

Ellis Moore – 1811157

All drawings done by me have been included in hard copy folder at full size. Please use all hard copy separate drawings for marking as these show the most detail

1. Undertake a preliminary desk top study of the site and record and complete a walk-over inspection. Then write up your preliminary observations.

Observations

The site location that had been purposed to me for the upcoming structure was visited by myself recently. I took many images of the site and noticed a few features of the site that might be difficult to work around if not managed efficiently.

Two of the main features of this site that will sway the location of my building will be the public walkway running between the two car parks, and the vehicle access gate/path to allow emergency or approved vehicles down to the beach. The public footpath is in heavily use daily so its essential this is not built over. The vehicle access gated path is used lightly by pedestrians and rarely by vehicles. This access way could potentially be build over but a new vehicles



access road would need to be put in place. I also observed that the site also has lampposts along the south boarder with the walkway, even though these are not in my building zone I have considered whether the cables powering them might run across my potential site area. The path along the south border has a high amount of use from the public daily so its essential minimal disruption occurs in this location.



After talking to a few senior members of my team, they advised me that Swansea was a very high area for contaminated soil and buried foundations. After doing further research on the site after my walk over inspection, I have found an image deducting that no building or feature has been here previously from 1890 to present day. I acquired this information from a document found online by City and County of Swansea called "Consultation Draft" from 2015.



The image, although poor quality, shows no outline of any kind representing a building in purposed site location. This allows me to deduct that I do not have to worry about previous buildings foundations still being present under the topsoil.

The docks were heavily used during the industrial revolution to transport heavy amounts of coal. From my current industry experience, I know that a site north of my site by half a mile had contamination also. Through this knowledge I can make a educated assumption that this site would also have at least low levels of contamination and would need to be taken off site to a specialist cleaning facility or disposed legally.

Knotweed is also a big problem in the Swansea docks area but after my site walk over I can deduct that no knotweed was present in the site area.

I went on a search around the perimeter of my site for BT network green boxes or substations. These could affect my site as underground wires could be affected by the development. I came across no substations or BT network boxes that indicates the site is clear and these risks can be eliminated.

Whilst on site, I also checked for overhead cables as this could restrict a buildings location/height, canes movements or cause



inconvenience if the cables must be permanently redirected/moved. No evidence of this was found so max height parameters are not in place for my purposed building.

Salt content in the air and ground at the docks is very high and can affect materials in a negative way over time. Corrosion of steel can be a huge problem in coastal towns, so the steel will need to be (for example) galvanised.

During my site walk over, I also investigated the layout of the 2 carparks, one owned by the Marriot and one owned by Swansea City Council. Both car parks utilise a one-way system with a one in and one out entrances. If I chose a building location by one of these car parks, temporary closure of the car park will need to occur as this will allow material deliveries in and out of the site and keep the public out of harms way. This should cause minimal disruption as there is an overflow car park just over the road in which the Marriott can utilise.

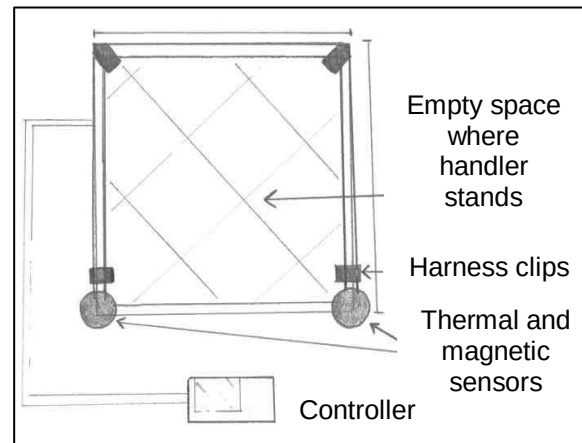
From doing a site walkover, I gathered that the ground around the site had a high-water content as the ground was very muddy and seemed to hold water. Light rain had accursed that morning, but this does tell me that along with being so close to the sea and the weather conditions in Swansea, high amounts of water could also be left standing on the car parks and potentially flood my building. I can deduct this from not seeing much drainage across the two car parks. From geographical knowledge, I know that this site is very flat, along with the surrounding areas, so if drainage isn't considered, this floodplain could easily become flooded as the surrounding areas do not have much surface drainage vertically, only surface run off drainage.

2. Describe with the aid of neat, annotated, proportional sketches the recommendations that you would make for a more detailed site investigation which will be undertaken by others.

Bomb Survey

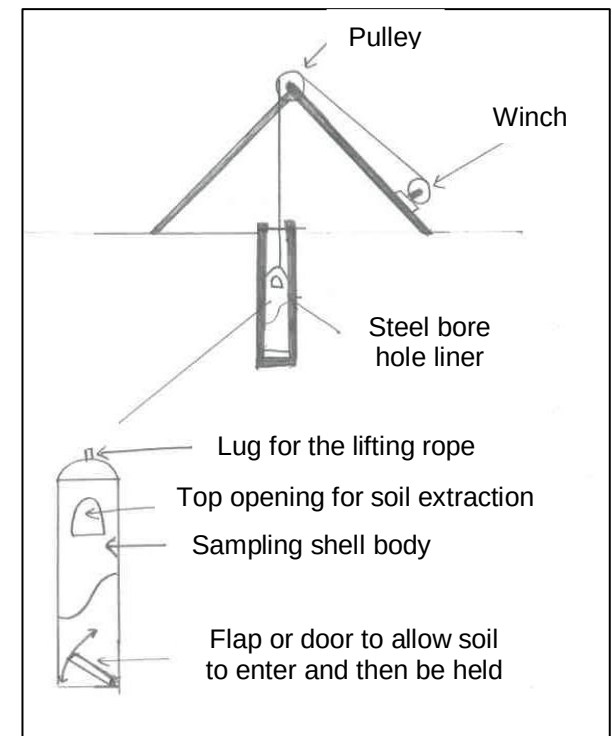
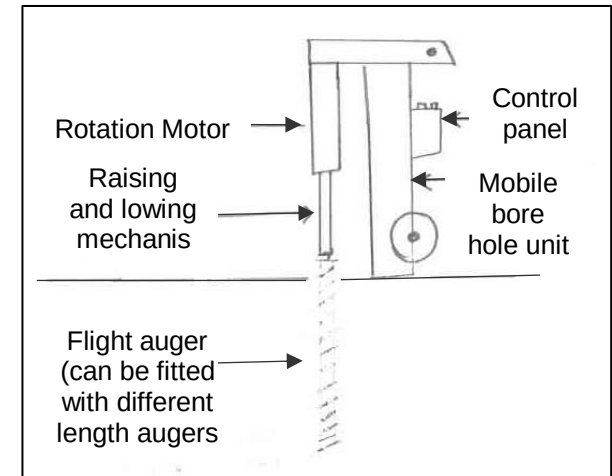
During WW2, the docks were heavily bombed by the German Airforce. Swansea docks were a high traffic area for cargo ships, importing and exporting materials and ammunition. As part of tactical bombing during this time, the docks were shelled on many occasions. Unexploded bombs are a major issue in the area as ground works. Encountering unexploded bombs on a construction site has a high risk of setting the sleeping explosive off. A specialist bomb detection Survey will be needing to be conducted that will scan the subsurface for metallic objects that could be unexploded bombs. As Swansea was such a heavily bombed area, I know that structures such as LC2 (just north of my site) had a full specialist bomb detection survey done to make sure there was no danger to the builders or the public in the future.

