

EFA-FTI CF PROJECT: PROPOSED SCHOOL CONSTRUCTION PROGRAMME

GENERAL

This document sets out the proposed school construction programme for the EFA-FTI CF Project. It explains how the construction programme is to be managed and supervised; what types, sizes and numbers of educational facilities are to be constructed and what the roles of the various parties to the construction programme will be.

The construction programme is planned to take place in two phases over a minimum of two years but may well have to be extended.

CONSTRUCTION MANAGEMENT

General

The construction programme will be managed by construction consultants engaged for this purpose.

The majority of the facilities that will be constructed will be located in remote rural locations with difficult access and therefore, given the current low capacity of small contractors and artisans to carry out building works, the major responsibility for ensuring that the facilities are constructed in accordance with the drawings and specifications and on time will rest with the consultants and in particular the site supervisors employed by the consultants.

Objectives

The primary objectives of the consultancy are to provide construction management services to facilitate the construction of ECD centres, primary schools and basic education schools (combined primary and junior secondary schools) and that will ensure that:

- The construction works carried out by contractors are carried out in accordance with the contract drawings, specifications and other contract documents, in accordance with the contract conditions, on time and to an acceptable standard;
- The construction works managed by communities and carried out by local artisans or small builders are carried out in accordance with the drawings and specifications and to an acceptable standard.

The secondary objectives of the assignment are to provide:

- Training to site supervisors and other construction professionals employed by the consultants to ensure that they understand the project documents and can carry out their duties in managing and supervising the construction work in a competent and professional manner;

- Training to contractors and artisans to ensure that they understand the project documentation and are capable of constructing the facilities to an acceptable standard;
- Training to communities to ensure that they are capable, if provided with technical assistance to manage small construction projects at their schools.

The construction contracts will be labour-only contracts and part of the consultants' responsibilities will be to ensure that the construction materials are delivered to the sites on time.

As part of the training programme, a typical classroom and a two-cubicle double-pit VIP latrine will be constructed on a site in or around Monrovia supervised by the consultants and their site supervisors. This will stand as an example to the site supervisors and the contractors of the design of the buildings to be constructed and the standard of work that is to be expected.

The Division of Educational Facilities (DEF) in the Ministry of Education (MOE) must identify a suitable site to be used for this exercise as soon as possible.

A further objective of the project will be to provide technical assistance and capacity-building to the DEF. It will be the responsibility of the DEF staff to monitor the progress of the construction works and additional qualified staff will have to be hired. All staff will require training in construction management the consultant's team leader, who will be based in the DEF will provide this training and other technical assistance to DEF staff as well as managing the construction component of the project.

It is vital that DEF selects the sites for the project schools as soon as possible. The consultants when appointed will have to visit each site and carry out a basic survey in order that they can prepare site layout drawings showing the position of all the school buildings, toilets and wells, play areas, paths and other site works and schedules of materials for any site works.

CONSTRUCTION MATERIALS

Two of the major constraints for the small and medium contractors who will be carrying out the construction work are 1) difficulty in obtaining credit from either banks or suppliers to enable them to purchase building materials and 2) difficulties in transporting the materials to the sites.

In order to avoid these difficulties, all imported construction materials such as cement, reinforcement, steel roof sheets, hinges, door locks, nails and screws and locally sourced materials such as sawn timber will be purchased and supplied to each site by the MOE. The contractors will however be responsible for obtaining sand and aggregate for concrete locally.

The construction consultants will prepare schedules of materials (not bills of quantities) for all standard buildings and all school building sites and the schedules of materials will set out in detail the amount of materials required for the individual buildings and sites. They will set out for instance: the number of cubic yards of sand and large aggregate and the number of bags of cement required for the concrete in the foundations, floor slabs and ring beams; the number of stabilised soil blocks required for the walls; the number and length of roof sheets required to cover the roof; the size, length and number of pieces of timber required for the roof trusses and purlins, the number of sheets of plywood required for ceilings; the number of cubic yards of sand and bags of cement that are required for the render to walls; the amount of nails and screws required; etc, etc. All quantities will have to allow for damage and wastage.

The consultants will then prepare bidding documents for the materials required for all school building sites and the MOE procurement division will advertise the bids and award contracts. The consultants will advise the procurement division on the award of contracts and all building materials supply contracts will include delivery to the individual sites.

The contracts for construction will therefore be labour-only contracts (apart from the supply of sand and large aggregate) but the contractors will have to allow for the security and storage of materials supplied to them on the sites.

CONSTRUCTION OF EARLY CHILDHOOD DEVELOPMENT CENTRES

General

ECD centres would be constructed on eight of the sites selected for the construction of three-classroom primary schools managed by communities (see below).

The centres will be on the same sites as the schools but will have separate facilities (group rooms and toilets) and a separate play area. The centres will however share the use of the school's well and hand-pump.

The centres will be very simple in design and construction and the construction will be managed by the community using local materials as much as possible.

The sites for the centres must be selected by DEF in consultation with the Division for Early Childhood Development as soon as possible and visited and checked to ensure that they comply with the agreed site selection criteria.

Facilities

The ECD centre design that was agreed in December 2010 was to have two group rooms each 29' 0" x 20' 0" wide with access off a large covered front veranda. There was also to be an office and store at one end of the building and two VIP latrines

adjacent to the building. Water was to be provided from the primary school well.
See Drawing 1 attached

The ECD Division has now requested a larger ECD centre that will have three group rooms each 29' 0" x 20' 0" wide with access off a large covered front veranda. There will also be an office and store and two internal toilets that will not have a piped water supply but will be flushed with buckets of water from the well to a septic tank and soakaway. This design will obviously be more expensive to construct than the original design with the result that it will not be possible to construct as many ECD centres as originally intended. See Drawing 2 attached.

The group rooms in both designs will be divided up with bookshelves and lightweight partitions in order to accommodate different activities. The verandas will accommodate activities such as cooking and activities requiring water. Ramps up to access verandas will be provided to enable access for physically disabled children and at least one disabled toilet will also be provided.

A decision must be made by the ECD Division as soon as possible as to what design they wish to go forward with and the number of sites where the centres will be constructed.

Construction

The construction of the ECD centres will be as follows:

- Floors will be of 4" mass concrete built on 8" solid (or filled) concrete block foundation walls on mass concrete footings. The floors will be finished with a steel trowel to an acceptable flat surface which will have to be protected until the building construction is completed; there will be no screeds;
- Walls will be of 6" stabilised soil blocks (with block piers to increase stability) rendered internally with smooth sand/cement render and externally with self-coloured 'tyrolean' render to produce a more durable finish. There will be a concrete ring beam on top of the walls but no concrete columns;
- Roofs will be of 28 gauge corrugated steel sheets on timber purlins on exposed timber trusses. There will be large roof overhangs to protect walls and windows from sun and rain. Sloping ½" plywood ceilings will be fixed under the purlins in the rooms to follow the roof slope but there will be no ceilings to verandas or under any other roof overhangs;
- Light will be provided in all rooms through openings in the walls (see drawings) and timber shutters at child-eye height;
- All buildings will have 8' 0" wide front access verandas with 4" diameter steel posts supporting the ends of roof trusses or rafters.

