

This declaration must be completed and filed immediately after Appendix A in the Learner's File.

Centre Number 1083

Candidate's Examination number

201083026175

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I, Enkle Makinda (print full names)

declare that all external sources used in my SBA have been properly referenced and that the remaining work contained in this Learner File is my own original work. I understand that if this is found to be untrue, I am liable for disqualification from the National Senior Certificate Examination.

Date: 2020/10/15

EB

### DECLARATION BY THE CANDIDATE'S TEACHER:

I GODFREY TEMBO (print name and title of teacher)  
at

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that the work provided by this candidate has been monitored and checked for plagiarism.

Signed: [Signature] Date: 2020/10/15  
Teacher

Sheet #

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Entle Makinta  
201083020175  
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Date:

2020/10/08

Scale:



**LEBONE II**  
College of the Royal Bafokeng

**PAT** EGD CIVIL PAT 2020  
Proposed Teacher Unit  
at Lebone II College of the Royal Bafokeng

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# Design Brief

## Primary problem:

There is a need to design and build a new housing complex that can accommodate the teachers and families of the Lebone College of the Royal Bafokeng staff, on an unused piece of land. This is because the teachers and staff are in need for accommodations as they work for the school.

## Secondary problem:

The unit should be cost effective, environmentally friendly, energy saving and accommodate handicap and infirm. The unit has to be the most cost efficient as possible. The complex needs to cater for 10 identical units

## Problem statement:

I am going to design and draw a free standing unit that can be duplicated or attached to cater for teachers and their families at Lebone II College of the Royal Bafokeng that must satisfy the following specifications and constraints.

## Specifications:

Design must be either a free standing unit or attached

Three spacious bedrooms

Open plan lounge, dining room and kitchen

Two full bathrooms

Small covered patio/verandah with built-in braai

Two parking bays for each unit

One bathroom with an en-suite bathroom

## Constraints:

Environmentally friendly fixtures are compulsory in the final design

10 identical free standing units

Unit needs to cater for handicapped personal

Complex needs to fit in unused piece of land

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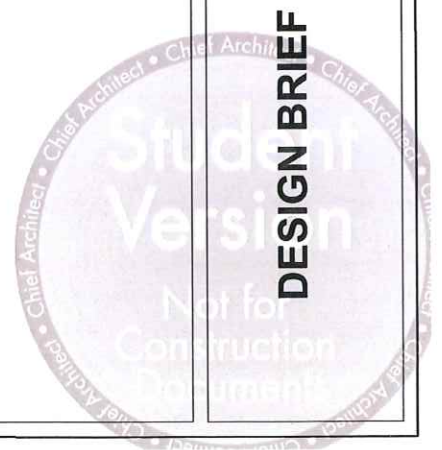
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# Types of Foundations

A foundation is a lower portion of a building structure that transfers its weight loads to the earth. Buildings must have a strong foundation if they are to stand for a long time. Foundations are generally broken into two categories, shallow foundations and deep foundations.

[Chosen]

## Shallow foundation

Shallow foundations are where the founding depth is less or equal to the width of the footing. Shallow foundations are below frost level and are used when surface soils are sufficiently strong and stiff, to support the imposed loads. They are generally unsuitable in weak or highly compressible soils and in cold climates, shallow foundations must be protected from freezing with use of insulation.

Types of shallow foundation

- Pad foundations
- Strip foundations
- Raft foundations

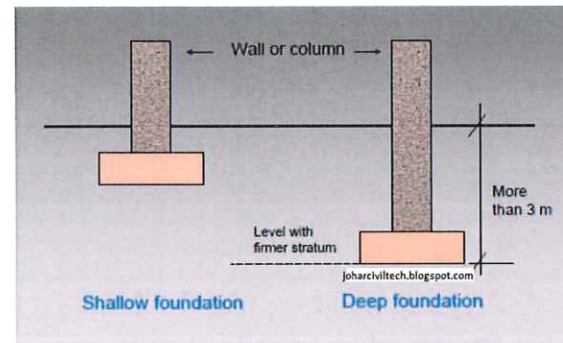
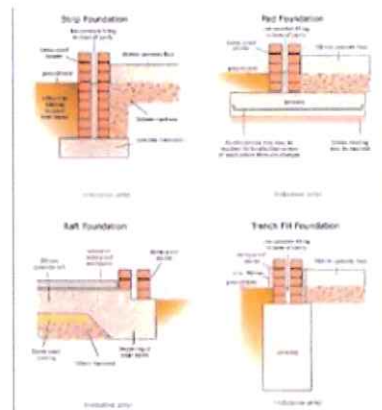
Pros and cons:

### ADVANTAGES:

Cost is affordable  
Construction Procedure is simple  
Materials used are mostly concrete  
Labor does not need expertise

### DISADVANTAGES:

It has limited capacity soil Structure  
Irregular ground surface (slope, retaining wall)  
Foundation subjected to pull out, torsion, moment.



## Deep foundation

Deep Foundations are when the depth at which the foundation is placed, is greater than its width. The depth is 3m below finished ground level so surface conditions won't affect it. It is used when there is weak or unstable soils near the surface or when the loads are very high such as very large skyscrapers.

Types of deep foundations

- Piles foundation
- Piers foundation
- Caissons foundation
- Compensated foundation

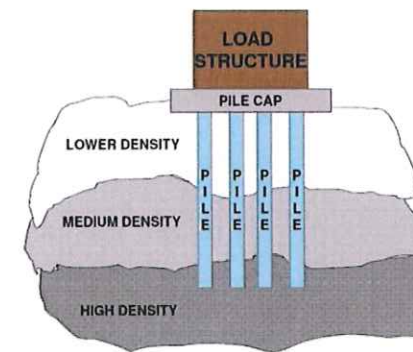
Pros and cons:

### ADVANTAGES:

Ability to withstand great loads.  
Easy to build, no special training requirements for personnel.  
Very long service life.  
Provides a good foundation where soil is weak

### DISADVANTAGES:

Is expensive  
A pile can be damaged quickly by driving through stones and boulders.  
Piles can be attacked by marine borers  
It is very difficult to know the actual required length in advance.  
Vibrations and noise produced when installing



## Comparative Evaluations

Shallow foundations are used for small, light buildings, while deep foundations are for large, heavy buildings. The construction costs for shallow is more cost efficient compared to deep. Deep foundations are costly and more disruptive in terms of sound.

## Personal Evaluation Choice

Since shallow foundations are used for small, single story light buildings, while deep ones are for large, heavy multi - story buildings, I will settle for a shallow foundation for the teacher unit.

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REQUIRED RESEARCH  
Types of Foundations



# Types of Energy Savers

[Chosen]

## Light Emitting Bulbs (LEB)

These are becoming increasingly common because of their energy efficiency and a variety of light colors. LED is a semiconductor device in which the electricity is applied to the negatively charged diode, resulting in the flow of electron and release of the photon. The photons combine to emit light from the diode.



### Pros and Cons

#### Advantages

- It is durable
- Cost efficient
- Energy efficient
- Does not produce as much heat compared to other lights
- Efficiency rate is 80-90% more than regular light bulbs
- Environmentally friendly
- Long Lifetime
- No warm-up period

#### Disadvantages

- They are found to be more expensive than other light bulbs
- They emit UV rays which are harmful for your eyes
- The performance is affected or dependent by the temperature
- Produces small amounts of lumens

## Compact Fluorescent Light (CFL)

This is just as energy efficient as the linear fluorescent tubes, but screws into the same socket as an incandescent. Is a more energy-efficient option than known incandescent lights.

### Pros and Cons

#### Advantages

- They are cost-effective.
- They are efficient.
- They come with versatility.
- They help reduce emissions of carbon dioxide.

#### Disadvantages

- Not all of them can be used with dimmer switches.
- They cannot hold up to frequent switching.
- Don't last as long as LED
- They cannot endure outdoors elements.
- Contains toxic mercury

[Chosen]

## Gas stove

A gas stove is a stove in which the combustion of gas is used as the source of heat.



### Pros and Cons

#### Advantages

- Is cost efficient
- Heats up quicker
- Allowance to change temperature rapidly

#### Disadvantages

- Risk of gas leaks
- Is an expensive product

## Electric stove

An electric stove is a stove with an integrated electrical heating device to cook and bake.

### Pros and Cons

#### Advantages

- Easy to clean
- Stable cooking surface

#### Disadvantages

- Dependant on power, so ineffective when there is no electricity
- Burners take time to cool off

## Comparative Evaluations

LED lights are cost and energy efficient, does not produce as much heat compared to CFL, environmentally friendly and is long lasting while CFL lights cannot hold up to frequent switching, not all of them can be used with dimmer switches, contains toxic mercury, cannot endure outdoors elements, don't last as long as LED. Gas stoves are cost efficient, heat up quicker, gives allowance to change temperature rapidly while electric stoves dependant on power, so ineffective when there is no electricity and burners take time to cool off.

