Ministry of Education, Heritage & Arts

Minimum Infrastructure Standards
Fiji Primary, Secondary and ECE Schools

Note: This is a living document that will be reviewed and improved after each round of funding and school infrastructure audit to ensure that lessons learned are captured and used to improve these standards.

1.0 Introduction

The document outlines the Schools infrastructure standards that are expected to be the objectives for all Ministry of Education assistance to Primary, Secondary and ECE schools in Fiji. Through this document, the Ministry of Education, Heritage and Arts (MEHA) sets out clearly the level of acceptability as a standard and gives guidance on how to achieve them.

It is not expected that all schools will be able to meet all standards in a single round of funding.

These standards also specify a process for identifying where earlier standards have been inadequate, such as the resultant construction fails systemically, or is difficult to repair and maintain. In such cases, these standards trigger the development of improved standards.

These standards also specify a process for identifying where school operations and management (O&M) practices are not adequate to maintain the standard. In such cases, these standards trigger a process for improved school training and supervision.

These standards have been developed through a review of the existing MEHA minimum infrastructure standard - including Establishment and Registration of School Regulation 1966 and MEHA Occupation, Health and Safety Manual for Schools, and a consultation process with the Assets Monitoring Unit of the MEHA

2.0 Target use

These standards and guidelines have been written to ensure a common understanding of acceptable levels of school infrastructure between Assets Monitoring Unit (AMU) and Construction Implementation Unit (CIU) in rehabilitating school infrastructures.

The scope of this exercise will cover both rehabilitation work and new buildings. Whenever possible – considering topography and existing school building layout – access for students with a disability will be provided.

The renovation work will be carried out to match with the existing setting, the change of material have to be in accordance to the minimum standards or with AMU/CIU approved recommendation.

3.0 Standards

There are three elements in child development that are essential for child-friendly school design – safety, health and nutrition. These elements are reflected in four (4) basic school standards:

- Standard A: Buildings – School must have appropriate, sufficient and secure buildings.
- Standard B: Health – School must be a healthy, clean, secure and learner protecting environment.
- Standard C: Access – School must have a child-friendly and barrier free environment that promotes inclusive access and equal rights of every child.
- Standard D: Equipment – School must have adequate and appropriate equipment that support the quality of education.

4.0 Standard A: Buildings

4.1 All buildings

Buildings **must** be:

- structurally stable
- weatherproof according to local environmental conditions
- climatically comfortable
- easily exited in case of emergency and
- well integrated with the environmental and cultural context.

4.2 Classrooms

The classrooms **must** be:

- safe
- comfortable
- accessible
- flexible and adaptable and
- provide sufficient space to ensure children's dignity, health, safety and well-being for successful learning.

A standard classroom **must** make provision for:

1. A minimum 1.1m² floor space per pupil with 20% of room space for the teacher.
2. The shortest side of any classroom shall not be less than 6.1 metres.
3. Every primary school classroom shall comprise an area of not less than 33 m² for the first 30 pupils and 0.38 m² for each additional pupil.
4. Every secondary school classroom shall comprise an area of not less than 39 m² of floor space for the first 30 pupils plus 1.12 m² for each additional pupil.
5. Space between desks should be 500mm apart for ease of movement.
6. The furniture type will dictate the area requirement within this floor area range.
7. Two doors must be provided for each classroom. This is to make sure that two avenues for escape are available in case of fire, earthquake and other potential incidents.

8. All dividing walls or partitions between classroom shall extend to ceiling height and shall completely divide each classroom from the next.
9. Schools that do not meet the minimum internal floor requirement will be nominated for future assistance to expand.
10. Emergency Evacuation plan should be clearly pasted in the notice board and it should be visible. Everyone should read it and understand it to anyone entering the room.

4.3 Science Laboratories

1. Every science laboratory shall comprise an area of not less than 55.76 m² for the first 20 pupils, 1.8 m² for each of the next 10 pupils and 1 m² for each additional pupil.

2. A room which is square or nearly square in shape is desirable.

3. Every laboratory shall be provided with more than one means of exit.
4. Adequate preparation room/storage space shall be provided. This area shall comprise not less than 20% of the teaching floor space of the laboratory.

5. A lockable cupboard for the storage of dangerous chemicals shall be provided in every laboratory.

6. Firefighting equipment and an adequate first aid kit shall be included in every laboratory.
7. Emergency Evacuation plan should be clearly pasted in the notice board and it should be visible. Everyone should read it and understand it to anyone entering the room.

4.4. Workshop

1. Workshops shall have a standard size of 128 m² [16mx8m]

2. Every Primary school woodwork shop shall comprise an internal area of not less than 128 m² for the first 10 pupils plus 2.39 m² for each pupil thereafter. In addition, storage area of not less than 14.87 m² internal in the case of workshops having less than 14 places, and of not less than 29.74 m² internal in the case of workshops having 14 or more places shall be provided.

3. Every Secondary school woodwork shop shall comprise an internal area of not less than 66.9 m² for the first 12 pupils plus 3.72 m² for each pupil thereafter. In addition, storage area of not less than 14.87 m² internal in the case of workshops having less than 14 places, and of not less than 29.74 m² internal in the case of workshops having 14 or more places shall be provided.

4. Every metalwork shop shall comprise an internal area of not less than 128 m² for the first 20 pupils plus 2.79 m² for each pupil thereafter. In addition, storage area of not less than 14.87 m² internal in the case of workshops having less than 16 places, and of not less than 29.74 m² internal in the case of workshops having 16 or more places shall be provided.

5. An adequate first-aid kit and adequate firefighting equipment shall be provided in every workshop.
6. Every tools store must be secure and doors shall be provided with locks.
7. Emergency stop switches shall be provided in all workshops fitted with powered machinery.
8. All powered machinery shall be adequately guarded.

9. Every workshop should clearly paste an emergency evacuation plan for disaster and should be clearly visible and easy to understand.
10. Emergency Evacuation plan should be clearly pasted in the notice board and it should be visible. Everyone should read it and understand it to anyone entering the room.

4.5 Technical Drawing Rooms

Every technical drawing room shall comprise an area of not less than 128 m² for the first 20 pupils plus 2.0 m² for each additional pupil. Additional equipment storage space/room amounting to 7/1/2% of the teaching floor space shall be provided.

Emergency Evacuation plan should be clearly pasted in the notice board and it should be visible. Everyone should read it and understand it to anyone entering the room.

4.6 Workshop for Home Economics Rooms

1. Every home economic room shall comprise an area of 128 m² for the first 20 pupils and 2.0 m² for each additional pupil.

2. Cookers in all home economics rooms shall be provided with fire-proof PPE [Personal Protective Equipment's]

3. Adequate space for an outside clothes line shall be provided adjacent to every home economic room.

4. All home economics rooms shall be provided with an adequate water supply.

5. Adequate fire-fighting equipment and an adequate first-aid kit shall be provided in every home economics room.

6. Emergency Evacuation plan should be clearly pasted in the notice board and it should be visible. Everyone should read it and understand it to anyone entering the room.

4.7 Office Technology or Computer Rooms

1. Office technology room shall comprise an area of 96 m² for the first 20 pupils plus 1.58 m² of each additional pupil. In addition, a secure storage area amounting to not less than 15% of the teaching floor space shall be provided.
2. Adequate fire-fighting equipment and an adequate first-aid kit shall be provided in every home economics room.
3. Emergency Evacuation plan should be clearly pasted in the notice board and it should be visible. Everyone should read it and understand it to anyone entering the room.

4.8 Head Teacher's and Principal's Room

The Head Teacher's and Principal's Room **must** have adequate space for a table, chair and cupboard, plus an area to hold meetings. The Head Teacher's room should be located close to the Staff Room, as well as located to provide surveillance of the main school grounds.

4.9 Staff Room

Separate room or rooms for staff gives privacy to teachers and maximizes the use of classroom space, enabling staff to work separately from students when not teaching. Proximity between classrooms and administrative offices is recommended to monitor students' activities and create safety through visibility. The Staff Room **must** have adequate space for a table, chair and cupboard for each staff member, plus an area to hold meetings.

4.10 Storage

A school **must** have a safe, secure, lockable and dry storage space for education materials, sports equipment and cleaning material. The recommended floor area is in the range of 10-15m2. This storage space must be located in a location easy to be monitored by a member of staff or caretaker.

4.11 Computer Room

Dependent upon many factors, such as availability of electricity, availability of computers and the availability of a computer educational program, a school **should** have a dedicated computer room or through making allowance within the classroom. The allowance within the classroom may include electrical power sockets or laptop charging stations and the ability to re-organize furniture.

Computer rooms **must** have the following qualities: is dust free, has good ventilation (to prevent overheating due to the heat from equipment), has no glare (by providing window blinds), and is lockable. The computer room should be organized in such a manner that it allows easy electrical supply to the computer stations, preferably along the wall by cable trunking to secure cables from damage. If computer stations are located toward the middle of the room, the electricity supply/cable trunking should be hanging from the ceiling and not over the floor to avoid trip hazards.

4.12 Play Area

Sports are a fundamental need for students' education and playgrounds and sports pitches **must** be offered by the school.

a. The minimum play space of 9 m² per child and layout should allow for easy supervision of all areas and activities.

b. The pitch must be level with a smooth surface and well drained.

b. The surface must not be hazardous.

c. Shaded outdoor play areas should be provided, such as groups of trees or canopies.

4.13 Library

A school **should** offer a special room for storing and displaying reference materials. This room may be a centralized room i.e. a library or located in each classroom as a learning resource area. The consideration of inclusion of pupils with disabilities is particularly important for this space. A reading/research area must be provided with adequate furniture arrangements and where possible a computer for *e* - research.

4.14 Kitchen

When a school offers meals, the school **must** have an adequate and hygienic kitchen area. Space for school meal preparation **must** be designed and provided with equipment and furniture that ensure food is kept fresh and away from flies and other pests that undermine food quality.

Provision shall be made in every school kitchen for the washing, drying and storage of cooking utensils in an approved manner. Preparation tables shall be provided in every school kitchen and these shall be kept in a good state of repair.

Provisions shall be made for bulk storage of dry and frozen food.

Cooking stoves or alternative cooking apparatus shall be of an approved type and must incorporate arrangements for the extraction of smoke.

Covered refuse containers shall be provided for every kitchen.

Latrines of an approved type shall be provided for the use of kitchen staff.

There shall be a washbasin, towels, nail brush and soap, and an ample supply of water in every school kitchen for the personal use of kitchen staff.

Provision of the right size portable fire extinguisher equipment and First Aid kit in easily accessible places.

Water tank (2 x 5200L) with proper water harvesting system to be installed within the kitchen premises for emergency use.

Kitchen staff should be properly attired and practice proper hygiene.

4.15 DINING HALL

Every school dining room shall be large enough to allow not less than 1 m^2 of floor space for each pupil at each sitting.

Provision of the right size portable fire extinguisher equipment in easily accessible places

Emergency Evacuation plan should be clearly pasted in the notice board and it should be visible. Everyone should read it and understand it to anyone entering the room.

4.16 HOSTEL

Hostel buildings shall comply in all respects with the Building health Regulations and shall be provided with beds of an approved pattern.

Double tier beds shall not be placed where the ceiling is less than 2.7m high.

Preferable bed size shall be 2m x 1.2m with covered foam mattress of 100mm thickness.

Every bed shall be provided with a mosquito net of approved type unless the dormitory itself is mosquito – proofed.

Beds shall be so arranged as to permit at least 1.8m distance between bed centres unless separated by partitions.

Artificial lighting of an approved type shall be installed in every dormitory.

Every school hostel shall be provided with adequate laundry facilities for pupils clothing and hostel linen. In every school hostel all eating and drinking utensils shall at all times be kept a hygienic condition

Provision of the right size portable fire extinguisher equipment and First Aid kit in easily accessible places.

Emergency Evacuation plan should be clearly pasted in the notice board and it should be visible. Everyone should read it and understand it to anyone entering the room.

4.17 Sick Bay

The school **should** have a room where sick pupils can rest until they are picked up by parents. The Sick Bay should be available in the school when the nearby health clinic is located 2km or more from the school site. The room must have a medical First Aid Kit available: refer to Standard D, Section 8.21.

4.18 Kindergarten Schools

Playroom and Indoor Area

There may be a local hall available which can be used temporarily until such time when a special building is erected.

1. The premises must be approved by and be maintained always to the satisfaction of the appropriate health Authority and the Education Department.

2. There must be a minimum floor space of 10sq feet (approx..9290 cm Sq²) per child and not more than 35 children may be accommodated in any one room or hall.

3. Floors must be free from splinters or be covered throughout by mats.

4. Adequate windows and doors to be provided to give good lighting, ventilation and easy access outside in case of emergencies.

5. Storage space must be provided for materials and equipment (lockable cupboard and shelves).

6. Proper sanitary facilities must be provided. Toilets should be no more than 10" – 12" high (30.5cm), and there must be one for every 15 children or part the roof. In case of ordinary size toile pans, use wooden box for children to climb on).

7. Wash hand basins, if available, should be set 2' feet high (60.10cm) – a mirror fixed over the basin is desirable – (optional). Standing taps with proper drainage would also suffice.

8. Hand towels should be provided and placed within the children's reach.

9. There must be ample supply of furniture and play equipment to cater for the number of children attending the center.

Precautions in case of illness or injury

1. Drinking water must be safe and free from contamination. Well and river water must be boiled before use.

2. All drinking and eating utensils must be kept in hygienic conditions.

3. A first aid kit must be available with the following items: Cotton wool lint Dettol/savlon mercurochrome ointment Acriflavine band aid Bandages (small & large)

Outdoor Play Area

1. There should be a minimum play space of 100sq feet per child and the layout should allow for easy supervision of all areas and activities.

2. The areas should be well drained and surfaced, and it should provide some shade.

3. The area should be fenced on all sides with a gate which can be securely fastened. A galvanized wire fence or thick hedge 3' high (90.15cm) is desirable.

4. The propose structure should be certified by an engineer and OHS officer or relevant officer before it is to use by the children.

Pre- School Kindergarten Equipment

1. All equipment should be safe, clean and in good repair.

2. Furniture provided should be of a size suitable for small children.

3. Adequate and suitable equipment is very important to the successful operation of a pre-school centre. Therefore, sufficient paly equipment to cater for the number of children in the group should be available.

4. The following is a guide for the amount and type of equipment necessary for a one unit center where 35 children attend on a half day basis. A double unit centre will required for a playground and material. You will note some items will not cost money but can be collected from a variety of sources.

4.19 Safety and Security

Safety and security issue **must** be considered in Program planning and implementation. The following are school specific needs to be addressed.

Security

Security is about surveillance, supervision of access and protection against theft. Particular attention needs to be given to:

- Access control, for instance to ensure visitors can be shown to an interview room from reception but cannot enter the school without permission;
- Securing the building 'envelope' – walls and roofs but particularly windows and doors; security bars may be used to glazed areas.
- Having clearly defined site boundaries, using appropriate fencing and/or planting of hedges.

Fire Hazards
All school buildings must adhere to the Fiji Building Code. Fire safety is important and having the right building design and fire safety equipment could save lives and school property. This safety measure includes:

- Provision of a secondary exit in each classroom for a second means of escape in case of fire.
- Provision of the right size portable fire extinguisher equipment in easily accessible places.
- Provision of fire escape ladder shall be provided for facilities exceeding one-storey building.

Natural Hazards

Depending on the geographical location, Fiji is prone to natural hazard. Schools in the hazard prone areas must have protection features against this kind of natural hazard. The features include:

- Ensuring that roof covering, battens, purlins, rafters and roof trusses are securely fixed to the main structure to prevent the roofs from being blown away.
- Adequacy of the main structure against cyclonic wind.

- Provision of external protective fixtures, such as external window shutters.
- Securely fixing external doors to the main structure.
- Provision of high shelves and cupboards for pre flood storage.
- Tie downs for water tanks.

5.0 Standard B: Health

A combination of dirty drinking water, dirty environment and improper disposal of excreta contributes to the degradation of health at schools. A concerted effort to supply safe water and clean sanitation facilities will drastically reduce illnesses in schools.

5.1 Water

Fresh potable water **should** be available to students within the school. Proper plumbing infrastructure allows for the distribution of safe water. If such a setup is not possible, a borehole/well should be included in the school compound. This can be augmented with a rainwater catchment system in the roof as appropriate.

Each school **should** have a water storage facility for up to 40% to 60% of the daily children's water demand. If a municipal network exists, it is preferable to make arrangement to connect the school to it. All connections to the existing mains shall be made with the utmost care using the correct type of couplings and note that additional treatment may be required for drinking purposes. The making of these connections shall be planned carefully so as to prevent or limit any disruption or interruption of the existing water supply service. The school management **should** also ensure provisions are made to pay for the service.

Potable (drinking) water quantity		
Type of occupancy at school		Quality (litres/pupil/day)
Full-Time Pupils	Lunch at school	2
	Lunch at home	1
Boarding pupils		2.5 to 3
Teacher/other staff members		4

Non-Potable water quantity		
Type of occupancy at school		Quantity (litres/pupil/day)
Full-Time Pupils	Lunch at school	3 to 9
	Lunch at home	2 to 7

Boarding pupils	5 to 20

5.2 Sanitation

The link between poor sanitation and poor health is evident. Also the lack of adequate sanitation is a major reason why many children, particularly girls, fail to attend school. The lack of facilities affects the performance and achievement of all pupils, and is certainly detrimental to the working conditions of teachers.

Bathrooms

Teachers need to have separate facilities for men and women. For students, designated separate bathrooms for boys and girls within or close to the classrooms are the most practical and safest arrangement. These facilities can also be designed and located so that they are shared among clusters of classrooms to protect younger children. Accessible toilets **must** be provided for students with special needs. See Standard C: Access, Section 6.0.

Sanitation Quantity

1. For every day-school carried on in a building used solely for school purposes, separate closets for:

a. Teachers and adults

b. Children

The number of closets will be worked out as follows:

(a) Teachers and Adults: Separate closets for each sex. One closet for every twenty persons or part of twenty persons of either sex.