The project will provide building materials as set out in 'Construction Materials' above. The communities will provide labour to clear the sites and locally available

materials, at a reasonable price such as sand and aggregate for the concrete footings and floor slab.

Technical Assistance

Sensitisation of the communities and community development work with the communities will be provided by an NGO or NGOs contracted to provide similar services to the 16 communities who will be managing the construction of their primary schools.

Technical supervision and assistance will be provided by the construction consultants engaged to supervise and manage the entire school construction programme. Construction will be monitored by DEF staff.

CONSTRUCTION OF PRIMARY SCHOOLS

General

Two types of primary school will be constructed: a three classroom primary school and a six classroom primary school. The construction of the three classroom schools will be managed by communities and the construction of the six-classroom schools will be carried out by small contractors. The construction programme will be supervised by the construction consultants and monitored by DEF staff.

Ramps will be provided up to access verandas to all buildings to allow access for physically disabled children and at least one disabled toilet will be provided for each sex.

The layout of the buildings at the individual sites will vary according to the physical characteristics of the sites. However all buildings should if possible be oriented to face north/south to avoid solar penetration into rooms.

Classrooms

The government has set the maximum number of students per primary school classroom at 44 and a standard classroom size of 20'0" x 29'6" has been adopted which will be used in primary schools being reconstructed under the EFA-FTI CF project. The classroom can seat 44 students at double desks 3' 8" x 1' 10" which can be arranged in different layouts. The internal floor area is 590ft² (54.6m²) giving an area per pupil of 13.4ft² (1.24m²).

Other Facilities

The other facilities to be provided at primary schools will consist of all or some of the following:

- a principal's office and store 20' 0" x 9' 6";
- a teachers' room 20' 0" x 9' 6";

- a library 20' 0" x 19' 6";
- double-pit VIP latrines;
- a well and hand-pump.

The facilities to be provided at the different size schools will vary depending on pupil numbers (see below). The design of all facilities will be based on the agreed designs and drawings prepared by Joshua Palmer for DEF and already in their possession.

See Drawings 10 and 11 for details of a typical double-pit VIP latrine building.

Construction

The construction of all primary school classroom buildings will be as follows:

- Floors will be of 4" mass concrete built on 8" solid (or filled) concrete block foundation walls on mass concrete footings. The floors will be finished with a steel trowel to an acceptable flat surface which will have to be protected until the building construction is completed; there will be no screeds;
- Walls will be of 6" stabilised soil blocks (with block piers to increase stability) rendered internally with smooth sand/cement render and externally with self-coloured 'tyrolean' render to produce a more durable finish. There will be a concrete ring beam on top of the walls but no concrete columns;
- Roofs will be of 28 gauge corrugated steel sheets on timber purlins on exposed timber trusses. There will be large roof overhangs to protect walls and windows from sun and rain. Sloping ½" plywood ceilings will be fixed under the purlins in the rooms to follow the roof slope but there will be no ceilings to verandas or under any other roof overhangs;
- Light will be provided in all rooms through openings in the walls (see drawings);
- All buildings will have 6' 0" wide front access verandas with 4" diameter steel posts supporting the ends of roof trusses or rafters.

All rooms will be 20' 0" wide internally with blockwork walls or piers at 10' 0" centres giving a range of room lengths: 9' 6"; 19' 6" and 29' 6". The construction details of all facilities will be based on the agreed designs and drawings prepared by Joshua Palmer for DEF and already in their possession.

Three Classroom Primary Schools

Sixteen of these schools will be constructed in remote rural villages where there are at present no primary schools and with a primary school age population (6 -11 years) of less than 132. The construction will be managed by the communities with the assistance and support of an NGO and the construction consultants and monitored by DEF staff.

The facilities to be provided will consist of:

- a three classroom building with office and store and a front veranda;
- two, three-cubicle double-pit VIP latrines;
- a well and hand-pump.

The girls' and female teachers' toilets will be separated on the site from the boys' and male teachers' toilets.

The sites for these schools must be selected by DEF as soon as possible and visited and checked to ensure that they comply with the agreed site selection criteria. ECD centres will also be constructed on up to 8 of the sites and sufficient space must therefore be available on these sites for the centres.

Six Classroom Primary Schools

Four of these schools will be constructed in remote rural villages with a primary school age population (6 – 11 years) of up to 264 within a distance of 2 kilometres. The schools will be constructed on the sites of existing primary where the existing facilities are temporary, semi-permanent or in such bad condition that they require replacement. The construction will be carried out by small contractors managed and supervised by the construction consultants and monitored by DEF staff.

The facilities to be provided will consist of:

- a principal's office and store; a teachers' room; a library and two classrooms in one building;
- either one, four-classroom building or two, two-classroom buildings depending on the site conditions;
- two, five-cubicle double-pit VIP latrines;
- and a well and hand-pump.

The girls' and female teachers' toilets will be separated on the site from the boys' and male teachers' toilets.

The sites for these schools must be selected by DEF as soon as possible and visited and checked to ensure that they comply with the site selection criteria.

The actual layout of the buildings for the four schools will vary according to the characteristics of the school sites; the shape, size, contours, etc. If at all possible however, all buildings should be oriented to face north/south to avoid solar penetration into rooms.

See Drawing 9 attached for the layout of the buildings for a typical six-classroom primary school.

BASIC EDUCATION SCHOOLS

General

The basic education schools will consist of a single stream lower school (primary) and a two stream upper school (junior secondary). The target number of pupils per class for the lower school will be 44 and the total number of pupils for the lower school will be 264. The target number of pupils per class for the upper school will be 40 and the total number of students in the upper school will be 240.

Twenty of the basic education schools will be constructed in rural areas where there are sufficient Grade 7 pupils for grade entry (80 pupils) from both the lower school and from surrounding primary schools.

The sites for these schools must be selected by DEF as soon as possible and visited and checked to ensure that they comply with the site selection criteria.

Ramps will be provided up to access verandas to all buildings to allow access for physically disabled children and at least one disabled toilet will be provided for each sex.

Concrete paths will link all of the buildings and other facilities.

The actual layout of the buildings for the twenty schools will vary according to the characteristics of the school sites; the shape, size, contours, etc. If at all possible however, all buildings should be oriented to face north/south to avoid solar penetration into rooms. See Drawing 8 attached for the layout of the buildings for a typical Basic Education School.

Lower Basic Education School Facilities

Classrooms

A standard classroom size of 20'0" x 29'6" has been adopted which will be used in the lower school of the basic education schools being reconstructed under the EFA-FTI CF project. The classroom can seat 44 students at double desks 3' 8" x 1' 10" which can be arranged in different layouts. The internal floor area is 590ft² (54.6m²) giving an area per pupil of 13.4ft² (1.24m²).

The facilities to be provided for the lower school will consist of:

- two, three-classroom buildings plus teachers' room/store;
- two, five-cubicle double-pit VIP latrines;
- a well and hand-pump serving the lower school.