## Personal Evaluation Choice

Since LED lights are durable, cost and energy efficient, environmentally friendly and long lasting, I will settle for LED lights rather than CFL lights. Since gas stoves are cost efficient, heat up quicker, don't depend on power and give allowance to change temperatures rapidly, I will settle for gas stove.

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REQUIRED RESEARCH  
Types of Energy Savers



# Types of Solar Water Geyser

A solar water geyser heats water using the sun's energy and provides for more efficient access to hot water for your home or business. There are Solar Water geyser using either evacuated tubes or flat plate collectors. The heat is transferred to the water in the tank through a number of different heat transfer processes. The different types available are: Flat Plate, Evacuated Tube, Retrofit, Thermosiphon system, Direct Thermosiphon, Indirect Thermosiphon, Closed Coupled, Low Pressure.

**[Chosen]**

## The Flat-Plate Collector System

The system comprises of a solar panel which is approx 80mm thick and ranges in size anywhere from 1.5 sq. The solar panel can be mounted on the roof and is connected to a solar geyser. The system utilizes the thermosyphon principle whereby cold water is fed into the bottom of the solar panel, and as the panel is heated up water automatically starts to rise to the top of the solar panel from where it is then fed into the solar geyser. It does require direct sunlight, predominately North facing because in South Africa during winter, North face captures most sunlight. There should be clear of all cast shadows from trees or buildings.

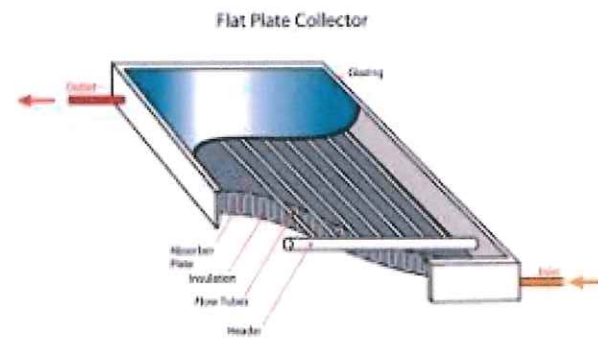
Pros and cons

### ADVANTAGES:

- save money on energy bills
- Cut your carbon footprint
- Get hot water throughout year
- Easy to manufacture.
- Permanently fixed
- Little maintenance.
- North west often has clear hot weather

### DISADVANTAGES:

- Aren't compatible with combi boilers
- Flat plate can be less effective than other systems
- Cost can be high
- Dependent on weather
- carries a lot of weight
- Contributes to Pollution



## The Evacuated Tube Collector System

It is a much newer system in South Africa and has been around for 2 years. Each tube is approx 1.9m long and inside each tube is a copper rod which extends from the bottom to the top of the tube and then into a manifold. A special chemical formula inside each tube starts to boil between 30 and 40°C. This quickly heats up the copper rods in each tube which in turn heats the water.

Pros and cons

### ADVANTAGES:

- Decrease carbon footprint
- You get lower bills
- Very low operating costs
- Supports space heating
- Achieves higher temperatures
- Low weight system
- North west often has clear hot weather

### DISADVANTAGES:

- Good functioning depends on location
- The space and support requirements are demanding
- More expensive system
- More vulnerable to breaking in domestic use
- Cannot be mounted horizontally, must have a slope of 25°C

## Comparative Evaluations

Evacuated Tube Collector system produces high temperatures while the Flat-Plate Collector system is the least efficient. The Evacuated Tube Collector has little weight while the Flat-Plate Collector system carries a lot of weight. The Evacuated Tube Collector has low operating costs while the Flat-Plate Collector needs high costs.

## Personal Evaluation Choice

Since Evacuated Tube Collector achieves higher temperatures, has low operating costs and has little weight where the Flat-Plate Collector is less effective, has high costs and uses a lot of weight. I will settle for the Evacuated Tube Collector geyser for the teacher unit.

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REQUIRED RESEARCH  
Types of Solar Water Geyser



# Types of Handicap and Infirm Bathroom Features

A foundation is a lower portion of a building structure that transfers its weight loads to the earth. Building must have a strong foundation if they are to stand for a long time. Foundations are generally broken into two categories, shallow foundations and deep foundations.



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Ramp

## Ramp

A wheelchair ramp is an inclined plane installed in addition to or instead of stairs. Ramps permit wheelchair users for easy access into buildings. for Ramp to cater the disabled, need to be a ratio of 1:12 gradient.

I have settled for floor mounted toilets because it has easier installation, low costs, and is easier to access for repairs



Railings/Bars

## Railings/bars

This is suitable for elderly and disabled to use as a support system to go on and off the toilet seat. The bars a design to hold the weigh of a person so that they can depend on it like a third leg.



Raised toilet seat

## Raised toilet seats

Raised toilet seats reduce the distance that a person has to move when they sit down on the toilet, involves less stretching and bending efforts to get on and off of the seat which puts less stress on the joints. A suitable height is from 17 to 19 inches high. The installation is very simple. It is just placing the seat on the toilet.



Curbless shower

## Walk in or curbless shower

This is a shower the consists of the same floor level as the entire bathroom. Creating a walk in or a curbless shows allows easier access to sanitary area because there is no longer an obstacle in the way for wheelchairs and those who find climbing steps difficult.

## Faucet handles or levers

Faucet handles are used in contrast to traditional handles to prevent one from twisting and turning to have access of water. This makes it easier for elderly and the disable so that their presses of using the sanitary basin becomes less complicated.

Extended faucet lever



[Chosen All]

Personal Evaluation Choice

Since the extended lever helps with reachability, the curbless shower allows accessibility into the shower with minimum effort, the elevated toilet seat reduces effort, the ramp permits easy access and the rails provide a support system. I will settle for all these features

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REQUIRED RESEARCH  
Types of Handicapped and  
infirm Bathroom Features

Good



# Types of Doors

A door is a hinged, sliding, or revolving barrier at the entrance of a building or room. Its primary purpose is to provide security by controlling access to the doorway. Types of doors are Timber Doors, Battened, Lugged Doors, Framed and Paneled Doors, Flush Doors, Glass Doors, Steel Doors, PVC Doors and Fiberglass Doors.

## [Chosen]

### Timber/wood doors

This door is purely made out of wood. It is the oldest material used for doors. Door can be used for an external entrance of a building and for internal entrances into rooms. Aesthetic of wooden doors tend to look traditional..



#### Pros and cons

##### Advantages:

- Wood is a natural insulator of heat
- High temperatures won't destroy door
- Is a strong material
- Process of making a wooden door is environmentally friendly
- Can reach reasonable prices

##### Disadvantages:

- Wood needs maintenance or it will rot
- Easily absorbs moisture
- Can get infected by termites or other insects
- Can warp, expand and contract, which compromises the shape

### Aluminum doors

These doors are purely made out of aluminum. They are used for exterior use. Available in a wide range of colors and styles. Aluminum looks sleek and contemporary.



#### Pros and cons

##### Advantages:

- Can be made to fit different structures
- Is very strong
- Immune to warping or changing shape
- Very low maintenance
- Can get rust proof doors

##### Disadvantages:

- Cost is high
- It conducts a lot of temperature and becomes an energy consumer

## Comparative Evaluations

Aluminum doors are very heavy but are expensive, used for external door because of security but are not aesthetically pleasing for a home environment and it conducts outside temperatures. Timber doors vary in weight and cost, can be used for external and internal doors, wide range of aesthetically pleasing designs and are an insulator to temperature. uPVC doors are very light and have low costs, are used for internal door mainly bathrooms, do not look aesthetically pleasing and insulates temperatures.

## Personal Evaluation Choice

Since aluminum doors are heavy, expensive and thermal conductors and uPVC doors are aesthetically unpleasant and light. I am going to settle for Timber doors for both internal and external doors because they are light, range with cost, aesthetically pleasant for homes and thermal insulators

## [Chosen]

### uPVC doors

These doors made of Poly Vinyl Chloride (PVC). This is a tough plastic that doesn't have any additives when manufactured. PVC is mainly used for water tanks and pipes. This type of door is popular in the UK. Tends to be available in white which can discolor. It is an excellent material choice for doors in your bathroom.



#### Pros and cons

##### Advantages:

- Prices are reasonably low
- Reasonably low maintenance
- Are water, dust and sound resistant

##### Disadvantages:

- The weakest of all materials
- Able to brittle and discolor
- Can warp, expand and contract, this changes the shape
- Isn't as thermally efficient
- Are least aesthetically pleasing

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ADDITIONAL RESEARCH  
Types of Doors



# Types of Roof

A roof is the top covering of a building, including all materials and constructions necessary to support it on the walls of the building, providing protection against rain, snow, sunlight, extremes of temperature, and wind.

## [CHOSEN]

### Metal roofing

A metal roof is constructed using several pieces of metal, usually zinc, copper, aluminum, steel alloy or metal tiles that are of high resistance and longevity.



