T-LEVELS IFATE Institute for Apprenticeships and Technical Edit

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T Level Technical Qualification in Onsite Construction (8711-30)

8711-033 Employer-Set Project Exemplar – E Grade Summer 2024



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Introduction

Summer 2024 Results

This document is aimed at providers and learners to help understand the standard that was required in the summer 2024 assessment series to achieve an E grade for the 8711-033 Onsite Construction Employer-Set Project (ESP).

Providers and learners may wish to use it to benchmark the performance in formative assessment against this to help understand a potential grade that may be achieved if a learner was to attempt the next summative assessment series.

The Employer-Set Project is graded A* to E and Unclassified.

The exemplar evidence provided for the E grade displays the holistic standard required across the tasks to achieve the E grade boundary for the summer 2024 series. A slightly weaker performance would have resulted in an Unclassified (U) result being issued.



The Employer-Set Project brief and tasks can be downloaded from here.

Important things to note:

- We discussed the approach to standard setting/maintaining with Ofqual and the other awarding organisations before awarding this year. We have agreed to take account of the newness of qualifications in how we award this year to recognise that students and teachers are less familiar with the assessments whilst also recognising the standards required for these qualifications (grading-arrangements-for-vtqsand-technical-qualifications-within-t-levels-in-the-academic-year-2023-to-2024).
- The exemplar evidence presented, as a whole, was sufficient to achieve the E grade. However, performance across the tasks may vary (i.e. some tasks completed to a higher/lower standard than an E grade).

Marking of this Employer-Set Project is by task and Assessment Objective, below is a summary of these along with the mark achieved by the evidence presented and the maximum mark available for each aspect.

| Task | Assessment Objectives | Mark achieved | Max mark available |
|--------------------------|--|------------------|-----------------------|
| Task 1.1 Research | AO1 Planning skills and strategies AO2a Apply knowledge to the context of the project AO3 Analyse contexts to make informed decisions AO4c Use digital skills | 3 | 9 |
| | - AO1 Planning skills and strategies | 2 | 6 |
| Task 1.2 Report | - AO2 Apply knowledge and skills to the context of the project | 4 | 12 |
| | - AO3 Analyse contexts to make informed decisions | 1 | 2 |
| | - AO4 Use maths, English and digital skills | 2 | 6 |
| Task 1.3 Project plan | AO1 Planning skills and strategies AO3 Analyse contexts to make informed decisions AO4a Use maths skills | 2 | 8 |
| | - AO2 Apply knowledge and skills to the context of the project | 4 | 16 |
| Task 1.4 Presentation | AO1 Planning skills and strategies AO3 Analyse contexts to make informed decisions AO4b Use English skills | 3 | 6 |
| | - AO2 Apply knowledge and skills to the context of the project | 4 | 12 |

| Task 2.1 Collaborative problem-solving | AO2 Apply knowledge and skills to the context of the project AO3 Analyse contexts to make informed decisions AO5a Carry out tasks | 5 | 15 |
|--|---|---|----|
| Task 2.2 Evaluation | AO4b Use English skills AO5b Evaluate for fitness for purpose | 4 | 8 |

Task 1.1 Research

| Assessment number (eg 1234-033) | 8711-033 |
|------------------------------------|---|
| Assessment title | Employer-Set Project |
| | |
| Candidate name | <first name=""> <surname></surname></first> |
| City & Guilds candidate No. | ABC1234 |
| | |
| Provider name | <provider name=""></provider> |
| City & Guilds provider No. | 999999a |

| Task(s) | 1.1 |
|------------------------------|---|
| Evidence title / description | Research notes (with record of sources) |
| Date submitted by candidate | DD/MM/YY |

• I can't provide verbatim excerpts from specific documents like Approved Document A of the Building Regulations, as it's copyrighted material. However, I can give you a general overview of what Approved Document A typically covers regarding foundation design for safely carrying building loads into the subsoils.

- 1. **Introduction and Scope**: Approved Document A usually starts with an introduction outlining its purpose and scope, which includes ensuring that buildings have adequate foundations to support the loads they will encounter.
- 2. **Basis of Design**: This section often provides guidance on determining the loads that a building will impose on its foundations. It may include information on dead loads (the weight of the building itself) and live loads (such as occupants, furniture, and snow loads).
- 3. **Selection of Foundation Types**: Approved Document A typically offers guidance on selecting suitable foundation types based on factors like soil type, building loads, and site conditions. Common foundation types include shallow foundations (such as strip, pad, and raft foundations) and deep foundations (such as piles and caissons).
- 4. **Soil Investigation and Testing**: Adequate soil investigation and testing are crucial for determining the properties of the subsoil and its bearing capacity. This section may provide guidance on conducting soil tests, interpreting soil reports, and determining allowable bearing pressures.
- 5. **Foundation Design Principles**: Approved Document A usually outlines fundamental principles for designing safe and stable foundations. This may include factors such as ensuring proper distribution of loads, avoiding excessive settlement, and accounting for potential ground movement.
- 6. **Design Considerations for Specific Soil Conditions**: Different soil types require different foundation designs. The document may provide specific guidance for designing foundations in various soil conditions, such as clay, sand, or peat.
- 7. Water Table and Groundwater Considerations: Foundations must also account for groundwater conditions to prevent issues like buoyancy, heave, or instability. Guidance on assessing groundwater levels and designing appropriate foundation drainage systems may be included.
- 8. **Building Regulations Compliance**: The document will emphasize the importance of complying with relevant building regulations and standards to ensure the safety and stability of the foundation design.