(b) Children – Boys: One closet for every 33 boys or part of thirty three boys up to 200 boys, and an additional closet for every fifty or part of fifty boys over the number of two hundred boys. A urinal should also be provided.

(c) Girls: One closet for every 20 girls or part of twenty girls up to 200 girls, and an additional closet for every 25 girls or part of twenty five girls over that number up to three hundred girls, and one additional closet for every thirty three girls or part of thirty three girls over three hundred.

Sanitation Quality

Sanitation facilities **must** be of appropriate quality. Recurrent problems that are the result of design flaws must be identified and fixed. All facilities:

- must be of a high standard without environmental risks, such as unstable floors or full pits.
- must be constructed to be able to be kept clean and hygienic.
- must have adequate (natural or artificial) light.
- must have adequate ventilation.
- must provide sufficient privacy for the user.

Easy cleaning and maintenance

- Use smooth durable floor surface that can be cleaned easily.
- Ensure water and liquid run off to avoid pools of stagnant water.
- Consider lower height handles for smaller children
- Consider smaller toilet seat for smaller children. Toilet pans for ECE student should be no more than 0.25–0.30m high.

Hygiene materials

- Provision of hand washing basins and soap for boys/girls and staff facilities.
- Provision of general cleaning equipment such as, deck brooms, mops, scrapers and bowl brush
- Sanitation towel, toilet paper and sanitation bins in each cubicle for girls and female staff.
- *Air freshener for urinals*
- *Toilet papers in each boys cubicles*

5.3 Incinerator

An incinerator (in accordance with district or city planning policy) **should** be available within the school grounds. Its location in the school yard **should** allow operating it without interfering with the normal course of classes due to the smoke and gas it might produce.

Provision of incinerator chimney should be at a height above the roof of the closest classroom.

Alternatively, consider an open pit which should be filled up after use.

NB: Each installation should be authorized by the Rural Local Authority.

6.0 Standard C: Access

A school **must** have a child-friendly, barrier free environment that promotes inclusive access and equal rights of every child.

6.1 Child Friendly Environment

The school environment, as a child-friendly one, **must** provide the basis for mental and physical development of children, meaning that the facilities are the social setting for child interaction as much as a formal learning environment.

6.2 Barrier Free Environment

A school **must** ensure that the facilities are reasonably accessible and usable to all, regardless of age, gender and any special needs. The built environment **should** encourage the integration of all pupils into the same learning environment and teaching.

Access

A school **must** allow reasonable access to all (pupils, visitors and staff) into the learning environment. All users including visitors, pupils and staff **must** be able to:

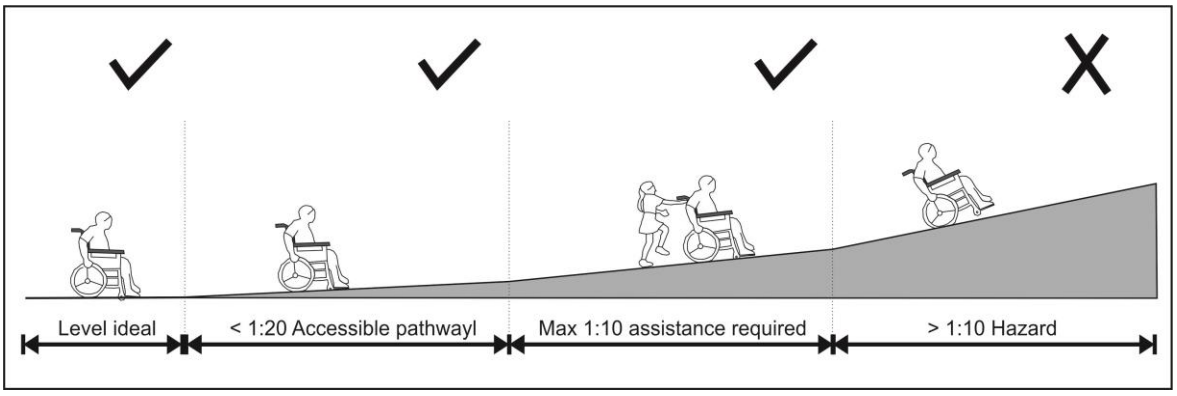
- Gain access to and within the educational facilities.
- Use sanitary conveniences.

Other requirements include:

- Walkways and doors must be a minimum of 900mm wide for a wheelchair to pass.
- Any thresholds (level changes at the door) must not be more than 13mm high.
- Floor surfaces must be firm, durable, slip resistant and smooth.

Ramps

Where there is a change in level, a ramp **should** be provided at 1:20 gradient and a maximum 1:10 gradient when assistance is available (refer to ramp gradient diagram); where possible it is beneficial to have steps as well as a ramp.



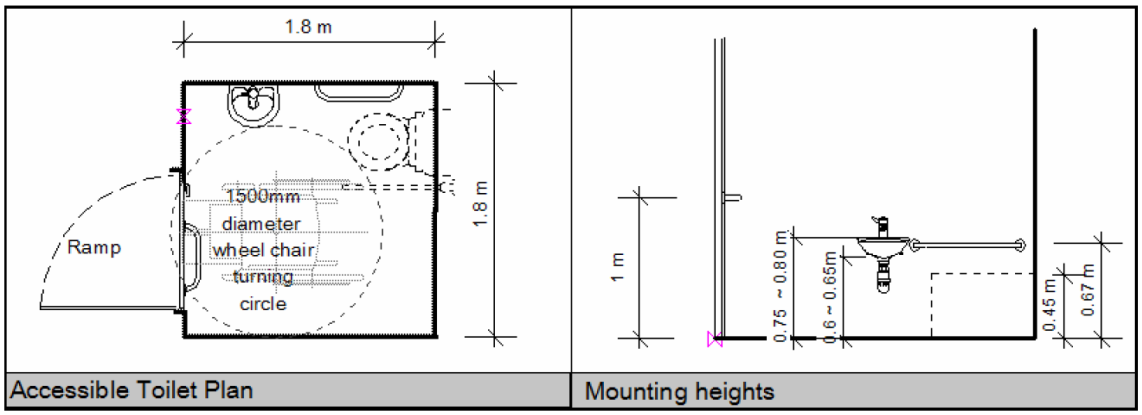
In conditions were both ramps and stairs are provided, the ramp **should** have a minimum 900mm width with 900mm width steps. Requirements include:

- The ramp surface must be slip resistant, especially when wet.
- There must be a landing at the foot and head of the ramp at least 1.2m long and clear of any door swings or other obstructions.
- There must be a handrail on one side of the ramp at 800mm above finished floor level. Alternatively, there may be two handrails at different levels to accommodate different height users i.e. children - One at 600mm and another at 900mm.

Accessible toilets and hygiene facilities

Whenever possible – without extending or changing the outline of existing toilet blocks- schools **should** make the provision of a minimum one wheelchair-accessible toilet per school. Wheelchair users must be able to approach, enter, transfer to, and use sanitary facilities provided within the school grounds. Details include:

- Approach: The accessible toilet must have a wheelchair-accessible route to and from the toilet, if necessary with ramps.
- Enter: The user must be able to be open and close the door independently. The door must be outward opening with a pull close handle to the inside of the door, allowing enough maneuvering space for the wheelchair user to turn.
- Transfer: The space provided for maneuvering should enable wheelchair users to adopt various transfer techniques that allow independent or assisted use. When transferring to and from their wheelchair, people require horizontal support rails as shown in the diagram below.
- WC pan: The WC seat height should be 480mm above finished floor level.



Accessible Toilet Plan | Mounting heights

7.0 Standard D: Equipment

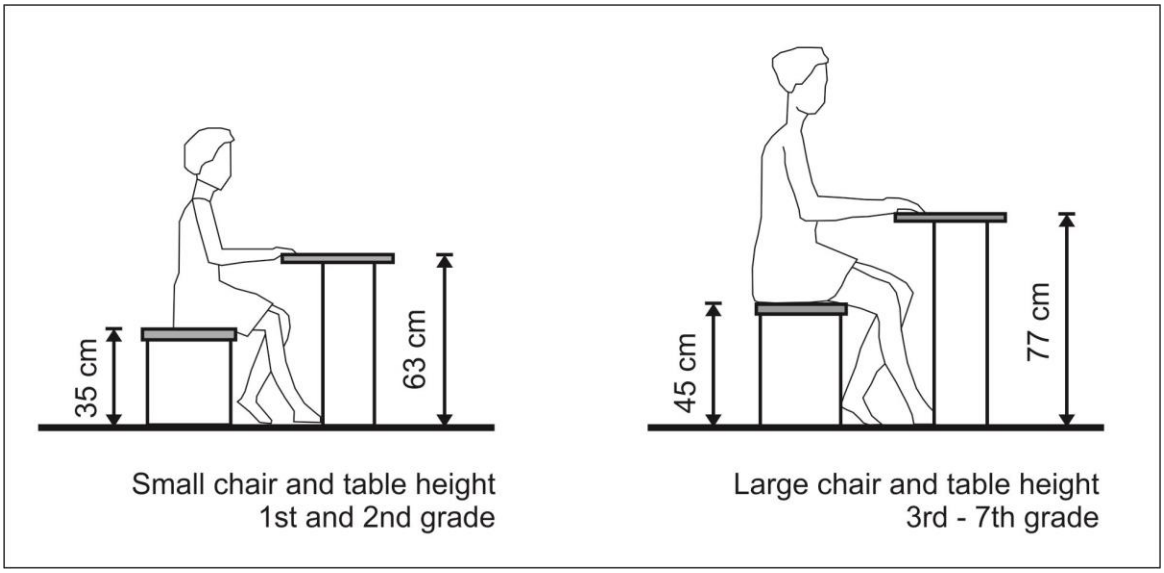
A school **must** have adequate and appropriate equipment that support the level of education.

7.1 Furniture

The correct school furniture is of high importance as they will enable the efficient functioning of activities within the school. The following table outlines the furniture which **should** be in each room type.

It **must** be ensured that the furniture provided is of compatible heights and suitable for use by pupils. The school **should**, when there is a need, provide adapted furniture, table and chair, for pupils with special needs. Different size of chairs and desks **should** be used for

different size of pupils. Below are the sizes of furniture for children of different ages/school grades.



7.2 First Aid Kit

A first aid kit is a collection of supplies and equipment for use in giving first aid. All kits must be in a clean condition and kept in a waterproof container to keep the contents safe and aseptic. Kits should also be checked regularly and restocked if any items are damaged or expired.

7.3 Basic Science Kit – Primary

Item	Unit of measure	Number of units
Balloon	medium size	1 Pkt
Beaker glass 250ml - graduated (pyrex)	250 ml	10
Blotting paper (medium size)	medium size	1 Pkt
Boiling flask rb 250ml (pyrex)	250 ml	5
Bulb Holder	2.5-3Volts screw bulb	5
Compass magnet with lid	45 mm	5
Conical flask Bomex Nn Grad	250 ml	5
Copper Strips	100 g	1
Copper Sulphate	250 g	1
Copper Wire, Standard, Bare		2
Crucible porcelain with lid 50 ml	50 ml	5
Dissecting Kit -	11 piece in wallet - set	1
Dissecting tray [waxed] - tray		1
Dropper		10
Evaporating Dish		5
Filter Paper	9 cm pkt/100 - pkt	1

Gas Burner & Cartridge - Complete		2
Gas Jar Glass	50 X 150 mm w/cover	2
Hand gloves disposable vinyl latex - pkt		1
Hydrochloric acid [dilute] - 500ml	500 ml	1
Iodine Crystals	25 g	1
Iron Filings	100 g	1
Lead Nitrate Solution	500 ml	1
Litmus Blue	1 pkt/100 strips - pkt	1
Litmus Red	1 pkt/100 strips - pkt	1
Magnesium Ribbon - 2 Metres	2 metres	1
Magnet Alinico Bar - Pair	75 mm	5
Magnifier Handheld	100mm 2x/4x	5
Measuring cylinder glass- 100 ml x 1 ml grad	100 ml	5
Methylated Spirit 500 Ml	500 ml	1
Plain Mirror	10 cm x 8 cm	5
Plastercine	[5 colours X 500 gram]	1
Plastic Beaker	200 ml	5
Plastic Funnel Pp	6 cm diameter	5
Plastic Tubing	8 mm diametre [50 cm]	5
Pottasium Iodide Solution	500 ml	1
Rubber Bungs To Fit Test-Tubes		5
Rubber Stopper -E	2 holes, 32 mm bas	5
Safety Goggles Coated Clear Lens		6
Spatula Metal Spoon Spade	150 mm	5
Spirit Burners With Wick	100 ml	5
Spring Balance	1000g	5
Stop Watch		5
Sulphur Powder 500 G	500g	1
Syringers Plastic Disposal	5 ml	10
Test Tubes Glass W/Rim	15X150mm 50/pk	50
Test Tubes Rack Pp	6 hole 28mm + 6 PEGS	10
Thermometer Alcohol	[-10°C -110°C]	5
Tongs-For Crucible Stainless Steel		5
Tripod Stand	127 X 125mm	5
Watch Glass	90mm DIA 10/PK	10
Wire Gauze Ceramic Centre	15 cm x 15 cm	5

7.4 Basic Science Kit – Secondary

Name of equipment	Quantity

Aluminium Foil	1 pkt
Ammonia Solution	1 × 500 ml
Balances – Triple Beam	1 per school
Barium Chloride	1 × 100 g
Batteries (1.5 V)	2 per 5 students
Beaker (Glass) • 250 ml • 400 ml • 1000 ml	 1 per 5 students 1 per 5 students 1 per 5 students
Beaker (Plastic) □ 250 ml • 400 ml • 1000 ml	 1 per 5 students 1 per 5 students 1 per 5 students
Beaker Tongs	1 per 5 students
Benedict's Solutions	1 × 100 ml
Binocular Microscope	1
Burner - Bunsen	1 per 5 students
Burner – Spirit Burner with Wick	1 per 5 students
Calcium Hydroxide	500 g
Calcium Oxide	500 g
Clamp Stand	1 per 5 students
Cobalt Chloride Paper	1 pkt
Compass	2 per 5 students
Copper Sulphate	500 g
Copper Wire (Bare)	1 roll
Cover Slip (1 Pkt/100)	1 pkt
Crucible Porcelain with Lid (50 mm)	1 per 5 students
Dissecting Kit (16 Item Kit)	2 per school
Dissecting Tray - Waxed	2 per school
Distilled Water	1 × 1 gallon
Dropper With Teats	1 pkt
Fehling's Solution	1 × 100 ml

7.5 Biology Lab Materials

Equipment and Glassware	Quantity

Aluminum foil (disposable)	1 × 30 cm × 30 m per school
Beaker (100 mL)	1 per 5 students
Beaker (250 mL	1 per 5 students
Beaker (50 mL)	1 per 5 students
Beaker (500mL)	1 per 5 students
Bunsen burner	1 per 5 students
Clamp stand and clipper	1 per 5 students
Conical flask (250 mL)	1 per 5 students
Cobalt paper	1 × 1 packet per school
Depression slide	5 per school
Digital balance	3 per school
Dissecting board	1 per 5 students
Dissecting kit	1 per 5 students
Dissecting tray	1 per 5 students
Droppers	1 per 5 students
Funnel	1 per 5 students
Gauze mat	1 per 5 students
Glass rod	1 per 5 students
Graduated cylinder (10- 20 cm^3)	1 per 5 students
Hand lens	1 per 5 students
Light bulb (100 W)	5 per school
Litmus paper (red)	1 × 1 packet per school
Litmus paper (blue)	1 × 1 packet per school
Micropipette	2 per school
Monocular or binocular Microscope (in a working condition)	5 per school
Pasteur pipette	1 per 5 students
Pestle and mortar	1 per 5 students
Petri dish	1 per 5 students
Pipette	1 per 5 students
Pipette filler	1 per 5 students
Stopper/ rubber bung	1 per flask/ test tube
Test tube	1 per 5 students
Test tube holder	1 per 5 students
Test tube rack	1 per 5 students

Thermometer	1 per 5 students
Tripod stand	1 per 5 students
Trough	2 per school
Universal indicator paper	1 × 1 pack per school
Watch glass	1 per 5 students
Wide glass tubing	1 per 5 students

7.6 Chemistry lab Materials

Glassware/Equipment	**Volume/Size/Quantity**	**Remarks**
Triple beam balance	2	per school
Digital balance/electronic balance	2	per school
Spring balance	5	per school
Bent glass tubing	5	per school
Stoppers/rubber bungs	20 (different sizes)	per school
Bunsen/gas burner	5	per school
Tripod stand	10	per school
Gauze wire/mat	10	per school
Motar and pestle	3	per school
Thermometers	1	per group of 4 students
Clamp/retort stand	1	per group of 4 students
Boss head clamp	1	per group of 4 students
Titration burette clamp	1	per group of 4 students
Tongs	5	per school
Test tube rack	10	per school
Test tube holder	10	per school
Stop watch	5	per school
Spatula	5	per school
Pipette filler	3	per school
Voltmeter	2	per school
Connecting wires	10	per school
Bar magnet	5	per school
Pasteur pipette	5	per school
Dropper	5	per school
Gas collection jar	5	per school
Glass tubing	10 length	per school

Watch glass	10	per school
Glass rod	10	per school
Pipette: 20 mL/25 mL	1	per group of 4 students
Burette – 50 mL	1	per group of 4 students
Test tube	50	per school
Boiling Tubes	10	per school
Semi-micro test tube	7	per school
Round bottom flask	5	per school
Side-arm flask	5	per school
Filter funnel: small large	5 5	per school per school
Separating funnel	3	per school
Thistle funnel	5	per school
Storage bottle	3	per school
Wash bottle	5	per school
Crucible	1	per group of 4 students
Pipe clay triangle	10	per school
Desiccator	2	per school
Molecular models	1	per group of 4 students
Gas syringe	5	per school
U-tube	5	per school
Alligator clips	10	per school
Distillation apparatus	3	per school
Fractional distillation apparatus	3	per school
Melting point/ capillary tubes	2 packets	per school
Delivery tube	5 pieces	per school
Broken porous pot/Boiling chips	200 g	per school
Hydrometer	3	per school
Bee-hive shelf	3	per school
Conductivity tester	2	per school
Beaker: 50 mL 100 ml 200 mL 500 mL 1 L	7 7 7 3 3	per school per school per school per school per school