#### Pros and cons

##### ADVANTAGES:

- Is long lasting
- Carries light weight
- Resistant to fire, insect and rot
- Easy installation process

##### DISADVANTAGES:

- Costs are very high
- Conducts temperature
- Creates a lot of noise
- Is vulnerable to denting
- Paint can peel off



### Slate roofing

Slate is a fine-grained, foliated, homogeneous metamorphic rock composed of clay or volcanic ash through low-grade regional metamorphism.



#### Pros and cons

##### ADVANTAGES:

- It is energy efficient because it insulates outside temperatures
- Is fire resistant
- Is long lasting, can reach 100 years or more
- Is durable
- Is a natural product

##### DISADVANTAGES:

- Is extremely heavy
- Reaches high costs
- Requires specialized installation
- Tiles can break



## Comparative Evaluations

Metal roofing carries light weight, undergoes and easy installation process and does not break easily. Slate roofing tiles are extremely heavy, reach high costs, require specialized installation and can break or crack.

## Personal Evaluation Choice

Since the guidelines for the PAT requires the roofing material for the proposed teacher unit to be metal, carries light weight, undergoes and easy installation process and does not break easily. I will settle for metal roofing.

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ADDITIONAL RESEARCH  
Types of Roofs



# Types of Floor Finishes

A foundation is a lower portion of a building structure that transfers its weight loads to the earth. Building must have a strong foundation if they are to stand for a long time. Foundations are generally broken into two categories, shallow foundations and deep foundations.

[Chosen]

## Ceramic flooring

Ceramic tiling is made from a mixture of clay and water and is hardened by use of heating. The tile is coated in a specific glaze that protects and seals the tile. It is often used for watery environments like kitchens and bathrooms



Pros and cons

### ADVANTAGES:

Is water resistant because of the special glaze protecting it  
Very durable  
Requires low maintenance  
Easy to clean

### DISADVANTAGES:

Does not hold heat well and often gets cold  
Is heavy compared to other tiling  
Stone flooring

## Stone flooring

Stone flooring is a natural type of flooring that looks stylish and beautiful. This type of flooring is made of stone and polished after. There are different varieties of flooring such as marble, limestone and granite



Pros and cons

### ADVANTAGES:

Is very durable  
Is stain resistant  
Aesthetically pleasing  
An eco-friendly material

### DISADVANTAGES:

The flooring is cold during winter  
Installation is costly compared to others  
Development cracks over time

## Comparative Evaluations

Stone flooring gets very cold during winter, the installation is costly compared to others flooring materials and can development cracks over time. Ceramic is water resistant because of the special glaze protecting it, requires low maintenance and is easy to clean. Wooden flooring makes the room aesthetically pleasing, it does not get cold during winter, can easy to remove stains and costs of material and installation is low.

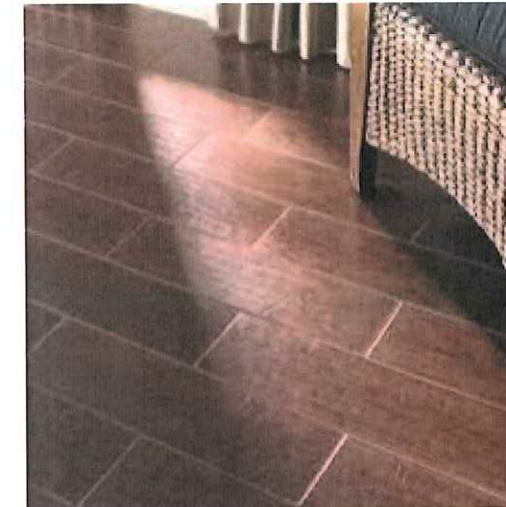
## Personal Evaluation Choice

Since wooden flooring do not get cold easily, thus making them energy efficient, stain resistant and aesthetically pleasing, I am going to use them in all the bedrooms. Since ceramic tiles are water and stain resistant because of the glaze covering, I am going to use them in all the common areas because of the low maintenance.

[Chosen]

## Wood flooring

Wood flooring is entirely made from wood, a natural material, and is plastered to the floor. It is best to not place wooden flooring in wet environments like bathrooms or kitchens.



Pros and cons

### ADVANTAGES:

Makes room aesthetically pleasing  
Does not get cold during winter  
Easy to remove stains  
Cost of material and installation is low

### DISADVANTAGES:

Prone to insects and termites  
Can be damaged easily when there's water  
Can be costly to buy  
Catches fire quickly

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ADDITIONAL RESEARCH  
Types of Floor Finishes



# Types of Window Frames

A window frame is the combination of the head, jambs and sill that forms a precise opening in which a window sash fit. The most popular types of frames are wooden, vinyl, fiberglass and aluminum however most houses in South Africa use wooden and aluminum frames.

**[Chosen]**

## Wooden frames

These frames are made out of wood. It is the oldest material used for window frames. Come in a diverse range of shapes and designs. Are very traditional and simple in how the mechanisms work.



### Pros and cons

#### Advantages:

- Wood is a natural insulator of heat
- High temperatures won't destroy door
- Adds a lot of style to house
- Process of making a wooden door is environmentally friendly
- Ranges in prices

#### Disadvantages:

- Wood needs maintenance or it will rot
- Easily absorbs moisture
- Can get infected by termites or other insects
- Can warp, expand and contract, which compromises the shape

## Steel frames

These doors are purely made out of steel. They are used for exterior use. Available in a wide range of colors and styles. Aluminum looks sleek and contemporary.



### Pros and cons

#### Advantages:

- Can be made to fit different structures
- Strong enough for protective purposes
- Immune to warping or changing shape
- Long lasting and durable frames
- Recyclable and reusable in most instances

#### Disadvantages:

- Cost is high
- It conducts a lot of temperature
- Requires maintenance to protect against corrosion

## Fiberglass frames

These window frames are made out of Fiberglass and are essentially composed of glass fibers and resin



### Pros and cons

#### Advantages:

- Extremely strong, can hold large expanses of glass
- Low maintenance
- Do not require repainting
- Resist swelling, rotting and warping

#### Disadvantages:

- Have few color options
- Fiber glass can break easily
- Need to be re-gelled

## Comparative Evaluations

Steel frames are very strong which makes them useful for security purposes, it is provided in many different shapes, it is long lasting and is immune to wrapping or stretching. Wooden window frames require a lot of maintenance to prevent rotting, absorbs a lot of moisture, can get infected by insects and fiberglass breaks easily and requires re-gelling and maintenance. Fiberglass frames are very light and have low costs, are used for internal door mainly bathrooms, do not look aesthetically pleasing and insulates temperatures.

## Personal Evaluation Choice

Since steel frames require little maintenance, they are very strong which is helpful for security reasons and doesn't wrap or stretch while wooden and fiberglass frames are very much weaker and break easily, fiberglass needs to be maintained and re-gelled and wooden frames need to be maintained or will be infected by insects. I am going to settle for steel frames because they are strong and require little maintenance.

