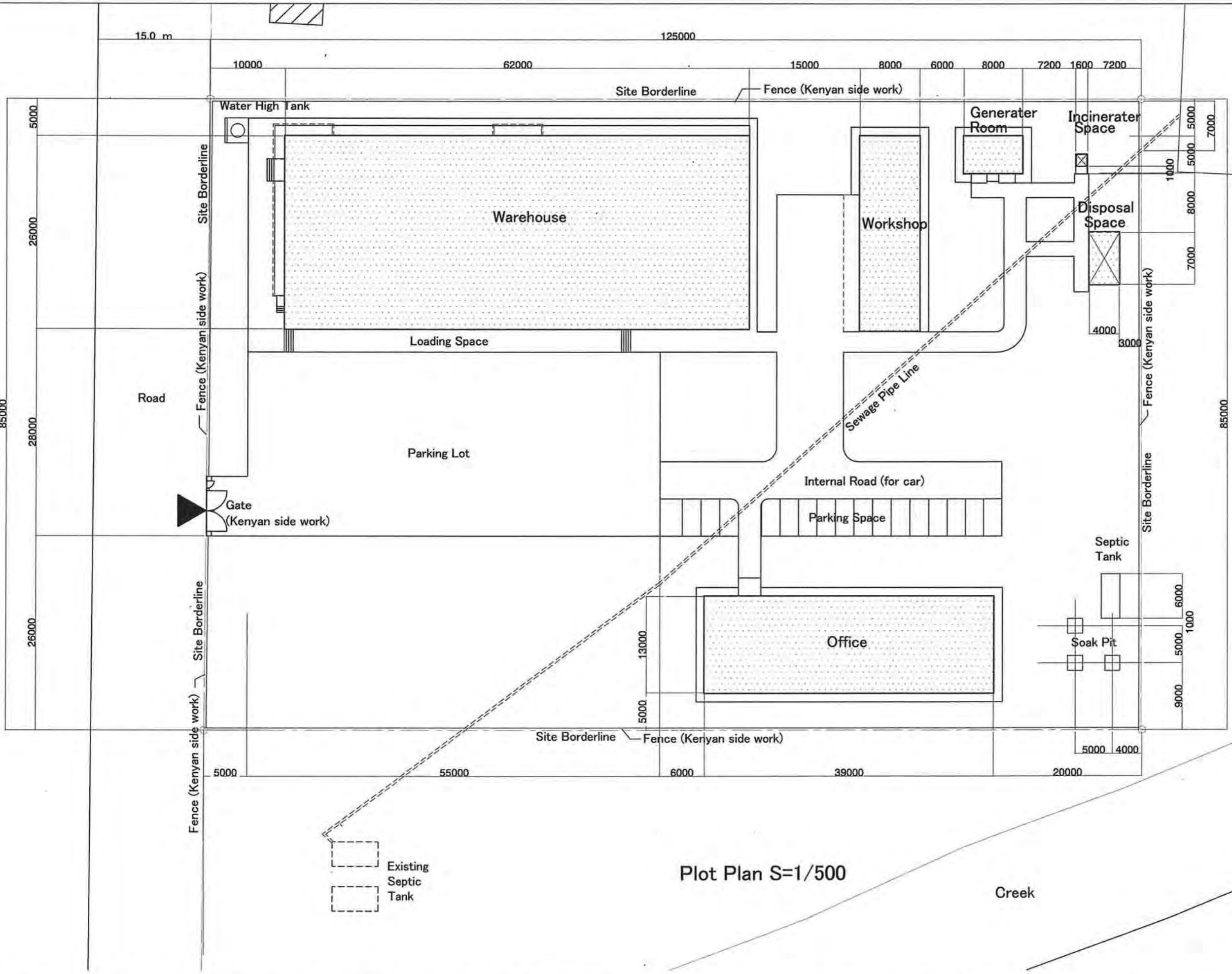


2-2-3 Outline Design Drawings

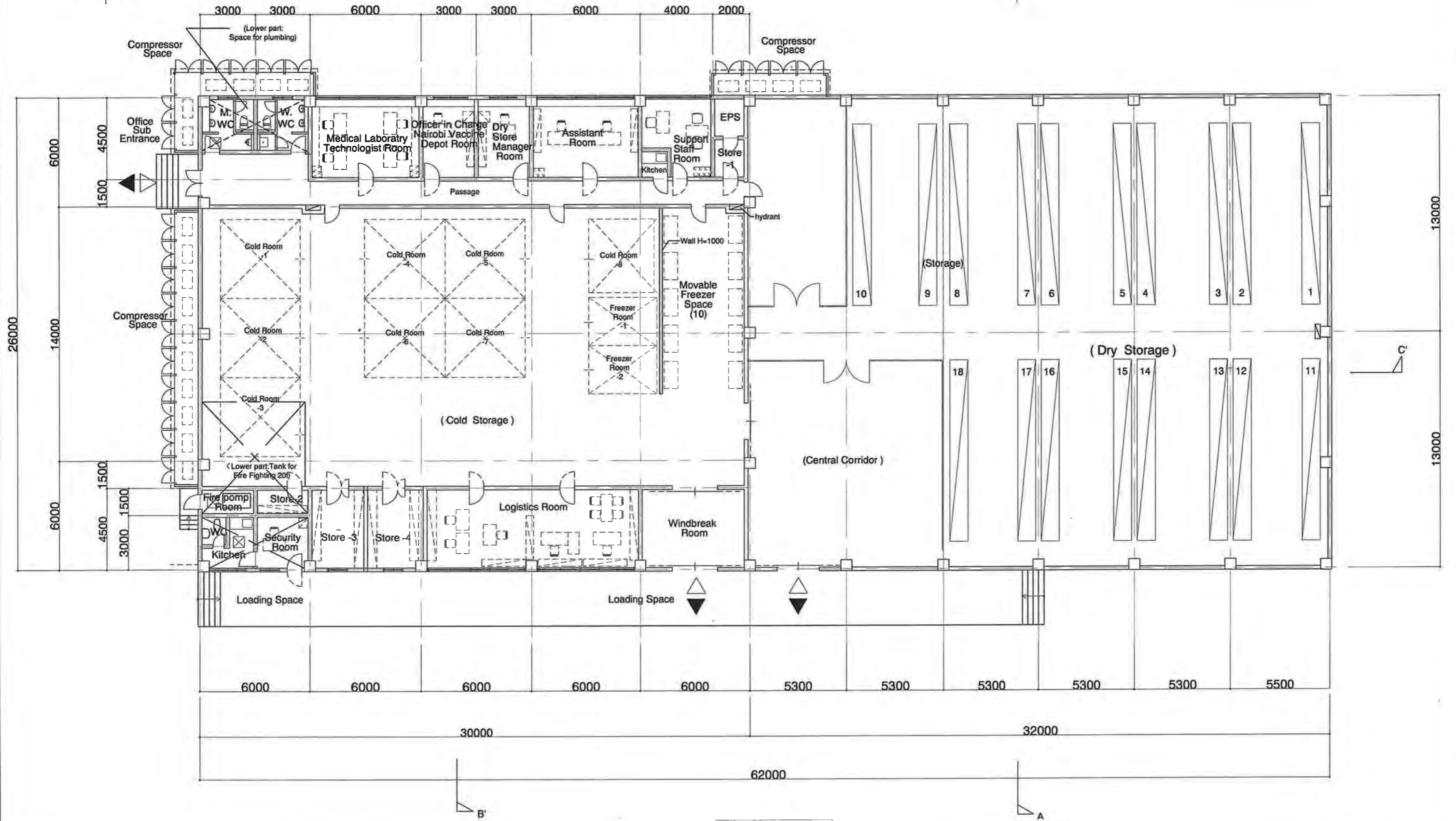
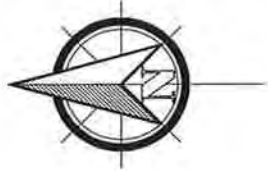
Nairobi National Vaccine Depot:	Plot Plan, Floor Plan, Elevation, Section
Meru Regional Vaccine Depot:	Plot Plan, Floor Plan, Elevation, Section
Kakamega Regional Vaccine Depot:	Plot Plan, Floor Plan, Elevation, Section
Garissa Regional Vaccine Depot:	Plot Plan, Floor Plan, Elevation, Section



The Project Site
Area = 10,625(m²)

Plot Plan S=1/500

Floor Area = 1,612.00m²



Floor Plan

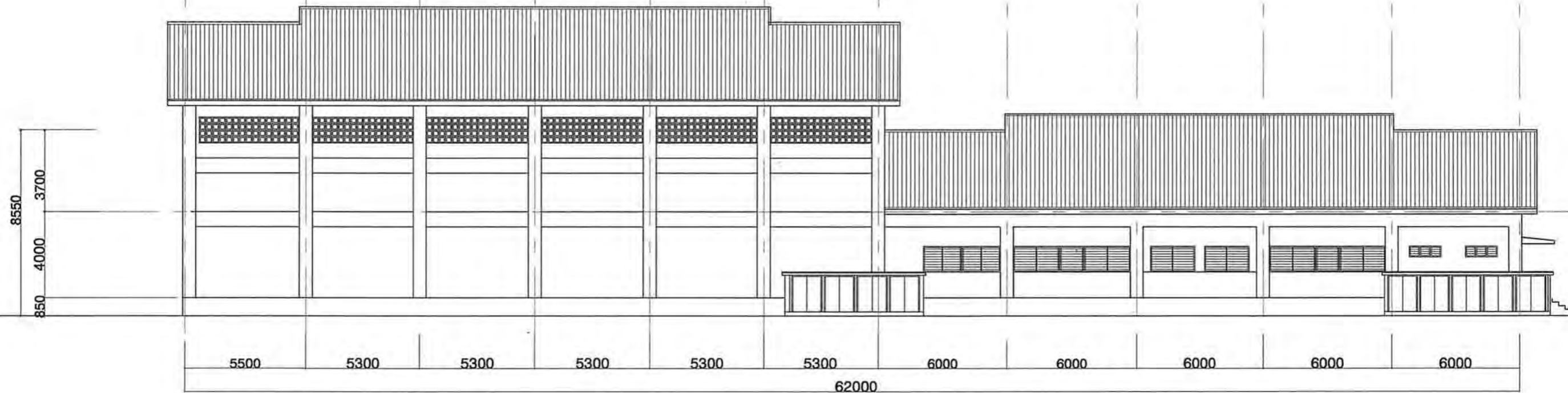
 **YOKOGAWA ARCHITECTS & ENGINEERS, INC.**

THE PROJECT FOR THE REINFORCEMENT OF VACCINE STORAGE
IN THE REPUBLIC OF KENYA

Name of Drawing
Nairobi Cetral Depot

**Warehouse
Floor Plan**

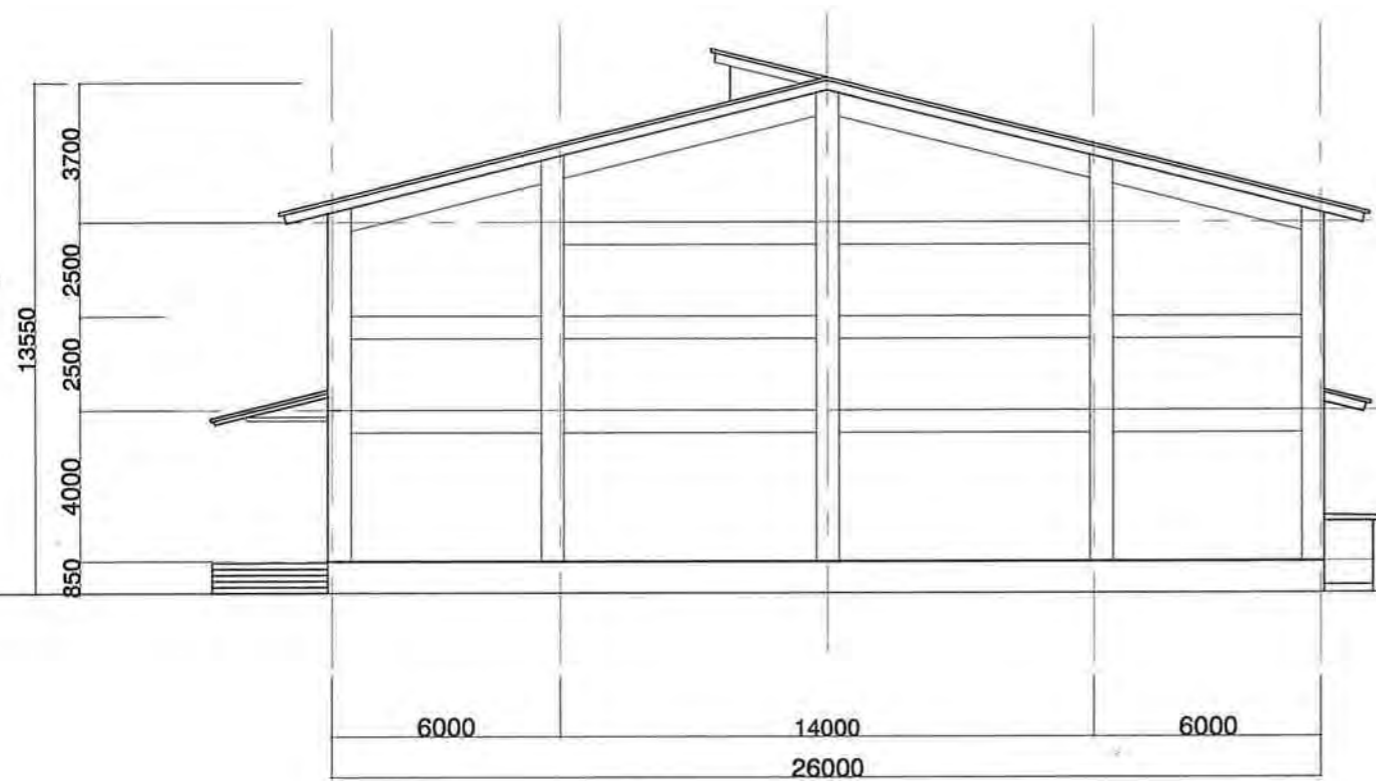
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NA-02
Scale
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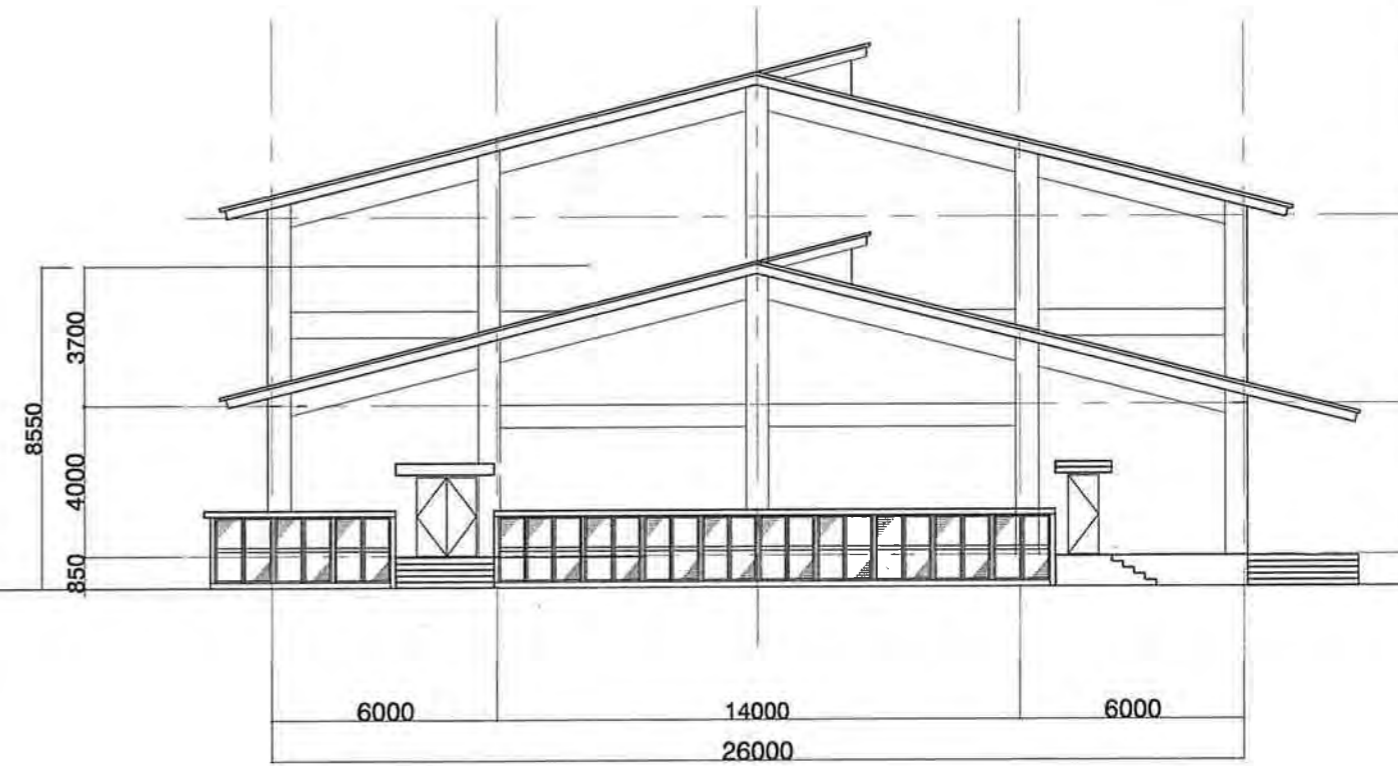
East Elevation



West Elevation



North Elevation



South Elevation



YOKOGAWA ARCHITECTS & ENGINEERS, INC.