The survey I would choose to do on my site and encourage others also so to is a non-intrusive unexploded ordnance (UXO) survey. This fully eliminated the risk of getting anywhere near the



bobs and can scan as deep as 50 metres below dense ground.

Bore hole Tests



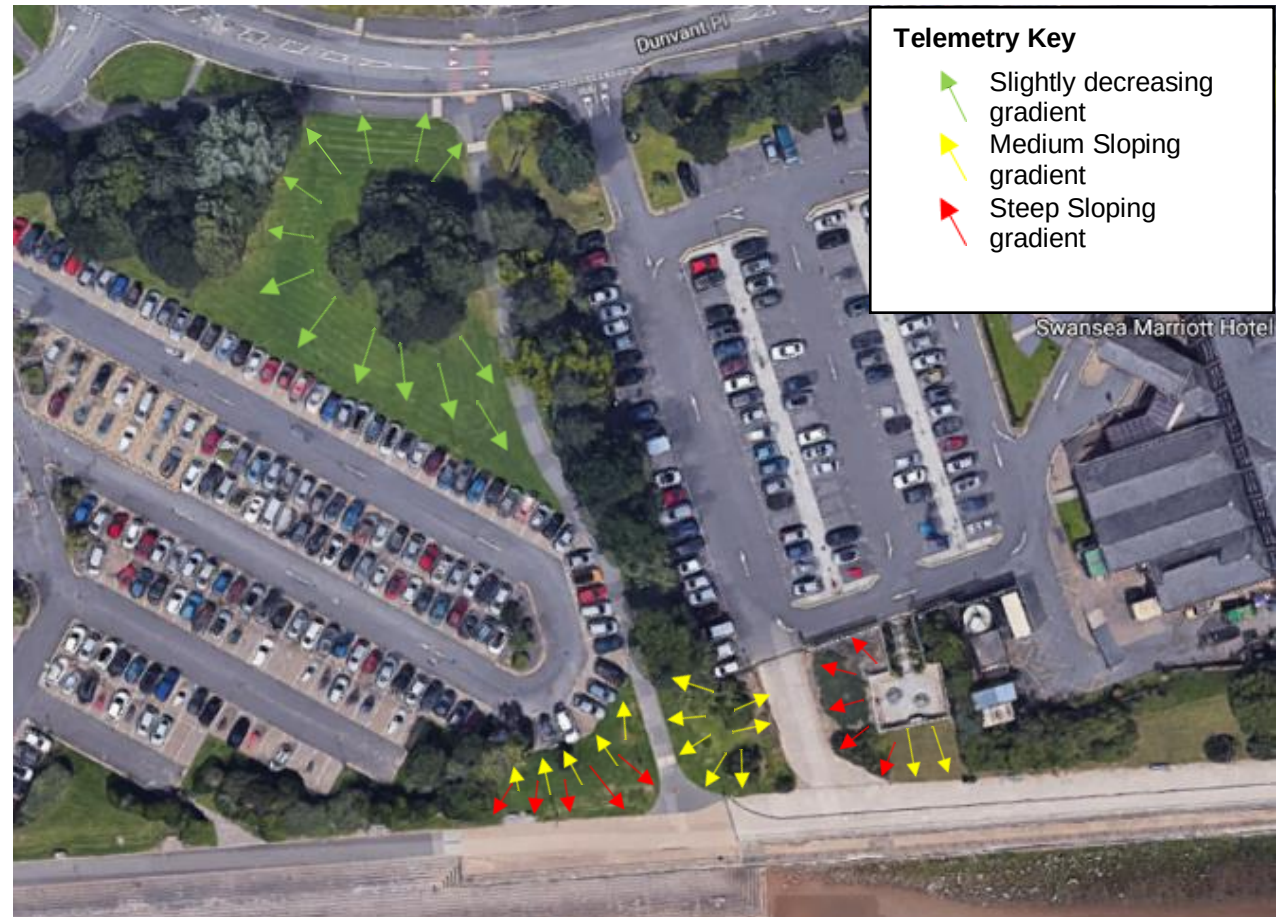
I would highly recommend borehole tests be taken from the sites subsoil to allow in-depth analysis of the soils condition, components and structure. This could sway the choice is foundations used on a site dramatically. Bore hole samples should be at least 5 metres down to gather relevant depth samples to analyse its suitability. It is extremely important to take borehole samples from many different locations on the site as the structure, materials and components could change throughout the site.

Contamination

Highly likely to occur at this site as it is in Swansea Docks, a place where most sites even have low levels of contamination. This is because of the waste products from factory's, dumping and the coal industry from the industrial revolution taking its effect on the soil. Bore hole tests that have already been discussed can be used to extract soil to potentially run tests on the quality and contamination of the soil.

Drainage

To further enhance my survey, I would in the future recommend doing a pipe network survey to make sure there are no mains anywhere near my build area. If this is not done, then serious implications could occur like hitting a water main. This would not only cause a resource shortage but would even give way to mass flooding as its extremely flat across the two car parks. The natural areas around the edges and centre of the site act as a basin potentially holding the water on the car parks. This could affect the surrounding buildings and their day to day business. The image below I have taken from google maps, I have edited to show the gradients I am talking about above. The slight slop leading down to the red gate on the Marriott's car park would allow some surface run off drainage by the council's car park is a danger zone for flooding



so would be unwise to build here. I would also investigate how my waste and supply water could be attached to the existing water and waste network to make sure it is viable. If I discover this isn't viable, waste and supply tanks will have to be implemented.