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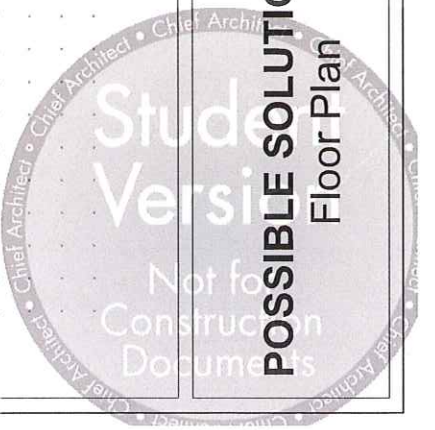
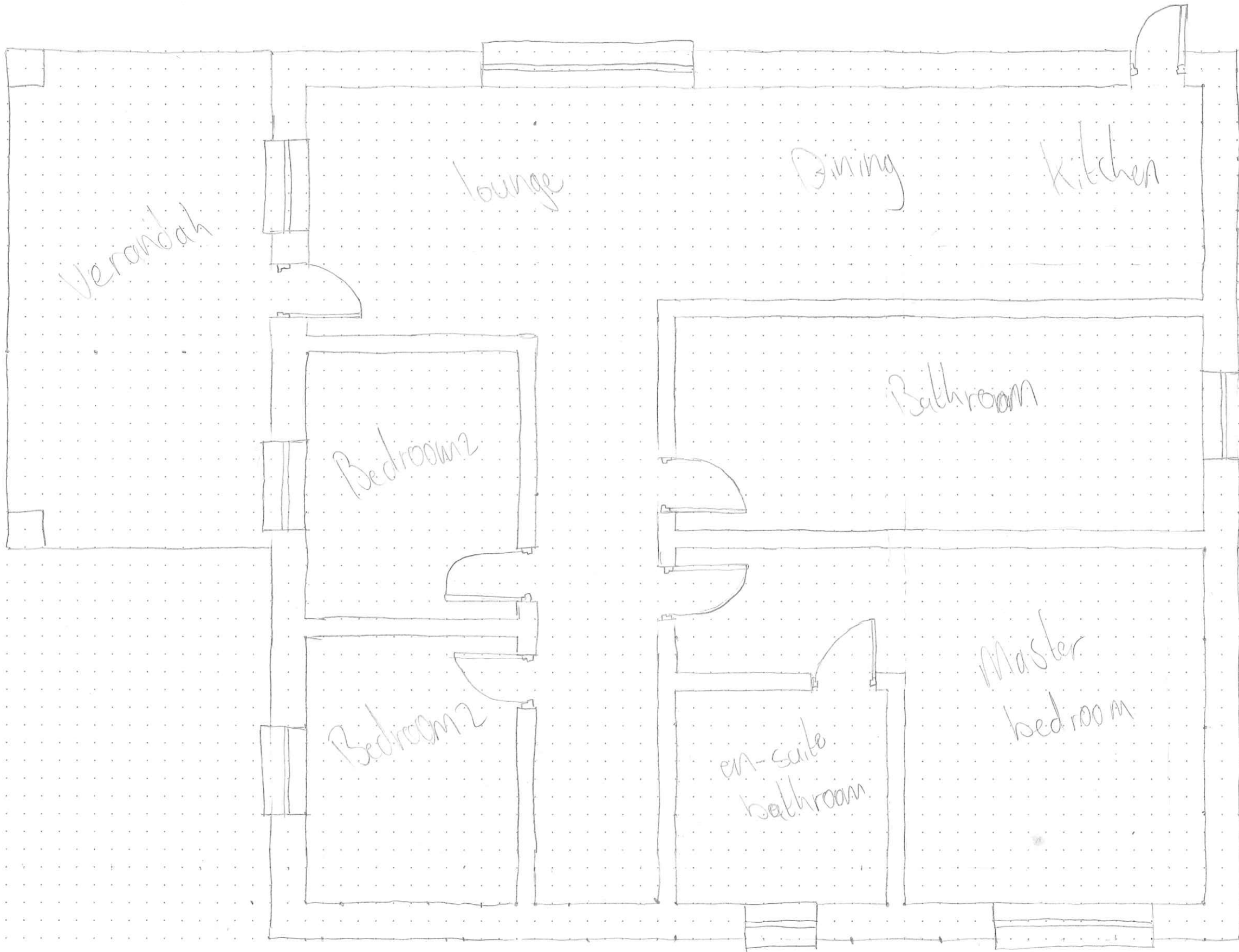


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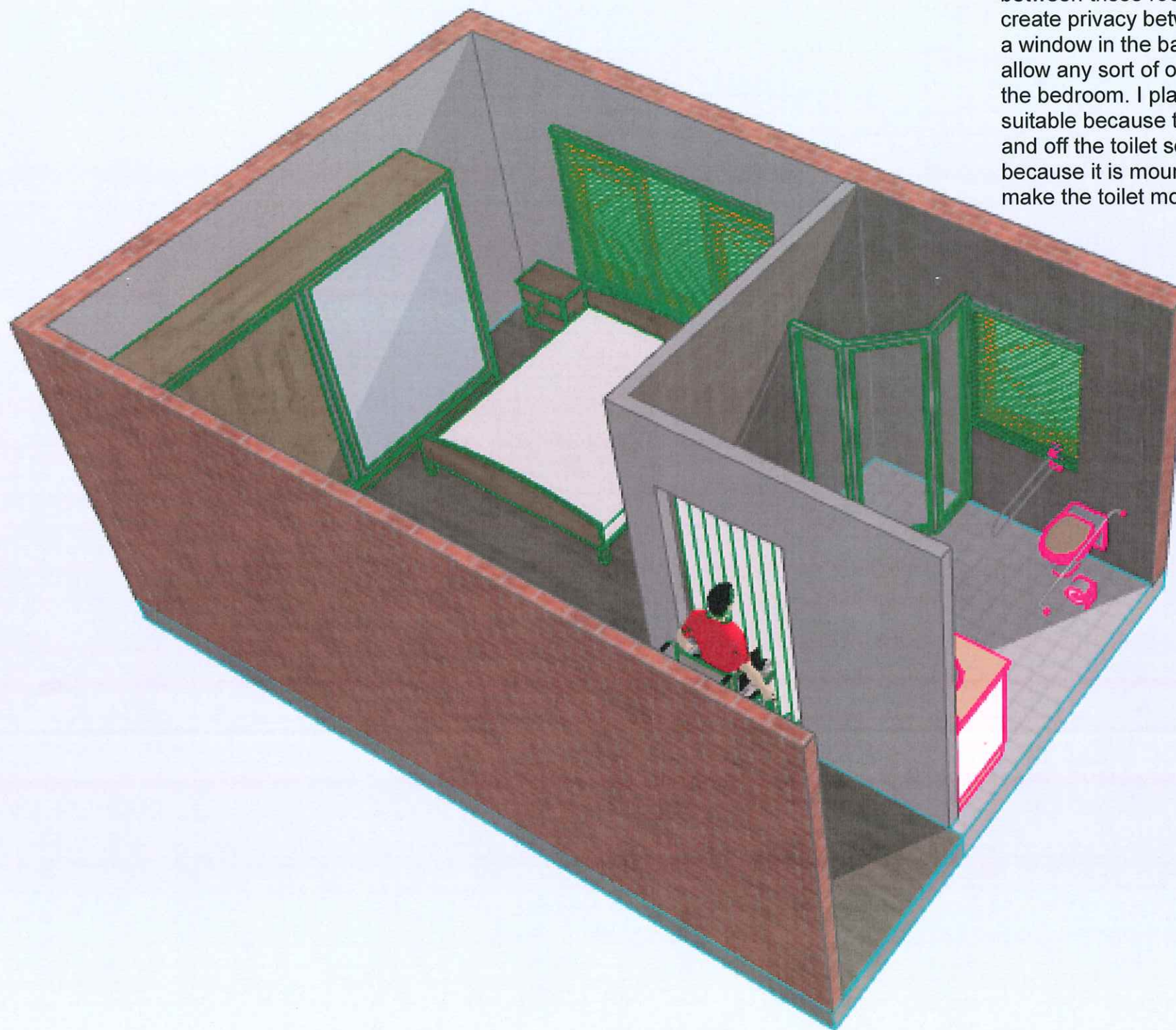
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ADDITIONAL RESEARCH  
Types of Windows









### Evaluation:

The chosen design aspect is the required master bedroom with a en-suite bathroom. In my design I made sure to create appropriate spacing to accommodate if the house holder himself is disabled. I created an opening rather then placing a physical door in between the bedroom and the bathroom to allow someone with a wheelchair to have easy access in between these rooms. I placed blinds for the opening to create privacy between the rooms. I made sure to place a window in the bathroom to create ventilation and allow any sort of odor to escape rather than spread to the bedroom. I place the toilets with bars This is suitable because this creates a support system to go on and off the toilet seat. I used a wall mounted toilet because it is mounted to the wall with screws, and this make the toilet more stable and strong.