Measuring cylinder: 10 mL 25 mL 50 mL 100 mL 200 mL 250 mL 500 mL 1 L	5 5 5 5 5 5 3 3	per school per school per school per school per school per school per school per school
Standard flask: 100 mL (Volumetric) 250 mL 1 L	3 1 3	per school per group of 4 students per school
Conical flask: 100 mL 250 mL	7 4	per school per group of 4 students
Flat bottom flask – 500 mL	3	per school

7.7 Physics Lab materials

Content	Number of units
Ammeter (0-100 µA, 0-500 mA, 0-10A)	2 each per group of 6 students
Ball bearing – brass and steel (2 different size: small and medium)	2 per group of 6 students
Batteries – Dry cell (1.5 V)	2 per group of 6 students
Beakers (250 ml and 500 ml)	2 each per group of 6 students
Bent Glass Tubing	1 per group of 6 students
Bulb with holder	3 per group of 6 students
Bunsen burner	1 per group of 6 students
Calorimeter	1 per group of 6 students
Capacitors (2 µF and 100 µF)	2 each per group of 6 students
Carbon Paper for ticker timer	2 per group of 6 students
Connecting wires with alligator clips	5 per group of 6 students
Copper wire	5 metres
Cylinder bracket	1 per group of 6 students
Electroscopes	1 per group of 6 students
Eureka Can	1 per group of 6 students
Flywheel	1 per group of 6 students
Funnel	1 per group of 6 students
Galvanometer	1 per group of 6 students

Gas tanks	1 per school
Gauze wire	1 per group of 6 students
Glass capillary tubing	1 per group of 6 students
Glass slabs – semicircular and rectangular	1 per group of 6 students
Lenses – concave and convex	2 per group of 6 students
Magnetic Compass	1 per group of 6 students
Magnets	2 per group of 6 students
Masses- Brass (5g, 10g, 20g, 50g, 100g, 500g)	10 per group of 6 students
Measuring Cylinder (100 ml x 1 ml grad)	1 per group of 6 students
Measuring scale	1 per group of 6 students
Measuring tape	1 per group of 6 students

7.8 List Of Industrial Arts Standard Tools And Machines

NO	TOOL/EQUIPMENT	Quantity	SIZE/ SPECIFICATIONS	REMARKS
1	Arc Welding Machine		Output current (60-180)	Portable machine
2	Arc Welding Shield		Black glass	Safety equipment
3	Bits Drill Set		HSS 1-13 x 5mm	Hand tool
4	Vernier Calipers		Digital 150 mm (6 inch)	Hand tool
5	Micrometer		25-50mm	Hand tool
6	Pipe Wrench		HD – 12 inch	Hand tool
7	Pop rivet gun		16 inch	Hand tool
8	Portable Angle Grinder		650 W Disc 100mm	Portable machine
9	Soldering Iron (Electrical)		40W	Hand tool
10	Marking Gauge			Hand tool
11	Cold Chisels		300mm	Hand tool
12	Engineering Vice		No.3 100mm	Hand tool
13	Hammer Ball Pein		Wooden handle 16oz	Hand tool
14	Hammer Cross Pein			Hand tool
15	Pliers - Combination		200mm	Hand tool
16	Centre Punch		3mm	Hand tool
17	Sliding Bevel		46-826 Plastic or wooden handle	Hand tool
18	Tin Snip – Curve		14 inch	Hand tool
19	Tin Snip – Flat/Straight		14 inch	Hand tool
20	Screwdrivers - Flat		6 x 150	Hand tool
21	Screwdrivers - Star		6 x 150	Hand tool
22	Engineering Square		250mm	Hand tool
23	Cramp Sash		48 inch – 1220mm	Hand tool
24	File - Half round		250mm – 10 inch	Hand tool
25	Hacksaw Frames		HD – 12 inch	Hand tool
26	Hacksaw Blades		12 x ½ inch	Hand tool

27	**Marking or Engineering Scriber**			Hand tool
28	**Safety Gloves Leather**			Hand tool
29	**Bench Grinder**			Portable machine
30	**Woodwork vice**		7 inch Quick Release	Hand tool
31	**Portable Drill**			Portable machine
32	**Portable Drill (Cordless)**			Portable machine
33	**Gas Welding Set**			Portable machine
33	**Screwdriver set**		6-13pcs	Hand tool
34	**Safety Goggles**		Clear	Safety Equipment
35	**File – Flat**		10 inch	Hand tool
36	**Rubber Mallet**		32 oz	Hand tool
37	**Steel Brush wire**			Hand tool
38	**Spanner - Adjustable**		HD – 10 inch	Hand tool
39	**Spanner Set – Ring/Box**		12 - 24 pcs (6-24mm)	Hand tool
40	**Portable Planer**			Hand tool
41	**Portable Router**		With carry case	Portable machine
42	**Portable Jig Saw**			Portable machine
43	**Portable Circular Saw**			Portable machine
44	**Portable Drop Saw**		355 mm	Portable machine
45	**Portable Belt Sander**			Portable machine
46	**Portable Grinder**		750 W	Portable machine
47	**Tenon saws**			Hand tool
48	**Hand saws - Rip Saw**		Jet cut – 7 inch	Hand tool
49	**Hand Saws - Crosscut Saw**		7 inch	Hand tool
50	**Iron Jack Plane**			Hand tool
51	**Smoothing Plane (Jointer)**		No. 4	Hand tool
52	**Nail Punch**		3mm – (4-8 pcs)	Hand tool
53	**Chisel - Firmer (Flat)**		½ inch (12 mm)	Hand tool
54	**Chisel - Firmer (Flat)**		1 inch (25 mm)	Hand tool
55	**Chisel-B/Edge Firmer**		½ inch (12 mm)	Hand tool
56	**Chisel-B/Edge Firmer**		1 inch (25 mm)	Hand tool
57	**Chisel-Mortise**		¼ inch (6mm)	Hand tool
58	**Coping Saw**		150mm (6 inch)	Hand tool
59	**Claw Hammer**		HD – 16 oz Steel handle	Hand tool
60	**G Cramp**		150 mm (6 inch)	Hand tool
61	**Gouge - Scribing**		1 inch	Hand tool
62	**Rachet brace**			Hand tool
63	**Steel Rule**		12 inch	Hand tool
64	**Bench Circular Saw**			Fixed machine
65	**Try square**		250 mm	Hand tool
66	**Tack Hammer**			Hand tool
67	**Gas Welding Goggles**			Safety equipment
68	**Multi-meter**		General purpose	Testing equipment
69	**Insulation Resistance Meter**			Testing equipment
70	**Oilstone**		150 mm	Hand tool
71	**Hand Saw Set 3pc**			Hand tool
72	**Mitre Square**			Hand tool

73	Spring Divider		250 mm	Hand tool
74	Spokeshave – flat		250 mm x 54 mm	Hand tool
75	Spokeshave – round		250 mm x 54 mm	Hand tool
76	Wood Rasp - Flat Rough		300 mm	Hand tool
77	Wood Rasp - Flat Medium		300 mm	Hand tool
78	Wood Rasp - Flat Fine		300 mm	Hand tool
79	Anvil		5 kg	Hand tool
80	Caliper Inside		200 mm Adjustable	Hand tool
81	Caliper Outside		200 mm Adjustable	Hand tool
82	Mallet Bossing			Hand tool
83	Wire cutter		200 mm	Hand tool
84	Carving Tool set			Hand tool
85	Marking knife		4 pcs	Hand tool
86	Air Compressor		24 litre – 2.2 kW	Portable machine
87	Staple Gun			Hand tool
88	Pincer		8 inch	Hand tool
89	Mortise Gauge			Hand tool
90	File - Round		12 inch	Hand tool
91	Tinman's Mallet			Hand tool
92	Band Saw		BP-250	Hand tool
93	Surface Planer/ Thicknessor		T-330	Hand tool
94	Wood Lathe		WI-18	Fixed machine
95	Spirit Level		600 mm	Hand tool
96	Measuring Tape		50 metre	Hand tool
97	Pinch Bar		600 mm	Hand tool
98	Point Trowel		200 mm	Hand tool
99	Square Trowel		275 × 132 mm	Hand tool
ESTIMATED BUDGET PER SCHOOL = $8,000.00 – $10,000.00				

7.9 List Of Industrial Arts Standard Technical Drawing Instruments

NO	TD EQUIPMENT	BRAND	QTY
1	Set Square 45^0	Quality	
2	Set Square 60^0	Quality	
3	Protector	Quality	
4	Technical Drawing set	Quality	
5	T-square	Quality	
6	Blackboard meter ruler	Quality	

7	**Blackboard Compass**	Quality	
8	**Blackboard Protector**	Quality	
9	**Blackboard 45^0 set square**	Quality	
10	**Blackboard 60^0 set square**	Quality	
ESTIMATED BUDGET PER SCHOOL = $1,500.00 – $2,000.00			

7.10 Agriculture Tools

1	Axe
2	Buckets
3	Budding knives
4	Budding tape
5	Cane knives
6	Digging forks
7	Digging Spades
8	Feeders
9	Flat File
10	Garden line

11	Garden rake
12	Hammer
13	Hand Sprayer
14	Hand fork
15	Hand spade
16	Hand rake
17	Hose pipe
18	Hurricane lantern
19	Measuring tape (30m)
20	Planter bags (s, m, l)

21	Post-hole spade
22	Pots for pot plants
23	Scale
24	Secateurs
25	Shovel
26	Sprinklers
27	Tin snip
28	Water troughs
29	Watering cans
30	Wheel barrow

Safety clothing – teachers and students are to provide and wear appropriate safety clothing for practical tasks and classes. Some of these items may include and will depend on the task at hand.

i) Dust jacket/overalls/clothes suitable for farm work.
ii) Gloves.
iii) Head gear.
iv) Respirators.
v) Safety foot wear.
vi) Safety glasses.
vii) Dust masks.

7.11 Computer Lab Materials

i) FURNITURE

	ITEMS	URBAN (Quantity)	RURAL /MARITIME (Quantity)	REMARKS
1.	Long Table	3	3	3 to be placed against the wall.
2.	Chairs (optional swivel)	10	5	To be placed along the long table.
3.	Table (2m x 80cm) – normal size	5	5	To be placed in the middle of the room or 2 long table to replace them.
4.	White board	1	1	To be mounted on the wall for

				teaching.

ii) ICT EQUIPMENTS

	ITEMS	URBAN (Quantity)	RURAL /MARITIME (Quantity)	REMARKS
1.	Desktop Computer	10	5	With latest specifications. Expected number is depending on the class size and the school geographic location (urban /rural / maritime). Ratio of 1:2 to enable maximum learning Laptop can be used as "back up" to desktop computers.
2.	Laptop	5	3	
3.	Printer (Laser)	1	1	To be shared and networked / wireless. For printing of students' projects and other learning resources.
4.	Uninterruptible Power Supply (UPS)	1	1	(5 KVA online centralized UPS or 625 VA UPS for each system) Provides emergency power to a load when the input power source or main power fails.
5.	Multimedia (optional)	1	1	Essential tool for effective and efficient teaching. The item should be mounted onto the ceiling.
6.	Server	1	Optional (External hard-drive)	(Windows 2003 or latest version). For "back-up" services. Students / teachers files need to be archived.
7.	Internet (at least 500 mbps)	1	1	A must since internet is a part of the curriculum.

8.0 Technical specification for maintenance/repair work

The technical specification is intended to describe the desirable quality of work and construction method for the school improvement project. This technical specification was formulated through a review of FESP-EU project specification and in consultation with the Assets Monitoring Unit of the MoE.

Note: These specifications are for guidance as to minimum standards, and shall be used in place of a full specification specific to each project.

8.1 Signage

The CIU, in conjunction with the AMU, will continuously monitor whether these requirements are being met, through feedback from the District Education Offices and CIU's engineer consultants as well as other sources.

School Sign Board

The school management committee **must** organize the installation of visible school signboard. This signboard **will** contain the school logo, school name, registration number, school vision, motto, school address and contact details.

8.2 Material

All material **shall** be new and shall be of first grade unless otherwise specified and, when liable to damage, the materials shall be properly handled, stacked and stored with adequate protection.

All labour and workmanship **shall** be executed in a manner compatible with first class building practice.

8.3 Timber

Grading

All timber **shall** comply with the requirements of the "National Grading Rules for Fijian Timbers":

- Selected timber for joinery, flooring, weatherboards, lining, and other uses which will generally be covered or painted.
- Timber for utility shelving, sharking, rough lining and sheeting and high grade concrete formwork.
- Structural timber to be **F7** seasoned and graded and sized to suit the application

Timber Moisture Content

All Joinery and dressing timber shall conform to the following requirement:

- Wet zone (e.q. Suva, Nausori, Lami) = 17% + 1-3%
- Intermediate zone (e.q. Sigatoka, Lambasa) = 15% + 1-3%
- Dry zone (e.q. Nadi, Lautoka) = 14% + 1-3%
- Moisture content of framing timber at time of delivery shall not exceed 25%

Timber preservative treatment requirement

All timber used on site to be seasoned, straight and free of knots and treated following the Fiji Department of Forestry's current recommendation. See "Fiji Timbers and their uses No.69".

Finishes

- All timber used on site to be finished with primer/paint/sanding sealer or 3 coats of varnish immediately following installation.
- All Joinery work **shall** be finished with sandpaper and/or sanding machine to a smooth finish ready to receive paint, polish or finishes specified.

Fixings

Fixing (generally all screws, nails, and other fixings necessary to complete this section of work) should be allowed for and be of ample length and gauge necessary for secure fixing.

- Nails: All nails shall be 2.5 times the thickness of the timber being secured. Galvanised nails must be used on Fiji Pine.
- Screw: All visible screws in Joinery shall be drilled and countersunk and filled with putty.
- Bolts: All bolts shall be hot-dipped galvanized mild steel bolts, complete with nuts and washers.
- Straps: All straps shall be 25 mm @ 25g galvanized mild steel.

8.4 Concrete

Cement: **shall** be standard Portland cement of approved manufacture delivered to the site in sealed bags as provided by the manufacture. No cement showing signs of lumping shall be used, no re-bagged cement shall be delivered to the site. Cement shall be stored off the ground in a clean and dry area.

Sand: **shall** be clean coarse grain, free from silt, salt, and organic material.

Coarse Aggregate: **shall** be sieved to specify grades and stock-piled separately. No aggregate > 2 cm diameter.

Water: **shall** be potable, clean and free from salt and other organic material.

Reinforcement: **shall** be round mild steel bars complying with AS1302, clean and free from dirt, grease or other foreign material.

Mixing: concrete **shall** be mixed only in the quantities required for immediate use.

Concrete strength: Unless otherwise stated, the characteristic strength of the concrete **shall** be 20 MPa generally.

8.5 Foundations

Buildings with a severely damaged foundation that would require major renovation or rebuilding **shall** be recommended for demolition and build new. Only moderate repair work, such as replacement of damaged foundation piers with treated pine post, is allowed. Treated pine post **shall** not be less than 150 mm diameter.

8.6 External wall – concrete

Finishing **shall** be flat, weather tight, and free from defects. No uneven or dirty surface will be accepted.

Render **shall** be 3:1 sand cement mix.

8.7 External wall – timber

The exterior wall **shall** be weather tight

Weather boards shall be fixed to framing members by galvanized nails with two (2) nails per fixing point approximately 50 mm apart.

8.8 Internal walls

Internal walls are to be stud framed.

Walls are to be straight and true; perpendicular walls are to meet at 90 degrees unless otherwise noted.

8.9 Ceilings

Defective ceilings **shall** be replaced to complete the project. The ceiling **shall** be:

- 6 mm int. ply ceiling in all rooms.
- 6 mm ext. ply over wet areas.
- For minor repair works match the existing.

8.10 Floor – timber

Floor decking **shall**:

- provide safe support within acceptable deflections for the appropriate floor load.
- floor boards shall be laid in straight parallel lines at right angles to joists, with tongue fitted into grooves and cramped tightly together.

Floor lining **shall** be 20 mm thick and nailed at every floor joist junction according to best trade practices and good workmanship.

8.11 Floor – tiles

Install floor finishes to all floors with these details:

- Interiors: allow 300 x 300 Corrie tiles
- Wet areas: allow 300 x 300 mosaic tiles.
- For minor repair works match the existing.

8.12 Roof

After the repair work, the roof **shall** be structurally stable and weatherproof according to local environmental conditions. All roofing shall be capable of withstanding 60 meter/second wind speed.

Rotten or defective roof trusses **shall** be replaced with new treated timber with minimum F7 Grade/local hard wood.

The roof frame **shall** be anchored to the wall/post with a 6mm hot dipped galvanized angle plate. All roof frame joints **shall** be fixed with 90x200 mm galvanized nail plate.

Purlins **shall** be strapped to rafters with 25 mm @ 25g galvanized mild steel.

Roofing materials **shall** be 24g prefinished (Colorbond) corrugated metal roof sheet (zincalume to Australian standard). All roofing crest at the eaves **shall** be screw fixed. Except for the eaves, minimum spacing of laths is 600 mm for nails or 900 mm for screws.

Install downpipes, gutters, flashings, barge rolls as required: to be metal, colourbond finish to match the roof.

8.13 Doors

All doors **shall** be solid core timber doors with paint finish. Doors must to be fitted to open and close smoothly; all doors to be fitted with door furniture, minimum: 3 hinges and latch and lever.

8.14 Windows

All defective, broken, or cracked glass **shall** be replaced.

