COSVR549

Prepare and erect earthen structures

Overview

This standard is about preparing and erecting earthen structures, interpreting information, adopting safe, healthy and environmentally responsible work practices, selecting and using materials, components, tools and equipment, in accordance with organisational requirements which are equal to or exceed current statutory and legislative requirements This standard is for people working in the occupational area of heritage skills and can be used by operatives, supervisors and managers

Performance criteria

You must be able to:

Interpretation of information

P1 interpret the information relating to the work and resources as relevant to geographical location and climatic conditions to confirm its relevance for the following:

- drawings
- specifications
- schedules
- method statements
- risk assessments
- manufacturers' and suppliers' information
- oral, written or electronic instructions
- current regulations, legislation, official guidance and permits

Safe work practices

P2 comply with the relevant, current legislation and official guidance to carry out the work and maintain safe and healthy work practices relating to the following:

- methods of work
- safe use of appropriate personal protective equipment (PPE)
- safe use of access or lifting equipment
- safe use, storage and handling of materials, tools and equipment
- safe use of health and safety control equipment
- specific risks to occupational health and safety including mental health awareness
- specific risks associated with hazardous or asbestos containing materials

Selection of resources

P3 select the required quantity and quality of resources for the methods of work for:

- materials and components
- tools and equipment

Minimise the risk of damage

P4 comply with organisational procedures to minimise the risk of damage to the work and surrounding area by:

- taking relevant steps to protect the work and its surrounding area from accidental or unintended damage
- working with an awareness of the environment in liaison with other occupations
- maintaining a safe, clear and tidy work area
- disposing of waste in accordance with current legislation

Meet the contract specification

P5 comply with the contract information to prepare and erect earthen structures efficiently to the required specification by:

• demonstrating earth and turf building work skills to:

- select
- measure
- mark
- mix
- fit
- finish
- cut
- lay
- position
- bed

• using and maintaining hand and power tools and ancillary equipment

• preparing earthen structures by:

- checking the dimensions and quality of foundations and subflooring
- planning for seasonal appropriateness and timing
- preparing during-the-work protection
- controlling mix moisture, any fibre content and binding materials

• erecting earthen structures by:

- checking capillary breaks, damp proof course (DPC) such as:

o slate
o foamed glass
o other natural traditional moisture breaks
o Radon barrier

- connecting earth walls to other components
- creating expansion, shrinkage and structural joints
- fixing structural and non-structural elements (wall plates, frames, sills)
- making chamfered, shaped or reinforced corners
- keying or dampening day work
- creating openings
- preparing top of wall interface with other built elements

and at least two of the following:

- integrating insulation systems
- chasing or building in services (pipes, boxes, fixing)

- integrating reinforcing (geo grid, wire mesh)
- executing special elements
- producing surface finishes
- making surface repairs

Allocated time

P6 complete the work within the estimated, allocated time, taking account of climatic conditions, in accordance with organisational procedures, the programme of work and to meet the needs of other occupations and/or client

Knowledge and understanding

You need to know and understand:

P1 Interpretation of information
K1 why organisational procedures have been developed and how they are implemented
K2 types of information, their source and how they are interpreted in relation to:
• drawings
• specifications
• schedules
• method statements
• risk assessments
• manufacturers' and suppliers' information
• contractual information
• current legislation, regulations, official guidance and permits including but not limited to listed buildings and scheduled monuments
• conservation reports and plans
• oral, written or electronic instructions
K3 the importance of organisational procedures to solve problems with the information, and why it is important to follow them
K4 information for relevant, current legislation, official guidance and site-specific requirements and how it is applied
P2 Safe work practices
K5 how emergencies should be responded to in accordance with organisational authorisation and personal skills in relation to:
• fires and the types of fire extinguishers and how and when they are used in relation to water, CO2, foam and powder
• spillages and injuries
• emergencies relating to occupational activities
• identification of and reporting of hazardous substances including but not limited to asbestos containing materials and lead carbonate
K6 the organisational and site-specific security procedures for tools, plant and equipment in relation to:
• site
• workplace
• vehicles

• company
• operatives
• clients
• the general public

K7 how to report risks and hazards identified by the following:

• methods of work
• risk assessments
• personal assessment
• manufacturers' technical information
• statutory regulations
• official guidance
• Control of Substances Hazardous to Health (COSHH)

K8 the accident reporting procedures and who is responsible for making the report

K9 why, when and how health and safety control equipment identified by the principles of prevention should be used in relation to:

• collective protective measures
• personal protective equipment (PPE)
• respiratory protective equipment (RPE)
• local exhaust ventilation (LEV)

K10 how to comply with environmentally responsible work practices to meet current legislation and official guidance when dealing with potential accidents, health hazards and the environment whilst working in the workplace in relation to:

• below ground level
• confined spaces
• working at height
• tools, plant and equipment
• materials and substances
• moving and storing materials by manual handling and mechanical lifting

P3 Selection of resources

K11 why the characteristics, quality, uses, sustainability, suitability, limitations and defects associated with the resources are important and how defects should be reported