• Remember to consult the latest version of Approved Document A or relevant building codes and regulations in your jurisdiction for specific requirements and guidance on foundation design.

• Here are some typical cross-sections of foundations that could be proposed:

- Shallow Foundations: a. Strip Footing: A continuous strip of concrete that supports load-bearing walls or piers. Cross-section: Typically rectangular or trapezoidal in shape with a certain width and depth. b. Pad Footing: Isolated concrete pads that support individual columns or piers. Cross-section: Square, rectangular, or circular shape with a certain width and depth. c. Raft Foundation: A large reinforced concrete slab that spreads the load over a wide area. Cross-section: Thick slab with reinforcement bars (rebar) distributed throughout its depth.
- 2. Deep Foundations: a. Pile Foundation: Deep foundations that transfer loads to deeper, more stable soil or rock layers. Cross-section: Typically consists of reinforced concrete piles driven into the ground. Cross-sections can vary based on the type of pile (e.g., timber, concrete, steel) and the method of installation (e.g., driven piles, bored piles). b. Caisson Foundation: Large-diameter cylindrical or box-like structures sunk into the ground and filled with concrete. Cross-section: Circular or rectangular shape with a significant diameter or width.
- 3. **Combination Foundations**: a. **Trench Fill Foundation**: Similar to strip footing but with a deeper excavation and more concrete volume. Cross-section: Trench-shaped excavation filled with concrete, usually deeper than strip footing. Reinforcement bars may be included for added strength.
- 4. Special Foundations: a. Piled Raft Foundation: A combination of raft foundation and pile foundation, where piles are driven into the ground and connected to a raft slab. Cross-section: Raft slab with piles extending beneath it, providing additional support. b. Raft on Piles: Like a raft foundation but supported by piles rather than being directly on the ground. Cross-section: Raft slab supported by piles, typically used in areas with poor soil conditions.

• These are some common types of foundation cross-sections, each suitable for different soil conditions, building loads, and site requirements. The choice of foundation type and cross-section should be based on a thorough analysis of site conditions and structural requirements by a qualified engineer. https://chat.openai.com/c/a9fc1e76-920c-44ae-a305-458d8e912425

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 Building over existing sewers presents several potential challenges and considerations that need to be carefully addressed to ensure the safety, integrity, and functionality of both the sewer system and the new construction. Here are some common issues associated with building over existing sewers:

- 1. **Structural Integrity**: The weight and vibrations from new construction can potentially damage or compromise the structural integrity of the sewer pipes. This is especially true for older, more fragile pipes.
- 2. **Access and Maintenance**: Building over sewers can make it challenging to access and maintain the sewer lines in the future. Routine inspections, repairs, and maintenance may require special access provisions or even temporary removal of parts of the building.
- 3. **Sewer Capacity**: Adding new structures over sewers may increase the load on the sewer system. It's essential to ensure that the existing sewer has the capacity to handle the additional flow from the new construction without causing backups or overflows.
- 4. **Utilities Conflict**: Sewer lines are often part of a network of underground utilities. Building over sewers can create conflicts with other utilities such as water lines, gas lines, or electrical cables. Careful coordination and planning are necessary to avoid damaging these utilities during construction.
- Regulatory Compliance: Local building codes and regulations may have specific requirements and restrictions regarding building over sewers. Compliance with these regulations is essential to ensure the safety and legality of the construction project.
- 6. **Risk of Contamination**: If the sewer pipes are old or damaged, there may be a risk of leakage or contamination. Building over such sewers without addressing these issues can pose health risks to occupants and may lead to environmental contamination.
- 7. **Settlement and Subsidence**: Construction activities near sewer lines can cause ground settlement or subsidence, especially if the soil is poorly compacted or if there are voids around the sewer pipes. This can result in uneven settling of the building, leading to structural damage.
- 8. **Legal and Liability Issues**: Building over existing sewers can raise legal and liability concerns, particularly if damage occurs to the sewer system or neighboring properties during or after construction. Clear agreements and contracts outlining responsibilities and liabilities are necessary to mitigate these risks.

