

The construction technology assignment construction essay

[Design](#)



This is the study on development of the house which comprise of land floor and one upper floor.

The elaborate specification of 32o pitched roof building will be attached on the drawing. The study will stipulate type of pit wall, subdivision of around the caput and cill of the lumber window and elaborate specification of external brick work. Following paragraph describes drainage demands for a edifice and eventually elaborate scrutiny and specification of the land floor.

Roof

Members of the roof

Roof structure- Truss Rafters

The roof that traveling to cover 15. 6 long and 10. 6 metres broad House is a traditional pitched roof with a pitch of 38o. I was sing two forms of tied balks on this peculiar undertaking what was Fink and Howe, but eventually I decide to travel for Howe because of quite broad span which is 10.

2 metres. Rafters will be prefabricated by Magtruss Company from Drogheda Co. Louth. Chemically treated lumber used for those is 175x50mm broad.

Wooden building traveling to be connected by Galvanised steel gang-nail connection home bases. Trussed Rafters will be placed at every 600 millimeter on the 75x100 millimeter wall home bases. For best stableness of roof building will be used diagonal brace. Keeping down roof to the walls is non needfully in this country.

Insulation

Insulation is a major portion of our undertaking. The roof that will cover the house, is a cold type of the roof what means the ceiling has to be decently insulated. The insularity stuff that will be used is called Owens Corning PINK. It is a 160 millimeter midst fiber glass insularity which does n't absorb wet. That will forestall cold span forming from the cold roof infinite to the go forthing infinite. [hypertext transfer protocol: //insulationireland. com/index. php? option= com_content & A ; task= view & A ; id= 51 & A ; Itemid= 47](http://insulationireland.com/index.php?option=com_content&task=view&id=51&Itemid=47)

Roof infinite airing

In fact all new belongings should hold a continues signifier of airing installed on both sides of the roof. Cold Roof infinities should be ventilated to outside air to cut down the possibility of condensation. A more rational attack to cut downing the possibility of warm, damp air perforating a cold roof infinite. To supply roof infinite airing in the house, Eaves ventilators will be laid over insularity in the eave country, to enable air freely perforate the roof infinite (pulling) .

The air from exterior will acquire through the deepness soffit ventilators. [hypertext transfer protocol: //www. glidevale. com/rafter_ventilators. html](http://www.glidevale.com/rafter_ventilators.html)

Breathing Membrane

To avoid air current blow into the roof infinite, breathable membrane - Solitex will be laid across roof balks from the eaves upward up to ridge. Breathable membranes allow unwanted H2O vapor to get away from the roof infinite while still excepting air current. Ventilation through the roof and

breathable membranes cut down the potency for condensation to organize on the cold surfaces within the roof.

Timber battings of 50mm ten 35 mm broad at every 330 millimeter will procure Solitex membrane. Solitex is designed to replace underlay felt in house building. Solitex acts like a gortex stuff on the house, letting the house to take a breath whilst at the same clip forestalling H2O incursion. It is lightweight and easy to work with. It is highly strong and does non rupture.

It does non devolve under heat and Sun and is guaranteed to last a life-time. Solitex is much more expensive than underlay felt and many other roofing membranes. Much more expensive means that an addition in roofing cost on a big roof will be of approximately 400 Euro above the cost of carpet pad felt. This is really small excess to pay when you consider the end point benefits and should be considered as money good invested and money really good spent. Solitex is a stuff that is designed for modern life, being environmentally friendly and offering immense benefits.

Covering- Roadstone SL8 slates

Slates is a traditional roof covering stuff in many states. It is a splitted and shaped as a slate rock. They are really lasting.

Slates conveying to homeowner many advantages like non-combustible, resists fire, storm and windA . The fact that they are made of natural rock there is broad scope of colour combination. Slates are rainproof and they A resists climatic alterations.

The cost of care is really small and inadvertent breakage is easily replaced.

