Mason Heritage Works

Electives: Lime/ Stone

QP Code: CON/Q5101

Version: 1.0

NSQF Level: 4

Construction Skill Development Council of India || CPB 103 & 104 (1st Floor), Block 4B, DLF Corporate Park, Phase III, MG Road
Gurgaon-122002 || email:jancy@csdcindia.org

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CON/Q5101: Mason Heritage Works

Brief Job Description

The job holder is responsible for conservation works on heritage buildings and sites using lime and stone including repair, restoration, consolidation, replacement and re-building with traditional material and craftsmanship keeping in line with all safety and quality aspect . The mason needs to understand the difference in conservation of heritage buildings and modern construction owing to difference in materials and construction techniques used prior to undertaking any task.

Personal Attributes

The individual is expected to be physically fit and should be able to work across various locations not with standing extreme weather/ site conditions. The person must be able to perform efficiently within a team, handle the various masonry tools and materials and work responsibly

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. CON/N5101: Carry out preparation of lime putty, lime mortar, lime concrete, lime plaster and lime wash for conservation of heritage buildings
2. CON/N5106: Carry out conservation of heritage buildings by removal of existing decayed lime works and cleaning and repairing of stone surfaces
3. CON/N8001: Work effectively in a team to deliver desired results at the workplace
4. CON/N8002: Plan and organize work to meet expected outcomes
5. CON/N9001: Work according to personal health, safety and environment protocol at construction site

Electives*(mandatory to select at least one):*

Elective 1: Lime

The job holder is required to prepare, provide and lay lime mortar or concrete using appropriate tools and equipment as per approved schedule, drawings and specifications.

1. CON/N5102: Carry out laying of lime flooring and terracing in heritage buildings
2. CON/N5103: Carry out lime render and plaster on walls of heritage buildings
3. CON/N5104: Carry out pointing with lime in brick and stone work
4. CON/N5105: Carry out conservation of ornamental plaster work in lime for heritage buildings

Elective 2: Stone

The job holder is required to identify, cut, shape, lay, fix and dress the stone, namely sandstone, limestone, granite, quartzite, laterite etc. using appropriate tools

1. CON/N5107: Identify, cut, dress, lay and fix stone in heritage buildings and sites
2. CON/N5108: Reconstruct stone masonry walls, stone domes, brackets, arches, column and beams in heritage buildings and sites
3. CON/N5109: Lay and fix stone for flooring in heritage building and sites
4. CON/N5110: Lay and fix decorative elements in heritage building
5. CON/N5111: Carry out veneering/ cladding with stone on walls and domes on heritage buildings and sites

Qualification Pack (QP) Parameters

Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry - Heritage
Country	India
NSQF Level	4
Credits	NA
Aligned to NCO/ISCO/ISIC Code	NCOâ€ï¿½2015/7114.9900
Minimum Educational Qualification & Experience	Basic Literacy with 3-5 Years of experience site experience in masonry occupation OR Basic Literacy OR Basic Literacy
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	21 Years
Last Reviewed On	01/08/2018

Next Review Date	11/01/2022
Deactivation Date	11/01/2022
NSQC Approval Date	19/12/2018
Version	1.0
Reference code on NQR	2019/CON/CSDCI/03118
NQR Version	1.0

CON/N5101: Carry out preparation of lime putty, lime mortar, lime concrete, lime plaster and lime wash for conservation of heritage buildings

Description

This unit describes the skills and knowledge required to prepare lime and its different forms used for conservation of heritage buildings and sites including lime putty, lime mortar, lime concrete, lime plaster and lime wash under the supervision of supervisor/ site-in-charge/ consulting conservation architect

Scope

This scope covers the following:

- Carry out preparatory work prior to commencement of conservation work
- Carry out preparation of lime putty by means of slaking
- Carry out preparation of lime mortar/lime concrete
- Carry out preparation of lime plaster
- Carry out preparation lime wash

Elements and Performance Criteria

Carry out preparatory workprior to commencement ofconservation work

To be competent, the user/individual on the job must be able to:

PC1. Interpret relevant information from basic working drawings/ sketches prior to commencement of conservation work

PC2. select tools and tackles and check their working condition

PC3. set out the layouts as per drawings/ sketches/instructions

PC4. check and ascertain that quick lime is as per specifications

Carry out preparation of limeputty by means of slaking

To be competent, the user/individual on the job must be able to:

PC5. check and ensure mixing of lime and water in the recommended ratio

PC6. collect the grit using an appropriate sized sieve and store the lime putty underwater as specified

PC7. check and ensure that lime putty being used is as per specifications

Carry out preparation of limemortar /lime concrete

To be competent, the user/individual on the job must be able to:

PC8. mix lime putty ,sand and aggregate in the specified proportion on water tight platform/in a traditional lime mill /specially developed mechanical lime mixer

Carry out preparation of limeplaster

To be competent, the user/individual on the job must be able to:

PC9. prepare the plaster of specified consistency using lime putty , sand and aggregate as per specifications /instructions

Carry out preparation of limewash

To be competent, the user/individual on the job must be able to:

PC10. prepare lime wash of recommended consistency by adding and mixing lime putty and water in recommended proportion as per specifications/instructions

PC11. add colour pigments, in case of coloured wash, as per specifications

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. traditional practices of preparing lime and its various forms

KU2. traditional methods, materials and equipment used for preparation of lime mortar

KU3. personal protection including the use of related safety gears and equipment

KU4. maintenance of tools and equipment

KU5. basic principles of measurement

KU6. standard specification of all masonry tools and equipment, their care and maintenance

KU7. standard practices for layout and earthwork

KU8. Selection and use of tools and equipment such as measuring tape, trowels,floats, brushes, shovels, wheel-barrows, joint rules, masons square, etc.

KU9. basic knowledge of water lime ratiot

KU10. disadvantage of using quicklime directly in work

KU11. disadvantage of using revolving drum type of cement mixer, avoid lumping of lime

KU12. knowledge of material used for lime putty making

KU13. use of coarse sand instead of fine sand for lime concrete

KU14. quality of water used for making lime

KU15. knowledge of making lime putty as per Indian standard codes

KU16. dos and donts including precaution while making lime putty, lime mortar, lime wash/ lime concrete and lime plaster

KU17. different mortar mixes used for lime works as per Indian standards, or as per specifications, or evidence at site

KU18. preparation of lime concrete/lime mortar

KU19. process of storage of lime mortar mix prior to application

KU20. process of remixing of lime mortar prior to application to ensure its workability

KU21. checks for quality of lime mortar

KU22. use of galvanized water tank or an underground pit for making lime putty

KU23. use of traditional lime mill or specially developed mechanical lime mixer that allows for mixing and grinding of the ingredients instead of revolving drum mixers used in case of cement