 To address these issues, it's crucial to conduct thorough site investigations, engage qualified engineers and contractors, obtain necessary permits and approvals, and implement appropriate construction techniques and protective measures.
 Collaboration with local authorities, utility companies, and sewer agencies is also essential to ensure compliance with regulations and to minimize risks associated with building over existing sewers. • Given the information provided, the choice of foundation would need to consider the specific conditions of the site:

- 1. **Ditch to the east:** The presence of a ditch nearby might indicate potential water flow or drainage issues. It's important to choose a foundation type that can mitigate any risks associated with water flow, such as a deep foundation like piles or a raft foundation.
- 2. **Land drains:** The existence of land drains suggests that there may be some existing drainage infrastructure in place. This could influence the choice of foundation by either utilizing or avoiding interference with these drains.
- 3. **Combined sewer:** The presence of a sewer running across the site could limit the options for foundation placement. It's crucial to avoid damaging or obstructing the sewer line during construction.
- 4. **Existing trees:** Trees can affect soil moisture content and stability. Shallow foundations might be impacted by tree roots, so deeper foundations or root barriers may be necessary.
- 5. **Clay layer:** The presence of a clay layer at 1 meter deep can affect soil stability and the potential for differential settlement. This would need to be considered in the design of the foundation to ensure adequate support and prevent issues like cracking.
- 6. **High groundwater levels:** High groundwater levels can pose significant challenges during construction. Waterproofing measures or deep foundations may be necessary to address this issue and ensure the stability of the foundation.

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• Considering these factors, a deep foundation system like piles or a raft foundation might be the best option. Piles can be driven deep into the ground to reach stable soil layers unaffected by groundwater, while a raft foundation distributes the load over a larger area to minimize differential settlement. Additionally, waterproofing measures would likely be needed to address the high groundwater levels. Consulting with a geotechnical engineer or foundation specialist would be essential to determine the most suitable foundation design for the specific conditions of the site. The cost of raft foundations can range from £80 to £150 per square meter in the UK.

• For this project the foundation will in total cost £10,880. Also, the excavation project will cost £5,000

Advantages of raft foundations

 Many buildings use raft foundations – they have lots of benefits and are popular with architects and builders. Raft foundations are good for places with bad soil and work well on soft clay or loose sand. Other shallow foundation types normally don't work here. They spread the weight of a building evenly over a big area and prevent the building from sinking or moving. Raft foundations are sometimes cheaper than deep foundations (like pile foundations) because they don't need as much digging into the ground, and the slab also works as a floor slab.

Disadvantages of raft foundations

A raft foundation is not best for all soil types, like clay which changes size a lot. This soil type can make the raft foundation move and crack. Raft foundations are hard to change or make bigger when built. This could stop people from making changes to the building. A raft foundation may cost more than some foundation types because it uses more steel and concrete.

- To sum up, raft foundations are good for spreading the weight of a building evenly over a bigger area. They are better for places where the ground is not very strong and the building is heavy. They can also help stop damage to the building. However, they can also be more expensive to build than other foundations and are only good for some types of buildings or soil.
- A building expert can help decide if raft foundations are best for the job.

• The information on this website is intended to be for general guidance – however every project is different which could affect the suitability for your particular project or circumstances. References to a product, service or material should not be considered a recommendation or any indication of fitness for any specific purpose. Where applicable work must be carried out by a qualified professional. Seek appropriate specialist advice if needed and always follow manufacturer's instructions advice and ensure compliance with any applicable laws or regulations.

Trench-Fill Foundations

• Traditionally the foundations for the walls of houses and similar buildings have consisted of strip foundations (generally unreinforced) with block or brick masonry up to damp proof course level. In 'trench-fill' narrow trenches are dug to the required foundation depth and completely filled with concrete.

• This approach minimises the amount of excavation as access to lay blocks or bricks in the trench is no longer required. In addition, the trench is only open for a short time, leading to safer site working.

Advantages of Pile Foundations

 Not like shallow foundations such as pad footings, <u>*raft</u></u> <u>foundations</u>, etc., the settlement of the foundations is minimal
</u>* or zero in cast in-situ boar piles. A certain settlement could be expected for the *driven piles*.

- Mostly the pile foundations are socketed into the rock or rested on the hard soil strata, structural stability against loads such as earthquakes would be safer.
- When the condition of the ground is weak or when there are loads on a structure that are not bearable by the soil bearing capacity, the solution becomes the pile foundation.
- Construction of piles can be done in any ground condition.
 Whether there are weak soil layers or not, piles can be constructed as friction piles or socketed piles on the rock.
- There are many <u>types of pile foundations</u> such as cast in situ bored piles, precast driven piles, timber piles, micro piles, etc.
- Precast piles and micro piles are readily available or can be made before the construction of the foundation as per the design requirements.