The girls' and female teachers' toilets will be separated on the site from the boys' and male teachers' toilets.

See Drawing 3 attached for details of the lower school three-classroom building.

Upper Basic Education School Facilities

Classrooms

A standard general classroom size of 22'0" x 29'6" has been adopted which will be used in the upper school of the basic education schools being reconstructed under the EFA-FTE CF project. The classroom can seat 40 students at double desks 4' 0" x 2' 0" which can be arranged in different layouts. The internal floor area is 649ft² (60m²) giving an area per pupil of 16.23ft² (1.5m²).

It is common practice in many countries to provide a number of larger general classrooms in secondary schools for project work when teaching subjects such as geography, history and even maths as these allow room for students to work on projects requiring light practical work such as drawing, working on models, preparing maps, etc. These larger classrooms can still be used as class bases and are usually provided in the ratio of one larger classroom to four or five standard classrooms. The size of the large general classroom as proposed will be 22' 0" x 39' 6". The large general classrooms will each have two stores attached size 10' 6" and 11' 0" x 9' 6" for the storage of teaching materials.

Six classrooms will be provided as class bases and it is proposed that these will consist of four standard general classrooms and two large classrooms in two, three-classroom buildings. See Drawing 4 attached for details of the upper school three-classroom building.

Specialist facilities

The only subjects likely to need a specialist facility for teaching are general science, an introduction to technology and agriculture. The only specialist teaching facility that will be required therefore will be a multi-purpose room for science and practical subjects. The room will have benches down one long, window wall with some sinks and possibly electrical outlets (although the science of electricity at this level can probably be taught using dry cell batteries). Gas supplies will not be required. Only one multi-purpose room will be required in this size of school for the number of practical periods taught for all three subjects. Storage space will however be needed for all three subjects.

The only other facility that will be required is a library. It is noted that IT is not on the old or the proposed new curriculum but IT facilities could also be provided and used to support the teaching of many subjects. The provision of IT facilities will depend on the provision of teachers, a budget and on a dependable electricity supply (solar power should be investigated as a viable option). If IT facilities are provided they should be viewed as part of a 'library resource centre' and used in conjunction with the library facilities rather than as a stand-alone 'IT classroom'.

The specialist facilities to be provided will therefore consist of:

- a multi-purpose room for science, agriculture and light practical technology subjects that is 22' 0" x 39' 6" with two stores 10' 6" and 11' 0" x 9' 6";
- and a library resource centre consisting of a library space 22' 0" x 49' 6", a store/office 18' 6" x 9' 6" and an IT resource room 22' 0" x 19' 6". The library will accommodate a full class and the IT resource room will accommodate half a class.

See attached Drawing 5 for details of the multi-purpose building and Drawing 6 for details of the library resource centre. It should be noted that the library resource centre will be shared by both the lower and upper schools and the size of the library has therefore been increased.

Other Facilities

There will also be:

- two, five-cubicle double-pit VIP latrines;
- and a well and hand-pump to serve the upper school.

The girls' and female teachers' toilets will be separated on the site from the boys' and male teachers' toilets.

Teaching Staff and Administration Facilities for Lower and Upper Schools

The following accommodation is proposed for the teaching and administrative staff of the combined lower and upper schools:

- principal's office 20' x 9' 6";
- administration office, store and waiting area 20' x 19' 6";
- vice-principal's office, lower school 20' 0" x 9' 6";
- vice-principal's office, upper school 20' 0" x 9' 6";
- registrar's office 20' 0" x 9' 6";
- two stores 9' 6" x 9' 6" and 10' 0" x 9' 6"
- a staff room 20' 0" x 29' 6".

See Drawing 7 attached for details of the administration building. It should be noted that two extra offices have been added for the vice-principal lower school and the vice-principal upper school.

Electrical installations will be provided to those schools with a dependable electricity supply or the likelihood of obtaining one in the near future. Remote rural schools with no likelihood of an electricity supply within the next ten years will not be provided with an electrical installation. The possibility of providing solar power systems to remote rural schools should be explored to provide power for the computers in the IT room if provided, the admin building and the multi-purpose room.

Construction

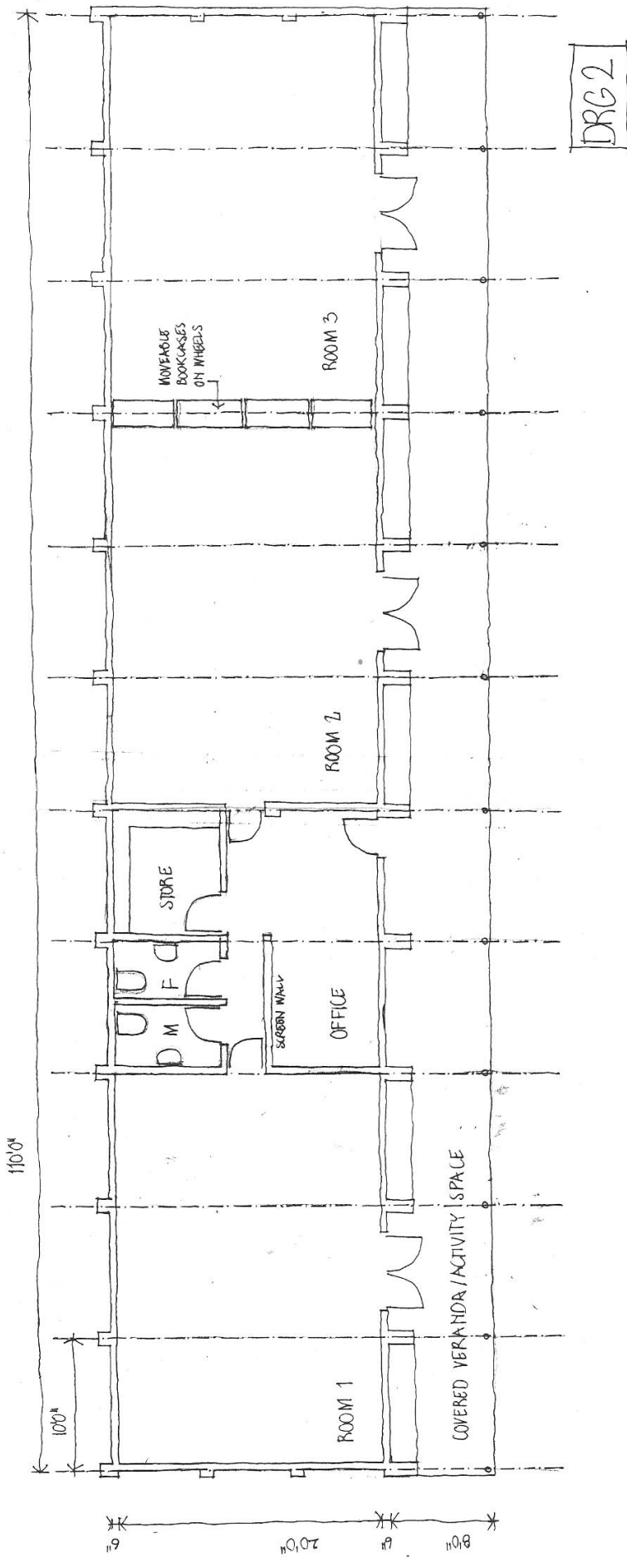
The design and construction of the basic education secondary schools will be similar to that of the primary schools.

