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To

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1.0 Issues that may arise during the construction phase of this project.

During a project such as this the most common issues that may arise during the construction phase includes condensation and ventilation.

1.0.1 causes and sources of condensation and the effects of condensation upon building fabric.

(Moodle.uwtsd.ac.uk. (2019). *UWTSD Moodle 2018/19*. Thomas Duxbury) Tells us that at the point when air cools, it decreases its ability to hold moisture, which in turn causes the density of the saturated water vapour to fall. The point also known as the dew point is where relative humidity reaches 100 percent. If the air continues to cool, the moisture will begin to condensate. Condensation typically happens in structure when warm air meets cooler surfaces that are at or beneath the dew point. For example, the water and condensation that often appears in places such as windows. Condensation can have detrimental effects upon building materials and fabrics. These include Production and growth of Mould; this can cause respiratory effects on habitants of the building, mildew, staining, damage to equipment, corrosion and decay of the building envelope and reduced performance of insulation.

1.0.2 Methods of ventilation that will reduce condensation within this proposed building.

(Designingbuildings.co.uk. (2019). *Condensation in buildings - Designing Buildings*) States that condensation in buildings is regulated by Approved document C (Site preparation and resistance to contaminants and moisture) and Approved document F (Ventilation) and further guidance is available in BS 5250 Code of practice for the control of condensation in buildings. Some of the suggested methods of ventilation that can reduce condensation within this proposed building include increasing surface temperatures such as installing insulation or by improving glazing standards, dehumidification, limiting sources of moisture such as ensuring the correct ventilation of moisture producing appliances such as boilers, tumble dryers and showers. Other methods might include natural or mechanical ventilation. This can include measures such as air conditioning systems or the honeycomb styled sleeper wall in this project.

When considering ventilation and methods of reducing condensation (UK Building Regulations Approved Document F) provides guidance on ensuring that building regulations that apply to ventilation are correctly met. (UK Building Regulations Approved Document F) tell us that enough methods of ventilation must be in place to prevent excess condensation build up which could potentially structurally damage the property. By building in accordance with UK Building Regulations Approved Document F It can be ensured that air is able to properly flow throughout the property.