Disadvantages of Pile Foundations

- Pile foundations are constructed to deeper levels under the ground. There are many difficulties in maintaining the quality of construction though there are many methods to ensure the construction quality and testing methods to be carried out after the construction.
- Pile foundations could not be economical when compared to the other types of <u>shallow foundations</u>. Construction of <u>pile</u> <u>caps</u>, and ground beams, would require additional cost.
- Not like shallow foundations, lots of testing is required to make sure the pile can be loaded and can safely transfer loads of the superstructure to the ground.
- Highly qualified and experienced staff is required for construction.
- High-tech machines are required for construction.
- Construction time is comparatively higher.

 https://www.structuralguide.com/advantages-and-disadvantages-of-pilefoundations/

Task 1.2 Report

| Assessment number (eg 1234-033) | 8711-033 |
|------------------------------------|---|
| Assessment title | Employer-Set Project |
| | |
| Candidate name | <first name=""> <surname></surname></first> |
| City & Guilds candidate No. | ABC1234 |
| | |
| Provider name | <provider name=""></provider> |
| City & Guilds provider No. | 999999a |

| Task(s) | 1.2 |
|------------------------------|----------|
| Evidence title / description | Report |
| Date submitted by candidate | DD/MM/YY |

Introduction

In this project the client wants me to fully justify the correct foundation for the timber frame, that is provided in the project brief. This means that I will have to go through all the foundations in order to figure out what is the best for the conditions of the ground around the timber, which includes ditches to the east, land drains, combined sewer, existing trees, clay layers and high groundwater levels, evidently pricing them up and decide what is the best for the job. I will also have to talk about the different layers of the foundations, including all requirements needed for meeting the needs of document A. This means that I will have to cross-section images and sketches to make sure that it is all stable within the foundations. As well as this I will have to calculate the price of all the materials used and all the labour which is getting put into it the project. Also, with the price I will have to work out the volume of space which is going to be filled in with the concrete.

Foundations

There are two types of foundations strip foundation, deep and shallow. Deep, are generally a lot more expensive because they have a lot more excavation work to be done but, on the other hand, they are a lot stronger than the shallow foundations because of the reinforcement in the ground and the amount of concrete used to make them. Shallow is good because of the price; the materials are low cost because there are not that much as it is only a shallow foundation meaning that there is not that much excavation work to be done. However, they have their bad qualities as for soft ground or heavy buildings they are not good. This is because they will cause the building to sink or fall through the soft floor, evidently causing it to fall or lose a lot more structural integrity. I started to think on what foundations are good for the timber frames on this project so here is a list of some foundations that could be used in this project: Raft, pile, trench, caisson, raft on piles. Some advantages about raft foundations are that it is good on soft grounds or on soft clay. This means that the weight of the building is evenly spread widely over a good area. This is great for the project we are currently trying to work on as there is a layer of clay one metre deep below the building. Also raft foundations are great on the price because they are a lot cheaper than any deep foundations. This is because they do not need as much digging up on the ground. To sum up the raft foundation, it is good for distributing the weight of a building evenly over a bigger area. They are better for places where the ground is not very strong, and the building is heavy. Also, they help to stop damage to the building. However, they are only good for some types of building foundations. Another foundation that can be used in this project could be pile foundation. This foundation is good because most of the foundation is socketed into the rock or rested on the hard soil strata, structural stability against loads of earthquakes would be safer. Also, with the pile foundation I found out that when the condition of the ground is weak or when there are loads on a structure that are not bearable by the soil bearing capacity, the solution becomes the pile foundation because it is good because it is strong. There are many different types of pile foundations such as cast in situ bored piles, precast driven piles, timber piles, micro piles, etc. The precast pile and the micro pile are readily available or can be made before the construction of the foundation as per the design requirements. Some disadvantages of the pile foundation are that they are constructed to deeper levels under the ground. There are many difficulties in maintaining the guality of construction though there are many methods to ensure the construction guality and testing methods to be carried out after the construction. Pile foundation could not be economical when compared to the other types of shallow foundations. Construction of pile caps, and ground beams, would require additional cost. Not like shallow foundations, lots of

testing is required to make the pile can be loaded and can safely transfer loads. Also, because it is underground highly level staff are required for construction which is a massive disadvantage of this foundation because it means that if you want to use it then you will have to find the people who are highly trained in that department in order to do the foundation. It also means that you will have to pay more money as they are worth a lot more than the normal employee. In conclusion pile foundations are great for land which is soft as it is very strong and for normal ground. On the downside of the pile foundation, you need experienced staff in order to have it is a hard one to put in place. One more foundation that I think would be good for this project is strip. This is one continuous strip of concrete that supports load bearing walls or piers. This is a shallow foundation which typically is rectangular or trapezoidal shape with a certain width and depth. This image is clearly showing that a strip foundation is made up of the first layer of concrete under the ground being think as it must provide a good strong support for the building. Then there are two walls going up connected to the foundation in the ground which is then filled in with more concrete to make sure that they do not move in any way. The well compacted fill and the damp proof membrane are both there to make sure that they are building doesn't move with the ground if it was to ever go soft. The order of the foundation is a great part



