 are able to attend, while there are only 211 secondary schools at which G9 can do so in Amhara Region (2008/09). According to the Standards of secondary schools in this Region, PSR 1:40 should be the target whereas the actual situation is 1:67 (General Secondary:G9-10) and 1:56 (Preparatory Secondary: G11-12) in 2008/09. Furthermore, approximately 44% of secondary schools are implementing double shift schooling in 2009/10. Therefore, there is much room for improvement in terms of access and learning environments.

Under the above-mentioned circumstances, a Grant Aid to construct primary and secondary schools was requested to Japan by the Government of Ethiopia initially. In response to this request, JICA dispatched the Preparatory Survey Team to Ethiopia in July and November 2010 in order to carry out site surveys. Through the site surveys and the discussions with the Amhara National Regional State Education Bureau (AREB), it was agreed that the Project will focus on the secondary schools due to emerging needs. Also it was agreed that the Project would cover new school construction (8 schools), additional classroom construction and construction of libraries for the existing schools (9 schools).

Finally, the plan was drawn up through in-house analysis and the explanation of the draft

report survey in March-April 2011, followed by the explanation of the technical reference for tender document in June-July 2011.

1-2 Project Sites and Their Surroundings

1-2-1 Infrastructure

（1）Transportation and Access to the Project Sites

All Project areas are situated in the respective zone capitals, except for Gonji Kolela of the West Gojjam Zone. The main roads connecting the Woredas are well-paved and thus the access to them is good overall. A trip to Gonji Kolela is about 60km on an unpaved road from Bahir Dar, the regional capital, however, the Woreda is not far away from the main road and access during the rainy season is not a problem.

However, all newly established school sites are located in the suburbs of the respective Woredas and are off the main road by 50m to 300m. Therefore, at the implementation stage, access road construction is needed for each new school site.

（2）Electricity and Sewage

While electricity is available in most of the Project target areas; water is not. In fact, schools do not use a water-tank type toilet, but a privy one. Several Project schools do not have any hand washing basins. Some of them do not have any water supply facilities at all.

1-2-2 Natural Conditions

（1） Climate

Amhara Region is divided into 3 areas according to their altitude. They are highlands which are 2,300m or higher above sea level, mid-high lands whose altitude is between 1,500m and 2,300m, and lowlands which are below 1,500m above sea level. Approximately 50 % of the regional land lies in the mid-high lands. Thus, the climate in Amhara Region is pleasant overall . Table 1-1 shows the climate zone, average temperature, and annual rainfall by altitude. During the main rainy season between June and September, more than 1,200mm rainfall is observed, especially in the western part of the region.

Table1-1 Climate Zone, Average Temperature & Annual rainfall in Amhara Region

Altitude	Climate Zone	Average Temperature	Annual Rainfall
~ 1,830m	Tropical	27 C	510mm
1,830 ~ 2,440 m	Semi-tropical	22 C	510~1,530mm
2,441 m ~	Microthermal	16 C	1,530~2,000mm

（2） Project Site Conditions

① Result of Topographic Survey[1]

The level difference and size in the respective 17 Project sits are as per Table 1-2.

② Result of Soil Survey[2]

Table 1-2 shows whether or not each Project site contains black cotton soil.

Table1-2 Summary of Topographic and Soil Surveys at 17 Project Sites

New/ Existing	Zone	Woreda	School Name	Level Difference (Remark 1)	Size (Remark 2)	Black Cotton Soil
New Schools	North Gondar	Gondar	Kebele 18	36 m	26,258 ㎡	No
	Bahir Dar	Bahir Dar	Kebele 14	3 m	17,569 ㎡	No
	South Wollo	Dessie	Boru Selasie K.14	3 m	41,265 ㎡	Yes
	East Gojjam	Debre Markos	Kebele 3	18 m	47,422 ㎡	No
	North Shoa	Debre Birhan	Kebele 6	9 m	35,895 ㎡	No
	North Wollo	Woldia	Defrega Kibi Kebele	20 m	34,990 ㎡	Yes
	South Gondar	Debre Tabor	Debre Tabor Eyesus	46 m	50,244 ㎡	No
	West Gojjam	Gonji Kolela	Gonji Kolela	6 m	49,826 ㎡	No
Existing Schools	Bahir Dar	Bahir Dar	Tana Sec. School	6 m	78,863 ㎡	No
			Ghion Sec. School	5 m	61,396 ㎡	No
			Fasilo Sec. School	3 m	46,740 ㎡	No
	North Gondar	Gondar	Fasiladas Sec. School	10 m	About 30,200 ㎡	Yes
			Edgit Feleg Sec. School	18 m	34,970 ㎡	No
			Azezo Sec. School	20 m	46,547 ㎡	No
	South Wollo	Dessie	Hottie Sec. School	35 m	77,583 ㎡	Yes
			Niguse Michael Sec. School	18 m	28,485 ㎡	No
			Kidame Gebya Sec. School	15 m	39,730 ㎡	Yes

(Remark 1) : The level difference is between the lowest point and the highest point at each site.
(Remark 2): A part of site boundary of Fasiladas Sec. School is unclear. Therefore, the size is not an exact figure. Therefore, the facilities will not be laid out in the unclear part of the site.

[1] The survey was carried out in April-May 2011 at all 17 Project sites.
[2] Likewise, the soil survey was carried out in April-May 2011 at all 17 Project sites.

1-3 Environmental and Social Consideration

The Project sites are located within the existing schools or on vacant land. There will be no forced resettlement of any people from the Project sites. The Project does not need to attain larger land developments for construction, while felling is necessary in several sites. There will be no negative impact on the eco-system or social issues. According to “JICA Guidelines for Environmental and Social Considerations,” the Project is categorized as “C,” which is likely to have minimal or little adverse impact on the environment and society.

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Objective

The Project is expected to contribute to the fulfillment of the ESDP. By establishing new secondary schools and enhancing facilities in existing schools, the Project aims to expand access to secondary education as well as improve teaching and learning environments in secondary schools in Amhara Region.

2-1-2 Outline of the Project

In order to achieve the above-mentioned goal, the Project aims to build school facilities consisting of classrooms, science laboratories, libraries, IT centers, administration offices, staff rooms, resource centers, satellite receiver rooms, mini-media rooms, janitor rooms and latrines for seventeen schools in eight cities (Bahir Dar, Gondar, Dessie, Debre Markos, Debre Birhan, Woldia, Debre Tabor and Gonji Kolela) in Amhara Region. Through the Project, it is expected that school facilities (seventeen schools: eight newly established and nine existing), access to secondary education as well as the teaching and learning environments will improve.

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

2-2-1-1 Basic Policy

(1) Project sites

As explained above, the project sites (target schools) are seventeen in total including eight newly established schools and nine existing schools in eight cities.

(2) Components

[Newly established schools (8 schools)]

The minimum required facilities to operate secondary schools will be constructed.

The maximum number of classrooms will be thirty-two, the requested number from the Ethiopian side, considering effective operational size of the school.

[Existing schools (9 schools)]

It is vital to provide students self-study space at libraries in Ethiopia. It was found that the requested schools do not have enough seats for students at their libraries. To meet these needs, one library will be constructed for each school. The seating capacity will be either 150 or 300.

Also, all nine schools do not have enough classrooms. Therefore, those will be constructed.

[School Furniture and Equipment]

The minimum required school furniture and apparatus for distance learning curriculum will be provided for all schools (both new and existing ones).

In Ethiopia, a distance learning curriculum by nationwide live TV program has been in place to facilitate secondary education. This program covers six main subjects (Physics, Chemistry, Biology, Mathematics, English and Civics), playing a vital role in implementing the secondary education curriculum. In fact, one set of apparatus for the distance learning curriculum per classroom is a standard, and so far, 5,000 classrooms in Amhara Region have had the apparatus installed. Therefore, the Project provides the apparatus for the distance learning curriculum.

(3) Setting class size

Following the Standard of Secondary Education (SSE) as well as the Amhara National Regional State School Construction Standards (ARSCS), a size of forty students per class will be used for the Project.

2-2-1-2 Policy for Natural Environment Conditions

(1) Climate condition

Six out of eight target cities belong to highlands at more than 2,000 meters above sea level. Even Bahir Dar, which is the lowest amongst all, is approximately 1,800 meters above sea level. The areas also have relatively stable temperatures, since the country is located at lower latitude. Although people feel strong sunlight and ultraviolet rays during the daytime when it is fine weather, the temperature is not so high and it feels cool in the shade. Some houses are equipped with fireplaces since it is cold at night and in the early morning. Therefore, it is necessary to take measures against cold in building design, but not against high temperatures, as in common in other lower latitude countries. For the above-mentioned reasons, as it is common, airtight glass windows with iron frames will be used to prevent heat loss from inside the classrooms. Ceilings are also needed because the noise of heavy rain falling on the roof often disturbs the classes

during the main rainy season which is from June to September.

(2) Usage of wood and measures against termites

Eucalyptus logs shall be used for the structure of the trussed roof. There are two major reasons for this: 1) In Ethiopia, it is conventional to use eucalyptus logs for trusses of a roof. 2) Eucalyptus is fairly durable and less costly than other options. Moreover, the usage of eucalyptus logs for the Project will not cause destruction of the forests. Eucalyptuses grow fast. Farmers usually grow eucalyptuses on their extra farmlands and cut them down within several years to sell them at the nearby market. Eucalyptus is a cash crop in Ethiopia. Thus, its usage is not related to any acts of forest destruction.

Despite a few reports on termite damage below 2,000 meters above sea level, there is little information on it in the Project area, which is located at more than 2,000 meters above sea level. For this reason, it is possible to cope with termite damage only by applying anti-termite paint to the wooden building materials.

(3) Topography and condition of the site

In general, the topography of the Project sites is flat or gently inclined, except the new sites in Gondar, Debre Markos, Woldia, and Debre Tabor and some of existing school sites in Dessie and Gondar. For these sites, layout plan will be made on the gentle slope area, avoiding steep slope areas.

There are some schools with no sports ground due to space constraints, however, there will be enough area for the planned facilities.

Because of recent urban development, even in the schools that have a large space, it is required to use the land efficiently. Therefore, classrooms for the new schools should be two-storied. Furthermore, three-storied buildings will be built for some of the classrooms in Bahir Dar, Gondar and Dessie where rapid urban development has been occurring.

(4) Soil foundation

There are 5 Project sites with black cotton soil in Gondar, Dessie and Woldia (Refer to Table 1-2). In general, black cotton soil is easily distinguished by its color but occasionally it requires examination by touch. When it gets wet, its cubic content increases, and it may affect the floor, foundation and others. Therefore, countermeasures such as soil improvement work will be implemented.

(5) Earthquakes

According to the Ethiopia Building Code Standard (EBCS), there are five scales to indicate the degree of earthquake danger, from zone 0 to zone 4. The standard sets zone 4 for the African

Great Rift Valley that runs from the north to the south of the country. The further from this valley, the smaller the degree of danger becomes. In fact, only earthquakes less than a magnitude of 7 on the Richter scale have been reported during the last 100 years at the Great Rift Valley, the area having the highest scale of degree of danger. Dessie, Debre Birhan and Woldia belong to the zone 4 area while the others belong to the zone 0 area. The EBCS earthquake-resistant design will be referred to for the structural design.

2-2-1-3 Policy for Socio-Economic Conditions

(1) Gender

According to the SSE and the ARSCS, the latrine blocks for female students separated from those for male counterparts. Therefore, the Project shall plan the same. Also those blocks shall be located some distance from each other to avoid interference.

(2) Measures to be taken for physically challenged students

To assist physically challenged students, slopes will be built on the first floor of all the facilities of the new schools for smooth usage by wheel-chairs. Also paved passages will be built between the blocks.

2-2-1-4 Policy for Construction and Procurement of Construction Materials

(1) Relevant standards and codes, and building permit

The Project will refer to the EBCS, SSE and ARSCS. Since it is a public work, it will not require any approvals.

(2) Construction materials

In Ethiopia, it is possible to procure all the construction materials needed for the Project within the country, including imported materials. Thus the Project shall procure the materials domestically. However, the price of major construction materials such as cement might be unstable, because recently, there is a construction boom not only in Addis Ababa but also in smaller cities including Bahir Dar, Gondar and Dessie, the target Woredas of the Project. Hence it is necessary to collect the latest information on the prices of construction materials, and to draw up an estimate for the total cost of the Project through the Outline Design stage and the Detailed Design stage.

2-2-1-5 Policy on Utilization of Local Contractors and Local Consultants

This Project will be implemented under the Grant Aid for Community Empowerment. The Japanese Procurement Agent will provide the procurement services for products and services, including a Construction Supervision Consultant, Contractors, and Suppliers on behalf of AREB.

(1) Construction supervision consultants

The Japanese Consultant that has conducted the Preparatory Survey will be selected as a Construction Supervision Consultant having been recommended by JICA. The Japanese Consultant will supervise the work together with a local consultant that will be subcontracted. In Ethiopia, the consultants are divided into the following six groups concerning the specialized area of work:

① Architecture: Consultant Architect (CA)
② Architecture and Engineer: Consultant Architect & Engineer (CAE)
③ Management: Construction Management Consultant (CMC)
④ Highway and Bridge: Highway & Bridge Consultant (HBC)
⑤ Special Structure: Special Structure Consultant (SC)
⑥ Engineer: Consultant Engineer (CE)

The respective consultants are categorized from 1 to 5[3] based on their size, capacity, etc. ① CA or ②CAE groups will be utilized under the Project, and among them there are seven companies which are classified in the highest category. The consultant will be responsible for the preparation of the drawings, assisting tender process, supervision of the sites, and others.

(2) Contractors

Contractors will be selected amongst the Ethiopian companies through competitive tenders. The majority of the contractors are registered with the Ministry of Works and Urban Development. The contractors are divided into the following four groups concerning the specialized area of work:

① Civil Engineering, Architect Work: General Contractor (GC)
② Architect Work: Building Contractor (BC)
③ Road Work: Road Contractor (RC)
④ Electro Mechanical Contractor (EMC)

Likewise, the contractors are also categorized into 10 levels[4] based on their capacity

[3] Highest: Category 1, Lowest: Category 5
[4] Highest: Category 1, Lowest: Category 10

(financial, managerial, and quality control) and scale of business. Each category has its own maximum amount for receiving an order. In order to invite contractors in a higher category, it is necessary to plan larger lots to secure relevant contractors. It is because the smaller the size of the lots, the bigger the possibility that small-sized contractors, who may not have enough skill, will submit a bid. The contractor groups which are appropriate to the Project are ①GC and ② BC, and there are sixty-six companies[5] that are classified into the highest group.

2-2-1-6 Policy for Operation and Maintenance Plan

With regard to the operation and maintenance of the secondary schools in Amhara Region, the Woreda (District) Office is responsible for the salary of the secondary school teachers and staff, while stationeries, library books, examination related expenses and expenses for the school activities are born by the respective schools within the school budget. Regarding the facility maintenance, the PTA has been the main body to assist both financially and physically by providing labor. The system of operation and maintenance is in place in Ethiopia, thus a soft component concerning this will not be included in the Project.

2-2-1-7 Policy for Setting Facility and Material Grades

This Project will set a relevant grade for the facility, the furniture and the equipment for secondary schools by considering the points of functionality, cost and ease of maintenance. For this, other schools constructed under the Project for Construction of Primary Schools in Oromia Region[6] and the specifications of the schools constructed by the other donors will be referred to. The specifications of the afore-mentioned Project in Oromia Region and that of the drawings of AREB will be referred to for the facility. With regard to the furniture, the standard design drawings of Education Materials Production and Distribution Agency (EMPDA) will be referred to. As for the equipment, local standards will be also referred to.

2-2-1-8 Policy for Implementation Schedule

(1) Construction work schedule

The work will be divided into 2 groups: construction of new schools as the first group, likewise the existing schools as the second group. Based on the bidding result of the 1st Group, it

[5] List of Registered Contractors for 2003 EC Budget Year.
[6] Proceeding project under the Japan's Grant Aid for Community Empowerment.

might become necessary for the 2nd Group to adjust the lots and the components due to the shortage or surplus of funds. Hence work processes of the two groups will be separated having an offset period. This way, the balance of supervision work can be maintained by reducing overconcentration periods.

Furthermore, it is significant to take notice of the rainy season since civil engineering work, framework construction and finishing work might be affected, and consequently, the effectiveness and quality of work may be also affected during the main rainy season (June-September).

(2) Partial opening

It is important for the Project to hand over the newly established schools before the commencement of the new academic year of 2012/13. Hence exclusively single-story buildings of the new schools will be partially opened in late September (around the 20th) when the school starts.

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

2-2-2-1 Components of the Request

(1) Final requested schools (Target schools of the site survey)

The original request included upgrading existing schools and establishing new schools for both primary and secondary levels at 39 sites in total. These were divided into following four types: 1) Type 1: Constructing new full cycle primary schools, 2) Type 2: Upgrading first cycle primary schools to full cycle primary schools, 3) Type 3: Constructing new full cycle secondary schools, 4) Type 4: Constructing new libraries for existing secondary schools.

However, due to the acute need to expand secondary education, the Project will target only secondary schools. Considering the results of the site survey, constructing additional classrooms for existing schools (Type 4) was added as Type 5.

Finally, the Ethiopian side and the Japanese side agreed to target eight new full cycle secondary schools and nine existing secondary schools (a total of seventeen schools) of the below three types:

Type 3: Constructing new full cycle secondary schools;
Type 4: Constructing new libraries[7] for existing secondary schools;
Type 5: Constructing additional classrooms for existing schools.

[7] In Ethiopia, secondary school libraries play a significant role not only for lending and reading books, but also for self-study. Students frequently use the facility in between classes.

Table2-1 List of the Final Requested Schools

Type	School No.	Zone	Woreda	Site and School Name	Distance from Bahir Dar
Type 3 (new schools)	GD-1	North Gondar	Gondar	Kebele 18	176km
	BH-2	Bahir Dar	Bahir Dar	Kebele 14	0
	DS-3	South Wollo	Dessie	Boru Selasie K.14	480km
	DM-4	East Gojjam	Debre Markos	Kebele 3	265km
	DB-5	North Shoa	Debre Birhan	Kebele 6	695km
	WD-6	North Wollo	Woldia	Defrega Kibi Kebele	365km
	DT-7	South Gondar	Debre Tabor	Debre Tabor Eyesus	101km
	GK-8	West Gojjam	Gonji Kolela	Gonji Kolela	60km
Type 4 & 5 (existing schools)	BD-9	Bahir Dar	Bahir Dar	Tana Sec. School	0
	BD-10			Ghion Sec. School	0
	BD-11			Fasilo Sec. School	0
	GD-12	North Gondar	Gondar	Fasiladas Sec. School	176km
	GD-13			Edgit Feleg Sec. School	176km
	GD-14			Azezo Sec. School	176km
	DS-15	South Wollo	Dessie	Hottie Sec. School	480km
	DS-16			Niguse Michael Sec. School	480km
	DS-17			Kidame Gebya Sec. School	480km

(2) Components of the final request

1) Facility

Table 2-2 shows the original components of the request.

Table2-2 Requested Facility Components of Each Type

Type 3 (New School)	Classrooms, Chemistry laboratory, Physics laboratory, Biology laboratory, Library, ICT center, IT center, Satellite receiver center, Mini-media room, Technical drawing room, Demonstration room, Extracurricular club room, Assembly hall, Office, Staff room, Resource Center, Guidance counseling room, Room for department, Clinic, Latrine, Guard room, Janitor room, Information desk, Electric distribution room
Type 4 (Existing School)	Library
Type 5 (Existing School)	Classrooms

Based on the SSE, the ARSCS and also actual situation of the usage of the facilities, both parties agreed to the following three categories having in mind of the priority order;

Table2-3 Categories of the Requested Components (Type 3)

Category A	Classrooms, Chemistry laboratory, Physics laboratory, Biology laboratory, library, IT Center, Office, Staff room, Resource Center, Latrine
Category B	①Assembly hall, ②Technical drawing room, ③ICT center, ④Guidance and counseling room, ⑤Mini-media room, ⑥Satellite receiver center, ⑦Electric distribution room, ⑧Guard room, ⑨Janitor room
Category C	Demonstration room, Extracurricular club room, Department room, Clinic, Information desk

Category A: Will be included in the Project.
Category B: Will be considered based on the priority of Ethiopian side (from ①to ⑨), purpose, and frequency of usage.
Category C: Will be excluded from the Project.

2) School furniture and equipment

The Ethiopian side and the Japanese side agreed to set the components other than the facility as follows:

- Furniture: Basic ones such as desks, chairs, and chalkboards will be covered by the Project.
- Equipment: The apparatus for distance learning curriculum will be covered by the Project. Other items will be excluded from the Project (Science laboratory materials, computers and books for the library). However, those should be prepared for all the planned schools. It was confirmed that the said preparation can be done by the Ethiopian side. Thus these will be included as one of the obligations of the recipient country.
- Vehicle: Will not be covered by the Project.

2-2-2-2 Target Schools

(1) Prerequisites

Criteria for the target schools are listed below as prerequisites:

① There should be justifiable need for enrollment.
② No other plan exists for current/ongoing facility improvement at the sites by the Government of Ethiopia, other donors, NGOs and etc. to avoid duplication.
③ Topographically/environmentally safe and appropriately sized land for construction is secured.

④ The sites should be secured by the responsible organization (The landownership or right to use the land should be verified by presenting valid documents when necessary).

(2) Validity of the target schools

1) Type 3 Constructing new full cycle secondary schools

①[Necessity for constructing new secondary schools]

The result of the site survey concluded that it was important to construct new secondary schools in eight cities by finding the problems as follows: ①Classrooms are heavily crowded, ② Double shift schooling has been implemented, ③Long distance commuting is required of the students, ④Admission restrictions are imposed.

For instance, out of the 23 feeder schools[8] listed in Table 2-4, 16 schools have been implementing double shift schooling. Even among those schools, there are some schools that record PSR as 1:84. Moreover, there are 2 schools that rejected about 1,000 students to enroll due to overcrowding.

②[Validity of the proposed school size]

- Construction of a size of 32 classroom-schools is requested by the Ethiopian side.
- Following the ARSCS, single shift schooling and 40 students per class are the basis of setting the size of the facility.
- The Ethiopian side sets the maximum size of the school as 32 classrooms (1,280 students' size) from managerial and operational points of view.
- The number of classroom shortage in the respective school catchment areas are calculated based on the total number of the existing students and classrooms in each school catchment area.

Number of classroom shortage =

Number of current students ÷ 40-Number of existing classrooms (round up a decimal point)

[8] 'Feeder schools' refers to the schools belonging to the same school catchment area where the Project schools will be built. Some of the students will shift from the feeder schools to the Project schools, once construction has been completed

Table2-4 Number of Classroom Shortage of New Schools in the Respective School Catchment Areas

Woreda	Feeder Schools	G9	G10	G11	G12	Total No. of Students	No. of necessary CRs	No. of existing CRs	No. of lacking CRs
Gondar (GD-1)	Azezo Secondary School	1,361	981	476	322	3,140	79	27	52
	Fasiladas Secondary School	1,675	1,682			3,357	84	28	56
	Fasiladas Preparatory School			1,089	858	1,947	49	41	8
	Total	**3,036**	**2,663**	**1,565**	**1,180**	**8,444**	**212**	**96**	**116**
Bahir Dar (BH-2)	Ghion Secondary School	915	833	521	570	2,839	71	34	37
	Tana Secondary School	1,167	1,229	508		2,904	73	43	30
	Fasilo Secondary School	1,411	706			2,117	53	33	20
	Bahirdar Preparatory School			955	1,267	2,222	56	39	17
	Total	**3,493**	**2,768**	**1,984**	**1,837**	**10,082**	**253**	**149**	**104**
Dessie (DS-3)	Hottie Secondary School	1,646	915	531	375	3,467	87	60	27
	Kidame Gebya Secondary School	1,194	898			2,092	53	30	23
	Suala Secondary School	505	306			811	21	8	13
	Total	**3,345**	**2,119**	**531**	**375**	**6,370**	**160**	**98**	**62**
Debre Markos (BM-4)	Debre Markos Secondary School	1,235	1,235			2,470	62	19	43
	Debre Markos Preparatory School			1,065	863	1,928	49	36	13
	Total	**1,235**	**1,235**	**1,065**	**863**	**4,398**	**111**	**55**	**56**
Debre Birhan (DB-5)	Basso Secondary School	1,302	602			1,904	48	16	32
	Debre Birhan Secondary School	1,623	1,167			2,790	70	36	34
	Helie Mairearn Mamo Secondary School			966	777	1,743	44	35	9
	Total	**2,925**	**1,769**	**966**	**777**	**6,437**	**162**	**87**	**75**
Woldia (WD-6)	Millenium Secondary School	620				620	16	12	4
	Woldia Secondary School	1,044	1,283			2,327	59	26	33
	Woldia Preparatory School			1,600	900	2,500	63	15	48
	Total	**1,664**	**1,283**	**1,600**	**900**	**5,447**	**137**	**53**	**84**
Debre Tabor (DT-7)	Dagmawi Tewdros High School	1,745	1,593			3,338	84	36	48
	Debre Tabor High School	528	650			1,178	30	12	18
	Tewdros II Higher Education Preparatory Secondary School			907	741	1,648	42	15	27
	Total	**2,273**	**2,243**	**907**	**741**	**6,164**	**156**	**63**	**93**
Gonji Kolela (GK-8)	Gonji Secondary School	840	271			1,111	28	0	28
	Enrollment of the neighboring Woreda (Adet)					Unknown	0	0	0
	Total	**840**	**271**	**0**	**0**	**1,111**	**1,111**	**0**	**28**

It is obvious that except in Gonji Kolela, more than 32 classrooms are needed when single shift schooling and a capacity of 40 students per classroom are applied. In the case of Gonji Kolela, there is Gonji Secondary School in that particular area. However this school will be converted to a primary school and no classrooms for secondary school. The above Table states the number of necessary classrooms in Gonji Kolela as 28 which is less than 32. But there is no preparatory schools (G11-G12) in the area and those students go nearby District (Woreda). Therefore, even if the same size secondary school is constructed in Gonji Kolela, there would not be an oversupply of classrooms. Hence, 32 classrooms per school should be valid for all eight new secondary schools.