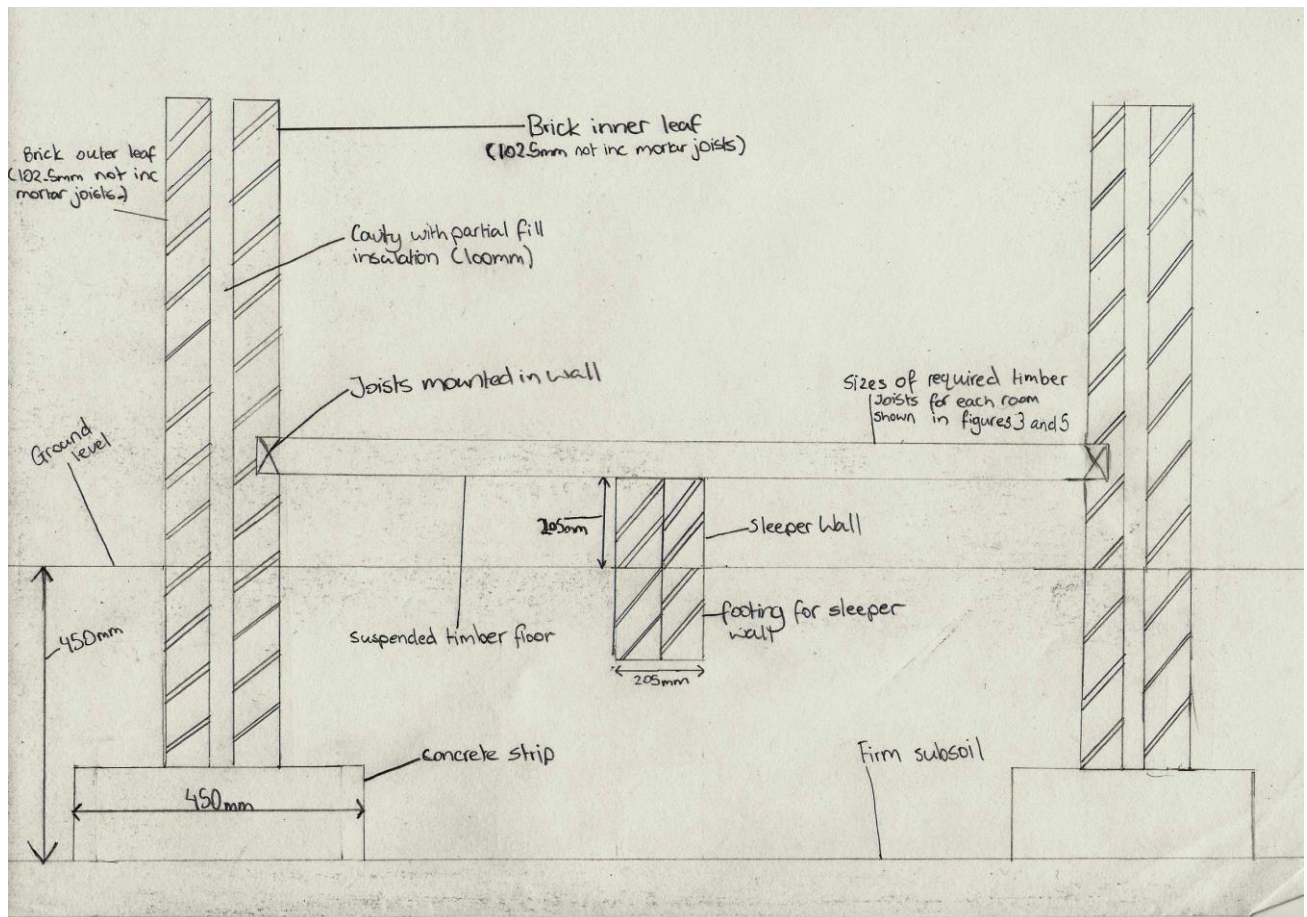
1.1 Foundation and substructure

When compiling the drawing of the proposed Foundation and substructure I have ensured that the specifications for the foundations and substructure I have provided comply with BS8004:2015: Code of practice for foundation. The type of foundation I

have chosen is a strip foundation. The concrete strip for this foundation is to be set at 450mm below ground level on top of the firm subsoil. The other type of foundation that I considered during this process was a raft foundation due to its suitability for being used on soils with a clay content. One of the main reasons why I have chosen the strip foundation is from the Developers point of view it would be a waste of materials, labour and funds to build a raft foundation that consists of a concrete ground floor when the specifications would then require a suspended timber floor to be placed on top of the concrete slab. This would mean that the concrete slab/floor would not be used for its intended purpose. As the soil has a low clay content and is positioned above the water table, I would think a concrete strip foundation, placed on top of the firm subsoil would provide a suitable foundation for a building of this specification.

I have decided to use this type of foundation as it also complies with UK building regulations Approved Document A: structure, which tells us that in regard to loading, the building should be constructed in a way that the combined dead, imposed and wind loads are sustained and transmitted by it to the ground in a safe manner and without causing deflection or deformation of any part of the building, or any movement of the ground as this could potentially reduce the stability of any part of another building. When considering whether a building complies with UK building regulations Approved document A: Structure you must ensure that the wind loads and imposed loads the building will allow the building to be used in the way it was intended for during the course of its use.

When considering ground movement, the proposed building must be constructed in a way that any ground movement caused by shrinkage, freezing or swelling of the subsoil, land-slip or subsidence can be reasonably foreseen, this should also not reduce the stability of any part of the proposed building.



