Unit 202: Changing practices over time

Worksheet 6: BIM and MMC (Tutor)

Task 1: Answer the following questions on BIM and MMC in groundworks/civil engineering.

1. What is BIM?

a Building information management.

b Building inspection management.

c Building information modelling.

d Building inspection modelling.

1. What is the purpose of using MMC techniques?

a To increase the amount of construction waste.

b To increase the amount of time required onsite.

c To reduce the amount of construction waste.

d To reduce the efficiency of the construction process.

1. What is the main benefit of using BIM in groundworks/civil engineering?

a Reducing construction waste.

b Improving collaboration between stakeholders.

c Faster construction process.

d Better quality control.

1. Which of the following is NOT a feature of BIM in groundworks/civil engineering?

a 3D modelling.

b Accurate cost estimation.

c Real-time project tracking.

d Onsite construction management.

1. How does BIM help in identifying design conflicts in groundworks/civil-engineering projects?

a By providing a detailed and accurate 3D model of the project.

b By allowing stakeholders to work together in real time.

c By automating the design review process.

d By reducing the need for manual calculations.

1. What is the main benefit of using MMC in groundworks and civil-engineering projects?

a Reduced cost of materials.

b Reduced time required onsite.

c Increased complexity of design.

d Increased risk of construction errors.

1. Which of the following is an example of MMC that can be used in groundworks and civil-engineering projects?

a Traditional bricklaying.

b Hand-dug excavation.

c Manual mixing of concrete onsite.

d Offsite manufacturing of precast concrete elements.

1. What is the impact of using MMC in groundworks and civil-engineering projects on the amount of construction waste produced?

a It increases the amount of waste.

b It has no impact on the amount of waste produced.

c It reduces the amount of waste produced.

d It depends on the type of MMC used.

1. Which of the following is NOT a benefit of using MMC in groundworks and civil-engineering projects?

a Reduced construction time.

b Improved sustainability.

c Increased cost of materials.

d Improved safety onsite.

1. Which of the following is a challenge that may arise when using MMC in groundworks and civil-engineering projects?

a Increased risk of design conflicts.

b Reduced quality of construction.

c Increased need for onsite labour.

d Increased construction waste.

Task 2: Answer the following questions about MMC in groundworks/civil engineering.

1. What is modular construction?

Modular construction is a modern method of construction that involves the use of prefabricated building components or modules that are manufactured offsite in a controlled factory environment and then assembled onsite to form the final building structure.

1. What are the benefits of modular construction?

Modular construction offers several advantages from a civil-engineering perspective, including faster construction time, greater design flexibility and accuracy, and improved sustainability.

1. What is 3D volumetric construction?

3D volumetric construction is an MMC that involves the use of precast concrete units which are manufactured offsite in a controlled environment and then transported to the construction site for installation.

1. What are the benefits of using 3D volumetric construction in groundworks/civil engineering?

The benefits of using 3D volumetric construction in groundworks/civil engineering include a faster construction process, reduced onsite labour costs, improved quality control due to offsite manufacturing and reduced environmental impact due to minimised waste and site disturbance.

1. What are precast flat panel modules?

Precast flat panel modules are building components that are precast in a factory and then transported to the construction site for installation. They are typically made of reinforced concrete and can be used for walls, floors and roofs in building construction.

1. What are precast flat panel modules used for in groundworks/civil-engineering projects in the UK?

Precast flat panel modules are used as structural components in the construction of buildings, bridges and other infrastructure projects in the UK.

1. What advantages do precast flat panel modules offer over traditional onsite concrete pouring methods?

Precast flat panel modules offer several advantages, including faster construction times, improved quality control and reduced onsite labour requirements. They also reduce the amount of waste generated onsite, making them more environmentally sustainable.

1. What is the hybrid concrete building technique?

The hybrid concrete building technique is a construction method that involves using a combination of precast concrete elements and cast-in-situ concrete to create a structure.

1. What are the advantages of using the hybrid concrete building technique in groundworks/civil-engineering projects?

The advantages of using the hybrid concrete building technique include faster construction time, reduced onsite labour requirements, improved quality control and lower costs.

Task 3: Answer the following questions on surveying and setting-out technologies.

1. What is drone surveying in construction?

Drone surveying, also known as aerial surveying, involves the use of unmanned aerial vehicles (UAVs) or drones to capture high-resolution images and data from construction sites.

1. How can drone surveying improve safety on construction sites?

By using drones to inspect hard-to-reach or dangerous areas, construction companies can reduce the risk of injury to workers. For example, drones can be used to inspect roofs, towers, and other structures that would be unsafe for workers to climb.

1. What are the benefits of using drone surveying in construction?

The benefits of using drone surveying in construction include increased accuracy, improved safety, and cost and time savings. Drones can capture detailed images and data from various angles and heights, which can be used to create 3D models and topographic maps. Additionally, drones can reduce the risk of injury to workers by inspecting hard-to-reach or dangerous areas, and the technology can help construction companies save time and money by completing surveys more efficiently.

1. What is a robotic total station and how is it used in construction surveying?

A robotic total station is a surveying tool that uses a theodolite and a distance meter to measure distances and angles on a construction site. It can be controlled remotely and used to measure various points across the site. The data collected is used to create detailed 3D models and plans for the design and construction process.

1. What are the benefits of using robotic total stations and GPS in combination in construction?

When used in combination, robotic total stations and GPS provide highly accurate measurements and data essential for successful construction projects. This technology reduces errors and minimises rework, ultimately saving time and money. It also allows for better project planning and management, improving overall efficiency and productivity.