2) Type 4: Constructing new library for existing secondary schools

① [Current situation of the requested schools]

All nine requested existing schools have their own libraries however, some uses temporary rooms while others use different rooms as libraries. Subsequently, all schools face a critical shortage of library seats to meet the students' needs. For this reason, it is appropriate to include library construction as one of the components of the Project for all the requested schools.

② [Validity of the dimensions]

The Ethiopian side initially requested the construction of libraries with a seating capacity of 300 each. Currently, there is no standard for library dimensions in the ARSCS. But according to the SSE, it states that 5-10 % of the total number of students are to be accommodated. Based on the SSE, the seat shortage was calculated by formulating one seat for every ten students.

According to the table below, the seat shortage varies from 100 to 350 among the requested schools. In addition, the Ethiopian side explained that a bigger size library is needed for a school located in the center of each Woreda, since secondary students from neighboring schools will also use it.

In light of the afore-mentioned, the Project prepares two library prototypes, the capacity of which are 150 and 300. Tana Secondary School, Fasiladas Secondary School and Hottie Secondary School, which are located in the center of respective Woredas, will have a library with a seating capacity of 300; while the remaining six schools will have a library with a seating capacity of 150.

Table2-5 Current Situation of the Type 4 Target Schools' Libraries and Proposed Plan

Woreda	Name of Target School	No. of students	Structure	No. of necessary seats	No. of available seats	No. of lacking seats	Planned No. of seats
Bahir Dar	Tana Secondary School	2,904	RC	291	100	191	300
	Ghion Secondary School	2,839	RC	284	70	214	150
	Fasilo Secondary School	2,117	RC	212	70+20	122	150
Gondar	Fasiladas Secondary School	3,357	RC	336	90	246	300
	Edgit Feleg Secondary School	2,019	RC	202	50	152	150
	Azezo Secondary School	3,140	RC	314	50	264	150
Dessie	Hottie Secondary School	3,467	Usage of other room	347	0	347	300
	Niguse Michael Secondary School	2,157	Timber (Dilapidated)	216	0	216	150
	Kidame Gebya Secondary School	2,092	Timber	210	108	102	150
Total		24,092	-	2,412	558	1,854	1,800

3) Type 5: Constructing additional classrooms for existing schools

Single shift schooling is a standard of Amhara Region and as described above, the existing schools need to have the same number of classrooms as that of classes.[9] According to this, the shortage of classrooms was calculated as below:

Shortage of classrooms
= No. of classes (No. of necessary classrooms) - No. of proper classrooms

[9] G9 and G10 classes of all the requested existing schools implement double shift schooling. Therefore, the number of classes is greater than that of classrooms.

Table 2-6 shows the shortage of classrooms in the requested existing schools. In this Project, four classrooms per school will be built, taking into account the entire scale of the Project.

Table2-6 Number of Classroom (CRs) Shortage (Type 5)

Woreda	Name of Target Schools	No of Students	No of Classes (No.of necessary CRs)	No of CRs in use	No of Proper CRs	No of CR Shortage
Bahir Dar	Tana Secondary School	2,904	56	43	43	13
	Ghion Secondary School	2,839	52	34	34	18
	Fasilo Secondary School	2,117	42	33	33	9
Gondar	Fasiladas Secondary School	3,357	48	28	9	39
	Edgit Feleg Secondary School	2,019	34	17	10	24
	Azezo Secondary School	3,140	43	27	27	16
Dessie	Hottie Secondary School	3,467	68	70	31	37
	Niguse Michael Secondary School	2,157	39	28	25	14
	Kidame Gebya Secondary School	2,092	44	31	31	13
Total		24,092	426	311	243	183

(3) Target schools

Based on the above said validity, the Project sites and the Types were determined as shown in Table 2-7 and Tale 2-8.

Table2-7 Type 3 Target Schools

Priority[10]	School No	Zone	Woreda	Site (Kebele)	Planned Components
1	GD-1	North Gondar	Gondar	Kebele 18	32 Classrooms and other facilities
2	BH-2	Bahir Dar	Bahir Dar	Kebele 14	32 Classrooms and other facilities
3	DS-3	South Wollo	Dessie	Boru Selasie K.14	32 Classrooms and other facilities
4	DM-4	East Gojjam	Debre Markos	Kebele 3	32 Classrooms and other facilities
5	DB-5	North Shoa	Debre Birhan	Kebele 6	32 Classrooms and other facilities
6	WD-6	North Wollo	Woldia	Defrega Kibi Kebele	32 Classrooms and other facilities
7	DT-7	South Gondar	Debre Tabor	Debre Tabor Eyesus	32 Classrooms and other facilities
8	GK-8	West Gojjam	Gonji Kolela	Gonji Kolela	32 Classrooms and other facilities

[10] The priority orders were stated in the request letter.

Table2-8 Type 4 (T4) & 5 (T5) Target Schools

Priority[11]	School No	Zone	Woreda	School Name	Planned Dimension
1	BD-9	Bahir Dar	Bahir Dar	Tana Secondary School	T4:300 seats, T5:4 classrooms
4	BD-10			Ghion Secondary School	T4:150 seats, T5:4 classrooms
7	BD-11			Fasilo Secondary School	T4:150 seats, T5:4 classrooms
2	GD-12	North Gondar	Gondar	Fasiladas Secondary School	T4:300 seats, T5: 4 classrooms
5	GD-13			Edgit Feleg Secondary School	T4:150 seats, T5:4 classrooms
8	GD-14			Azezo Secondary School	T4:150 seats, T5:4 classrooms
3	DS-15	South Wollo	Dessie	Hottie Secondary School	T4:300 seats, T5:4 classrooms
6	DS-16			Niguse Michael Secondary School	T4:150 seats, T5:4 classrooms
9	DS-17			Kidame Gebya Secondary School	T4:150 seats, T5:4 classrooms

2-2-2-3 Planned Components

The components of the Project are planned as follows.

(1) Facility components

Table 2-9 shows the components of all types. Besides the afore-mentioned Category A of the final requested components, a Satellite receiver center, Mini-media room and Janitor room, which are necessary for school operation, will be incorporated in the Project from Category B.

Table2-9 Final Facility Components

Type 3	Classrooms, Chemistry laboratory, Physics laboratory, Biology laboratory, Library, IT Center, Office, Staff room, Resource center, Satellite receiver center, Mini-media room, Janitor room, Latrine
Type 4	Library
Type 5	Classrooms

The number of planned classrooms at each site is stated in Table 2-11.

(2) School furniture and equipment components

Regarding the necessary furniture and equipment, refer to 2-2-2-1 (2).

Displays and Network apparatus necessary for distance learning curriculum will be set for the classrooms, science laboratories and IT centers.

[11] Ditto

Satellite Antenna and the related apparatus will be prepared by the Ethiopian side, since these will be solely handled by the ETC. On the other hand, TV stands will be included in the construction work of the Project.

(3) Soft component

There is no planned soft component in this Project.

2-2-2-4 Architectural Plan

(1) Layout plan

Layout of additional facilities in the existing schools should be well planned for the reason of safety. Circulation for construction work and school operation need to avoid interfering with each other.

Site conditions and natural conditions, such as natural lighting and prevailing winds, should be reflected in the layout plan for both existing and newly established schools. Some school sites are not by main roads but surrounded by a planned road or one of their boundaries adjoin such a planned road. Therefore, the location of the entrance and school buildings should be scrutinized from the long term viewpoint.

Layout of the new schools will be divided into several blocks to make it more functional: Administration Block, Laboratory Block, Classroom Block, Library Block, and Latrine Block. The administration block and the laboratory block, both of which consist of 3 buildings, will be arranged as a U-shape, and a courtyard will be built for the former. In front of the Administration Block, two flagpoles will be installed for an assembly location. As for the classroom block, the buildings will be arranged in parallel. The library block will be located in a quiet area, separately from the others. Due to space constraints, some arrangements in Gondar and Debre Tabor will differ from the standard but dividing into blocks will remain the same.

(2) Floor plan

1) Classrooms

The size for one classroom will be set as 7.4 m x 6.60 m = 48.84 ㎡. According to the ARSCS, a 1.65 m-wide corridor will be established in front of the classrooms. There will be one entrance to the classroom and a transom window will be provided above the door leaf. The entrance side window will be a tall side-light while the other side will be windows with high sills. A chalkboard and a notice board will be put on the front wall and a whiteboard will be installed on the other side of the classroom. The chalkboard will be movable so that a display can be stored on the backside.

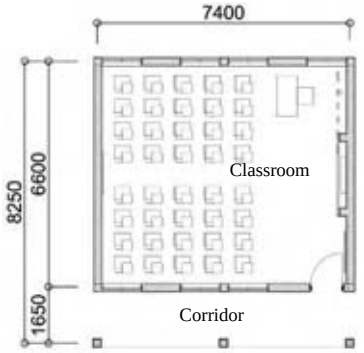


Figure 2-1 Floor Plan of the Classroom

2) Library

The library will be composed of a stack room, space for librarians, reading and self-study spaces and corridors. The entire size for the one-storied library will be 29. 60 m x 8.25 m=244.20 ㎡. The size of the two-storied one will be double the size of the above, and stairs will be set inside the building. There will be two entrances, and the windows will have high sills for both the entrance side and the other side. A chalkboard and a notice board will be installed on the wall of reading and self-study space.

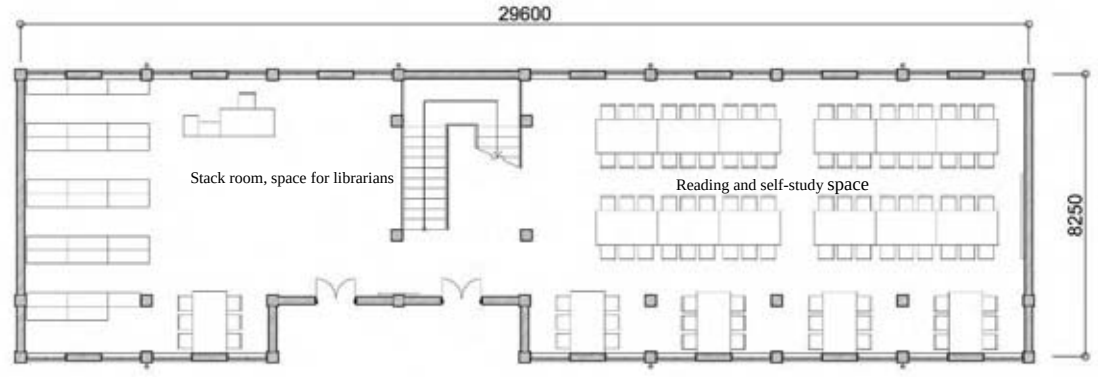


Figure 2-2 Floor Plan of the Library

(Ground floor of the two-storied building)

3) Science Laboratories (One each for Physics, Chemistry and Biology)

Science laboratories will be composed of laboratory spaces, teacher's room, storage and porch. The entire size will be 18.50 m x 8.25m = 152. 63 ㎡. There will be one entrance and in between the laboratories, a teacher's room and storage will be connected so that one can walk through those areas. The windows will have high sills. A counter with five sinks will be installed next to the entrance. A seepage pit will be built for draining the water. Under the Project, water supply outlets will be prepared while the Ethiopian side will need to install the water supply pipes.

A movable chalkboard (to store a display, in the same style as in the classroom) and a notice

board will be put on the front wall whereas a whiteboard and another notice board will be located on the rear wall.

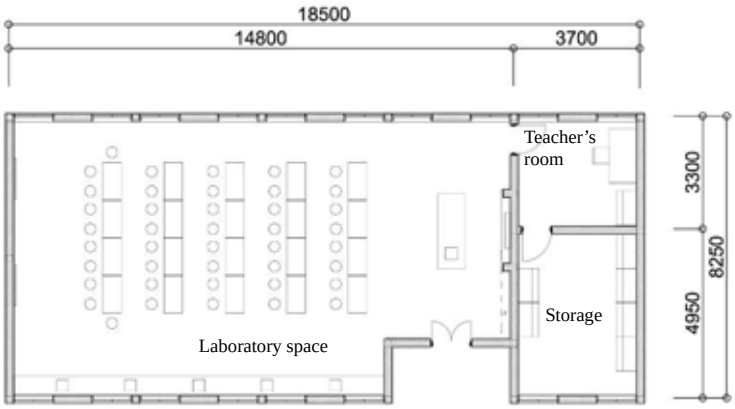


Figure 2-3 Floor Plan of the Science Laboratory

4) Resource Center

Resource center will be able to be used in parts. The overall size will be 18.50 m x 8.25 m = 152.63 ㎡. Two entrances will be made, and the areas can be used as a department room for 10 subjects and a resource center. Those rooms will be connected so that one can walk through those areas. The windows of the entrance side will be tall side-lights and those of the other side will have high sills. A set of a chalkboard and a notice board will be put both on the front wall and the rear side wall.

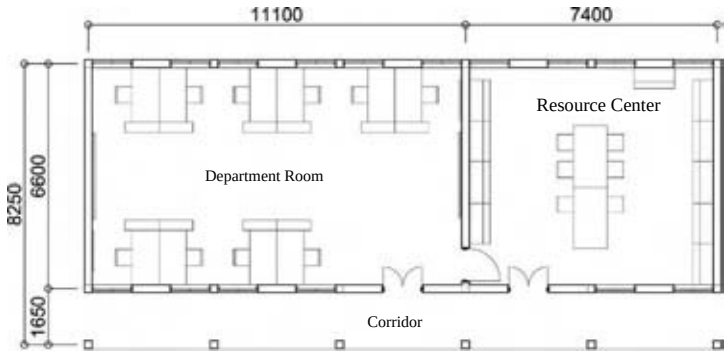


Figure 2-4 Floor Plan of the Resource Center

5) IT center

The size should be 7.40 m x 6.60 m=48.84 ㎡with an entrance. There will be one entrance, and the windows will have high sills.

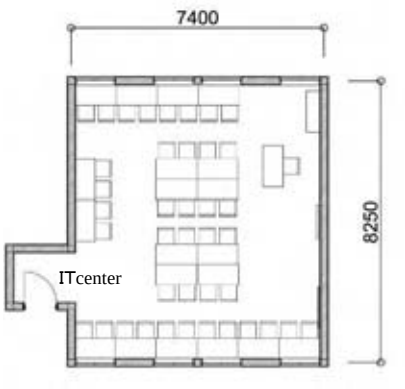


Figure 2-5 Floor Plan of the IT Center

6) Office

The office block will be composed of nine rooms: a director's room, two vice director's rooms, a secretary's room, an administration office room, two financial office rooms, and a record office room with storage for the documents. The director's room, the secretary's room and the vice director's rooms will be connected so that one can walk through those areas. Likewise, the record room and the storage for the documents will be also connected. Tall side-lights will be installed on the entrance side while windows with high sills will be installed on the other side of the room. A 1.65m-wide corridor will be established in front of the above rooms.

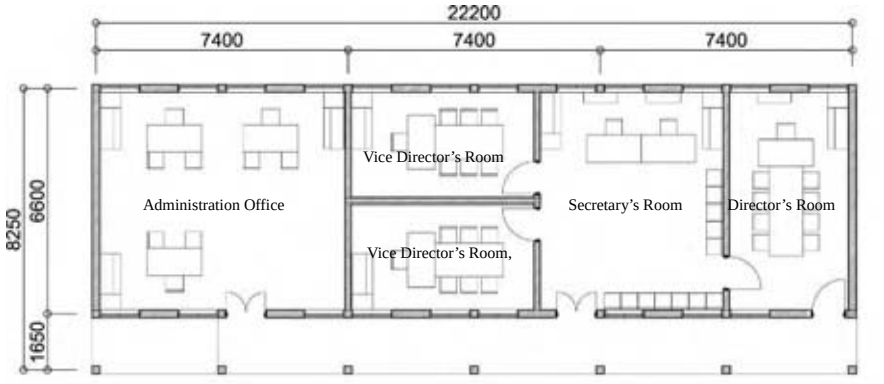


Figure 2-6 Floor Plan A of the Office

(Director's room, Vice Director's room, Secretary's room and a part of Administration Office)

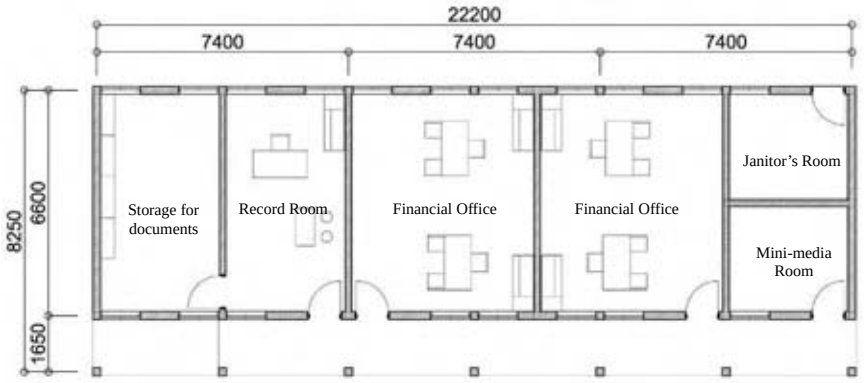


Figure 2-7 Floor Plan B of the Office

(Financial office rooms (2), and Record office room and a part of Storage for the documents)

7) Staff room

The size of the staff room will be 11.10 m x 6.60 m = 73.26 ㎡. There will be one entrance, and the windows will have high sills. A chalkboard and a notice board will be put on the wall. A 1.65m-wide corridor will be established in front of the room.

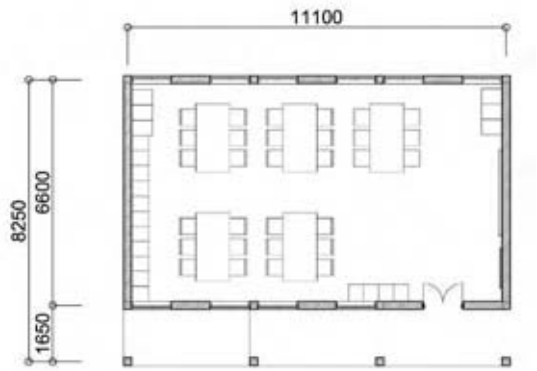


Figure 2-8 Floor Plan of the Staff Room

8) Latrine

Eight toilet booths will be built in a latrine block. All the toilets will be Turkish style. Each booth will be 1.55m x 1.2 m=1.86 ㎡ in size.

Six sets of hand wash sink and tap will be installed, and a seepage pit will be built for draining the water. The same as in the case of the laboratories, the water supply outlets will be prepared by the Japanese side while the Ethiopian side will need to install the water supply pipes. The latrine will be privy type, and a slope will be installed to minimize the differences in level.

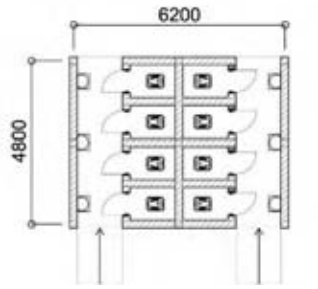


Figure 2-9 Floor Plan of the Latrine

9) Others (Mini-media room, Satellite receiver center and Janitor room)

An entrance and a window will be put in the mini-media room, satellite receiver center and the janitor room.

(3) Prototype of the facility

The facility plan should be developed by combining the prototypes listed in Table 2-10. This prototype will be applied for Type 3, Type 4 and Type 5 schools.

Table2-10 Facility Prototypes

Name of Block	Prototype	No. of Classroom / rooms	No. of Stories	Area（㎡）
Classroom Block A	4C	Classrooms（4 rooms）	One- Storied	224.20
Classroom Block B	2-8C	Classrooms（8 rooms）	Two- Storied	524.40
Classroom Block C	3-12C	Classrooms（12 rooms）	Three-Storied	793.35
Classroom Block＋Library	2-4CR	Classrooms（4 rooms）＋150 seats Library	Two- Storied	519.45
Library Block A	R	150 seats Library	One- Storied	244.20
Library Block B	2-R	300 seats Library	Two- Storied	488.40
Laboratory Block A	L	Science Laboratory (1 room)	One- Storied	152.63
Laboratory Block B	LI	Science Laboratory ＋ IT Center ＋Satellite receiver center	One- Storied	244.20
Administration Block A	AA	Director's room＋Vice Directors' room (2 rooms)＋Secretary's room＋ Administration office room	One- Storied	183.15
Administration Block B	AB	Financial office room (2 rooms) ＋Record room ＋ Document storage + Janitor room ＋ Mini-media room	One- Storied	183.15
Administration Block C	AC	Staff room ＋ Resource Center	One- Storied	244.20
Latrine Block	T	8 booths（for the students、for the teachers & staff)	One- Storied	29.76

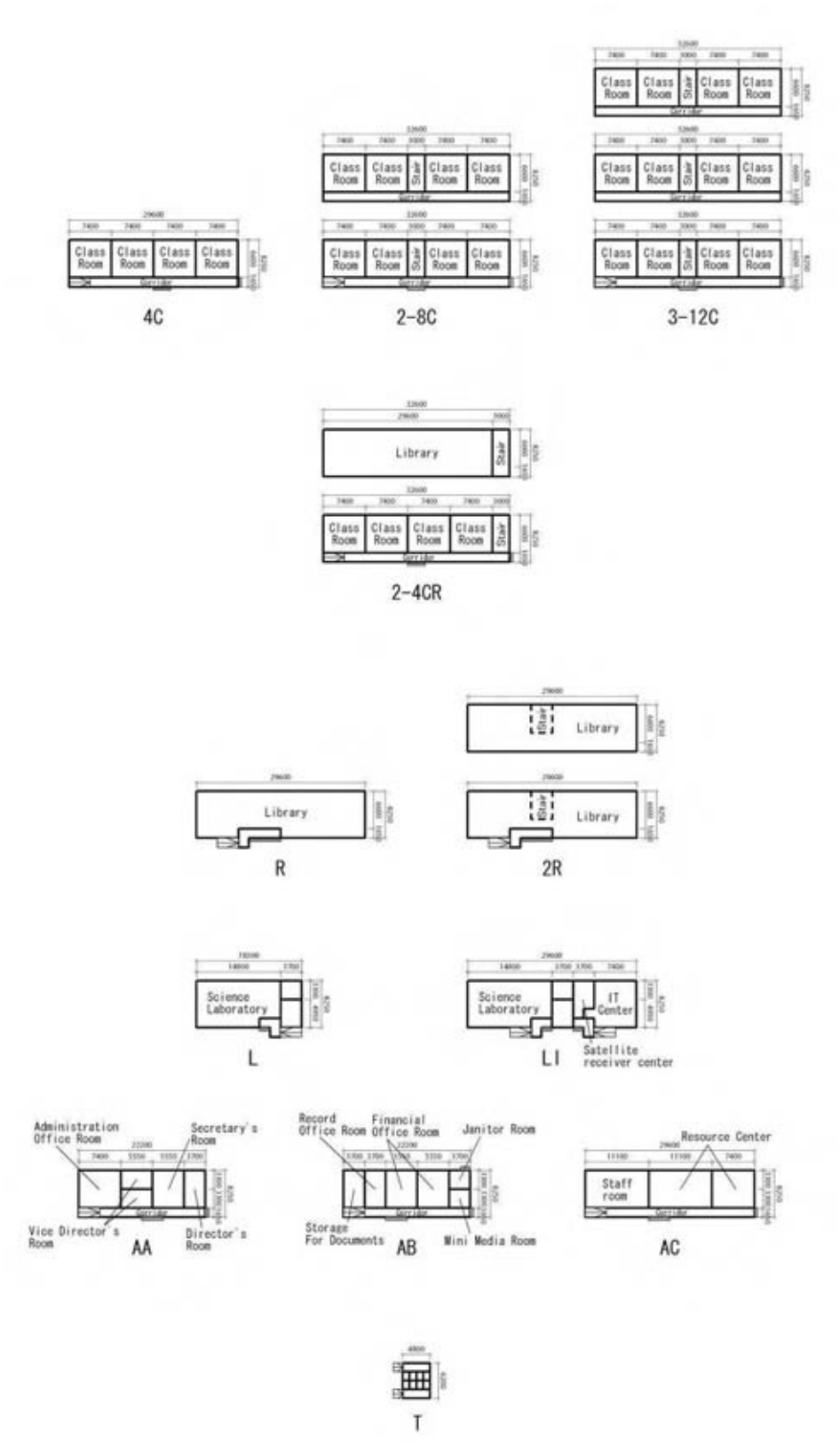


Figure 2-10 Prototypes

(4) Facility list of the target schools

Facility components, facility prototypes and the size will be listed in Table 2-11.