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SL8 is a new concrete thin taking border concrete slate. It has a riven texture significance that it is not a smooth surface but has the visual aspect of a river bed sand form. Roadstone roof tiles are manufactured to demanding criteria at Roof Tile works in Clondalkin, County Dublin and Currabeg, Ovens, County Cork. The size of tile is 420 mm x 330 mm and minimal pitch in instance of nailing is 25° or nipping 22.5°.

SL8 are suited to cover even 90° pitch roof. Thin taking borders and concealed interlocks give an reliable slate visual aspect to domestic and commercial developments likewise. The minimal headlap that SL8 can be laid in is 85mm and the maximal 110mm. The possible gage scope is from 310 mm up to 335mm. Covering capacity at 320mm gage is 10.4 slates / m².

The additive screen of one slate is 300mm. Minimum batten size for this peculiar slate is 47mm x 35mm. Weight of SL8 at 320mm gage is 51kg / m². SL8 concrete slates is an economical solution for new or re-roofing work to keep the character of natural slate. The roof covered by SL8 will heighten the traditional design of a edifice, peculiarly in rural scenes.

Possible Roof covering

The roof on our undertaking will be covered by SL8 Roadstone slate, nevertheless I would wish to depict three other possible in our instance types

of roof coverings which is Plain clay Tile, Asphalt Shingles and metal sheets covering.

Plain clay tiles

Clay tile is still among the most popular roofing stuffs in Europe, where places and Centres of commercialism are designed to last for coevals. Their simpleness of signifier and form make traditional, tapering mission tile ideal for funnelling and casting H₂O from pitched roofs. Clay roofing tile is a good pick for places with a southwesterly, Italian, or Spanish Mission design, or even for places with a modern, clean expression. This manner is more prevailing in California. Clay tiles offer the householder and roofing contractor legion advantages. The roof covered by clay tiles typically last for 50 old ages or longer and make non corrode or otherwise deteriorate. There is high scope of colorss available on the market: from tusk and Prunus dulcis to deep reds and browns, apricot to spill the beans and buff tones.

The beauty of natural clay colors is matchless, clay tiles mellow and better with age. With the unreal colours^A that you get with concrete tiles and many types of clay tile, A A coloring material is lost with clip, A you merely have to look at^A the concrete roofs of the past 70 old ages to detect this fact. Clay tiles resist the transition of heat addition from summer Sun and winter heat loss. They are more insulating than the other roof covering stuffs.

The mass them provides superior insularity from sound. Tile roofs are non-combustible and protect the construction from firing coals without enduring irreparable harm. However we need to maintain in head that a clay roof is really heavy, and expensive to put in. It requires small care but tiles are

delicate, so walking on them can interrupt them. That makes it more hard to carry through care like painting or cleaning rain troughs or hearths. Plain Clay tiles are a sustainable merchandise, the length of service of clay means that the energy and natural stuffs used in their production are offset over the whole life of the roof, which in the instance of most clay tile roofs, is over 100 old ages.

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Glass fiber Asphalt herpes zoster

Asphalt herpes zoster are the most common roofing stuff used today. They are comparatively cheap, get downing at around 0.

50 euro per square pes installed and travel up from at that place. Things that determine cost are geographical location, incline of the roof, tallness of the edifice, easiness of entree to the premises, complexness of the undertaking, the peculiar type of shake and legion other factors. Asphalt herpes zoster are really simple to put in enabling many householders to make the work themselves.

They come in a assortment of colorss and manners, are reasonably lasting and can be easy repaired and maintained. Asphalt herpes zoster are normally available with broad subdivision of sizes, manners and colorss, suited for most residential applications. Experienced Do-It-Yourselfers would be able to use asphalt herpes zoster successfully. They are low Maintenance and Easy Repairs. Other more expensive roofing merchandises can necessitate more care, specialised tools, can be more hard to mend and

about ever require professional installing. Glass fibre herpes zoster have a glass fibre reinforcing mat manufactured to the form of the shake.