(Figure 1)

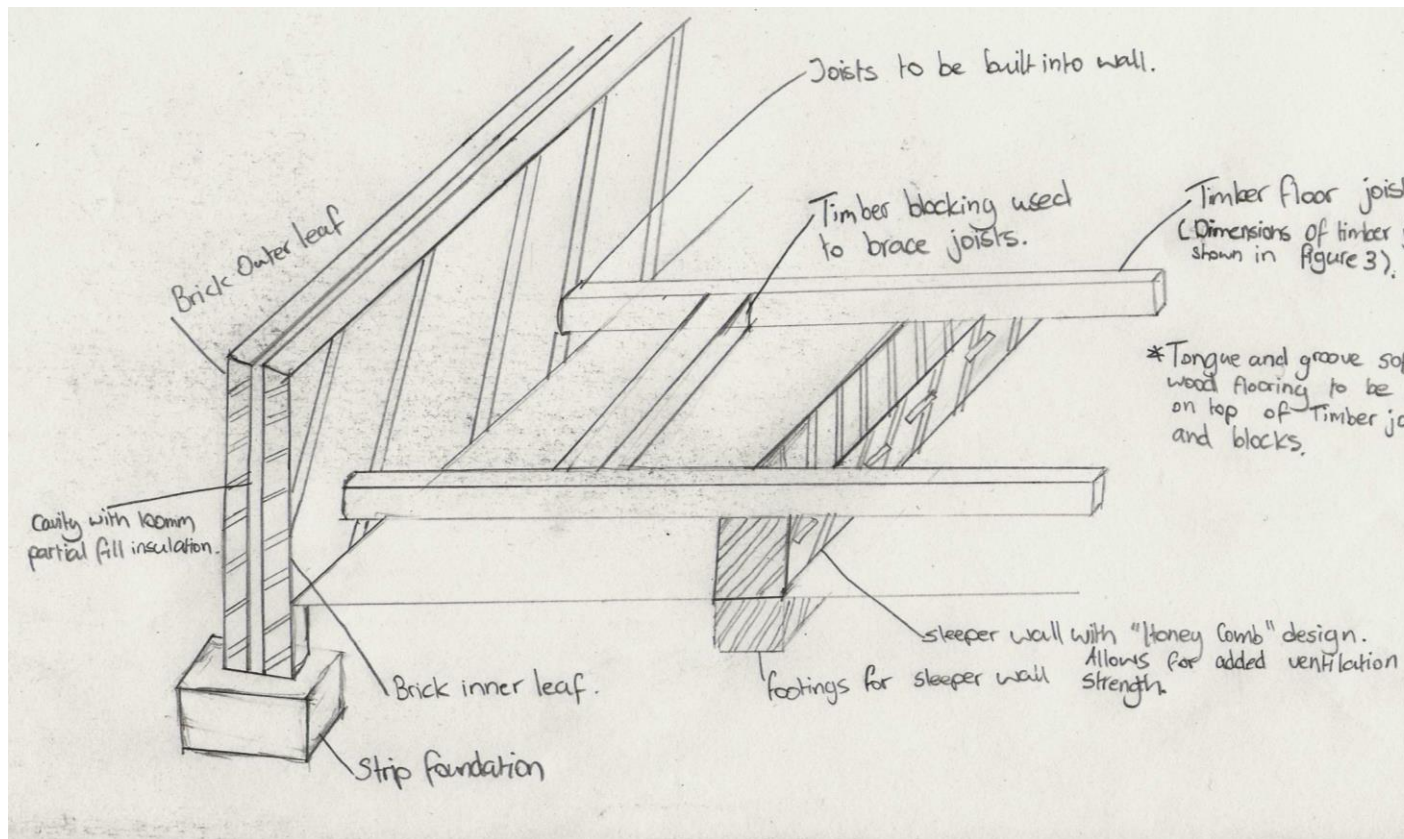
1.2 Detailing of the ground floor, first floor, eaves, roof covering and main roof structure.