Table2-11 Facility Components, Facility Types and Size

Type	School No.	District (Woreda)	Kebele (new)/ School Name (existing)	No. of Planned CR	Size (㎡)	Apparatus for distance learning	Facility Prototype											
							4C	2-8C	3-12C	2-4CR	R	2-R	L	LI	AA	AB	AC	T
New	GD-1	Godar	Kebele 18	32	3,604.54	36		1	2		1		2	1	1	1	1	3
	BH-2	Bahir Dar	Kebele 14	32	3,604.54	36		1	2		1		2	1	1	1	1	3
	DS-3	Dessie	Boru Selasie K 14	32	3,604.54	36		1	2		1		2	1	1	1	1	3
	DM-4	Debre Markos	Kebele 3	32	3,591.04	36		4			1		2	1	1	1	1	3
	DB-5	Debre Birhan	Kebele 6	32	3,591.04	36		4			1		2	1	1	1	1	3
	WD-6	Woldia	Defrega Kibi Kebele	32	3,591.04	36		4			1		2	1	1	1	1	3
	DT-7	Debre Tabor	Debre Tabor Eyesus	32	3,591.04	36		4			1		2	1	1	1	1	3
	GK-8	Gonji Kolela	Gonji Kolela	32	3,591.04	36		4			1		2	1	1	1	1	3
Existing	BD-9	Bahir Dar	Tana Sec. School	4	732.60	4	1					1						
	BD-10		Ghion Sec. School	4	519.45	4				1								
	BD-11		Fasilo Sec. School	4	519.45	4				1								
	GD-12	Gondar	Fasiladas Sec.S	4	732.60	4	1					1						
	GD-13		Edgit Feleg Sec.S	4	519.45	4				1								
	GD-14		Azezo Sec. School	4	519.45	4				1								
	DS-15	Dessie	Hottie Sec. School	4	732.60	4	1					1						
	DS-16		Nigus Michael S.S	4	519.45	4				1								
	DS-17		Kidame Gebya S.S	4	519.45	4				1								
Total				292	34,083.32	324	3	23	6	6	8	3	16	8	8	8	8	24

(5) Elevation/Section plan

Section planning requires consideration of the situation of the various sites together with the following:

- The floor of the one-storied building should be more than 45 cm above the ground so as to avoid flooding during the rainy season.
- The roof should be gable type, which is common in Ethiopia.
- Conforming to the local custom, ceilings should be built inside the rooms, the corridors and the eaves plenum (top story only)
- The windows should be installed even with the beams in order to maximize the intake of the natural draft.
- For the purpose of using the land effectively, the classroom block should be more than two-stories high for Type 3 schools.

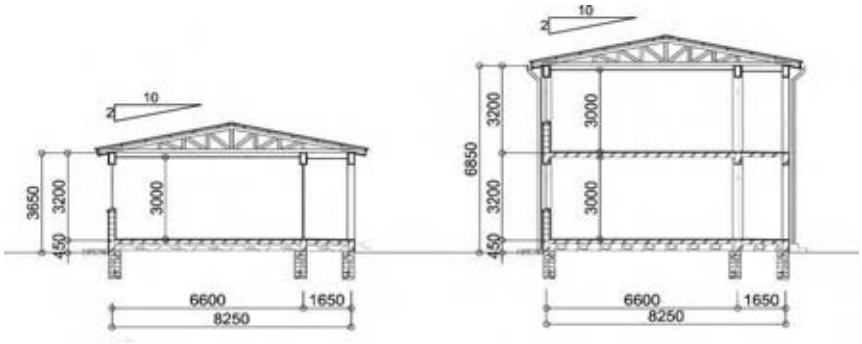


Figure 2-11 Section Plan of the Classroom
(Left: Classroom Block A, Right: Classroom Block B)

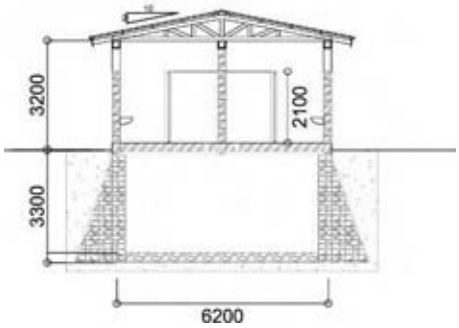


Figure 2-12 Section Plan of the Latrine

(6) Structure/Construction plan

Under this Project, the structure plan should be made following the EBCS.

1) Structural system

The below types of basic structure are used widely in the schools of Amhara region:

①Continuous footing of masonry using local natural stones

②Isolated footing of reinforced concrete (RC) structure

In general, ① is used only when one-storey construction on hard subsoil is implemented while ②is used when one-storey construction on soft soil, such as black cotton soil, is planned and two storey or higher buildings are constructed even on hard subsoil. In this Project, foundation design will be made considering the subsoil condition and the number of stories of the buildings.

As to the 5 sites with black cotton soil (Refer to Table 1-2), the soil will be either replaced with good quality soil up to a certain depth or the foundation will be laid in the deep ground

where there is hard subsoil.

The upper (column, beam and wall) structure will be as follows: The columns and the beams will be RC whereas the exterior wall and the partition walls will be concrete block. The roof will be a truss structure using eucalyptus timber.

2) External design forces

As described in 2-2-1-2 (5) (2-3~2-4 pages), Ethiopia is in a seismic zone, and according to the EBCS, there are five scales to indicate the degree of earthquake danger, from zone 0 to zone 4. Amongst all the target sites, only Dessie, Debre Brahin and Woldia belong to the zone 4 area while the others belong to the zone 0 area. Concerning the structural design, the Project will adopt an earthquake-resistant design under the EBCS.

Table2-12 Earthquake Zone

Earthquake Zone	4	3	2	1	0
Maximum Acceleration (Gal)	100	70	50	30	0
Japan Meteorological Agency Seismic Intensity	5 Lower	4Upper	4 Middle	4 Lower	0

(7) Electrical installation plan

Except the latrine, all other rooms (classrooms, science laboratories, library, IT center, administration office, staff room, resource center, satellite receiver center, mini-media room and janitor room) will have electrical installation (distribution board, lighting, receptacle, and light electrical appliance to receive school announcement), if necessary. However, electrical installation up to the distribution board should be handled by the Ethiopian side.

(8) Plan for plumbing installation and sanitary services

A septic tank for the latrine will be designed considering regular collection of waste.

(9) Plan for Construction Materials

Specifications of the planned facilities are listed in the Table 2-13.

Table2-13 Facility Specifications

Part		Local Construction Method (in general)	Adopted Method in the Project	Reason for Adoption
Main Structure	Foundation	Isolated footing of RC structure	ditto	Follow the local specifications
	Column・Beam	RC	ditto	Follow the local specifications
	Wall	Concrete block layer	ditto	Follow the local specifications
	Roofing	Wood truss (Eucalyptus)	ditto	Follow the local specifications
Exterior	Exterior Wall	Mortar Tyrolean finish	ditto	Follow the local specifications
	Outside Corridor, Floor of the Porch	Cement tile on mortar substrate	ditto	Follow the local specifications
	Moat	Stone veneer using local natural stones	ditto	Follow the local specifications
	Roof	Corrugated galvanized steel sheet	ditto	Follow the local specifications
	Eaves plenum	N.A.	Corrugated galvanized steel sheet	To improve durability
	Opening	Steel form, glass	ditto	Follow the local specifications
	Septic Tank	Masonry using local natural stones	ditto	Follow the local specifications
Interior	Floor	Cement tile on mortar substrate	ditto	Follow the local specifications
	Interior wall	Mortar substrate, Painting	ditto	Follow the local specifications
	Baseboard	Cement tile	ditto	Follow the local specifications
	Ceiling	Timber ground, Particle board, Painting	ditto	Follow the local specifications

(10) Procurement of the school furniture

According to the ARSCS, the following furniture will be supplied.

Table2-14 List of Furniture for the Respective Rooms

Name of the Room		No. of the Room	Name of the Furniture	No. of Materials for Each Room
Classroom		32	Arm Chair	40
			Teacher's Desk	1
			Teacher's Chair	1
			Chalkboard	1
			White Board	1
			Notice Board	1
Library for 150 seats/ 300 seats		1	Library Desk	25/50
			Library Chair	151/301
			Catalogue Box	1
			File Cabinet	1
			Librarian Desk (Kneehole Desk)	1
			Bookshelf (Small)	1
			Bookshelf (Large)	25
			Chalkboard	1
			Notice Board	1
Science Laboratory (Physics, Chemistry and Biology)		3	Stool	42
			Teacher's Desk	1
			Teacher's Chair	1
			Demonstration Table	1
			Student's Working Desk	20
			Cupboard A	6
			Cupboard B	1
			Chalkboard	1
			Notice Board	2
Resource Center		1	Office Desk	10
			Office Chair	16
			Cupboard A	10
			Book Desk	2
			Shelf	10
			Chalkboard	2
			Notice Board	2
IT Center		1	Computer Desk	20
			Computer Chair	41
			Teacher's Desk	1
			Shelf (Large)	1
			Whaite Board	1
			Notice Board	1
office	Director's Room	1	Office Desk	1
			Meeting Table	1
			Armrest Chair	1
			Office Chair	8
			Cupboard A	1
			File Cabinet	1
			Notice Board	1
	Vice Director's Room	2	Office Desk	1
			Meeting Table	1
			Armrest Chair	1
			Office Chair	6
			Cupboard A	1
			File Cabinet	1
			Notice Board	1
	Secretary's Room (for 2 staff)	1	Office Desk	2
			Office Chair	14
			Cupboard A	2
			File Cabinet	2
			Shelf	2
	Financial Office Room (for 4 staff)	2	Office Desk	2
			Armrest Chair	2
			Office Chair	4
			Cupboard A	2
			File Cabinet	2
	Administration Office Room (for 3 staff)	1	Office Desk	3
			Armrest Chair	3
			Office Chair	6
			Cupboard A	3
			File Cabinet	3
	Record Office (including Storage)	1	Office Desk	1
			Office Chair	1
			Cupboard A	1
			File Cabinet	1
			Shelf (Large)	4
Staff Room		1	Office Chair	30
			Meeting Table	5
			File Cabinet	6
			Chalkboard	1
			Notice Board	1
			Locker	15

(11) Procurement of the equipment

The following apparatus for long distance learning curriculum will be procured.

Table2-15 Apparatus for Distance Learning Curriculum

Apparatus	Specification/Use	Total Quantity
Display	・ 42 inch type ・ To receive the program each classroom	324
Network apparatus	・ Network apparatus for distribution amplifier ・ To build network up to the classrooms	324

(12) Exterior work

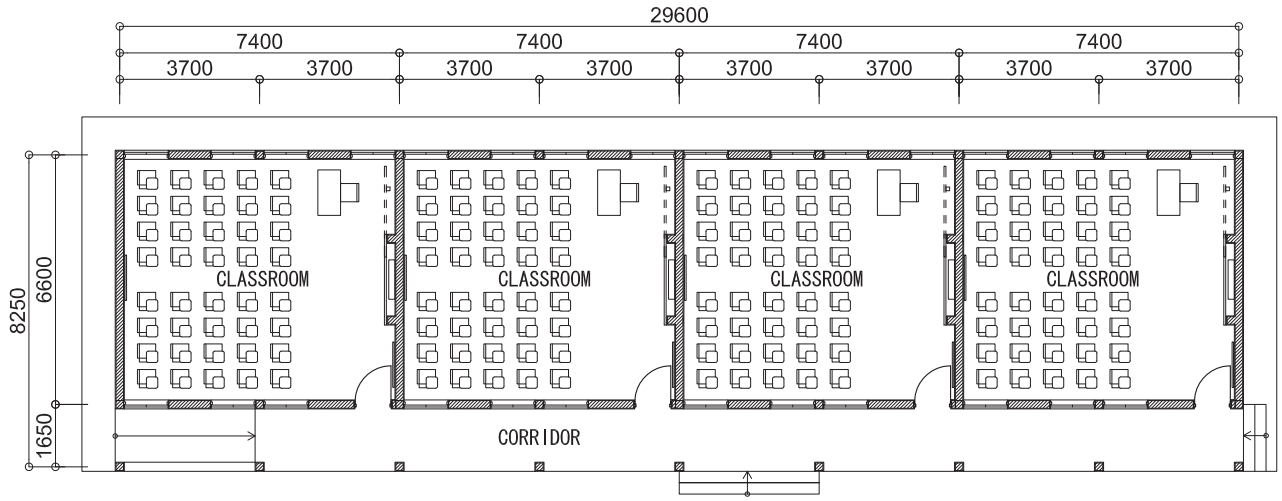
The Project includes the exterior works stated below.

・To pave the passages in between the buildings (blocks).
・To put two flagpoles each for 8 newly established schools

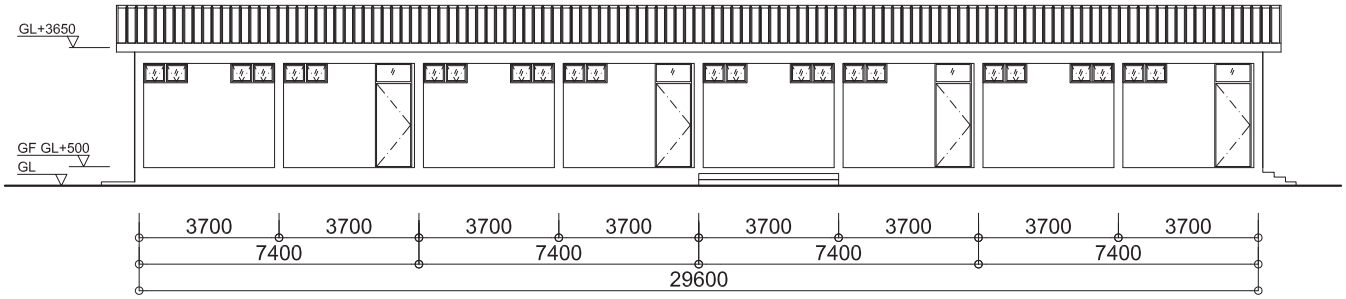
2-2-3 Outline Design Drawing

①	Classroom Block A	4C Type	Floor, Elevation, Section Plans
②	Classroom Block B	2-8C Type	Floor Plan
③	Classroom Block B	2-8C Type	Elevation, Section Plans
④	Classroom Block C	3-12C Type	Floor Plan
⑤	Classroom Block C	3-12C Type	Elevation, Section Plans
⑥	Classroom/Library Block	2-4CR Type	Floor Plan
⑦	Classroom/Library Block	2-4CR Type	Elevation, Section Plans
⑧	Library Block A	R Type	Floor, Elevation, Section Plans
⑨	Library Block B	2-R Type	Floor Plan
⑩	Library Block B	2-R Type	Elevation, Section Plans
⑪	Laboratory Block A	L Type	Floor, Elevation, Section Plans
⑫	Laboratory Block B	LI Type	Floor, Elevation, Section Plans
⑬	Administration Block A	AA Type	Floor, Elevation, Section Plans
⑭	Administration Block B	AB Type	Floor, Elevation, Section Plans
⑮	Administration Block C	AC Type	Floor, Elevation, Section Plans
⑯	Latrine Block	T Type	Floor, Elevation, Section Plans

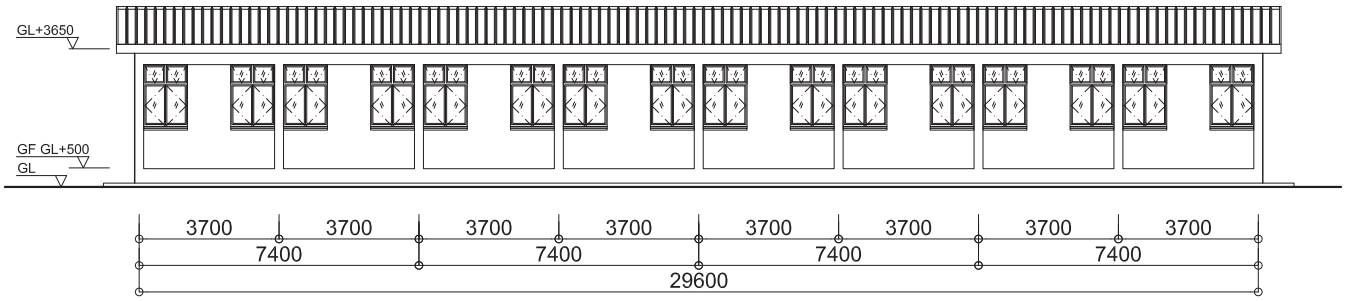
CLASSROOM BLOCK A TYPE 4C —FOUR ROOMS ONE STORY— S=1/200



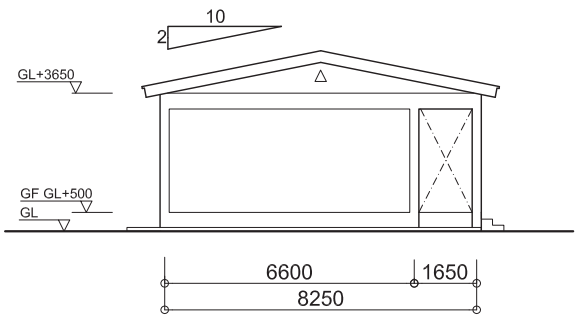
PLAN



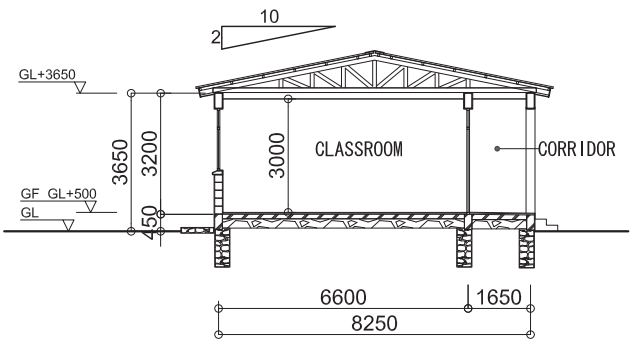
ELEVATION (CORRIDOR SIDE)



ELEVATION (CLASSROOM SIDE)

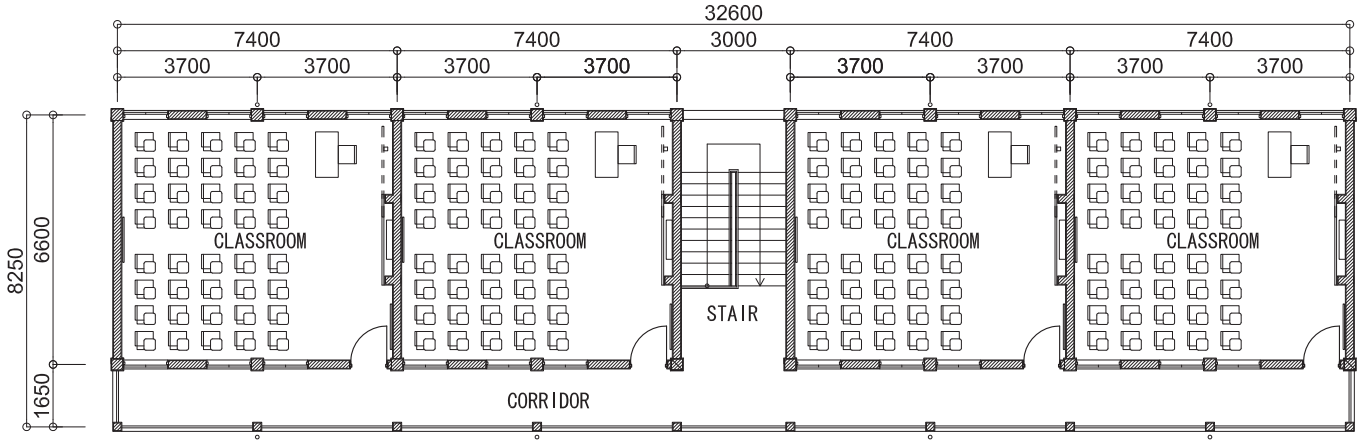


ELEVATION (PERP. GABLE ROOF)