Corroded or defective louvers **shall** be replaced with equal to "WIND brand" louvers. Louvre blades and glass doors: 6 mm clear float glass. Exposed edges of louvre blades **shall** be polished.

Timber window frame **shall** be free of knots and well-seasoned and finished prior to installation.

All window shutters shall be portable and made of solid material and weather-proof with 30 x 30 mm galvanised wire mesh. Shutters shall be fitted to window frames and properly fixed to the wall.

8.15 Paint

All paints and coatings shall be of premium quality, obtained from one manufacture, and comply with current SAA requirements for their respective kinds. All paints are to be lead-free.

All surfaces **shall** be clean before painting.

All painted surfaces **shall** have three (3) layers of coating, including primer, under coat and finishing coat.

Concrete and plaster surface **shall** be ground down before painting.

Timber **shall** be primed before fixing on all faces required to build in and at all joints before fabrication.

Nails or similar holes, open joints, cracks and other minor defects **shall** be puttied up/plastic wood before priming coat.

8.16 Steelwork

Install steelwork as noted on the school improvement plan, in this specification and as required to complete the project. All steel to be primed and painted prior to installation, with a final coat after installation.

8.17 Electrical Services

The installation of power supply, wiring, fittings and fixtures **shall** be carried out by a certified electrician as outlined in the school improvement plan and drawings and as required to satisfy the operation of the site and complete the project. All installation shall provide A/C power at 50 Hz to be consistent with existing power systems and appliances available in Fiji. The distribution voltage will be a nominal 230V for all systems.

Other requirements include:

- Replace all defective light fittings, switchboards, and power points.
- Obtain all local authority approvals and arrange for connection to local Supply Authority
- Provide access to power/electricity such as: servicing existing school generator or installing photovoltaic stand-alone solar system as noted on the school improvement plan.
- The photovoltaic system will be used to charge a 24V high capacity battery that will in turn operate a high efficiency inverter operating from the battery.

Solar option 1: 1,200 Wh/day	Light and power for office and internal/external lights for two classroom
Solar option 2: 660 Wh/day	Light and power points for a teachers quarters
Solar option 3: 360 Wh/day	Internal and external lights for a student dormitory

All cables **shall** be run in class A PVC conduit.

Note : **All electrical Works should be upgraded and inspected to the recent FEA and NFA Standard and Requirements**

8.18 Plumbing and Hydraulics

Install and or repair plumbing infrastructure, pipework, fixtures and fittings as required to complete the project.

Provide water storage tank and pump as noted on the school improvement plan and drawings.

Provide and install plumbing and sanitary fittings as shown in the school improvement plan.

8.19 Asbestos

No work will be done using any material that contains or may contain asbestos. Any work that involves removing, cutting or otherwise changing any existing materials that may contain asbestos will need expert advice from relevant agencies.

8.20 Fire Safety

Fire prevention and emergency evacuation plans must be part of the design process and part of the school operations.

Combustible materials should not be used for structural purposes unless treated to resist fire.

School should have a secondary exit door to allow for fast escape in case of fire and other emergency.

A portable 4.5kg fire extinguisher shall be available in the Head Teacher's office to extinguish or control a small fire. It is not intended for use on an out-of-control fire, such as one which has reached the ceiling.

Metal water buckets – dedicated for fire emergency - shall be made available near the area with a high potential fire hazard, such as the school kitchen and incinerator.

8.21 First Aid Kit

Schools shall have a minimum of one main first aid kit in the first aid room. First aid kits should be clearly identified by a suitable sign or label (i.e. white cross on a red background).

A list of emergency contact telephone numbers should be kept with the kit (e.g. emergency services, hospital, clinic, Public Health Doctor, and other emergency services should be kept with the first aid kit.

The minimum content requirements for the main first aid kit at a school/workplace are listed below:

First Aid Kit Content		
Item Description	Size	Quantity
Surgical tape	25MM x M	1
Alchohol swabs 100's		1
Elastic Crepe	50MM X 4M	2
Elastic Crepe	75MM X 4M	2
Eye pads	7.5 X 6.0	2
Gauze swabs 8ply	7.5 X 7.5	100
Latex gloves	PAIR	2
Plastic strips 50's (band aid)	72 X19MM	2
Safety pins	No1 33MM	12
Saline	30ML	2

Savlon cream	30G	1
Dettol liquid	125ML	1
Scissors strt, blnt, shrp	12.5CM	1
Thermal blankets disposable		1
Thermometer flt ovl disp cs		1
Triangular bandages	110 X 110 X 155	2
Tweezer	12.5 CM	1
Wound dressing	# 14	1

9.0 Continuous Improvement

The purpose of standards is to ensure that the school environment functions properly in the four areas specified by the functions.

The standards will not be effective if:

- they do not do what they are designed to do, or
- what is built is not correctly operated and maintained.

Reasons why the built environment in a school may fail are:

- they are not built to standard
- they are built to standard, but the standard is not sufficient to guarantee performance
- the construction is good, but the school is not operating or maintaining it correctly.

Therefore, every act of assessment under AMU/CIU will analyse each piece of construction to be refurbished following these steps:

1. WHY has the existing construction failed?
   a. Not up to standard?
   b. Up to standard, but still failing?
   c. Not being properly maintained.

2. In each case, the required response will be different:
   a. Don't build back as is: build back to standard.
   b. Don't build to current standard: make new details better than the standard, and refer improvements to AMU/CIU for inclusion in new standards.
   c. Build back appropriately, and prescribe training and monitoring for the School Management Committee and Head Teacher.

The following table gives examples, based on actual problems seen in the field:

Problem	Response
Shower heads in student ablutions missing	Instead of shower heads, crimp end of steel pipe into shower spray.
Broken PVC piping in student ablutions.	Specify only galvanised pipe.
Broken P-traps to toilets, or missing IO covers	Build external locked box to protect P-traps and IO covers
Broken water cisterns to student toilets	Use external cisterns on other side of wall, protect cisterns as with P-traps. (Note: this can also be accomplished by building a central maintenance hall in ablutions blocks, which runs behind toilets on both sides (M&F) and is used to protect and control access to key plumbing components.
Water running in ablutions when no-one is there	Provide locked gate valve to ablutions blocks so water supply can be controlled by management - during certain times only.
Rotten barge boards extending past roof cover	Mandate new standard details that do not extend past roof cover.
Rotten fascia boards always in need of repair.	Develop new standard details that do not require fascia boards.
Mildewed paint on ceilings.	Specify clear finishes only on ceilings.
WCs clogged up with leaves and sticks.	Either specify dry latrines suitable to local customs or develop budgets, training and monitoring system to introduce toilet paper.

Note: Every school inspection is an opportunity to improve the standards.

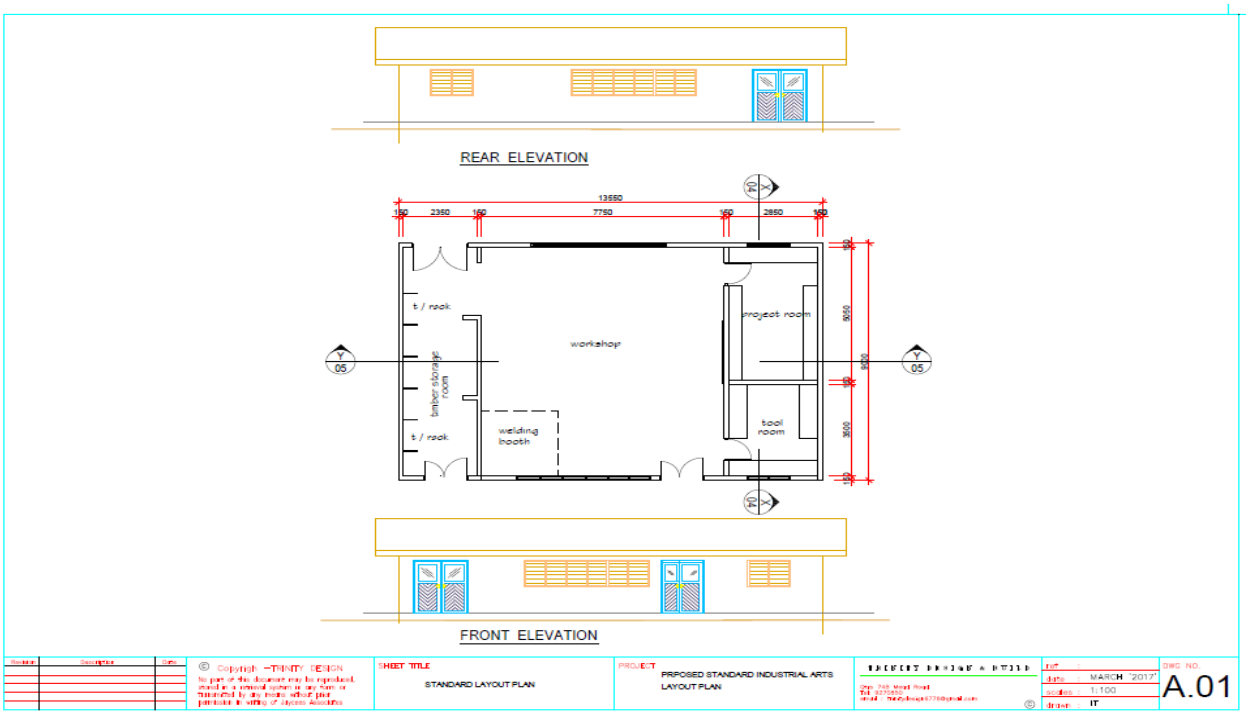
10.0 Additional Documents

These standards are meant to be used with the following specific manuals, to be developed in practice:

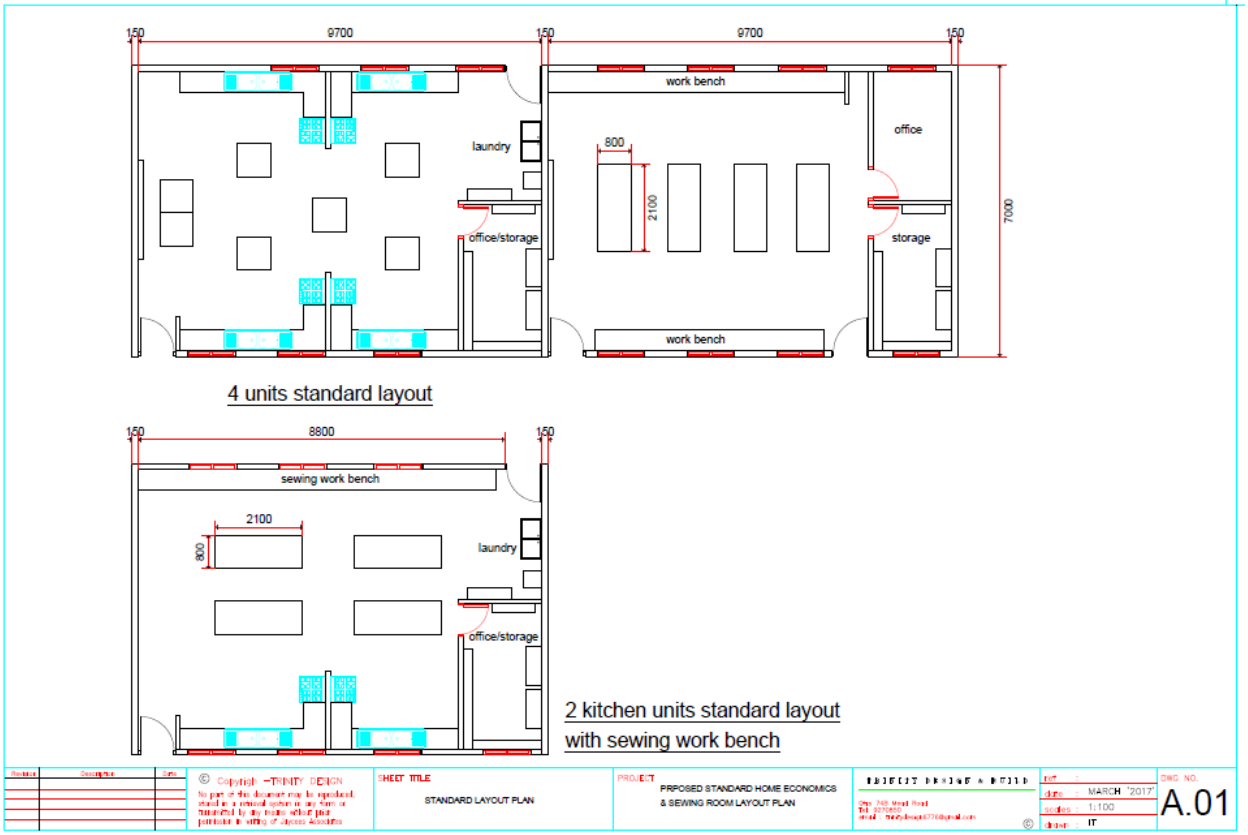
- Recommended details
- Sample floor plans (refer to "**4.0 building standard"** above) and
- Quality checklists.

11 STANDARD BUILDING PLANS

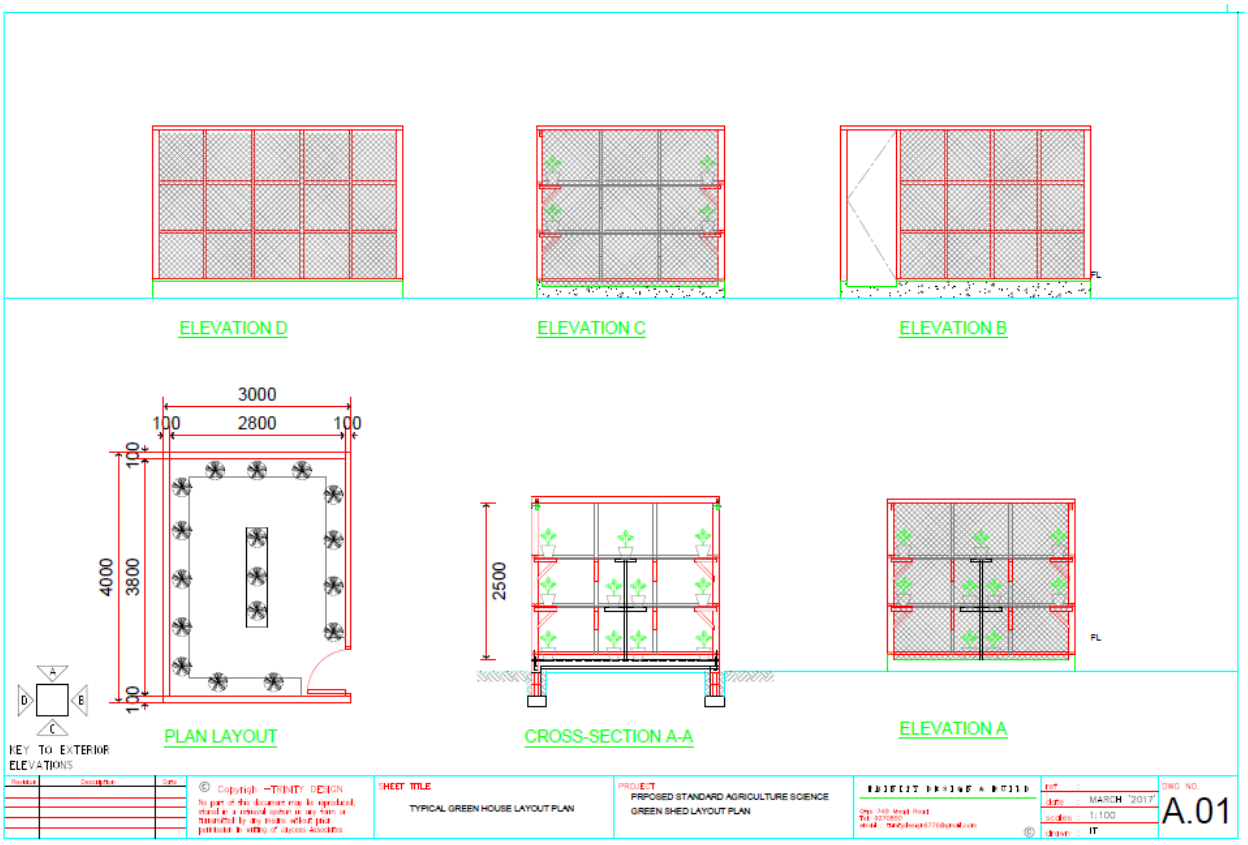
11.1 INDUSTRIAL ARTS BUILDING PLAN



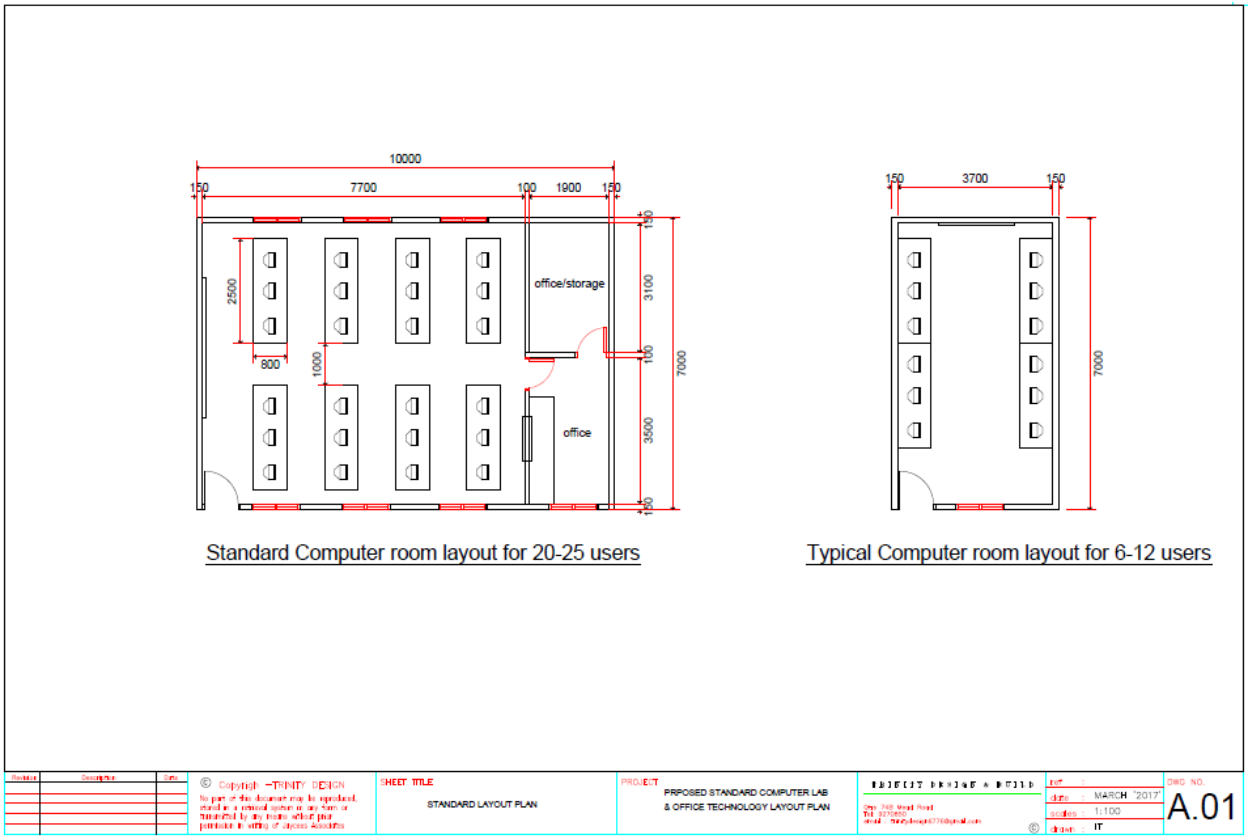
11.2 HOME ECONOMICS – FOOD LAB AND CLOTHING & TEXTILES BUILDING PLAN