1.2.1 Ground floor.

When considering the construction of the ground floor I have ensured that the ground floor meets the guidelines set out in BS EN 1995-1-1:2004+A2:2014, Eurocode 5: Design of timber structures. General. Common rules and rules for building. I have decided to build a suspended timber ground floor that is to have its joists built into the inner leaf of the external walls with a sleeper-wall in between that will provide additional strength to the ground floor. The sleeper wall will also have a "honey combed" design as this will allow for ventilation and air flow beneath the suspended timber floor. Tongue and groove soft wood flooring is to be laid on top of the suspended timber ground floor and timber blocks.

By building in accordance with both UK Building Regulations Approved Document A: structure and UK Building Regulations - Approved Document F: Ventilation it can be ensured that the floor will be able to provide structural support of the content of the room, the occupants/users and the mass of the floor itself. These UK Building

Regulations approved documents also tell us that If the proposed floor is a ground floor it must also provide resistance to heat loss and ground moisture.



(Figure 2)

During this process using a span table (Figure 3 and Figure 5) found in BS EN 1995-1-1:2004+A2:2014, Eurocode 5: Design of timber structures. General. Common rules and rules for building. Using the specifications provided, I have used this span table for the calculation of the timber joists required during the construction of the suspended timber ground floor.

Utility room (2665mm span) = 50x122mm joists required.

Kitchen/Dining area (3915mm span) = 63x170mm joists required.

Hallway/Study (2400mm span) = 38x122mm joists required.

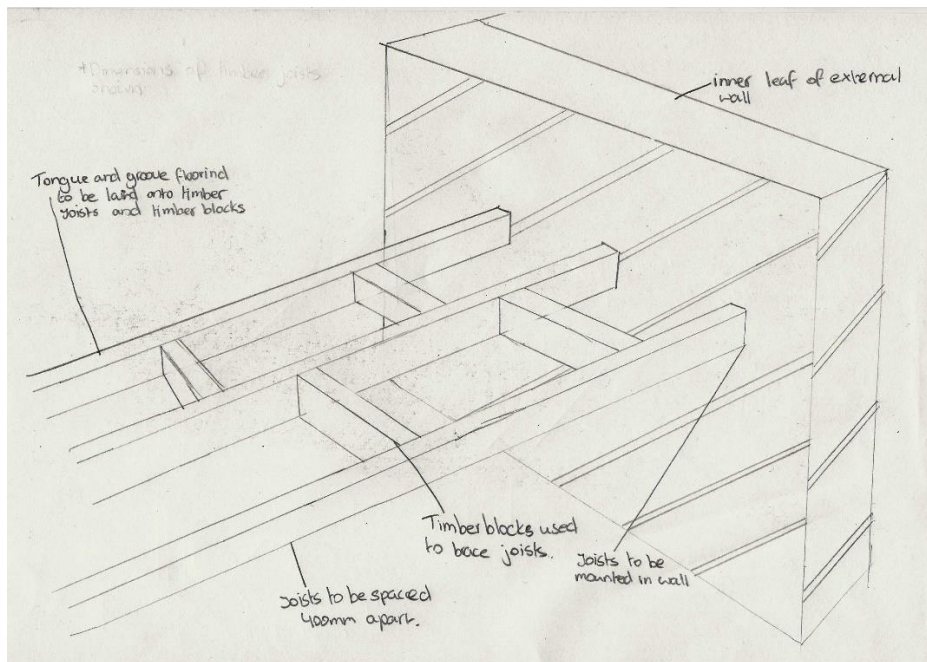
Lounge (3915mm span) = 63x170mm joists required.