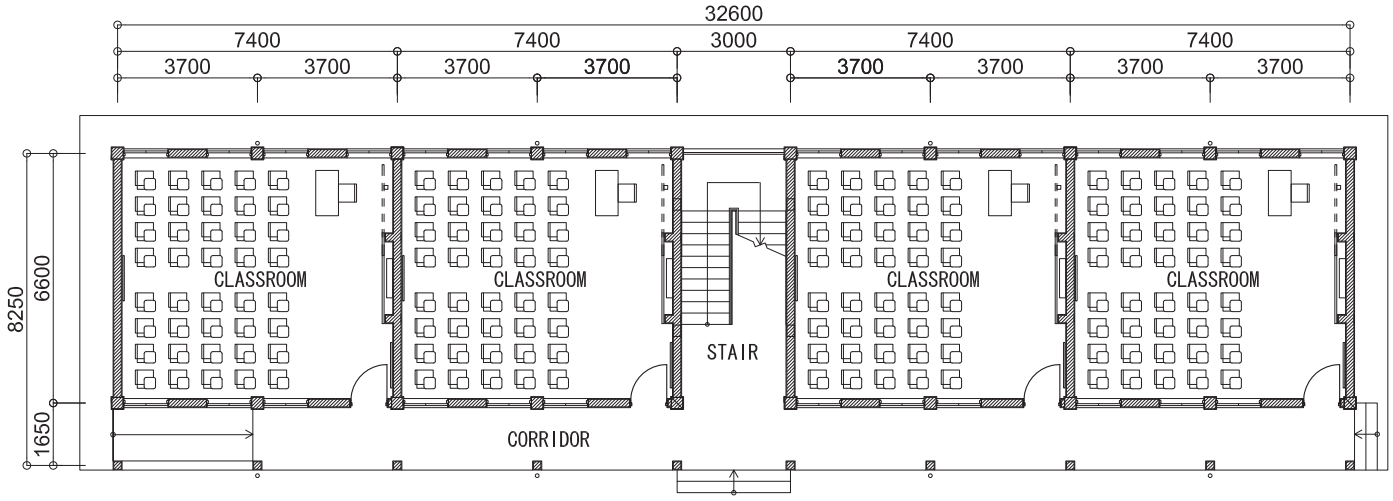


SECTION

CLASSROOM BLOCK B TYPE 2-8C —EIGHT ROOMS TWO STORY— S=1/200

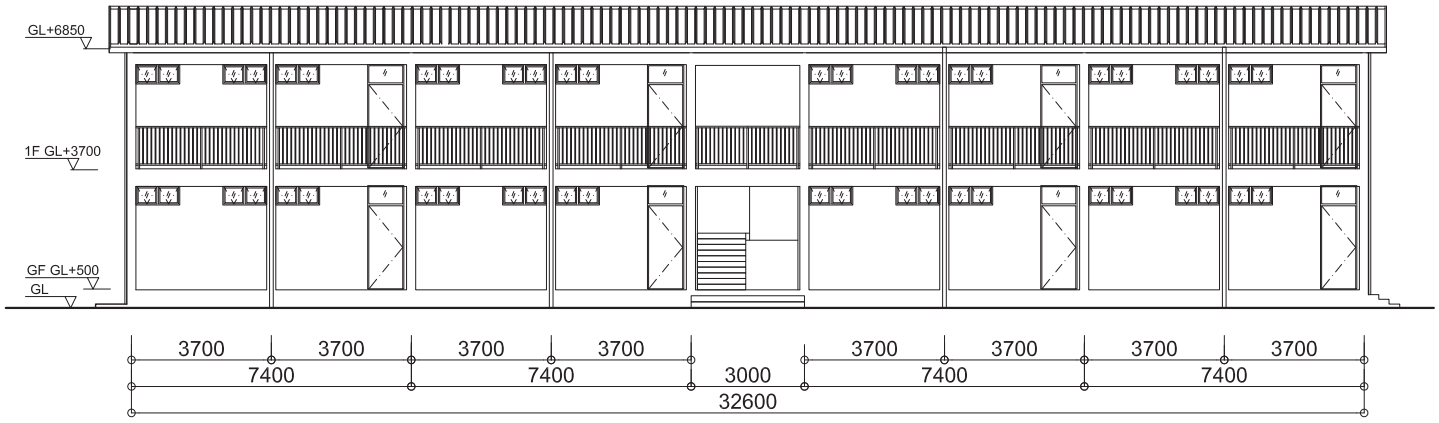


FIRST FLOOR PLAN

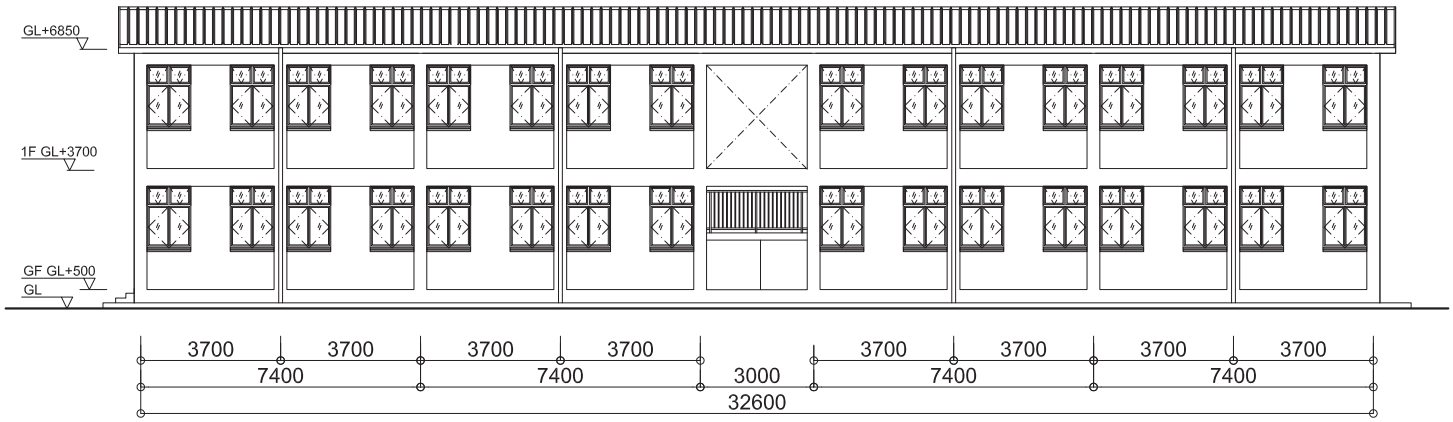


GROUND FLOOR PLAN

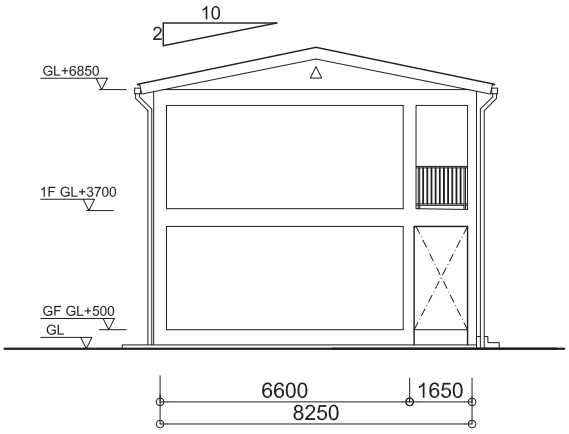
CLASSROOM BLOCK B TYPE 2-8C —EIGHT ROOMS TWO STORY— S=1/200



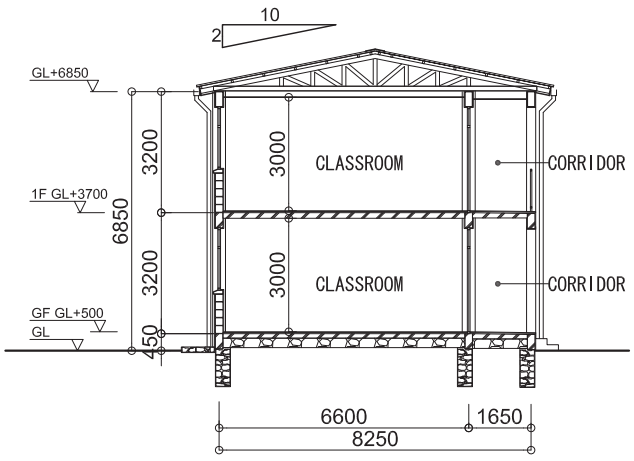
ELEVATION (CORRIDOR SIDE)



ELEVATION (CLASSROOM SIDE)

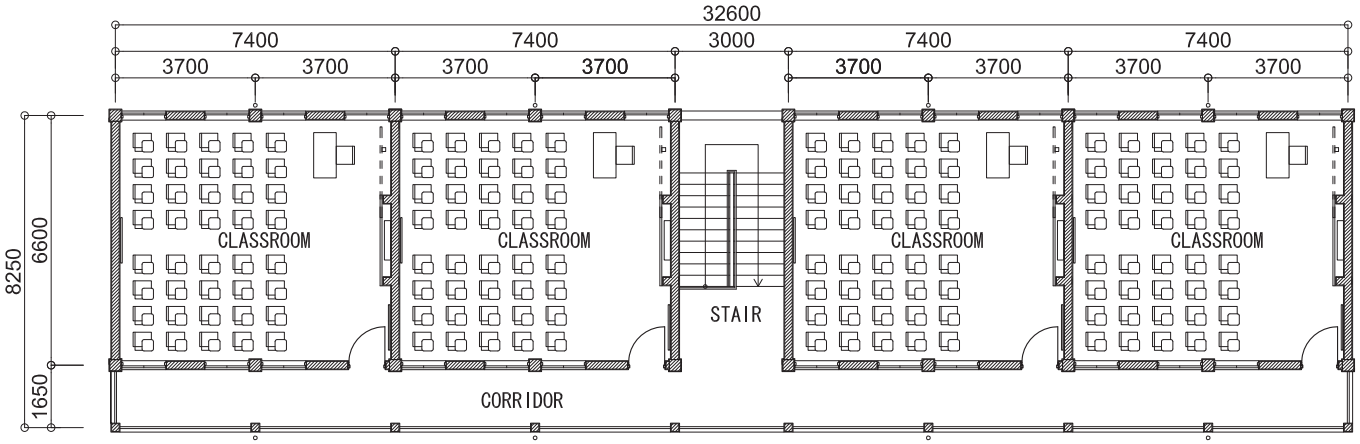


ELEVATION (PERP. GABLE ROOF)

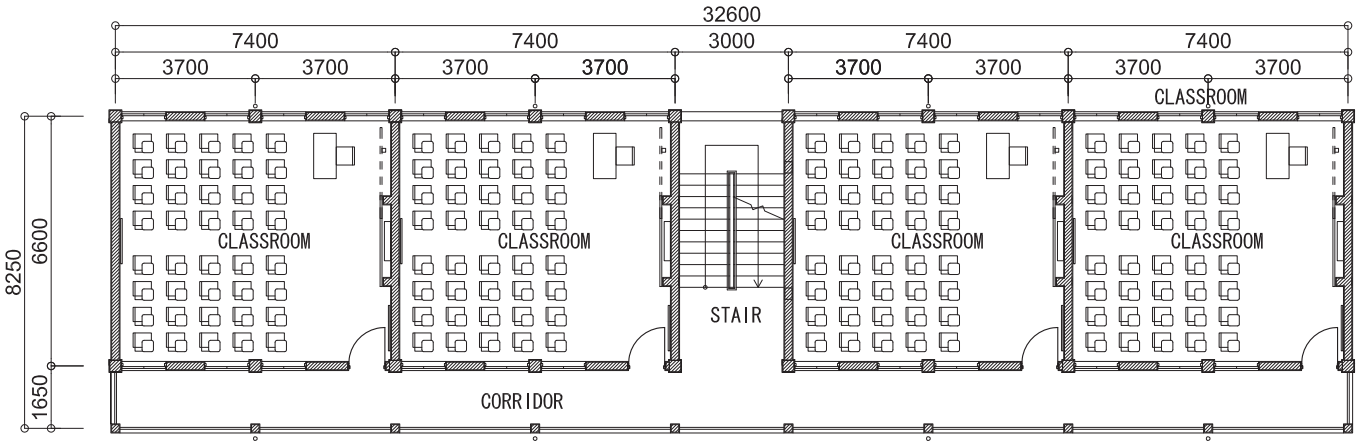


SECTION

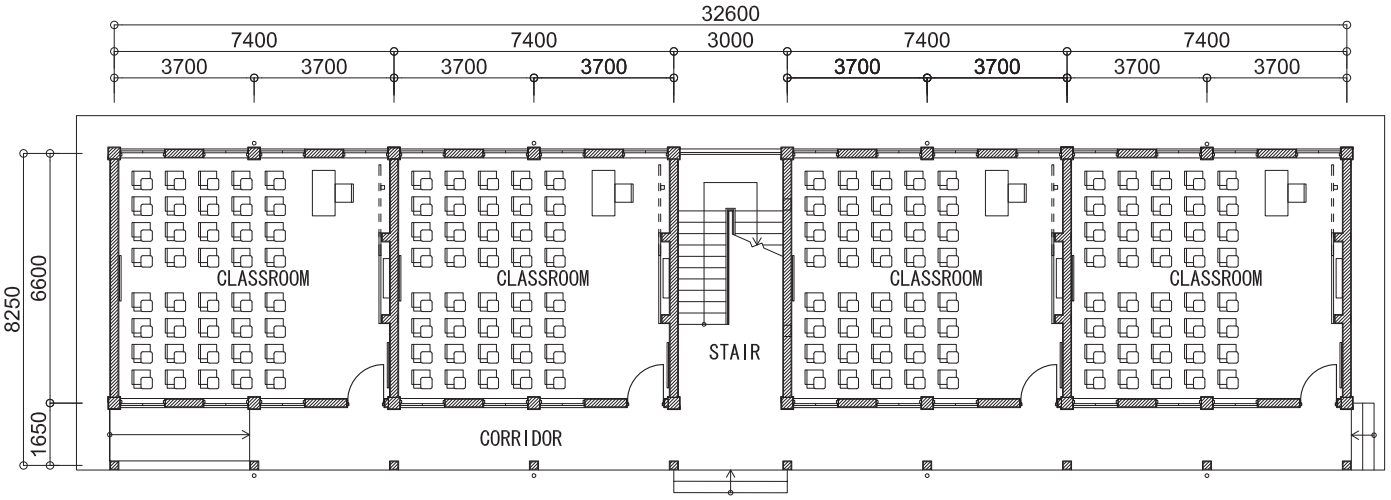
CLASSROOM BLOCK C TYPE 3-12C —TWELVE ROOMS THREE STORY— S=1/200



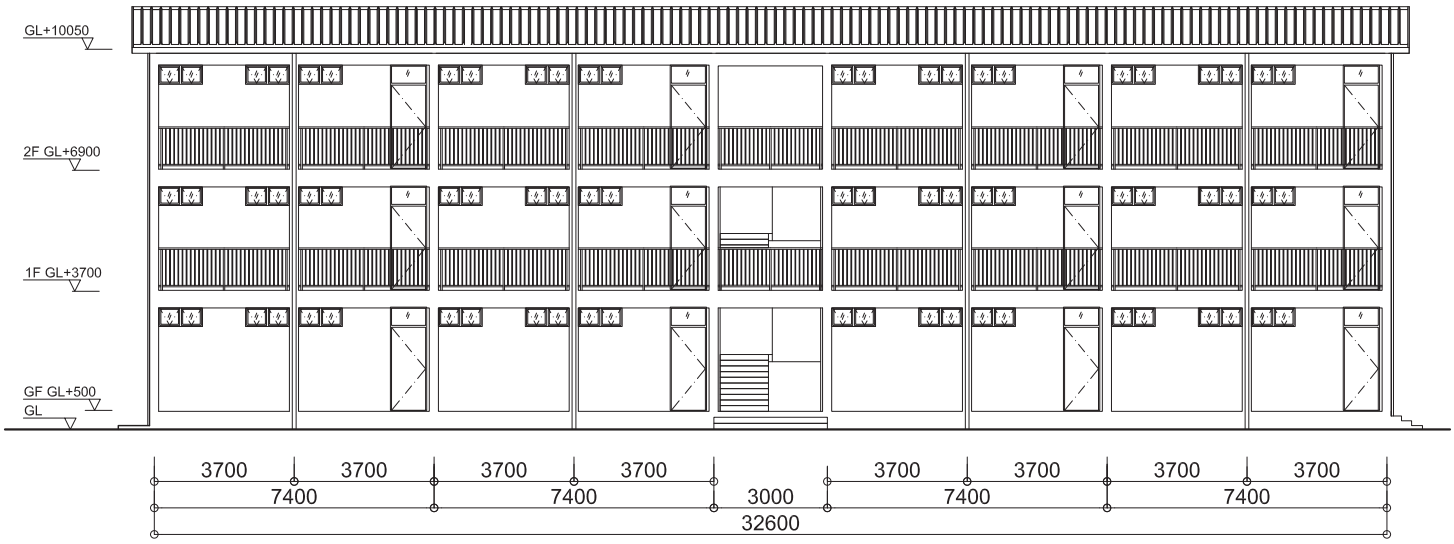
SECOND FLOOR PLAN



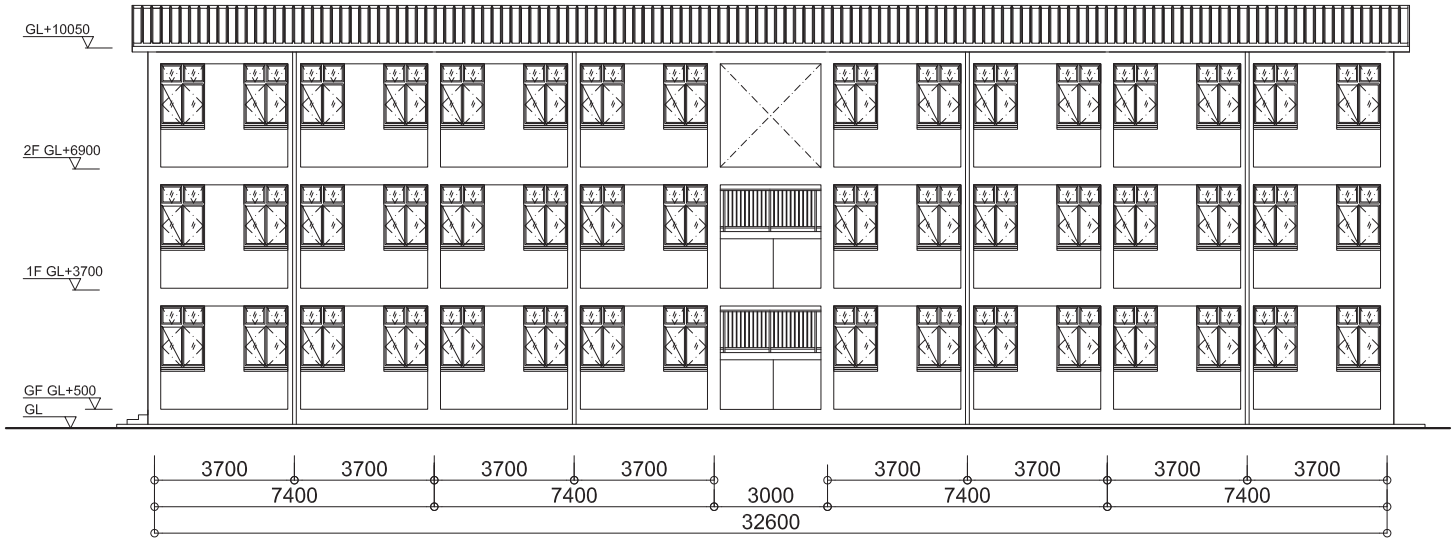
FIRST FLOOR PLAN



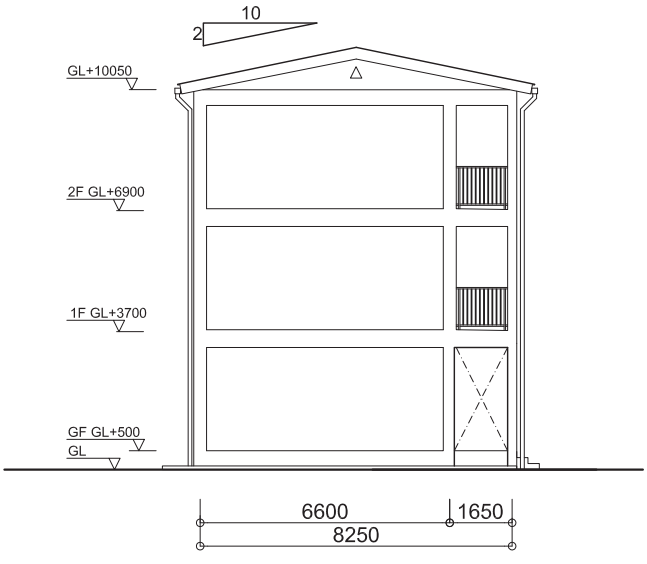
GROUND FLOOR



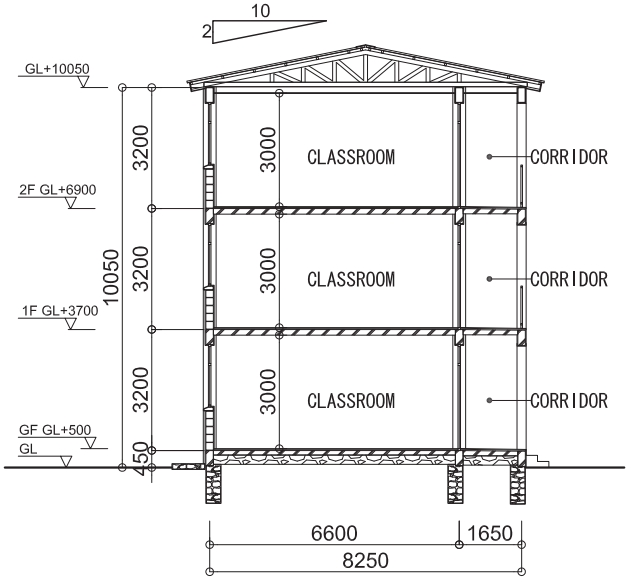
ELEVATION (CORRIDOR SIDE)



ELEVATION (CLASSROOM SIDE)

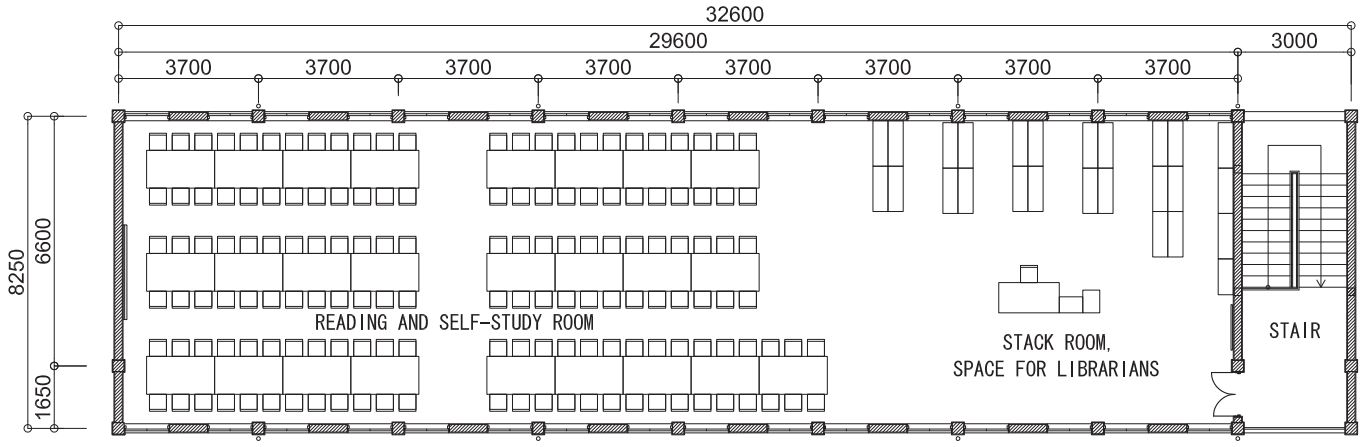


ELEVATION (PERP. GABLE ROOF)

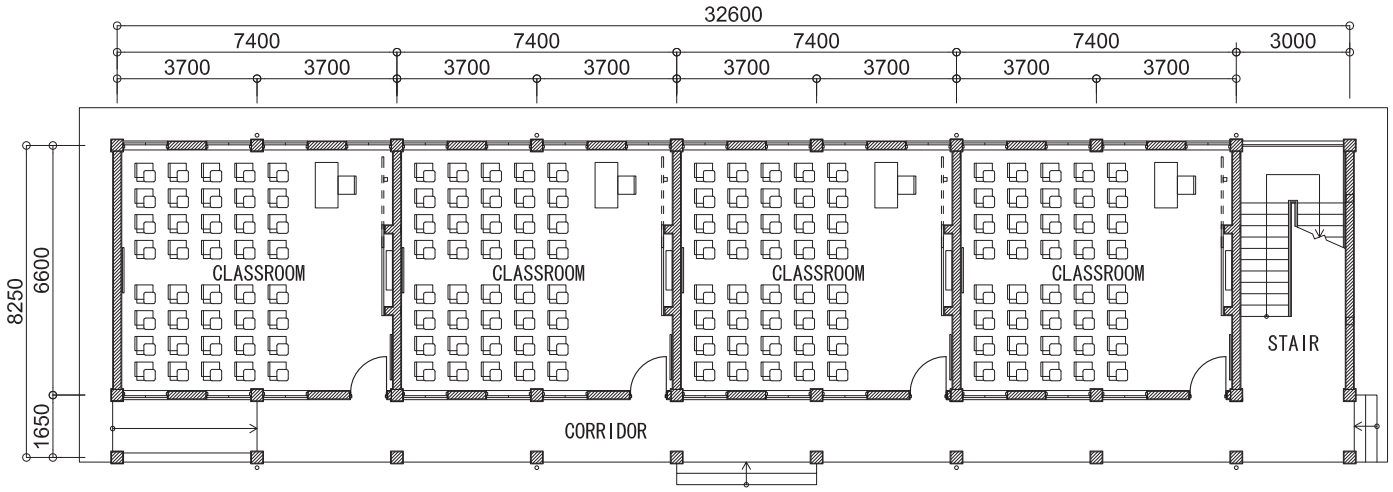


SECTION

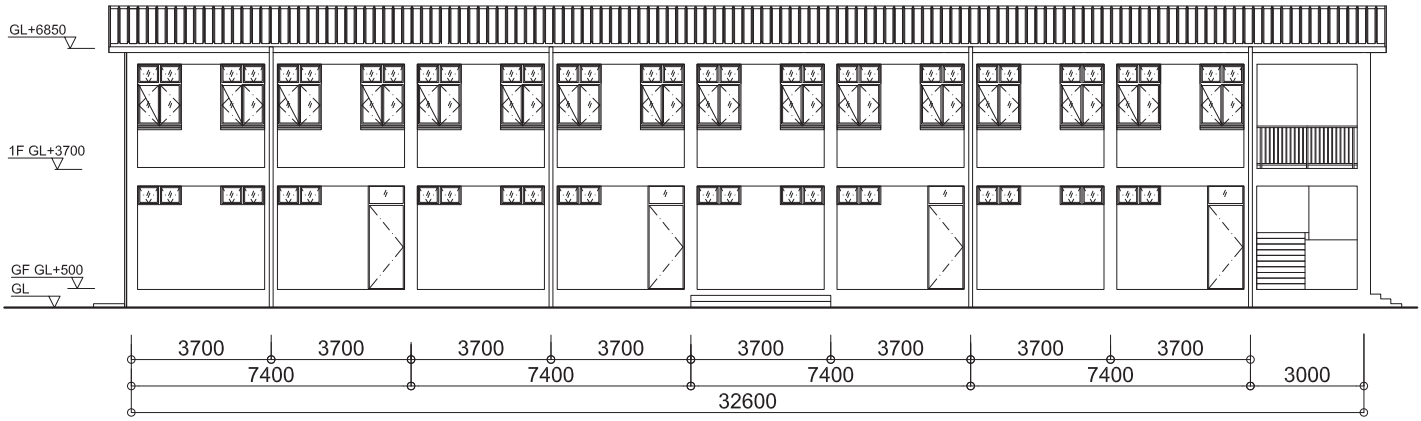
CLASSROOM BLOCK + LIBRARY BLOCK TYPE 2-4CR —TWO STORY— S=1/200