- Floors will be of 4" mass concrete built on 8" solid (or filled) concrete block foundation walls on mass concrete footings. The floors will be finished with a steel trowel to an acceptable flat surface which will have to be protected until the building construction is completed; there will be no screeds;
- Walls will be of 6" stabilised soil blocks (with block piers to increase stability) rendered internally with smooth sand/cement render and externally with self-coloured 'tyrolean' render to produce a more durable finish. There will be a concrete ring beam on top of the walls but no concrete columns;
- Roofs will be of 28 gauge corrugated steel sheets on timber purlins on exposed timber trusses. There will be large roof overhangs to protect walls and windows from sun and rain. Sloping ½" plywood ceilings will be fixed under the purlins in the rooms to follow the roof slope but there will be no ceilings to verandas or under any other roof overhangs;
- Light to classrooms in the lower school will be provided through openings in the walls;
- It is proposed that timber shutters are used for windows in all buildings in the upper school (except in the administration building and the library resource centre). Windows in the administration building and the library resource centre will be aluminium louvres in timber frames with burglar bars for security;
- All buildings will have 6' 0" wide access verandas with 4" diameter steel posts supporting ends of roof trusses or rafters.

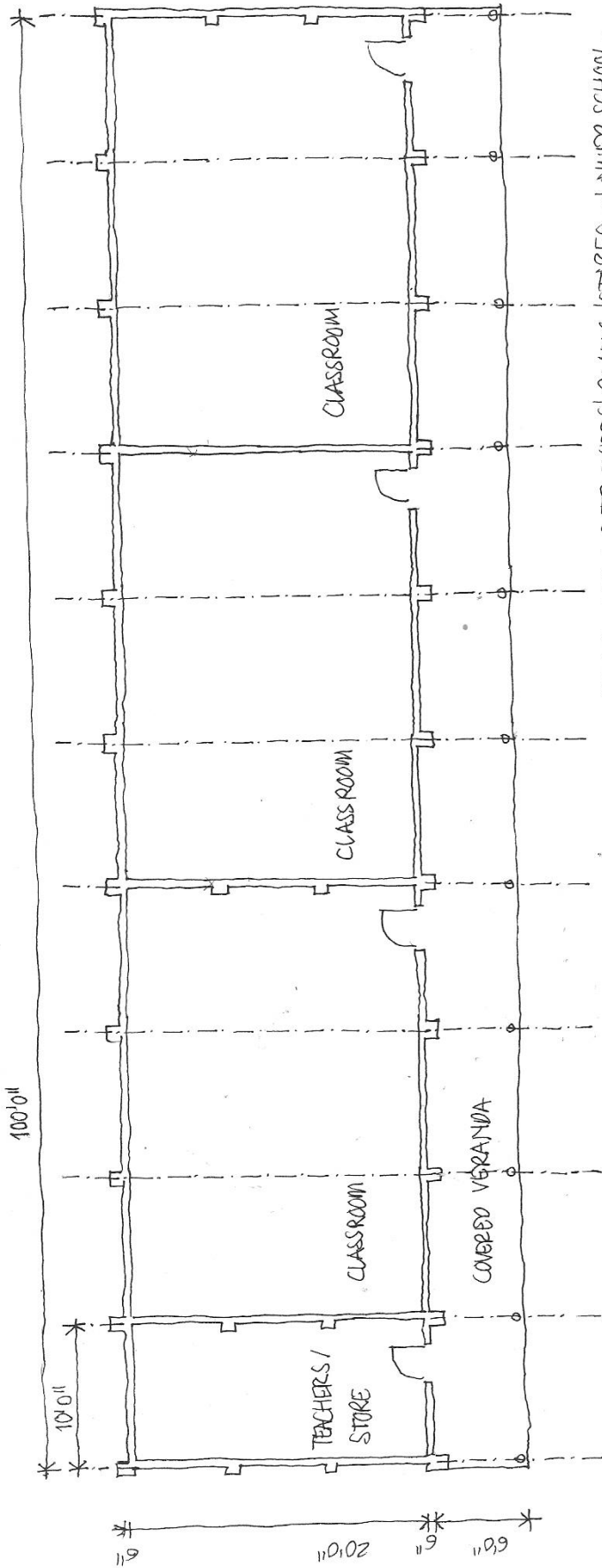
All classrooms in the lower school will be 20' 0" wide internally with blockwork walls or piers at 10' 0" centres giving a classroom length of 29' 6".

The structural grid in the upper school will be the same as for the primary schools but the rooms will be 22' 0" wide to accommodate the older and larger students. The rooms will therefore be 22' 0" wide internally with structural walls or blockwork piers/roof trusses at 10' 0" centres giving a range of room lengths as follows: 9' 6"; 19' 6"; 29' 6" and 39' 6".