THE PROJECT FOR THE REINFORCEMENT OF VACCINE STORAGE
IN THE REPUBLIC OF KENYA

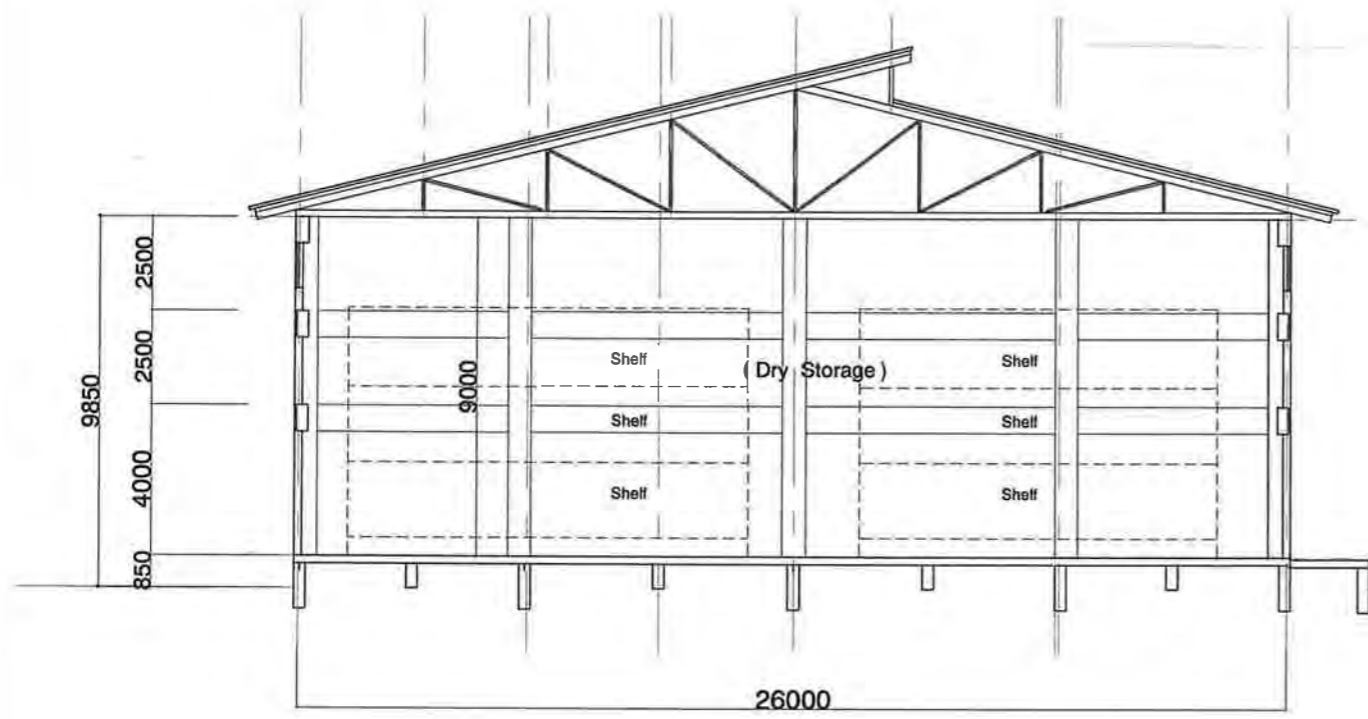
Name of Drawing
Nairobi Cetral Depot

**Warehouse
Elevation(North & South)**

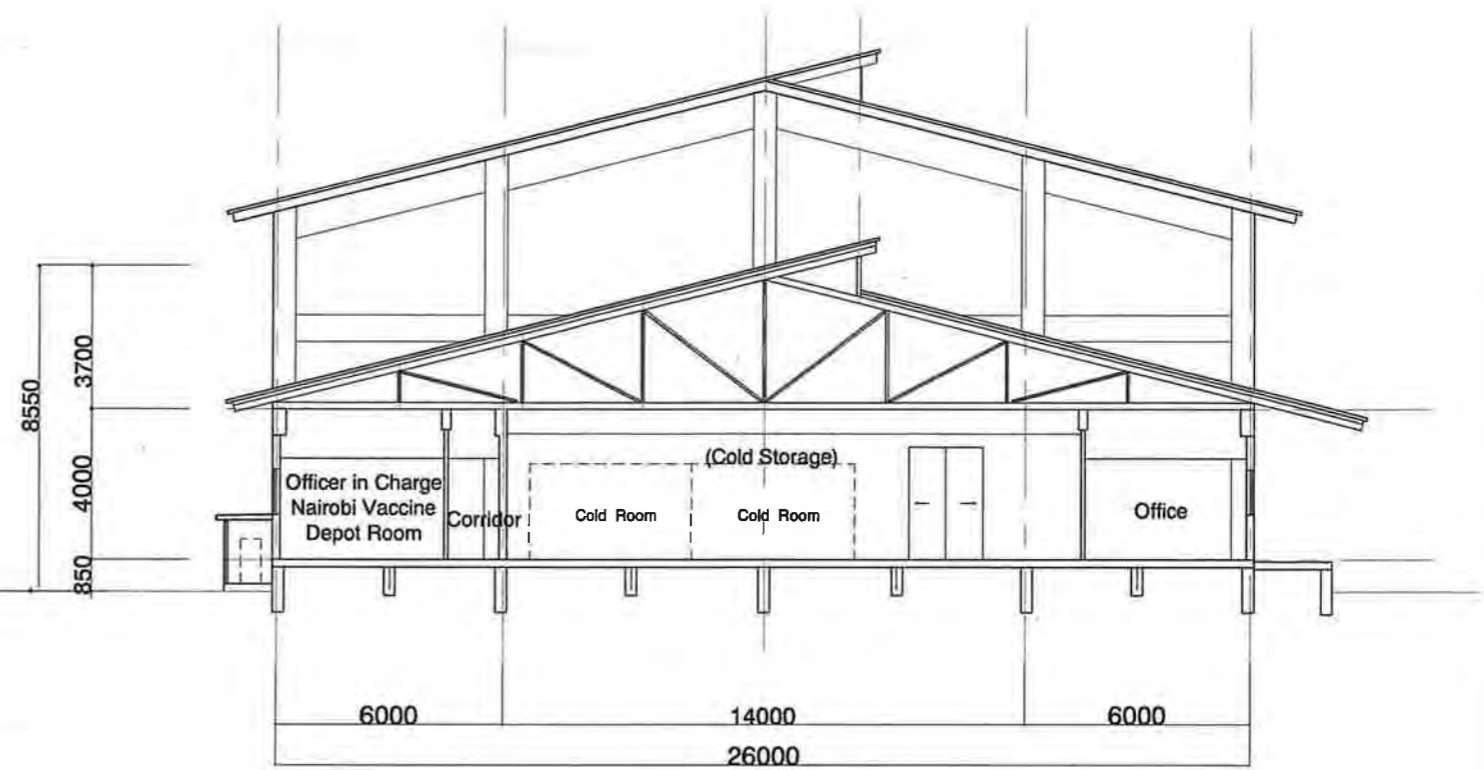
Number of Drawing

NA-04

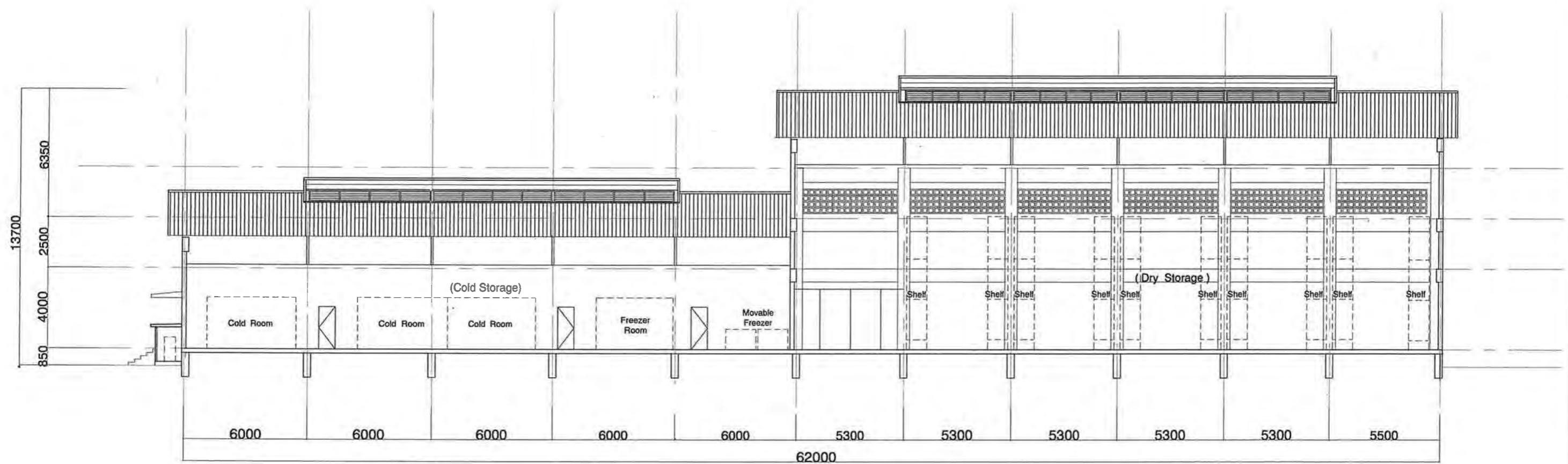
Scale
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A-A' Section



B-B' Section



C-C' Section



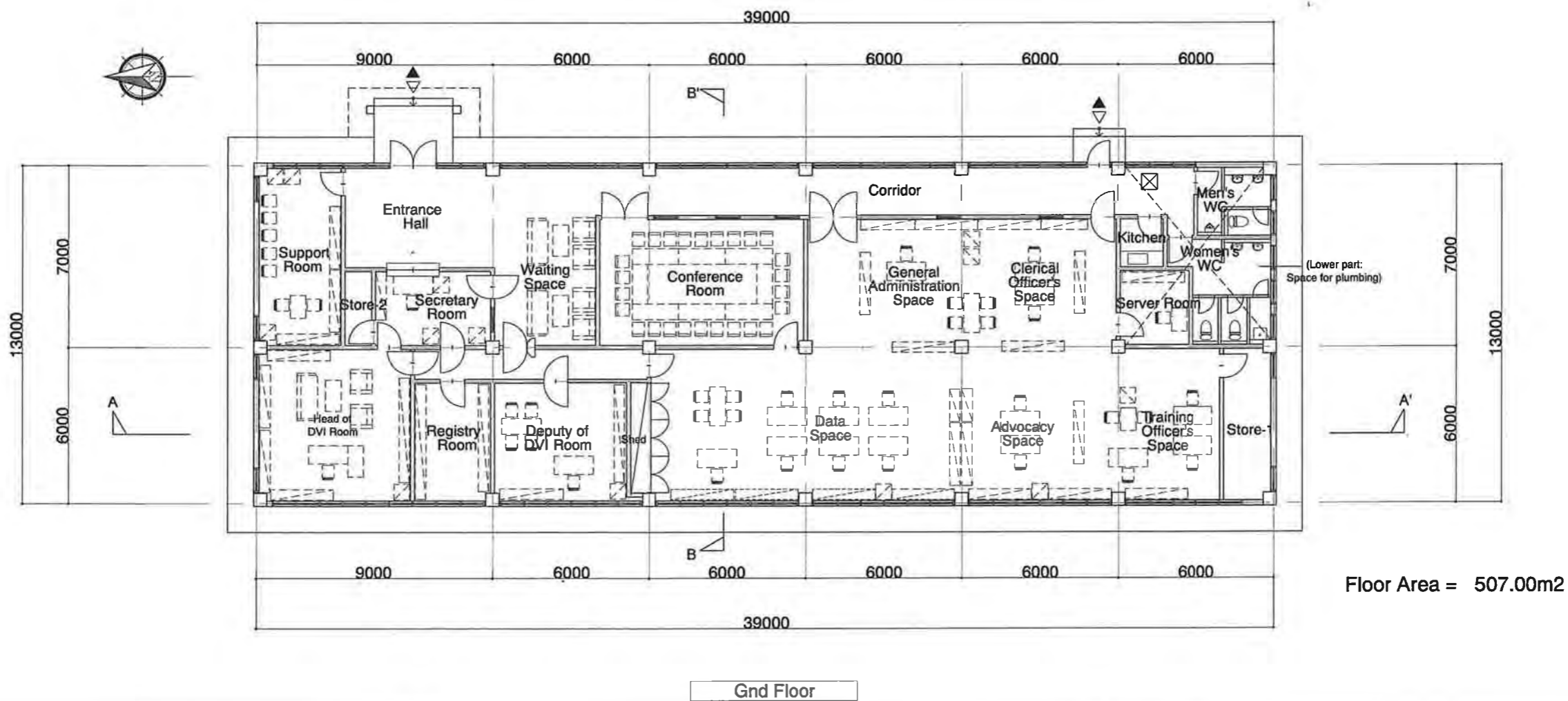
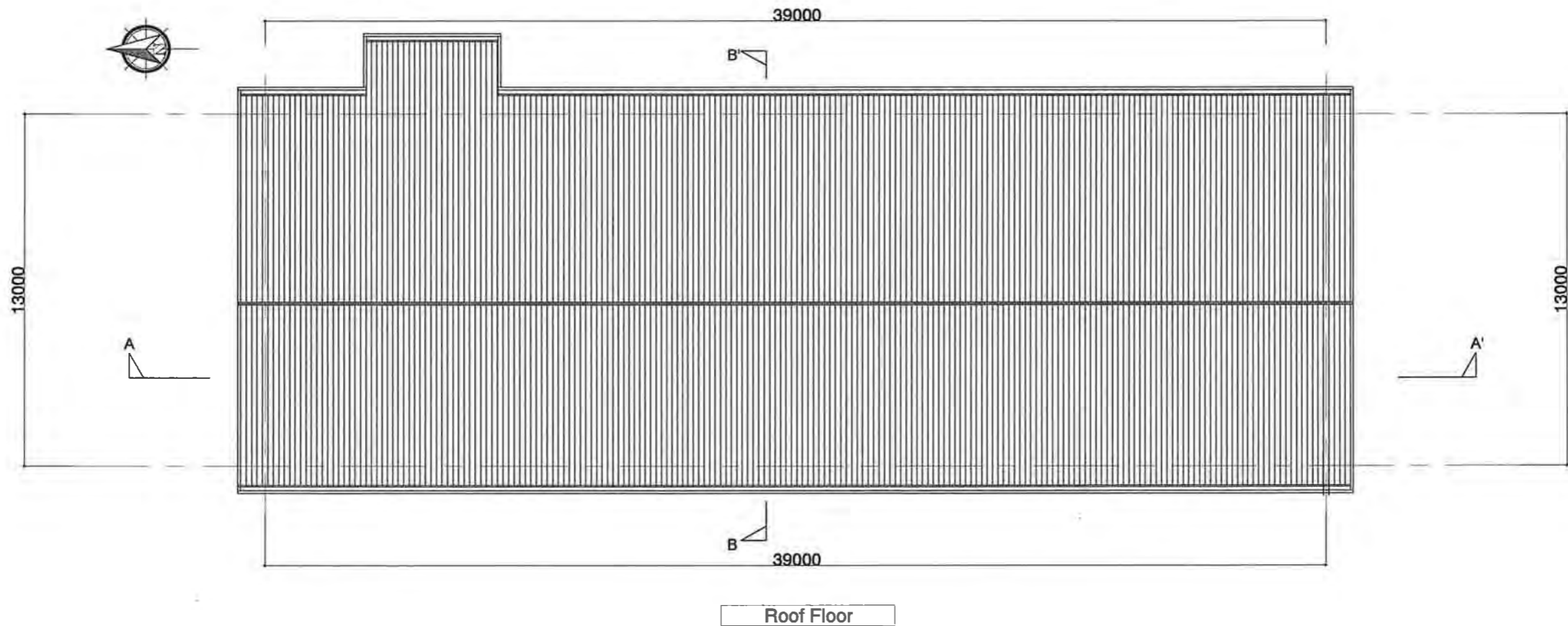
YOKOGAWA ARCHITECTS & ENGINEERS, INC.

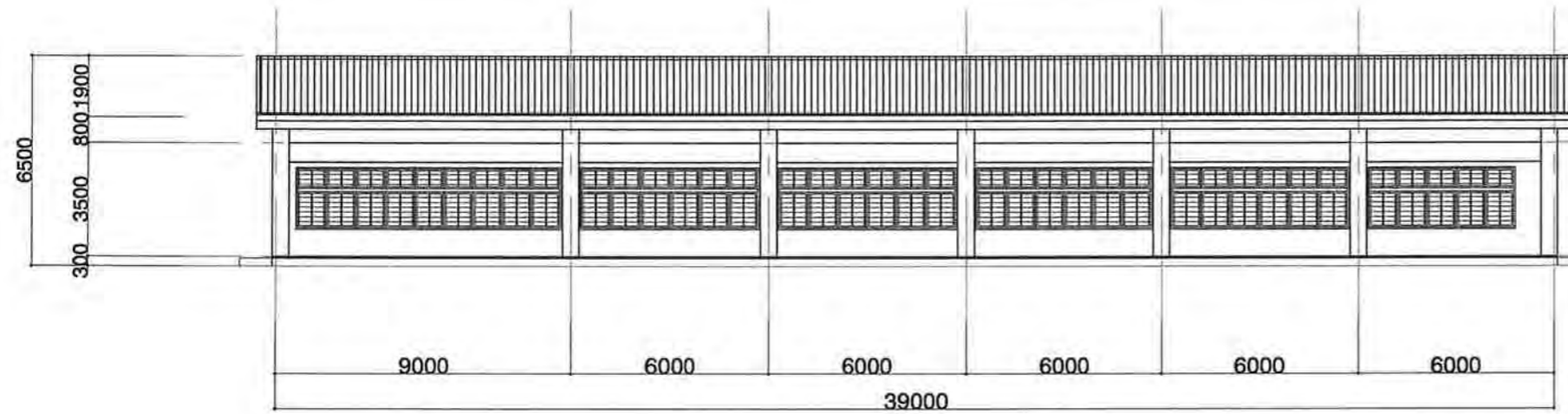
THE PROJECT FOR THE REINFORCEMENT OF VACCINE STORAGE
IN THE REPUBLIC OF KENYA

Name of Drawing
Nairobi Cetral Depot

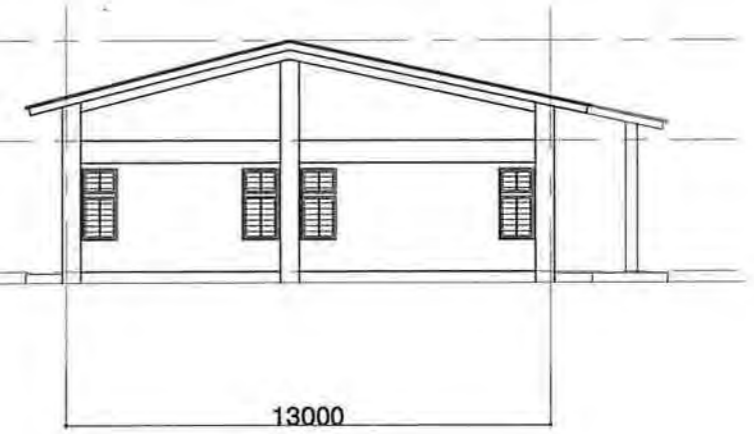
Warehouse
Section

Number of Drawing
NA-05
Scale
1:200

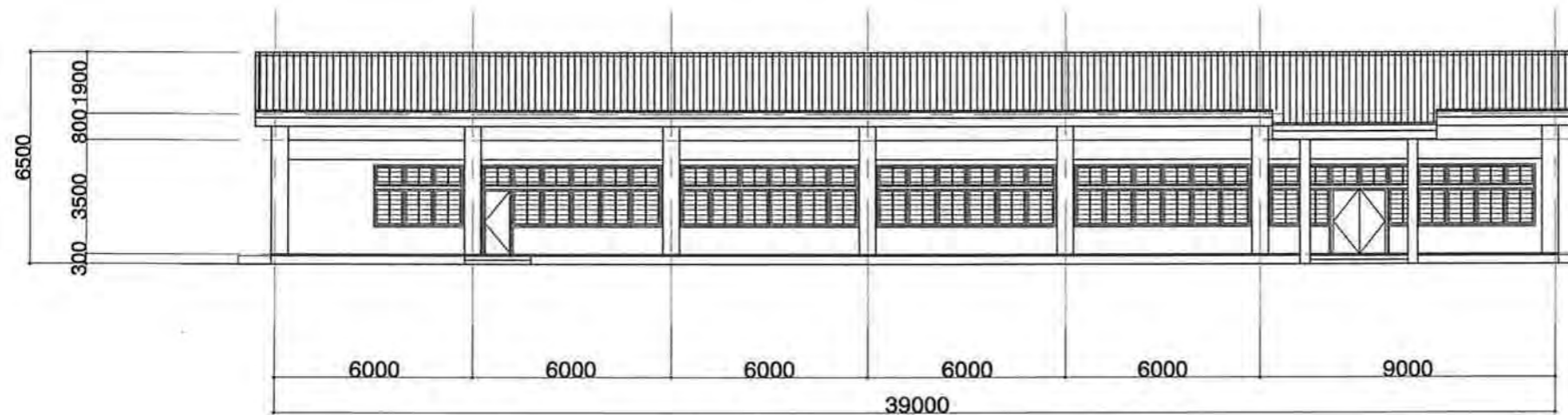




East Elevation



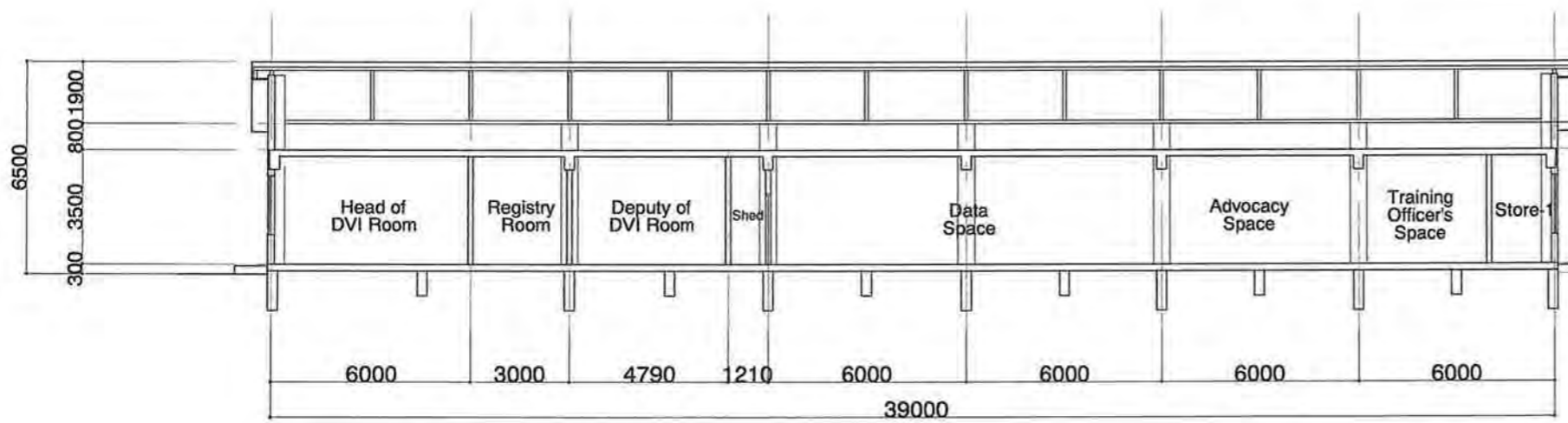
South Elevation



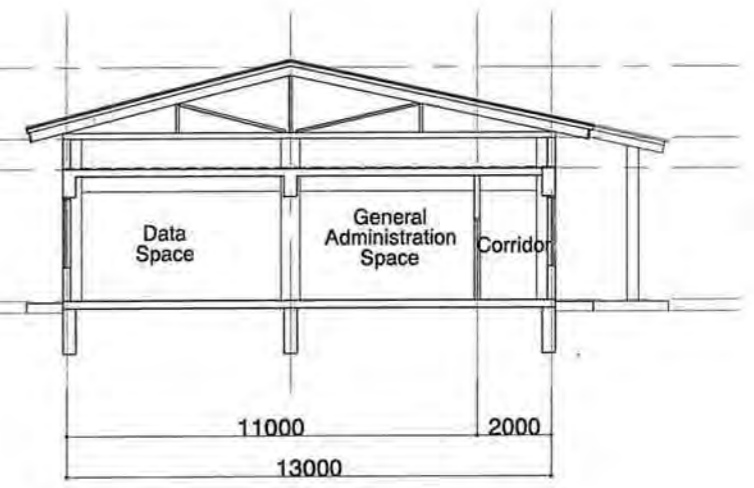
West Elevation



North Elevation



A-A Section



B-B Section



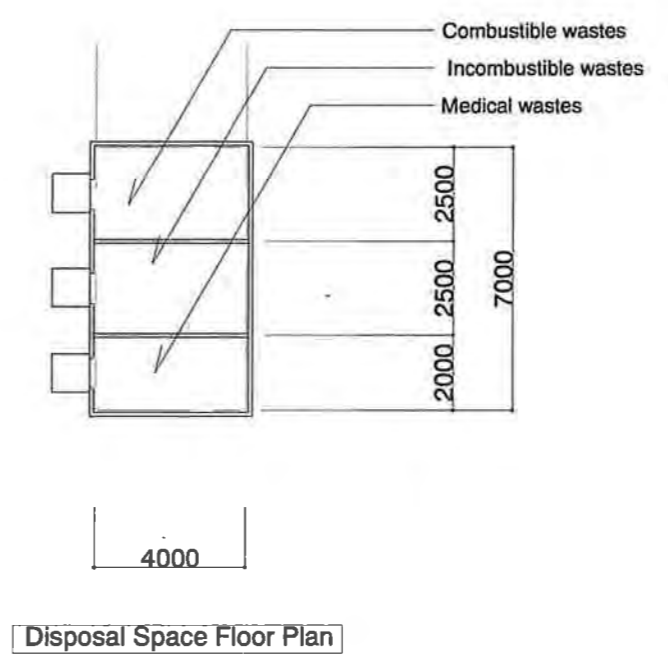
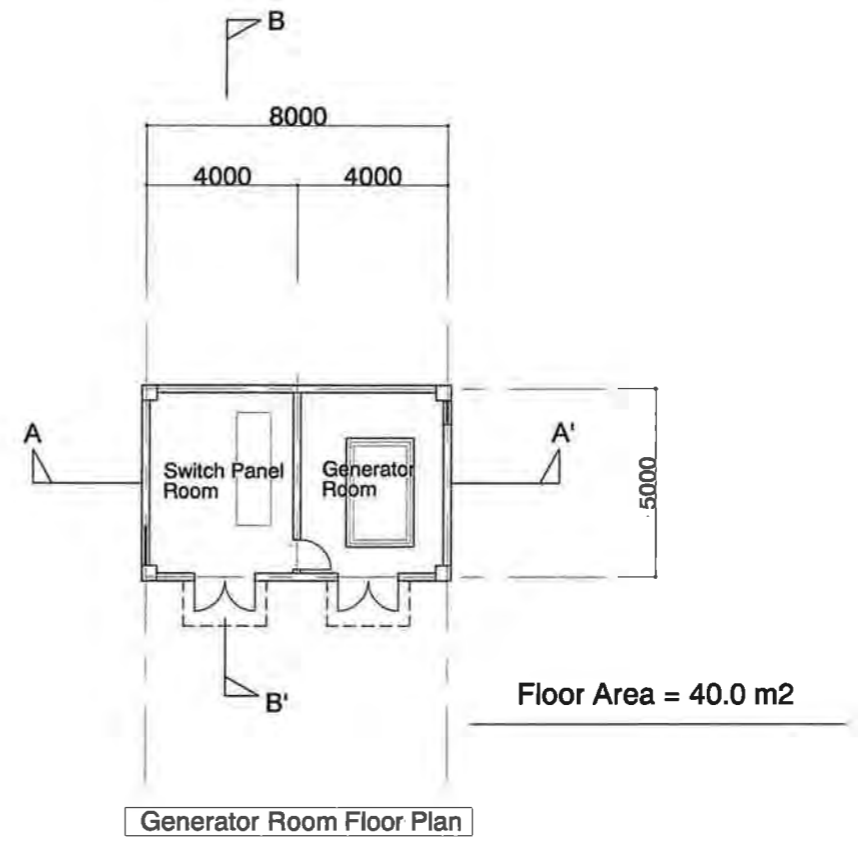
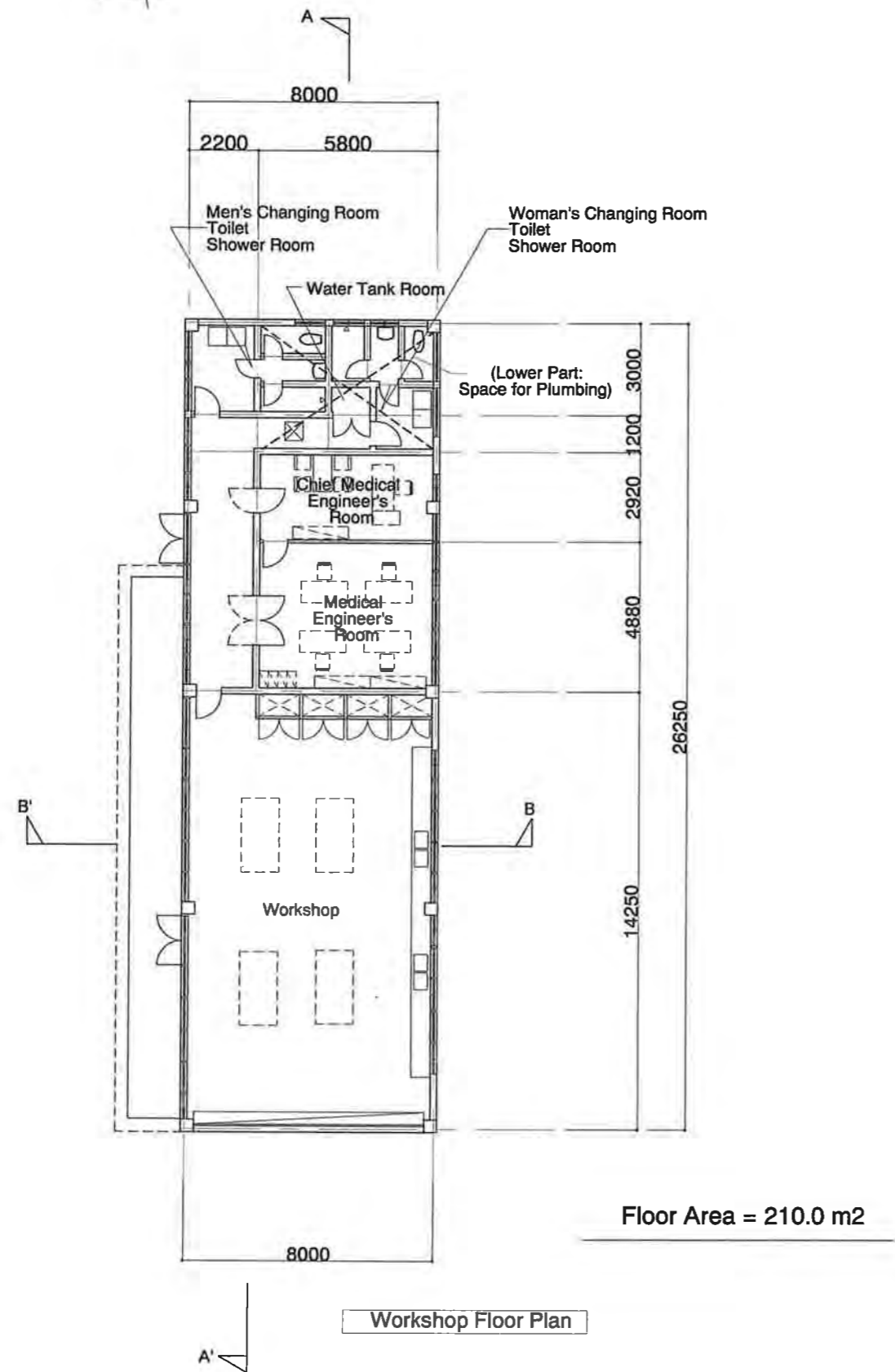
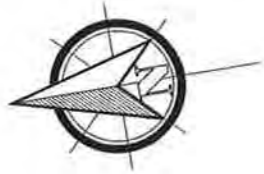
YOKOGAWA ARCHITECTS & ENGINEERS, INC.