This mat is so coated with asphalt which contains mineral fillers. The glass fibre mat is non waterproof by itself. It ' s purpose is for support.

What makes the glass fibre shake waterproof is the asphalt. However, the asphalt itself will non lodge to the mat. For this ground, " fillers " are used. The fillers in the asphalt cleaving to the glass fibres in the mat. The asphalt so encapsulates the glass fibres, fills all of the small holes and nothingness in the mat rendering it rainproof. After this cools a spot, an adhesive asphalt is used to cover the mat and the ceramic granules are so embedded.

The ceramic granules are at that place for two grounds. The primary ground is to protect the herpes zoster from the Sun. The Sun ' s UV beams are really detrimental to asphalt and do it to deteriorate prematurely.

This is one of the same grounds that crushed rock is used on built-up roofs. The 2nd and more obvious ground for the granules is aesthetics. Asphalt herpes zoster are available in a broad assortment of colourss to fit about any frontage or landscape. The lifetime of asphalt herpes zoster depends extremely upon the environment. Herpes zoster in ice chest climes seem to last longer than those installed in the heater climes.

The hotter the environment is, the shorter the service life of the herpes zoster. One thing that ' s really detrimental to herpes zoster is Thermal Shock. Thermal Shock is what roofing stuffs experience when the ambient

temperature alterations dramatically within a really short period of clip – normally 24 hours. In Ireland temperatures are comparable stable.

metal covering

Using a Metal sheets as a roof covering stuff day of the months back to the 12th century.

Over many old ages this engineering has been bettering until these yearss. There are figure of good grounds to utilize metal on residential edifice. First, metal is predictable and stable merchandise. Unlike other single-ply engineerings like gum elastic, a metal panel is non affected by ultraviolet beams, which are one of the taking beginnings of crucifix debasement. Second, Advantages in metal coating and completing engineerings have significantly improved the life rhythm of metal roof, and related cost benefits.

Metal roofing is besides highly puncture-resistant, which is a valuable benefit to today ' s edifice proprietor who is looking for long-run, low care solutions. Actually, lastingness is one ground for metals turning popularity. Metal roofing is highly various. It is compatible with all types of edifice stuffs and can be incorporated into all design construct. Metal roofing would be an effectual speech pattern for our masonry house. The building of metal roof is really light and highly lasting by the clip.

Colour and coatings are available to accommodate any application, from Earth tones to alien tropical chromaticities, from bare, unfinished surfaces to particular coatings designed to defy caustic ambiances such as Irish. The

usage of metal roofing panels on a abode offers pride of ownership to the householder who wants to hold something different for neighbors. Metal panels are made to imitate clay tile, wooden shingles and slate. For add-on they install easy and rapidly. Possibly the most important benefit of all, given before, is environmental friendliness of metal roofing, signifier installing through eventual tear-off. To get down with, many metal roofing merchandises use recycled metal in their initial fiction. Second, the edifice proprietor and contractor does non hold to postulate with external fires, hot boilers or noxious exhausts during installing. Finally, after the roof has served its utile life, most of its metal is 100 per centum recyclable, which eliminates concerns about risky waste disposal.

Cavity wall- Partial fill

Cavity wallsA consist of two ' skins ' separated by a hollow infinite. The outer foliage and the pit serve to defy the incursion of rain to the inside face and the interior foliage to back up floors, provide solid internal wall surface and, to some extent, act as insularity against transportation of heat. The Cavity wall in the house is 302, 5 millimeter midst. The outer foliage will be concept of Cheshunt Multi Brick lied in on stretcher bond. The brick of dimensions is 215mm ten 102. 5mm ten 65mm. Inner will be build of Lightweight Blocks the size of 440mm ten 225mm ten 100mm.

The spread between the walls traveling to be 100 mm broad. To bind the two leaves together will be used mild steel coated with Zn ties spaced at every 900mm horizontally and 440 millimeter vertically. The pit wall in our undertaking is partial fill one.