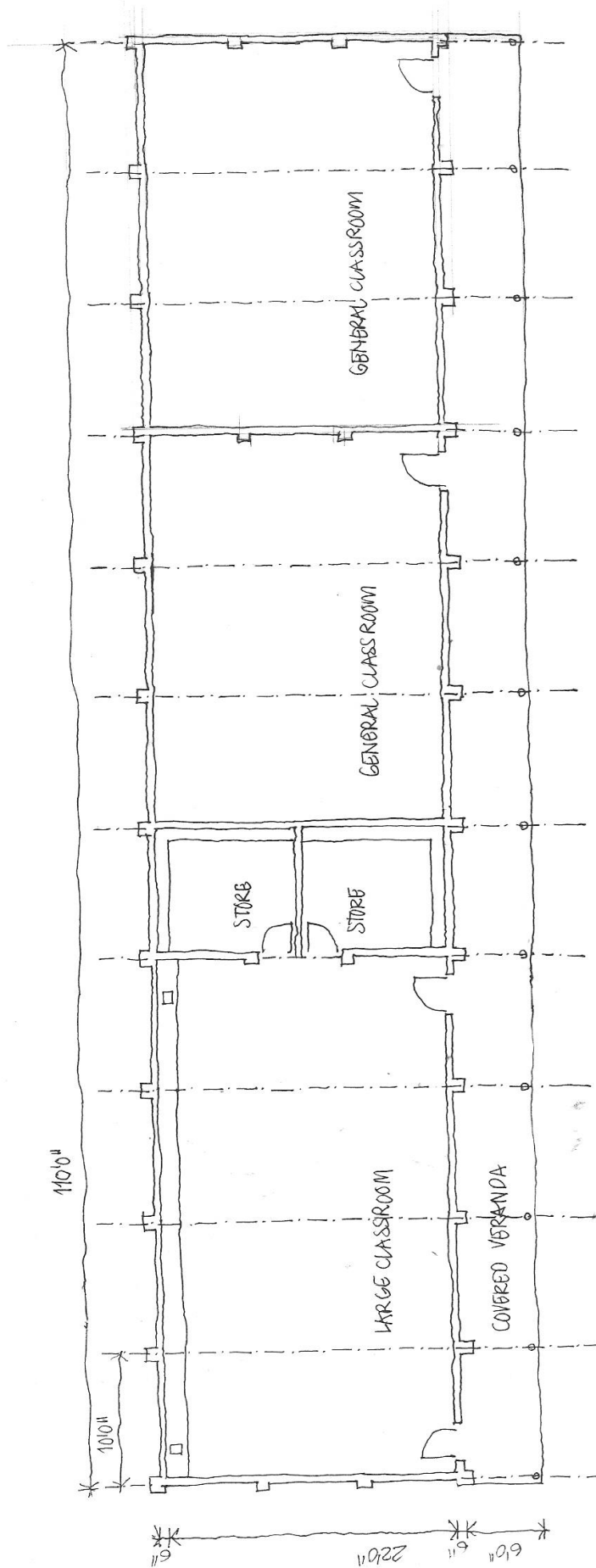


DRG 2



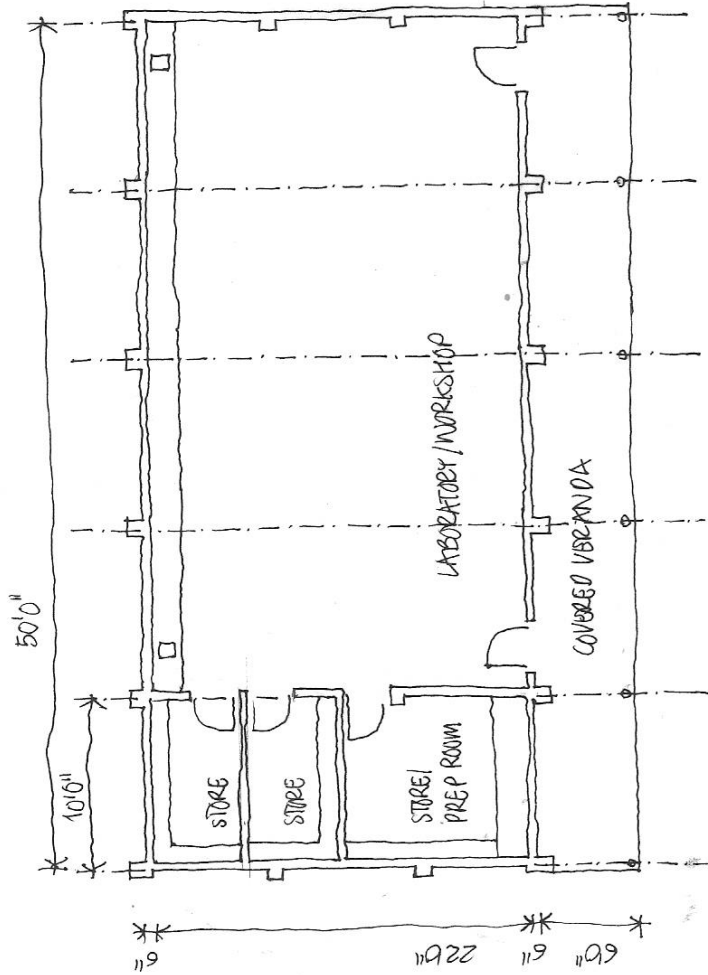
BASIC EDUCATION SCHOOL - CLASSROOM BUILDING - 10F 2 - 6 CLASSROOMS + 2 TEACHERS' ROOMS / STORES - LOWER SCHOOL

DRG 3



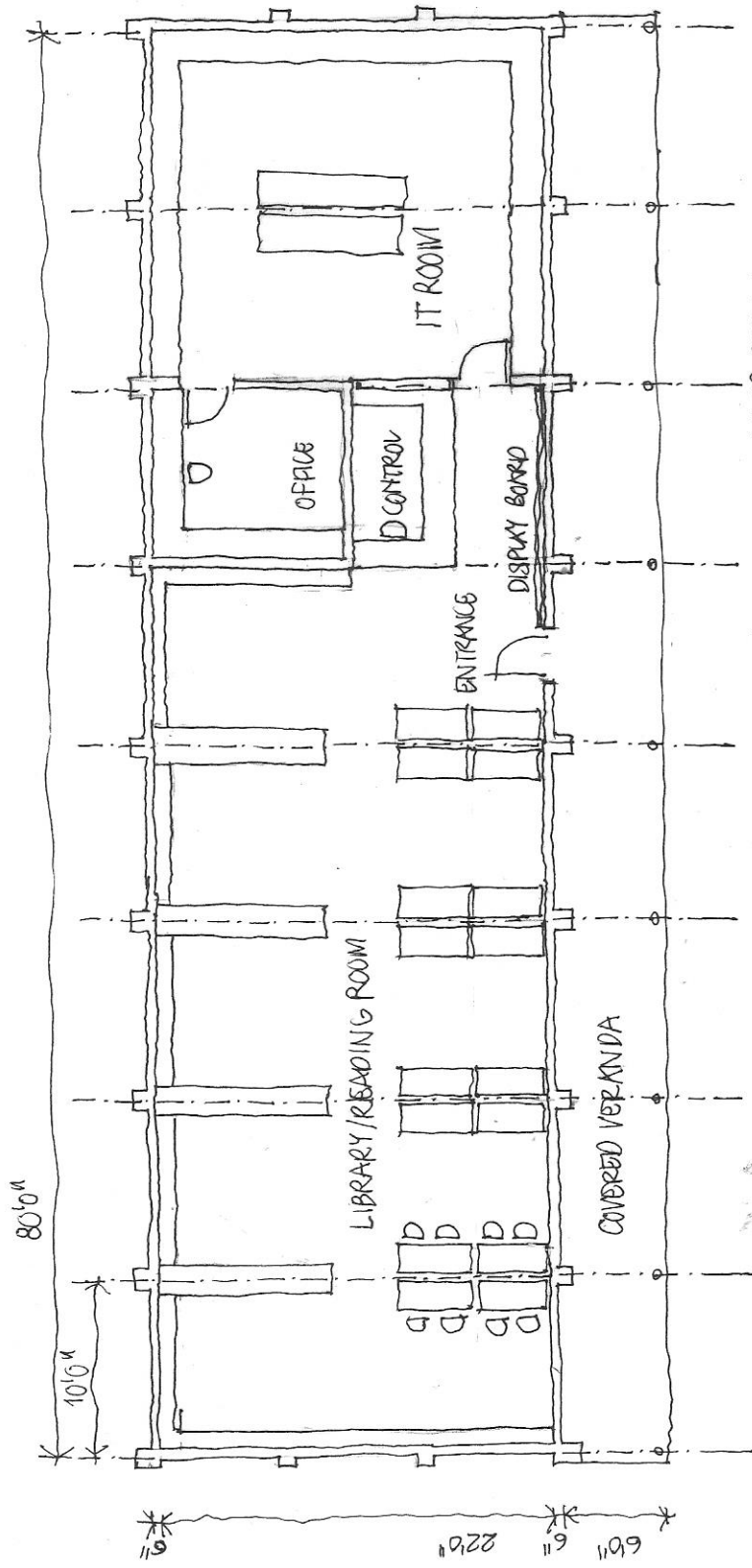
BASIC EDUCATION SCHOOL - CLASSROOM BUILDING 1 OF 2 TOTAL 6 CLASSROOMS + 4 STORES - UPPER SCHOOL