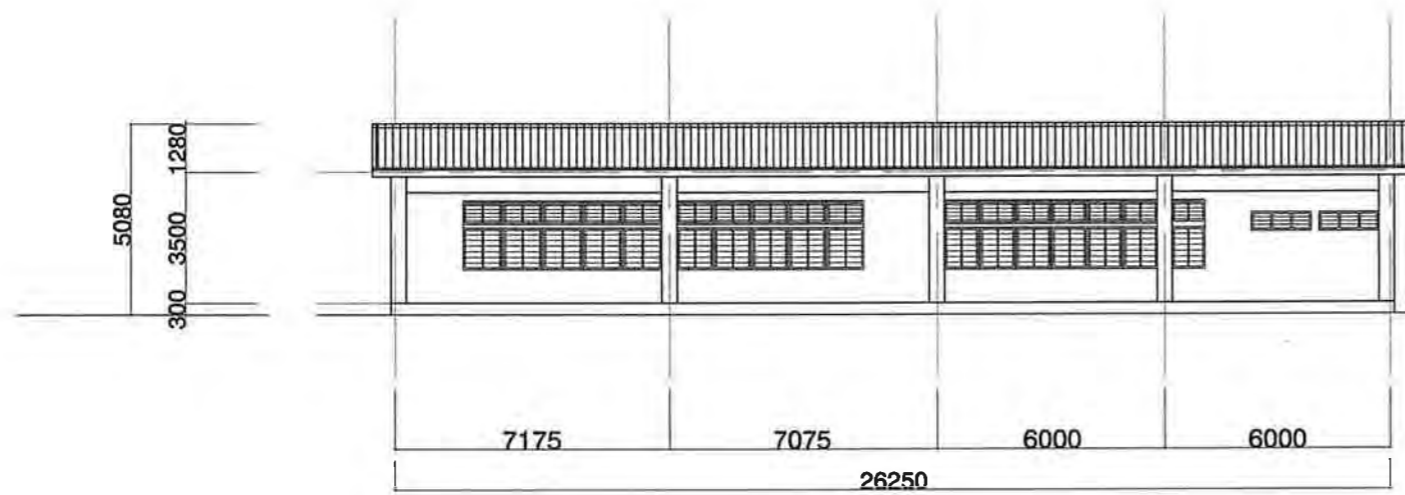
THE PROJECT FOR THE REINFORCEMENT OF VACCINE STORAGE
IN THE REPUBLIC OF KENYA

Name of Drawing
Nairobi Cetral Depot

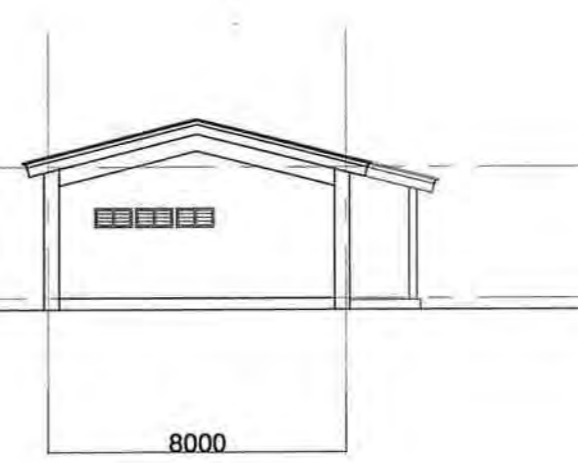
Office
Elavation & Section

Number of Drawing
NA-07
Scale
1:200

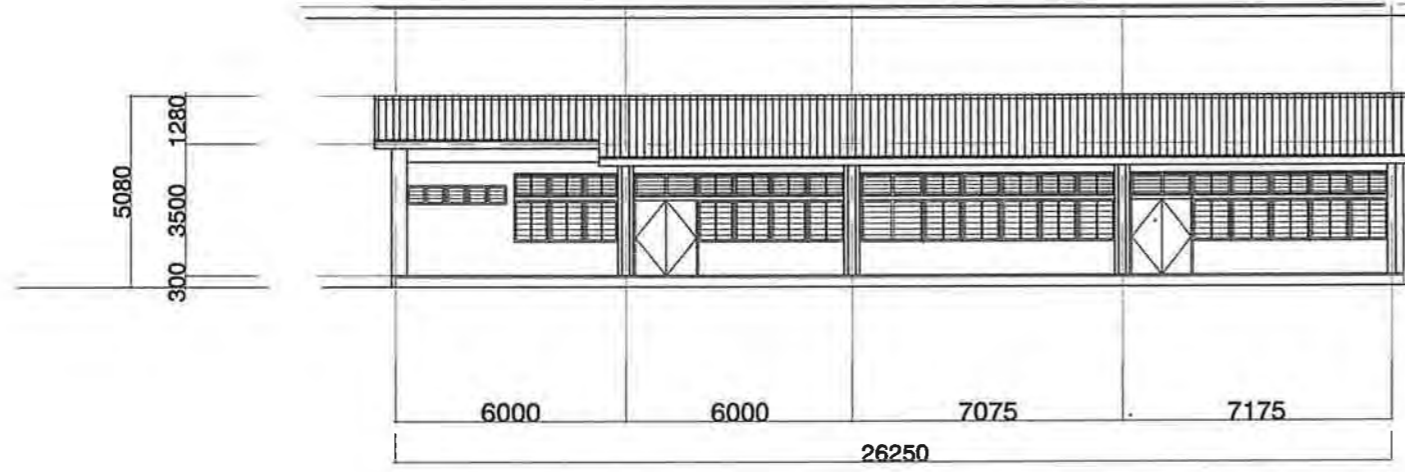




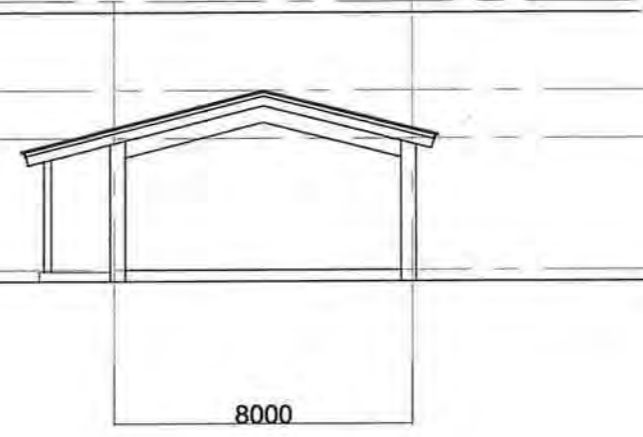
South Elevation



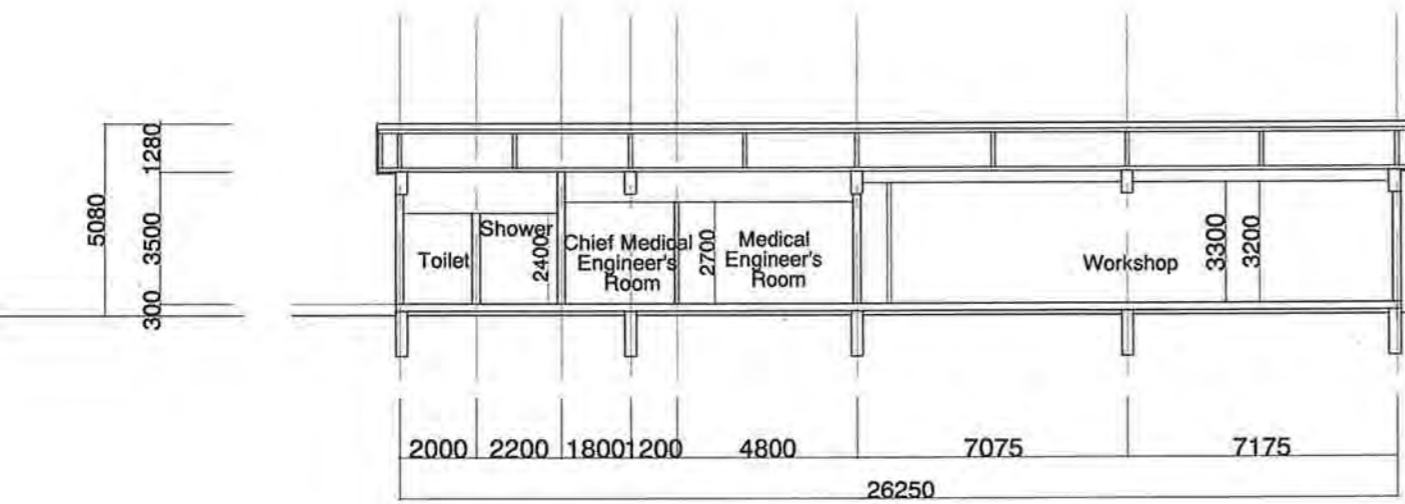
East Elevation



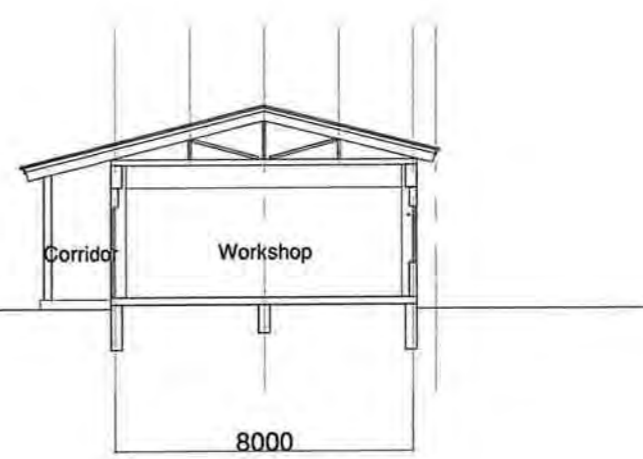
North Elevation



West Elevation



A-A' section



A-A' section



YOKOGAWA ARCHITECTS & ENGINEERS, INC.

THE PROJECT FOR THE REINFORCEMENT OF VACCINE STORAGE
IN THE REPUBLIC OF KENYA

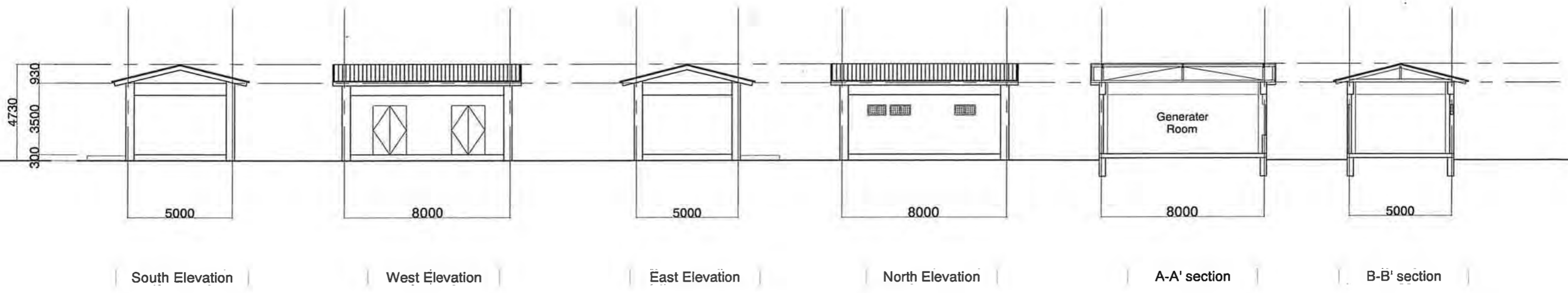
Name of Drawing
Nairobi Cetral Depot

Workshop
Elevation & Section

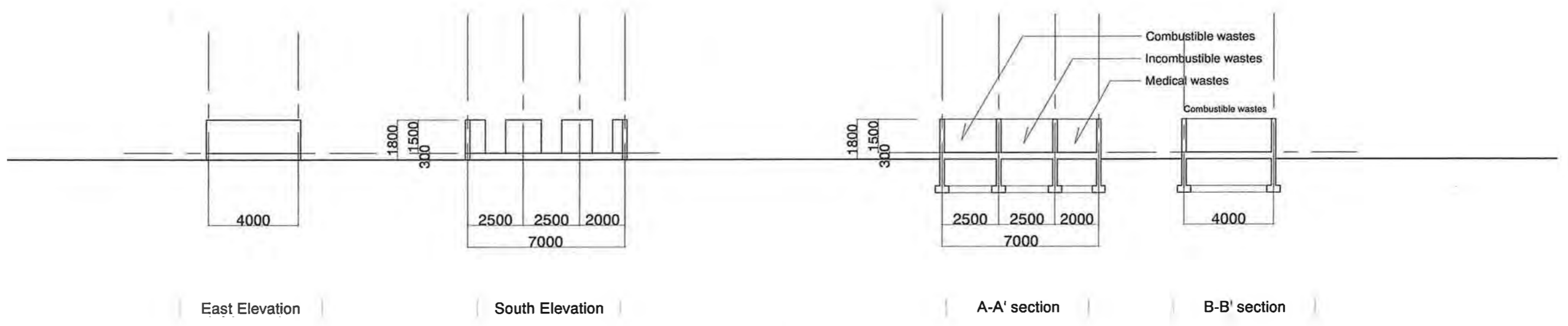
Number of Drawing

NA-09

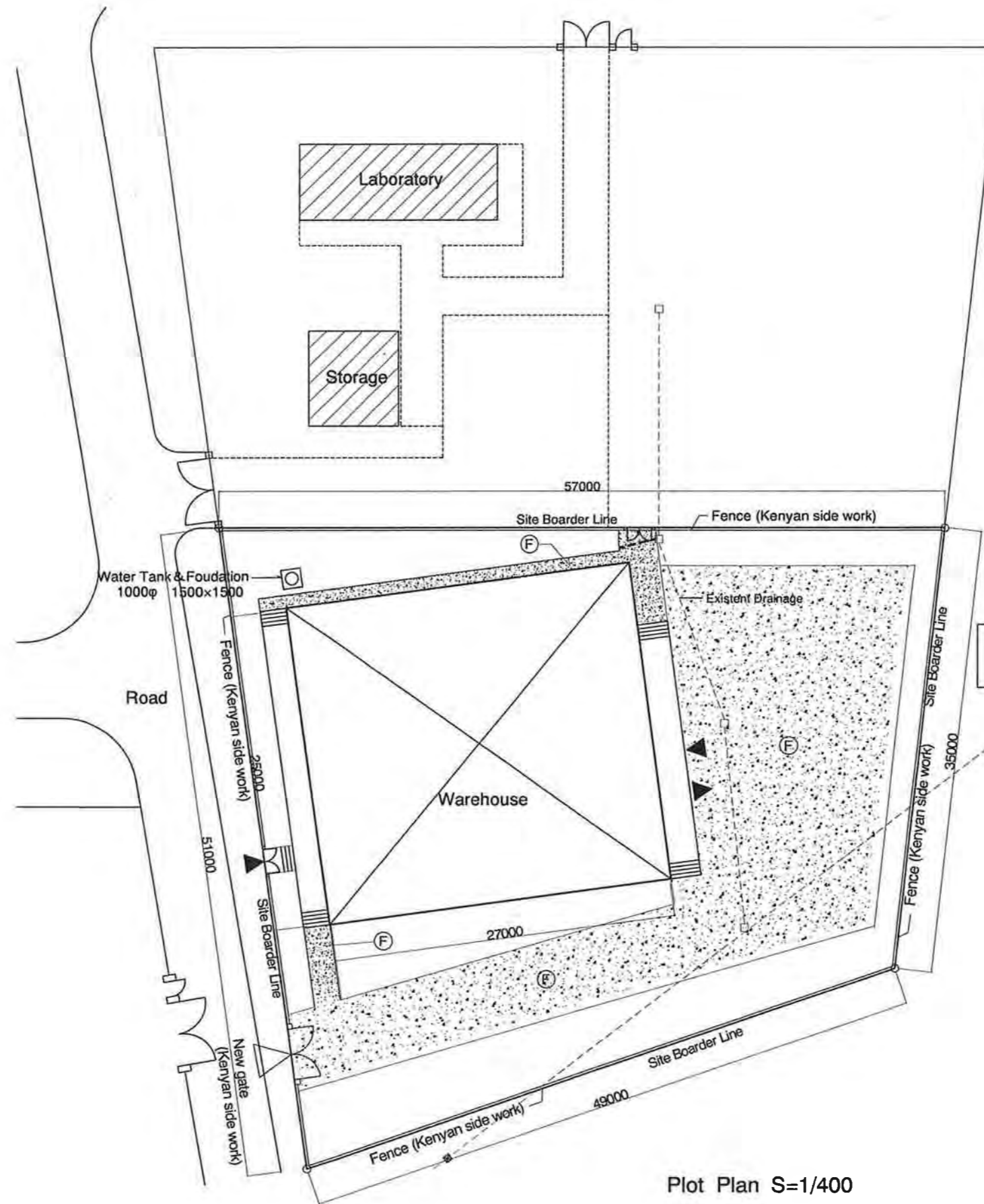
Scale
1:200



Generator Room



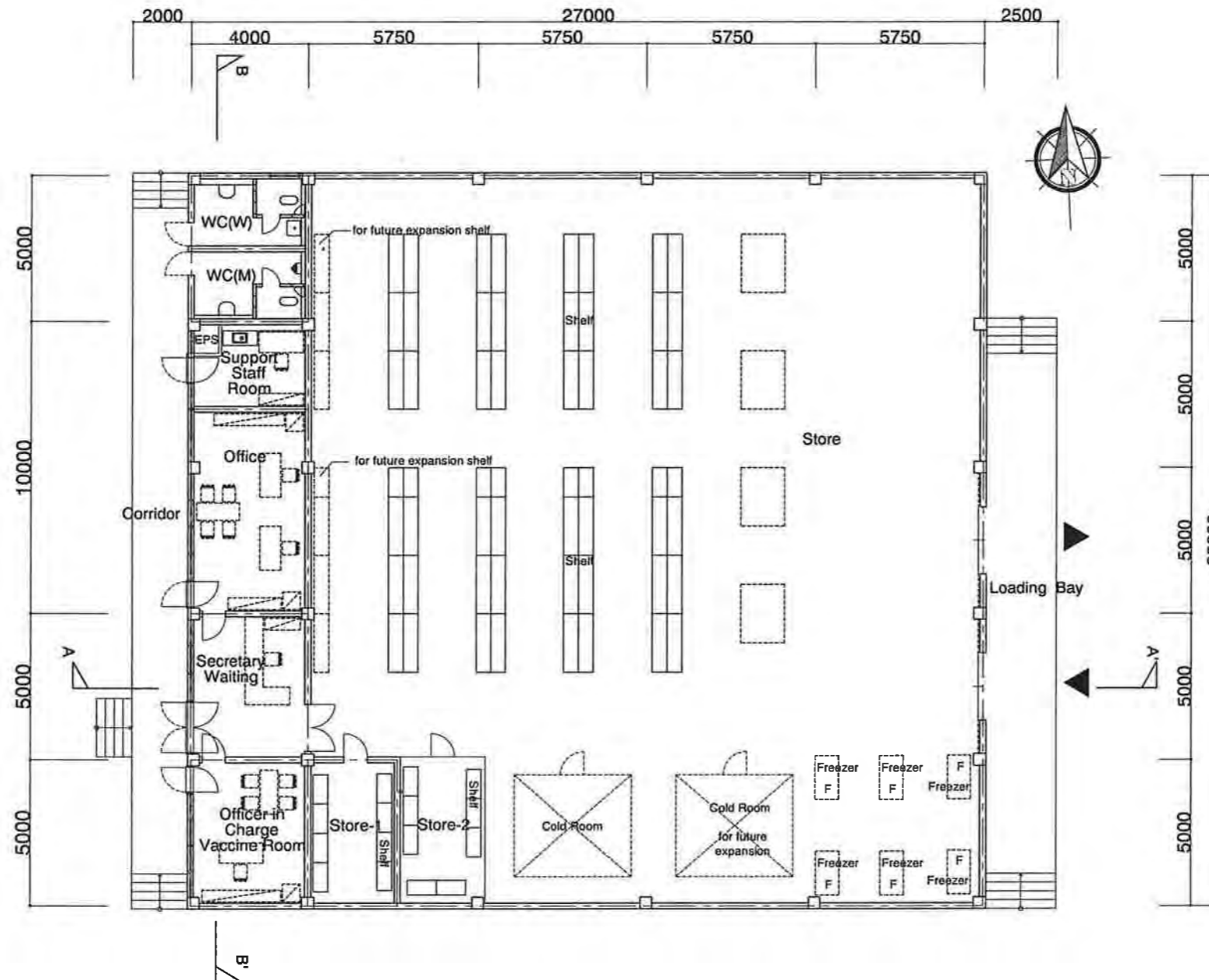
Disposal Space



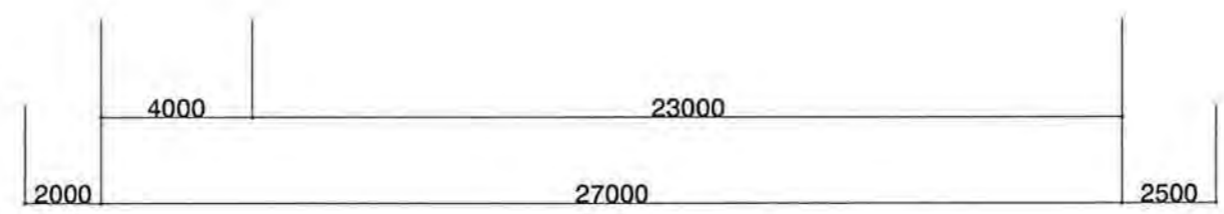
The Project Site
Area = 2170 (m²)