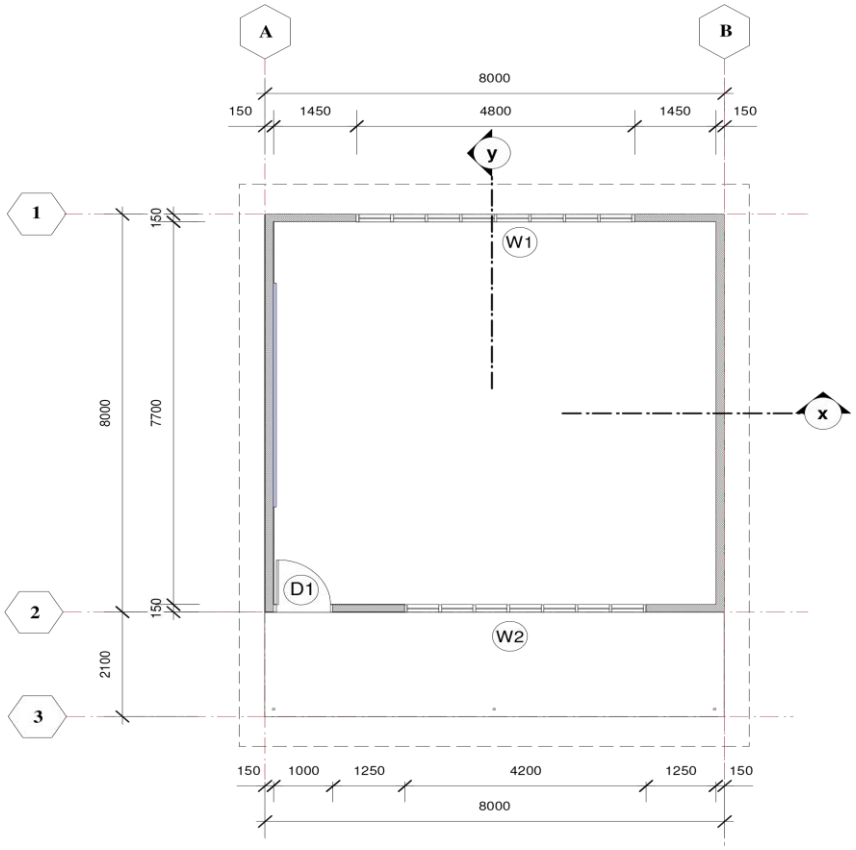
11.3 AGRICULTURE SCIENCE GREEN HOUSE PLAN

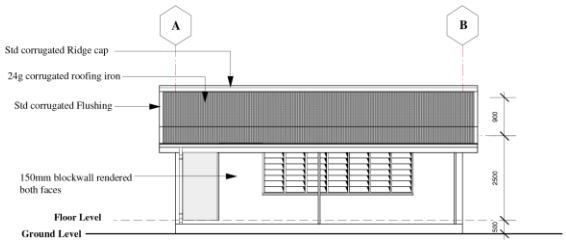


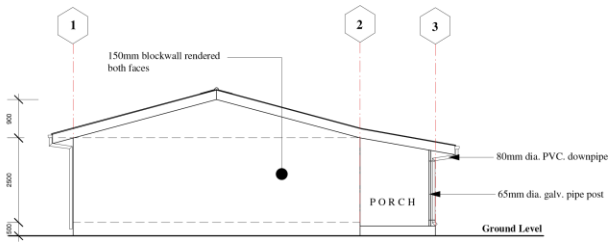
11.4 OFFICE TECHNOLOGY & COMPUTER EDUCATION BUILDING PLAN

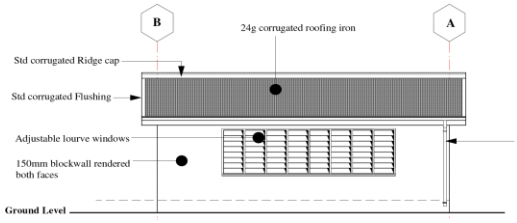


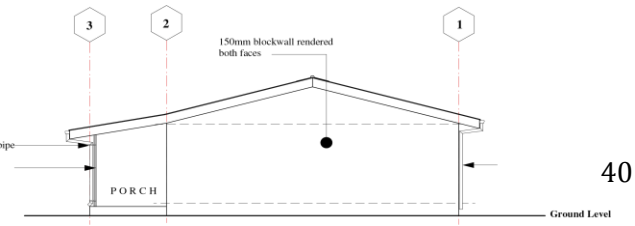
11.5 Single Classroom - Concrete



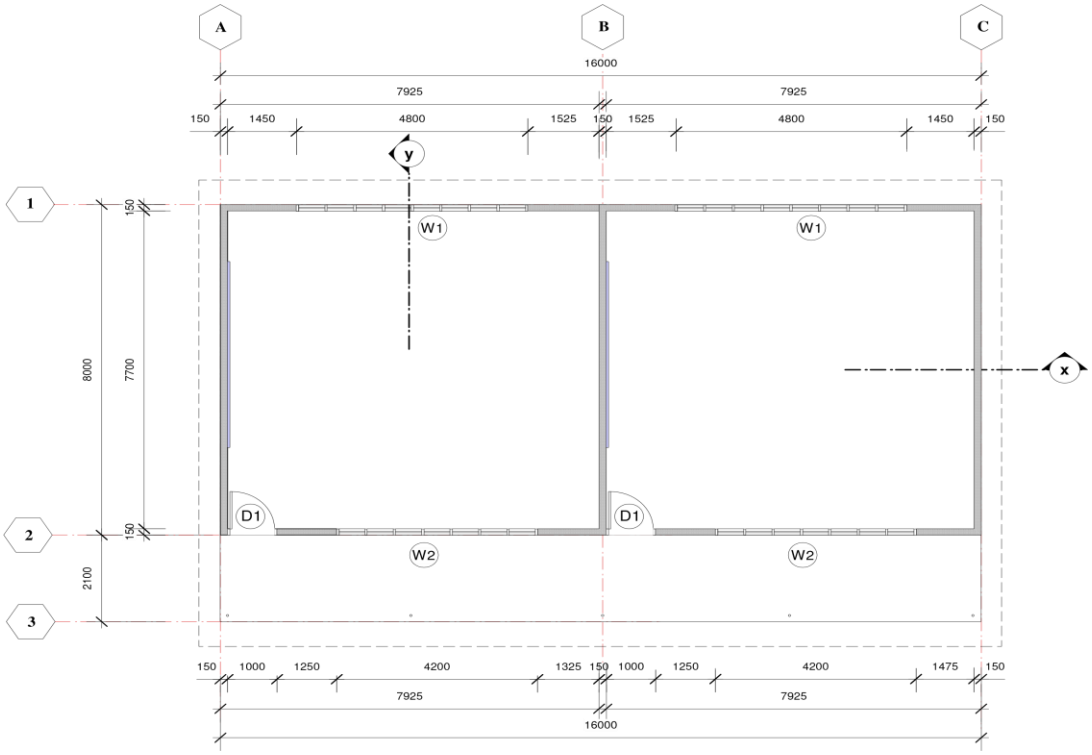


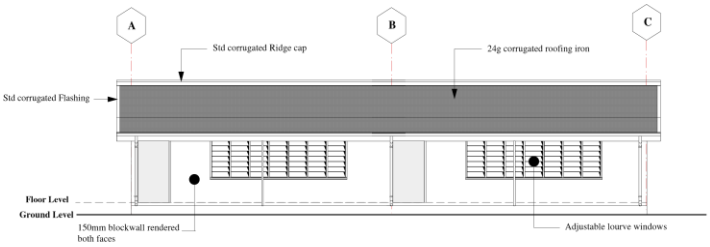




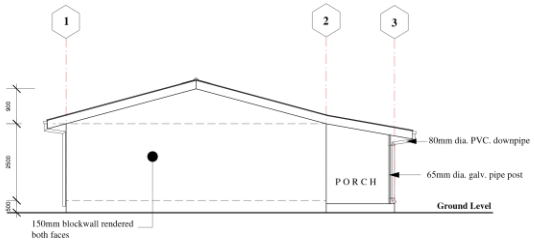


11.6 Double Classroom (Concrete)

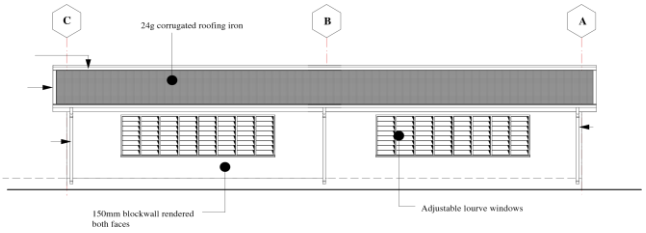


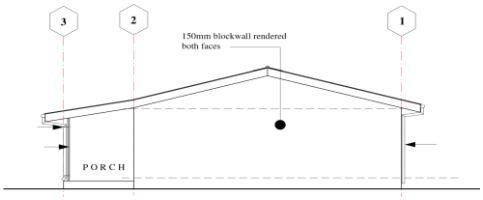


ELEVATION 1

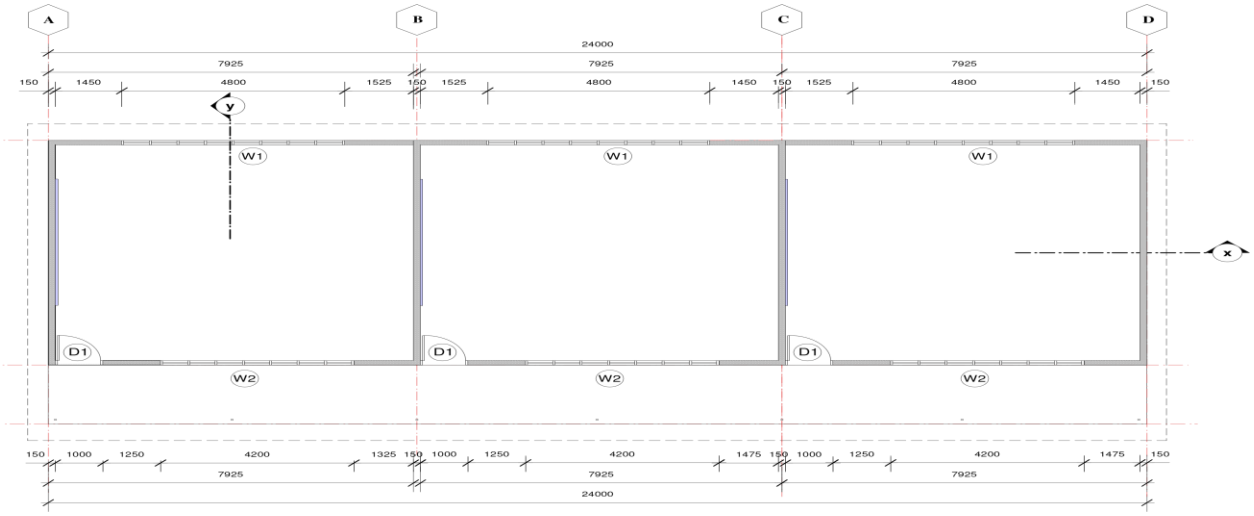


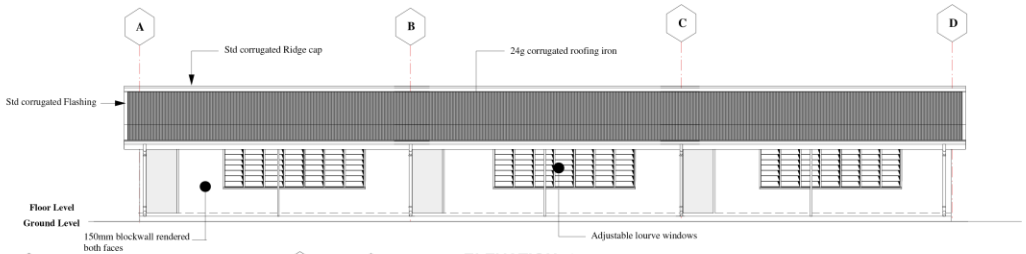
ELEVATION 2



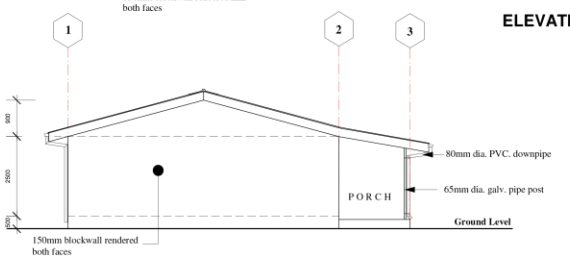


11.7 Triple Classroom (Concrete)

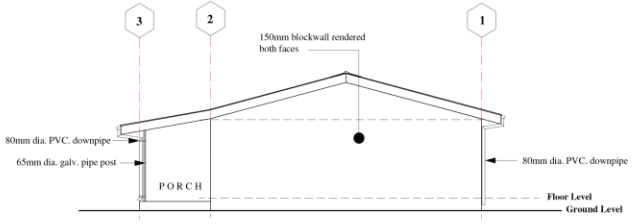




ELEVATION 1



ELEVATION 2



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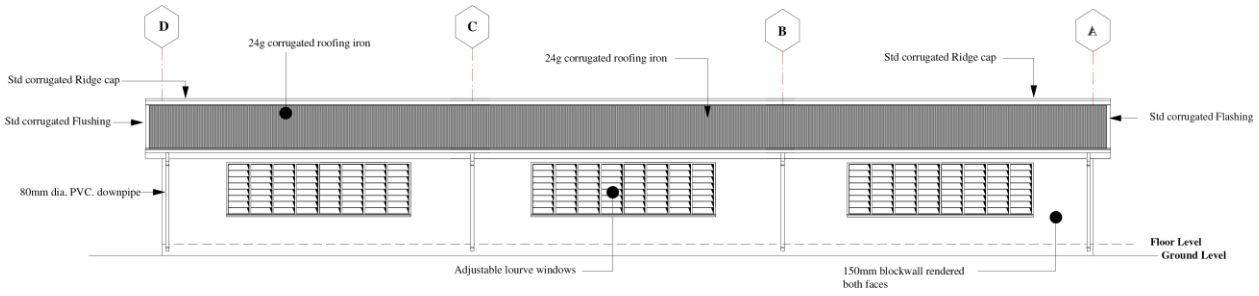
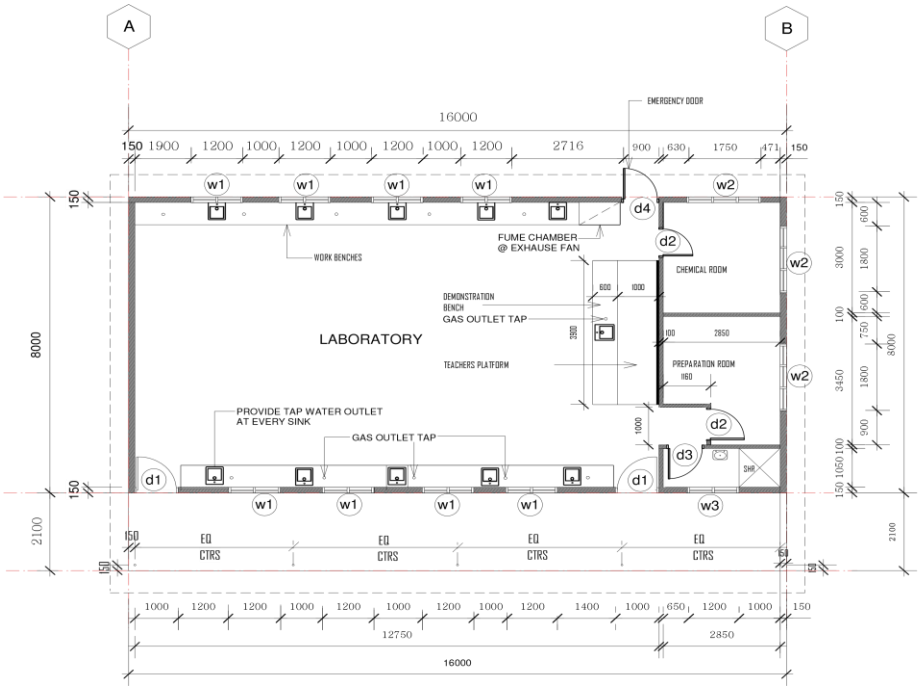
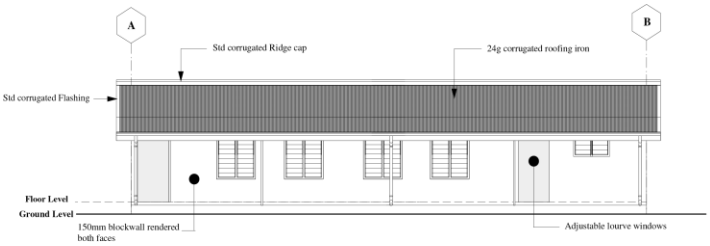