The main things that are looked out for when thinking about a foundation for this build is structural integrity and access and maintenance. This is because we are building over sewer pipes. Structural integrity: This is how strong the building needs to be. The weight and vibrations from new construction can potently damage or compromise the structural integrity of the sewer pipes. This is especially true for older, more fragile pipes. Access and maintenance: building over sewers can make it challenging to access and maintain the sewer lines in the future. They will have to do annual check and inspection of the sewage pipes as they may need repairs. This all needs to be taken in for the sewers which are

getting built on top of. It is important because if the sewers are in the way, then we will have to take a different approach on what foundation to use.

Approved document A agrees with the fact that I can use strip foundations in this project as I have the correct amount of space and in will not interrupt with the sewers giving them enough space to work on them when needed and so they are able to replace a pipe or fix one they can.

<u>Price</u>

The price of the project would be £10,880 without the excavation price. The price of the excavation will be around £5000. I worked this out by finding the area of the building and multiplying it by the volume which is the all the space which concrete will need to be filled in. I then multiplied that number my 35 as for everyone linear metre it cost £35 which then got me the answer of £10,880.

In conclusion I am going to use strip foundation on this timber build as it will be the best for the ground that we are building on. This will be good for the clay layer beneath the ground. It is going to cost a lot but that is for a new house. I have talked about how I could have used different foundations and how they are good and bad for this job.

Task 1.3 Project plan

| Assessment number (eg 1234-033) | 8711-033 |
|------------------------------------|---|
| Assessment title | Employer-Set Project |
| | |
| Candidate name | <first name=""> <surname></surname></first> |
| City & Guilds candidate No. | ABC1234 |
| | |
| Provider name | <provider name=""></provider> |
| City & Guilds provider No. | 999999a |

| Task(s) | 1.3 |
|------------------------------|----------------------|
| Evidence title / description | Programme of works |
| | Supporting statement |
| | |
| | |
| | |
| | |
| Date submitted by candidate | DD/MM/YY |

| | hours | | | | | | | | | | | | | | | |
|------------------------|-------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| phases | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| exivation | | | | | | | | | | | | | | | | |
| lay concrete | | | | | | | | | | | | | | | | |
| lay bricks | | | | | | | | | | | | | | | | |
| fill cavity | | | | | | | | | | | | | | | | |
| backfill with hardcore | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| place concrete slab | | | | | | | | | | | | | | | | |
| lay DPM | | | | | | | | | | | | | | | | |
| - | | | | | | | | | | | | | | | | |
| insulation | | | | | | | | | | | | | | | | |
| screed floor | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| quality check | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Programme of works

In my project plan I first started with eh excavation part of the project as in order to put the foundations in place I will need space. This is very important because if this never happened then the entire project would not be able to happen. Also, this part of the project will take from two to three hours. On my plan I have put a spare hour on as we do not know what may happen on the day as it could be heavy rainfall and we may not be able to continue working on the site. For the next part of my plan, I have put laying down the concrete, as it will set a strong foundation layer under the surface allowing it to be build off from. This is very important as they will not be able to lay the bricks on top of the foundation if it was concreted first. I have said on my plan that it will take between two to three houses to do. Also, I have added on some time as we do not know what the weather will be like on the day so in this part of the project it may starts to rain. After this I will lay the bricks on the foundations. This hast to be next as the next one is backfilling with hardcore. This task will only take one hour, and I didn't add any time onto this one because I didn't think that anything will bother with the time on this task. The next part of my plan is fil cavity. This is important as a cavity can cause a lot of heat loss and if it is filed wrong the ventilation in the build will be bad. Additionally, filling the cavity with insulation will heat up the house evidently reducing the cost of the build in the long run. Filling the cavity with the wrong material will reduce the amount of ventilation that the house is getting so this part of the project is very important and needs to be done right. I have given the time between one and two house to do this as it needs to be done correctly and to the correct standard. I have added an extra hour onto the time for this task to be completed as I feel like it may take a bit longer when they are trying to do it correctly. For the next part of my plan, I have put backfill with hardcore. This is a big part in the project. In this part we are trying to support the floor of the building, so this needs to be done correctly in order to carry the weight of the entire building. I have given them four hours to do this as it is a big part of the project. The next part of the foundation is implementing the concrete slab. This is important because it is the last part of the concrete in the foundation. This means that it all needs to be level for the insulation to be done correctly. I have given them two hours to do this task as it all needs to be perfect because then the entire building is level, and it will all be flat. The next stage in the foundations the insulation. This is an important part of the process because it will provide heat for the house without using power. I have given them one hours to complete this task as it is not difficult to do as it is slabs and it is like underlay. This means that it they can save a lot of time in this part leaving more time for the quality check at the end. The next part of this is to screed the floor. This is when the floor has a thin layer of concrete just above the insulation just to give it a clean finish. This should only take one hour as it is a quick task, but it might need some time to dry as on top of it is the carpets and all the flooring. The final stage of the foundations is the quality check. This is when an inspector comes to make sure that is all stable and had the correct a stability for a building to be put on top if it. They make sure that the materials used, and everything placed will not impact the surrounding areas by making the building sink in the soft clay layer under the ground.