KU24. method of curing of masonry structures

KU25. techniques for repairing and finishing

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site
GS2. read in one or more languages, preferably the local language on the site
GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags
GS4. speak in one or more languages, preferably one of the local language on the site
GS5. listen and follow instructions given by the site-in-charge/ supervisor/ consultant conservation architect
GS6. effectively communicate with team members
GS7. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work
GS8. decide on the workability of lime mortar /concrete
GS9. plan work and organize required resource in coordination with team members and superior
GS10. complete work as per agreed time schedule and quality
GS11. resolve and solve any conflict within the team
GS12. optimize resources efficiently
GS13. assess quantity and quality of materials for days work
GS14. minimize wastage in the workplace
GS15. start and finish levels for days work
GS16. evaluate the complexity of the task and seek assistance and support wherever required
GS17. bring to the notice of the supervisor any requirement of the requisite resources
GS18. bring to the notice of the supervisor violation of any safety norms which may lead to accidents
GS19. check the quality of scaffolding/working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out preparatory workprior to commencement ofconservation work	**6**	**19**	**-**	**-**
PC1. Interpret relevant information from basic working drawings/ sketches prior to commencement of conservation work	3	7	-	-
PC2. select tools and tackles and check their working condition	1	4	-	-
PC3. set out the layouts as per drawings/ sketches/instructions	1	4	-	-
PC4. check and ascertain that quick lime is as per specifications	1	4	-	-
Carry out preparation of limeputty by means of slaking	**6**	**14**	**-**	**-**
PC5. check and ensure mixing of lime and water in the recommended ratio	1	4	-	-
PC6. collect the grit using an appropriate sized sieve and store the lime putty underwater as specified	4	6	-	-
PC7. check and ensure that lime putty being used is as per specifications	1	4	-	-
Carry out preparation of limemortar /lime concrete	**5**	**10**	**-**	**-**
PC8. mix lime putty ,sand and aggregate in the specified proportion on water tight platform/in a traditional lime mill /specially developed mechanical lime mixer	5	10	-	-
Carry out preparation of limeplaster	**5**	**10**	**-**	**-**
PC9. prepare the plaster of specified consistency using lime putty , sand and aggregate as per specifications /instructions	5	10	-	-
Carry out preparation of limewash	**8**	**17**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. prepare lime wash of recommended consistency by adding and mixing lime putty and water in recommended proportion as per specifications/instructions	5	10	-	-
PC11. add colour pigments, in case of coloured wash, as per specifications	3	7	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5101
NOS Name	Carry out preparation of lime putty, lime mortar, lime concrete, lime plaster and lime wash for conservation of heritage buildings
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

CON/N5106: Carry out conservation of heritage buildings by removal of existing decayed lime works and cleaning and repairing of stone surfaces

Description

This unit describes the skills and knowledge required by a person to carry out conservation works on heritage buildings and sites by cleaning and repairing stone surfaces and remove existing deteriorated/weathered lime plaster using appropriate methods as per instructions by the supervisor/ site-in-charge/ consulting conservation architect.

Scope

This scope covers the following:

- Carry out removal of weathered lime plaster in heritage buildings and sites
- Remove stains from stone surfaces and manually remove vegetation using appropriate techniques
- Remove old sulphated /non sulphated lime/white wash/ colour in heritage buildings and sites as per specification
- Repair open joints/minor cracks in heritage buildings and sites.
- Repair , reinforce and retrofit structural elements in historical buildings and sites by using scientific methods

Elements and Performance Criteria

Carry out removal of weathered lime plaster in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC1. brush the wall to remove all loose material ensuring that pointing is not raked out for providing key

PC2. cut a patches of plaster to provide key for new mortar as per specifications/ instructions

Remove stains from stone surfaces and manually remove vegetation using appropriatetechniques

To be competent, the user/individual on the job must be able to:

PC3. manually remove vegetation from walls, columns, arches, floor and roof as per instructions using recommended tools and methods

PC4. remove stains including dirt, blackening and other contaminations from stone surfaces as per specifications/instructions

Remove old sulphated /nonsulphated lime/white wash/colour in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC5. scrub and scrape the additional layers of sulphate/non sulpahte deposits over historic stone surfaces as per specifications/instructions

Repair open jointsand/ or minor cracks

To be competent, the user/individual on the job must be able to:

PC6. scrape all loose binding material from the crack and fill the crack with lime mortar as per specifications

PC7. perform injection lime grouting as per specifications / instructions for the consolidation

Repair , reinforce and retrofitstructural elements in historical buildings and sites by usingscientific methods

To be competent, the user/individual on the job must be able to:

PC8. carry out drilling on stones and fixing of anchors to it as per specification

PC9. finish the surface with lime mortar as per specifications

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. traditional practices for removal of existing lime works

KU2. the traditional materials, techniques and equipment

KU3. personal protection including the use of related safety gears and equipment

KU4. maintenance of tools and equipment

KU5. sketches and drawings for all cleaning work

KU6. basic principles of measurement

KU7. different types of stones such as granite, marble, limestone, kota stone, sandstone, etc. and their properties

KU8. standard specifications of all tools and equipment, their care and maintenance

KU9. use of wire or metal lath to minimize damage to the surface below

KU10. process of removal of old sculpted lime/white wash, colour wash without sulphate deposits and weathered lime plaster from heritage buildings

KU11. all kinds of cleaning agents available, their usage and application for heritage building works

KU12. different types of soap solutions for cleaning, their purpose and importance

KU13. pH levels of the solution, its importance and ways to maintain the level

KU14. all kinds of Tree Killers available, their usage and application

KU15. how to repair the workability of the lime mortar mix

KU16. process of repairing cracks on stones in heritage building

KU17. different types of grouting nipples and their usage

KU18. different types of anchoring materials like stainless steel rods or other specified material

KU19. process of fixing anchors

KU20. understand the importance of structural interventions

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site

GS2. read and follow in one or more languages, preferably the local language at the site

GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags

GS4. speak in one or more languages, preferably one of the local language on thesite

GS5. listen and follow instructions given by the site-in-charge/ supervisor/consultant conservation architect

GS6. effectively communicate with team members

GS7. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work

GS8. decide on the workability of lime mortar /concrete

GS9. ensure the mix of the additives and lime mortar to achieve the desired consistency, texture and colour

GS10. resolve and solve any conflict within the team

GS11. optimize resources efficiently

GS12. assess quantity and quality of materials for day work

GS13. minimize wastage in the workplace

GS14. start and finish levels for day work

GS15. evaluate the complexity of the task and seek assistance and support wherever required

GS16. bring to the notice of the superiors any requirement of the requisite material and resources