11.8 Laboratory



elevation key



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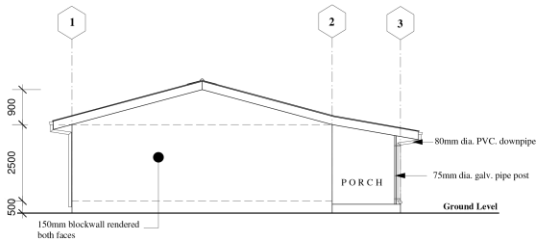

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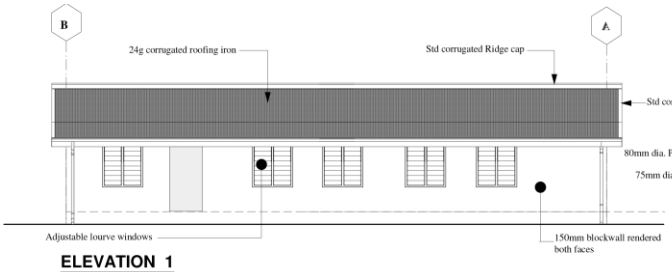

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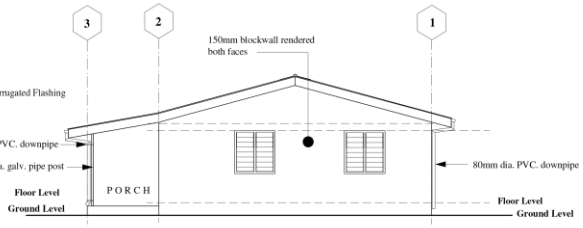
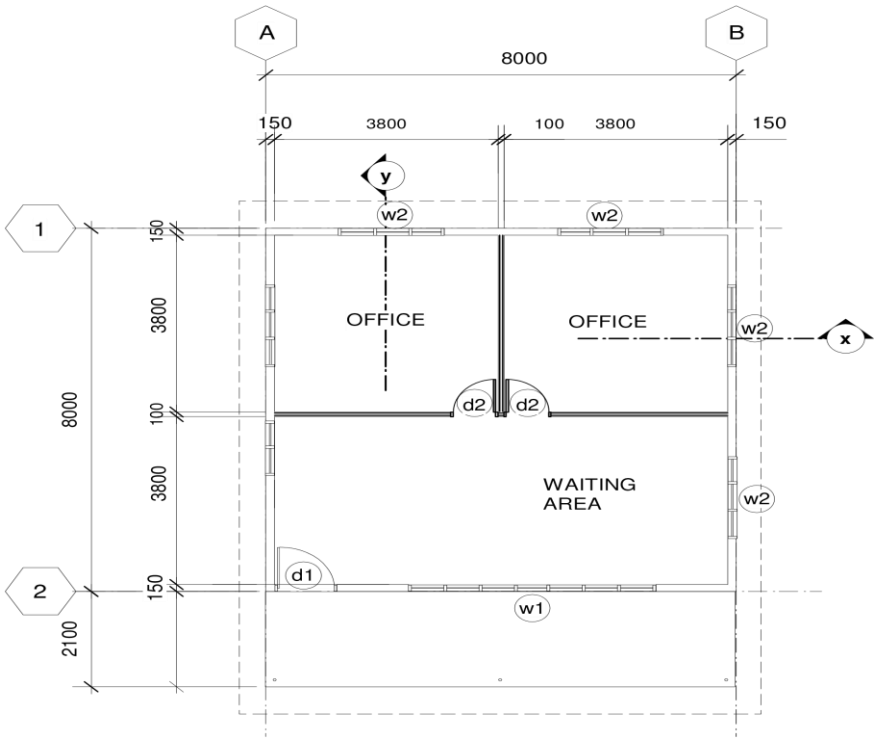
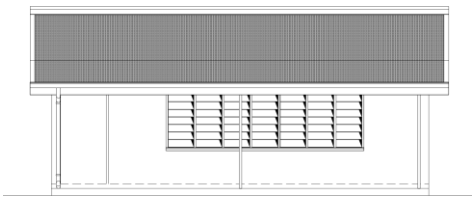


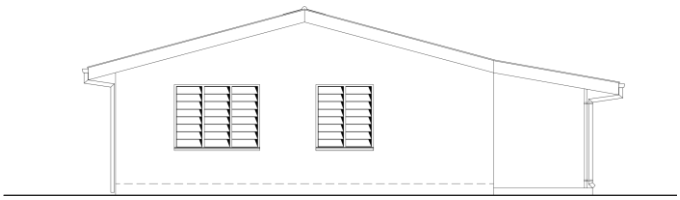
ELEVATION 4

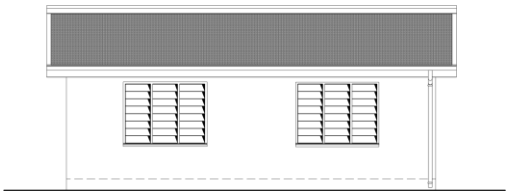
11.9 Administration Office

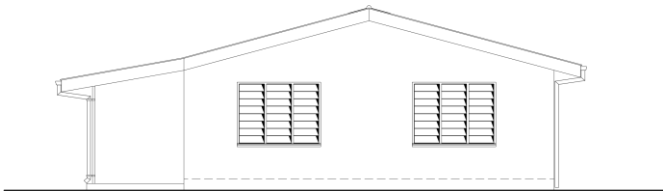


elevation key

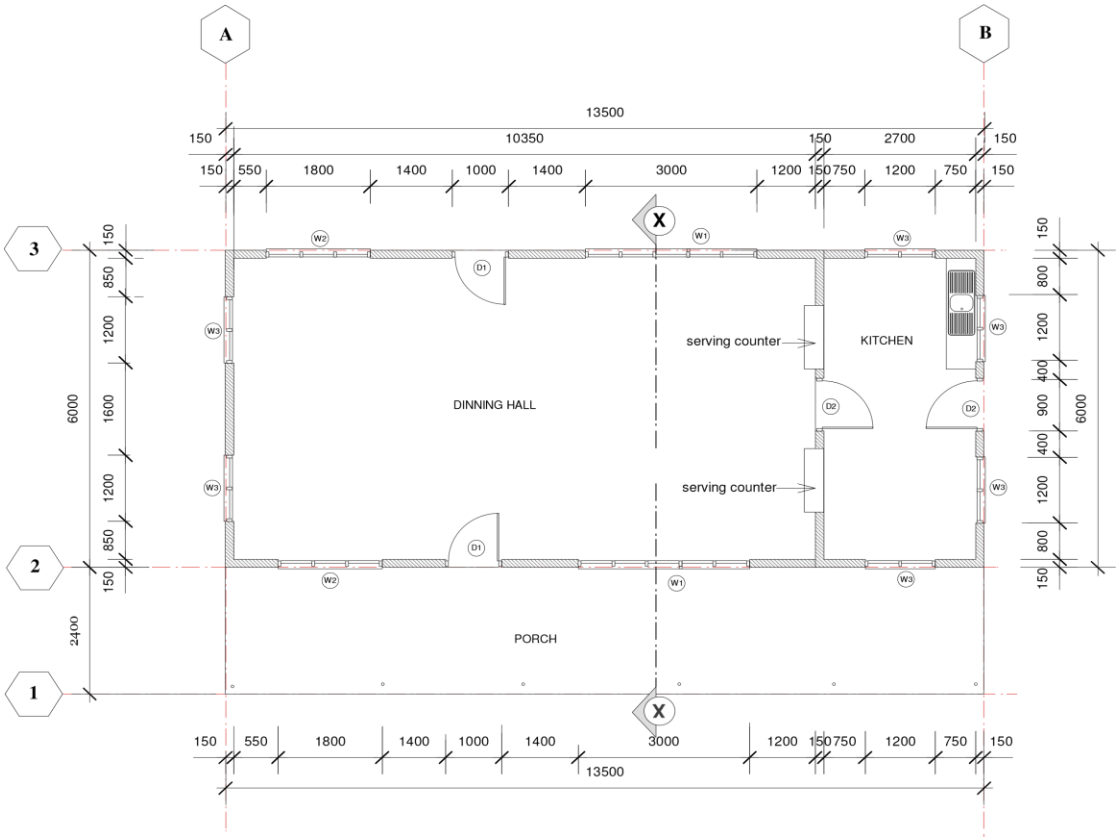


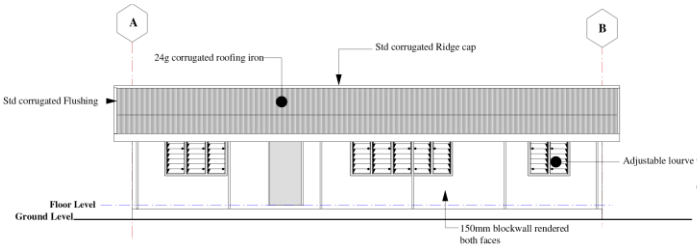






11.10 Dining Hall & Kitchen





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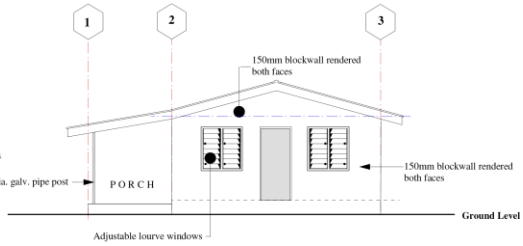

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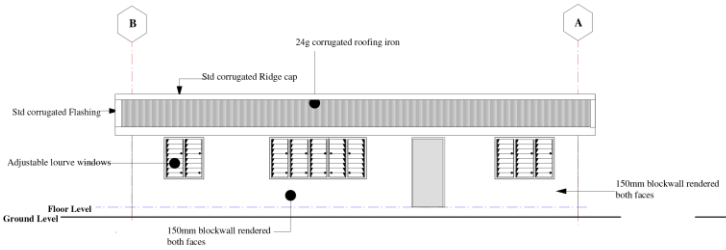
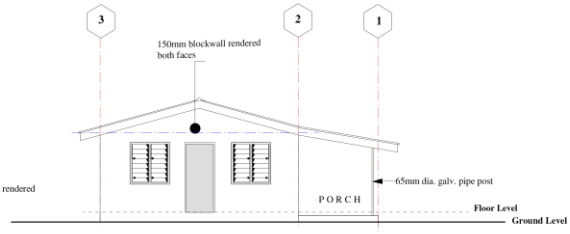
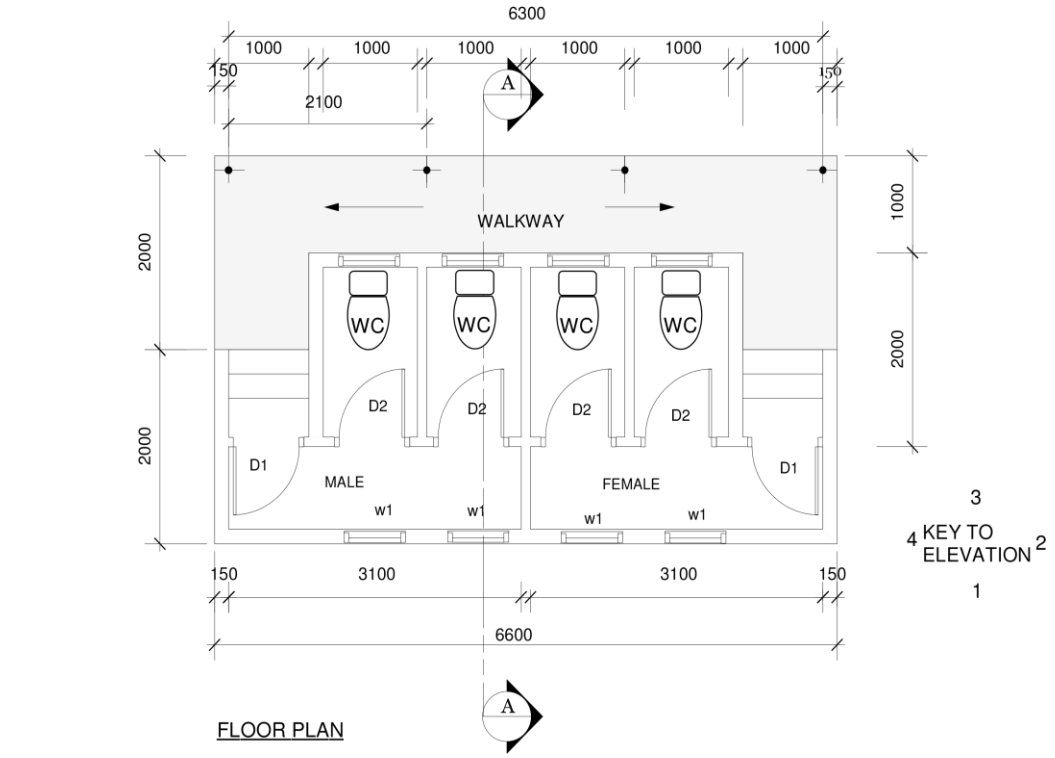