In conclusion it should all take 16 hours to complete this is not including the time it takes to dry all the cement.

Task 1.4 Presentation

| Assessment number (eg 1234-033) | 8711-033 |
|------------------------------------|---|
| Assessment title | Employer-Set Project |
| | |
| Candidate name | <first name=""> <surname></surname></first> |
| City & Guilds candidate No. | ABC1234 |
| | |
| Provider name | <provider name=""></provider> |
| City & Guilds provider No. | 999999a |

| Task(s) | 1.4 |
|------------------------------|---|
| Evidence title / description | Presentation slides Note: Presentation recording is not included with this document. Please refer to the Observation Record below the presentation slides for commentary |
| Date submitted by candidate | DD/MM/YY |



Strip foundations

A strip foundation is great for construction as they are very cost effective, and they are very good for bad soil conditions. Strip foundations are very suitable for buildings with a linear layout. Strip foundations are a shallow foundation that's distribute the weight of a building over a widespread. This then evidently reducing the price of the overall cost of the build.



First, we needed to excavate the land to fit the strip foundation. In total this should cost £5000, and it will take up to three hours to complete it.

Then we lay the concrete out with rebar to further reenforce it. This will also take around three hours to complete.

Next, we must lay the bricks on the concrete to provide additional support. This will only take around 1 hour.

Next, we must fill the cavity's this will stop the wall from moving side to side. This will only take one hour Then we have to backfill with hardcore, this adds more support to the building. This will take 4 hours in total

Next is placing the concrete slab, this takes two hours. Then we <u>have to</u> lay the DPM this is short for damp proof membrane. This will take 2 hours Next is insulation the floor, This will only take one hour to complete.

The final stage in the foundation is screed the floor. This will only take one hour.

Is strip foundation sustainable?

Some materials used in the strip foundation can have a massive impact to the sustainability. For example, if concrete is used then it emits a significant amount of carbon dioxide. However, we can reduce it with recycled concrete which will help with the build cost as well as the carbon footprint of the build.

Advantages of using strip foundations.

- It is less expensive than other types of foundation, such as deep foundations
- Strip footing is also quicker in construction
- It is easy to install strip footing on the field
- Strip foundation is good on poor soil conditions
- It meets all the needs of approved document A

Disadvantages of using strip foundations

- They cannot be installed on grounds with irregular soil conditions.
- They are not suitable for insulation on sloping construction sites
- They can only be installed in limited construction sites with low loading requirements
- Some people find that there could be water logging and drainage issues

Approved document A

The approved document A is building regulations in the UK, which sets out requirements for the structural integrity of a buildings. It provides guidance on various aspects of construction, ensuring that buildings are safe, stable, and durable. The document covers a wide range of topics, including foundation design, load-bearing walls, floors, roofs and other structural elements.

Regarding the strip foundations, which are commonly used to support load bearing walls, Approved document A specifies requirements for their depth, width and construction materials. These are critical for distributing the weight of the building evenly to the ground below, preventing settlement or structural failure.

Employer-Set Project - Observation Record (Task 1.4 Presentation)

8711-30 T Level Technical Qualification in Onsite Construction

8711-033 Core: Employer-Set Project (Summer 2024)

| Candidate name | <first name=""> <surname></surname></first> |
|-----------------------------|---|
| City & Guilds Candidate No. | ABC1234 |
| Date | DD/MM/YY |
| | |
| Provider name | <provider name=""></provider> |
| City & Guilds Provider No. | 999999a |

Record observation notes below to inform external marking. Notes must be detailed, accurate and differentiating. They should identify areas of strength and weakness to distinguish different levels of performance quality for each of the prompts below.