FLOOR JOISTS SUITABLE FOR DOMESTIC FLOOR LOADINGS			
Size of joists in mm	Maximum clear span in metres for joist spacing of		
	400mm	450mm	600mm
97 x 47	1.93	1.82	1.47
120 x 47	2.52	2.42	2.05
145 x 47	3.04	2.92	2.59
170 x 47	3.55	3.42	3.00
195 x 47	4.07	3.91	3.41
220 x 47	4.58	4.39	3.82
145 x 75	3.54	3.41	3.10
170 x 75	4.14	3.99	3.63
195 x 75	4.72	4.52	4.13
220 x 75	5.15	5.01	4.67

(Figure 3) Span table for timber joists taken from BS EN 1995-1-1:2004+A2:2014, Eurocode 5: Design of timber structures. General. Common rules and rules for building.

1.2.2 First floor.

BS EN 1995-1-1:2004+A2:2014, Eurocode 5: Design of timber structures. General. Common rules and rules for building provides the basic guidelines for the construction of the solid timber floor proposed in the provided specifications. As with the ground floor I have decided to mount the timber floor joists into the inner leaf of the external walls. The opposite end of the floor joists is to sit on the internal load bearing walls and be braced by timber blocks placed between the joists. The tongue and groove soft wood flooring is then to be laid on top of the timber joists and timber blocks. By building in accordance with both UK Building Regulations Approved Document A: structure it can be ensured that the floor will be able to provide structural support of the content of the room, the occupants/users and the mass of the floor itself.



(Figure 4)

During this process using a span table (Figure 3 and Figure 5) found in BS EN 1995-1-1:2004+A2:2014, Eurocode 5: Design of timber structures. General. Common rules and rules for building. Using the specifications provided, I have used this span table for the calculation of the timber joists required during the construction of timber 1st floor.

Bed 1 (3915mm span) = 63x170mm joists required.

Bed 2 (3915mm span) = 63x170mm joists required.

Bed 3 (2990mm span) = 44x147mm joists required.

Bathroom (3325mm span) = 63x147mm joists required.

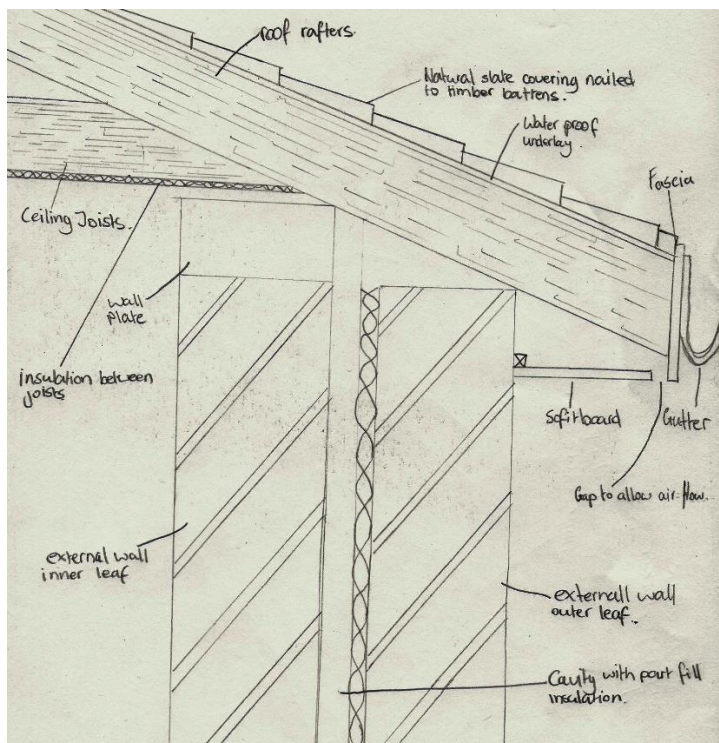
Hallway (2400mm span) = 38x122mm joists required.