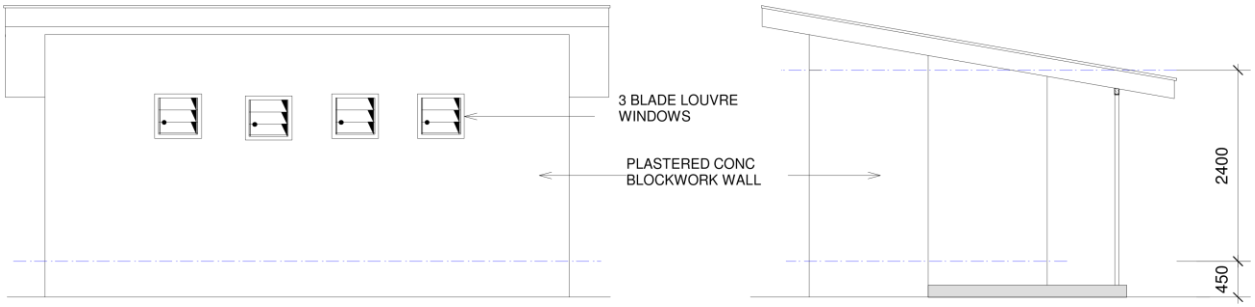
ELEVATION 3

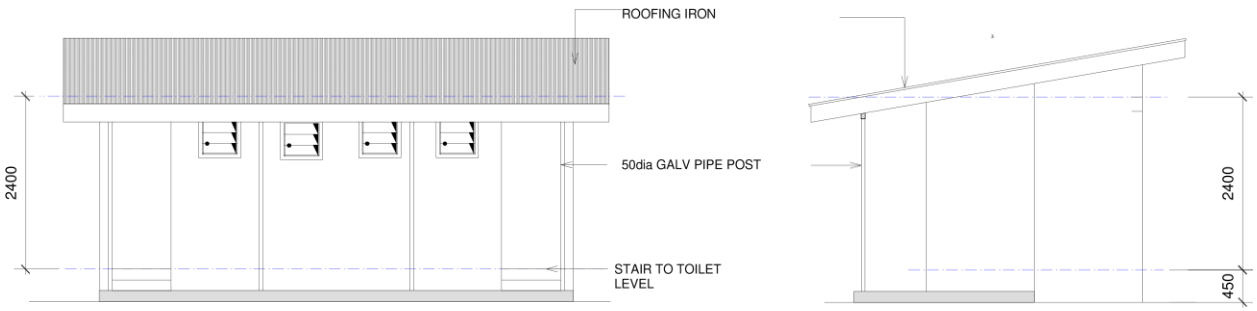


ELEVATION 4

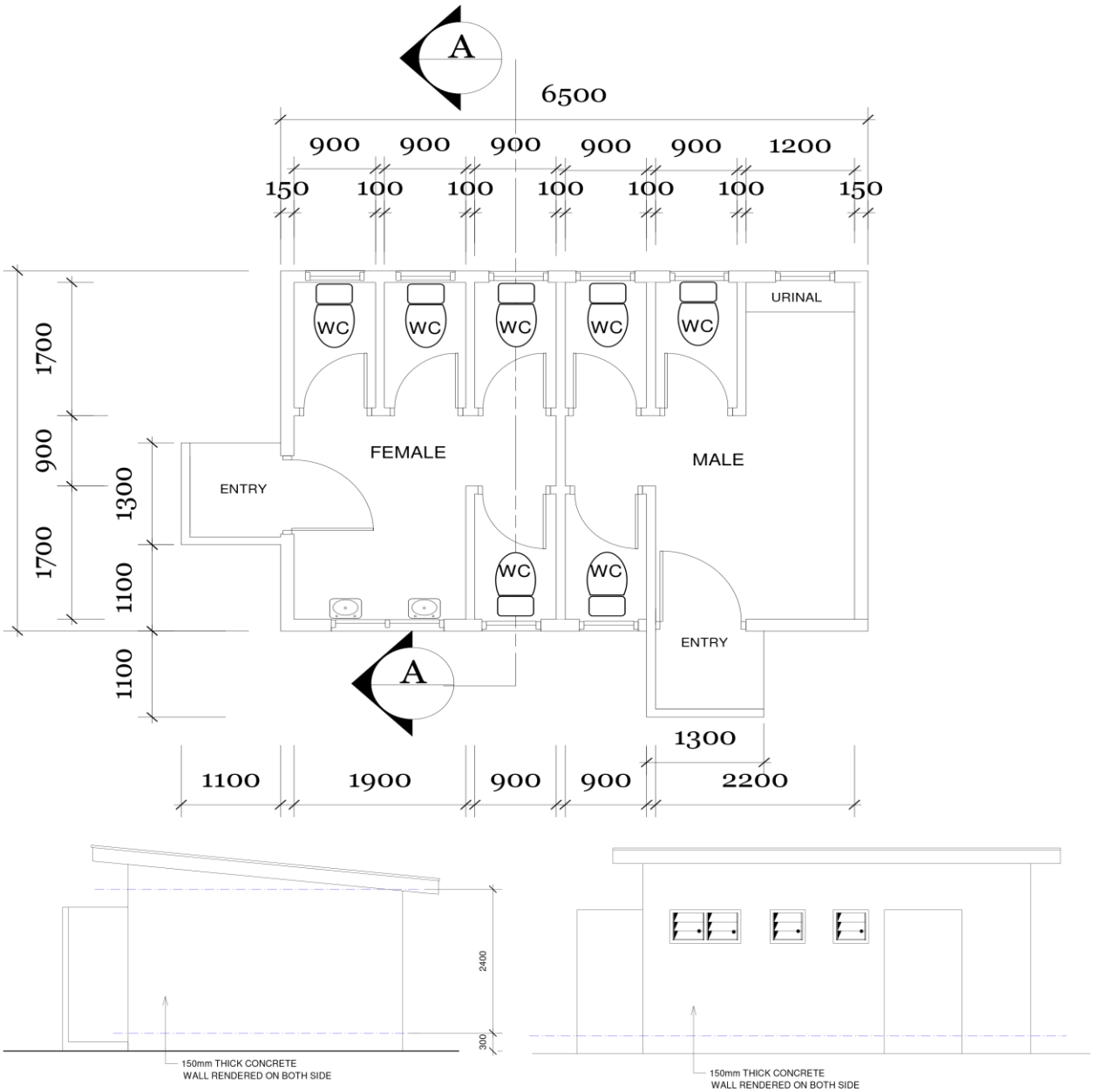
4 Pan Toilet Block

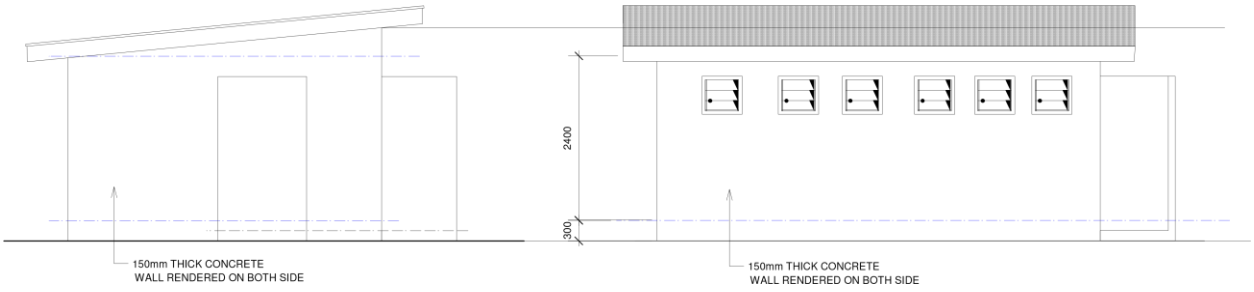




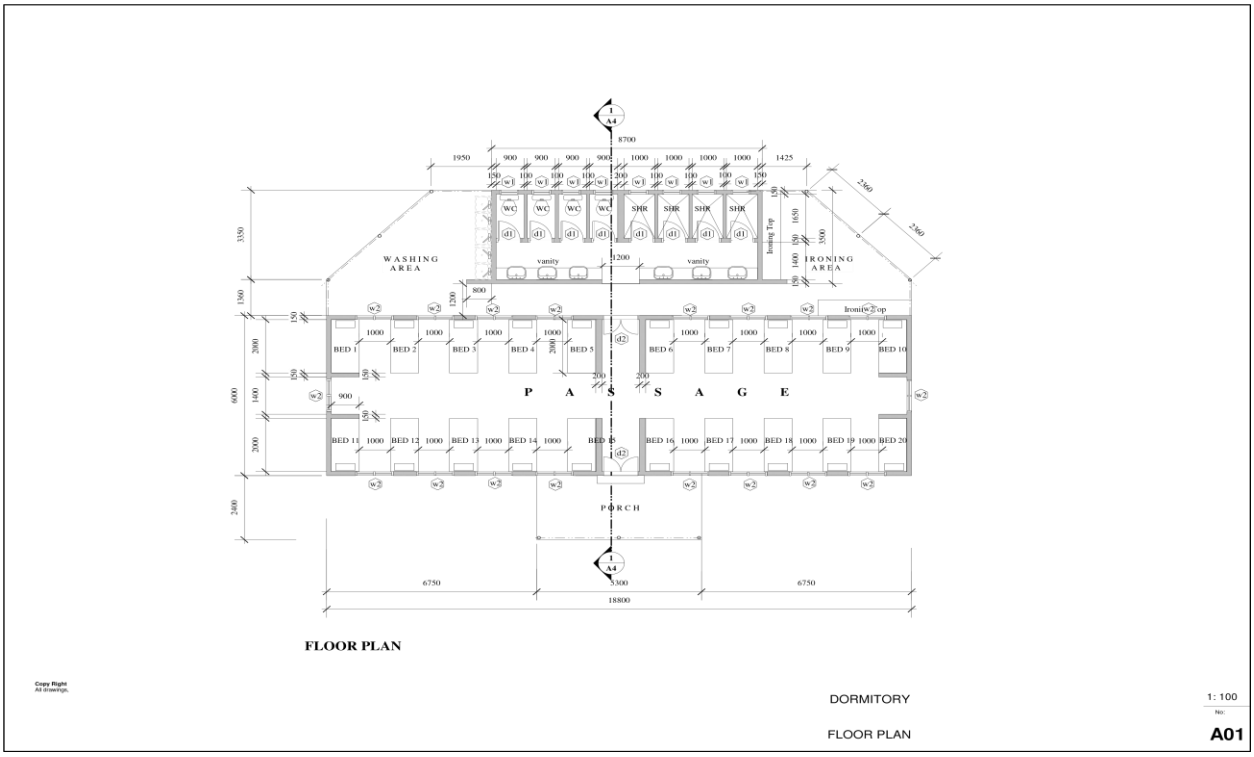


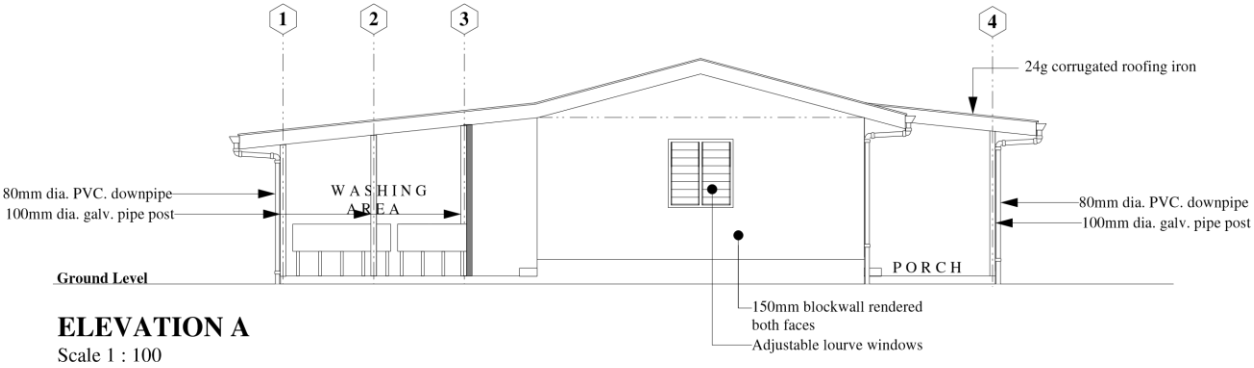
4.11 7 Pan Toilet Block

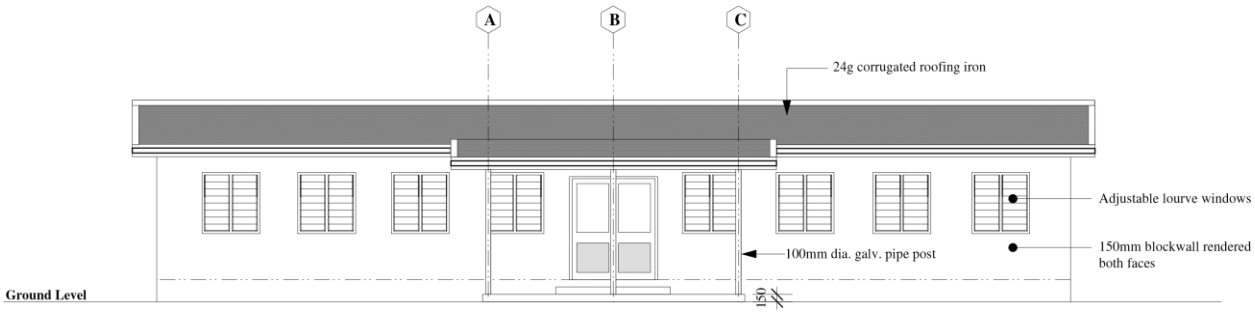




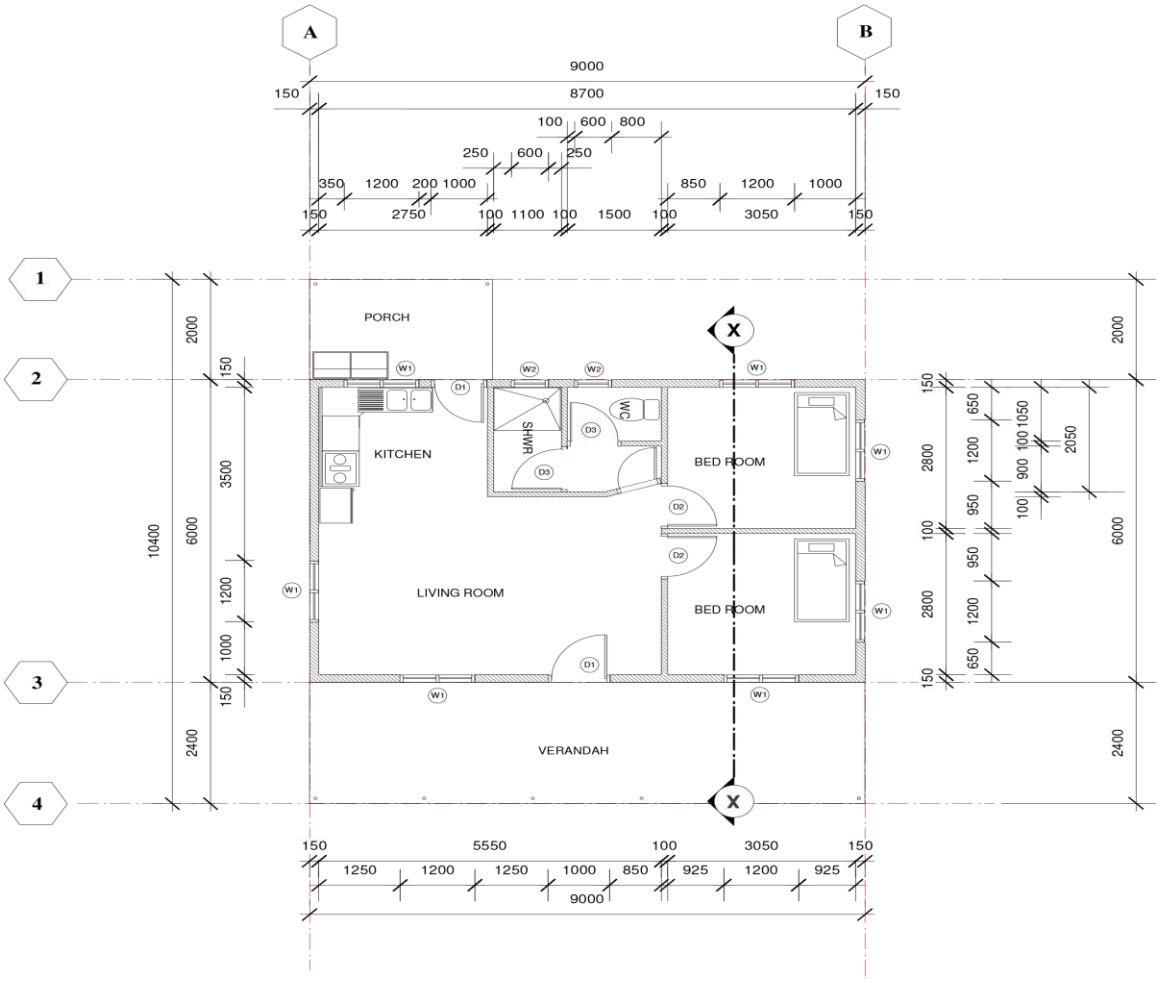
4.12 Dormitory

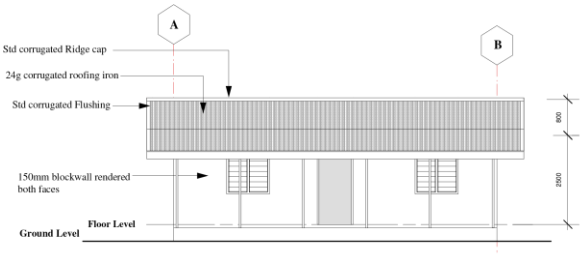


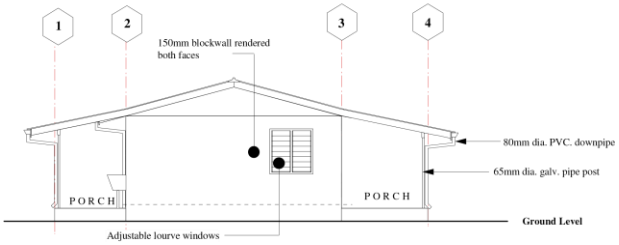


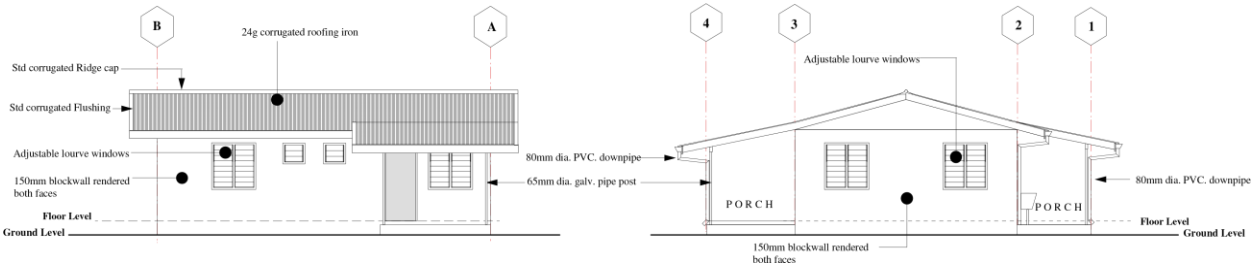


7.13 2 x Bedroom Quarters - Concrete

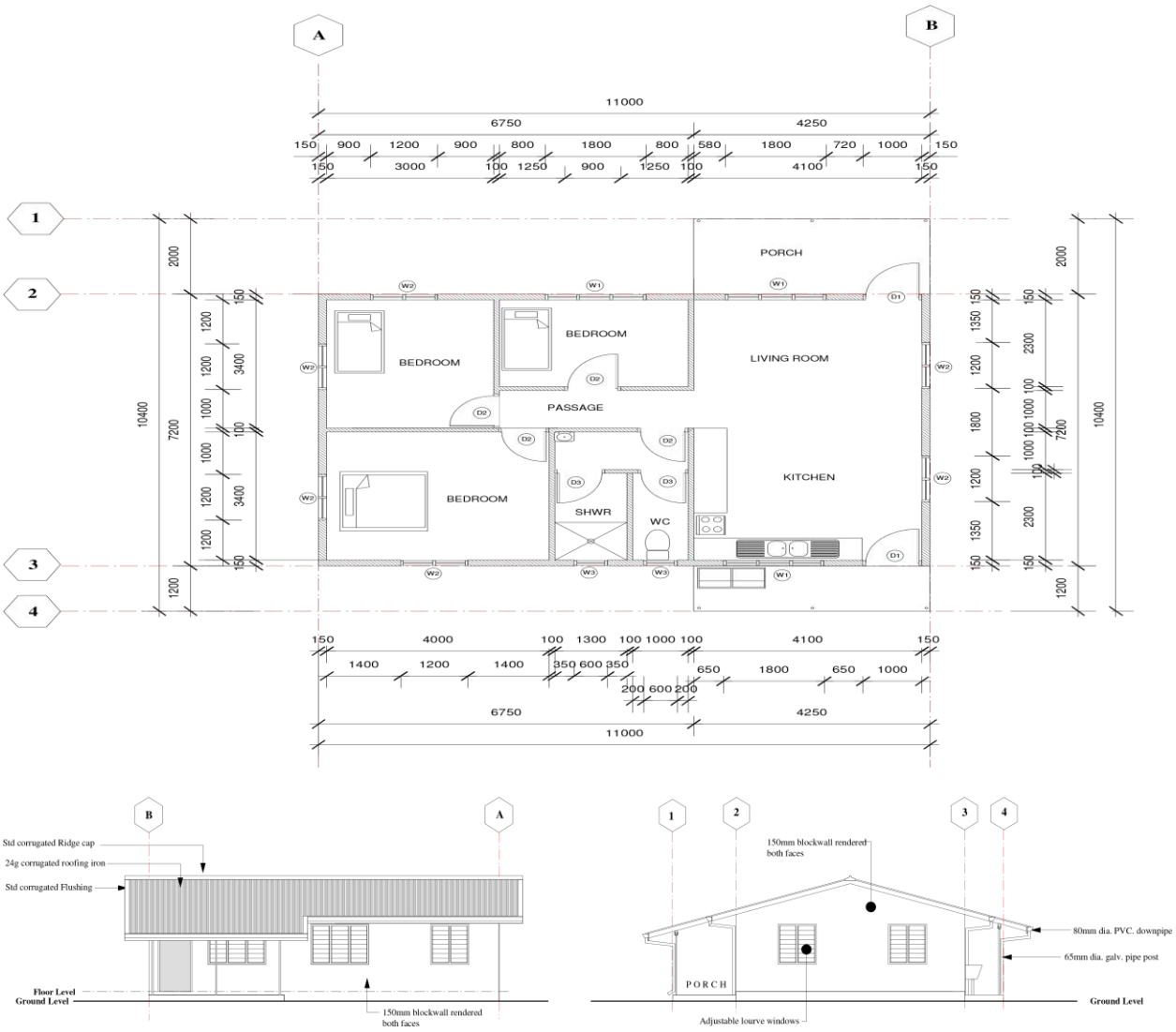




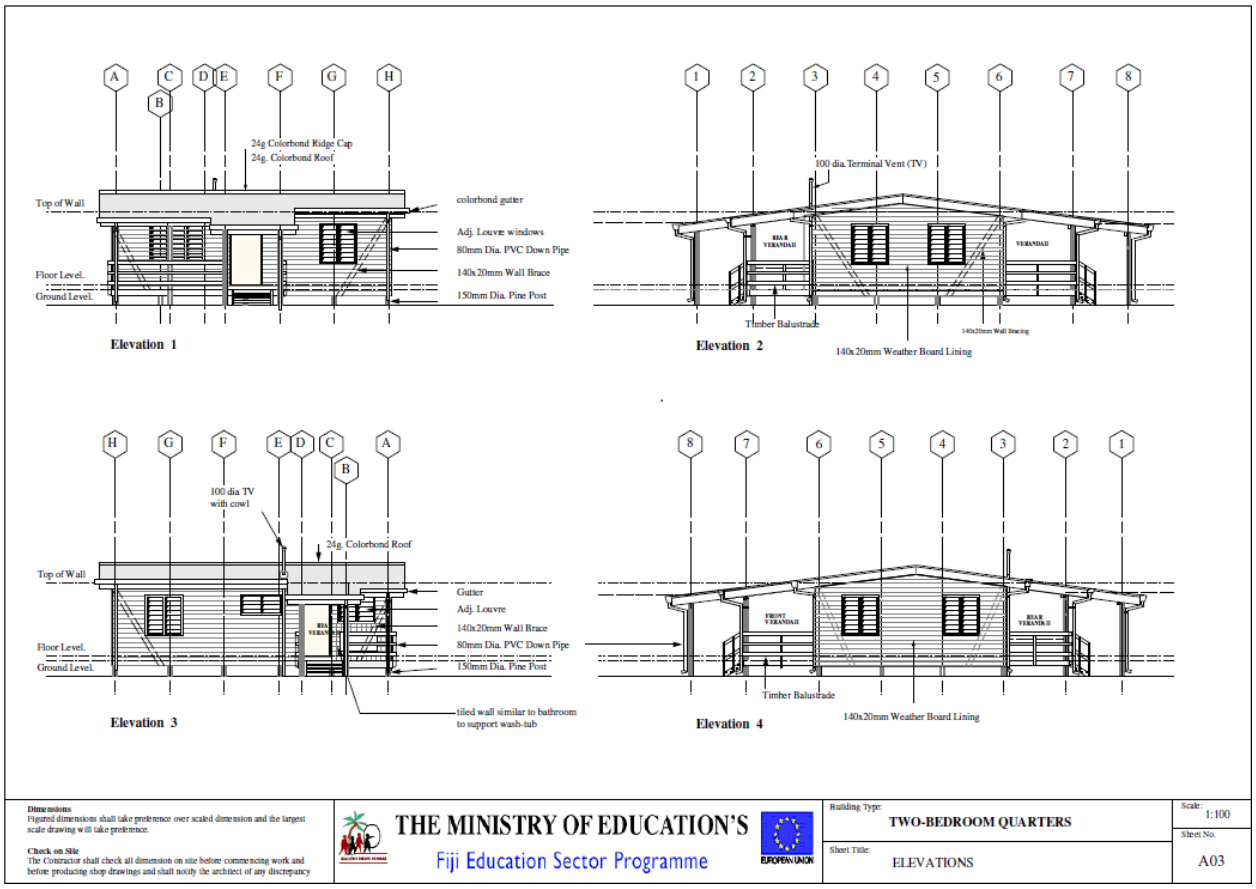


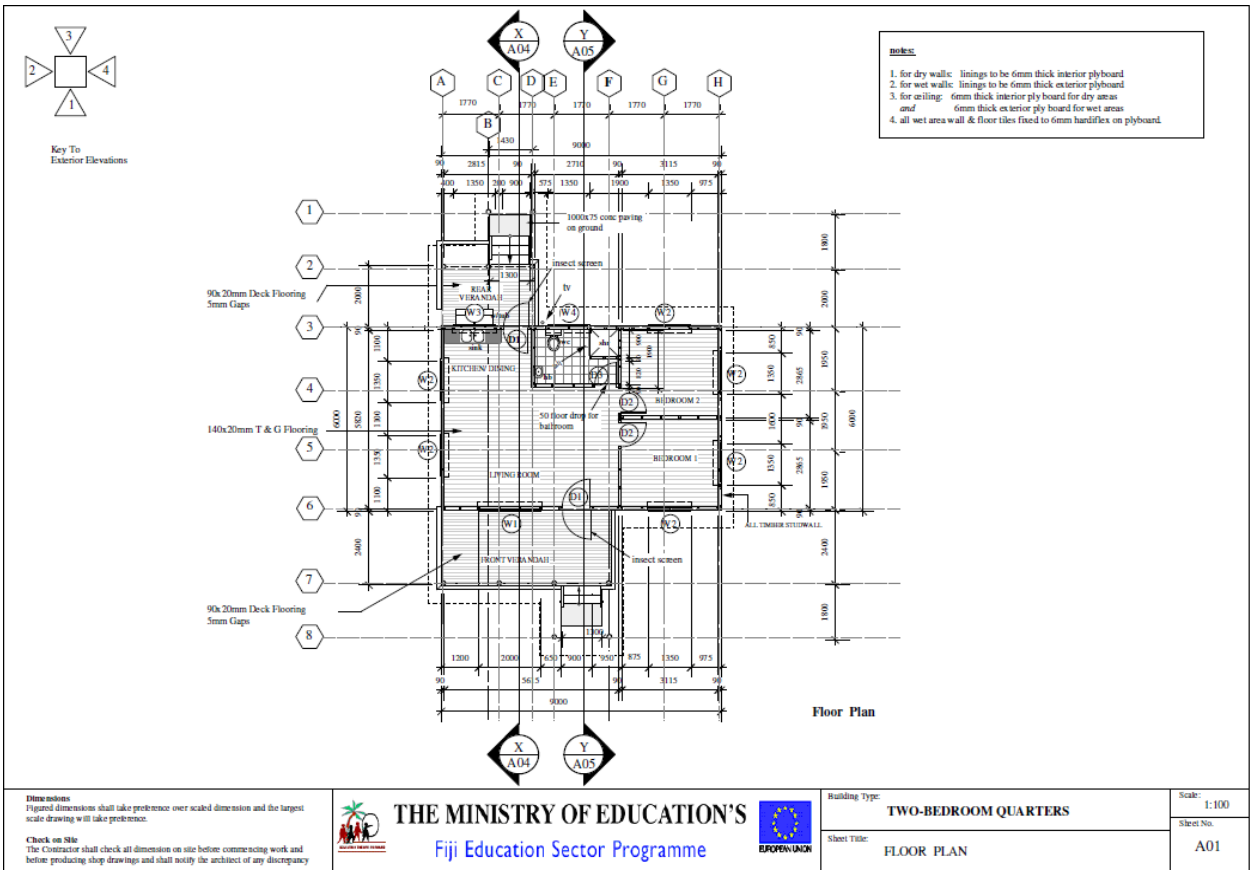


7.14 3 x Bedroom Quarters - Concrete

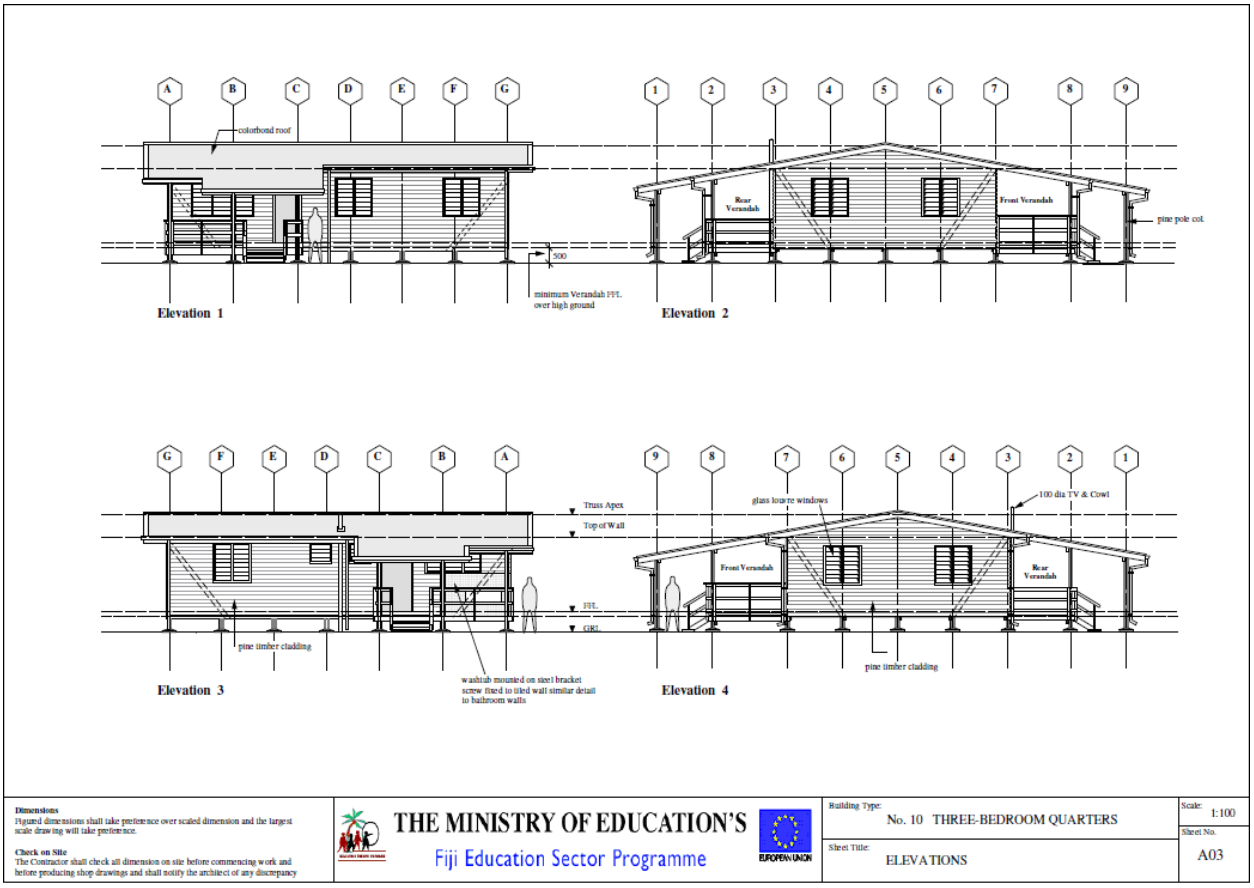


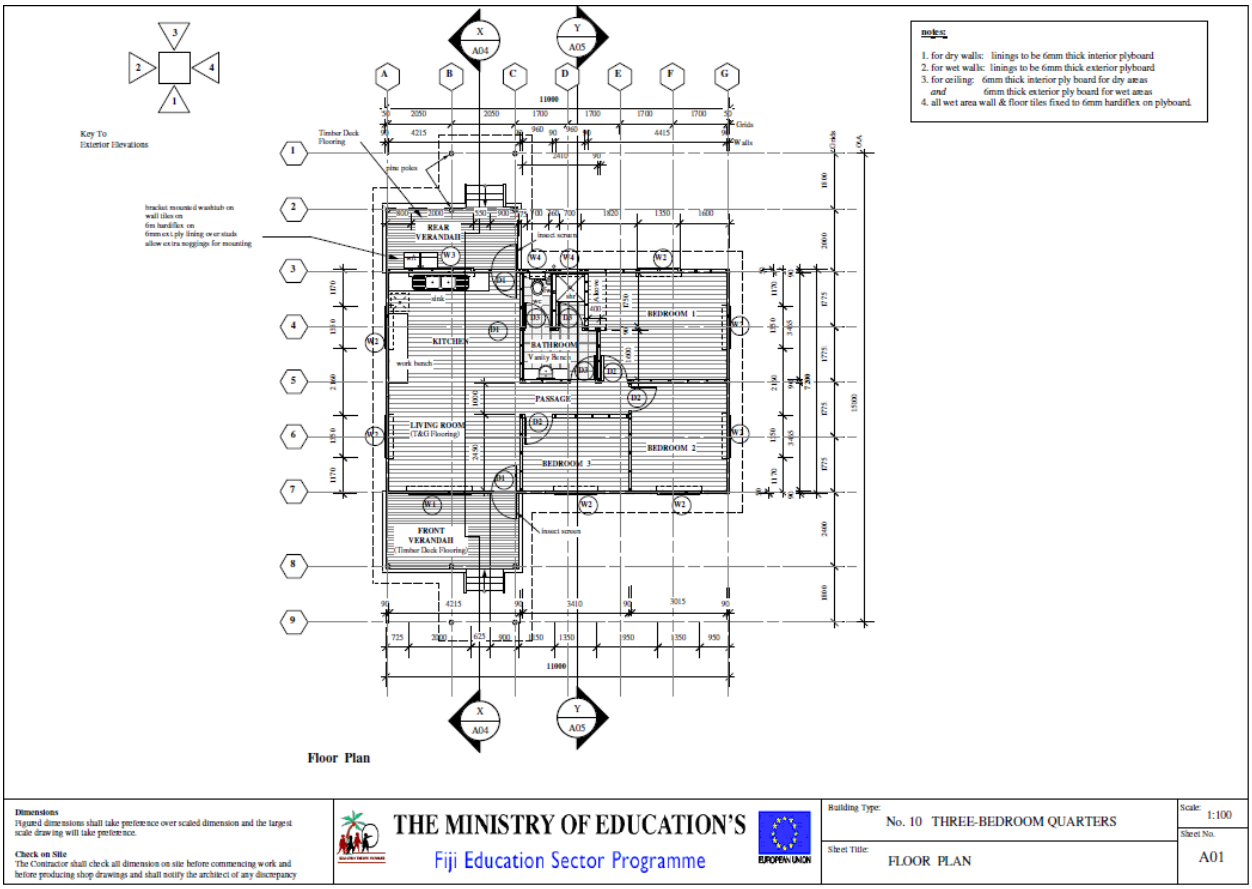
7.15 1 x 2 Bedroom Quarters -Timber




notes:
1. for dry walls: linings to be 6mm thick interior plyboard
2. for wet walls: linings to be 6mm thick exterior plyboard
3. for ceiling: 6mm thick interior ply board for dry areas
and 6mm thick exterior ply board for wet areas
4. all wet area wall & floor tiles fixed to 6mm hardiflex on plyboard.
Key To
Exterior Elevations
1000x75 conc paving on ground
insect screen
90x 20mm Deck Flooring 5mm Gaps
140x20mm T & G Flooring
REAR VERANDAH
KITCHEN/ DINING
LIVING ROOM
BEDROOM 2
BEDROOM 1
50 floor drop for bathroom
ALL TIMBER STUDWALL
FRONT VERANDAH
Floor Plan
Dimensions
Figured dimensions shall take preference over scaled dimension and the largest scale drawing will take preference.