Structure/detail

- Structured based of points on task brief
- Minimal planning evident with how quickly the presentation was delivered
- Good amount of information per slide
- Not enough information to expand further

Techniques

- Read from slides
- Faced the screen for most the presentation
- Put large quantities of information on each slide rather than pad it out
- Used a design to increase aesthetics of slides

Terminology

- Good terminology used
- Terminology used in the correct context when presenting
- Used correct terminology but was hesitant when questioning

Theories and concepts

- Evidence of knowledge and understanding displayed
- Gaps or lack of depth to knowledge in responses
- Concepts displayed on presentation are factual
- Provided logical responses to questioning

Communication

- Spoke clearly
- Faced away from listener when presenting
- Closed body language

| Tutor questions to candidate | Candidate responses |
|---|--|
| What goes into the foundation to reinforce the concrete? | Rebar and you can add more depending on the consistency of the concrete you can add more sand or water. |
| How is your foundation suitable to the ground conditions outlined on the project? | There is clay 1m below the ground and the foundation I have chosen it supports the ground as it spreads it across a wide surface, so it corrects it from sinking. |
| What has been the most difficult part of your employer set project? | Finding the research and implementing it across the work and having enough for the entire project. |

Any other aspects

| Tutor signature | Date |
|-----------------|----------|
| X | DD/YY/MM |

If completing electronically, double click next to the 'X' to add an electronic signature once the record is **finalised**.

Task 2.1 Collaborative problem-solving

| Assessment number (eg 1234-033) | 8711-033 |
|------------------------------------|---|
| Assessment title | Employer-Set Project |
| | |
| Candidate name | <first name=""> <surname></surname></first> |
| City & Guilds candidate No. | ABC1234 |
| | |
| Provider name | <provider name=""></provider> |
| City & Guilds provider No. | 999999a |

| Task(s) | 2.1 |
|------------------------------|--|
| Evidence title / description | Collaborative problem-solving group discussion notes |
| | Draft email |
| | Note: Collaborative discussion recording is not included with this document. Please refer to the Observation Record below for commentary |
| Date submitted by candidate | DD/MM/YY |

<candidate name> - hi <group member name> want to talk about the project brief.

<group member name> - Hi <candidate name>I would love to talk about the project brief.

<candidate name> what foundation are you thinking about using?

<group member name> - shallow strip foundation as it is the most applicable for the building foundation.

<candidate name> - that foundation is great as the ground condition is poor and strip foundation is good for bad soil quality. There is also a dich to the east of the site which could cause potential water flow or drainage issues. As well a this there is a clay layer presented 1metre deep which can evidently affect the soil quality.

<group member name> - however, when using a shallow strip foundation, the reinforced concrete footings extend below the frost line and transfer the weight of the structure evenly into the soil below. What foundation have you used?

<candidate name> - I could've alternatively went for the also common raft foundation which has rather large number of benefits, but no. I also decided to go with the classic shallow strip foundation. Within my project I have a lot of load bearing points which is a very large benefit when using shallow strip foundation

<group member name> - How do you ensure health and safety and how to you reinforce and reduce the chance of the concrete cracking?

<candidate name>- To start off I initially put barriers around the intended area to enforce health and safety and reduce the risk factor of people potentially stepping over the concrete whilst its drying. Or worse they could fall in. To prevent the cracking, I for one reinforce the wet concrete with steel rebar, upping the stability of the concrete when drying. I also make a 1-3 ration off concrete to soil/sand ratio. To further reduce the chance of cracking. I even add plastic fibres. But what are some implications and risks that could arise when it comes to building over a sewer?

<group member name> - Construction over a sewer can pose risk of damage to the sewer line, leading to leaks, blockages, or structural instability. Excavation work near the sewer can also disrupt existing infrastructure, leading to service disruptions and potential environmental hazards. But there is other implication the consider. Before building over a sewer, it is essential to conduct thorough site surveys and inspections to identify the exact location and depth of the sewer lines. Collaboration with local utility companies and municipal authorities is necessary to obtain relevant permits and ensure compliance and regulations.

<u>Email</u>

To whom this may concern, I am writing this to you today to take into consideration of all the potential risks associated when building over a sewer. Some risks could be that the sewage pipes could get damaged and there could be an environmental hazard and may evidently devalue the property. Also, when they need to fix a pipe or do a repair, I will be very hard to reach. This is important as it will cost a lot more to fix. When I am pouring the concrete for this project there will be barriers around the site to ensure that nobody ends up falling into it whiles it is drying. When building over a sewer it may also cause flooding and drainage issues in the long run which will bring down the house cost because they may constantly have to deal with the building flooding. Also having sewage pipes underneath the house could lead to the house having less support beneath it. This means that the support of the house will be week and the house may become damaged because it has fewer bearing points. This is why I have gone with the strip foundation as it spreads the load of the building out over a wide area. Also, the strip foundation provides layers of support in order to withhold the building weight. In conclusion I think that we need to implement more safety procedures in construction as it is lacking any type of health and safety. Thanks for reading and I hope you can get back to me.