Partial fill building requires the usage of insulating stuff in the signifier of boards that are sufficiently stiff to be secured against the interior foliage of the pit. Thermwall TW 50- Partial Fill insularity of thickness 250mm is a high public presentation thermic insulating mineral wool which satisfies the Building Regulations with a merchandise that is BBA approved and that has a Euroclass A1 fire evaluation. Because mineral wool is high public presentation acoustic dielectric, flanking noise transmittal down the wall pits is besides reduced. Partial fill pit walling has been regarded as the best-practice signifier of wall building in Ireland for at least two decennaries. It is the most efficient manner to nest eggs on energy heat loss. I compared thermic conduction values of two Kingspan insularities. First one was 250mm partial fill Thermwall TW 50 and the 2nd 750 mm mineral fiber full fill batt.

The consequence was rather surprising. Partial fill with 0. 022 W/m. K all in mineral fiber by 0. 012 W/m. K! However we have to retrieve that partial fill pit wall require a clear pit to avoid wet perforating into the board articulations and through to the interior foliage of the wall by capillary action. A Care should be taken to guarantee that howitzer does non fall on pit ties.

Were howitzer falls on the tie it can besides make a cold bridge. While a pit is clear, such a wall application provides the most effectual barrier to rain incursion by leting the traditional wall pit to be maintained.

External brick work

The face work is done in Pressed Brick. - The open surfaces of theA buildingA including theA chimneys, to be faced with Cheshunt Multi pressed brick.

All face brick to be laid in the most adept mode in colored howitzer. Each brick to be dipped in H₂O before laying ; each border of the brick and down the center to be butted, and all perpendicular articulations to be filled solid from forepart to endorse. The brick to be laid with plumb bond and bonded to the backing with a diagonal header to every brick in every class. Particular attention should be taken to guarantee that howitzer does not fall into pit infinite. All classes of brickwork shall be kept degree, and the bonds shall be accurately preserved. When necessary to convey any classes to the needed tallness, clipped classes shall be formed, as in no instance shall any howitzer joints finish more than 10 mm midst. All brickwork shall be laid to the lines, and all walls and wharfs must be built plumb, true and square.

Walls to be carefully leveled for a floor joist. All window gaps are described on the affiliated drawings. Mortar - A Cement Mortar - All brickwork below the class line and parapet walls shall be laid in howitzer composed of 1 portion fresh cement and 2 parts clean, crisp bank sand, decently screened, A mixed with sufficient H₂O to render the mixture of proper consistence. Care must be taken to thoroughly blend the sand and cement prohibitionist, in the proportions specified, before adding the H₂O. The howitzer shall be mixed in little measures merely, and in no instance shall mortar that has commenced to put or stood over dark be used. Colored Mortar. - All face brick to be laid in howitzer composed of lime putty and finely-sifted sand, coloured with Pecoria mortarA discolorations ; colour brown. Bricks available through Dublin ' s premier provider -Bricks Ireland.

The company is located in South Dublin and its unfastened 7 years a hebdomad. They supply both to trade and to the retail market for bricks.

Drain

When planing a drainage system for a rural scene brooding we must esteem local authorization demands. First, " A edifice shall be provided with such a drainage system as may be necessary for the hygienic and equal disposal of disgusting H₂O from the edifice. " (Department of the environment heritage & A ; local authorities, 1997)A edifice besides shall be provided with a speared, drainage system for disposal of surface H₂O from the edifice.

These can non be connected to a cloaca or infected armored combat vehicle reserved for disgusting H₂O, and no portion of a drainage system conveying disgusting H₂O shall be connected to asewer reserved for surface H₂O. Foul H₂O drainage must be save of escape.