3. With the aid of sketches describe a suitable foundation and sub-structure details for the building, based on your preliminary observations.

The site area is highlighted below in yellow, before moving forward, I took some time to evaluate the location and think about where my foundations/structure would be. After identifying the listed public walkway running straight through the proposed site area, I have decided to not

build over the top of the pathway as this will affect public movement severely short and long term. The blue outline also below shows my primary thought of where I wish my future building to be moving forward. The current structure here is a picnic bench area on top of a slope. In my opinion, next to the new developments and the beauty in the area. This tatty structure seems to be more of an eyesore than a thing of beauty. Demolishing this structure and levelling the ground will be a little more work

than other site positions but it has the least amount of distribution to the public and has a very low risk of flooding. I have chosen to build over the existing vehicle access route as this will allow me to have at least 4 metres from the purposed building area boundary. I will be implementing a new access route for vehicles that I will use whilst constructing my

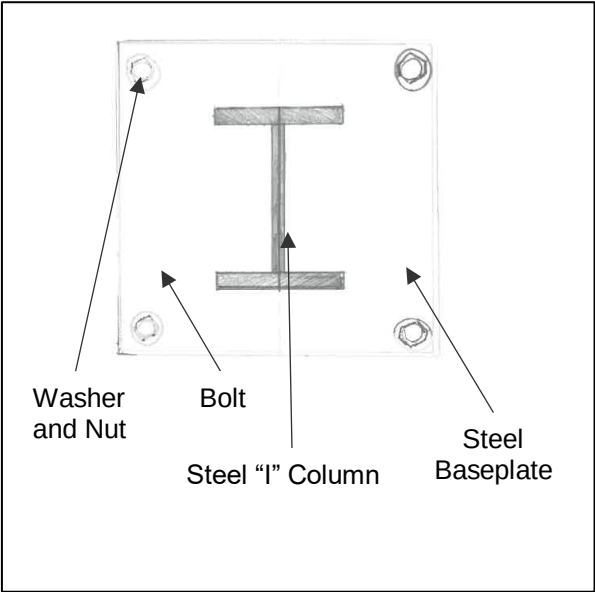
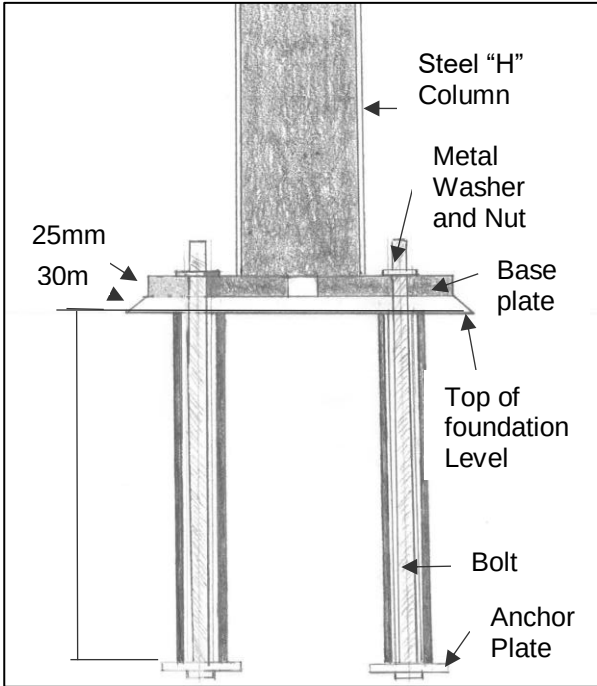


building but will also be used by pedestrians and council vehicles once my works are complete as the new vehicle access route. I will detail this new pathway further on.

will also be moving the containers highlighted in green further east by 3m metres to push them out of my works area. This will allow me further access and won't affect the Marriott at all as this is only a loading area for supplies and still leaves plenty of room for movability.

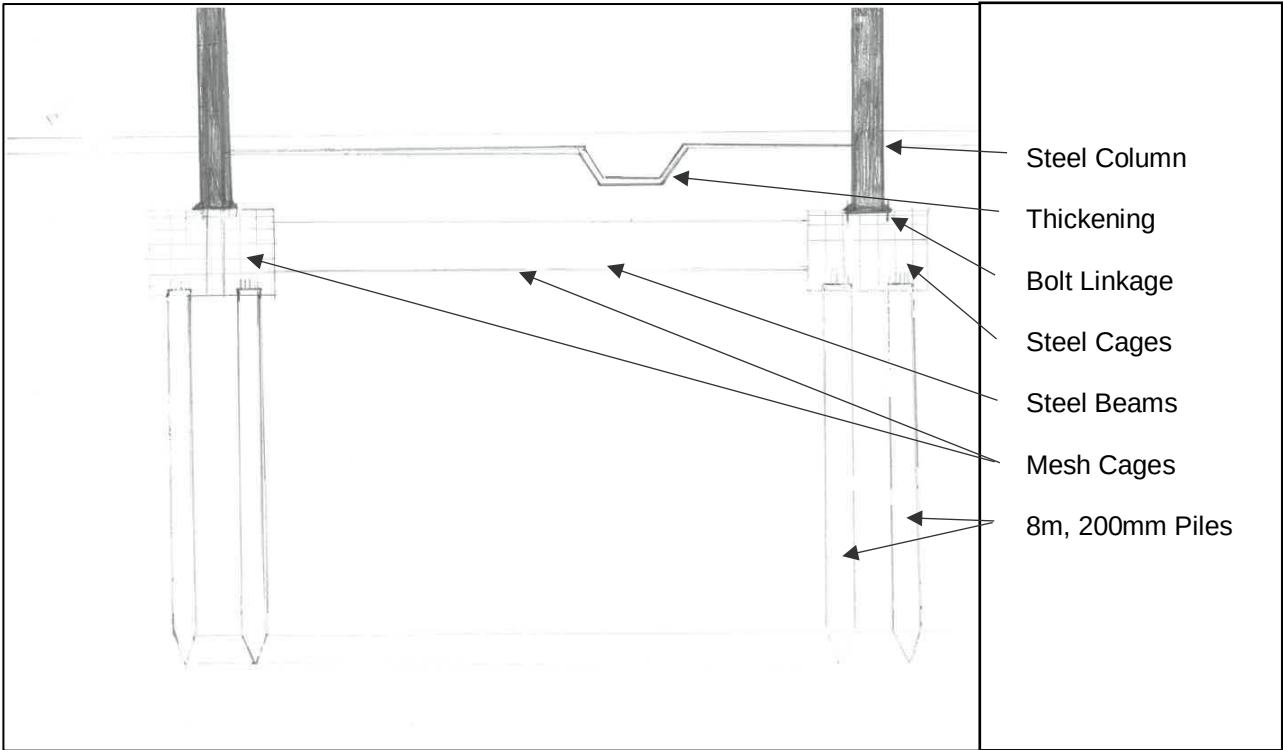
After further research into the site, I have chosen to follow the method of pre-cast concrete pile foundations for my structure.