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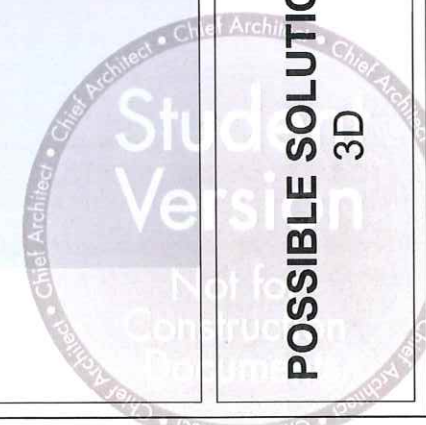
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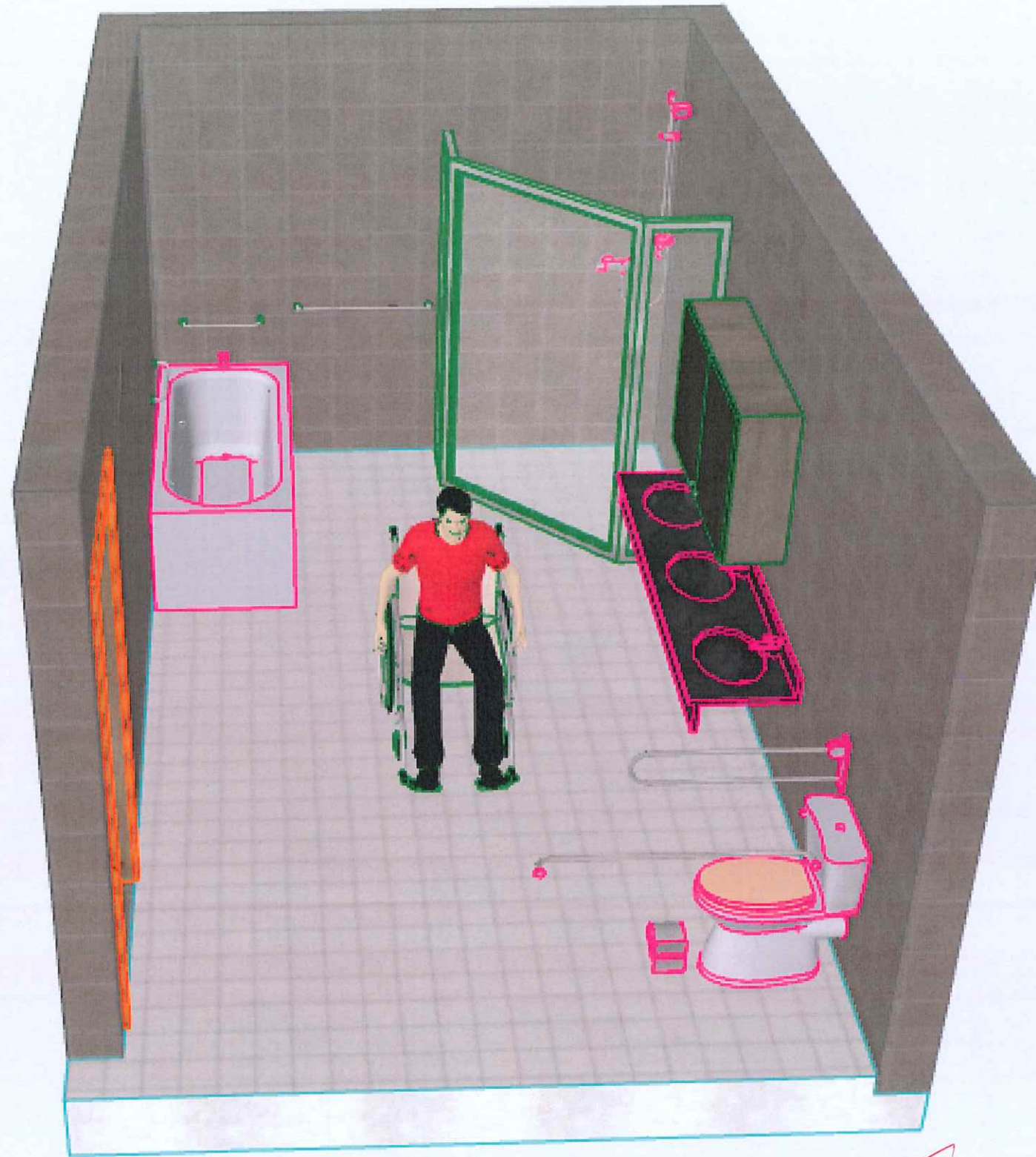
**POSSIBLE SOLUTIONS 1**  
3D





### Evaluation:

The chosen design aspect is the main bathroom and tried to make it as user friendly as possible for the disabled and infirm. I lowered the basin and the cupboard to accommodate people that use wheelchairs to create accessibility. I increased the size of my shower and the door to allow a wheelchair to enter into the shower. I selected a walk in and curbless shower to allow easier access to the shower because there is no longer an obstacle in the way for wheelchairs and those who find climbing steps difficult. My toilet seat was raised to reduce the distance that a person has to move when they sit down on the toilet. My toilet is a floor mounted to minimize costs considering the installation and maintenance. I applied bars and rails around the toilet seat and bathtub to create a support system to go on and off the sanitary areas. The bars a design to hold the weigh of a person so that they can depend on it like a third leg.



Sheet #

13

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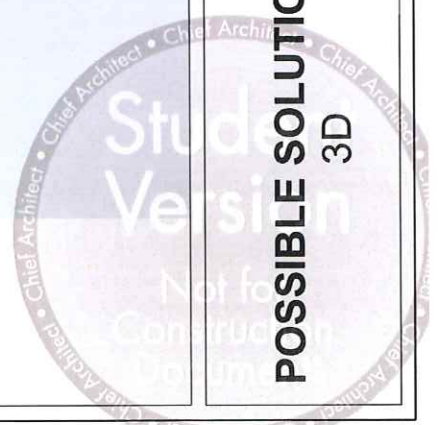


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POSSIBLE SOLUTIONS 2

3D



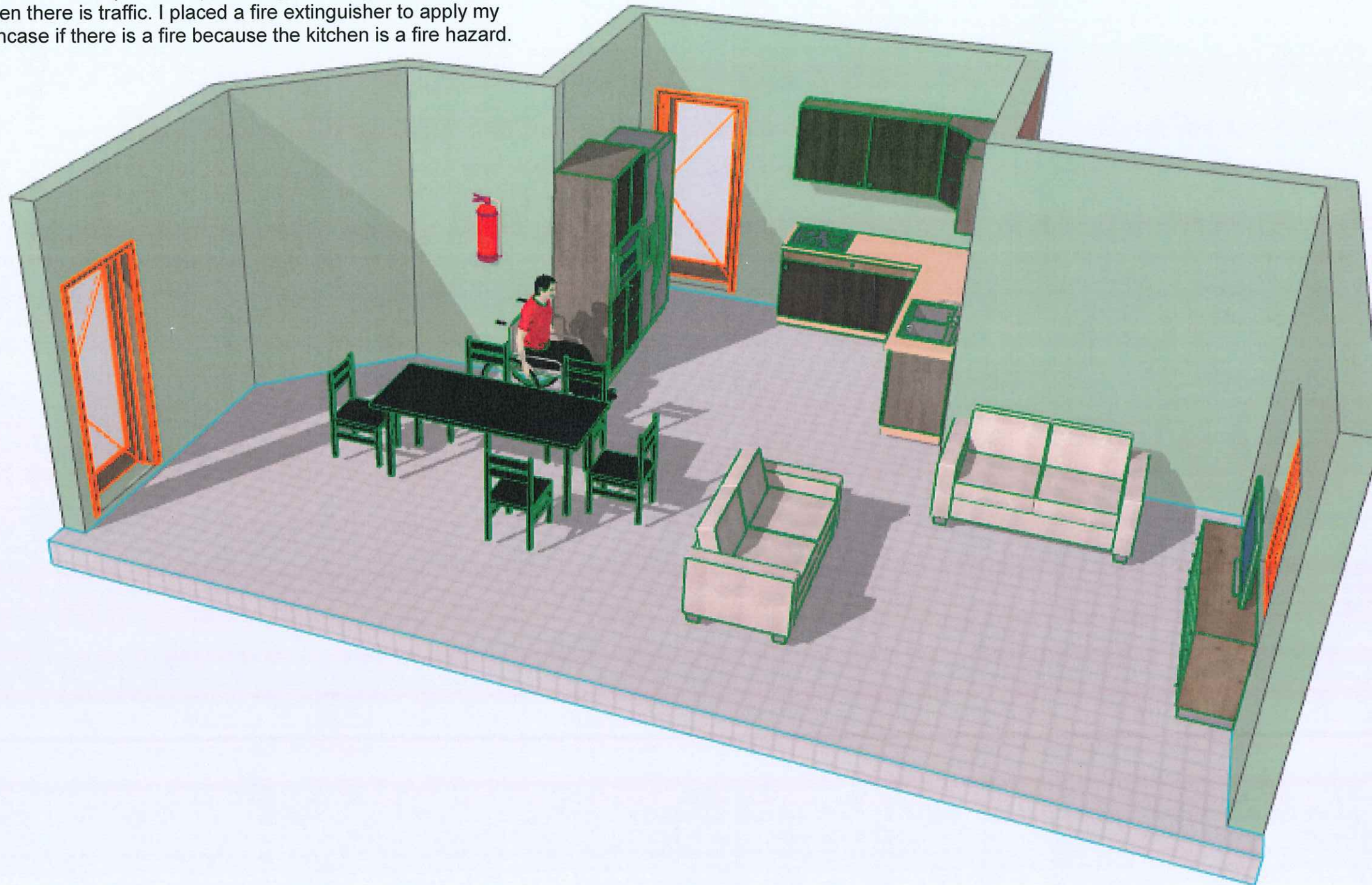






### Evaluation

The chosen design aspect is the open lounge. The reason for this open lounge was to allow easy movement of furniture when moving in. I created a "u" shaped kitchen to create maximum accessibility between all the facilities. The open lounge also creates better movement for someone with a wheelchair so that they may not have to struggling with entering individual rooms with use of a door. I made sure to create a spacious open lounge to allows allow easy movement even when there is traffic. I placed a fire extinguisher to apply my safety to the room incase if there is a fire because the kitchen is a fire hazard.