Septic armored combat vehicle

On our site there is no entree to foul H₂O outfall, so needfully is usage of disgusting H₂O infected armored combat vehicle. A infected armored combat vehicle must be of equal capacity and so constructed that it is impermeable to liquids. The proper airing has to be provided to avoid roll uping unsafe gasses. Septic armored combat vehicle must be located in accessible in instance of emptying topographic point. High scope of Precast Septic armored combat vehicles are available on the market. The company called Shay Muratagh (hypertext transfer protocol: //www.

shaymurtagh. ie/Septic-tanks. aspx) supply concrete armored combat vehicles that are non damaging to the wellness of any individual and do not foul, so as to jeopardize public wellness, any H₂O including land H₂O.

Foul H₂O Drain

convey the flow of disgusting H₂O to a disgusting H₂O outfall while making disgusting H₂O drainage few facets has to be considered. The capacity of it (depends on the size and gradient of the pipes) should be big plenty to transport the expected flow at any point.

In our instance H₂O flow rate which based on the typical family group of 1 WC, 1 bath, 1 or 2 washbowls and 1 sink is about 2, 5 litres/second. So that the edifice ordinances require to utilize stack of 75 millimeters diameter, and recommended gradient to lie pipe resistance would be from 1: 60 to 1: 100. To forestall proper H₂O flow in branch pipes, WC demands pipe of 100 millimeters diameter and gradient of 9 millimeters, washbowls, the same as sink 50 millimeter and 18 millimeter gradient. Foul H₂O drainage should be save of obstruction or escape. If a trap forms portion of an contraption, the contraption should be removable. All other traps should be fitted straight after the contraption and should be removable or be fitted with a cleansing oculus. While building drainage system we must retrieve to forestall disgusting air from come ining the edifice under working conditions. These peculiar drainage system the same as infected armored combat vehicle must be decently ventilated to forestall the physique up of flammable gases.

Venting pipes unfastened to external air should complete at least 900 millimeters above any gap into the edifice within 3 m and should be finished

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with a coop or other perforated screen which does not curtail the flow of air. The diameter of the portion of a discharge stack which serves merely for airing in the two floor houses should be at least 75 millimeter. The local climate is free of low temperatures so PCV pipes can be laid on the external lift of the house. Foul H₂O system besides has to be accessible for uncluttering obstructions. All of the trap which forms portion of a contraption should be removable.

The other traps should be fitted straight after the contraption and besides should be removable or be fitted with a cleansing oculus. Branch pipes should dispatch into another subdivision pipe, or a discharge stack, unless the contraptions are on the land floor. A subdivision pipe should not dispatch into a stack in a manner which could do cross flow into any other subdivision pipe. A subdivision pipe should not dispatch into a stack at a point lower than 450 millimeters above the invert of the tail of the crook at the top of the stack in individual homes of up to three floors. Rodding points should be provided to give entrance to any lengths of pipe which cannot be reached from any other portion of the system. All Pipes should be moderately accessible for fix. All traps should dispatch to a drain. The crook at the top of the stack should hold as big a radius as possible and should be at least 200 millimeter at the Centre line.

Traps functioning urinals should be not less than 50 millimeter in diameter and traps functioning H₂O cupboards should be not less than 100 millimeter in diameter.

Underground Pipe work – connexion to infected armored combat vehicle by PVC-u BS 4514

The layout of the drainage system should be every bit simple as possible. Changes of way and gradient should be minimised and every bit easy as operable. Pipes should be laid in consecutive lines where operable but may be laid to cold-shoulder curves if these can still be cleared of obstructions. Access points should be provided merely if obstructions could non be cleared without them. Drains should be laid to falls and have enough capacity to transport the flow.

Belowground drainage should be adequately protected from inadvertent harm from beginnings such as traffic, land colony and tree roots. The deepness of screen will depend on the degrees of the connexions to the system, the gradients at which the pipes are to be laid and the land degrees. The minimal deepness should be 900 mm under any route and 600 millimeter in Fieldss and gardens. The system should be ventilated by a flow of air.

Surface H₂O drainage

This drainage is to transport merely rainfall H₂O and it is non connected to the any waiter. There is no demand in this Document for the proviso of rainwater drainage for countries of 6 M², However, following computation of country drained regulation indicates that our country is 146 M².