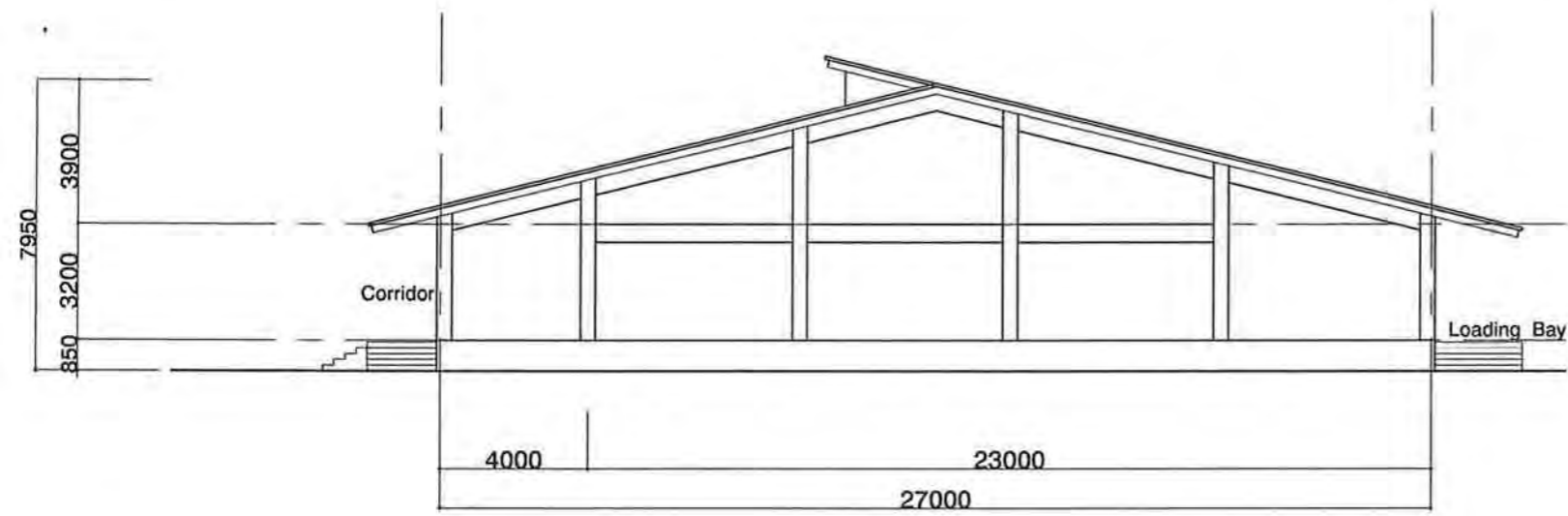
- Remarks:
- Fence (Kenyan side work)
 - ⊕ Concrete Pavement
 - ▨ The existing building

Plot Plan S=1/400

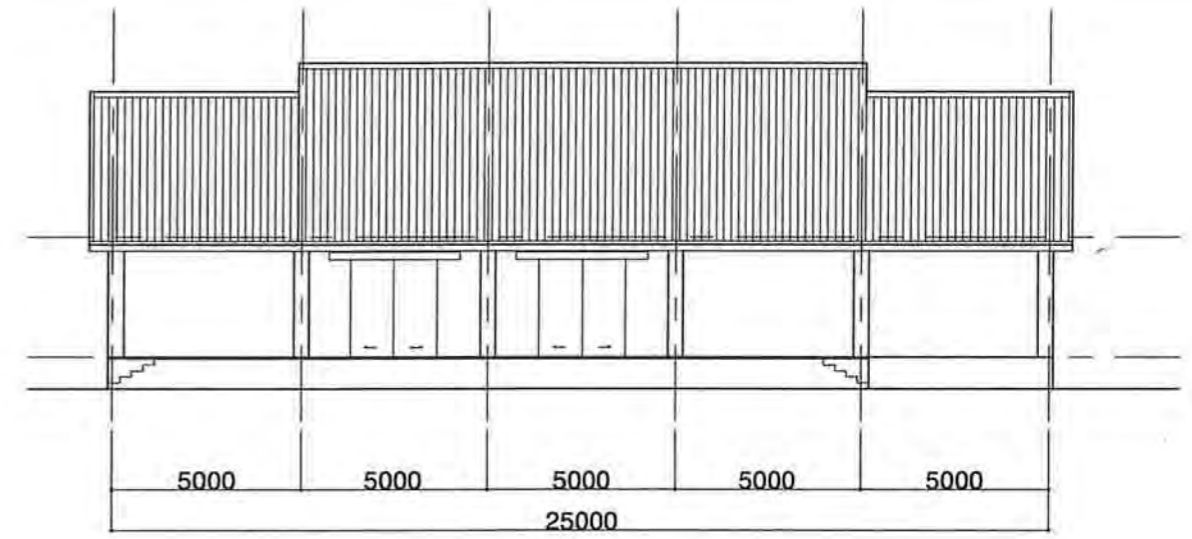


Floor Area = 675.00m²

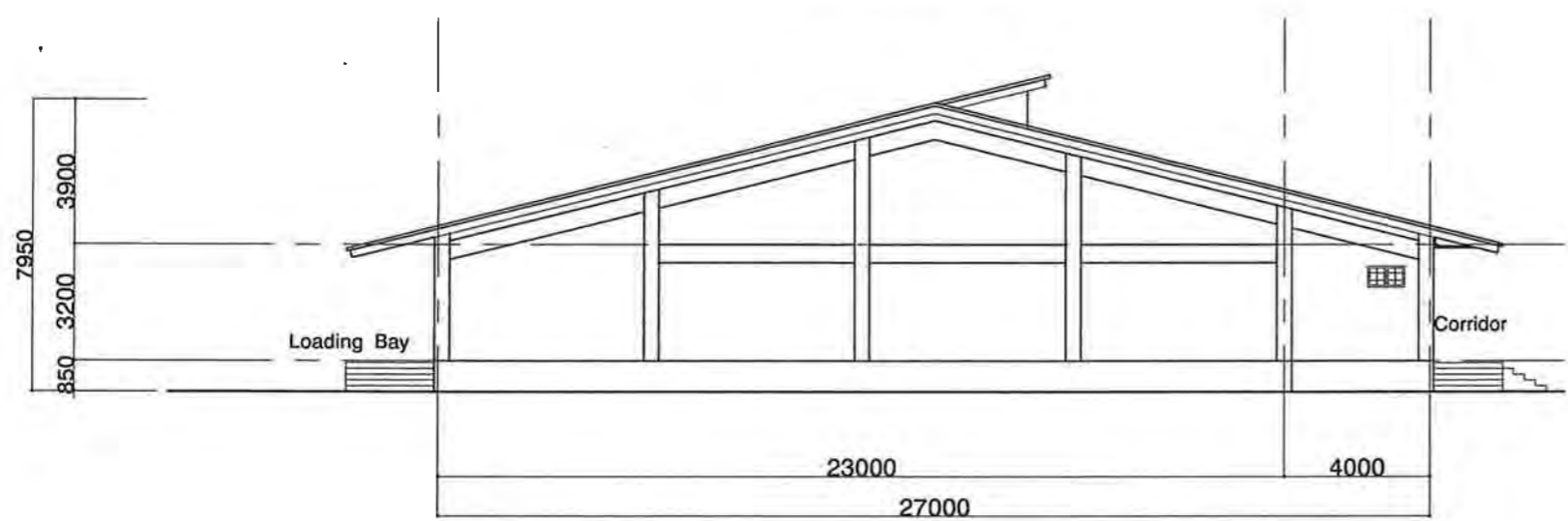




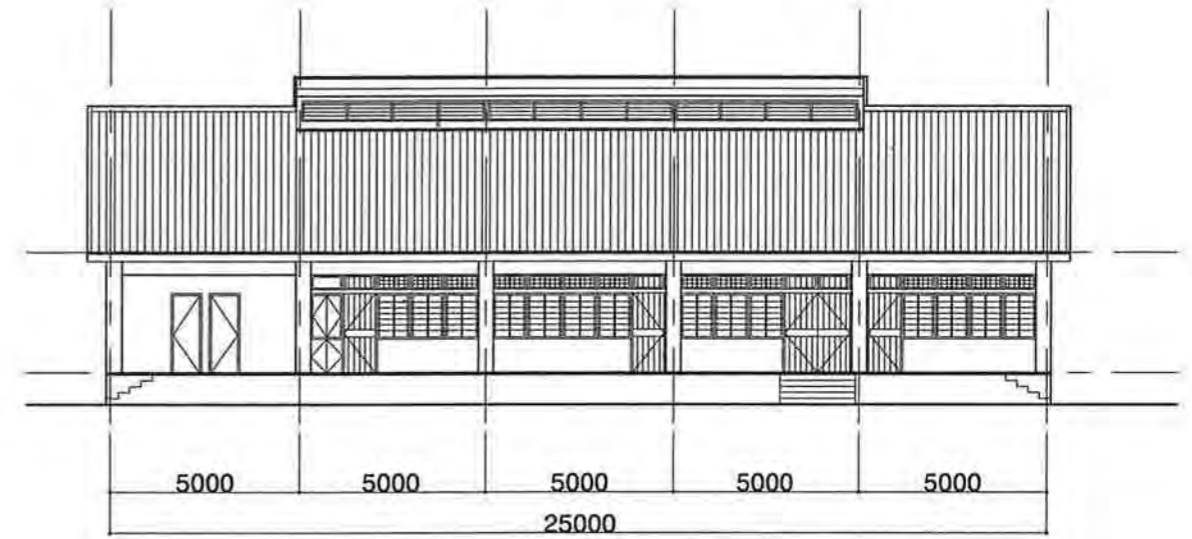
East Elevation



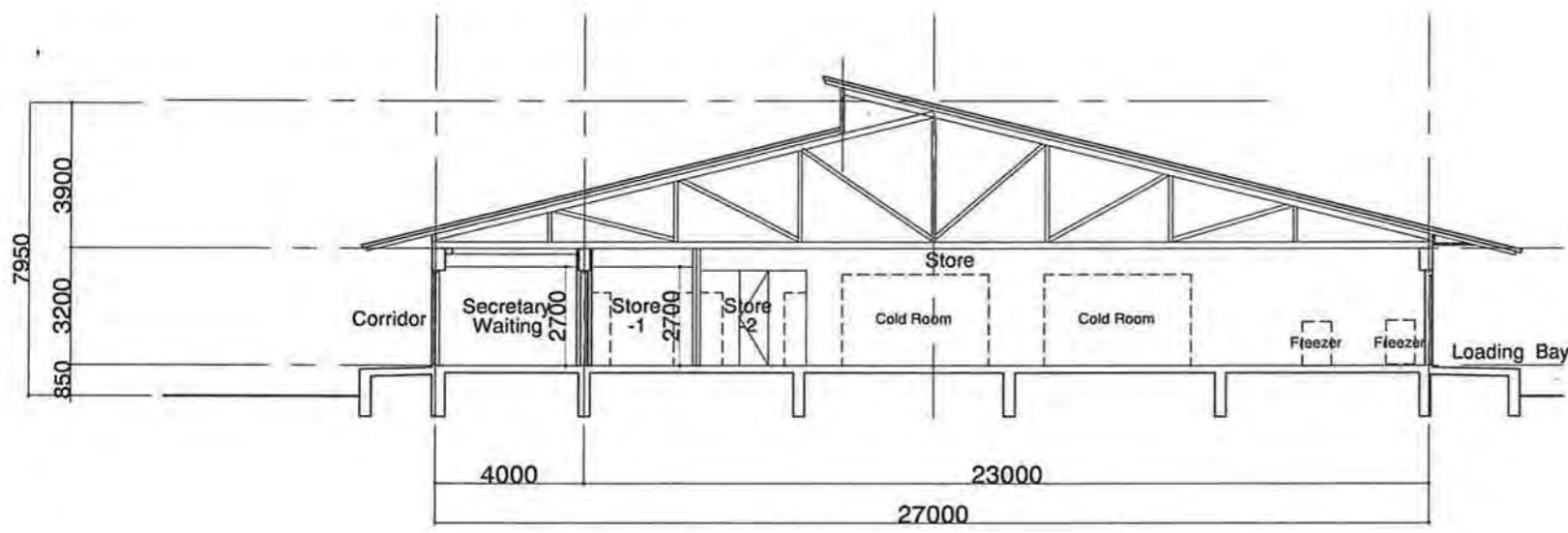
South Elevation



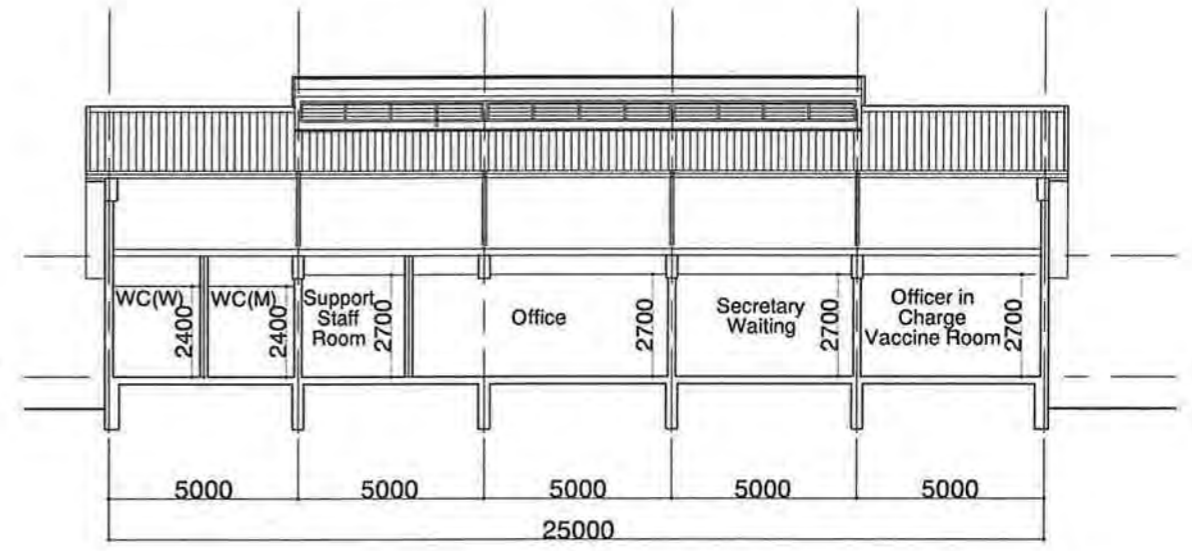
West Elevation



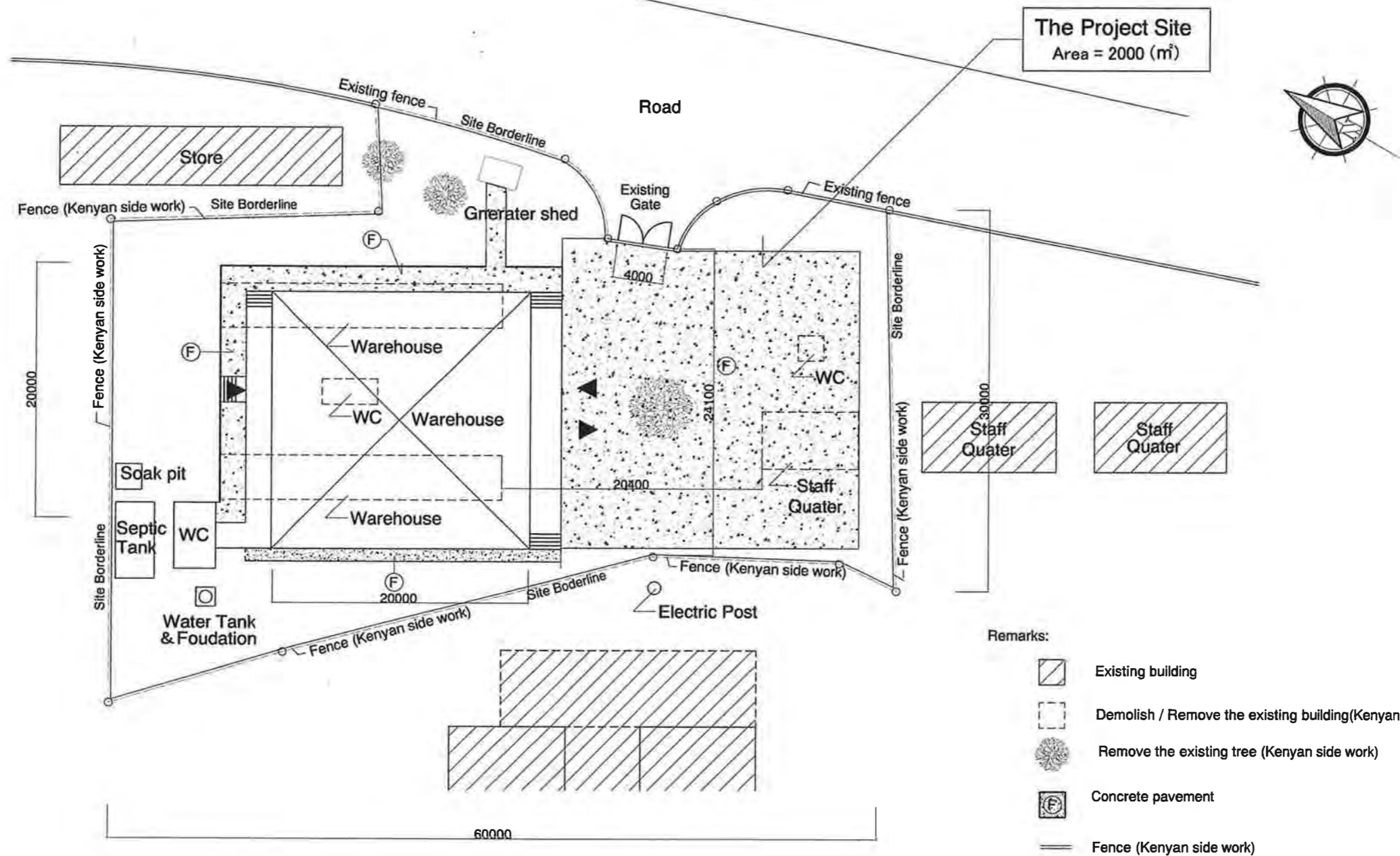
North Elevation



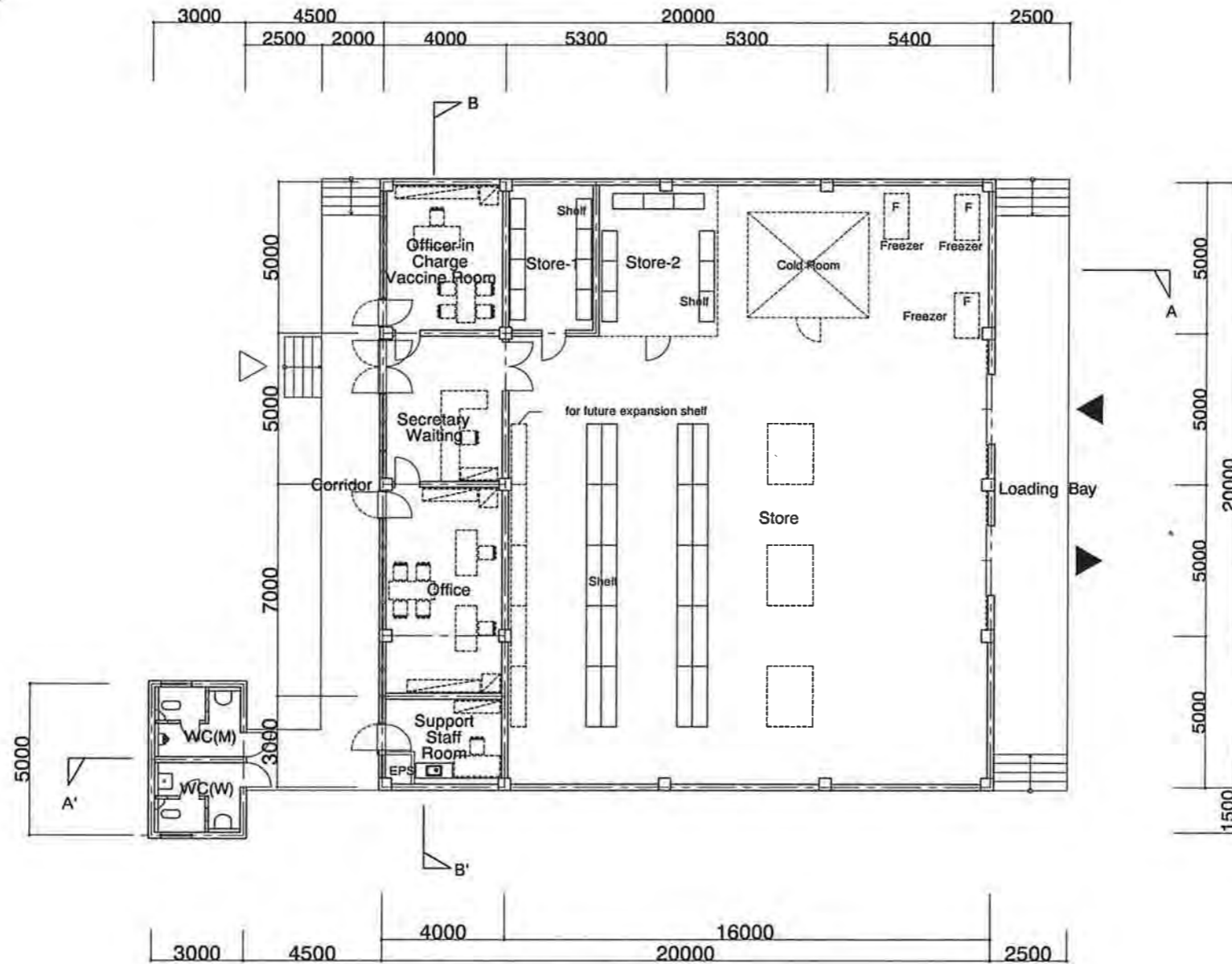
A-A' Section



B-B' Section



Plot Plan S=1/400



Floor Area = 415.00m²

Floor Plan



YOKOGAWA ARCHITECTS & ENGINEERS, INC.