Sheet #

15

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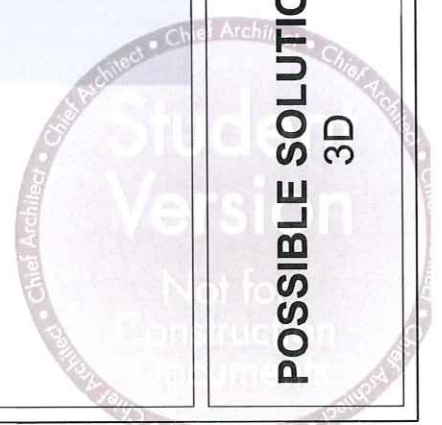
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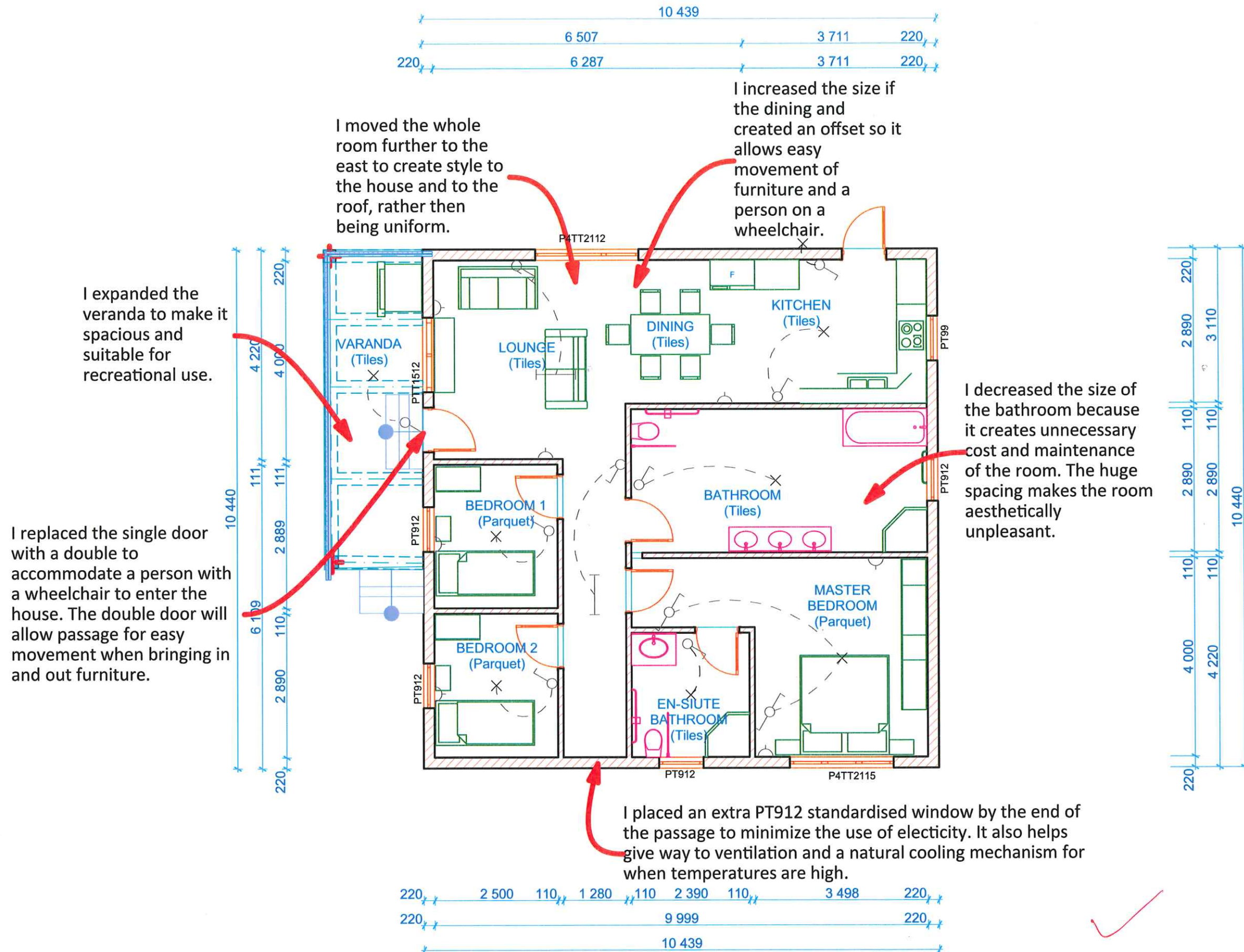
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**POSSIBLE SOLUTIONS 3**  
3D







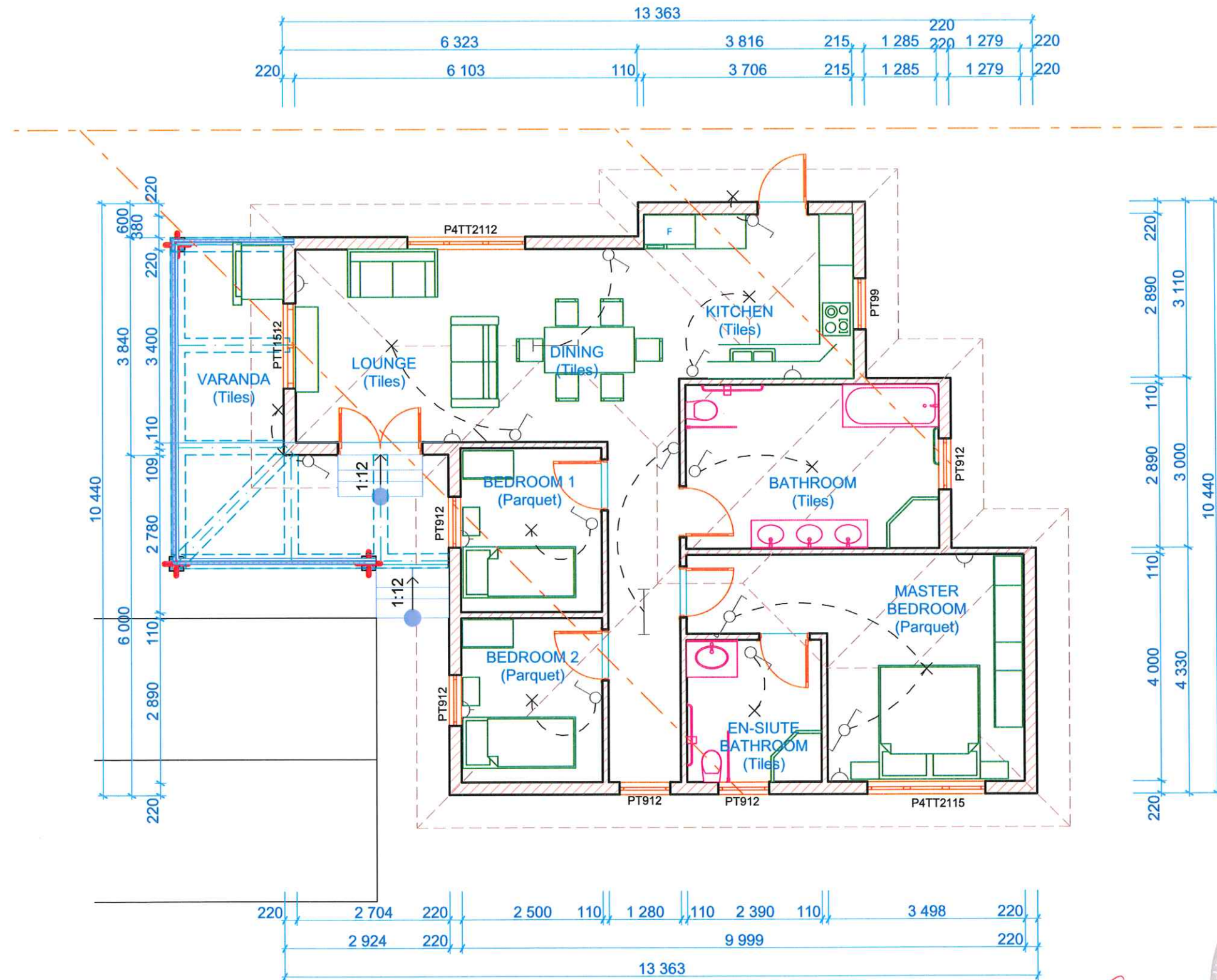


### Floor Plan Notes:

1. All window frame are made from aluminum
2. All the window and doors have a lintel of 85mm above the fixtures
3. The floors are 100mm thick concrete slab reinforced with mesh set 25mm
4. All external and internal wall dimensions are provided

### Evaluation:

I consider the chosen and modified floor plan to be a good outcome. What I did notice was that I used a lot of land for a single unit which introduce some problems in the site plan in terms of fitting all the units.