Check on Site
The Contractor shall check all dimension on site before commencing work and before producing shop drawings and shall notify the architect of any discrepancy
THE MINISTRY OF EDUCATION'S
Fiji Education Sector Programme
EUROPEAN UNION
Building Type:
TWO-BEDROOM QUARTERS
Sheet Title:
FLOOR PLAN
Scale:
1:100
Sheet No.
A01

7.16 3 Bedroom Quarters – Timber




notes:
1. for dry walls: linings to be 6mm thick interior plyboard
2. for wet walls: linings to be 6mm thick exterior plyboard
3. for ceiling: 6mm thick interior ply board for dry areas
and 6mm thick exterior ply board for wet areas
4. all wet area wall & floor tiles fixed to 6mm hardiflex on plyboard.
Key To Exterior Elevations
Timber Deck Flooring
bracket mounted washtub on wall tiles on 6mm hardiflex on 6mm ext.ply lining over studs allow extra noggings for mounting
REAR VERANDAH
KITCHEN
work bench
BATHROOM
Vanity Basin
PASSAGE
LIVING ROOM (T&G Flooring)
BEDROOM 1
BEDROOM 2
BEDROOM 3
FRONT VERANDAH (Timber Deck Flooring)
insect screen
Floor Plan
Dimensions
Figured dimensions shall take preference over scaled dimension and the largest scale drawing will take preference.
Check on Site
The Contractor shall check all dimension on site before commencing work and before producing shop drawings and shall notify the architect of any discrepancy
THE MINISTRY OF EDUCATION'S
Fiji Education Sector Programme
EUROPEAN UNION
Building Type:
No. 10 THREE-BEDROOM QUARTERS
Sheet Title:
FLOOR PLAN
Scale: 1:100
Sheet No.
A01