GS17. check for quality of scaffolding/ working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out removal of weathered lime plaster in heritage buildings and sites	**6**	**16**	**-**	**-**
PC1. brush the wall to remove all loose material ensuring that pointing is not raked out for providing key	2	8	-	-
PC2. cut a patches of plaster to provide key for new mortar as per specifications/ instructions	4	8	-	-
Remove stains from stone surfaces and manually remove vegetation using appropriatetechniques	**6**	**14**	**-**	**-**
PC3. manually remove vegetation from walls, columns, arches, floor and roof as per instructions using recommended tools and methods	2	6	-	-
PC4. remove stains including dirt, blackening and other contaminations from stone surfaces as per specifications/instructions	4	8	-	-
Remove old sulphated /nonsulphated lime/white wash/colour in heritage buildings and sites	**4**	**8**	**-**	**-**
PC5. scrub and scrape the additional layers of sulphate/non sulpahte deposits over historic stone surfaces as per specifications/instructions	4	8	-	-
Repair open jointsand/ or minor cracks	**7**	**16**	**-**	**-**
PC6. scrape all loose binding material from the crack and fill the crack with lime mortar as per specifications	2	6	-	-
PC7. perform injection lime grouting as per specifications / instructions for the consolidation	5	10	-	-
Repair , reinforce and retrofitstructural elements in historical buildings and sites by usingscientific methods	**7**	**16**	**-**	**-**
PC8. carry out drilling on stones and fixing of anchors to it as per specification	5	10	-	-
PC9. finish the surface with lime mortar as per specifications	2	6	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5106
NOS Name	Carry out conservation of heritage buildings by removal of existing decayed lime works and cleaning and repairing of stone surfaces
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

CON/N8001: Work effectively in a team to deliver desired results at the workplace

Description

This unit describes the skills and knowledge required to work effectively within a team to achieve the desired results

Scope

The scope covers the following:

- Interact and communicate effectively with co-workers, superiors and sub-ordinates across different teams
- Support co-workers, superiors and sub-ordinates within the team and across interfacing teams to ensure effective execution of assigned task

Elements and Performance Criteria

Interact and communicate in effective and conclusive manner

To be competent, the user/individual on the job must be able to:

PC1. pass on work related information/ requirement clearly to the team members

PC2. inform co-workers and superiors about any kind of deviations from work

PC3. address the problems effectively and report if required to immediate supervisor appropriately

PC4. receive instructions clearly from superiors and respond effectively on the same

PC5. communicate to team members/subordinates for appropriate work technique and method

PC6. seek clarification and advice as per the requirement and applicability

Support co-workers to execute project requirements

To be competent, the user/individual on the job must be able to:

PC7. hand over the required material, tools tackles, equipment and work fronts timely to interfacing teams

PC8. work together with co-workers in a synchronized manner

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. own roles and responsibilities

KU2. importance of effective communication and establishing strong working

KU3. risks of a failure in teamwork in terms of effects on project outcomes, timelines, safety at the construction site, etc.

KU4. different modes of communication, and its appropriate usage

KU5. importance of creating healthy and cooperative work environment among the gangs of workers

KU6. different activities within his work area where an interaction with other workers is required

KU7. applicable techniques of work, properties of materials used, tools and tackles used, safety standards that co- workers might need as per the requirement

KU8. importance of proper and effective communication and the expected adverse

KU9. importance and need of supporting co-workers facing problems for smooth

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in at least one language, preferably in the local language of the site

GS2. read in one or more languages, preferably the local language of the site

GS3. read communication from team members regarding work completed, materials used, tools and tackles used, support required

GS4. speak in one or more languages, preferably in one of the local language of the site

GS5. listen and follow instructions / communication shared by superiors/ co-workers regarding team requirements or interfaces during work processes

GS6. orally communicate with co-workers regarding support required to complete the respective work

GS7. decide on what information is to be shared with co-workers within the team or from interfacing gang of workers

GS8. plan work and organize required resources in coordination with team members

GS9. complete all assigned task in coordination with team members

GS10. take initiative in resolving issues among co-workers or report the same to superiors

GS11. ensure best ways of coordination among team members

GS12. communicate with co-workers considering their educational / social background

GS13. evaluate the complexity of task and determine if any guidance is required from superiors

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Interact and communicate in effective and conclusive manner	**14**	**34**	**-**	**-**
PC1. pass on work related information/ requirement clearly to the team members	2	5	-	-
PC2. inform co-workers and superiors about any kind of deviations from work	2	5	-	-
PC3. address the problems effectively and report if required to immediate supervisor appropriately	3	7	-	-
PC4. receive instructions clearly from superiors and respond effectively on the same	2	5	-	-
PC5. communicate to team members/subordinates for appropriate work technique and method	3	7	-	-
PC6. seek clarification and advice as per the requirement and applicability	2	5	-	-
Support co-workers to execute project requirements	**16**	**36**	**-**	**-**
PC7. hand over the required material, tools tackles, equipment and work fronts timely to interfacing teams	8	18	-	-
PC8. work together with co-workers in a synchronized manner	8	18	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N8001
NOS Name	Work effectively in a team to deliver desired results at the workplace
Sector	Construction
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	TBD
Version	1.1
Last Reviewed Date	23/05/2015
Next Review Date	31/03/2022
NSQC Clearance Date	21/07/2016

CON/N8002: Plan and organize work to meet expected outcomes

Description

This unit describes the knowledge and the skills required for an individual to plan and organize own work in order to meet expected outcome

Elements and Performance Criteria

Prioritize work activities to achieve desired results

To be competent, the user/individual on the job must be able to:

PC1. understand clearly the targets and timelines set by superiors

PC2. plan activities as per schedule and sequence

PC3. provide guidance to the subordinates to obtain desired outcome

PC4. plan housekeeping activities prior to and post completion of work

Organize desired resources prior to commencement of work

To be competent, the user/individual on the job must be able to:

PC5. list and arrange required resources prior to commencement of work

PC6. select and employ correct tools, tackles and equipment for completion of desired work

PC7. complete the work with allocated resources

PC8. engage allocated manpower in an appropriate manner

PC9. use resources in an optimum manner to avoid any unnecessary wastage

PC10. employ tools, tackles and equipment with care to avoid damage to the same

PC11. organize work output, materials used, tools and tackles deployed

PC12. processes adopted to be in line with the specified standards and instructions

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. importance of proper housekeeping

KU2. policies, procedures and work targets set by superiors

KU3. roles and responsibilities in executing the work for subordinates and self

KU4. standard practices of work to be adopted for assigned task

KU5. how to use available resources in a judicious and appropriate manner to minimize wastages or damage

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in at least one language, preferably in the local language of the site

GS2. list out the assigned works and targets

GS3. read in one or more language, preferably the local language at the site

GS4. read communication from co-workers, superiors and notices from other departments as per requirement of the level

GS5. speak in one or more language, preferably one of the local language at the site

GS6. listen and follow communication shared by co-workers regarding standard work processes, resources available, timelines, etc.