With the ground conditions potentially being not suitable for holding push weight from pad foundations, piling was my fall-back option. I have chosen 8 metre piles with a 200mm diameter that will be placed in a quad format. I will follow the process of displacement piling for getting the piles to enough depth o hold my building structurally.



I have drawn and annotated a diagram of the exact layout of how my steel column will be attached to my pile. 4 bolts will be attached to the pile cap when the concrete is being poured into the cages. The bolts will have a bolt foam cones around them that will stay on during this process. Once they are encased in concrete, I plan to pour petrol down the bolt hole to dissolve the bolt foam cones, leaving a void to be able to move the bolts when the steel is attached to their tips. This will allow play in the bolts to get the steel beam truly straight. Once the beam is straight, grout is poured into the hole between the pile cap and the plate causing the liquid to set and hold the bolts in place.

I have also decided to use a steel frame in my design as I feel it's the most efficient to work

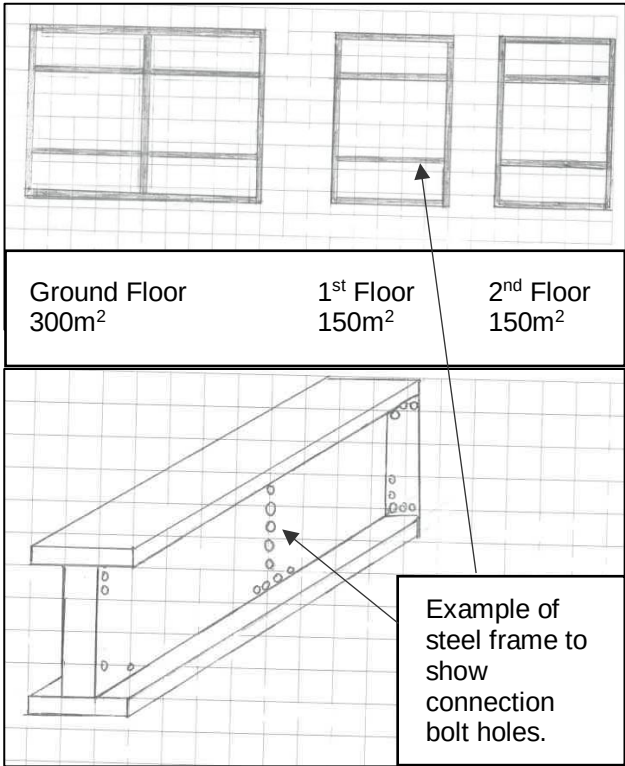


alongside my piling strategy and salt content in the area selected.

Using steel alongside my piling was mainly because of weight as it was a concern for the site area. Steel frames are lighter than concrete and I was afraid that the concrete frame would be unnecessary and way too heavy and could cause instability.

Another concern was joining mid beams. Steel frame beams have nut holes in them to allow easy fitting of a connection to allow another beam to branch from its mid-section.

I plan to have 2 cross beams in 4 parts on the ground floor, and 2 mid beams in 2 parts for the 1st and 2nd floor. Below is an example how my frame will be set out as explained above.