DRG 4



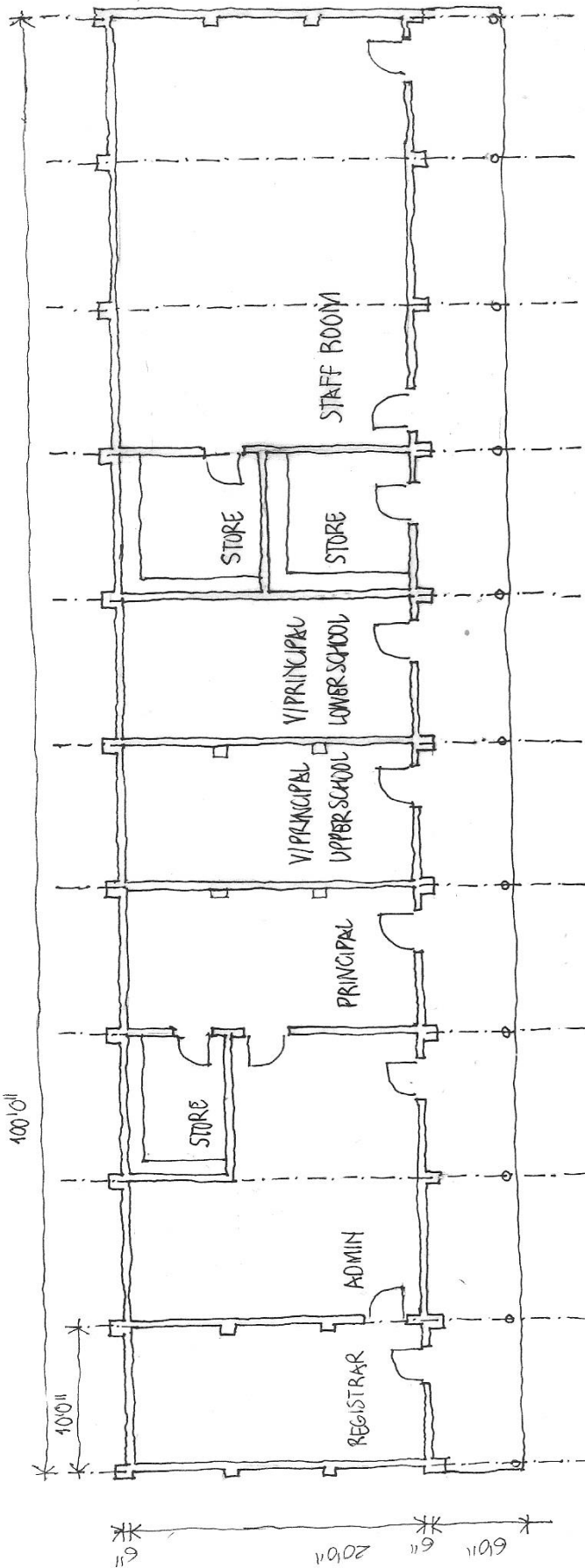
BASIC EDUCATION SCHOOL - MULTIPURPOSE ROOM - UPPER SCHOOL