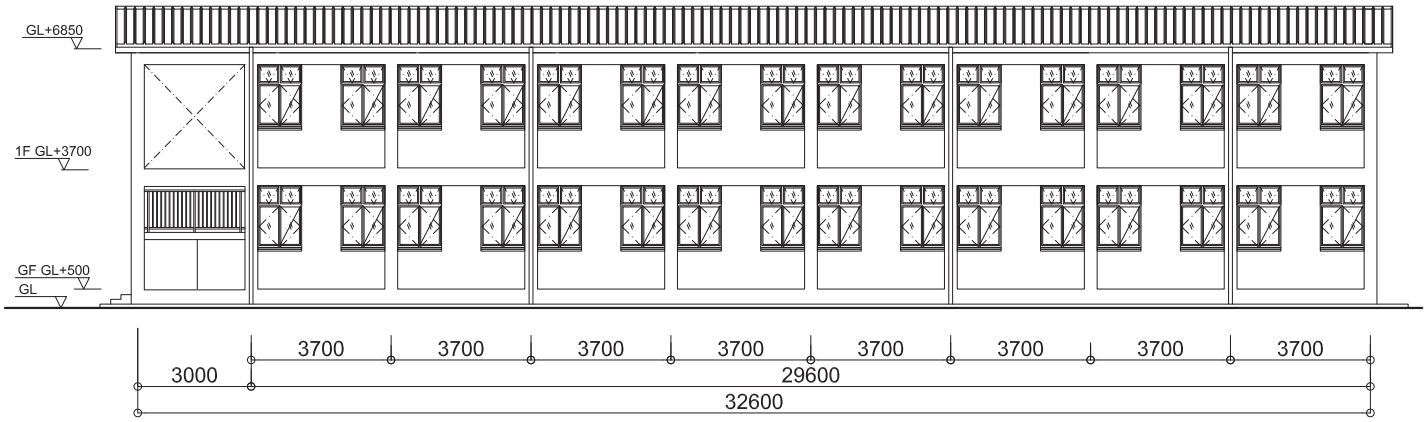
FIRST FLOOR PLAN



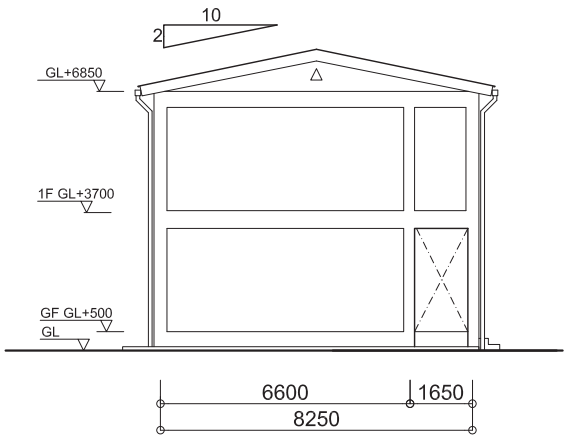
GROUND FLOOR PLAN



ELEVATION (CORRIDOR SIDE)



ELEVATION (CLASSROOM SIDE)



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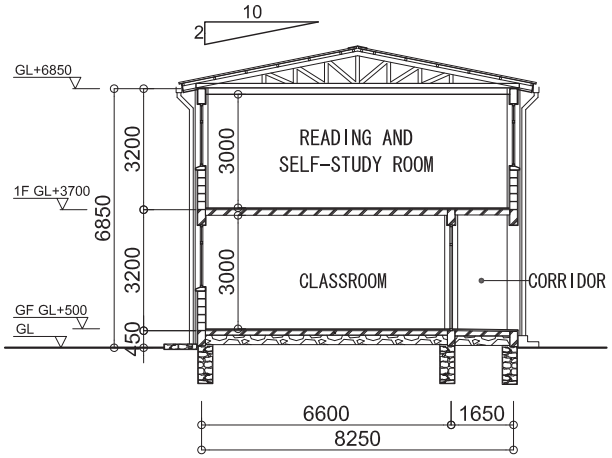

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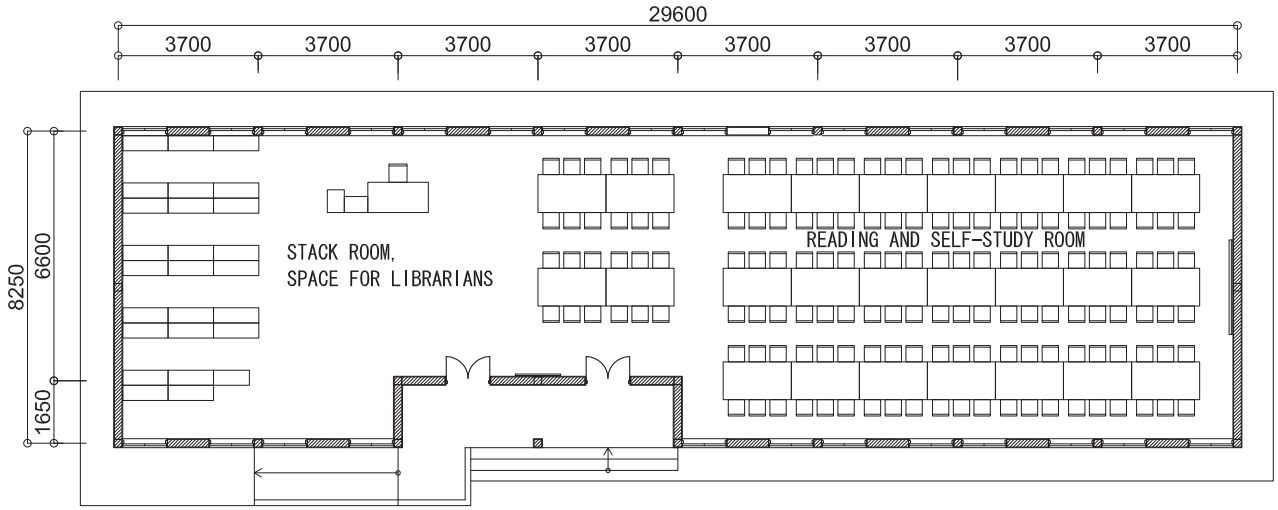
LIBRARY BLOCK A TYPE R —ONE STORY— S=1/200



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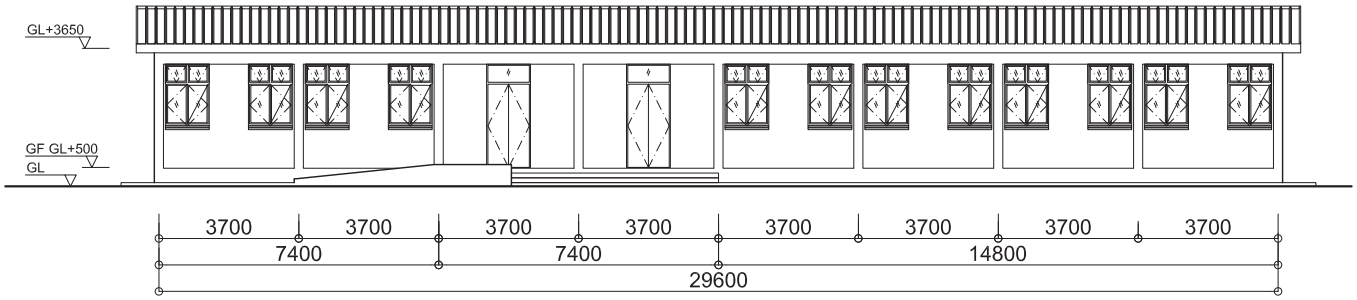

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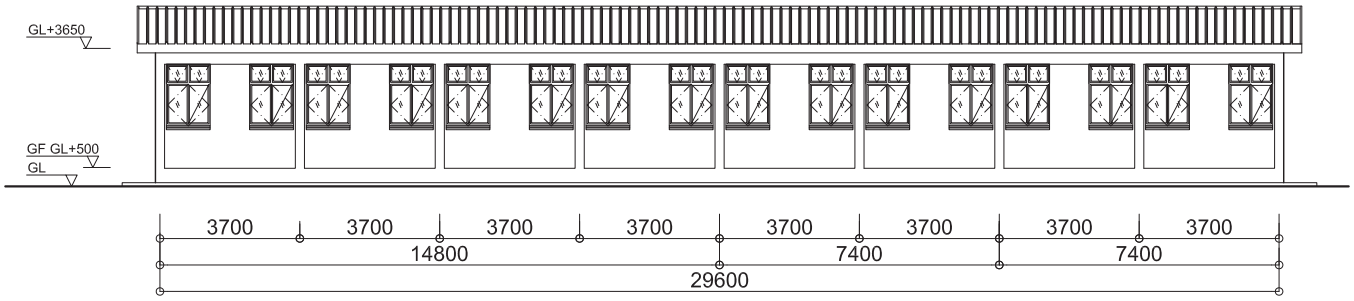

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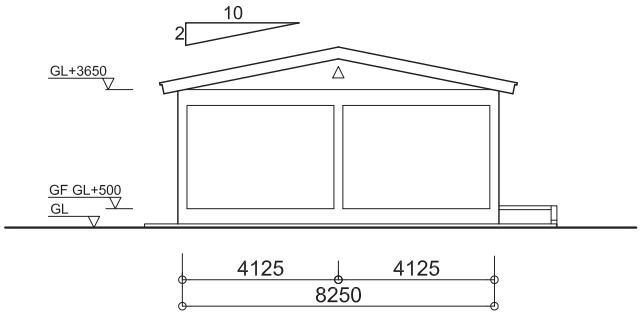

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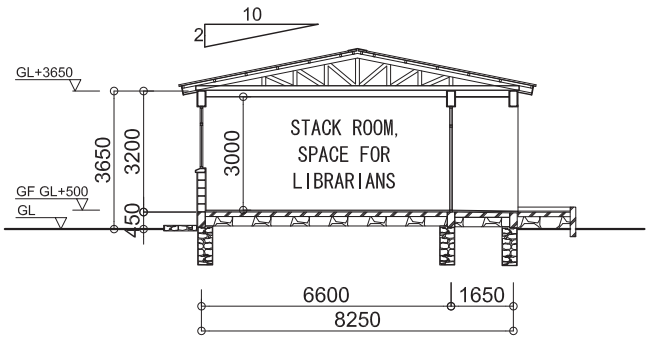

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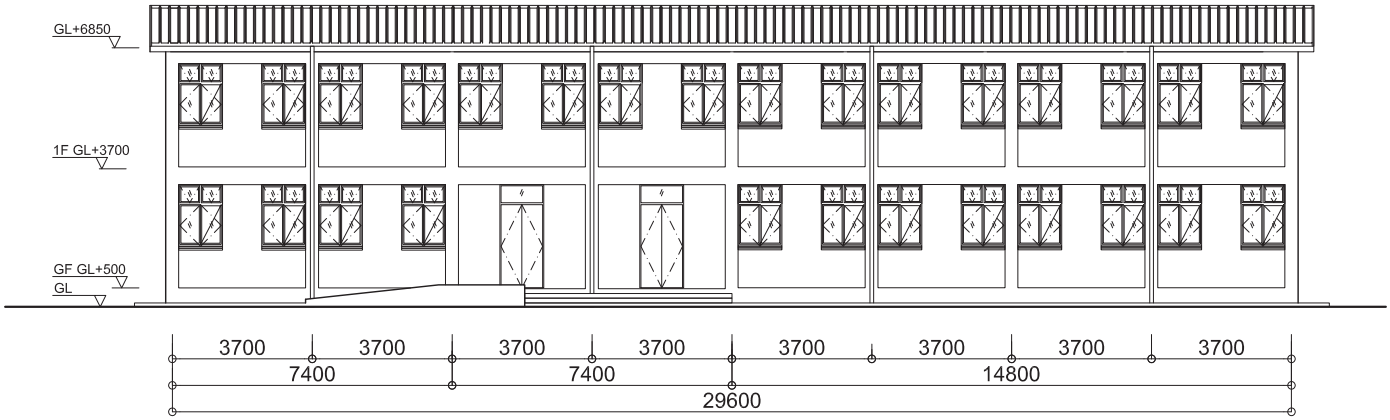

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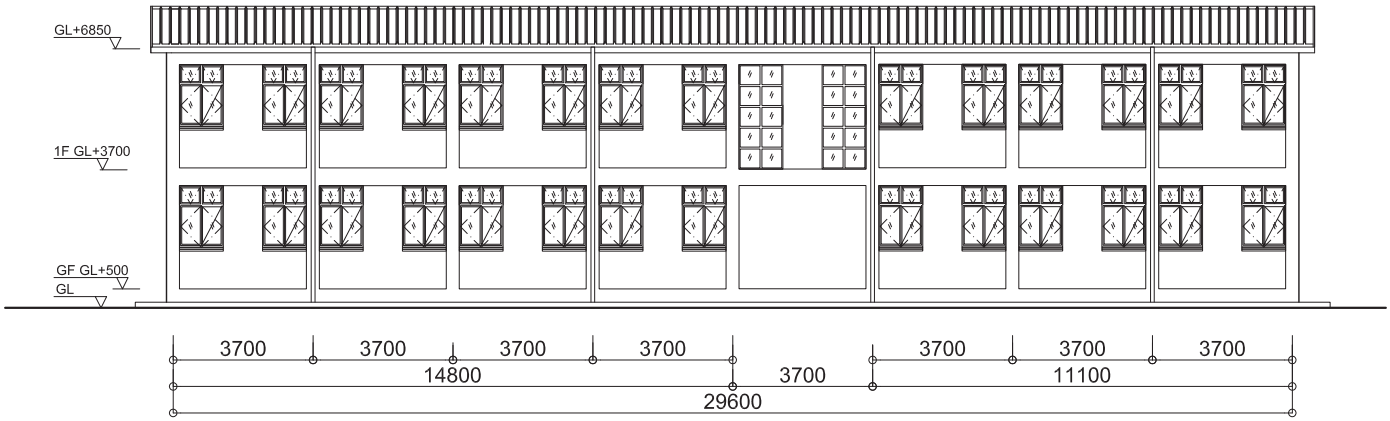

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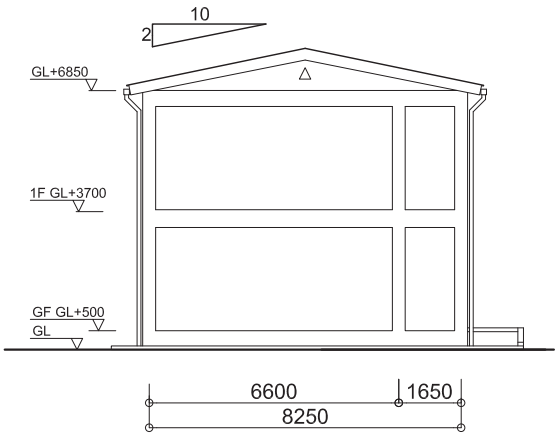

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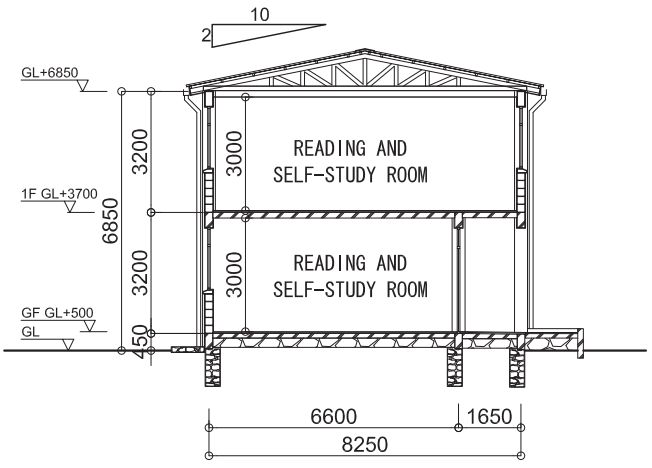

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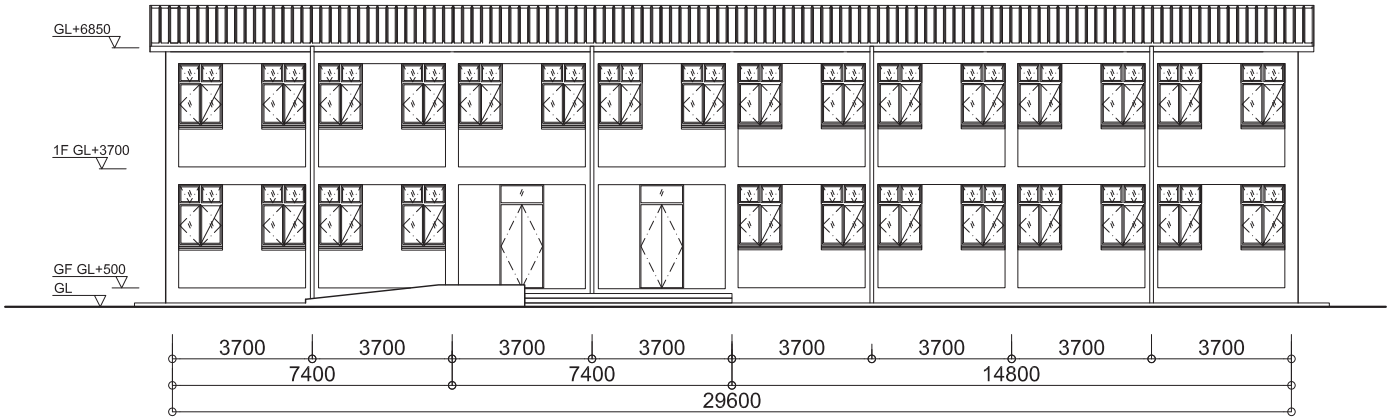

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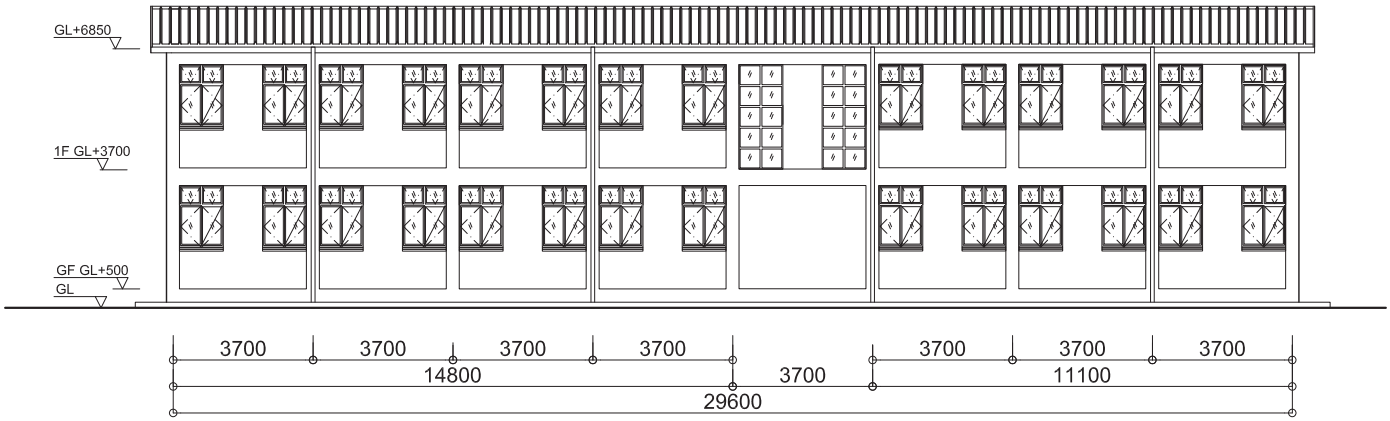

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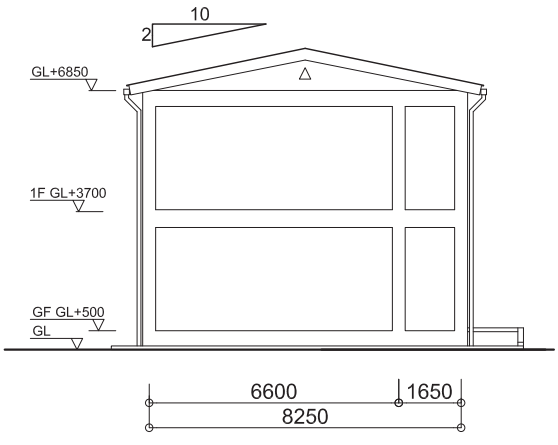

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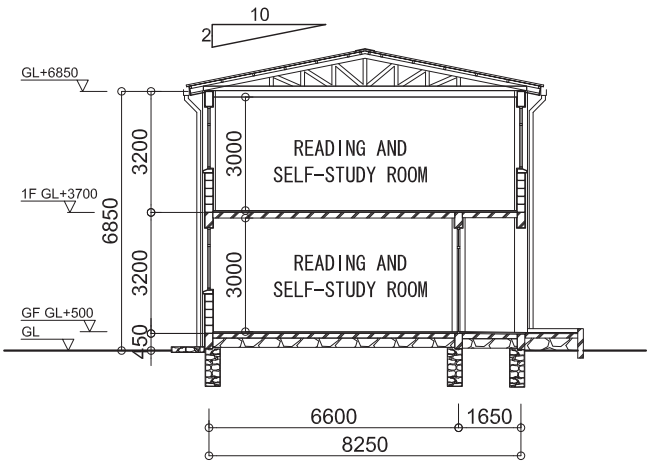

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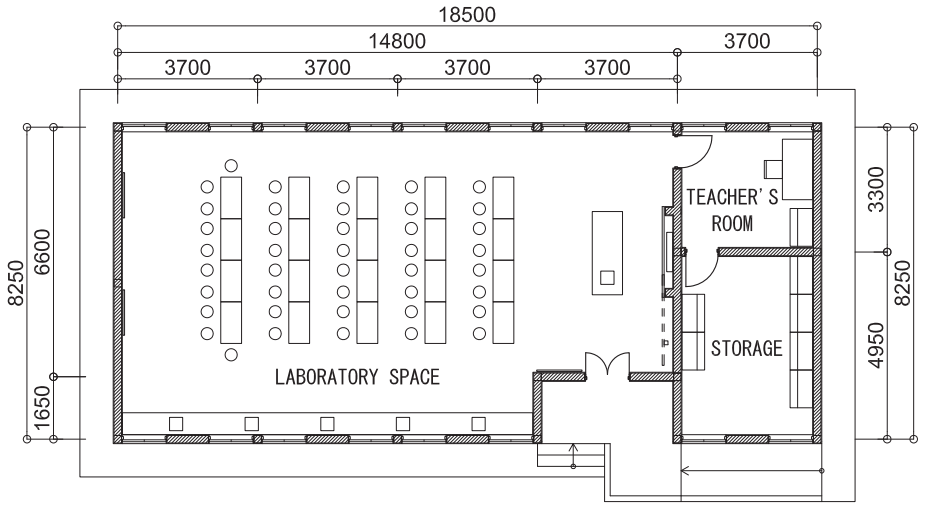