FLOOR JOISTS SUITABLE FOR DOMESTIC FLOOR LOADINGS			
Size of joists in mm	Maximum clear span in metres for joist spacing of		
	400mm	450mm	600mm
97 x 47	1.93	1.82	1.47
120 x 47	2.52	2.42	2.05
145 x 47	3.04	2.92	2.59
170 x 47	3.55	3.42	3.00
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145 x 75	3.54	3.41	3.10
170 x 75	4.14	3.99	3.63
195 x 75	4.72	4.52	4.13
220 x 75	5.15	5.01	4.67

(Figure 5) Span table for timber joists taken from BS EN 1995-1-1:2004+A2:2014, Eurocode 5: Design of timber structures. General. Common rules and rules for building.

1.2.3 Eaves and roof covering.

When considering the detailing and construction of the eaves and roof covering BS 5534:2014+A2:2018, Slating and tiling for pitched roofs and vertical cladding, code of practice states that fixings need to consider increased wind loading and need to be corrosion resistant – galvanized or Stainless-Steel ring shank nails for battens and copper or alloy for slates or tiles. Local Authority Building Control states the minimum size of 50x25mm must be used when securing the slate tiles to the battens. When constructing the eaves and roof coverings

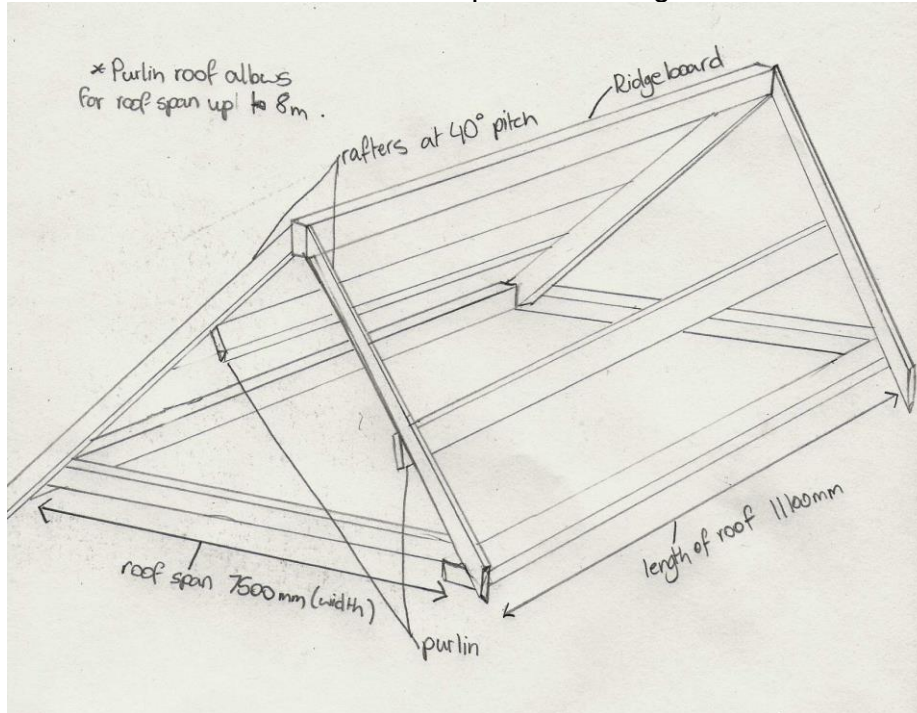


(Figure 6)

1.2.4. Main roof structure.

As the proposed main roof structure is to be a timber structure it is important that it meets the guidelines and requirements set by BS EN 1995-1-1:2004+A2:2014, Eurocode 5: Design of timber structures. General. Common rules and rules for building. I have decided to utilise a roof structure with a Perlin design. This type of roof structure is suitable for a building such as this as it allows a roof span of up to 8m, which accommodates the 7500mm span of this proposed roof structure. This roof structure also complies with UK Building Regulations Approved Document A: structure 2010 as this document states that a new roof will be required to be tied

down to the main structure to stop it from lifting in the case of heavy or strong winds.



(Figure 7)

1.3 Bibliography, References and sources of information.

BS EN 1995-1-1:2004+A2:2014 Eurocode 5: Design of timber structures. General. Common rules and rules for buildings. (2004). BSI.

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