GS7. communicate effectively with co-workers and subordinates

GS8. decide on what sequence is to be adopted for execution of work

GS9. plan and organize the materials, tools, tackles and equipment required to execute the work

GS10. complete all assigned task with proper planning and organizing

GS11. arrange or seek help to arrange for material, tools and tackles in case of shortfall

GS12. analyze areas of work which could result in a delay of work, wastage of material or damage to tools and tackles

GS13. evaluate potential solutions to minimize avoidable delays and wastages at the construction site

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prioritize work activities to achieve desired results	**9**	**22**	**-**	**-**
PC1. understand clearly the targets and timelines set by superiors	2	5	-	-
PC2. plan activities as per schedule and sequence	2	5	-	-
PC3. provide guidance to the subordinates to obtain desired outcome	3	7	-	-
PC4. plan housekeeping activities prior to and post completion of work	2	5	-	-
Organize desired resources prior to commencement of work	**21**	**48**	**-**	**-**
PC5. list and arrange required resources prior to commencement of work	3	7	-	-
PC6. select and employ correct tools, tackles and equipment for completion of desired work	3	7	-	-
PC7. complete the work with allocated resources	3	7	-	-
PC8. engage allocated manpower in an appropriate manner	3	6	-	-
PC9. use resources in an optimum manner to avoid any unnecessary wastage	3	6	-	-
PC10. employ tools, tackles and equipment with care to avoid damage to the same	2	5	-	-
PC11. organize work output, materials used, tools and tackles deployed	2	5	-	-
PC12. processes adopted to be in line with the specified standards and instructions	2	5	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N8002
NOS Name	Plan and organize work to meet expected outcomes
Sector	Construction
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	TBD
Version	1.0
Last Reviewed Date	23/03/2015
Next Review Date	31/03/2022
NSQC Clearance Date	19/05/2015

CON/N9001: Work according to personal health, safety and environment protocol at construction site

Description

This NOS covers the skill and knowledge required for an individual to work according to personal health, safety and environmental protocol at construction site

Scope

The scope covers the following:

- Follow safety norms as defined by organization
- Adopt healthy & safe work practices
- Implement good housekeeping and environment protection process and activities

Elements and Performance Criteria

Follow safety norms as defined by organization

To be competent, the user/individual on the job must be able to:

PC1. identify and report any hazards, risks or breaches in site safety to the appropriate authority

PC2. follow emergency and evacuation procedures in case of accidents, fires, natural calamities

PC3. follow recommended safe practices in handling construction materials, including chemical and hazardous material whenever applicable

PC4. participate in safety awareness programs like Tool Box Talks, safety demonstrations, mock drills, conducted at site

PC5. identify near miss , unsafe condition and unsafe act

Adopt healthy & safe work practices

To be competent, the user/individual on the job must be able to:

PC6. use appropriate Personal Protective Equipment (PPE) as per work requirements including: Head Protection (Helmets) Ear protection Fall Protection Foot Protection Face and Eye Protection, Hand and Body Protection Respiratory Protection (if required)

PC7. handle all required tools, tackles , materials & equipment safely

PC8. follow safe disposal of waste, harmful and hazardous materials as per EHS guidelines

PC9. install and apply properly all safety equipment as instructed

PC10. follow safety protocol and practices as laid down by site EHS department

Implement good housekeeping practices

To be competent, the user/individual on the job must be able to:

PC11. collect and deposit construction waste into identified containers before disposal, separate containers that may be needed for disposal of toxic or hazardous wastes

PC12. apply ergonomic principles wherever required

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. reporting procedures in cases of breaches or hazards for site safety, accidents, and emergency situations as per guidelines
KU2. types of safety hazards at construction sites
KU3. basic ergonomic principles as per applicability
KU4. the procedure for responding to accidents and other emergencies at site
KU5. appropriate personal protective equipment to used based on various
KU6. importance of handling tools, equipment and materials as per applicable
KU7. health and environments effect of construction materials as per
KU8. various environmental protection methods as per applicability
KU9. storage of waste including the following at appropriate location: non-combustible scrap material and debris combustible scrap material and debris general construction waste and trash (non-toxic, non-hazardous) any other hazardous wastes any other flammable wastes
KU10. how to use hazardous material, in a safe and appropriate manner as per
KU11. safety relevant to tools, tackles, & requirement as per applicability
KU12. housekeeping activities relevant to task

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in at least one language, preferably in the local language of the site
GS2. fill safety formats for near miss, unsafe conditions and safety suggestions
GS3. read in one or more language, preferably in the local language of the site
GS4. read sign boards, notice boards relevant to safety
GS5. speak in one or more language, preferably in one of the local language of the site
GS6. listen instructions / communication shared by site EHS and superiors regarding site safety, and conducting tool box talk
GS7. communicate reporting of site conditions, hazards, accidents, etc.
GS8. not create unsafe conditions for others
GS9. keep the workplace clean and tidy
GS10. identify safety risks that affect the health, safety and environment for self and others working in the vicinity, tackle it if within limit or report to appropriate authority
GS11. assess and analyze areas which may affect health, safety and environment protocol on the site
GS12. ensure personal safety behavior
GS13. respond to emergency

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Follow safety norms as defined by organization	**11**	**27**	**-**	**-**
PC1. identify and report any hazards, risks or breaches in site safety to the appropriate authority	2	5	-	-
PC2. follow emergency and evacuation procedures in case of accidents, fires, natural calamities	2	5	-	-
PC3. follow recommended safe practices in handling construction materials, including chemical and hazardous material whenever applicable	3	7	-	-
PC4. participate in safety awareness programs like Tool Box Talks, safety demonstrations, mock drills, conducted at site	2	5	-	-
PC5. identify near miss , unsafe condition and unsafe act	2	5	-	-
Adopt healthy & safe work practices	**15**	**33**	**-**	**-**
PC6. use appropriate Personal Protective Equipment (PPE) as per work requirements including: Head Protection (Helmets) Ear protection Fall Protection Foot Protection Face and Eye Protection, Hand and Body Protection Respiratory Protection (if required)	3	7	-	-
PC7. handle all required tools, tackles , materials & equipment safely	2	5	-	-
PC8. follow safe disposal of waste, harmful and hazardous materials as per EHS guidelines	2	5	-	-
PC9. install and apply properly all safety equipment as instructed	4	8	-	-
PC10. follow safety protocol and practices as laid down by site EHS department	4	8	-	-
Implement good housekeeping practices	**4**	**10**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. collect and deposit construction waste into identified containers before disposal, separate containers that may be needed for disposal of toxic or hazardous wastes	2	5	-	-
PC12. apply ergonomic principles wherever required	2	5	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N9001
NOS Name	Work according to personal health, safety and environment protocol at construction site
Sector	Construction
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	TBD
Version	1.2
Last Reviewed Date	23/05/2015
Next Review Date	31/03/2022
NSQC Clearance Date	21/07/2016

CON/N5102: Carry out laying of lime flooring and terracing in heritage buildings

Description

This unit describes the skills and knowledge required by a mason to lay lime flooring and lime terracing in heritage buildings and sites as per specification/instructions bysupervisor/ site-in-charge/ consulting conservation architect or evidence at site

Scope

The scope covers the following -

- Carry out preparatory work prior to laying lime flooring and terracing in heritage buildings and sites.
- Carry out laying and finishing of lime concrete in heritage buildings and sites.
- Carry out laying of khurra for lime terracing in heritage buildings and sites.
- Carry out laying of gola (batta) for lime terracing in heritage buildings and sites