Floor Plan 1:100

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17

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WORKING DRAWINGS  
Floor Plan





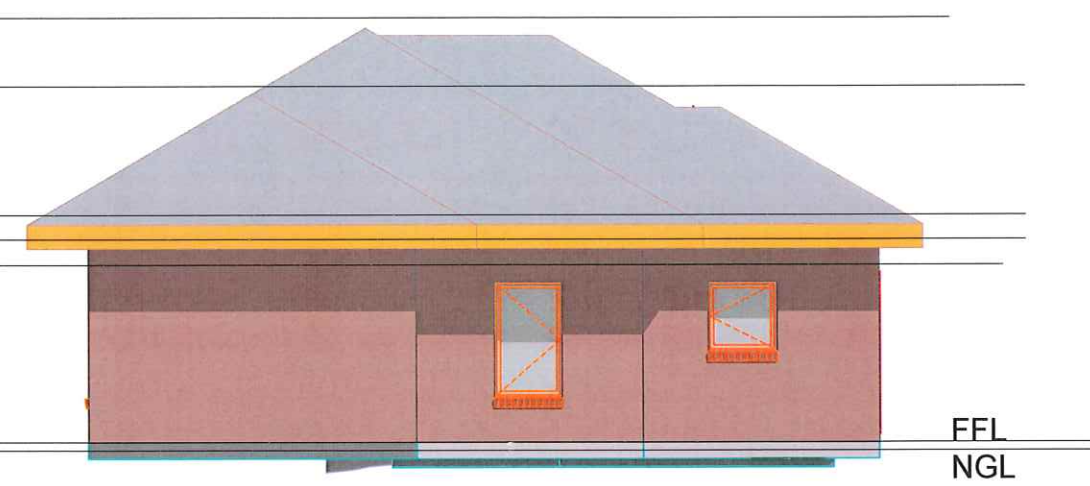
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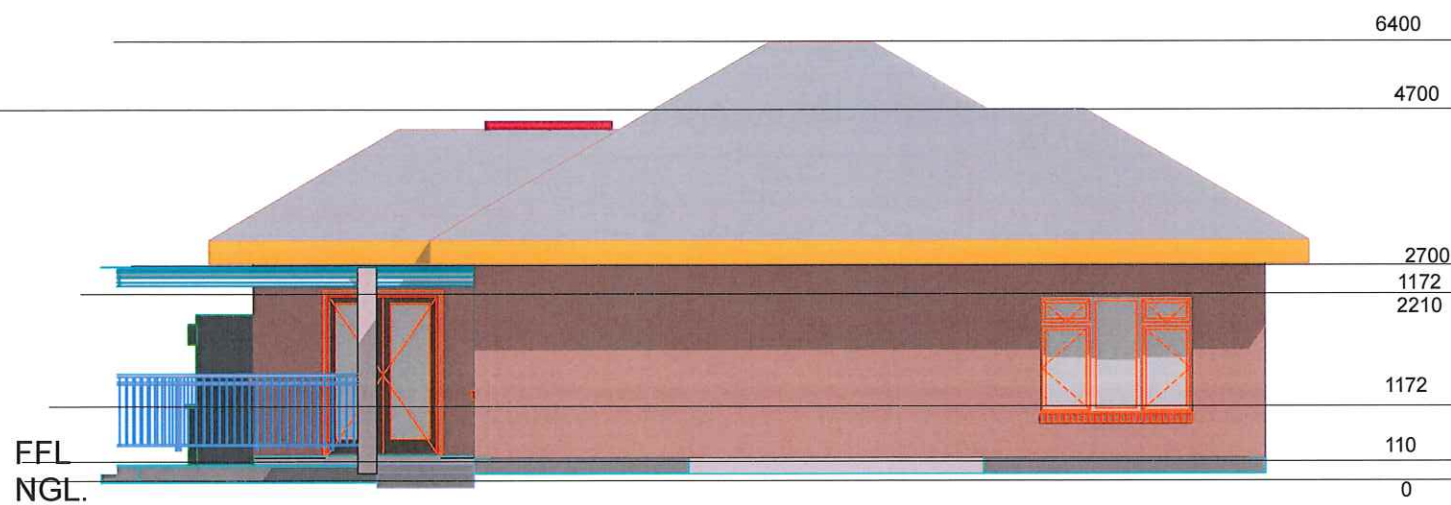
**WORKING DRAWINGS**  
Elevation



**NORTH ELEVATION**



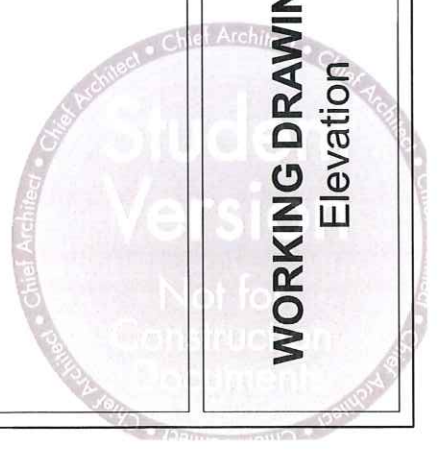
**EAST ELEVATION**



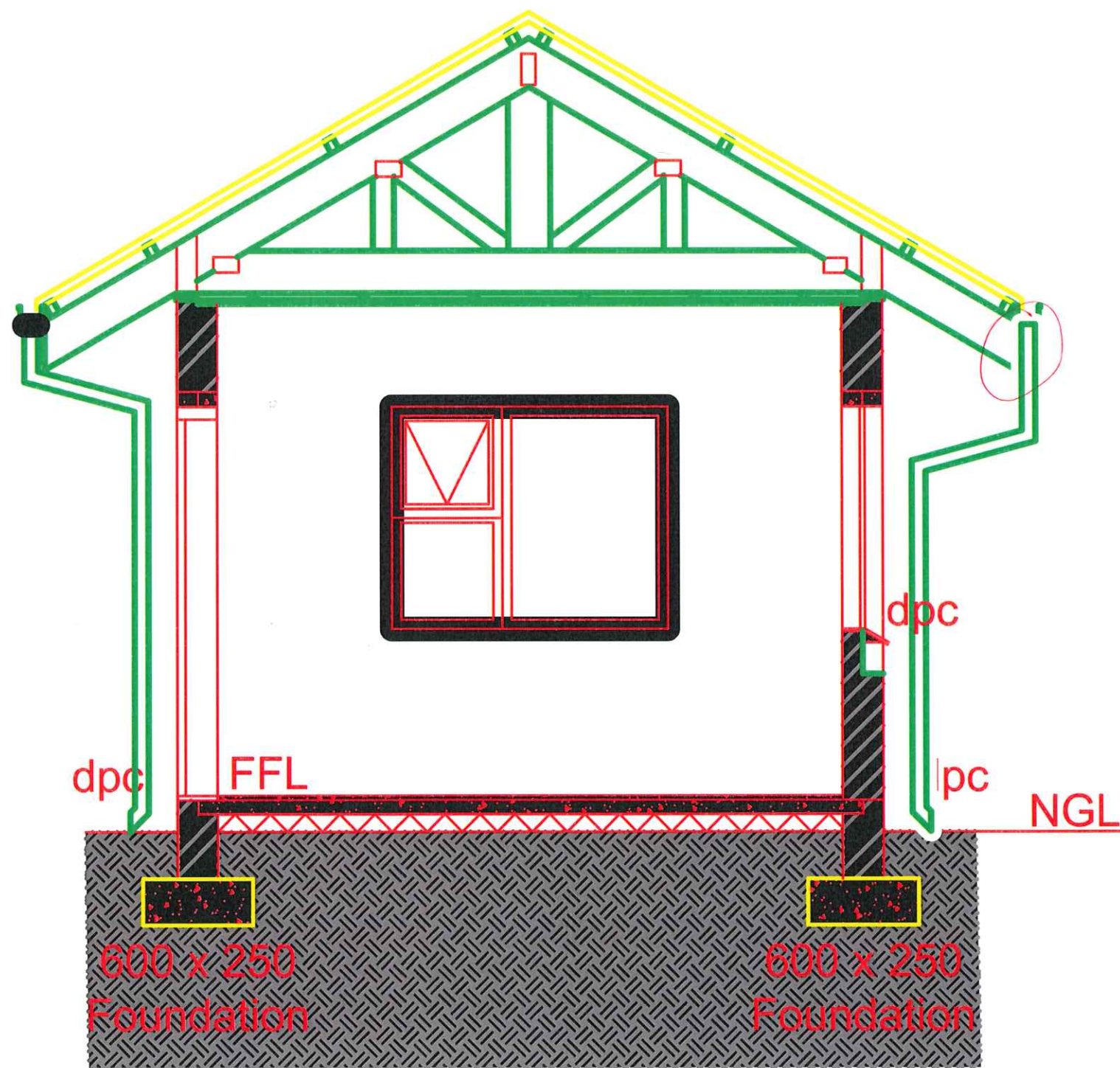
**SOUTH ELEVATION**



**WEST ELEVATION**







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**WORKING DRAWINGS**  
Sectional View