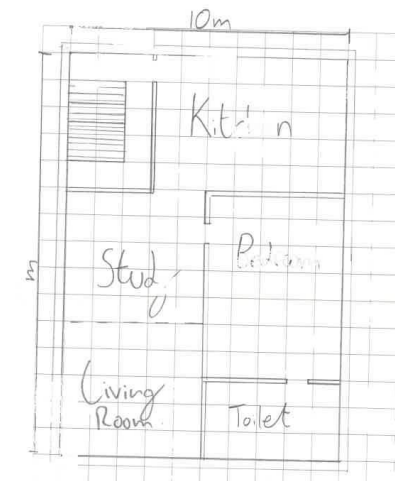
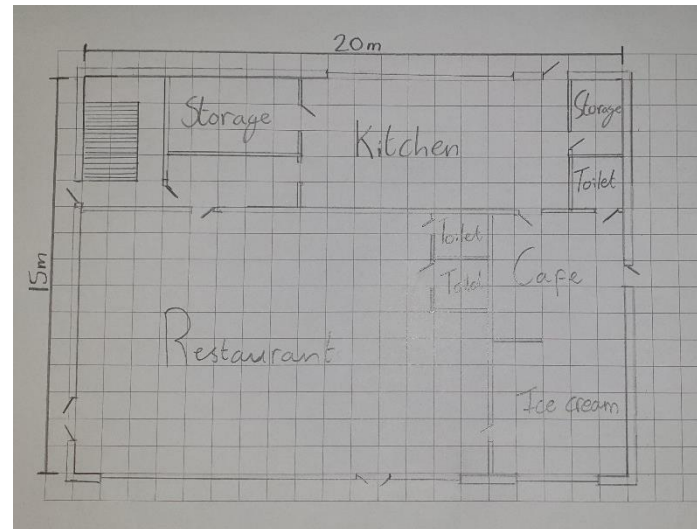
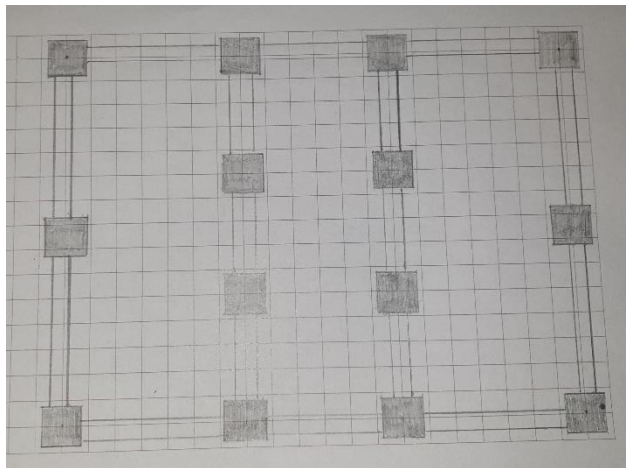
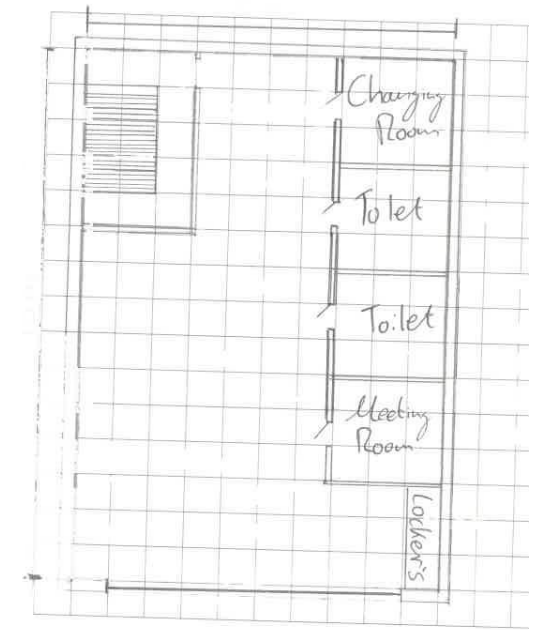
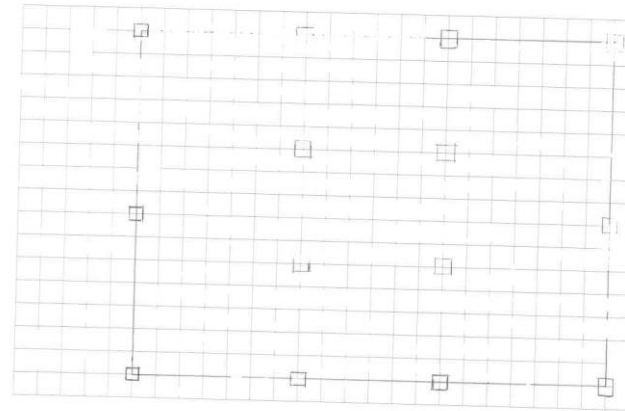
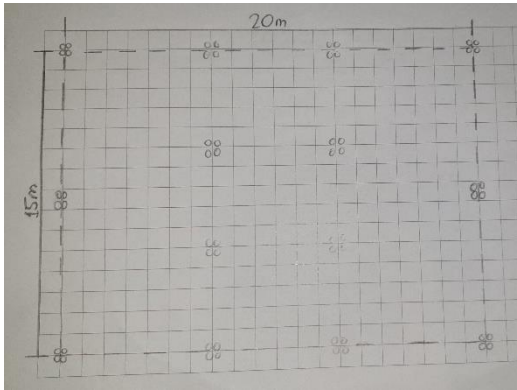


This set up will allow the building to deal with the live and dead weights throughout itself giving full structural integrity. I have lined up the centre beam of the ground floors ceiling with the east wall of the 1st floor to allow the weight to be supported and now cause issues with deadweight.

The steel will be galvanised to prevent harmful foreign materials harming the steel and causing corrosion. This will give the steel a further lifespan and allow this building to be sustainable.

The steel frames simple and effective bolt in strategy allows its erecting to be fast and adjustable if needs be. I would also choose steel over a concrete frame as steel is more moveable so will allow work to move faster and cause less disruption to the area.

4. Select and produce neatly drawn suitably annotated sections and sketches that illustrate your suggested choice of materials and methods for the detailing of the following building elements and construction interfaces:



All the images above are photocopies of my own full design including foundations, connectors and floorplan. All the drawings are of a 1:1 square scale and are all presented at the back of the hard copy hand in for closer inspection. All share the same ratio to show a slice of each floor in retrospect of the other in simple detail. All drawings below also are at the back of hardcopy.

(i)The external wall. External wall, window and door intersections to the ice-cream parlour;

The sketch I have done below is a simple design that utilises a glass side to my building that overlooks Swansea Bays unique beauty with a coastal view. I have also implemented a heating trench system in which the glass is heated by warm air to reduce the head loss against the close glass on the exterior of the building.