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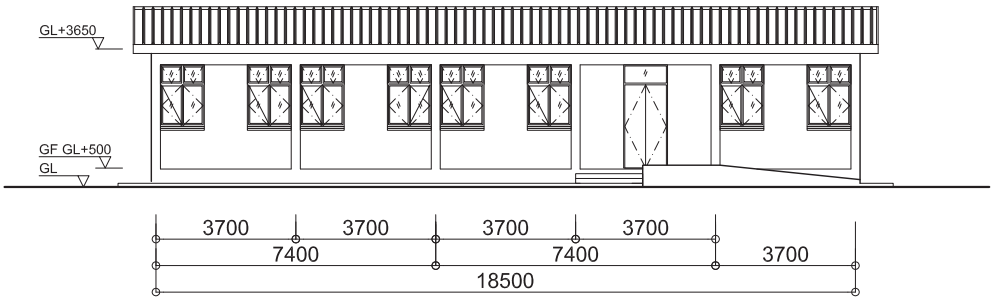

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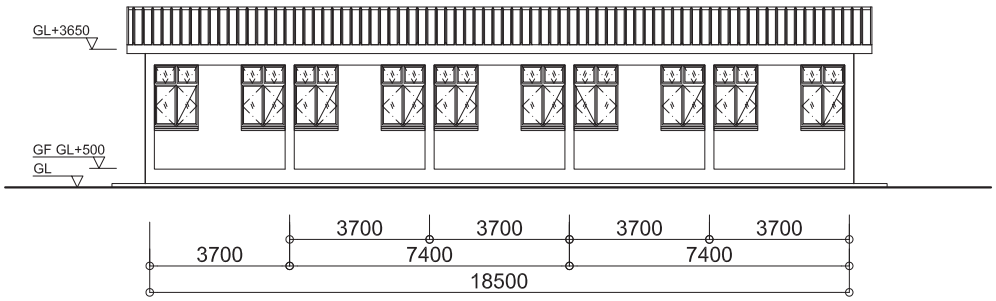

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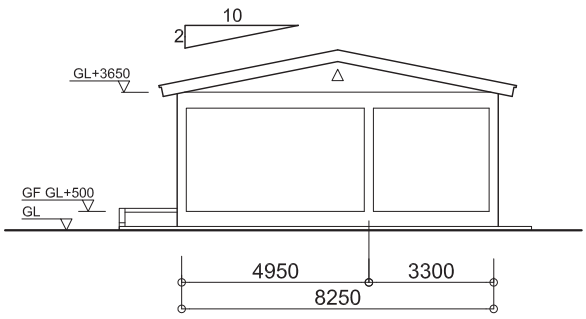

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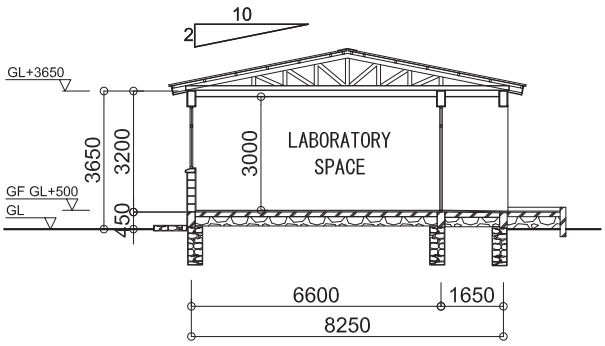

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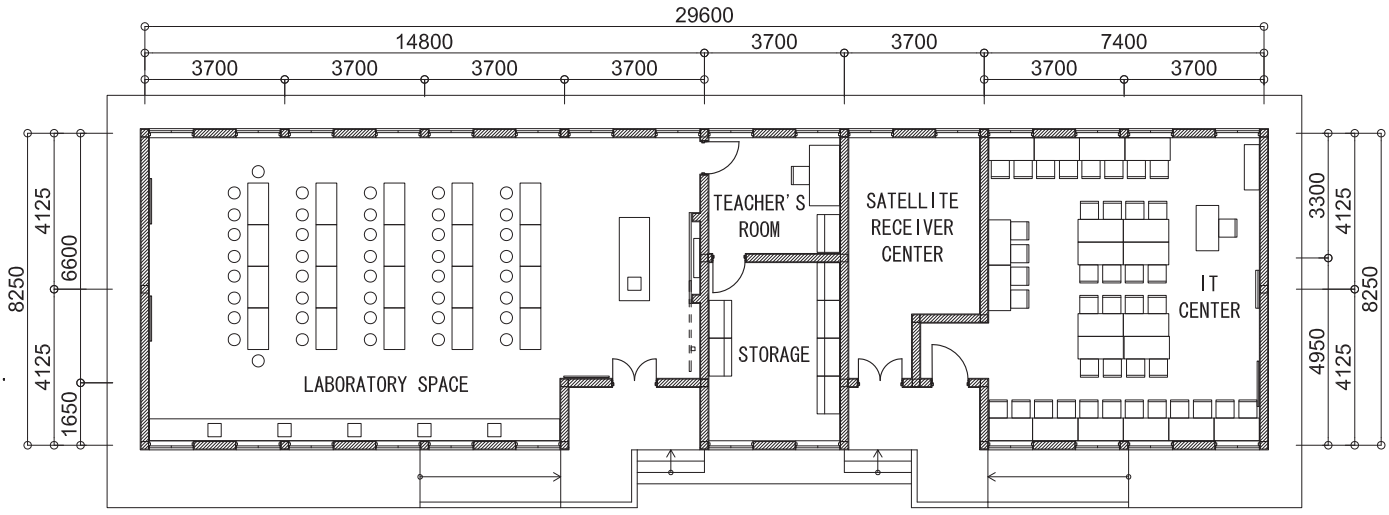
LABORATORY BLOCK B TYPE LI —ONE STORY— S=1/200



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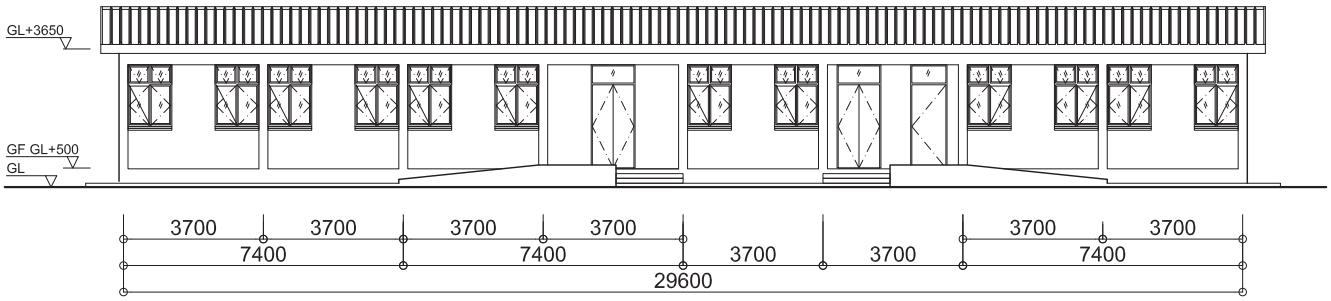

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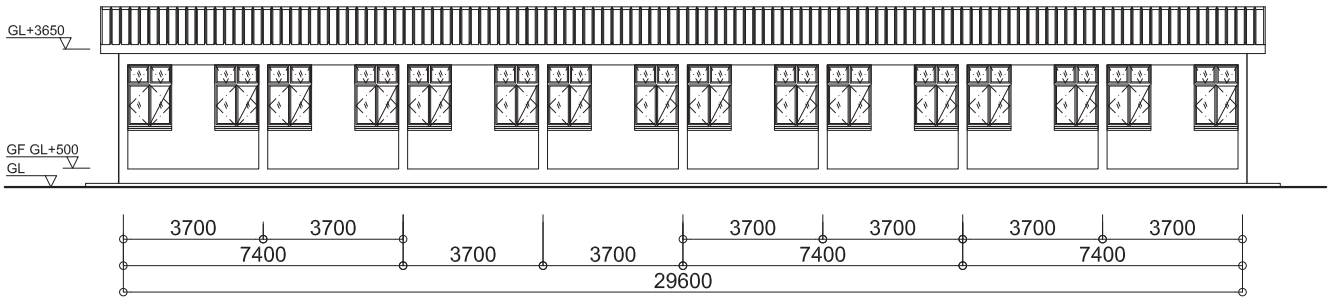

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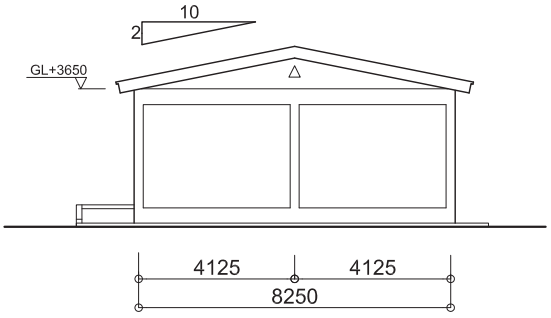

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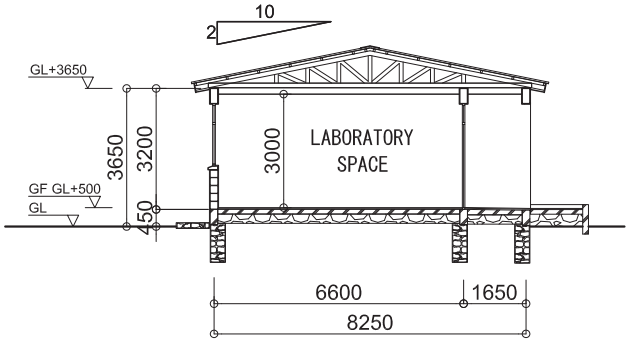

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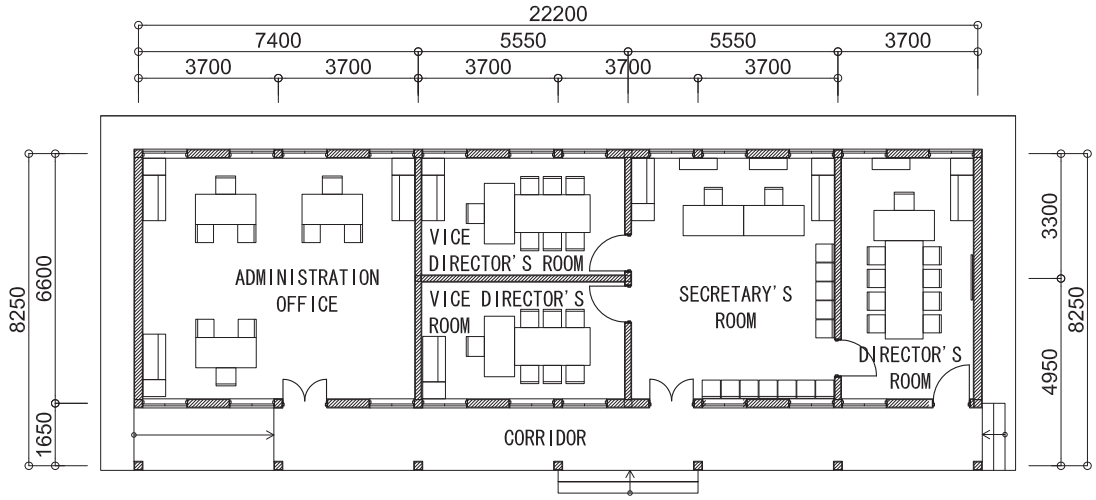

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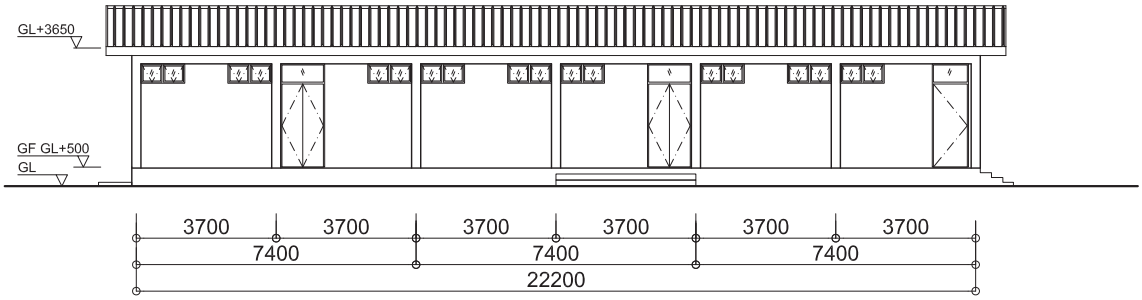

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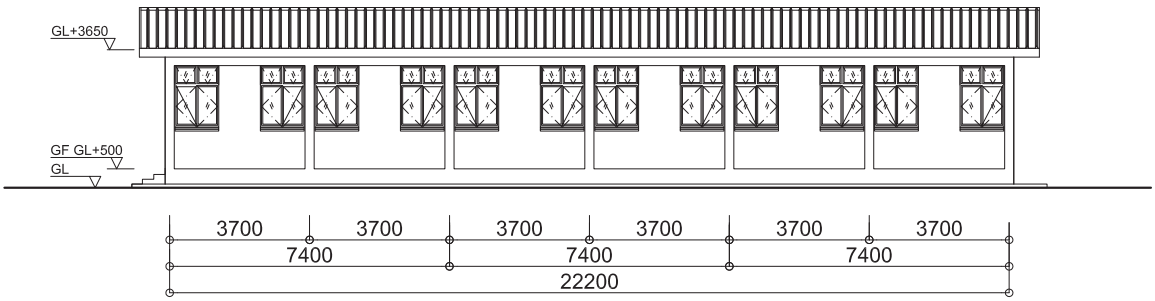

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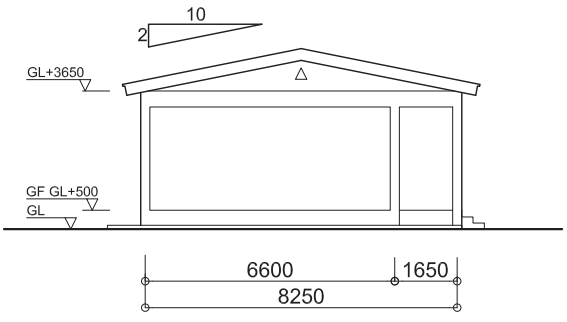

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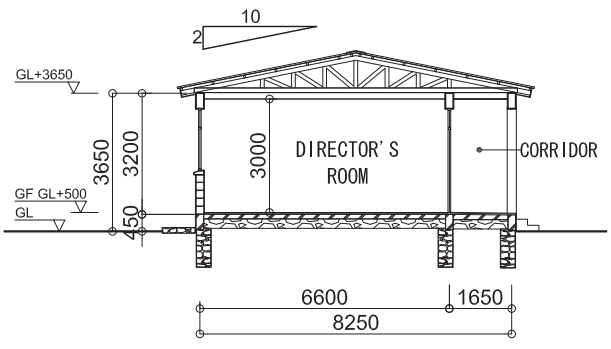

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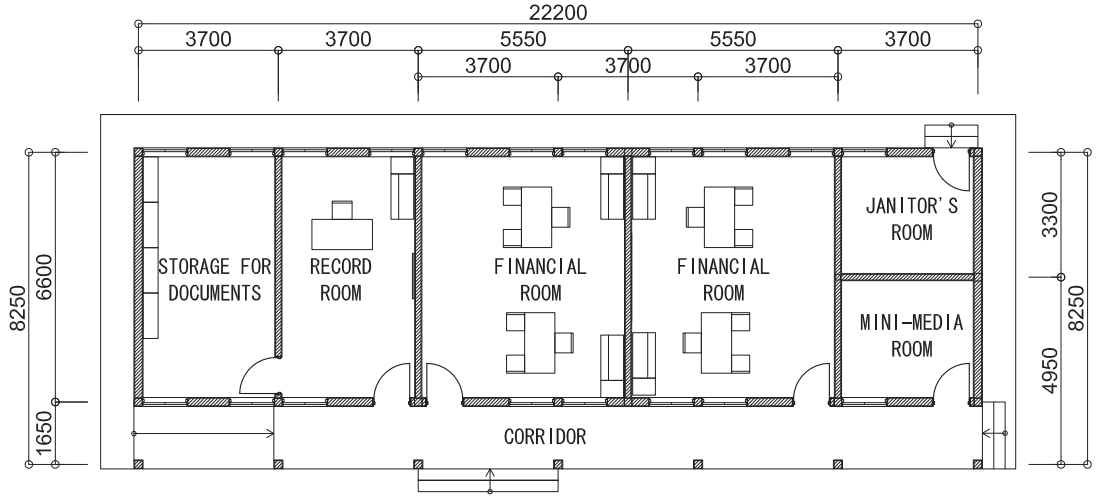

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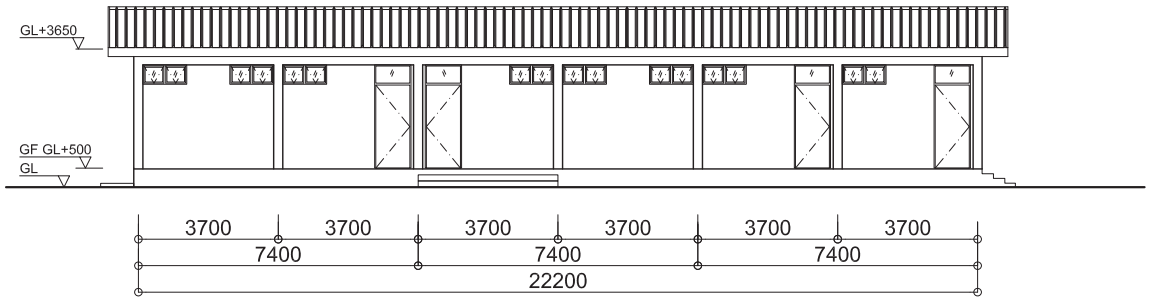

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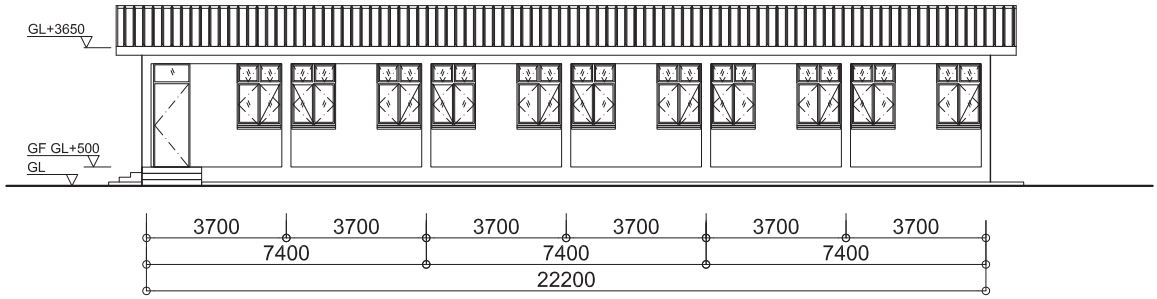

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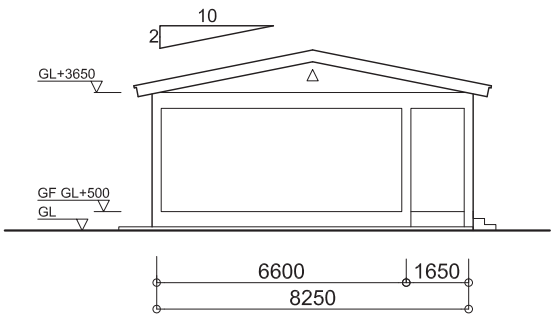

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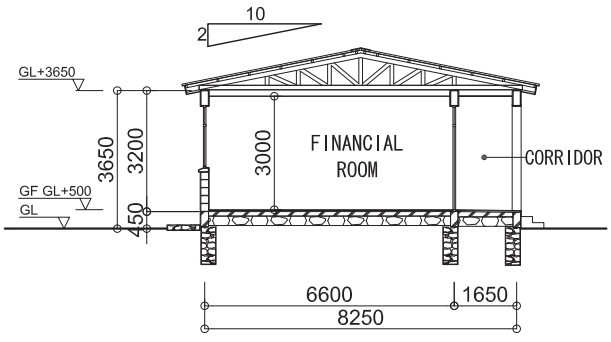

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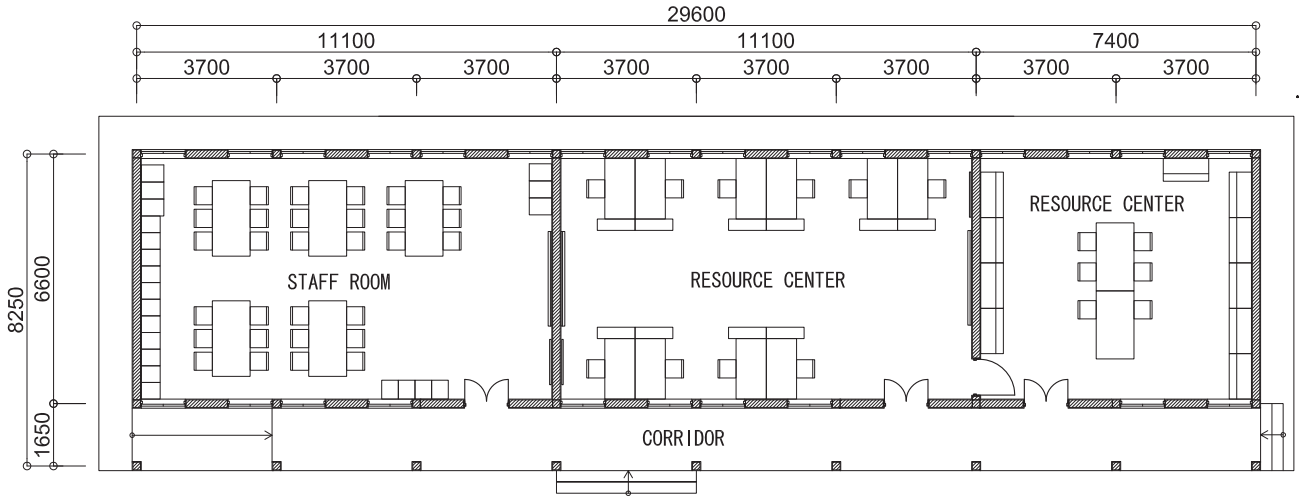
ADMINISTRATION BLOCK C TYPE AC —ONE STORY— S=1/200



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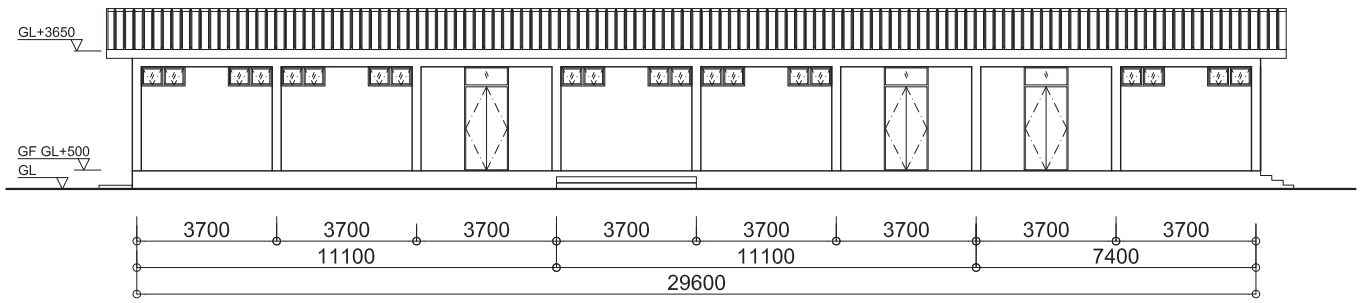

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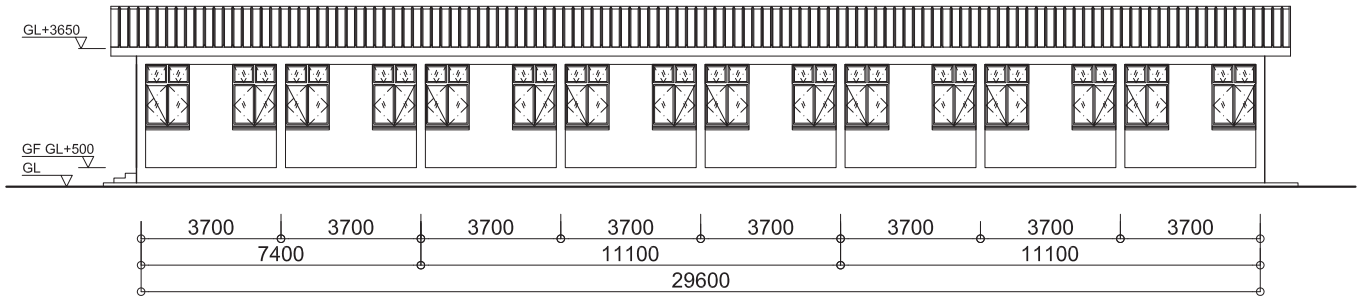