Elements and Performance Criteria

Carry out preparatory work prior to laying lime floor and terrace in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC1. select and mix appropriate proportions of slaked lime and surkhi as per specifications / instructions

PC2. select and use appropriate size of aggregate and sand as per specifications / instructions

PC3. ensure soaking of burnt - brick aggregates in water as per specifications /instructions

Carry out laying and finishing of lime concrete in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC4. lay lime concrete /lime mortar over structural and non-structural members of specified thickness as per instructions

PC5. carry out ramming of lime concrete as per specification

PC6. carry out remedial action of pricking the surface and spreading fresh lime concrete to even out surface undulations

PC7. carry out finishing of lime concrete with lime putty/ gur and belgiri treatment as per instructions

PC8. carry out curing of the lime concrete as per specifications/instructions

Carry out laying of khurra (in lime terracing) in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC9. lay khurras of recommended size as per specifications/instructions

PC10. apply lime plaster to finish the khurras maintaining average thickness as per specification / drawings/ sketches/instructions

Carry out laying of gola (batta) (in lime terracing) in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC11. lay gola (batta) in lime concrete as per specifications/instructions using recommended brick aggregate and mortar

PC12. lay the gola (batta) along joints of the walls and terrace using the recommended method and tools as per drawings/ sketches/

PC13. carry out finishing of gola with lime mortar mixed with local addiditives as per specifications / instructions

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. traditional practices for laying lime flooring and lime terracing

KU2. the appropriate traditional methods, techniques and equipment

KU3. personal protection including the use of related safety gears and equipment

KU4. maintenance of tools and equipment

KU5. drawings / sketches for laying lime flooring and lime terracing

KU6. basic principles of measurement

KU7. standard specifications of all masonry tools and equipment, their care and maintenance

KU8. how to use basic leveling tools in the masonry trade such as - spirit level, water level, plumb bob, line thread, etc.

KU9. how to select and use tools and equipment such as measuring tape, trowels, straightedge, shovels, wheelbarrows, joint rules, mason's square, etc.

KU10. how to determine vertical and horizontal alignment using appropriate tools to provide vertical datum lines for building measurements

KU11. how to use the triangulation method (3 - 4 - 5 method) for squaring corners

KU12. lime mortar mix proportions and its importance

KU13. basic knowledge of water lime ratio

KU14. mix proportions and ingredients of lime concrete as per Indian standards.

KU15. use of graded stone aggregate of appropriate size for lime concrete as per Indian standards

KU16. proper soaking time of burnt brick aggregate

KU17. importance of laying concrete as per minimum compacted thickness of the layer

KU18. appropriate ramming of concrete and tools used for ramming

KU19. process of curing of lime concrete as per Indian standards

KU20. process of correction of undulations in lime concrete

KU21. local additives for waterproofing

KU22. techniques for repairing and finishing

KU23. process of providing khurra in terrace

KU24. process of laying gola in lime terrace

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site

GS2. read and follow in one or more languages, preferably the local language at the site

GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags

GS4. speak in one or more languages, preferably one of the local language on the site

GS5. listen and follow instructions given by the site-in-charge/ supervisor/ consultant conservation architect

GS6. effectively communicate with team members

GS7. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work

GS8. decide on the workability of lime mortar /concrete

GS9. plan work and organize required resource in coordination with team members and supervisors

GS10. complete work as per the agreed time schedule and quality

GS11. ensure the mix of the additives and lime mortar to achieve the desired consistency, texture and colour

GS12. resolve and solve any conflict within the team

GS13. optimize resources efficiently

GS14. assess quantity and quality of materials for day work

GS15. minimize wastage in the workplace

GS16. start and finish levels for day work

GS17. evaluate the complexity of the task and seek assistance and support wherever required

GS18. bring to the notice of the superiors any requirement of the requisite material and resources

GS19. check for quality of scaffolding/ working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out preparatory work prior to laying lime floor and terrace in heritage buildings and sites	**3**	**12**	**-**	**-**
PC1. select and mix appropriate proportions of slaked lime and surkhi as per specifications / instructions	1	4	-	-
PC2. select and use appropriate size of aggregate and sand as per specifications / instructions	1	4	-	-
PC3. ensure soaking of burnt - brick aggregates in water as per specifications /instructions	1	4	-	-
Carry out laying and finishing of lime concrete in heritage buildings and sites	**15**	**28**	**-**	**-**
PC4. lay lime concrete /lime mortar over structural and non-structural members of specified thickness as per instructions	6	9	-	-
PC5. carry out ramming of lime concrete as per specification	2	3	-	-
PC6. carry out remedial action of pricking the surface and spreading fresh lime concrete to even out surface undulations	3	7	-	-
PC7. carry out finishing of lime concrete with lime putty/ gur and belgiri treatment as per instructions	3	7	-	-
PC8. carry out curing of the lime concrete as per specifications/instructions	1	2	-	-
Carry out laying of khurra (in lime terracing) in heritage buildings and sites	**3**	**12**	**-**	**-**
PC9. lay khurras of recommended size as per specifications/instructions	1	6	-	-
PC10. apply lime plaster to finish the khurras maintaining average thickness as per specification / drawings/ sketches/instructions	2	6	-	-
Carry out laying of gola (batta) (in lime terracing) in heritage buildings and sites	**9**	**18**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. lay gola (batta) in lime concrete as per specifications/instructions using recommended brick aggregate and mortar	5	7	-	-
PC12. lay the gola (batta) along joints of the walls and terrace using the recommended method and tools as per drawings/ sketches/	3	7	-	-
PC13. carry out finishing of gola with lime mortar mixed with local addiditives as per specifications / instructions	1	4	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5102
NOS Name	Carry out laying of lime flooring and terracing in heritage buildings
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

CON/N5103: Carry out lime render and plaster on walls of heritage buildings

Description

This unit describes the skills and knowledge required by mason to finish walls with lime plaster in heritage buildings and sites as per instructions of the supervisor/ sitein-charge/ consulting conservation architect or as per evidence at site.