I have also designed outwards opening double

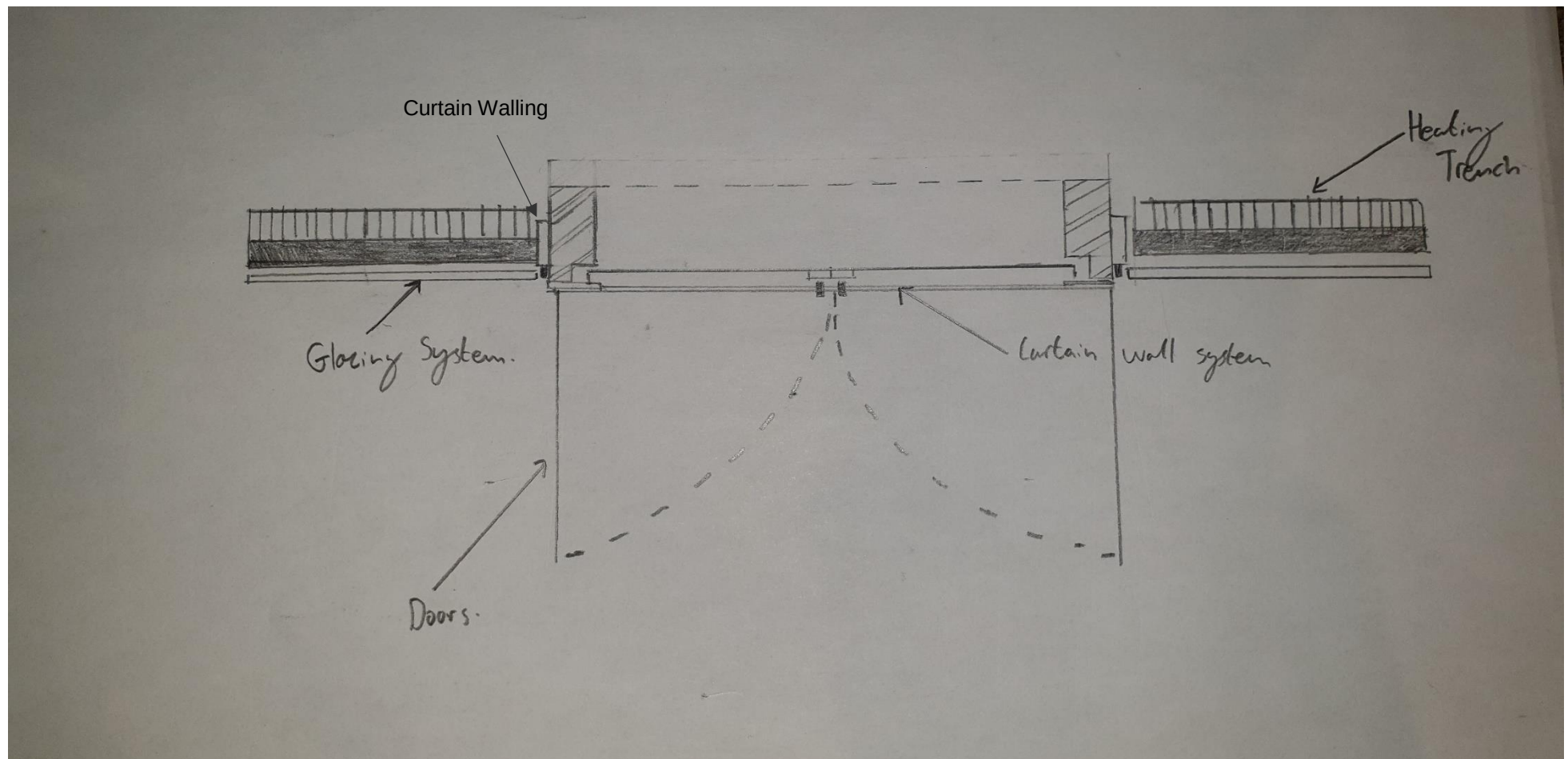
glass doors as these double as an aesthetic and a safety procedure. The glass doors are surrounded by a glazing system to help show off the scenery but also the modern look of the building.

The sketch I have completed on the next page shows how effective this glass sheet is as an aesthetic feature and memorable feature.

The windows will have a blue reflective tint to them to copy the colours of the water in the bay. This will not be visible from the inside but will be

visible from outside the structure.

The doorway leads into a reception with two doors inside, one for the ice-cream parlour and one to the restaurant. The walls will be a brick/block work cavity wall solution as this will work best with my buildings steel frame.



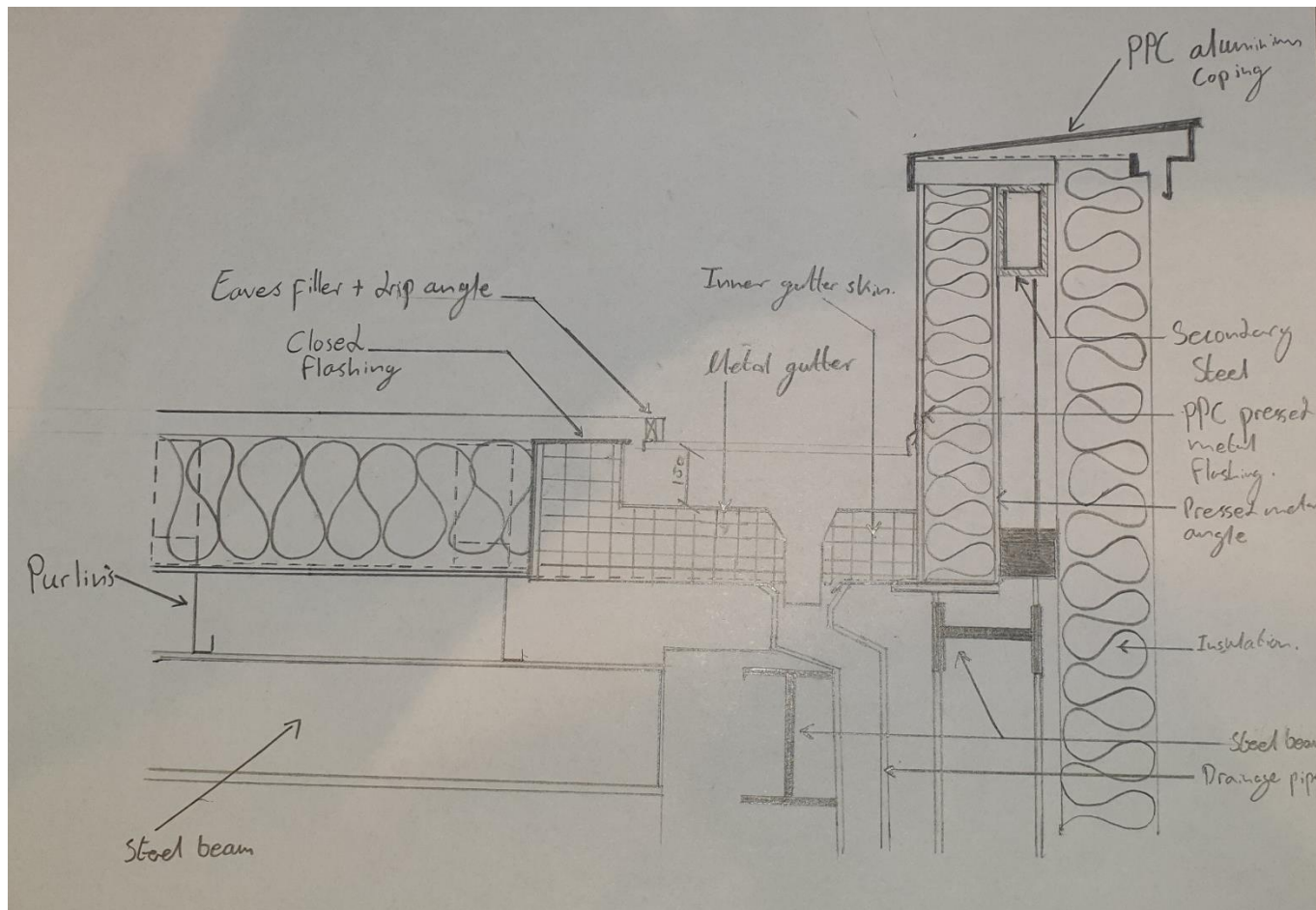
(ii) The roof weathering and structure of the restaurant and kitchen areas;

I have chosen to go for a "flat roof" on my building as I feel this is incorporated well into my design. This will be implemented on the lower and higher rooftops for a similar reason. A pitch roof was originally drawn up, but it made the building way too tall and would be an eye sore next to the Marriott. I have chosen to go for PPC aluminium coping as its nonpermeable, does not rust and can be custom made to be fitted to my roofing design.