K12 why sustainable and ethical work practices and materials should be adopted

K13 the organisational procedures to select resources, why they have been developed and how they are used K14 how to confirm the resources and materials conform with the specification

K15 how the resources should be used and how any problems associated with the resources are reported in relation to:
• aggregates, bio aggregate, fibres, earth, binding materials, finishing materials, turf, masonry elements, building mixes
• geo grid and wire mesh
• lintels, plates, other interface systems and materials
• fixings
• hand and power tools and ancillary equipment for:
- mixing
- cutting
- lifting
- laying
- placing
- compacting
• digital equipment
• responsible sourcing and use of earth products
• timber, manufactured sheet material, limes
• choice of vapour permeable materials to include paints and other forms of cladding (surface finishes)
• sacrificial plasters
K16 how to identify and report the hazards associated with the resources and methods of work and how they are managed with reference to method statements and risk assessments
K17 methods of calculating the quantity, length, area and wastage associated with the method and procedure to prepare and erect earthen structures
P4 Minimise the risk of damage
K18 how to protect work and its surrounding area from damage and the purpose of protection from general workplace activities, other operations and adverse weather conditions and how to minimise damage
K19 how to, and the importance of, carrying out the safe disposal of waste in accordance with the following:
• environmental responsibilities
• organisational procedures
• manufacturers' information
• suppliers' information
• statutory regulations

• official guidance
K20 why it is important to maintain a safe, clear and tidy work area
P5 Meet the contract specification
K21 how the methods of work to meet the specification are carried out, and how problems are identified and reported, by the application of knowledge for safe, healthy and environmental work practices, procedures and skills, relating to:
• the versatility and different qualities of different building types:
- mass
- framed
- rammed
- light
- masonry
- earth
- turf
• varying density and its impact on thermal conductivity
• the issues affecting traditional and modern earth building techniques:
- geological
- geographical
- cultural
• the importance of seasonal appropriateness and timing for work with earthen structures
• how covering choices for protection before, during and after building aids or impedes drying
• how to control mix moisture, fibre content and binding materials
• the characteristics of curved walls and walls with complex geometry
• how to produce surface finishes and make and apply surface treatments and repairs
• why it is necessary to integrate reinforcing (geo grid, wire mesh)
• height and width ratio (slenderness) in humid and dry state, to include how high to build according to regional technique, weather and site conditions
• the impact of ground water on earth structures foundations, and wall bases
• the importance of checking the dimensions and quality of foundation and subflooring
• how to create capillary breaks to include:
- damp proof course (DPC)
- slate
- foamed glass
- other natural traditional moisture breaks

- radon barrier
• connections with other walls or components to include:
- expansion
- shrinkage
- structural joints
- bonding techniques
• how to fix structural or non-structural elements to include:
- wall plates
- frames
- sills
• how to integrate and apply insulation systems and materials
• how to make, protect and reinforce edges and chamfered and shaped corners
• the different types of openings to include:
- frames
- lintels
- sills
• how to create and form openings to include:
- inserting and fitting lintels
- plates
• how to chase or build in services for erecting, repairing and refurbishing earthen structures to include:
- pipes
- boxes
- fixing
• how tops of walls interface with other built elements
• technical or decorative elements to include:
- furniture
- stairs
- stoves
- chimneys
• how to identify defects, signs of deformation and collapse or slumping,
• how to prevent defects, signs of deformation and collapse or slumping
• the importance of keying and dampening day work
• methods to test and control moisture content (site or lab)
• when to get advice from a structural engineer
• how to prevent water damage and abrasion

• the use of:
- gutters
- gravel drains
- air bricks
• the treatment of:
- openings
- floors
- edges
- tops of walls
• the installation of services
• why it is important to maintain heritage and archaeological integrity
• why it is necessary to maintain the principles of minimum intervention and reversible alterations
• why it is necessary to record work carried out (written and digital formats)
• why it is important to recognise and report protected flora and fauna (mortar bees)
• why it is important to store salvageable fabric, materials and structural components
• why it is important to recognise and determine when specialist skills and knowledge are required and report accordingly
• the relevance of an assessment of significance
• why it is important to determine specific requirements for:
- structures of special interest
- traditional build (pre-1919)
- historical significance
• how to use all hand and power tools and ancillary equipment
• how and why operative care and maintenance of all hand and power tools and ancillary equipment is carried out
• how to work at height using access equipment
• how to work with, around and in close proximity to plant and machinery

K22 the organisational procedures with respect to site behaviours, and recognise and action fairness, inclusion and respect within the working environment, and how to address and report inappropriate site behaviours K23 the importance of methods of work, interpersonal relations and communication and the needs of other occupations associated with preparing and erecting earthen structures

P6 Allocated time

K24 the programme of work to be carried out including the estimated and allocated time, and why deadlines should be kept or reported if likely to be missed

K25 the types of progress charts, timetables and estimated times and the organisational procedures for reporting circumstances which will affect the work programme

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