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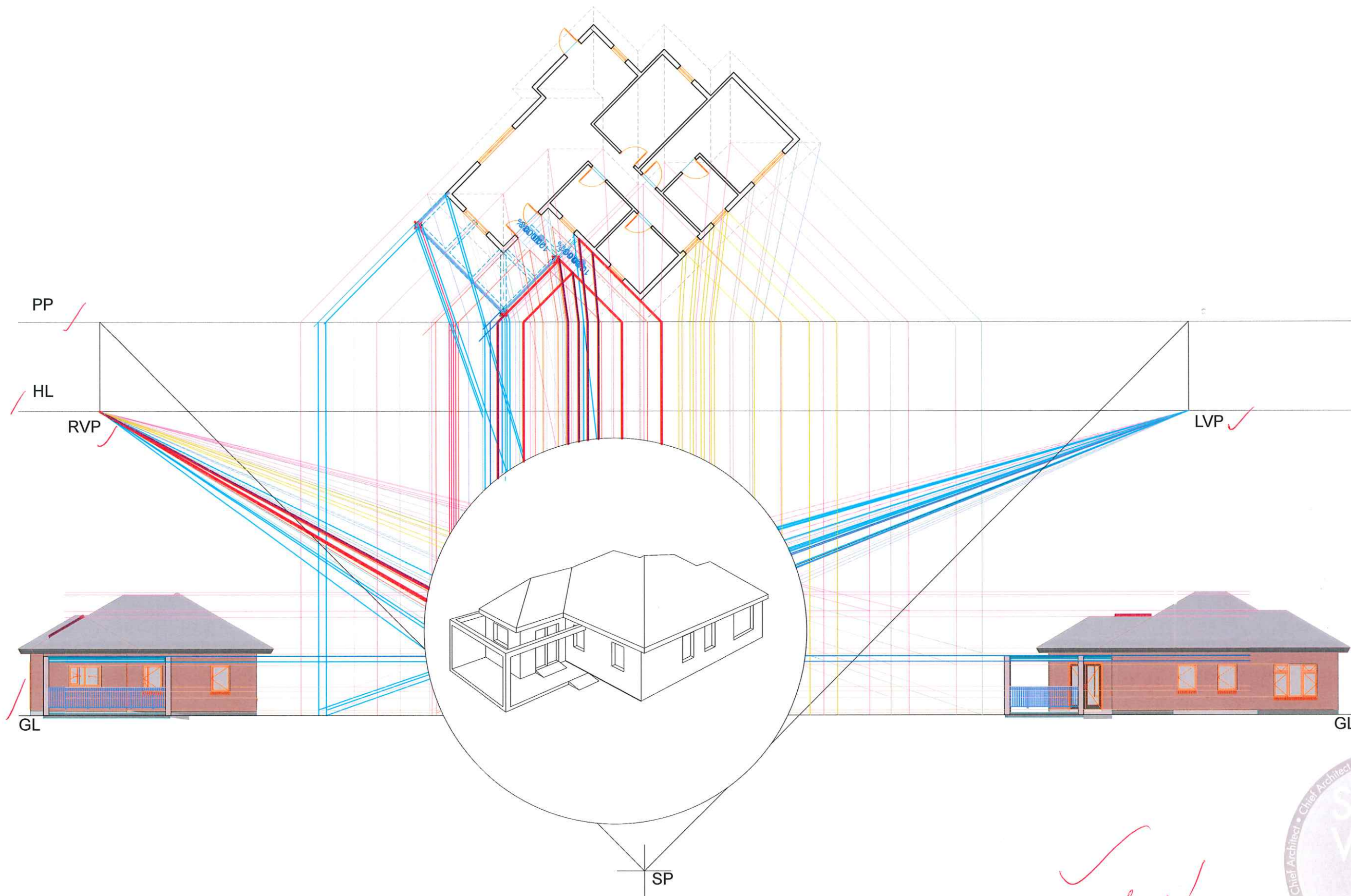
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WORKING DRAWINGS  
Perspective View



Well done!



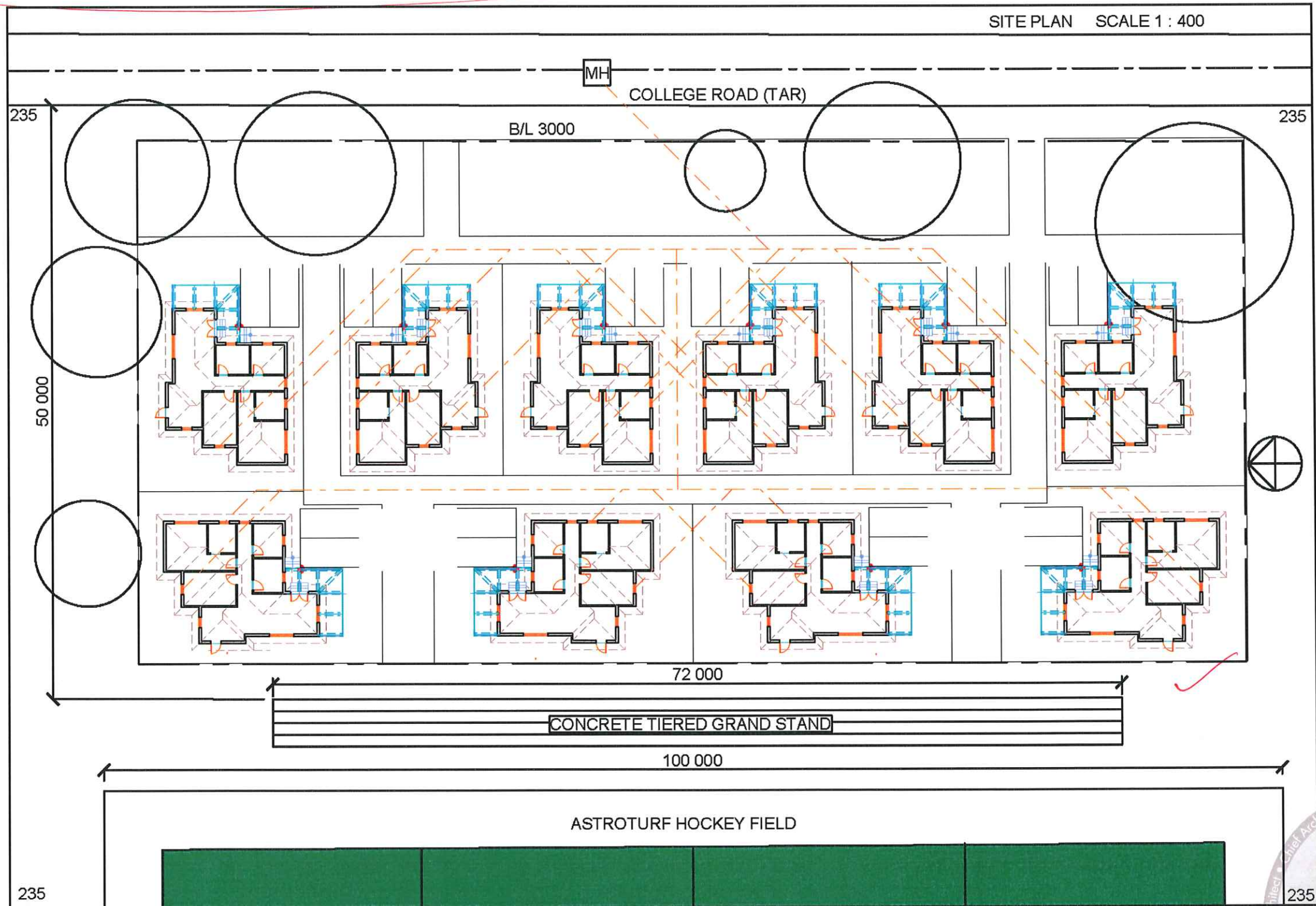


## APPENDIX C

SITE PLAN SCALE 1 : 400

### Site Plan Notes:

1. Site plan consists of a 10 units complex
2. 13.5x10.5m housing units
3. An average of 44x90m provided land
4. A road is provide to create passage to each individual house
5. Sewer line that connector the given established manhole



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21

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WORKING DRAWINGS  
Site Plan



# Bibliography

<https://www.nationwide.com/lc/resources/home/articles/types-of-roofing>

<https://theconstructor.org/geotechnical/foundation-types-and-uses/9237/>

<https://www.nvroofs.com/gas-vs-electric-stoves-pros-cons/>

#:~:text=While%20electric%20stoves%20are%20fairly,slowly%20than%20gas%20stoves%20do.&text=This%20use%20of%20electricity%20will,by%20a%20comparable%20gas%20stove.

<https://blog.constellation.com/2016/03/25/led-vs-cfl-bulbs>

/#:~:text=LED%20bulbs%20are%20much%20more,however%20C%20has%20upped%20the%20ante.

<https://www.ctm.co.za/floors/tile-styles/wood-look-tiles-category.html>

<https://www.thespruce.com/ceramic-flooring-pros-and-cons-1314687>

<http://www.buildingafrika.co.za/index.php/roofing/features/212-slate-a-roofing>

option#:~:text=Slate%20roofing%20is%20also%20one,or%20from%20adjacent%20house%20fires.

<https://www.milgard.com/materials/fiberglass>

[https://www.swartland.co.za/aluminium\\_product\\_category/aluminium-windows/](https://www.swartland.co.za/aluminium_product_category/aluminium-windows/)



The Saluda • 3 Bed 2 Bath • 1,070 Sq Ft • River Bluff of Lexington



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