From <first name>.

Employer-Set Project - Observation Record (Task 2.1 Collaborative problem-solving)

8711-30 T Level Technical Qualification in Onsite Construction

8711-033 Core: Employer-Set Project (Summer 2024)

| Candidate name | <first name=""> <surname></surname></first> |
|-----------------------------|---|
| City & Guilds Candidate No. | ABC1234 |
| Date | DD/MM/YY |
| | |
| Provider name | <provider name=""></provider> |
| City & Guilds Provider No. | 999999a |

Record observation notes below to inform external marking. **Notes must be detailed**, accurate and differentiating. They should identify areas of strength and weakness to distinguish different levels of performance quality for each of the prompts below.

Communication skills

- Spoke clearly throughout
- Read from notes
- Didn't make eye contact with candidate facing them
- Began laughing and recomposed themself

Collaboration/contribution

- Equal contribution to the discussion
- Some good collaboration

Methods to solve the problem

• Did not discuss methods to solve the issues but highlighted issues and implications

Any other aspects

Candidates did not fully understand the brief and spoke about their chosen foundation and did not discuss any methods of how to overcome the issues they highlighted.

| Tutor signature | Date |
|-----------------|----------|
| X | DD/MM/YY |

If completing electronically, double click next to the 'X' to add an electronic signature once the record is **finalised**.

Task 2.2 Evaluation

| Assessment number (eg 1234-033) | 8711-033 |
|------------------------------------|---|
| Assessment title | Employer-Set Project |
| | |
| Candidate name | <first name=""> <surname></surname></first> |
| City & Guilds candidate No. | ABC1234 |
| | |
| Provider name | <provider name=""></provider> |
| City & Guilds provider No. | 999999a |

| Task(s) | 2.2 |
|------------------------------|------------|
| Evidence title / description | Evaluation |
| Date submitted by candidate | DD/MM/YY |

- 1.1 For the research task we had to read the project brief and search all the information needed to complete all the other tasks. This involves going onto the internet and finding what is the best and worst foundations for the timber frame we were given. Also, we had to take into consideration that the land we decided to build on had sewage pipes underneath and there is a small layer of clay one meter beneath the ground. I found that when I was looking at the project brief, I didn't really understand what to research. This means that when I am doing the other tasks, I do not have all the correct information needed for the task at hand.
- 1.2 For this task we had to do a report on everything that we had researched. This means that we had to summarise all what we did in the previous task and write how it is relevant to the foundation that we are going to be using in the project. I struggled with finishing this task as my research task didn't have enough information for me to write about.
- 1.3 This task is the project plan. It involves taking the time it will take to complete each part of the project for example it will take one hour to lay all the bricks in the foundation. I didn't struggle with this task as I am very fond on how to do a project plan as I have done them before. Also, with this task I have had to do a support statement which entails me writing 750 words about the order and the time of all the different tasks. I also didn't struggle with this task because I knew what the order and what each task in is in detail.
- 1.4 For this task I had to write and perform a fifteen min power point. First, I had to make the power point which is about strip foundations and how they are sustainable in construction. Then I had to do the power point inform of my tutor and he had to film it. This is so he can send it to city in guilds. I struggled with getting the information because I struggled with my research part of the project. This made it hard for me to get the information to put on my PowerPoint.

2.1 In this part of my project I had to write notes in order to talk to someone about what foundations are good and bad for the project. This discussion was recorded by my tutor and sent to the city and guilds construction. I struggled with this task because I didn't know what to talk about when it comes to the foundations as I didn't have enough information on my research.

In my opinion I think hat the project plan was the easiest thing to complete as I have done one before, so I knew wat I was doing. Also, the support statement was good as all I was doing was explaining what order to do all the foundation tasks to do. Also, I think that the 1.1 task of research was one of the easiest because all I had to do was copy and paste work onto the document.

I have learnt that I need to do more research if I ever must do it again. This is important because it has limited my knowledge in other tasks. I have also learnt that I can perfectly do project plan as I was able to do then before this task.

T-LEVELS IFATE Institute for Apprenticeships and Technical Edit



Get in touch

The City & Guilds Quality team are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

Should you require assistance, please contact us using the details below:

Monday - Friday | 08:30 - 17:00 GMT

T: 0300 303 53 52

E: technicals.quality@cityandguilds.com

W: http://www.cityandguilds.com/tlevels

Web chat available here.

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