THE PROJECT FOR THE REINFORCEMENT OF VACCINE STORAGE
IN THE REPUBLIC OF KENYA

Name of Drawing

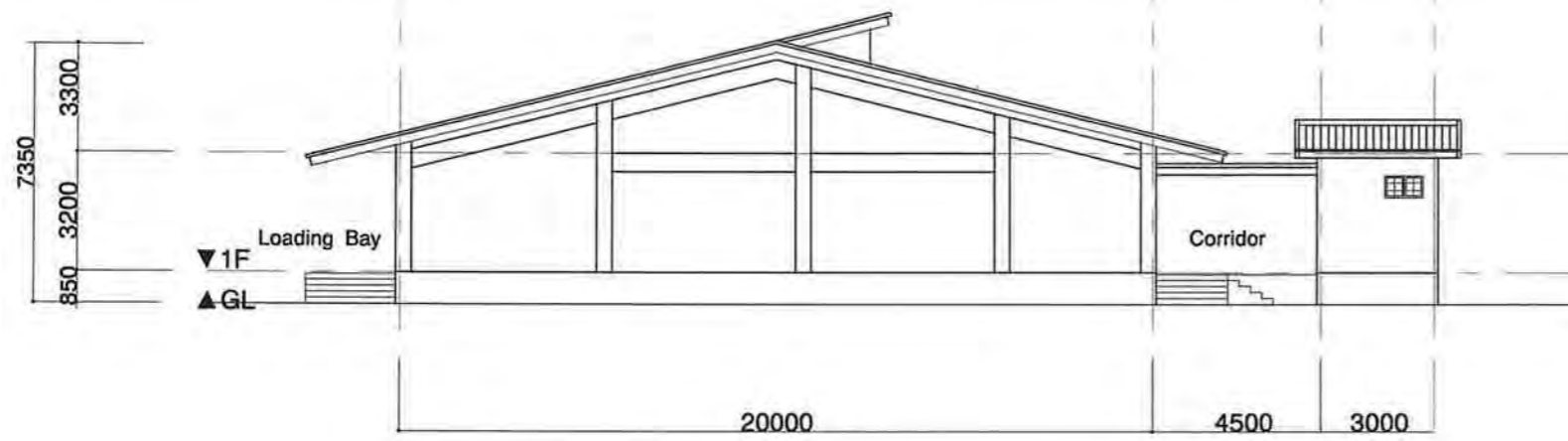
Meru Depot

Floor Plan

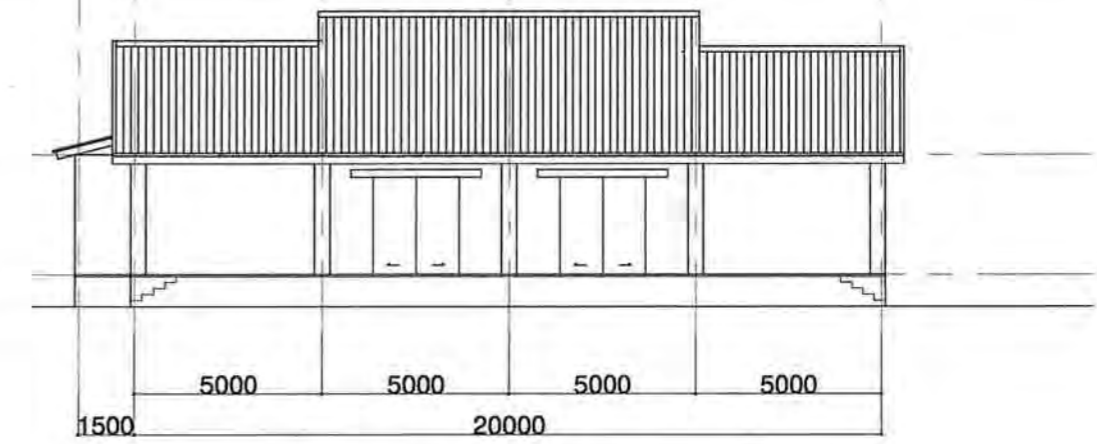
Number of Drawing

MA-02

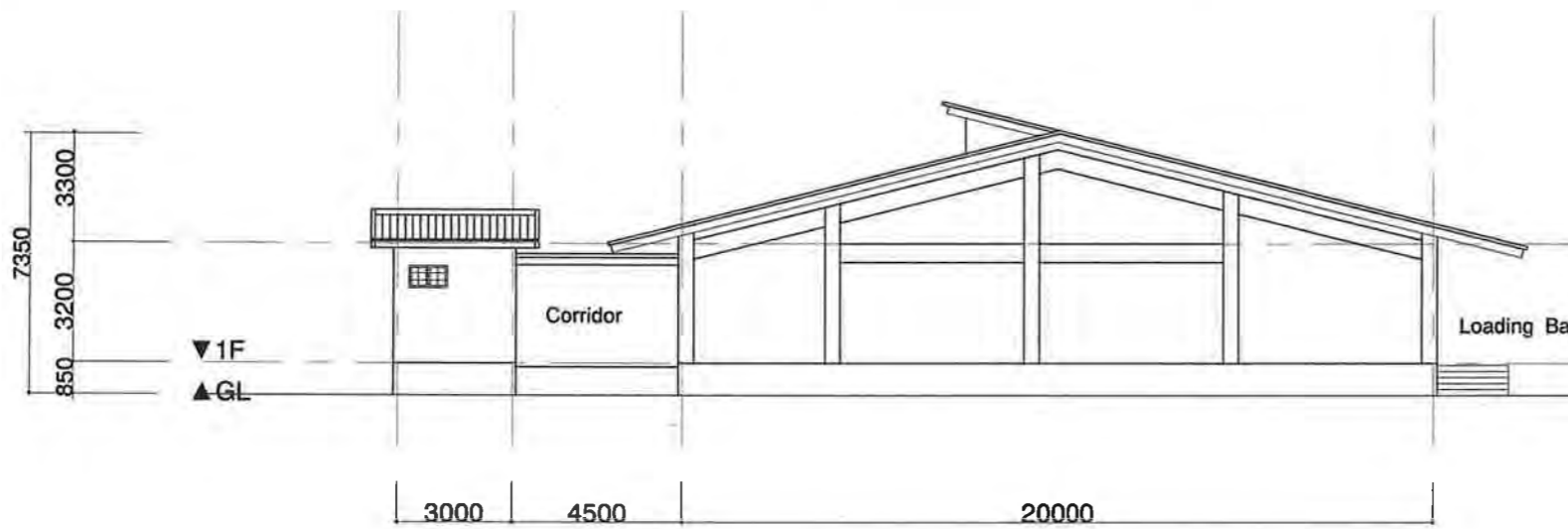
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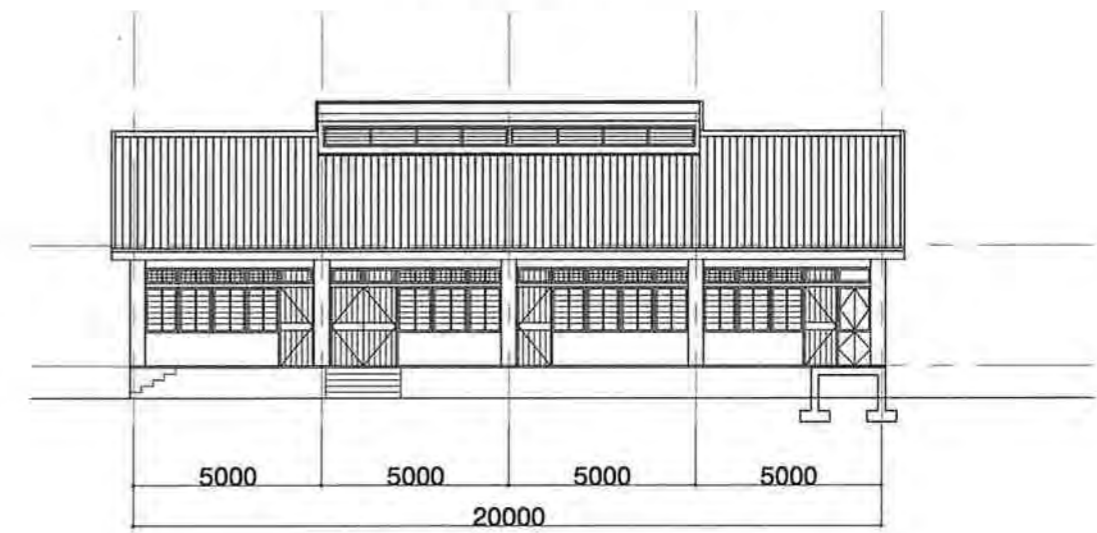
East Elevation



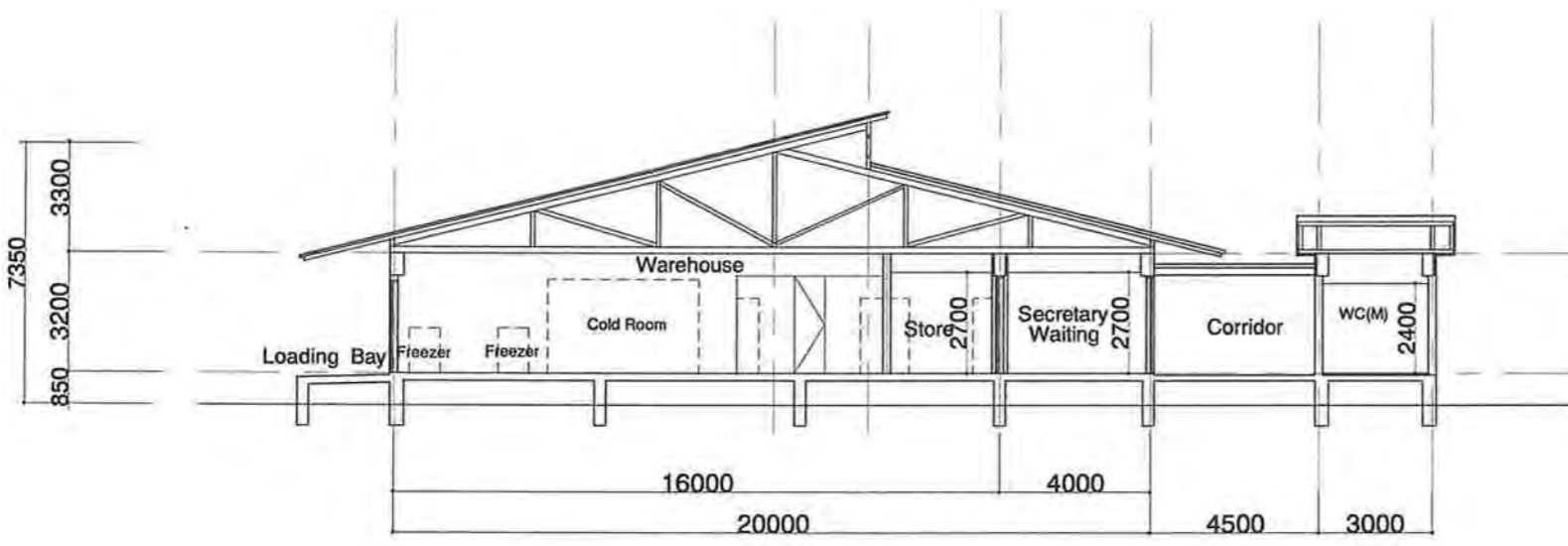
South Elevation



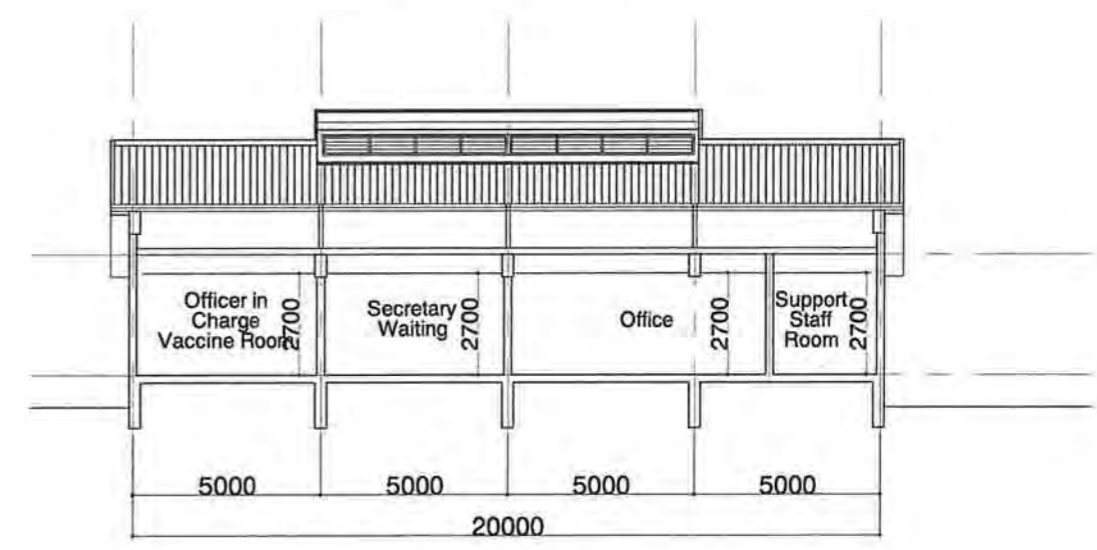
West Elevation



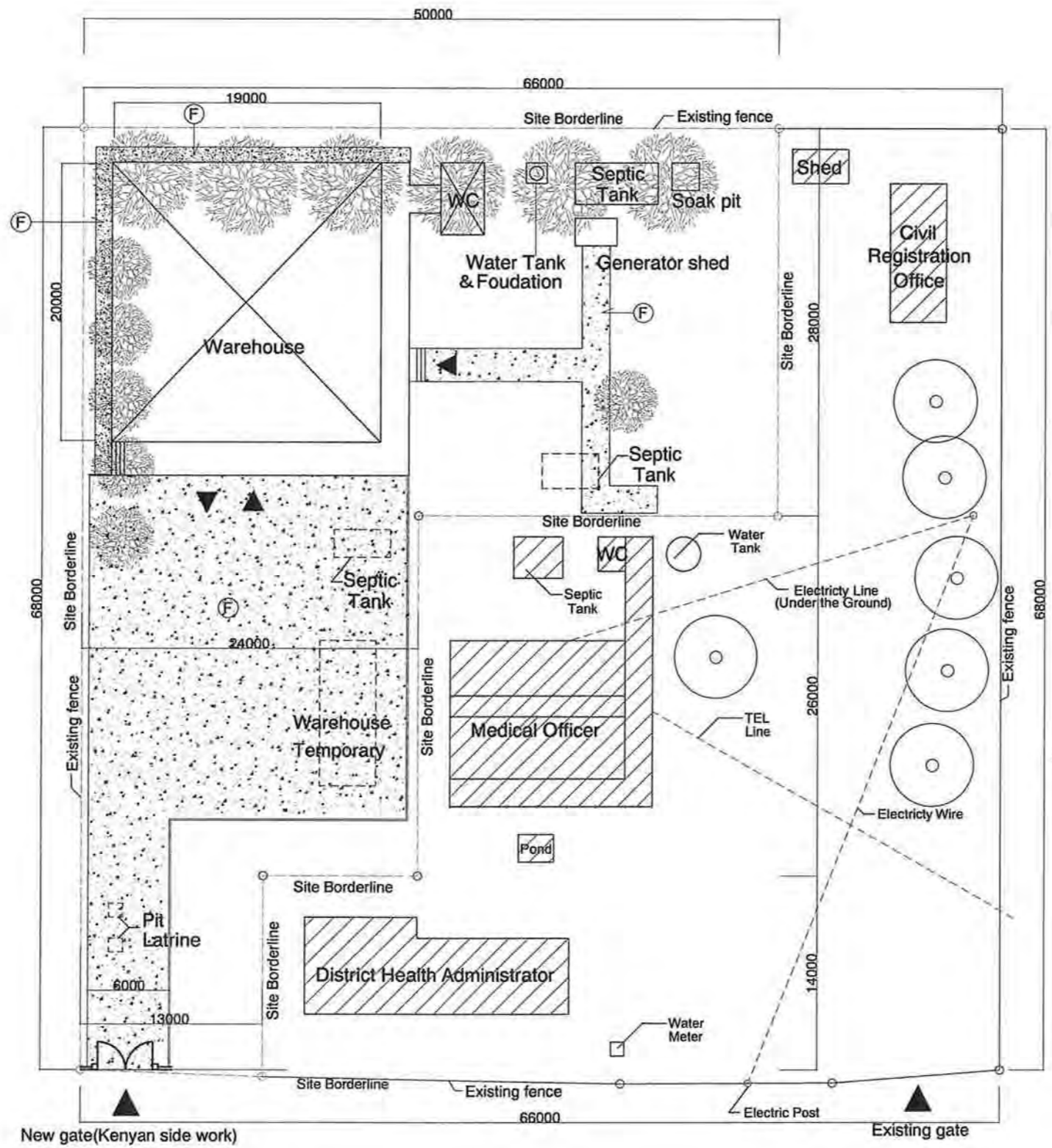
North Elevation








A-A' Section



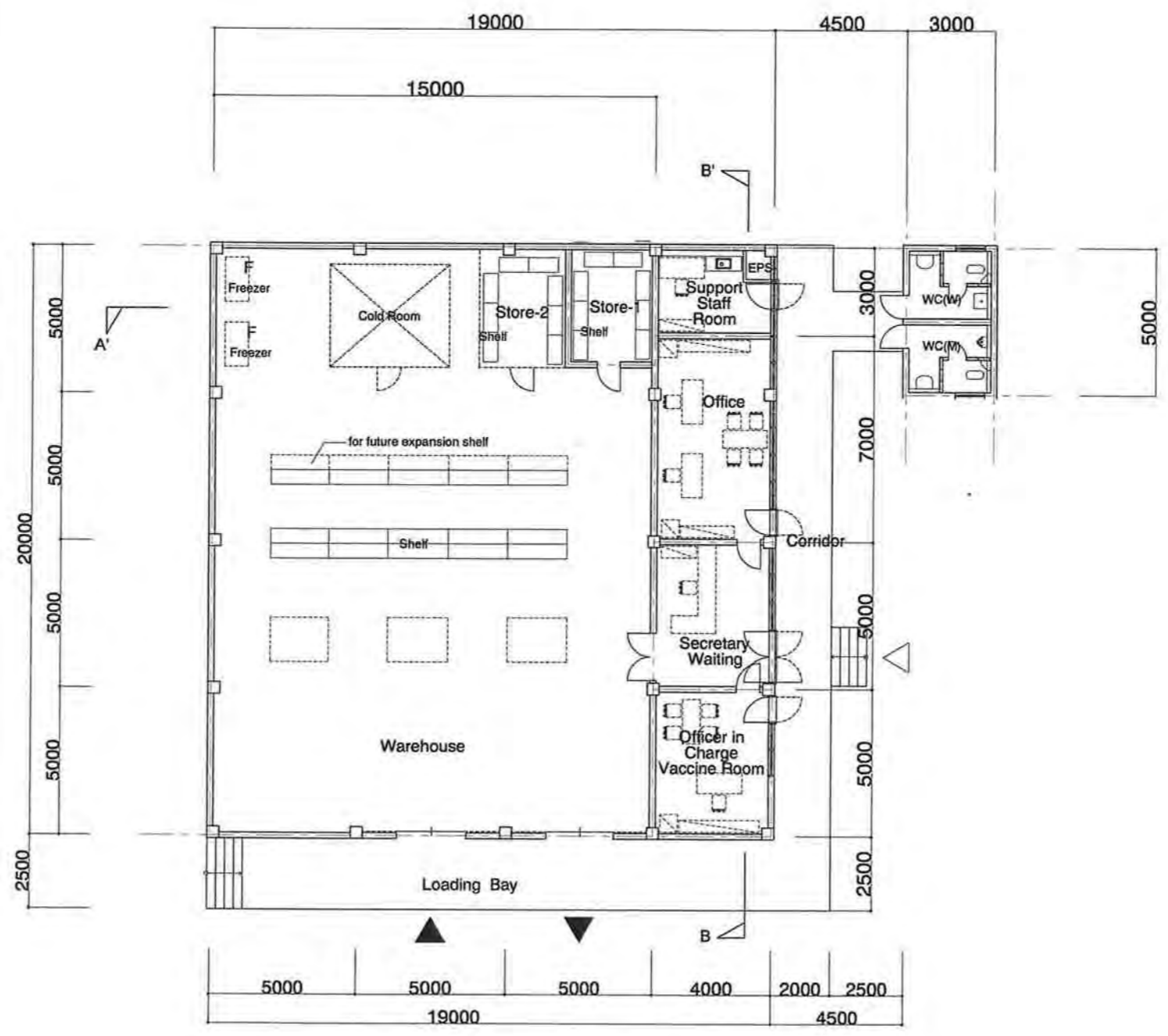
B-B' Section



The Project Site
Area = 2200 (m²)

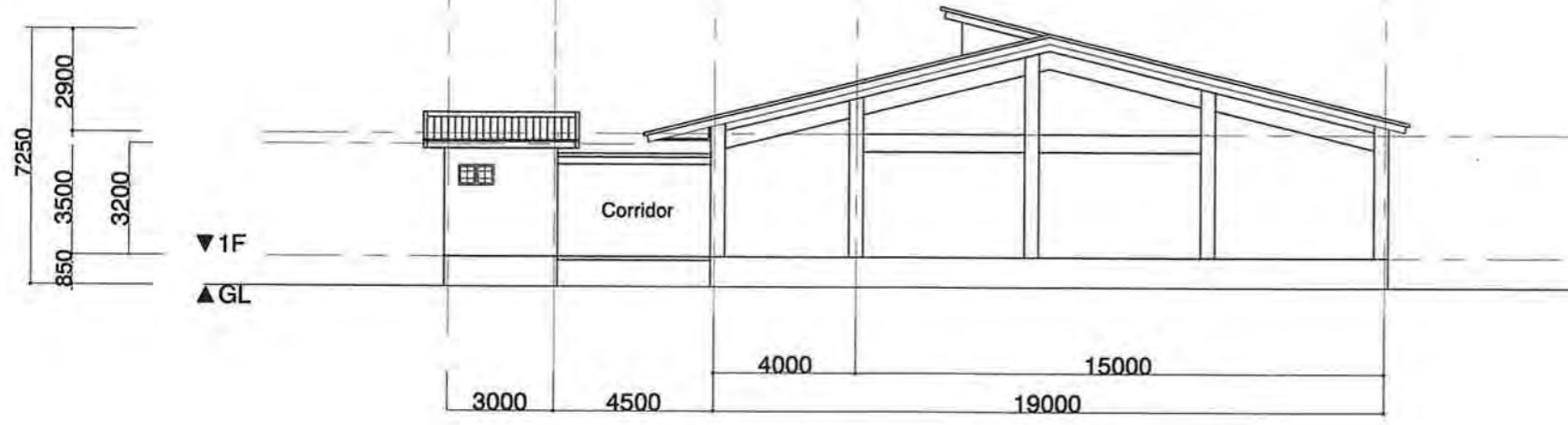
- Remarks:
-  Existing building
 -  Demolish/ Remove existing building (Kenyan side work)
 -  Remove the existing tree(Kenyan side work)
 -  Concrete Pavement
 -  Existing tree