Scope

This scope covers the following:

- Carry out preparatory work before starting of conservation work in heritagebuildings and sites
- Apply lime plaster on walls in heritage buildings and sites
- Repair lime plaster on walls in heritage buildings and sites

Elements and Performance Criteria

Carry out preparatory work before starting of conservation work in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC1. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions

PC2. ensure wetting of the walls surfaces prior to plastering, as per instructions

PC3. prepare the surface of the wall using lime mortar as per drawings/ sketches / instructions

PC4. undertake necessary protection measures to protect the historic fabric

Apply lime plaster on walls in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC5. apply the base coat of lime plaster of specified thickness as per specifications / /instructions using recommended tools while maintaining the contour

PC6. scour the surface using appropriate tools to avoid cracks and peeling in the scratch coat

PC7. apply further coats of plaster as per specifications / /instructions

PC8. finish the final plaster as per specifications / /instructions and ensure proper curing of finished surface

Repair lime plaster on walls in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC9. cut the damaged/affected patch using appropriate tools

PC10. rake out the loose pointing in the wall behind and repoint roughly

PC11. brush out loose dust and apply the plaster in thin coats using recommended tools as per specifications/ instructions

PC12. consolidate and save the cracked and hollow plaster

PC13. finish the final plaster patch as per specifications / instructions and ensure proper curing of finished surface

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. traditional practices for finishing walls with lime plaster
KU2. the appropriate traditional methods, techniques and equipment
KU3. personal protection including the use of related safety gears and equipment
KU4. maintenance of tools and equipment
KU5. drawings/ sketches for finishing of walls with lime plaster
KU6. basic principles of measurement
KU7. standard specifications of all masonry tools and equipment, their care and maintenance
KU8. type and size of materials used for lime plaster
KU9. different mortar mixes used for plastering
KU10. various plastering tools and techniques and methods of plastering as per specifications
KU11. process of applying lime plaster on wall
KU12. use of basic leveling tools in the masonry trade such as spirit level, water level, plumb bob, line thread, etc.
KU13. selction and use of tools and equipment such as measuring tape, trowels, straightedge, shovels, wheelbarrows, joint rules, masons square, etc.
KU14. Process to determine vertical and horizontal alignment using appropriate tools to provide vertical datum lines for building measurements
KU15. Lime mortar mix proportions and its importance
KU16. basic knowledge of water lime ratio
KU17. appropriate aggregates matching the texture and consistency of the existing plaster as per specifications/instructions
KU18. Protections for non-structural exposed elements including windows, doors, floor and other exposed areas using a tarpaulin or polythene sheet
KU19. techniques for repairing & finishing of lime plaster on walls
KU20. how to prevent the work from rapid drying
KU21. Process of curing of finished plastered surface

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site
GS2. read and follow in one or more languages, preferably the local language at the site
GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags
GS4. speak in one or more languages, preferably one of the local language on the site
GS5. listen and follow instructions given by the site-in-charge/ supervisor/ consultant conservation architect
GS6. effectively communicate with team members

GS7. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work

GS8. decide on the workability of lime mortar /concrete

GS9. plan work and organize required resource in coordination with team members and supervisors

GS10. complete work as per the agreed time schedule and quality

GS11. ensure the mix of the additives and lime mortar to achieve the desired consistency, texture and colour

GS12. resolve and solve any conflict within the team

GS13. optimize resources efficiently

GS14. assess quantity and quality of materials for day work

GS15. minimize wastage in the workplace

GS16. start and finish levels for day work

GS17. evaluate the complexity of the task and seek assistance and support wherever required

GS18. bring to the notice of the superiors any requirement of the requisite material and resources

GS19. check for quality of scaffolding/ working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out preparatory work before starting of conservation work in heritage buildings and sites	**10**	**20**	**-**	**-**
PC1. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions	3	7	-	-
PC2. ensure wetting of the walls surfaces prior to plastering, as per instructions	2	3	-	-
PC3. prepare the surface of the wall using lime mortar as per drawings/ sketches / instructions	3	7	-	-
PC4. undertake necessary protection measures to protect the historic fabric	2	3	-	-
Apply lime plaster on walls in heritage buildings and sites	**12**	**28**	**-**	**-**
PC5. apply the base coat of lime plaster of specified thickness as per specifications / /instructions using recommended tools while maintaining the contour	3	7	-	-
PC6. scour the surface using appropriate tools to avoid cracks and peeling in the scratch coat	3	7	-	-
PC7. apply further coats of plaster as per specifications / /instructions	3	7	-	-
PC8. finish the final plaster as per specifications / /instructions and ensure proper curing of finished surface	3	7	-	-
Repair lime plaster on walls in heritage buildings and sites	**8**	**22**	**-**	**-**
PC9. cut the damaged/affected patch using appropriate tools	3	7	-	-
PC10. rake out the loose pointing in the wall behind and repoint roughly	2	3	-	-
PC11. brush out loose dust and apply the plaster in thin coats using recommended tools as per specifications/ instructions	1	4	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. consolidate and save the cracked and hollow plaster	1	4	-	-
PC13. finish the final plaster patch as per specifications / instructions and ensure proper curing of finished surface	1	4	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5103
NOS Name	Carry out lime render and plaster on walls of heritage buildings
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

CON/N5104: Carry out pointing with lime in brick and stone work

Description

This unit describes the skills and knowledge required by a lime mason to carry out pointing with lime in brick and stone work

Scope

This scope covers the following:

- Carry out preparatory works prior to pointing work on wall in heritage buildings and sites
- Carry out pointing works in heritage buildings and sites
- Carry out brushing of the joints in heritage buildings and sites
- Carry out protection of pointing in heritage buildings and sites

Elements and Performance Criteria

Carry out preparatory works prior to pointing works on wall in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC1. rake out loose, powdery or decayed mortar using recommended tools while maintaining width of joints

PC2. grout rubble walls previously repointed in lime mortar in case of hollow joints prior to pointing

PC3. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions

Carry out pointing works in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC4. carry out the pointing works as per drawings/ sketches /instruction using appropriate tools

PC5. apply mortar ensuring there is no gap behind the new pointing

Carry out brushing of the joint in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC6. brush or tamp the joints with appropriate tools on the surface of the mortar and close any cracks that might have formed

PC7. carry out curing of pointing works as per specifications

Carry out protection of pointing in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC8. carry out curing of pointing works as per specifications

PC9. ensure protection of new pointing form direct sun, wind and rain

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. traditional practices for carrying out pointing in lime

KU2. the traditional materials techniques and equipment

KU3. personal protection including the use of related safety gears and equipment
KU4. maintenance of tools and equipment
KU5. drawings/ sketches for pointing with lime in stone and brick masonry
KU6. basic principles of measurement
KU7. standard specifications of all masonry tools and equipment, their care and maintenance
KU8. Use of basic leveling tools in the masonry trade such as spirit level, water level, plump bob, line thread, etc
KU9. selction and use of tools and equipment such as - measuring tape, trowels, straightedge, shovels, wheelbarrows, joint rules, masons square, quirk channel with blade, pointing key, metal spatula etc.
KU10. Process to determine the vertical and horizontal alignment
KU11. basic knowledge of water lime ratio
KU12. techniques for repairing and finishing
KU13. different mortar mixes used for pointing
KU14. grouting of rubble walls to restore strength and solidarity of the wall
KU15. various pointing and raking tools and techniques and method of pointing a joint as per specifications
KU16. advantage of using only hand tools, preferably scraping and picking tools to rake out the mortar
KU17. advantage of avoiding hackling and chiseling in pointing works
KU18. process of mortar mixing
KU19. process of pointing
KU20. process of brushing on pointing works
KU21. why to avoid brushing along the joint
KU22. process of providing protection to pointing works