DRG 5



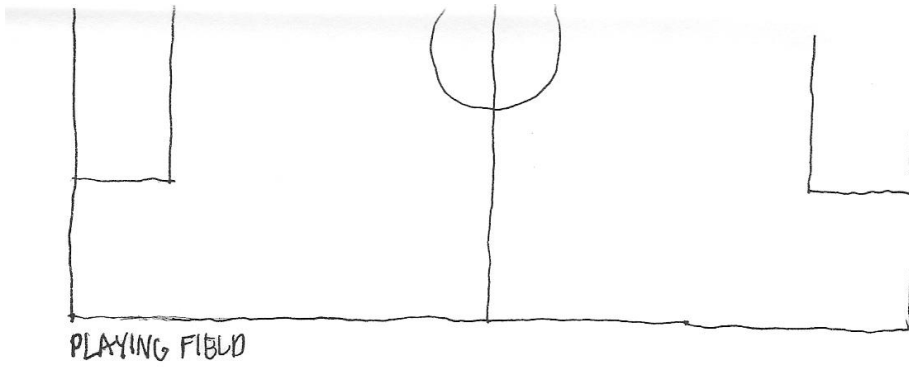
BASIC EDUCATION SCHOOL - LIBRARY RESOURCE CENTRE - UPPER + LOWER SCHOOL

DRG 6



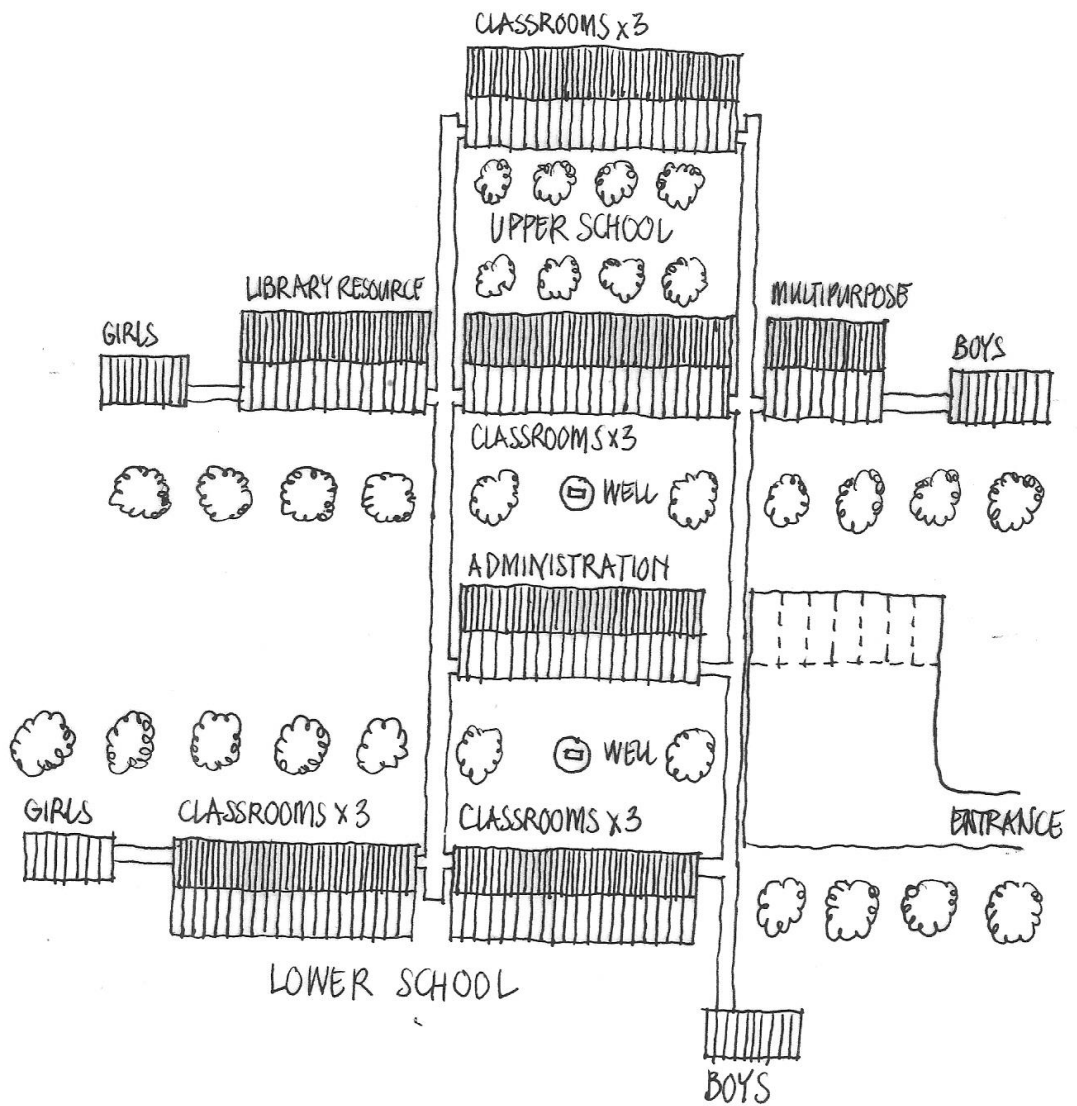
BASIC EDUCATION SCHOOL - ADMINISTRATION BUILDING - UPPER + LOWER SCHOOL

DRG 7



PLAYING FIELD

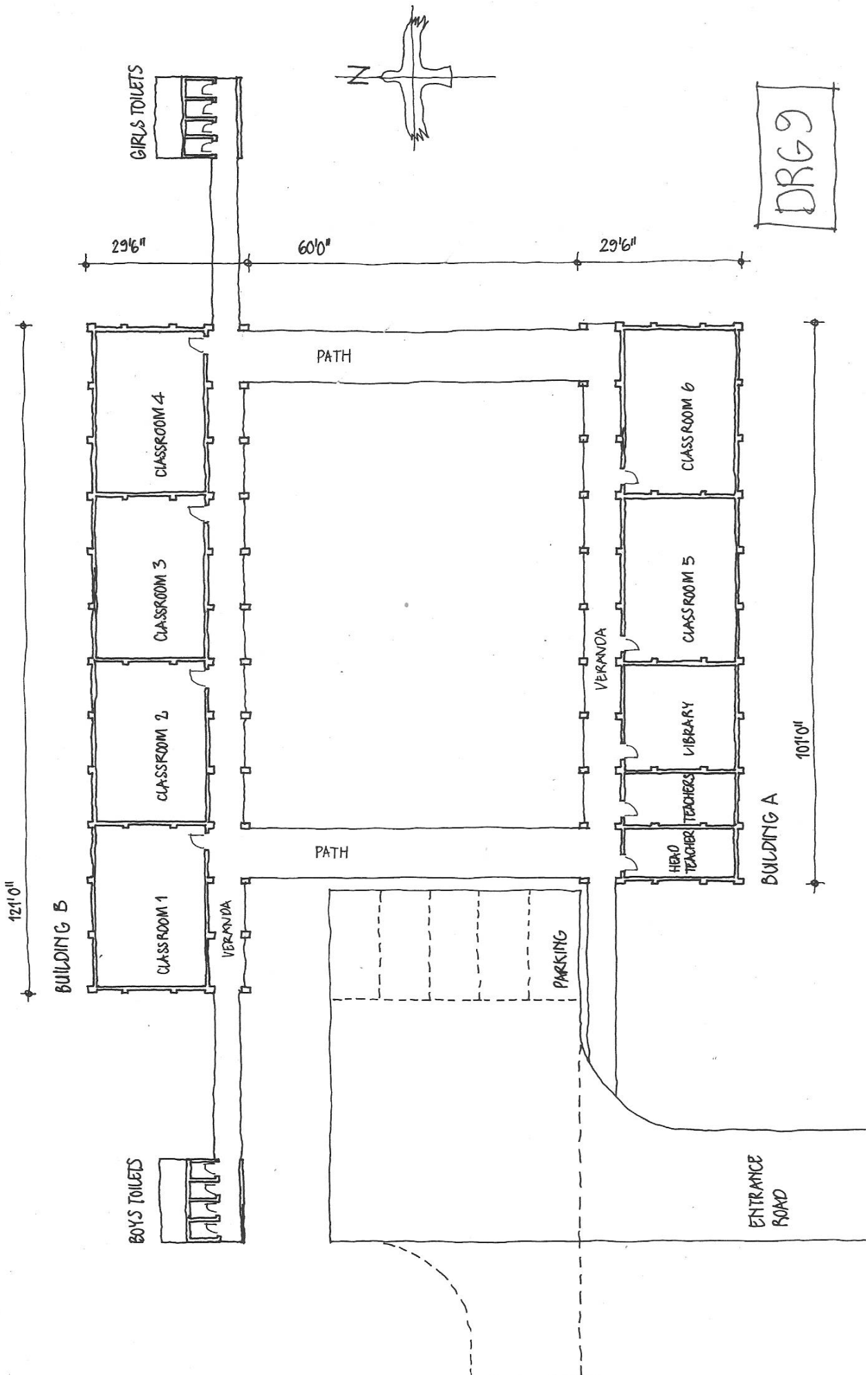
AGRICULTURE AREA