I have included drainage for my roof to show how my design incorporates the wet weather conditions in its location. The metal Purlins are essential to my design as they rest on a steel beam running the opposite direction to the beams above the manager's apartment floor.

The flat roof will need to be sustained as dead leaves could become build up in the guttering and cause standing water to form. I have chosen to make my guttering tube 150mm across to help prevent this from happening.

I have used a heavy thickness on insulation across the inside of the roofing to prevent as much heat loss as possible. The insulation thickness is 350mm and this will allow the building run more efficiently. The roof will have a 7 degree gradient to allow no stagnant water to form.



(iii) The ground floor. Construction, detailing and junctions with external walls;

I have sketched a cross sectional area (CSA) of my ground floor windows on the south side of my design. This design includes drainage/moisture adaptation, insulative properties, and floor supportive aspects.

I have chosen to include Type One Sub Base stone as I believe it is suitable material to hold the weight of my building and stabilise the weight exerted on the floors.

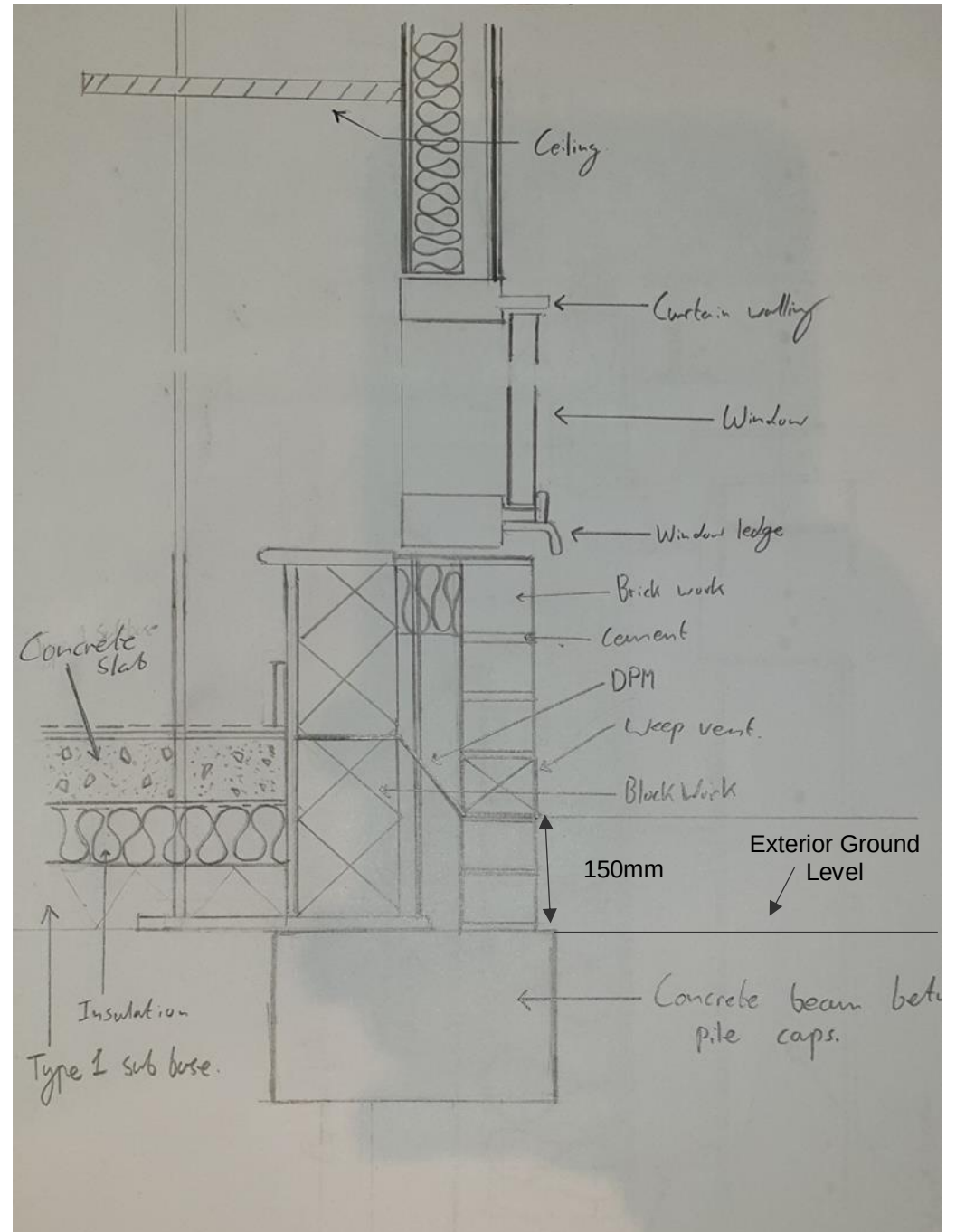
I have chosen to use concrete floor slabs as my materials of choice for my underside flooring as it is a durable material that can withstand high strains.

The main section of my wall is blockwork and brickwork as this allows a sustainable, effective heating and strength. The DPM is used 300mm above ground level in the blockwork and slopes down the 150mm off the ground in the brickwork to allow moisture to get pushed away from the building allowing moulds and damp to be deterred. Weep vents allow this to occur and without them this process wouldn't be possible.

I also used plastic window ledges to disperse water away from the lower brickwork of the exterior of the building. The run off from the windows will then follow the slope down towards the beach and reduce the risk of flooding. This drawing matches up with British Standards and would be suitable for the purpose I intend.



Image that will be visible from this window area.



(iv) Describe the site set up and plant that might typically be required to expedite the work in a safe manner;

On my site, I have taken into health and safety as a prime obligation for all to follow, not just for works, but to protect the public also.