Plot Plan

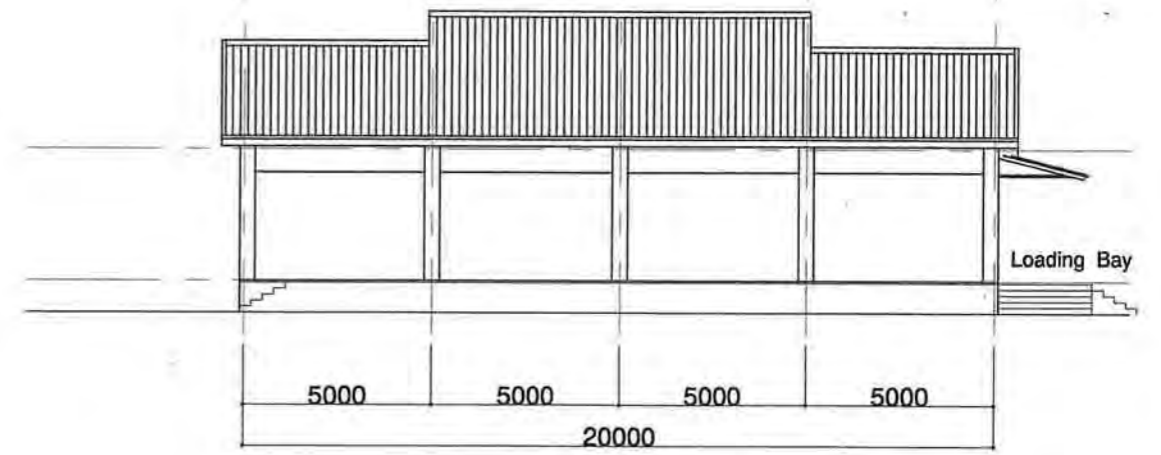


Floor Area = 395.00m²

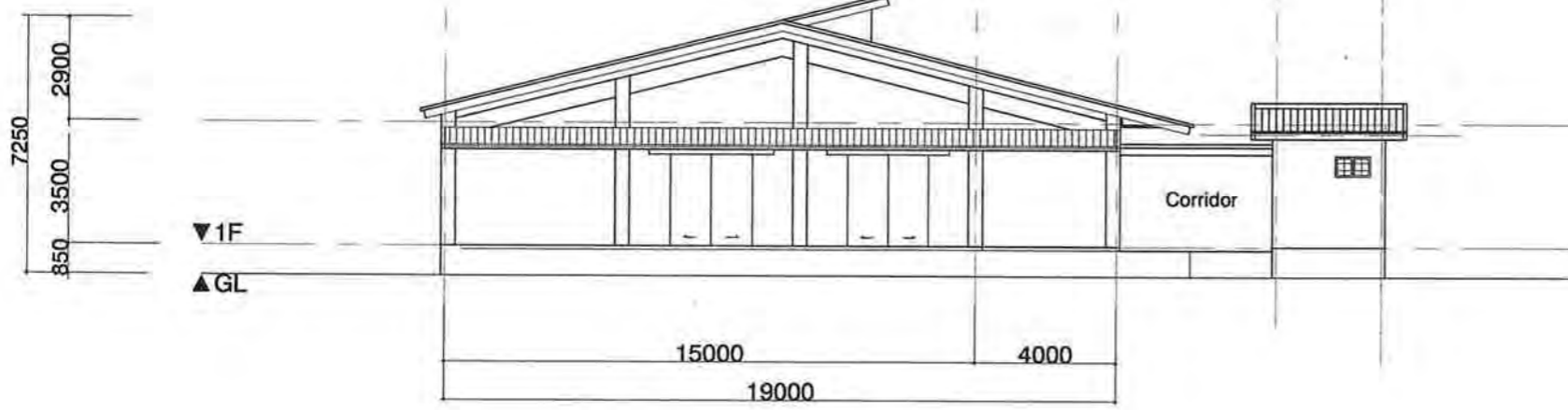
Garissa Depot



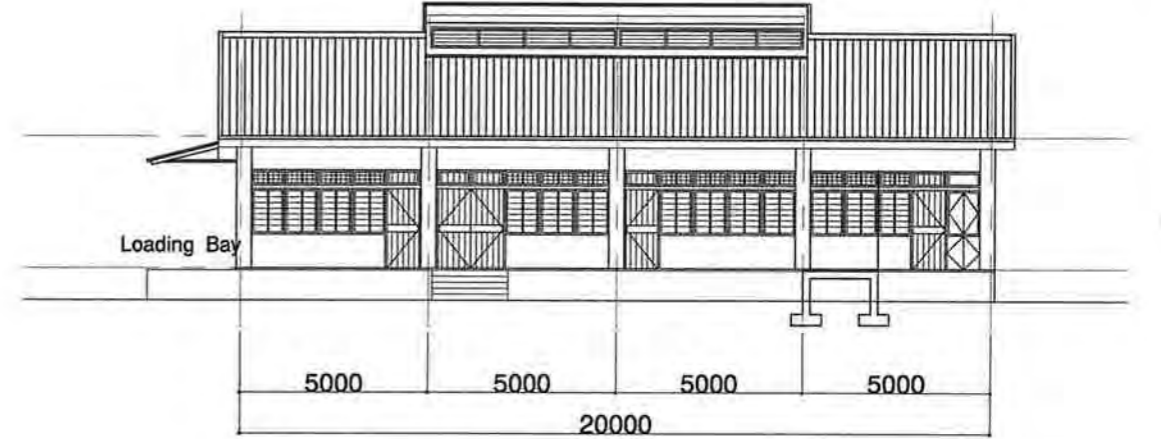
East Elevation



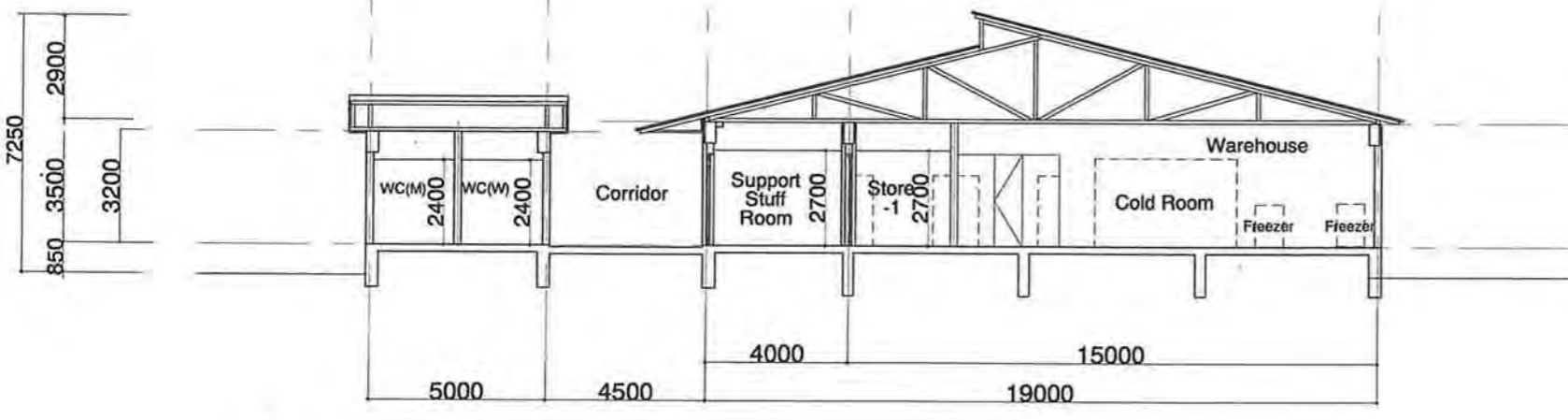
South Elevation



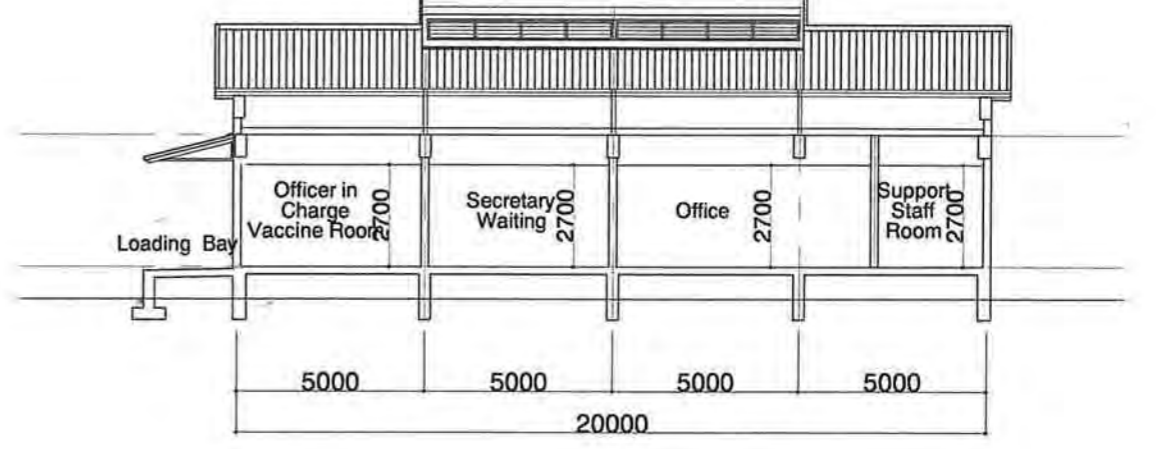
West Elevation



North Elevation



A-A' Section



B-B' Section

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The project consists of the construction of facilities at four vaccine depots in Nairobi, Meru, Kakamega and Garissa as well as supply and installation of equipment for nine vaccine depots. The work for which the Japanese side is responsible will be implemented in compliance with the Japanese Grant Aid scheme.

The project site for the Nairobi National Vaccine Depot is a rectangular lot (125m x 85m) in the premises of Kitengela Health Center in Kitengela City which is about 30 km southwest of Nairobi City. The land is a grass field having a slight slope from east to west. An embedded sewage pipe for a newly built hospital runs from south to west in the premises of the Center. The new national depot buildings will be situated to avoid this sewage pipe.

The project site for the Meru Regional Vaccine Depot is a lot situated in the east of the premises of Meru District Hospital and has a slight slope land. There are two warehouses, one staff dormitory and two toilet houses in the lot. Demolition of these buildings as well as felling and removal of trees in the center of the lot will be necessary.

The project site for the Kakamega Regional Vaccine Depot is a flat lot used as farm field which is situated in the south of the premises of Kakamega Provincial General Hospital. There are no remaining structures in the lot but rerouting of the embedded sewage piping which runs in the center of the lot will be necessary.

The project site for the Garissa Regional Vaccine Depot is a flat land situated in the north of the premises of a district office of MOPHS. There are a temporary warehouse, two temporary toilets and two septic tanks in the lot. Preparation of the land including demolition and removal of these structures according to the project schedule will be necessary.

The above-mentioned preparatory works including demolition and/or removal of existing buildings and structures at each site will be the responsibility of the Kenyan side. Prompt execution of these preparatory works will be necessary once the implementation of this project is officially approved.

The Kenyan side explained that these demolition and removal works would be undertaken before the commencement of the construction works of the project by the Japanese side. It is very important to elaborate the implementation plan to guarantee efficiency and safety during the construction work in consideration of the works to be undertaken by the Kenyan side. In addition, close coordination between the Kenyan side and the Japanese side should be maintained because the construction schedule of fences around the premises and planting work by the Kenyan side is assumed to coincide with the construction works by the Japanese side.

Once the project is approved at the Cabinet meeting in Japan, the Exchange of Notes (E/N) is signed and the Grant Agreement (G/A) is signed regarding the implementation, the project will be officially implemented. After the signing of E/N and G/A, the implementation organization of the Kenyan side and the Japanese consultant will conclude the consultant agreement, and the project

will enter the detailed design stage. Following completion of the detailed design, tenders will be called to the Japanese construction companies for construction and to the Japanese equipment suppliers for the supply and installation. The successful consultant and successful contractors will carry out their respective works according to the following principles.

(1) Implementing Agency

The responsible agency and implementing agency for this project is MOPHS of the Government of Kenya. DVI of MOPHS is regarded as the ultimate user unit of the project.

(2) Consultant

When the E/N and G/A are concluded, the Japanese consultant will, conforming to the Japanese Grant Aid scheme, enter into a consultant agreement with the implementation organization of the Kenyan side, and will then be responsible for the following services under this agreement:

1) Detailed design

Finalization of the component plan, preparation of the detailed design documents (drawing, specifications and other technical documents concerning the facilities and equipment to be included in the project, and tender documents), assistance including the tender evaluation and contract conclusion for construction work and supply and installation of the equipment.

2) Supervision of the work

Supervising the contractor in construction work as well as supervising the supplier in supply, installation, orientation for operation and instruction for maintenance of the cold chain equipment.

The detailed design involves determining the details of the architectural and equipment plans according to the Preparatory Survey Report, and to compile the tender documents that will include the specifications, tender conditions, draft conditions of contracts for construction and equipment supply and installation. The estimation of construction and equipment costs is also included in the detailed design.

The tender assistance includes attendance to the tendering for the selection of the construction contractor and the equipment supplier by the implementing agency, the execution of the required procedures for concluding each contract, and reporting to JICA, etc. The supervision of the work involves ensuring that the contractors have effectively carried out the construction or equipment supply and installation work in accordance with the contractual terms, and to confirm that they have properly met their contractual obligations. For the successful completion of the project, the consultant will, from a true and fair perspective, extend advice and instructions, and coordinate the persons concerned. Specifically, the supervisory services of the consultant include the followings:

- i) Review and approval of the work program, shop drawings, equipment specifications and other documents prepared and submitted by the construction contractor and the cold

chain equipment supplier.

- ii) Inspection and approval of the construction machinery and materials, and pre-shipment inspection and approval of the quality, quantity and performance of equipment.
- iii) Confirmation of the delivery and installation of equipment for the facilities and medical equipment, and their operation manuals.
- iv) Supervision of the work progress and reporting.
- v) Final inspections of the facilities and medical equipment, and attendance during the handover.

In addition to the aforementioned services, the consultant will report to the Japanese authorities concerned regarding the progress of the project, payment procedures, completion of the project and handing-over, etc.

(3) Construction Contractor and Equipment Supplier

Based on the contract, the construction contractor will construct the facilities, and the equipment supplier will procure, supply and install cold chain equipment. They will also give technical instructions to the Kenyan side concerning the operation and maintenance of the supplied equipment. Once the equipment is handed over, the equipment supplier will, in cooperation with the agency of the equipment manufacturers, support the continuous supply of spare parts and consumables for major equipment during the guarantee period, either free of charge or on a chargeable basis.

(4) Japan International Cooperation Agency

JICA will supervise the progress of the project to ensure that it will be properly implemented in compliance with the Grant Aid scheme.

(5) Implementation plan

During the detailed design period, the Kenyan implementing agency and the Japanese consultant will examine the project implementation plan. This examination includes identification of the scope of works of each party, confirmation of the commencement date and method of work, and work-related discussions by each individual party so that the work can be conducted efficiently based on the schedule specified in the Preparatory Survey Report. In special, the preparation work by the Kenyan side, including the demolition and removal of obstacles in the site grounds, should be carried out before the construction work of the project by the Japanese side. In addition, close coordination between the Kenyan side and the Japanese side should be maintained because the construction schedule of fences around the premises and planting work by the Kenyan side is assumed to coincide with the construction works by the Japanese side.

2-2-4-2 Implementation Conditions

(1) Observations for Construction

The following matters should be observed during the project construction, and the work execution program should be planned to take these observations into consideration.

1) Management of work schedule

The construction work will consist of the construction of facilities for the Nairobi National Vaccine Depot and three Regional Vaccine Depots at Meru, Kakamega and Garissa. The construction period of Nairobi National Vaccine Depot is expected to extend over the longest period of time. In comparison of the size of facilities, the construction period of the Regional Vaccine Depots is assumed to be about a half of that of the Nairobi National Vaccine Depot. Moreover, the construction period and zone will be carefully examined in consideration of various factors like the travel distance between the Nairobi National Vaccine Depot to each regional site, for the purpose of systematic planning and management of work schedule.

2) Safety management

Elaborate management and coordination will be necessary among the Kenyan side, the consultant and the contractors for each project site. The project sites at Meru and Kakamega are located in the premises of hospitals. The work areas will be enclosed using temporary fences so that the construction works and/or vehicles may not adversely affect the operation of hospitals and safe passage of hospital staff, patients and visitors. Similarly, the project site at Garissa will be separated from the District Office of MOPHS and the Civil Registration Office with temporary fences to secure safety of their staffs and visitors.

(2) Observations for Equipment Procurement

Installation planning of cold rooms, freezer rooms and a cold room / freezer room temperature monitoring system at the Nairobi National Vaccine Depot needs coordination with the facility planning. The drain system and electric power supply system necessary for the equipment in the cold rooms and freezer rooms will belong to the scope of construction. Installation of externally mounted condensing unit and refrigerant piping system including pipe hangers and wall penetration sleeves between this condensing unit and the cold rooms / freezer rooms will be planned under the equipment work of this project.

The cold room / freezer room temperature monitoring system requires installation of temperature sensor cables between the main unit to be located in the Workshop and the cold rooms and freezer rooms in the Warehouse. The piping work to lay the temperature sensor cable work will belong to the building construction work while the installation of sensor cable will belong to the equipment work.

2-2-4-3 Scope of Works

The project will be implemented in the form of collaboration between Kenya and Japan. When the implementation of the project by the Japanese Grant Aid is approved, the two governments will share the responsibilities of works as follows:

(1) Undertakings by the Japanese Grant Aid

The Japanese side will undertake the following tasks concerning consultation of the project, construction of the facilities and supply/installation of the equipment by the Grant Aid.

1) Consultant service

- a) To develop the detailed design documents for the facilities and equipment to be provided through the project, and to prepare the terms of tender
- b) To assist in the selection of contractors for construction work and supply/installation of the equipment, and the conclusion of contracts with them
- c) To supervise the construction work as well as supply, installation, instructions/training for operation and instruction for maintenance of cold chain equipment

2) Construction work and supply/installation of cold chain equipment

- a) To construct the project facilities and to do exterior and infrastructure work within the project sites
- b) To purchase, transport and deliver construction materials and equipment as well as cold chain equipment
- c) To install the equipment to be supplied and implement their adjustment through trial operations
- d) To instruct and train in the operation and maintenance of the equipment

(2) Undertakings by the Government of Kenya

The Kenyan side will undertake the following tasks concerning formalities and preparatory construction works.

1) Formalities

- a) Expropriation of land for the construction site
- b) Exemption of domestic tax
- c) Exemption of customs duties, support for prompt customs clearance and other facilitations for the materials and equipment imported from Japan or third countries
- d) Acquisition of the contract permit and other permission required for implementation of the project
- e) Application for connecting the public infrastructure systems (electricity, water supply, telephone lines, etc.)
- f) Intake of temporary electric power and water supply for the construction works
- g) Issuance of the banking arrangements and the authorization to pay
- h) Facilitation of formalities necessary for the Japanese nationals to enter/exit and stay in

Kenya for the accomplishment of their services

- i) All the costs except for those to be borne by the Japanese side

2) Works

- a) Site preparation work All the sites
- b) Demolition of the existing buildings Meru, Garissa
- c) Planting All the sites
- d) Relocation of the existing cold rooms and freezers Meru, Kakamega, Garissa
- e) Procurement of office equipment and furniture All the sites
- f) Exterior and infrastructure works other than those under the Japanese responsibility All the sites
- g) Connection of infrastructure (electricity, water supply, sewage, telephone) systems All the sites
- h) Construction of fences and gates All the sites

2-2-4-4 Consultant Supervision

(1) Facility Construction Supervisory Plan

1) Supervisory principles

For the prompt and proper accomplishment of the services, the consultant will organize a project team to pursue the detailed design and supervisory work based on the outline design, in compliance with the Grant Aid scheme. The supervisory principles of the project are as follows:

- a) The consultant will maintain close communication with the authorities concerned in both countries in order to avoid delays in the progress and completion of the construction work as well as the equipment supply/installation work.
- b) The consultant will maintain a fair standpoint, and will promptly extend appropriate instructions and assistance to the contractors during construction and equipment work.
- c) After confirming that the construction and equipment supply/installation work is completed in compliance with the contractual terms, the consultant will witness the handing over of the facilities and equipment. The services of the consultant will be completed when the work is accepted and approved by the Kenyan side.

2) Supervision of construction works

Some of the works under the Kenyan responsibility will have to be done before the commencement of the works by the Japanese side while other works are scheduled to be done simultaneously or after the works by the Japanese side.

A Japanese resident representative of the consultant (an architect) will be posted at the site to supervise the construction works, in consideration of the importance of coordination among the Kenyan side, the Japanese contractors and the Kenyan contractors, In addition, the

following engineers will be sent to the site as necessary during the work period.

- Supervision of works (Supervisory manager: presence at the commencement of construction work, entire management, schedule coordination, final inspection before completion)
- Supervision of works (architecture: construction methods, materials and specifications)
- Supervision of works (structural engineering: supporting ground, foundation work, framing work)
- Supervision of works (electrical work: incoming power and transformer, electric apparatus, final inspection before completion)
- Supervision of works (mechanical work: intake system, plumbing systems, final inspection before completion)

(2) Equipment Supervisory Plan

The consultant will conclude a consultant agreement with the Kenyan implementing organization on consultation service of detailed design, supervision of the equipment to be supplied and installed in this project. The purpose of equipment supervisory service is to ensure proper implementation of the contract, including supervision of the equipment supplier to accomplish equipment work in compliance with the design documents. During the equipment supply and installation period, the consultant will be responsible for quality management and work supervision through instructions, advices and adjustment of the work.

1) Assistance in tendering and contract stage

Preparation of tender documents for equipment supply and installation, tender notice, reception of application documents, examination of qualification, delivery of tender documents, examination of tenders, evaluation of the result of tender, assistance in contract negotiations for conclusion between the contractor and the Kenyan implementing organization.

2) Instructions, advice and coordination to the contractor

Examination of the equipment supply schedule, advice and coordination to the contractor in terms of prompt application for import permission, etc.

3) Confirmation of the equipment

Confirmation of the equipment to be procured by the contractor in conformance with the contract documents.

4) Examination of the equipment

Presence at the shop test and inspection of the equipment, quality check and performance test, if necessary.

5) Progress report

Supervision of procurement and installation progress, reporting to the authorities concerned of Kenya and Japan.

6) Final inspection

Inspections when the installation of the equipment is completed to confirm the quality and performance required in the contract documents are achieved, reporting the result of inspections to the Egyptian implementing organization.

(3) Project Implementation Diagram

The consultant will form a project team to conduct the above-mentioned services in Japan and Kenya.