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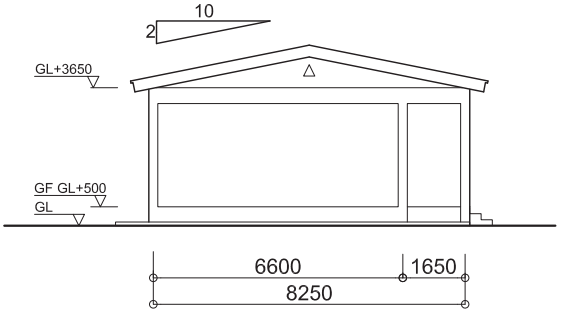

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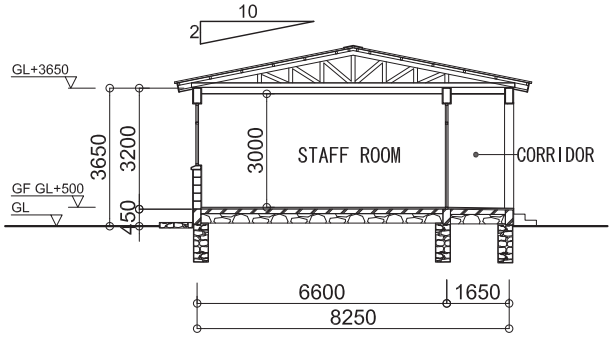

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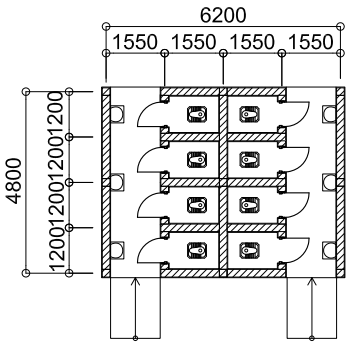

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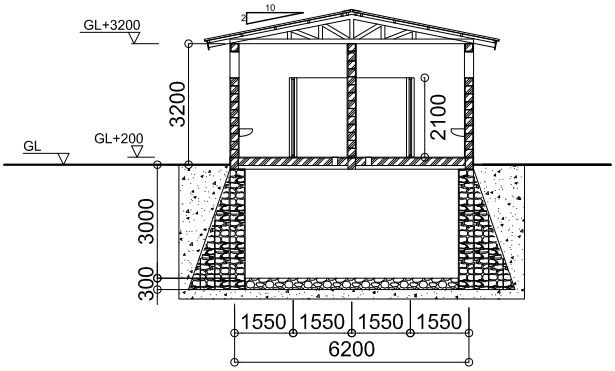

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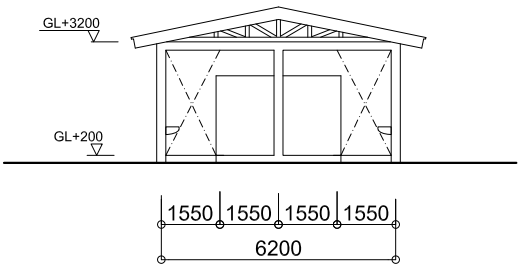

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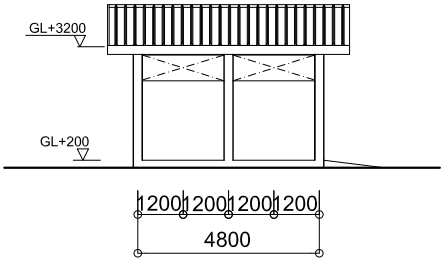

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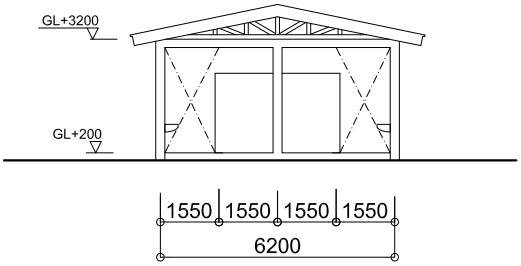

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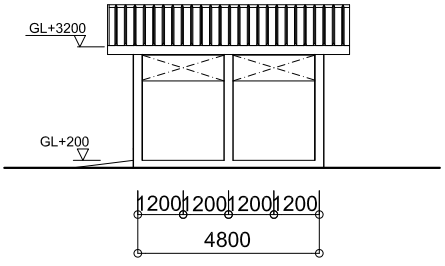


ELEVATION (CORRIDOR SIDE)

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

(1) Project implementation by the procurement management method

The Project will be implemented in accordance with a Procurement Management Method. The Procurement Agent is designated to conduct the procurement services for products and services including fund management, preparing tenders, contracts and others on behalf of AREB. The Procurement Agent, Japan International Cooperation System (JICS), is an impartial and specialized organization and shall render services according to the Agent Agreement with the Government of Ethiopia.

An approval by the Cabinet of the Government of Japan is required for the Project implementation. After the approval, both countries will sign the Exchange of Notes (E/N) for the Project. AREB will sign the Procurement Management Contract with JICS in accordance with the Agreed Minutes on Procedural Details (A/M), which is attached to the E/N.

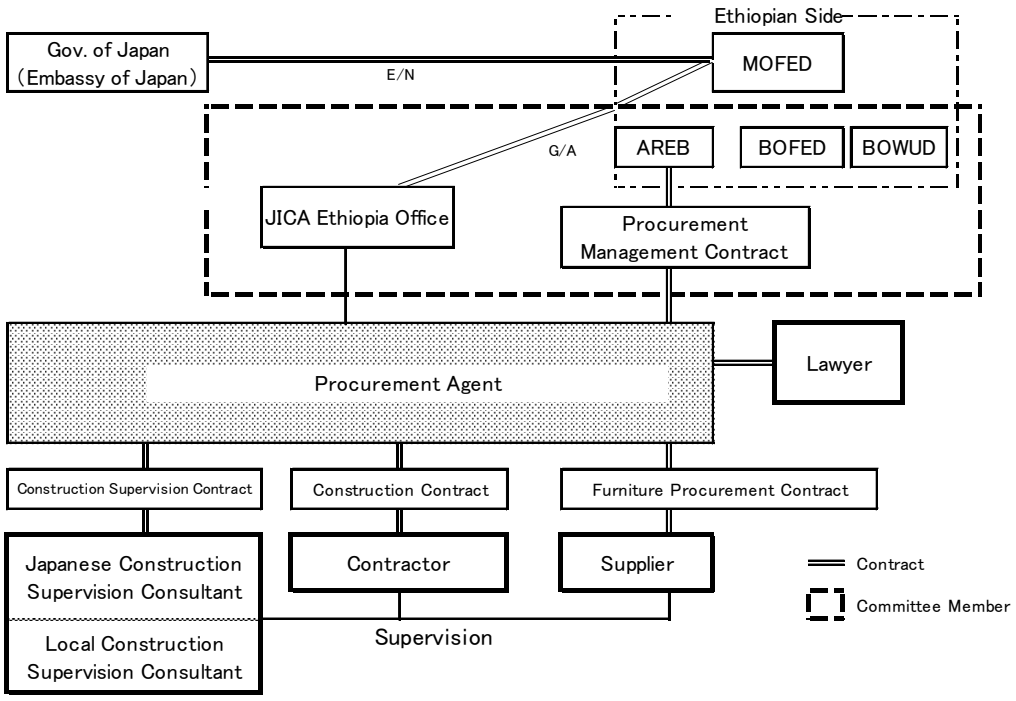


Figure 2-13 Implementation Organization

(2) Ethiopian side implementation organization

The Government of Japan will sign the E/N with the Ministry of Finance and Economic Development (MoFED) of Ethiopia while AREB will be an implementing and responsible organization of the Project.

As shown in Figure 2-14, under AREB, Educational Information System, Planning and Resource Mobilization Managerial Process will be a main body of the Project implementation, and Education Institution Expansion and Materials Supply Core Process will be in charge of technical matter. This will be for the first time for AREB to implement a Project supported by the Japan's Grant Aid. However, the above-mentioned responsible Core Processes have been handling number of school construction projects on their own and also supported by other donors. Thus there will be no problem for implementing the Project.

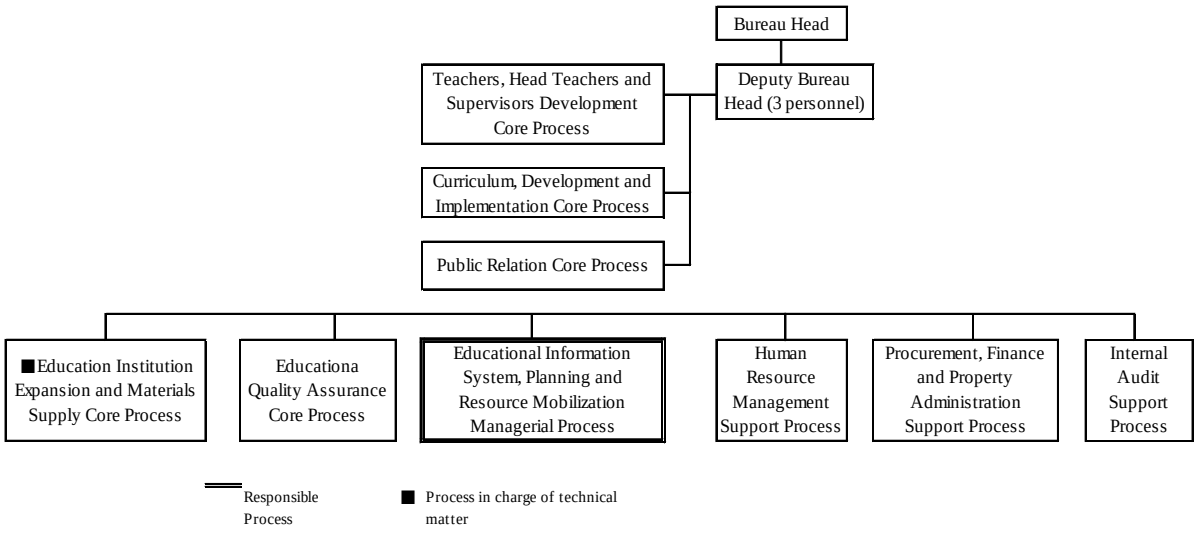


Figure 2-14 Organization Structure of AREB

(3) Committee

After the signing of the E/N, a Committee will be organized. The Committee consists of the representatives of both the Governments of Japan and Ethiopia. From the Ethiopian side, AREB, Amhara Region Bureau of Finance and Economic Development (BoFED) and Amhara Region Bureau of Works and Urban Development (BoWUD) will be participating the meeting whereas JICA Ethiopia Office will be doing so from the Japanese side. The Embassy of Japan will be joining the Committee as an observer. Various problems that may occur during the implementation of the Project will be discussed and coordinated in the Committee, and the Committee will provide advice to JICS.

(4) Procurement Agent

To implement the Project in accordance with the Procurement Management Contract, JICS will manage the Project fund, procure the services and products (Lawyer, Construction Supervision Consultant, Contractors and Suppliers) and oversee the implementation. JICS will set up an office in Bahir Dar, and an Assistant Project Manager will stay in Ethiopia from the tender period till the end of the construction work. The staff allocation and responsibilities of JICS shall

be as stated in Table 2-16.

Table2-16 Staff Allocation of the Procurement Agent (JICS)

Staff		Responsibilities
Japa-nese	Manager	To carry out overall supervision of the Procurement Agent work, the Manager will be dispatched to Ethiopia at the time of the tender and during the final stage of the Project.
	Assistant Manager	To supervise the work as a responsible person on site, specifically during the entire period of the tender and the construction work.
	Tender Document Developer	To prepare tender documents for facility construction and equipment procurement in Japan.
	Administration Staff (contract and financial management)	To handle contracts and payments as well as to manage the budget in Japan.
Local	Office Staff 1	To assist the tender process and budget management throughout the entire period of the Project.

(5) Construction Supervision Consultant

JICS will enter into a contract with a supervision consulting firm, the cost of which will be included within the Project budget. The consulting firm will assist the tender process and supervise the Project implementation. The firm which was responsible for the preparatory survey will be nominated and recommended by JICA for Project implementation. The scope of works of the consulting firm is described below:

[Tender Stage]

- To examine the feasibility of the Project implementation by conducting a site survey for all the requested schools.
- To develop a detailed design, specification, and a bill of quantity.
- To provide technical assistance to the Procurement Agent in order to prepare tender documents.
- To provide technical assistance to the Procurement Agent for smooth implementation of the tender, tender evaluation and contract negotiation.

[Implementation Stage]

- To conduct monitoring and inspection, and to report to the Procurement Agent regularly regarding the situation of quality control, work procedure and safety management as stated in the order specifications.

- To examine and report to the Procurement Agent concerning the construction progress when the Contractor requests payment.
- To conduct completion inspection and to report to the Procurement Agent.
- To conduct defect examination and report to the Procurement Agent one year after the completion of the construction work.

The Supervision Consultant will be Japanese and the said consultant will utilize a local consultants to implement the Project. The Supervision Consultant will set up a Construction Supervision Office in Bahir Dar, and will oversee the construction work of the entire target area as well as supervise the work of nearby areas (Debre Tabor and Gonji Kolela).

In the same way, a Construction Supervision Office will be established in Dessie. For the purpose of providing effective supervision, Construction Supervision Bases will be set up in Gondar, Debre Birhan, Debre Markos and Woldia.

Figure 2-15 shows the Organization of the Construction Supervision Consultant, and allocation of the consultants will be described in Table 2-17.

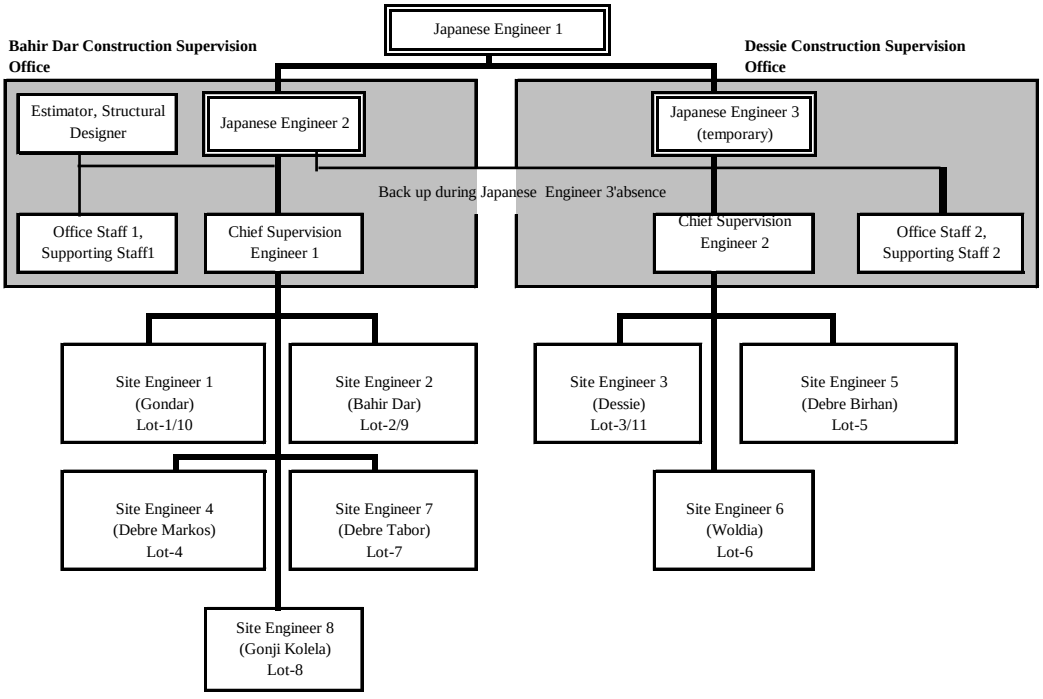


Figure 2-15 Organization of the Construction Supervision Consultant

Table2-17 Allocation of the Construction Supervision Consultants

Consultant		Responsibilities
In Japan	Japanese Engineer 1 (Tender related work)	To manage the entire work of the Construction Supervision Consultant as well as to take charge of tender related work.
	Japanese Engineer 2 (Supervision of Architecture)	To supervise the construction work from the initial stage till the final stage of said work; based in Bahir Dar Construction Supervision Office. Also to conduct a defect examination one year after completion of the construction.
	Japanese Engineer 3 (Supervision of Architecture)	To supervise the construction work during the initial stage of construction as well as at the time of partial opening; based in Dessie Construction Supervision Office.
	Japanese Engineer 4 (Supervision of Facility Construction)	To deal with questions and answers as well as conduct tender evaluations in Japan.
	Japanese Engineer 5 (Equipment)	To conduct tender evaluations and inspections of the equipment on site. And to handle equipment related work in Japan.
In Ethiopia	Chief Supervision Engineer 1	To assist the Japanese Engineer 1 during the tender period. To lead the Supervision Engineers during the time of the construction supervision period; based in Bahir Dar Construction Supervision Office.
	Chief Supervision Engineer 2	To lead the Supervision Engineers of Dessie, Woldia and Debre Birhan; based in Dessie Construction Supervision Office.
	Supervision Engineers 1-8	Eight Supervision Engineers will be allocated based on the contacted lots and the responsible sites. To conduct monitoring and supervision in the responsible sites; based in the respective site bases.
	Estimator, Structural Designer	To assist the Japanese Engineer 1 for preparation of the tender documents, implementation of the tender evaluation and also price & contract negotiation during the tender period. To inspect the progress of each lot at the time of construction supervision; based in the respective Construction Supervision Office.
	Office Staff1 & 2	To deal with the office work during the construction supervision period; based in the respective Construction Supervision Office or Construction Supervision Branch.
	Supporting Staff 1 & 2	To deal with the supporting work during the construction supervision period; based in the respective Construction Supervision Office or Construction Supervision Branch.

(6) Contractors

Contractors will be selected through open tenders. The Contractors will be responsible for the construction work in accordance with the contract documents.

(7) Suppliers (school furniture and equipment)

Suppliers will be also selected through open tenders. The Suppliers will procure and deliver the furniture to the school sites in accordance with the contract documents.

(8) Lawyer

A Lawyer will be employed to confirm various contracts as well as to settle any disputes or conduct arbitration when needed.

2-2-4-2 Implementation Conditions

The Project sites are scattered widely. Therefore, it is necessary to supervise the construction work efficiently to secure relevant quality. The targeted facility construction is divided into two groups: ①new school construction and ②construction of additional classrooms and libraries for the existing schools. For this reason, separated plans should be prepared for ① and ②. While one and two-storied buildings will be constructed for ① and ②, three-storied ones will be also included for ①. Procurement of the Contractors needs utmost consideration including setting criteria as well as the dimension of lots to secure proper Contractors to fulfill the requirements.

2-2-4-3 Scope of Works

As to implement the Project smoothly, the tasks that should be undertaken by the Ethiopian side should be done in a proper manner. Prior to the commencement of construction work, the Ethiopian side needs to handle cutting, filling, preparing the access roads, and removing the obstructions. Similarly, prior to the completion of the construction, installation of infrastructure to the facilities is also required.

The following work should be undertaken by either the Japanese side or Ethiopian side:

(1) The Japanese side

① Construction work of the planned facilities
② Procurement of the planned school furniture
③ Procurement of the apparatus for the distance learning curriculum (Display and Network Apparatus)

(2) The Ethiopian side

① Securing the lands
② Land formation
③ Construction of the access roads
④ Construction of the gates, fences, and guard rooms
⑤ Removing the obstructions (from the surface and underground)
⑥ Provision of the facility for electricity distribution
⑦ Provision of the facility for water supply
⑧ Construction of drinking fountains
⑨ Construction of sports grounds

⑩ Installation of apparatus for distance learning curriculum (Satellite Antenna and related apparatus)

⑪ Computers, science laboratory materials, educational equipment and books for libraries

2-2-4-4 Consultant Supervision

The Project requires completion of all the construction work at a wide range of sites within the planned schedule. Thus AREB, as a responsible and implementing organization of the Ethiopian side, and JICS should be well communicated via frequent discussions and regular reporting by the Supervision Consultant. Also the Supervision Consultant should provide proper instruction and supervision to the Contractors.

The Japanese Engineer 2, who has enough experience of supervision of construction work, will stay in Bahir Dar to control the schedule and the quality of work together with the local Chief Supervision Engineers (refer to 2-2-4-5). They will collect information on the supervision, prepare reports and conduct regular reporting to AREB and JICS.

2-2-4-5 Quality Control Plan

With regard to quality control, based on the design documents and the consultant supervision plan, the construction work plan, the shop drawings, and sample items need to be checked, and several inspections including on-site ones need to be conducted. Table 2-18 shows the major quality control items for the respective structural work stages.

Table2-18 Major Quality Control Items for Each Structural Work Stage

Work	Items	Method	Frequency
Excavation	Check the excavated areas	Observation	On completion of the excavation
Re-bar and Forms	Reinforcement material	Check the mil sheets or tensile test	Every lot Every size
	Bar arrangement	Inspection of the re-bar arrangement	Before concrete pouring
	Forms	Inspection of the forms	Before concrete pouring
Concrete Work	Material	Cement: sorts Aggregates: particle diameter	On planning the mixture
	Test mixing	Compression test	Every lot, Once every material used
	Striking installation	Compression test	Once every block Twice for two-storied buildings Three times for three-storied buildings
Concrete Blocks	Steel frame material	Material test	Before steel frame fitting

2-2-4-6 Procurement Plan

Major construction materials for the Project can be procured in Ethiopia. Reinforcement bars can be supplied locally both as national products and also imported ones from Turkey and other countries. As for cement, in addition to the Ethiopian product, Chinese and Pakistani cements are widely available in the local market. It should be noted that the quality standard of the aggregates and sand is important for concrete.

Other than in Addis Ababa, furniture factories exist in Bahir Dar, and their capacity and quality are sufficient. Arrangement and timing should be properly set for the procurement. Suppliers of the major materials are shown in the table below.

Table2-19 Suppliers of the Materials and Equipment for the Construction Work

Material	Suppliers		
	Local	Japan	Other countries
Cement	○		
Aggregates for concrete	○		
Reinforcement	○		
Steel frame	○		
Form material	○		
Plywood	○		
Concrete block	○		
Lumber	○		
Wooden fittings	○		
Steel fittings	○		
Aluminum fittings	○		
Glasses	○		
Paint material	○		
Roofing metal sheet	○		
Panel boards	○		
Electric wire・cable	○		
Conduit pipe	○		
Lighting	○		
Pipe material	○		
Valve, Attachment hardware for piping	○		

2-2-4-7 Implementation Schedule

(1) Division of the Construction Lots

Under this Project, there will be two types of orders: ①facility construction, and ② procurement of furniture and equipment. As for the former, it will be further divided into two groups (depending on the work schedule) and eleven lots (depending on the area). Contractors will be selected through open competitive tenders targeting Ethiopian companies. As for the latter, it will be divided into three lots to select the suppliers considering the delivery schedule and the areas. The nameplate and sticker procurement will be one lot. The equipment will be divided into two lots to select the suppliers: ① Display and ② Network. Table 2-20 shows the lot list.