To protect the public from harm, hoarding will be placed around the edge of my site to keep people out as the site is danger day and night. Linking

public walkways will be shut temporarily but the main public pathway will not be restricted.

I have put items in place to reduce risk to works on site such as dedicated walkways. These walkways keep vehicles and workers separate minimising risk to health.

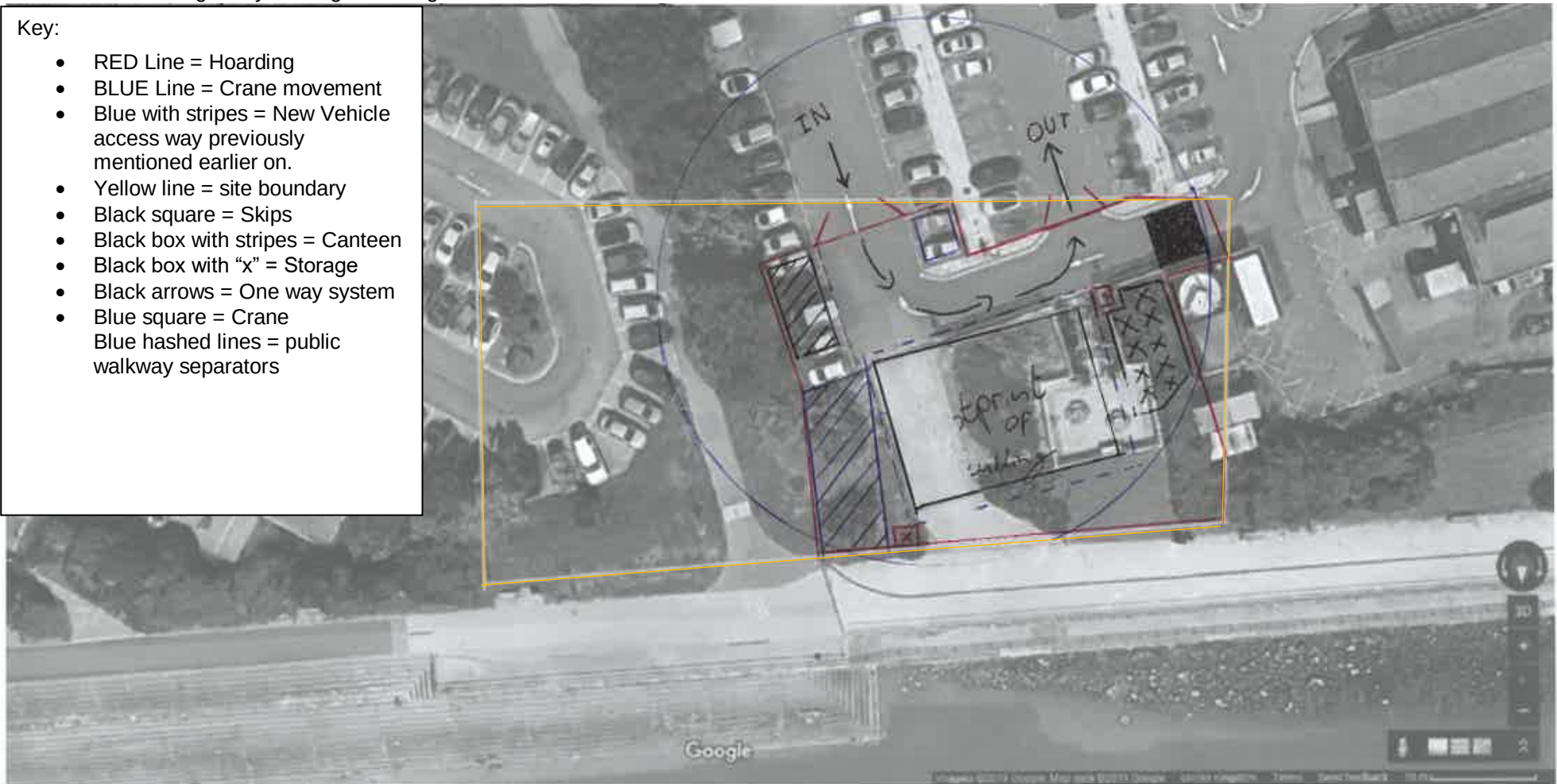
Another procedure I have followed is to have a "no lift" area with the Self erecting tower ballast crane during its operation. Marked on the map below are two blue X marks to show the points in which the crane cannot lift over as if materials

become dislodged and fell, a member of the public could have serious harm occur. If the crane needs to lift materials to the south of the site, there may have to be someone standing out on the public footpath to the south directing people whilst the crane performs the manoeuvres. When the crane is not used, it will be placed in free-flow to allow no stress from the high winds to occur on the crane.

I will not be using forklifts on my site as this could cause injury to driver as the footprint of the

Key:

- RED Line = Hoarding
- BLUE Line = Crane movement
- Blue with stripes = New Vehicle access way previously mentioned earlier on.
- Yellow line = site boundary
- Black square = Skips
- Black box with stripes = Canteen
- Black box with "x" = Storage
- Black arrows = One way system
- Blue square = Crane
- Blue hashed lines = public walkway separators



building is on rough ground and the forks could be a hazard to works and drivers. Instead I will use a small JCB as this can move across the terrain with ease and carry loads safer than a forklift.

I will also be implementing a one-way system into the carpark to reduce the risk of congestion between delivery vehicles. The car park will be closed to the public during the works completion as this reduces the risk to the public greatly..

I have allocated locations for skips to be placed to dispose of unwanted materials as tripping hazards are a huge issue on modern sites. With skis in place, there will be limited risk of trip hazards being around the site and weekly collections will be made to allow this resource to keep being used.

I have also allocated space for materials to be stored on the site, this space is limited but is accessible by crane and is a safe distance from the structure.

Welfare facilities such as a canteen have been provided for the works to allow them a warm dry place to get changes, have their lunch and bond with other works on the site. This is essential to the site as it allows a social aspect into work that can improve efficiency.



Site location

South Walkway

Research found on;

City and County of Swansea called "Consultation Draft" from 2015 - history of Swansea

Building Construction Handbook – R Chudley

Gleeds Management Services - Examples of structures that match my buildings size.

Birds eye view maps – public domain – Google Maps