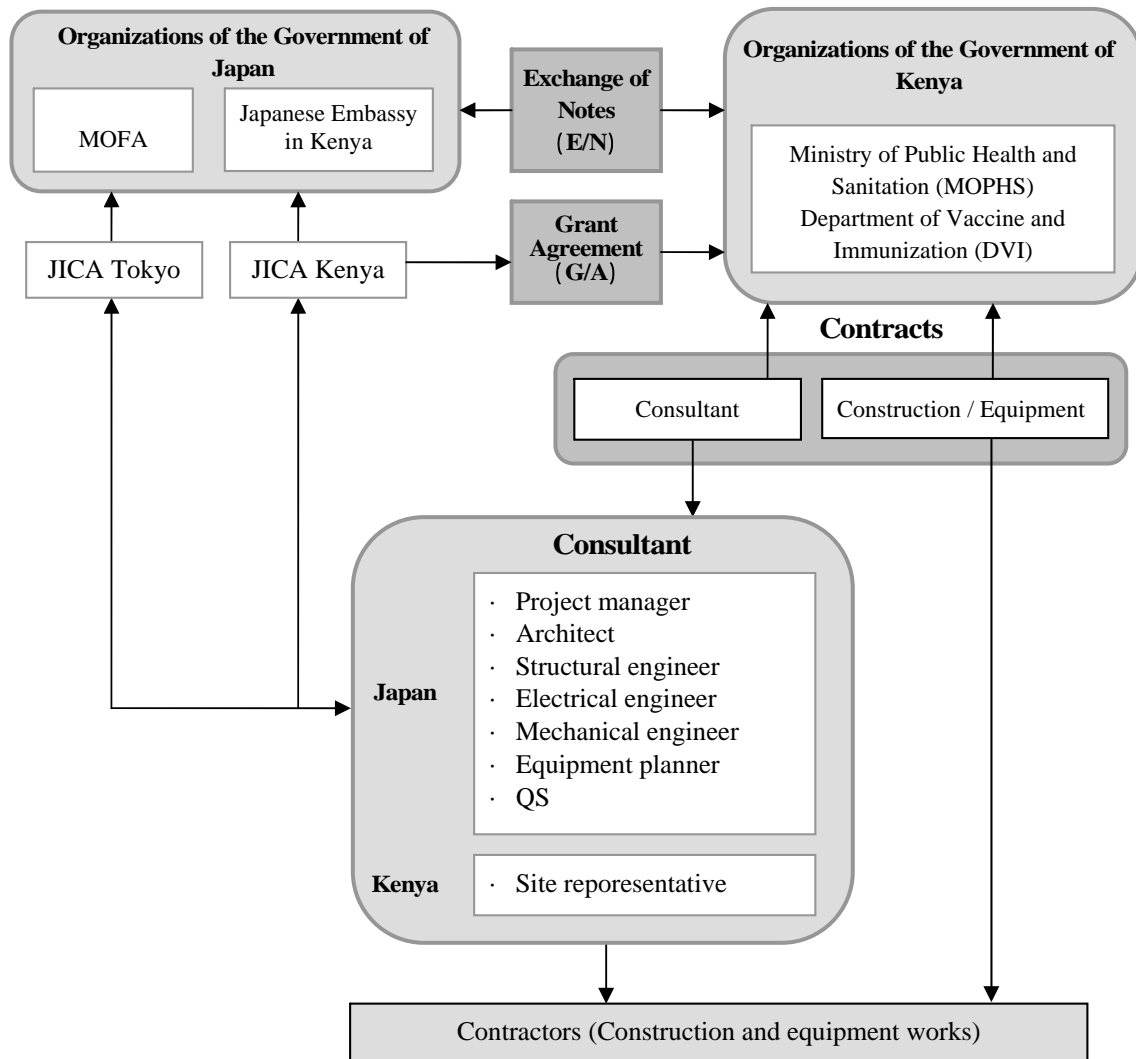


Figure-6 Project Implementation System Diagram

2-2-4-5 Quality Control Plan

The site representative of the consultant will inspect the quality of construction materials when they are delivered to the site. The required test items for quality control will be clarified in the particular specifications.

- The bearing strength of the soil will be tested at site in the presence of the structural engineer.
- The quality of reinforcement bars will be inspected at each delivery lot with the product test report of the fabricator (mill sheets).
- Concrete will be made in compliance with the Kenyan standards (British Standards). In principle, the slump test and test piece sampling will be done at least once per placing section, once a day, and once for each 100 m³ and its fractions of concrete.
- The compressive strength of concrete and tensile strength of reinforcement bars will be conducted as follows:

Nairobi site: Commissioned to a public testing laboratory in Nairobi City

Regional sites: There are no local laboratories capable of concrete compressive strength tests: commissioned to a testing laboratory in Nairobi City by sending test pieces, or tested at the site by installing a portable compressive tester.

2-2-4-6 Procurement Plan

(1) Construction Materials

Most of the construction materials are available in Kenya, and in principle, all the materials will be purchased locally.

Table-9 Procurement of Products and Materials

Materials and Equipment	Market in Kenya		Procurement Countries		
	Situation	Import	Kenya	Third countries	Japan
(Construction materials)					
1. Aggregate (sand, crushed stone)					
2. Cement					
3. Reinforcement bar					
4. Brick					
5. Plywood, lumber					
6. Floor / wall tile					
7. Wooden door and window sash					
8. Steel door and window sash					
9. Aluminum door and window sash					
10. Finishing hardware					
11. Glass					
12. Paint					
13. Work table, sink unit					
14. Folded plate for roofing					
15. PVC flooring material					
16. Sealant, waterproofing agent					

Materials and Equipment	Market in Kenya		Procurement Countries		
	Situation	Import	Kenya	Third countries	Japan
(Utility appliances and materials)					
1. Wire, cable					
2. 15KV cable					
3. PVC conduit, hardware					
4. Steel pipe					
5. Light					
6. 10KV switch panel					
7. Transformer					
8. Generator					
9. Cable rack					
10. Switch panel, distribution panel, control panel					
11. Automatic fire alarm					
12. Telephone system					
13. Nurse call	×				
14. PVC pipe (plumbing)					
15. SGP pipe (water supply)					
16. Pump					
17. Sanitary ware					
18. Boiler system					
19. FRP water reservoir tank	×				
20. Boca de riego de fuego					
21. Fire hydrant					
22. Air conditioner					
23. Wall mounted pressure fan	×				

(2) Equipment

Cold rooms and freezer rooms that are principal equipment to be provided in this project are also manufactured in Kenya, and these domestic products will be also considered in this project. In selection of the equipment that needs spare parts and consumables, priority is given to their availability in the domestic market of Kenya.

On the other hand, certain equipment may cause difficulty to sustain appropriate competition for procurement tendering if the procurement sources are limited to domestic or Japanese products. Other equipment needs manufacturers or distributors to ensure proper maintenance and repair services after the sales. Such equipment will be procured from third countries as shown in Table-10.

Table-10 Procurement Countries of the Equipment

No.	Name of Equipment	Procurement Countries		
		Local	Japan	Third Countries (Assumed)
1	Cold room with 3-rooms, 40m ³ each			(Thailand, Malaysia, etc.)
2	Cold room with 2-rooms, 40m ³ each			-do-
3	Cold room, 1-room, 30m ³ A			-do-
4	Cold room, 1-room, 30m ³ B			-do-
5	Freezer room with 2-rooms, 20m ³ each			-do-
6	Cold room/freezer room temperature monitoring system			(UK)
7	Freezer			(Denmark)
8	Forklift			(Germany)
9	Manual pallet lifter			
10	Refrigeration gas charging station			(Switzerland)
11	Oxy-acetylene gas soldering set			
12	Nitrogen gas cylinder set			
13	Cabinet for Non-EPI vaccine			
14	Automatic Voltage Regulator			

(3) Transport and Delivery Route of Construction Materials and Equipment

Materials and equipment procured in Japan and the third countries will be shipped to Mombasa Port, and then transported to each site by road.

Packaging should be rigid and durable so that the precision machines can endure the transportation of a long term, because their functions may deteriorate by the impact, moisture, and high temperature.

It will take about 1.5 months for shipping of the equipment from Japan and third countries (in Europe and U.S.A.) including the period for unloading, customs clearance and inland transportation. It usually takes about ten days for tax exemption and customs clearance at Mombasa Port.

2-2-4-7 Operation Guidance Plan

(1) Guidance during the Initial Operation

The equipment supplier will dispatch its technical personnel to the site at the time of delivery and installation of the procured equipment for guidance during the initial operation period. This guidance will be given concerning all the equipment in principle, especially on the operation method, handling and routine inspections, etc. to the facility maintenance technicians, and on trouble shooting, regular maintenance of the equipment to the equipment maintenance technicians.

(2) Operation Guidance Plan

Specific operation guidance does not seem necessary, because most of the equipment to be procured in this project will be replacement of the existing equipment or supplementation of the insufficient one.

2-2-4-8 Soft Component (Technical Assistance) Plan

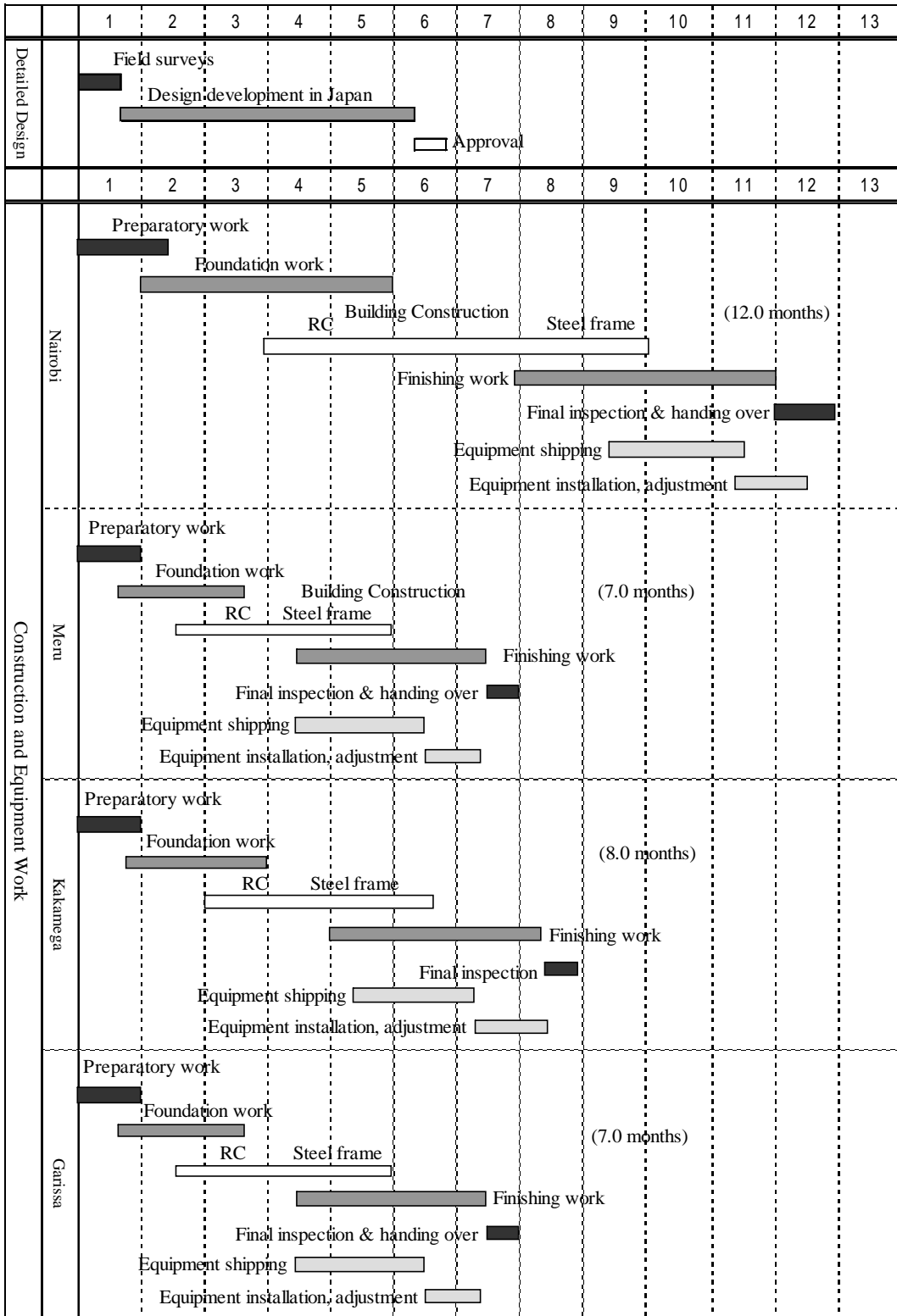
The soft component (technical assistance) plan of the supplied equipment will not be included in this project.

2-2-4-9 Implementation Schedule

The detailed design will take about 6.8 months, and the construction works including procurement and installation of the equipment will take approximately 12.0 months. The following chronogram shows a rough project implementation schedule.

Note: The following chronogram indicates the expected period for each work stage. It does not mean the detailed design and construction / equipment supply and installation works will start at the same time (i.e. the field surveys and preparatory work will not start simultaneously).

Table-11 Project Implementation Schedule



2-3 Obligations of the Recipient Country

2-3-1 Formalities

1) Expropriation of land

The land for construction sites of the Nairobi National Vaccine Depots and three regional depots are the premises of provincial hospital, district hospital or local communities. No considerations will be necessary of the ownership of the land (title deed) or leasehold expenses.

2) Application for permission necessary for the construction permit of the buildings to be constructed in this project and their registration

According to the hearing from the Kenyan side concerned, no application is required for permission necessary for the permission for construction of the buildings in this project, because the construction sites are located in the premises of public institutions. After the completion of construction of the buildings in the project, MOPHS should register them at the relevant offices.

3) Application for connecting the public infrastructure systems (electricity, water supply, sewage, telephone lines, etc.), contracting and payment necessary for these procedures

MOPHS should take care of application, contract and payment for connecting the public infrastructure systems (electricity, water supply, sewage, telephone lines, etc.) for the works to be undertaken by the Japanese side in this project.

MOPHS should also apply for temporary electric power, water supply and sewage to the site as necessary for the construction works. The contractors of the project will bear the service charges during the construction work period.

4) Banking Arrangement (B/A) and Authorization to Pay (A/P)

MOPHS should allocate the budget for the banking commissions (approximately 0.2% of the contract price) in order to ensure prompt issuance of B/A and A/P for the payment to the consultant, construction contractor and equipment supplier as required in the contracts.

5) Exemption of domestic tax

In order to ensure the exemption of domestic tax on the purchase of construction materials and equipment in Kenya necessary for the implementation of the project, MOPHS should register the items and quantities to apply for tax exemption beforehand, based on the list of materials and equipment to be purchased in Kenya which will be presented by the contractors.

- 6) Exemption of Customs Duties for the Materials and Equipment to be imported from Japan or Third Countries, Assistance to Prompt Customs Clearance and Facilitation for Inland Transportation
MOPHS should perform procedures for tax exemption to the Bureau of Customs based on the Bill of Lading and other shipping documents which will be presented by the contractors.

- 7) Facilitation of formalities necessary for the Japanese nationals to enter/exit and stay in Kenya for accomplishment of their services
MOPHS should support prompt issuance of long-term visa necessary for the Japanese staff of the consultant and contractors to enter, exit and stay in Kenya for accomplishing of their services.

- 8) Budgetary measures to ensure effective and efficient operation / maintenance of the facilities to be constructed and the equipment to be supplied in this project.

- 9) Budgetary measures for the costs except for those to be borne by the Japanese side
MOPHS should secure budgetary measures for the expenses that will not be covered in the project such as the purchase of general furniture for the operation of the facilities, construction of fences and a gate around the site premises, and planting work, etc.
Costs for demolition of the existing incinerator in the Kitengela Health Center and its reconstruction will be also the responsibility of the Kenyan side.

2-3-2 Works by the Kenyan Side

(1) Works relevant to the Facilities

1) Site Preparation and Leveling

The slope around the Meru site should be excavated and levelled to make it flat ground.

2) Demolition of the existing structures in the site premises

There are some buildings and trees in the sites for Meru and Garissa Regional Vaccine Depots. MOPHS should complete demolishing and removing all the remaining structures, foundations and all the trees including roots before the commencement of the construction work by the Japanese side. In the case any underground obstacles are found, they should be also removed promptly so that they may not affect the work schedule of the project.

3) Application for connecting the public infrastructure systems up to the boundary limit of the site

MOPHS should take care of the intake of electric power, water supply and sewerage piping, and telephone wiring from the public infrastructures to the boundary limit of each site.

4) Construction of fences and gate, and planting work

During or promptly after the construction work period of the project, MOPHS should construct fences around the site premises and install gates. MOPHS should also take care of greenery work in consideration of general landscaping.

5) Procurement of general furniture and utensils

MOPHS should procure general furniture and utensils other than those to be provided in the project for proper operation of the facilities.

6) Demolition of the existing incinerator in the Kitengela Health Center and its reconstruction

In the premises of the Kitengela Health Center, there is an incinerator on the boundary limit of the site for the Nairobi National Vaccine Depot. MOPHS is responsible for this demolition and relocation in order to construct a fence around the site.

(2) Works relevant to the Equipment

1) MOPHS should transfer the present cold rooms and freezers into the newly built Kakamega Regional Vaccine Depot, Meru Regional Vaccine Depot and Garissa Regional Vaccine Depot.

2) MOPHS should prepare space for installing cold rooms and freezers, electric power supply (including emergency power source) for the equipment, and construction of floor drains for the cold room at the Nakuru Regional Vaccine Depot, Eldoret Regional Vaccine Depot and Mombasa Regional Vaccine Depot.

3) MOPHS should prepare space and electric power supply for installing freezers at the Nyeri Regional Vaccine Depot and Kisumu Regional Vaccine Depot.

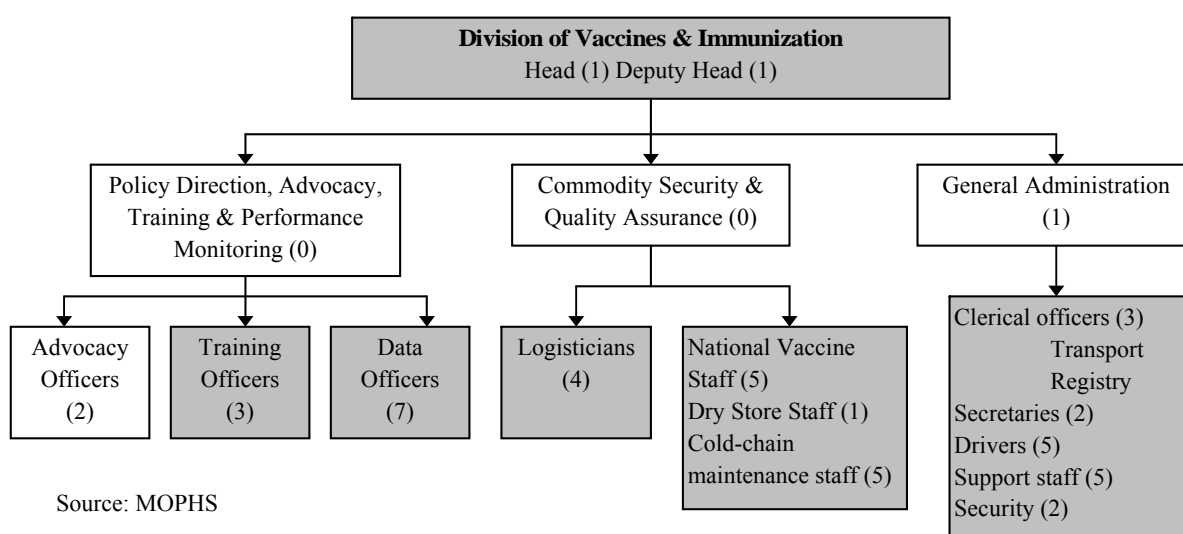
2-4 Project Operation Plan

2-4-1 Operation Plan (Staff Allocation Plan)

According to the implementation of the project, employment of the following additional staff will be necessary for the management of reinforced vaccine storage depots.

(1) Nairobi National Vaccine Depot

When the new Nairobi National Vaccine Depot including the new DVI Coordination Office is constructed, DVI plans to increase 15 staff members. On the other hand, no staff will be appointed to the sections of 'Policy Direction, Advocacy, Training & Performance Monitoring' and 'Commodity Security & Quality Assurance'. Accordingly there will be 13 staff increase in fact, which means there will be 49 staff in total (36 current staff plus 13 staff to be newly employed), as shown in Figure-7. The shaded sections indicate where the new staff will be appointed. Table-12 indicates the expected staff increase and personnel costs of these staffs.



Source: MOPHS

Figure-7 New Organogram of the Division of Vaccines & Immunization

Table-12 Expected Increase of Staff and Personnel Costs

(in KShs)

Section	Staff Increase	Cost /person/year	Subtotal
DIV	1	724,000	724,000
Training officer	1	724,000	724,000
Data officer	2	724,000	1,448,000
Logistician	3	272,000	816,000
Dry store staff	2	543,000	1,086,000
Clerical officer	1	543,000	543,000
Support staff	5	272,000	1,360,000
Total	10	--	6,701,000

Source: MOPHS

Annual personnel cost for these new staff is estimated about 6.7 million KShs, which is to be allocated from the DVI budget for “Development” as shown in Table-13. The budget for development has increased by 57 million – 138 million KShs every year for the past three years. It means the personnel cost for the new employment is not considered a big burden.

Table-13 shows the budget to DVI for the past three years. DVI budget is directly allocated out of the budget to MOPHS.

Table-13 DVI Budget (2007 – 2010) (in KShs)

DVI Budget		2007/08	2008/09	2009/10
Current expenditure	Electricity	200,000	200,000	200,000
	Water supply, sewage	100,000	100,000	100,000
	Tools and spare parts for Workshop	4,158,384	4,158,384	5,000,000
	Daily wage	4,000,000	4,000,000	4,500,000
	Fuel	5,000,000	5,000,000	5,000,000
	Maintenance	2,000,000	2,000,000	1,600,000
	Others	103,828,167	107,578,167	108,637,600
Development		578,350,000	635,617,818	774,095,035
Total		697,636,551	758,654,369	899,132,635

Source: MOPHS

(2) Kakamega Regional Vaccine Depot

A tentative regional vaccine depot has been established where one staff is allocated and takes care of its management. When the new Kakamega Regional Vaccine Depot is constructed, a new staff who has pharmacist qualification is to be appointed to succeed to the current staff along with a secretary, two clerical officers and a support staff. The annual personnel costs are estimated to be about 2.2 million KShs, which is to be allocated from the DVI budget for “Development”.

(3) Meru Regional Vaccine Depot

DVI plans to open a tentative regional vaccine depot at a space in the district hospital in the middle of 2010, where one staff is to be allocated. The staff allocation plan after the new Meru Regional Vaccine Depot is constructed will be the same as the Kakamega Regional Vaccine Depot.

(4) Garissa Regional Vaccine Depot

DVI plans to open a tentative regional vaccine depot at a space in the provincial hospital in the middle of 2010, where one staff is to be allocated. The staff allocation plan after the new Garissa Regional Vaccine Depot is constructed will be the same as the Kakamega Regional Vaccine Depot.