Table2-20 Lot List

Implementation Group	Facility Lot No.	Furniture Lot No.	Woreda and School ID No.	No. of Target School (No of Classroom)	Floor Area (㎡)
1	1	1	GD-1 Gondar	1 (32)	3,604.54
	2	1	BH-2 Bahir Dar		3,604.54
	3	2	DS-3 Dessie		3,604.54
	4	1	DM-4 Debre Markos		3,591.04
	5	2	DB-5 Debre Birhan		3,591.04
	6	2	WD-6 Woldia		3,591.04
	7	1	DT-7 Debre Tabor		3,591.04
	8	1	GK-8 Gonji Kolela		3,591.04
2	9	3	BD-9, 10, 11 Bahir Dar	3 (12)	1,771.50
	10	3	GD-12, 13, 14 Gondar		1,771.50
	11	3	DS-15, 16, 17 Dessie		1,771.50

(2) Implementation Schedule

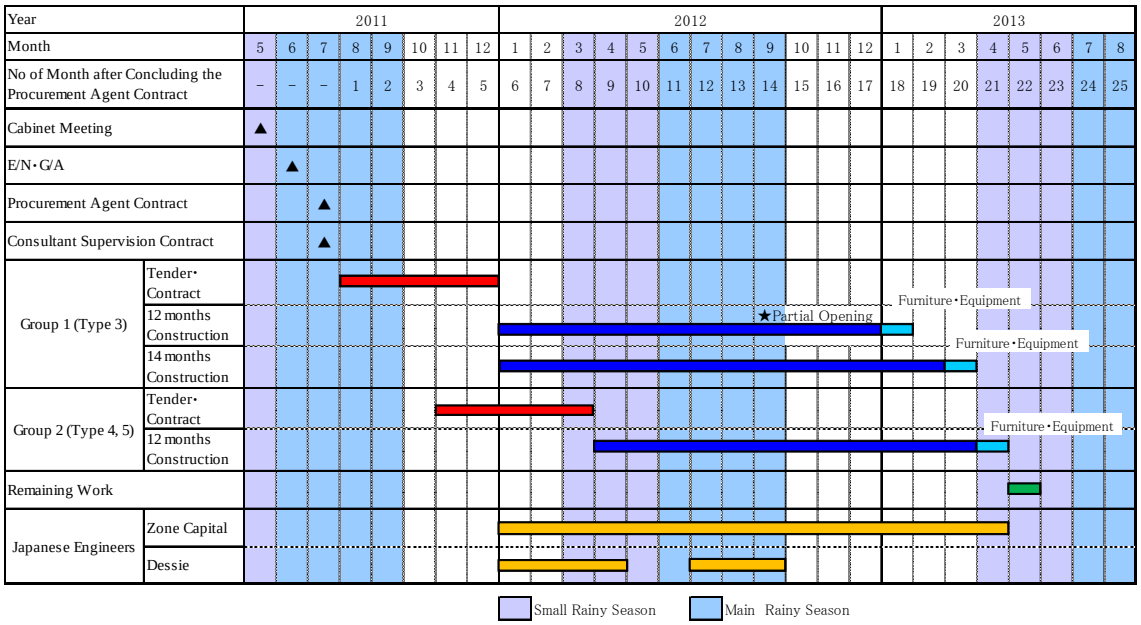
After concluding the Procurement Management Contract and the Consultant Supervision Contract, preparing tender documents to select contractors, conducting tenders and tender evaluation, negotiating the contract, and obtaining those approvals from the concerned parties, construction contracts will be concluded. This process is assumed to take five months.

It is estimated to take nine months to construct the new schools before opening them partially (one-storied buildings). On the other hand, for two-storied and three-storied buildings, the estimated schedule is twelve and fourteen months respectively.

Correspondingly, to construct classrooms and libraries for the existing schools, it is estimated to take nine months for one-storied buildings and twelve months for two-storied buildings.

Therefore, the construction work will be divided into two groups: ①new schools and ② existing schools (construction of additional classrooms and libraries). It will take twenty-two months from the time of the contract conclusion till the Construction Supervision Office can be closed down. The defect examination will follow afterwards.

Table2-21 Implementation Schedule



2-3 Obligations of Recipient Country

Under Japan's Grant Aid for Community Empowerment, the Ethiopian side shall take necessary measures described below:

1) To secure lots of land necessary for the implementation of the Project, and the landownership or right to use the land should be verified by presenting valid documents when necessary (AREB is responsible for this);

   - To conduct preparation work for the slope areas for GD-1 in Gondar, DM-4 in Debre Markos, and DT-7 school in Debre Tabor.
   - To conduct minor preparation work partially for 6 schools which have gentle slope areas (DB-5, WD-6, GD-12, GD-13, DS-16, and DS-17)

2) To construct access roads prior to the commencement of the Project;

3) To construct the gates, fences, guard rooms, to do the planting and other supplemental interior and exterior work;

4) To provide facilities for distribution of electricity, water supply, telephone and other incidental facilities necessary for the implementation of the Project, and to install the

apparatus for distance learning curriculum (satellite antenna and related apparatus) at the respective new schools;

5) To ensure prompt unloading and customs clearance at ports of disembarkation, and to assist internal transportation of the products;

6) To exempt customs duties, internal taxes and other taxes for the corporations and also the individuals under the Project;

7) To ensure customs duties, internal taxes and other fiscal levies which may be imposed in Ethiopia with respect to the purchase of the Components as well as the employment of the Agent be exempted, or be borne by the Ethiopian authority without using the Grant Aid;

8) To accord Japanese nationals whose services may be required in connection with the Project as may be necessary for their entry into the recipient country and stay therein for the performance of their work;

9) To ensure that the facilities be maintained and used properly and effectively for implementation of the Project;

10) To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project; and

11) To give due environmental and social consideration in implementation of the Project.

Table2-22 List of the Obligations of the Respective Project Sites

Areas	School No.	School Name	Land formation	Access road construction	Removing obstructions (surface & underground)	Gate, fence, & guard room construction	Drinking fountain construction	Water supply & electricity facility provision	Satellite antenna & related apparatus installation
Gondar	GD-1	Kebele 18	18,900 ㎡	300 m (6 m wide)	–	Gate:1 place, fence:1,000 m, guard room:1 place	1	Water supply: 400 m, Electricity: 200 m	Required
Bahir Dar	BH-2	Kebele 14	–	400 m (6 m wide)	–	Gate: 1 place, fence:600 m, guard room:1 place	1	Water supply: 450 m, Electricity: 150 m	Required
Dessie	DS-3	Boru Selasie K.14	–	350 m (6 m wide)	–	Gate: 1 place, fence:800 m, guard room:1 place	1	Water supply: 400 m, Electricity: 100 m	Required
Debre Markos	DM-4	Kebele 3	18,000 ㎡	400 m (6 m wide)	–	Gate: 1 place, Fence:950 m, Guard room:1 place	1	Water supply: 400 m, Electricity: 150 m	Required
Debre Birhan	DB-5	Kebele 6	9,300 ㎡	–	–	Gate: 1 place, Fence:800 m, Guard room:1 place	1	Water supply: 400 m, Electricity: 150 m	Required
Woldia	WD-6	Defrega Kibi Kebele	4,700 ㎡	100 m (6 m wide)	Felling , removing roots	Gate: 1 place, Fence:800 m, Guard room:1 place	1	Water supply: 400 m, Electricity: 50 m	Required
Debre Tabor	DT-7	Debre Tabor Eyesus	14,500 ㎡	100 m (6 m wide)	Felling , removing roots	Gate: 1 place, Fence:1,000 m, Guard room:1 place	1	Water supply: 400 m, Electricity: 200 m	Required
Gonji Kolela	GK-8	Gonji Kolela	–	–	–	Gate: 1 place, Fence:900 m, Guard room:1 place	1	Water supply: 350 m, Electricity: 100 m	Required
Bahir Dar	BD-9	Tana Sec. School	–	–	Removing rocks	–	–	Electricity: 75 m (installation from nearby building)	–
	BD-10	Ghion Sec. School	–	–	Felling , removing roots	–	–	Electricity: 50 m (installation from nearby building)	–
	BD-11	Fasilo Sec. School	–	–	Felling , removing roots & rocks	–	–	Electricity: 50 m (installation from nearby building)	–
Gondar	GD-12	Fasiladas Sec. School	400 ㎡	–	Scrapping fence (50 m) & existing building (50 ㎡)	–	–	Electricity: 50 m (installation from nearby building)	–
	GD-13	Edgit Feleg Sec. School	800 ㎡	–	Felling , removing roots	–	–	Electricity: 50 m (installation from nearby building)	–
	GD-14	Azezo Sec. School	–	–	–	–	–	Electricity: 25 m (installation from nearby building)	–
Dessie	DS-15	Hottie Sec. School	–	–	Scrapping classroom (250 ㎡), felling, removing roots	–	–	Electricity: 50 m (installation from nearby building)	–
	DS-16	Niguse Michael Sec. School	1,200 ㎡	–	Felling , removing roots	–	–	Electricity: 50 m (installation from nearby building)	–
	DS-17	Kidame Gebya Sec. School	400 ㎡	–	Felling , removing roots	–	–	Electricity: 50 m (installation from nearby building)	–

2-4 Project Operation Plan

2-4-1 Increasing the Number of Teachers and Staff

This Project aims to improve the overcrowded situation of the classrooms of the secondary schools situated in the target areas through the construction of new schools and additional classrooms for existing schools. It requires a certain number of teachers and staff to be employed and allocated to the new schools. On the other hand, in case of the existing schools, 4 classrooms

each are to be added. Therefore, it should not require such a significant increase for teachers and staff.

(1) New employment of teachers for the new schools

Eight new schools need to hire teachers for each subject considering the planned size (32 classrooms). The below Table was developed taking into consideration the following aspects[12]:

- Singe shift schooling and a size of 32 classrooms
- 24 classes for G9-G10 while 8 classes for G11-G12[13]
- 4 classes each for G11-G12 in two separated courses (Social Science and Science)
- One teacher will be responsible for 24 lessons/week based on the Standard of Amhara Region
- No teachers will be re-allocated from nearby schools

Table2-23 Number of Teachers Needed Per School

Subject		G9-10 (24 Sections)			G11-12 (8 Classes : 4 classes each for SS & S courses)			Total No. of Teachers Needed
		No. of lesson/week	Total No. of lesson/week	**No. of Teachers Needed**	No. of lesson/week	Total No. of lesson/week	**No. of Teachers Needed**	
Common Subject	Amharic	2	48	**2**				**2**
	English	4	96	**4**	6	48	**2**	**6**
	Mathematics	5	120	**5**	5	40	**2**	**7**
	Civics・Ethics	3	72	**3**	3	24	**1**	**4**
	Physical Edu.	2	48	**2**	1	8	**1**	**3**
	IT	2	48	**2**	3	24	**1**	**3**
	Native Language	2	48	**2**	3	24	**1**	**3**
G11-12 Elective Subjects for Social Science Course	Geography	2	48	**2**	4	16	**1**	**3**
	History	1	24	**1**	4	16	**1**	**2**
	Economics				4	16	**1**	**1**
	Business				2	8	**1**	**1**
G11-12 Elective Subjects for Science Course	Physics	4	96	**4**	4	16	**1**	**5**
	Chemistry	4	96	**4**	4	16	**1**	**5**
	Biology	4	96	**4**	4	16	**1**	**5**
	Technical Drawings				2	8	**1**	**1**
Total								**51**

Source: Based on the information given by AREB.

The above Table shows the necessary number of teachers as 51 (minimum). In the case of Gonji Kolela (GK-8), the existing school will be re-built. Hence the 46 teachers who are currently working there will remain. The rest (5 teachers out of 51) need to be newly employed.

[12] Currently, preparation of a new curriculum is under way. Once it is introduced, the number of necessary teachers may require some changes.
[13] During site survey, it was learned that in general, classroom ratio of lower and upper secondary schools is 3:1. However, upon submission of the detailed operation plan by AREB, this ratio may be re-considered.

(2) New employment of staff for the new schools

Staff, including the Director and Vice Director, should be also employed. According to the ARSCS, the average number of staff varies between 20-24 based on the size of the school (ref: Table 2-24). As explained above, currently there are approximately 10 staff members in Gonji Kolela (GK-8), which means 10 more staff will be needed.

Table2-24 Standard Allocation of Staff for Secondary Schools

Position	Number	Position	Number
Director	1	Secretary	1
Vice Director	1～2	Accountant	1
Coordinator	1	Casher	1
Human Resource Manager	1	IT Technician	1
Librarian	2	Janitor	3～4
Record Officer	2	Guard	4～6
Procurement Officer	1	**Total**	**20～24**

Source: Based on the information given by AREB.

(3) Total number of teachers and staff necessary to be employed to the new schools

Referring to (1) and (2), it is required to employ the following number of teachers and staff. It needs to be noted that this employment, along with proper formalities, should be completed prior to the opening of the schools.

Table2-25 Total Number of Teachers and Staff to be Employed for New Schools

School No.	District（Woreda）	Site（Kebele）	No. of Necessary Teachers	No. of Necessary Staff	Remarks
GD-1	Gondar	Kebele 18	51	20	The required number of staff is calculated considering the followings: The planned size of the new schools is 40 students/class and 32 classrooms, which brings the total number of students as 1,280/school. Schools exceeding 2,000 students require to employ 2 Vice Directors, hence the target schools will have 1 Vice Director each. Likewise, there will be 3 cleaners and 4 guards.
BH-2	Bahir Dar	Kebele 14	51	20	
DS-3	Dessie	Boru Selasie K.14	51	20	
DM-4	Debre Markos	Kebele 3	51	20	
DB-5	Debre Birhan	Kebele 6	51	20	
WD-6	Woldia	Defrega Kibi Kebele	51	20	
DT-7	Debre Tabor	Debre Tabor Eyesus	51	20	
GK-8	Gonji Kolela	Gonji Kolela	5	10	

2-4-2 Teaching Material/Equipment

AREB procures the equipment and materials for Science laboratories, Physical Education,

textbooks, computers, and other teaching materials together with generators, roofing materials, etc. Those are then provided to the respective Districts. On the other hand, stationeries and other necessary equipment are procured by the schools utilizing the Block Grant[14]and a subsidy from the General Education Quality Improvement Program Project (GEQIP)[15].

AREB needs to provide the afore-said materials and equipment to the target schools prior to the hand-over of the school buildings. Also, the schools are requested to prepare all other necessary materials and equipment in timely manner.

2-4-3 Other Operation and Maintenance

Small-scale maintenance has been handled by the community led by the PTA. This active participation of the community is also expected for the facilities under the Project.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

(1) Cost shared by Ethiopian side : 10,849,000 Birr（Approximately 62.3 million yen）

The breakdown of the cost is shown in Table2-26.

[14] Block Grant is provided based on the number of the G9 and G10 students.
[15] GEQIP is provided considering the total number of the students.

Table2-26 Breakdown of the Cost Shared by the Ethiopian Side

Item	Amount（Birr）
Land formation (Cut, Filling)	3,410,000
Construction of the access roads	83,000
Construction of the gates, fences and guard rooms	3,191,000
Removing the obstructions (surface and underground)	62,000
Provision of facility for electricity distribution	775,000
Provision of facility for water supply	640,000
Construction of drinking fountains	64,000
Installation of apparatus for distance learning curriculum (Satellite Antenna and related apparatus)	560,000
Computers, Science laboratory materials, books for the libraries, etc.	1,828,000
Bank charge	236,000
Total	10,849,000

(2) Condition of the Cost Estimation

① Point of estimation time: December 2010

② Exchange rate: 1 US$=86.61Yen

: 1 Birr = 5.74 Yen

③ Schedule of construction work and procurement: Ref. to 2-2-4-7 (2).

④ Others: Cost estimation is done considering the Japan's Grant Aid Scheme.

2-5-2 Operation and Maintenance Cost

(1) Operation cost

As explained earlier, the minimum required number of the teachers and staff for each school are 51 and 20 respectively. Salaries of those teachers and staff are estimated as shown in Tables 2-27 and 2-28.

Table2-27 Salary for Teachers Per School

(Birr)

Item	Initial salary (monthly)	No. of allocated teaches per school	Total annual salary
BA/BS level of teachers	1,119	51	684,828

Source：Based on the information given by AREB.

Table2-28 Salary for Staff Per School

(Birr)

Position	Initial/Lowest level Salary (monthly)	Highest level salary (monthly)	Initial/Starting level salary (annual)	Remarks
Director	2,417	5,254	29,004	There are 4 ranks "Beginner, Vice, Higher, Leader" for Director and Vice Director. Furthermore, they are divided into 11 levels considering working experience.
Vice Director	1,851	4,250	22,212	Schools with more than 2,000 students need to have 2 Vice Directors. As the Project schools expect 1,280 enrollments per school, 1 Vice Director will be sufficient.
Coordinator	1,228	N/A	14,736	
Human Resource Manager	928	N/A	11,136	
Accountant	928	N/A	11,136	
Librarian	1,602	N/A	19,224	2 Librarians are needed. (801 birr x 2)
Casher	801	N/A	9,612	
IT Technician	801	N/A	9,612	
Procurement Officer	801	N/A	9,612	
Secretary	692	N/A	8,304	
Record Officer	1,384	N/A	16,608	2 Record Officers are needed (692 birr x 2)
Janitor	1,191	N/A	14,292	Considering the size of the schools, 3 clearners are needed. (397 birr x 3)
Guard	1,588	N/A	19,056	Similar to the above, 4 guards are needed. (397 birr x 4)
Total	**16,212**	**-**	**194,544**	

Source：Based on the information given by AREB.

Under the Project, 6,299,964 Birr will be required as annual salaries for newly recruited teachers and staff for 8 new schools (Table 2-29).

However, this amount is only 0.4 % of the 2008/09 regional education budget in Amhara (Ordinary Expenditure: 1,555.78 Million Birr). Thus it is feasible to be borne by the Ethiopian side.

Table2-29 Total Salaries for Teachers and Staff for Eight New Schools

(Birr)

Item	Minimum necessary increase in annual salary per school		Total Salaries	
Salaries of Teachers	Others	194,544	Others	1,361,808
	Gonji Kolela	77,220	Gonji Kolela	77,220
Salaries of Staff	Others	684,828	Others	4,793,796
	Gonji Kolela	67,140	Gonji Kolela	67,140
Total	Others	879,372	Total	6,299,964
	Gonji Kolela	144,360		

Note 1: Salaries of Teachers in Gonji Kolela: It needs to hire a coordinator, human resource manager, IT technician, librarian, record officer, 2 guards and 3 janitors. Total monthly salaries of 10 additional staff will be 6,435 Birr.

Note 2: Salaries of Staff in Gonji Kolela: 5 teachers need to be newly recruited, and required additional monthly salaries will be 5,595 Birr.

(2) Other school operation cost

As mentioned above, stationeries, library books, examination expenses, club activity expenses and partial salaries of the guards and the janitors are borne by the respective schools within the school budget. This school budget consists of the tuition for G11 and G12 students[16],

[16] 50-70 Birr/student/year

the registration fee for G9-G12[17], the Block Grant for G9 and G10 Students[18], GEQIP[19] and financial support by the students' family and community.

Considering the afore-said points and the fact that the new school can accommodate 1,280 students[20], the total amount of the registration fee for one school will be 25,600 Birr/annual. Concerning the tuition fees, 16,000-22,400 Birr[21] will be collected. Total financial sources are shown in Table 2-30.

Table2-30 Student-Based Financial Sources for the Respective Schools[22]

Item	Base	Amount（Birr）
Registration Fee	Total No. of students (1,280) x 20 Birr	25,600
Tuition Fee	G11-12 students:320 x average fee 60 Birr	19,200
Block Grant	G9-10 students: 960 x 20 Birr	19,200
GEQIP	Total No. of students (1,280) x 20 Birr	25,600
Total		89,600

As described in 2-4-2, in order to commence school operation smoothly, GEQIP should be provided to all the schools before they open. At the same time, stationeries, teaching materials and equipment need to be procured at the school level in a timely fashion.

(3) Maintenance cost

The facilities that will be constructed under the Project will not require maintenance for a few years after handing them over to the Ethiopian side. Table 2-31 shows the items, frequency, and estimated cost when the maintenance comes into necessity. The cost will be 13.13 % of the total annual budget for 17 target schools, which is 2.4 million Birr, as calculated in Table below, so the school side should be able to manage.

[17] 20 Birr/student/year
[18] 20 Birr/student/year
[19] 20 Birr/student/year
[20] 40 students/classroom x 32 classrooms for each school
[21] Considering the current situation of the existing school, 8 classrooms out of 32 will be allocated to G11 & G12. Thus altogether 320 students' tuition fees will be collected.
[22] Calculated for 8 new schools. 24 classrooms out of 32 will be allocated for G9 and G10.

Table2-31 Maintenance Cost Estimation

Item		Frequency	Annual Cost（Birr）	Remarks
Re-painting	Exterior	Once every 10 years	71,000	Schools and Woredas are responsible bodies.
	Interior	Once every 5 years	182,000	
	Chalkboard	Once every 5 years	3,000	
	Fittings	Once every 5 years	8,000	
	Steel Frame	Once every 5 years	5,000	
Removing toilet sedimentation		Once a year	6,000	
Utilities		-	40,000	
Total			315,000	

As explained, other than providing labor, the community, led by the PTA, has been supporting financially in terms of small-scale facility maintenance. Thus, the same kind of active support by the community is expected for the facilities constructed by the Project.

Chapter 3 Project Evaluation

Chapter 3 Project Evaluation

3-1 Preconditions

Site preparation work, construction of access roads, securing water supplies, etc. are to be handled by the respective WEOs led by AREB as parts of the obligations of the Ethiopian side. Precisely, it is a precondition that those preparation works should be done without any delay. It should be well noted that the majority of the newly established schools require certain preparation work as described in 2-3.

3-2 Necessary Inputs by Recipient Country

The following measurements should be taken for all the targeted schools under the Project.

① To recruit necessary teachers and staff without delay.
② To admit and allocate students properly pertaining to the size of each school.
③ To allocate a sufficient budget in order for the schools to operate and perform the maintenance.
④ To undertake the operation and maintenance appropriately.

3-3 Important Assumptions

① The number of students of the Project schools will not increase beyond this estimation.
② There will be no sudden rise in prices which exceed the Project budget, and procurement of necessary materials and equipment can be conducted as planned.

3-4 Project Evaluation

3-4-1 Relevance

The Project proves to be adequate for the Japanese Grant Aid, on account of the justifications mentioned below.

① The beneficiaries of the Project are citizens of Amhara Region such as school students, teachers and staff totaling more than 53,000.

② The Project objective is to expand access to education and to improve teaching and learning environments in secondary schools in the target areas, which corresponds to the purpose of the Japanese Grant Aid, such as “Basic Human Needs” and “Education and Human Resource Development”.

③ It is normal practices for each school under the Project to perform operation and maintenance tasks in which high skills are not required. These are manageable within the budget and resources of the Ethiopian side.

④ This Project is expected to contribute to the fulfillment of the ESDP in line with improving access to quality education and expanding school facilities.

⑤ The Project is presumed to have an economic impact from a long term and large-scale point of view, while it does not involve any immediate financial profitability.

⑥ There will be no negative influence on the environmental and social aspects of the sites by the implementation of the Project.

⑦ The implementation of the Project is practicable without difficulties, by the Japanese Grant Aid Scheme (Japan’s Grant Aid scheme for Community Empowerment).

⑧ Furthermore, the Project will be able to utilize lessons learned and feedback from preceding projects under the Japan’s Grant Aid scheme for Community Empowerment “The Project for Construction of Primary Schools in Oromia Region,” and other experiences in order to manage this Project more efficiently and effectively. This can be noted as a comparative advantage of the Project. It also can refer to the other projects and programs in Education sector in Ethiopia such as “The Project on Improving Access to Quality Primary Education by Community Participation (Ho! ManaBU, Technical Assistance)” and “The Project on Increasing Access to Quality Basic Education through Developing School Mapping and Strengthening Micro-planning in Oromia Region (Development Study)” aiming to achieve the expansion of access to primary education and improve teaching and learning environments in Oromia Region.

3-4-2 Effectiveness

(1) Quantitative results

The quantitative results will be examined by comparing the baseline data and the desired value. Table 3-1 shows the indicators of the quantitative results.

Table 3-1 Indicators of the Quantitative Results

Indicators	Baseline data (Year 2010)	Desired value (Year 2017) [23]
Number of students in 8 newly established schools	0	10,240[24]
Average number of students per classroom[25] for the existing 9 schools (currently 24,092 in total)	80 (Total number of classrooms for 9 schools: 301)	71 (Total number of classrooms for 9 schools:337)
Number of students per library seat for the existing schools	43/seat (Total number of seats for 9 schools: 558)	13/seat (Total number of seats for 9 schools: 2,358)

(2) Qualitative results

① By constructing new schools in eight cities, and consequently increasing the number of secondary schools in the same school catchment areas from 23 to 30[26], the following are expected to be materialized: commuting distance for the students will be shortened and attendance rate as well as dropout rate will be improved.

② Through the betterment of the teaching and learning environments as a result of having more schools and classrooms, the situation of double shift schooling, the enrolment ratio and also the ratio of students who go on to the next education stage will be expected to improve.

③ Construction of additional classrooms and libraries for 9 existing schools will lead to the improvement of the quality of education.

The above results of the Project prove that it is relevant to implement it and also that the Project can be expected to be effective.

[23] The target year is set four years after construction completion (2013) when the first batch of G9 students from the newly established schools will become G12 (the final year of the 4 year secondary education).

[24] It is assumed that no students drop out and that 40 students per class under single shift schooling (based upon the standard) will continue to enroll every year after the opening of the schools.

[25] It is assumed that the total number of students per school remains unchanged from the base line year. Double shift schooling is not assumed in calculating the average number of students per classroom.

[26] Currently, there are 23 existing secondary schools in the Project school catchment areas, however, one of them will be transformed into a primary school after the construction completion. Therefore, the total number of the secondary schools in the Project school catchment areas will be 30, adding the 8 newly established schools.