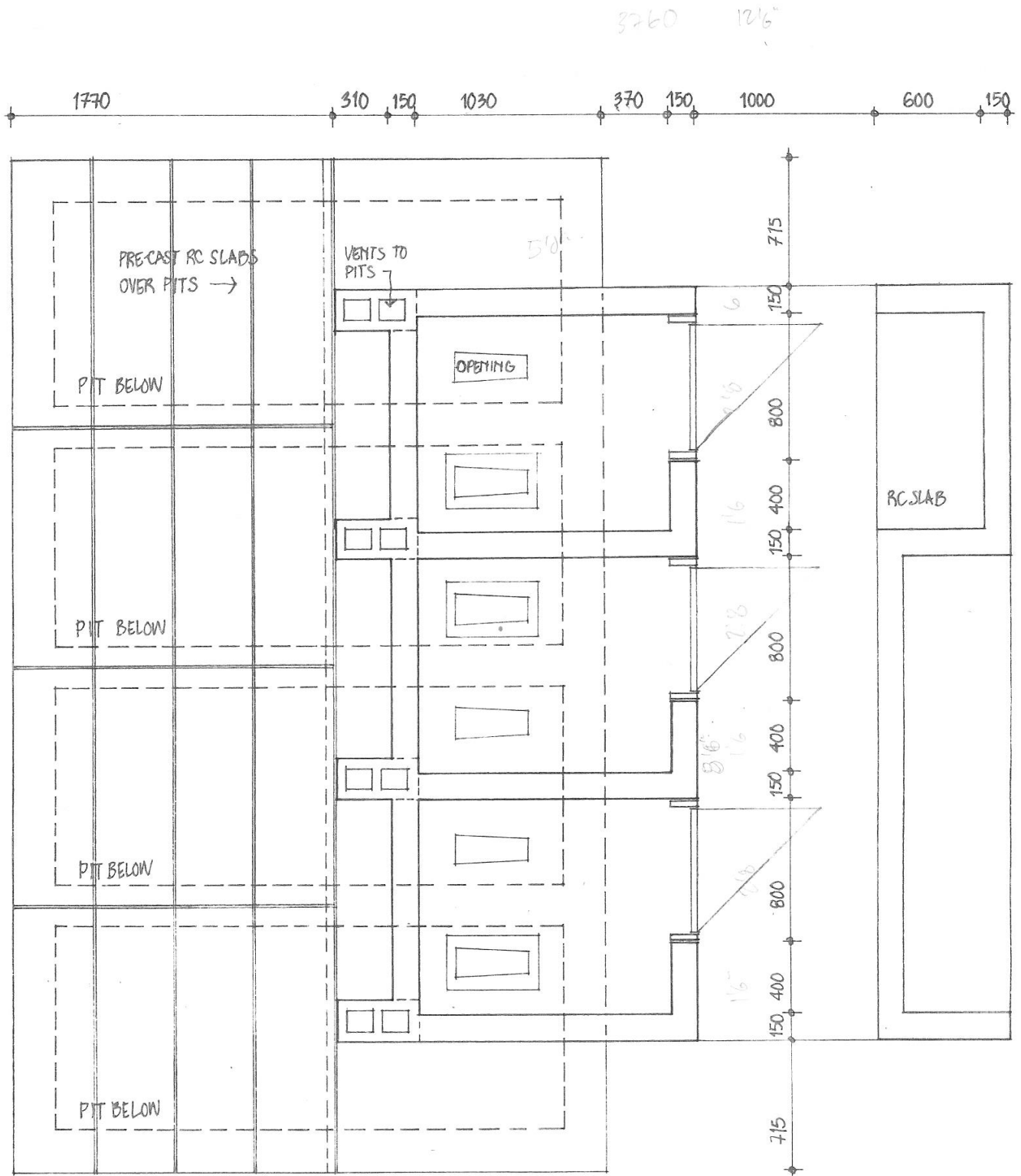


BASIC EDUCATION SCHOOL

SITE LAYOUT SHOWING SCHOOL BUILDINGS
 ACTUAL SITE LAYOUTS WILL VARY ACCORDING TO
 SITE CONDITIONS

DRG8

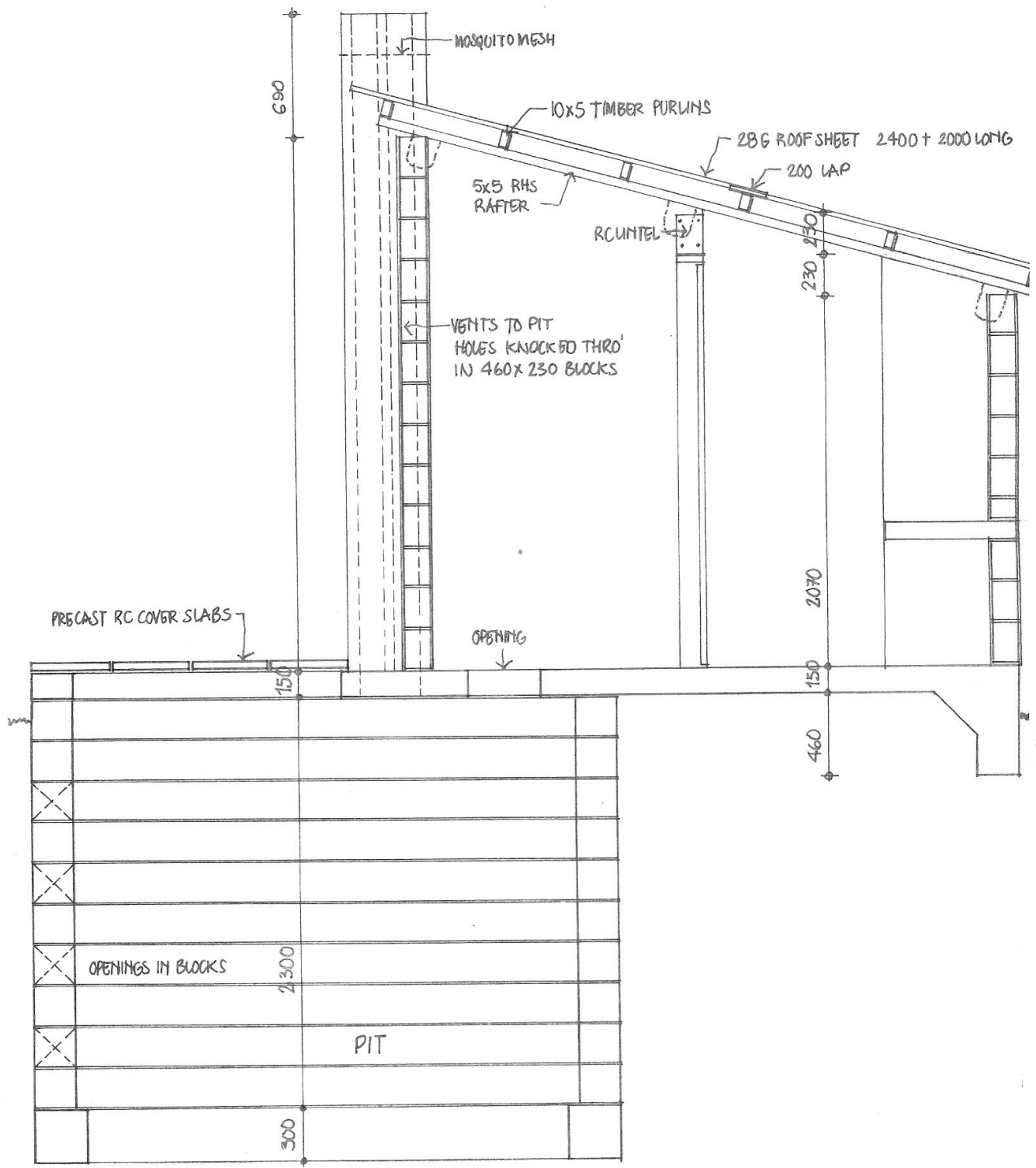




PLAN AT GROUND LEVEL

DOUBLE-PIT VIP LATRINE

DRG 10



SECTION

DOUBLE-PIT VIP LATRINE

DRG 11