In this instance the most effectual will be Gutter of 150 mm dimension. Gutters should be laid with any autumn towards the nearest mercantile establishment. Where there is a autumn, or the trough has a subdivision

which gives it larger capacity than a half-round trough, or the mercantile establishment is round edged, it may be possible to cut down the size of the trough and pipe. The size of a rainwater pipe should be atleast the size of the mercantile establishment from the trough.

Land floor

The type of land floor used in our undertaking is solid floor. Solid floor is meant this floor, which consist for the most portion of concrete, having uninterrupted support from the land. To supply a flat base on which to project a land floor slab, 150 millimeter bed of hardcore will be laid.

Hardcore raise the degrees, cut down the capillary rise of land wet, and supply a dry house base on which work can continue or transport building traffic. On the top of hardcore comes 20 mm bed of sand blinding. Before ling the slab, required is to set DPM below it.

It is to forestall wet organize the land making the interior of the edifice. DPM besides prevent the interaction of land contaminates with the concrete, halting interstitial condensation and retaining constructional H₂O. On the earlier prepared land with hardcore, sand and DPM comes 100mm thick 30 N Concrete slab. For good quality base will be used site assorted concrete of proportions 1: 2: 4 cement: all right sum: harsh sum: harsh sum by volume. Now floor is ready to be insulated by 50 millimeters QF therm insularity boards on which will be lied 50 millimeters screed.

Two chief factors made me to get with determination of utilizing solid concrete land floor. That was thermic and acoustic insularity, nevertheless there is many more benefits for the place proprietor. As we know from

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natural philosophies sound is transmit by air quiver. Beginnings bring forth sound moving ridges in air, such as from conversation or telecasting, will in bend produce quiver in floors. On the other manus, floors may besides be vibrated by direct impacts such as footfalls or objects dropped onto floor surfaces. The best manner to avoid quiver of the floor would be building solid, quiver immune concrete floor.

The lowest floor of a edifice, if carried on the land, usually does non present jobs of sound transmittal as the concrete Acts of the Apostless as a barrier to sound. Additionally, the concrete prevents air escape and slows down heat from get awaying hence a concrete place corsets warmer in the winter and ice chest in the summer. This can assist maintain public-service corporation costs low. For add-on using insularity to a groundbearing floor between the slab and the screed minimises thermic bridging and creates a floor with a rapid thermic response, which matches that of the remainder of the edifice. Concrete floor has a life clip lastingness and great strength every bit good. Poured concrete signifiers a barrier to the elements and can be farther strengthened by steel support.

In instance of fire solid concrete floor can decelerate the spread of the fires giving a clip to evacuate to safety. Not merely could this could intend the difference between life and decease, it could intend the difference between holding some repairable fire harm versus the loss of your place and its contents. Concrete floor building has a greater opposition to H₂O harm or escape of any kind due to its solidness. Insects are less likely to overrun solid

concrete houses. Environmentally friendly. Concrete is environmentally friendly as the ingredients of concrete are plentiful in supply.

Concrete upper floor

While planing first floor few factors has to be consider. First our client want to hold good thermally and soundly insulated house.

The other factors are to make with tonss that floor will necessitate to pull off. High quality with no addition of cost would be recommended. So that I decide to utilize precast concrete floor, which contains concrete t-beams (170×115 millimeter) and lied between concrete fill blocks (440x100x215mm) . T -beams will be lied at every 380 millimeter.

Between concrete fill blocks and 50mm reinforced screed will be lied aerobeam infill block insularity of 50 millimeter thickness. It is of import to set DPM membrane under screed, and DPC at joice of floor with the wall. Precast concrete floor will present to its user a indispensable comfort. Concrete upper floors provide improved sound Insulation between the floors and suites.

They besides act as a thermic shop ; this can cut down heating costs particularly when under-floor-heating systems are used.