2-4-2 Maintenance Plan

(1) Facilities

As it was mentioned in Paragraph 2-1, (6) 1), five technicians of the maintenance department of the Workshop at the Nairobi National Vaccine Depot maintain the equipment at DVI. A workshop will be also included in this project. At present they do mainly the equipment maintenance and repairs, but will be capable of the maintenance of door and window sashes, fitting hardware, ventilators, lights, etc. after the completion of the project, since their maintenance can be dealt with the repair tools and machinery in the Workshop. There do not seem problems in the maintenance of facilities.

(2) Equipment

Currently maintenance of the cold chain equipment at the target depots is done by five technicians of the maintenance department of the Nairobi National Vaccine Depot and the Workshop technician of the provincial general hospital, the district hospital and other hospitals of the areas where the regional vaccine depots are located. Their skill levels are high and they are capable of almost all kinds of maintenance and repairs if only sufficient tools and spare parts are available. Since 2008, the maintenance contracts have been concluded with the equipment manufacturers for the maintenance of cold rooms purchased by the governmental budgets. The maintenance staff of Nairobi National Vaccine Depot holds seminars / training on the equipment operation and maintenance for the technicians of cold chain equipment at the regional vaccine depots, district vaccine depots and medical institutions on the regular basis. In this situation, it can be assumed the equipment to be supplied in this project will be also managed and maintained properly.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

The detailed initial costs to be borne by the Kenyan side according to the split of works are estimated based on the calculation conditions as specified in (2), when the project is implemented through the Japanese Grant Aid. This cost estimate is provisional and would be further examination by the Government of Japan for the approval of the Grant.

(1) Costs to be borne by the Kenyan side

Items	Cost Estimate (in thousand KShs)
1) Acquisition of land	0
2) Preparation and leveling of the land	1,200
3) Demolition of the existing structures and trees, and their removal out of the site	1,800
4) Connection of infrastructure systems (electric power, water supply, sewage, etc.)	1,500
5) Acquisition of the permission for construction	0
6) Banking commissions (0.2% of the contract price)	1,671
7) Procurement of general furniture for the buildings to be constructed in the project	2,200
8) Construction of fence around the site and a gate in it, and planting	9,000
9) Destruction and reconstruction of an incinerator in the premises of Kitengela Health Center	600
Total	17,971

(Equivalent to 22 million yen)

(2) Calculation Conditions

- 1) Time of Estimation : as of February 2010
- 2) Conversion Rate : 1.00 US\$ = 92.15 yen
: 1.00 US\$ = 75.42 KShs
: 1 KShs = 1.22 yen
- 3) Construction Period : 12 months
- 4) Other Conditions : project implementation intended to be in compliance with the Grant Aid scheme of the Government of Japan.

2-5-2 Operation and Maintenance Costs

(1) Operation / Maintenance Costs

Table-14 shows estimated annual operation and maintenance costs of the Nairobi National Vaccine Depot and three regional vaccine depots at Kakamega, Meru and Garissa, where the buildings and cold chain equipment are planned to be provided, as well as the other regional vaccine depots at Nyeri, Mombasa, Kisumu, Eldoret and Nakuru, where cold chain equipment is to be provided.

Table-14 Annual Costs for Operation and Maintenance (in KShs)

	Electricity	Water Supply/Sewage	Generator Energy	Equipment Repairs	Total
National Vaccine Depot (new)					
Nairobi	1,378,302	262,560	156,358	503,000	1,899,220
Regional Vaccine Depot (new)					
Kakamega	327,768	18,000	54,914	157,000	451,682
Meru	177,134	18,000	46,068	86,000	292,202
Garissa	148,081	18,000	52,843	86,000	269,924
Regional Vaccine Depot (existing)					
Nyeri	7,266	-	654	86,000	58,880
Mombasa	40,068	-	7,044	157,000	98,112
Kisumu	14,531	-	723	208,000	117,254
Eldoret	54,599	-	3,291	157,000	108,890
Nakuru	50,967	-	2,015	86,000	103,982

Note: Figures for the regional vaccine depots (existing) indicate the expected annual cost increase due to the equipment supply in this project.

Annual cost of each expenses item is calculated as follows:

1) Electricity

The annual electric cost is the sum of demand charge plus the metered charge according to the consumption of electric power at each site. Table-15 shows the annual demand charge at each site.

Table-15 Annual Demand Charge

	Basic Rate (A) (KSh/kVA/month)	Contract Demand (B) (kVA)	Annual Demand Charge (A) x (B) x 12 months
National Vaccine Depot (new)			
Nairobi	223.77	30	80,557.20
Regional Vaccine Depot (new)			
Kakamega	223.77	6	16,111.44
Meru	223.77	4	10,740.96
Garissa	223.77	4	10,740.96

The monthly consumption of electric power to estimate the electric cost is calculated by the average power demand {max. power demand (kW) (max. power demand (kVA) x input

conversion rate (%) x load factor (%)} multiplied by the operation hours (24hours/day x 30 days). The input conversion rate is set at 80% and the load factor 30%.

Table-16 Monthly Consumption of Electric Power

	Average Power Demand (kW)	Monthly Consumption of Electricity Average Power Demand * 720
National Vaccine Depot (new)		
Nairobi	31.89kVA x 0.8 x 0.3=7.65	5,508.00
Regional Vaccine Depot (new)		
Kakamega	7.82kVA x 0.8 x 0.3=1.88	1,353.60
Meru	4.28kVA x 0.8 x 0.3=1.03	0741.60
Garissa	3.57kVA x 0.8 x 0.3=0.86	0619.20

The metered charge is composed of three block rates: first block rate (0 – 120kWh) being 14.65 KShs, second block rate (121 – 300kWh) 18.74 KShs, and third block rate (over 300kWh) 19.78 KShs. The annual metered rate at each site is shown in Table-17. Regarding the existing regional depots that now pay the demand charge and metered charges (first and second block rates), only the increases of electric costs for the cold chain equipment to be supplied in this project are estimated.

Table-17 Annual Metered Charge

(in KShs)

	(A) 1st Block Rate x 120	(B) 2nd Block Rate x 180	(C) 3rd Block Rate x (avg. power demand – 300)	(D)Subtotal (1st – 3rd)	Annual Metered Charge (D) x 12 months
National Vaccine Depot (new)					
Nairobi	1,758.00	3,373.20	103,014.24	108,145.44	1,297,745.28
Regional Vaccine Depot (new)					
Kakamega	1,758.00	3,373.20	20,840.21	25,971.41	311,656.92
Meru	1,758.00	3,373.20	8,734.85	13,866.05	166,392.60
Garissa	1,758.00	3,373.20	6,313.78	11,444.98	137,339.76
Regional Vaccine Depot (existing)					
Nyeri	-	-	605.5	605.5	7,266
Mombasa	-	-	3,339.0	3,339.0	40,068
Kisumu	-	-	1,210.9	1,210.9	14,531
Eldoret	-	-	4,549.9	4,549.9	54,599
Nakuru	-	-	4,247.3	4,247.3	50,967

2) Water supply and sewage

Table-18 shows the basis of water supply and sewage charge at each site. One person is assumed to require 80 liters of water per day to use toilet, sink and slop sink. At first, each depot has to pay 25,000KShs as the deposit. Unlike the electric charge, no demand charge is necessary.

Table-18 Consumption of Water and Sewage

	Number of Staff (A) (person)	Consumption (B) (L/person/day)	Operation Days (C) (day/month)	Monthly Consumption (A) x (B) x (C) (M ³)
National Vaccine Depot (new)				
Nairobi	49	80	25	98
Regional Vaccine Depot (new)				
Kakamega	05	80	25	10
Meru	05	80	25	10
Garissa	05	80	25	10

3) Generator energy

Table-19 shows the calculation basis of generator fuel (light oil) cost at each site. Regarding the existing regional depots that are already equipped with the generator system, only the increases of fuel costs for the cold chain equipment to be supplied in this project are estimated.

Table-19 Fuel Cost for Generator System

	Generator Capacity (kVA)	(A) Annual Operation Hours (h)	(B) Fuel Consumption (L/h)	Annual Fuel Cost (A) x (B) x 81.82
National Vaccine Depot (new)				
Nairobi	150	58.8	32.5	156,358
Regional Vaccine Depot (new)				
Kakamega	050	56.4	11.9	54,914
Meru	030	81.6	6.9	46,068
Garissa	30	93.6	6.9	52,843
Regional Vaccine Depot (existing)				
Nyeri	50	84	7.786	654
Mombasa	50	159	44.309	7,044
Kisumu	30	48	15.063	723
Eldoret	50	55	59.836	3,291
Nakuru	50	36	55.972	2,015

4) Equipment repairs

Some of the cold rooms have been equipped in the target depots under the governmental budget of Kenya during the years 2008 and 2010. When the cold rooms are installed in this project, provision of cold rooms and freezer rooms for all the target depots will be completed. As the life of the cold rooms and freezer rooms are 15 to 20 years, costs for their repairs are not considered in this project.

Meanwhile, freezers need replacement of compressors and refrigerant gas refill at the time of compressor replacement. The annual repair cost will be estimated based on the number of freezers that need replacement of compressors shown in Table-20.

Table-20 Freezers that Need Replacement of Compressors (Assumed)

Project Sites	Number of Freezers (Assumed)
(1) Nairobi National Vaccine Depot	3
(2) Nyeri Regional Vaccine Depot	1
(3) Nakuru Regional Vaccine Depot	1
(4) Eldoret Regional Vaccine Depot	2
(5) Kisumu Regional Vaccine Depot	3
(6) Mombasa Regional Vaccine Depot	2
(7) Meru Regional Vaccine Depot	1
(8) Kakamega Regional Vaccine Depot	2
(9) Garissa Regional Vaccine Depot	1

(2) Budget and Operation / Maintenance Costs of DVI

If this project is implemented, it will be years around 2011 and 2012 when the vaccine depots will be constructed and the equipment will be provided. Accordingly, budgets for operation and maintenance of the depots will be applied during the previous year of 2010/11. DVI has prepared a draft application schedule for budgets for four years from 2010/11 as shown in Table-21, and promises that the operation and maintenance costs (See Table-15) of the national and regional vaccine depots will be assured.

Table-21 DVI Budget Application Schedule (draft) (2010/11-2013/14) (in KShs)

	Subsistence Allowances for Supervision	Fuel for Supervision	Electric, water, sewage charges	Fuel & Oil for DEPOT Generator	Maintenance for DEPOT Refrigerator	Total
2010/11						
Nairobi	138,075	5,450	550,000	567,250	800,000	2,060,775
Kakamega	129,150	10,900	430,000	50,000	175,000	795,050
Meru	291,900	38,150	220,000	20,000	65,000	635,050
Garissa	33,600	27,250	220,000	40,000	110,000	430,850
Nyeri	203,700	10,900	430,000	50,000	175,000	869,600
Mombasa	147,000	21,800	430,000	60,000	210,000	868,800
Kisumu	236,775	10,900	430,000	50,000	175,000	902,675
Eldoret Nakuru	468,300	49,050	850,000	120,000	400,000	1,887,350
Total	1,648,500	174,400	3,560,000	957,250	2,110,000	8,450,150
2011/12						
Nairobi	144,978	5,940	613,000	635,320	1,313,000	2,712,238
Kakamega	135,608	11,881	494,500	55,000	183,750	880,739
Meru	306,495	41,584	253,000	22,000	68,250	691,329
Garissa	35,280	29,703	253,000	44,000	115,500	477,483
Nyeri	213,885	11,881	494,500	55,000	183,750	959,016
Mombasa	154,350	23,762	494,500	66,000	220,500	959,112
Kisumu	248,614	11,881	494,500	55,000	183,750	993,745
Eldoret Nakuru	491,715	53,465	977,500	132,000	420,000	2,074,680
Total	1,730,925	190,097	4,074,500	1,064,320	2,688,500	9,748,342

	Subsistence Allowances for Supervision	Fuel for Supervision	Electric, water, sewage charges	Fuel & Oil for DEPOT Generator	Maintenance for DEPOT Refrigerator	Total
2012/13						
Nairobi	152,226	6,475	697,320	711,558	1,848,550	3,416,129
Kakamega	142,388	12,950	578,565	60,500	202,125	996,528
Meru	321,820	45,326	296,010	24,200	75,075	762,431
Garissa	37,044	32,376	296,010	48,400	127,050	540,880
Nyeri	224,579	12,950	578,565	60,500	202,125	1,078,719
Mombasa	162,068	25,901	578,565	72,600	242,550	1,081,684
Kisumu	261,044	12,950	578,565	60,500	202,125	1,115,184
Eldoret Nakuru	516,301	58,276	1,143,675	145,200	462,000	2,325,452
Total	1,817,470	207,204	4,747,275	1,183,458	3,361,600	11,317,007
2013/14						
Nairobi	159,837	7,058	809,125	796,945	2,478,079	4,251,044
Kakamega	149,507	14,116	688,492	66,550	222,338	1,141,003
Meru	337,911	49,405	352,252	26,620	82,582	848,770
Garissa	38,896	35,290	352,252	53,240	139,755	619,433
Nyeri	235,808	14,116	688,492	66,550	222,338	1,227,304
Mombasa	170,171	28,232	688,492	79,860	266,805	1,233,560
Kisumu	274,097	14,116	688,492	66,550	222,338	1,265,593
Eldoret Nakuru	542,116	63,521	1,360,973	159,720	508,200	2,634,530
Total	1,908,343	225,854	5,628,570	1,316,035	4,142,435	13,221,237

2-6 Other Relevant Issues

(1) Exemption of Domestic Tax and Customs Duties

The Value Added Tax (hereinafter referred to as “VAT”) is imposed on the purchase in Kenya, however, VAT is to be exempted for the implementation of the project. The Kenyan side should register the items and quantities to apply for tax exemption beforehand, based on the list of materials and equipment to be purchased in Kenya which will be presented by the contractors. The Kenyan side should also perform procedures for tax exemption to the Bureau of Customs based on the Bill of Lading and other shipping documents which will be presented by the contractors

(2) Implementation of Works to be Undertaken by the Kenyan Side

1) Works relevant to the facilities

The slope around the Meru site should be excavated and leveled to make it flat ground. There are some buildings and trees in the Meru and Garissa sites. The Kenyan side should complete demolishing and removing all the remaining structures, foundations and all the trees including roots before the commencement of the construction work by the Japanese side. The Kenyan side should take care of the intake of electric power, water supply and sewerage piping, and telephone wiring from the public infrastructures to the boundary limit of each site.

During or promptly after the construction work period of the project, the Kenyan side should construct fences around the site premises and install gates, and should also take care of greenery work in consideration of general landscaping. In the site for the Nairobi National Vaccine Depot, the Kenyan side is responsible for demolition and relocation of the existing incinerator for the Kitengela Health Center.

2) Works relevant to the equipment

The Kenyan side should transfer the present cold rooms and freezers into the newly built Kakamega Regional Vaccine Depot, Meru Regional Vaccine Depot and Garissa Regional Vaccine Depot. The Kenyan side should prepare space for installing cold rooms and/or freezers and provide electric power supply (including emergency power source) for the equipment at the Nakuru Regional Vaccine Depot, Eldoret Regional Vaccine Depot, Mombasa Regional Vaccine Depot, Nyeri Regional Vaccine Depot and Kisumu Regional Vaccine Depot.

After the completion of the project, the operation and maintenance system for cold rooms and freezer rooms at each vaccine depot should be reviewed in order to secure proper and safe storage of vaccines.

- (3) Application for connecting the public infrastructure systems and payment necessary for these procedures

The Kenyan side should take care of application, contract and payment for connecting the public infrastructure systems for the works to be undertaken by the Japanese side in this project. The Kenyan side should also apply for temporary electric power, water supply and sewage to the site as necessary for the construction works.

CHAPTER 3 PROJECT EVALUATION

Chapter 3 Project Evaluation

3-1 Recommendations

3-1-1 Preconditions for Project Implementation

The Government of Kenya needs to consider the issues mentioned below to achieve satisfactory implementation of the Project.

It is important to ensure that the work the Kenyan side is responsible for is carried out in accordance with the project schedule, because any delay in their work causes a delay in the works of the Japanese side. Specifically, MOPHS needs to excavate and level the site ground at Meru, to demolish and remove all the remaining structures and foundations, all the trees including roots at the sites of Meru and Garissa, and to connect infrastructure systems to all the sites before the project starts. After the commencement of construction works by the Japanese side, MOPHS needs to secure the budget for banking arrangement commission fees, procure office furniture and equipment, to construct fences and gates at the sites of Nairobi, Kakamega and Meru as well as to construct a gate at the Garissa site, and to take care of planting work.

3-1-2 Preconditions and External Conditions for Achieving Overall Project Plan

Issues the recipient country needs to tackle and external conditions for the emergence and continuation of effects of the project are listed below.

(1) Issues the Government of Kenya needs to tackle

1) Adequate budgets

In order to deal with the expected additional expenditures for the operation and maintenance of the new national vaccine depot and three regional vaccine depots, sufficient budgets should be guaranteed according to the management program.

2) Staff training

Due to the shortage of storage capacity, DVI has commissioned the storage of KEPI vaccines and medical supplies to the warehouses of KEMSA or private companies. After the Project the increase in storage is inevitable because the vaccine storage system will be centralized through the implementation of the Project. Training for staff is required to maintain the efficient operation of the vaccine depots. Also, it has been found through the preparatory survey that many of the current staff of the provincial and district vaccine depots have a strong desire to attend training sessions and seminars relevant to the latest EPI. As the rotation of personnel is frequent and it is planned to introduce new vaccines, training for staff is necessary to maintain the technical levels concerning vaccine storage

3) Coordination among relevant organizations

In Central Province, Coast Province, Nyanza Province and Rift Valley Province, regional vaccine depots share the warehouses of KEMSA. Until now, major problems have not arisen, and continuous coordination will be necessary with KEMSA on such issues as the payment for fuel for generators and temperature control of cold rooms and freezers, etc.

4) Considerations associated with decentralization

Because decentralization has progressed, regional vaccine depots in Eastern Province, Northeast Province and Western Province are under the jurisdiction of the provincial office of MOPHS. However, KEPI will be effective when all the vaccines depots and medical facilities are functioning throughout the national, provincial and district levels in Kenya. For this purpose, DVI needs to maintain a cooperative relationship with the provincial offices of MOPHS for the operation and maintenance of these regional vaccine depots.

(2) External Conditions

1) Implementation of vaccine procurement and distribution plan

Although there is enough vaccine storage space, due to the lack of vaccines and/or vaccination staff and the lack of understanding of end-users, as well as a decrease in vaccination effects due to the deterioration of vaccines caused by improper storage, people may miss the vaccination opportunities and suffer from vaccine-preventable diseases. In order to prevent such situations, DVI needs to ensure the procurement and distribution programmes of the vaccines for the purpose of appearance as well as the sustainability of the effect of the Project.

2) Continuous donor support

Much of the budget of MOPHS is a grant or loan. In addition, vaccines and medical equipment are purchased with credit of UNICEF and support by GAVI. Continuous support is needed for the stable implementation and operation of EPI

3-2 Project Evaluation

3-2-1 Relevance

(1) Project Beneficiaries

The direct beneficiaries will be pregnant women and children under one year old who will receive vaccinations. In addition, this Project will lead to the prevention of the spread of infectious diseases. From this viewpoint, it will be beneficial to all the people of Kenya.

(2) Human Security and Urgency

KEPI is one of the social health services and is intended to protect the people of Kenya from

infectious diseases. The implementation of KEPI will release the people from the "fear of the spread of infectious diseases" and the "lack of disease prevention measures", and will become a guarantee of security. In addition, Kenya plans to introduce two non-EPI vaccines; however, the existing facilities do not have sufficient capacity for their storage. In this regard, the urgency of this Project is high.

(3) Operation and Maintenance

KEPI has become an established program with approximately 30 years of history after its start. Thus, with partial donor support, DVI has been undertaking operation and maintenance with its own finance, human resources and technology, and it is possible to ensure sustainability in the future.

(4) Contribution to Middle and Long-term Planning Goals

The goals of Kenya's Middle-term Programme (2008-2012) include a "reduction of the under-five mortality rate" and an "increase in immunization rates of children under one year old". The increased vaccine storage capacity of each vaccine depot through the implementation of this Project will facilitate KEPI activities that will contribute to increasing the immunization coverage of children under one year old. In addition, higher vaccination rates can lead to reducing the number of measles, pneumonia, and diarrhoeal diseases that are major causes of under-five mortality, which will contribute to the achievement of the Middle-term Programme.

(5) Profitability

The vaccination service is provided free of charge, thus, there is no direct profit from the Project.

(6) Negative Impact on Environment and Society

Although the site environment may change partially as a result of the project implementation, which includes removal of existing trees, installation of wastewater treatment facilities and an incinerator shed, it is planned to comply with Kenyan environmental standards and minimize negative impacts such as the destruction of nature and water contamination.

(7) Feasibility as a Grant Aid Project

MOPHS is familiar with the Japanese grant aid scheme through a previous project entitled "the Project for Improvement of Health Centers in the Western Part of Kenya". Therefore, there does not seem to be any special difficulty in implementing this Project.

(8) Necessity and Advantages of Using Japanese Technology

Vaccine storage facilities should be capable of maintaining the quality of vaccines because their degradation may harm humans. In this regard, there are advantages and necessity to use Japanese construction technology in this Project.

3-2-2 Effectiveness

(1) Quantitative Effects

The following outputs of the Project are expected to have quantitative effects:

Full immunization coverage of children under one year old differs in the provinces from about 50% to 85% (average of about 73%). The Middle-term Programme (2008-2012) aims to improve the immunization coverage of children under 12 months of age to 95% by 2012, while DVI, in order to minimize the wastage rate of unused vaccines, retains the actual purchase of vaccines at about 80% of the target population.

In addition, after the implementation of this project, the vaccine distribution system will be established throughout the country, and a regular distribution of vaccines will be realized instead of frequent and irregular distribution in the past.

Table-22 shows the quantitative effect which is anticipated through the implementation of the Project. The standard value is set in the year 2010, before the implementation of the Project, while the target value is set in the year 2016, three years after the completion of the project.

Table-22 Expected Quantitative Effects

Indicator	Standard (2010)	Target (2016)
Full immunization coverage of children under 12 month old (average percentage)	73%	80%
Frequency of vaccine distribution (at Kakamega)	12 times/year	4 times/year
Frequency of vaccine distribution (at all the vaccine depots)	4 times/year	*4 times/year

* The frequency of vaccine distribution is not expected to change, because the facility planning in this Project takes into consideration sufficient storage capacity corresponding to the future increase of vaccine storage according to the introduction of Non-EPI vaccines (rotavirus vaccine, pneumococcal vaccine).

(2) Qualitative Effects

The following outputs of the Project are expected to have qualitative effects:

Currently in the Nairobi National Vaccine Depot, DVI Coordination Office, Vaccine Warehouse, and Workshop, etc. are scattered in the premises of the Kenyatta National Hospital. Operational efficiency will be improved because these functions will be concentrated in one place.

The centralized management of the vaccine inventory and efficient on-off loading work will lead to the minimization of the wastage rate of vaccines, the deterioration of vaccine quality

and the work hours.

Reduction of the frequency of delivery and transportation will promote cost savings in vaccine management.

Introduction of a cold room/freezer room temperature monitoring system can minimize vaccine damage due to temperature rises.

Non-EPI vaccines will be introduced as scheduled.