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site
GS2. read and follow in one or more languages, preferably the local language at the site
GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags
GS4. speak in one or more languages, preferably one of the local language on the site
GS5. listen and follow instructions given by the site-in-charge/ supervisor/ consultant conservation architect
GS6. effectively communicate with team members
GS7. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work
GS8. decide on the workability of lime mortar /concrete
GS9. plan work and organize required resource in coordination with team members and supervisors
GS10. complete work as per the agreed time schedule and quality

GS11. ensure the mix of the additives and lime mortar to achieve the desired consistency, texture and colour

GS12. resolve and solve any conflict within the team

GS13. optimize resources efficiently

GS14. assess quantity and quality of materials for day work

GS15. minimize wastage in the workplace

GS16. start and finish levels for day work

GS17. evaluate the complexity of the task and seek assistance and support wherever required

GS18. bring to the notice of the superiors any requirement of the requisite material and resources

GS19. check for quality of scaffolding/ working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out preparatory works prior to pointing works on wall in heritage buildings and sites	**11**	**24**	**-**	**-**
PC1. rake out loose, powdery or decayed mortar using recommended tools while maintaining width of joints	3	7	-	-
PC2. grout rubble walls previously repointed in lime mortar in case of hollow joints prior to pointing	5	10	-	-
PC3. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions	3	7	-	-
Carry out pointing works in heritage buildings and sites	**7**	**18**	**-**	**-**
PC4. carry out the pointing works as per drawings/ sketches /instruction using appropriate tools	4	11	-	-
PC5. apply mortar ensuring there is no gap behind the new pointing	3	7	-	-
Carry out brushing of the joint in heritage buildings and sites	**6**	**14**	**-**	**-**
PC6. brush or tamp the joints with appropriate tools on the surface of the mortar and close any cracks that might have formed	3	7	-	-
PC7. carry out curing of pointing works as per specifications	3	7	-	-
Carry out protection of pointing in heritage buildings and sites	**6**	**14**	**-**	**-**
PC8. carry out curing of pointing works as per specifications	3	7	-	-
PC9. ensure protection of new pointing form direct sun, wind and rain	3	7	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5104
NOS Name	Carry out pointing with lime in brick and stone work
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

CON/N5105: Carry out conservation of ornamental plaster work in lime for heritage buildings

Description

This unit describes the skills and knowledge required by a lime mason to conserve ornamental plaster work in lime including cornice bands, decorative mouldings

Scope

This scope covers the following:

- Carry out conservation and repair of cornice bands, decorative mouldingsand bands or other patterns running over plinth or other areas in heritagebuildings and sites as per instructions by the supervisor/ site-in-charge/consulting conservation architect

Elements and Performance Criteria

Carry out conservation and repair of cornice bands, decorative mouldings and bands or other patterns running over plinth or other areas in heritage buildings and sites as per instructions by the supervisor/ site-in-charge/ consulting conservation architect

To be competent, the user/individual on the job must be able to:

PC1.	identify and separate the area for repair and conservation and ensure proper support and scaffolding is provided for the work
PC2.	remove the damaged section to expose the underlying structure to which the cornice/moulding is secured
PC3.	obtain a cross-section or profile through the cornice/moulding from finish ceiling to finish lines using an appropriate method as per drawings/ sketches / instructions
PC4.	reproduce, cut and fit the new length of cornice/moulding to match the existing cornice/moulding as per drawings/ sketches /instructions
PC5.	reproduce the ornamentation on the cornice/moulding as per drawings/ sketches / instructions
PC6.	repair and restore the existing ornamental plaster work as per drawings/ sketches / instructions

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1.	traditional practices for conservation of ornamental plaster work
KU2.	the traditional materials techniques and equipment
KU3.	personal protection including the use of related safety gears and equipment
KU4.	maintenance of tools and equipment
KU5.	drawings/ sketches for pointing with lime in stone and brick masonry
KU6.	basic principles and units of measurement

KU7. standard specifications of all masonry tools and equipment, their care and maintenance

KU8. type and size of raw materials

KU9. how to use basic leveling tools in the masonry trade such as spirit level, water level, plumb bob, line thread, etc.

KU10. how to select and use tools and equipment such as measuring tape, trowels, straightedge, shovels, wheelbarrows, joint rules, masons square, etc.

KU11. how to determine vertical and horizontal alignment using appropriate tools to provide vertical datum lines for building measurements

KU12. how to use the triangulation method (3-4-5 method) for squaring corners

KU13. mortar mix proportions and its importance

KU14. basic knowledge of water lime ratio

KU15. techniques for repairing and finishing

KU16. different mortar mixes used for pointing

KU17. various pointing and raking tools and techniques and method of pointing a joint as per specification

KU18. process of conservation of ornamental plaster work in lime including cornicebands, decorative mouldings, stucco work, coffered ceiling and ceiling medallions

KU19. knowledge of different ornamental elements in heritage sites

KU20. knowledge of traditional materials and techniques used in preparation of original decorative elements

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site

GS2. read and follow in one or more languages, preferably the local language at the site

GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags

GS4. speak in one or more languages, preferably one of the local language on the site

GS5. effectively communicate with team members

GS6. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work

GS7. decide on the workability of lime mortar /concrete

GS8. plan work and organize required resource in coordination with team members and supervisors

GS9. complete work as per the agreed time schedule and quality

GS10. ensure the mix of the additives and lime mortar to achieve the desired consistency, texture and colour

GS11. resolve and solve any conflict within the team

GS12. optimize resources efficiently

GS13. assess quantity and quality of materials for day work

GS14. minimize wastage in the workplace

GS15. start and finish levels for day work

GS16. evaluate the complexity of the task and seek assistance and support wherever required

GS17. bring to the notice of the superiors any requirement of the requisite material and resources

GS18. check for quality of scaffolding/ working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out conservation and repair of cornice bands, decorative mouldings and bands or other patterns running over plinth or other areas in heritage buildings and sites as per instructions by the supervisor/ site-in-charge/ consulting conservation architect	**30**	**70**	**-**	**-**
PC1. identify and separate the area for repair and conservation and ensure proper support and scaffolding is provided for the work	5	10	-	-
PC2. remove the damaged section to expose the underlying structure to which the cornice/moulding is secured	5	10	-	-
PC3. obtain a cross-section or profile through the cornice/moulding from finish ceiling to finish lines using an appropriate method as per drawings/ sketches / instructions	5	15	-	-
PC4. reproduce, cut and fit the new length of cornice/moulding to match the existing cornice/moulding as per drawings/ sketches /instructions	5	15	-	-
PC5. reproduce the ornamentation on the cornice/moulding as per drawings/ sketches / instructions	5	10	-	-
PC6. repair and restore the existing ornamental plaster work as per drawings/ sketches / instructions	5	10	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5105
NOS Name	Carry out conservation of ornamental plaster work in lime for heritage buildings
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

CON/N5107: Identify, cut, dress, lay and fix stone in heritage buildings and sites

Description

This unit describes the skills and knowledge required to identify, cut, dress, lay, and fix the stone for use in different types of work in heritage buildings and sites

Scope

This scope covers the following:

- Carry out preparatory work before starting masonry work in heritage buildings and sites.
- Identify,cut and dress stones for masonry works
- Lay and fix stones ensuring line, level and alignment in heritage buildings and sites
- Carry out pointing in stone masonry.
- Carry out curing and protection of stone masonry

Elements and Performance Criteria

Carry out preparatory work before starting of masonry work in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC1. select tools and tackles for work and ensure they are in working condition

PC2. set out the layouts as per instructions

PC3. identify and select stone matching the existing masonry on heritage building and sites and ensure they are free from defects

PC4. identify and transfer the required levels and markings using appropriate tools

Identifiy,cut and dress stones for masonry works

To be competent, the user/individual on the job must be able to:

PC5. mark correct dimensions on the stone before cutting/dressing

PC6. cut the stone block as per specifications/instructions

PC7. chisel and dress all sides of the cut stone member to ensure maximum fit while laying and fixing

Lay and fix stones ensuring line, level and alignment in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC8. lay and fix the stones as per specification while ensuring the line, level and alignment

PC9. lay and compact the lime mortar between joints as per specifications

PC10. check vertical and horizontal alignment using appropriate tools and maintain the same as per requirements

Carrying out pointing in stone masonry using lime mortar

To be competent, the user/individual on the job must be able to:

PC11. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions

PC12. out various types of pointing as per historic details using lime mortarincluding:a. flush pointingb. keyed/ grooved pointingc. recessed pointing

Carry out curing and protection of stone masonry

To be competent, the user/individual on the job must be able to:

PC13. carry out curing as per specifications / instructions

PC14. protect the masonry from damage, mortar dropping and rain during building works as per instructions/specifications

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. personal protection including the use of related safety gears &equipment

KU2. the traditional materials, techniques and equipment

KU3. how to request tools and materials as per set procedures

KU4. maintenance of tools and equipment

KU5. instructions based on drawings/ sketches for conservation works

KU6. basic principles and units of measurements

KU7. standard specifications of all masonry tools and equipment, their care and maintenance

KU8. how to use basic leveling tools in the masonry trade such as spirit level, water level, plumb bob, line thread, etc.

KU9. how to select and use tools and equipment such as measuring tape, trowels, floats, brushes, shovels, wheel-barrows, joint rules, masons square, etc.

KU10. how to determine vertical and horizontal alignment using appropriate tools to provide vertical datum lines for building measurements

KU11. how to use the Triangulation method (3-4-5 method) for squaring corners

KU12. how to identify type and size of stones in heritage buildings

KU13. understand the existing defects in historic stones like delamination, splitting, disintegration, bursting, cavities, fractures and cracks, flaws and sand holes, injurious veins and patches of loose or soft materials

KU14. various techniques/ procedures for cutting/ chiseling/ dressing different types of stone

KU15. type of mortar used for different types of stones works in heritage buildings and sites

KU16. properties of mortar and the knowledge of mix proportions

KU17. basic knowledge of water lime ratio

KU18. knowledge about how to lay and fix hard stones in position of the historic works

KU19. knowledge about the size and nature of joints

KU20. method of curing stone masonry structures

KU21. types of mortar mixes used for pointing in heritage buildings

KU22. various pointing and raking tools and techniques and method of pointing a joint as per specifications

KU23. process of pointing

KU24. process of curing and surface protection

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site
GS2. read and follow in one or more languages, preferably the local language at the site
GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags
GS4. speak in one or more languages, preferably one of the local language on the site
GS5. effectively communicate with team members
GS6. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work
GS7. decide on the workability of lime mortar /concrete
GS8. plan work and organize required resource in coordination with team members and supervisors
GS9. complete work as per the agreed time schedule and quality
GS10. ensure the mix of the additives and lime mortar to achieve the desired consistency, texture and colour
GS11. resolve and solve any conflict within the team
GS12. optimize resources efficiently
GS13. assess quantity and quality of materials for day work
GS14. minimize wastage in the workplace
GS15. start and finish levels for day work
GS16. evaluate the complexity of the task and seek assistance and support wherever required
GS17. bring to the notice of the superiors any requirement of the requisite material and resources
GS18. check for quality of scaffolding/ working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out preparatory work before starting of masonry work in heritage buildings and sites	**5**	**17**	**-**	**-**
PC1. select tools and tackles for work and ensure they are in working condition	1	4	-	-
PC2. set out the layouts as per instructions	1	4	-	-
PC3. identify and select stone matching the existing masonry on heritage building and sites and ensure they are free from defects	2	5	-	-
PC4. identify and transfer the required levels and markings using appropriate tools	1	4	-	-
Identifiy,cut and dress stones for masonry works	**8**	**16**	**-**	**-**
PC5. mark correct dimensions on the stone before cutting/dressing	2	4	-	-
PC6. cut the stone block as per specifications/instructions	2	6	-	-
PC7. chisel and dress all sides of the cut stone member to ensure maximum fit while laying and fixing	4	6	-	-
Lay and fix stones ensuring line, level and alignment in heritage buildings and sites	**7**	**16**	**-**	**-**
PC8. lay and fix the stones as per specification while ensuring the line, level and alignment	3	7	-	-
PC9. lay and compact the lime mortar between joints as per specifications	2	6	-	-
PC10. check vertical and horizontal alignment using appropriate tools and maintain the same as per requirements	2	3	-	-
Carrying out pointing in stone masonry using lime mortar	**8**	**13**	**-**	**-**
PC11. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions	7	9	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. out various types of pointing as per historic details using lime mortarincluding:a. flush pointingb. keyed/ grooved pointingc. recessed pointing	1	4	-	-
Carry out curing and protection of stone masonry	**2**	**8**	**-**	**-**
PC13. carry out curing as per specifications / instructions	1	4	-	-
PC14. protect the masonry from damage, mortar dropping and rain during building works as per instructions/specifications	1	4	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5107
NOS Name	Identify, cut, dress, lay and fix stone in heritage buildings and sites
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

CON/N5108: Reconstruct stone masonry walls, stone domes, brackets, arches, column and beams in heritage buildings and sites

Description

This unit describes the skills and knowledge required by a mason to re-build and/or, reconstruct stone masonry walls, domes, brackets, arches, columns and beams using sandstone, limestone, granite, quartzite and laterite for rubble and ashlar masonry in heritage buildings and sites

Scope

This scope covers the following:

- Carry out preparatory works for stone masonry
- Lay and fix stones for repairing/reconstruction of wall in coursed/uncoursed/ashlar masonry in heritage buildings and sites
- Carry out pointing and curing of finished masonry
- Repair, re-build / reconstruct arches and domes.
- Repair, re-build / reconstruct staircases , beams and columns

Elements and Performance Criteria

Carry out preparatory works for stone masonry

To be competent, the user/individual on the job must be able to:

PC1. select tools and tackles for work and ensure they are in working condition

PC2. set out the layouts as per instructions

PC3. identify and select stone matching the existing masonry on heritage building and sites and ensure they are free from defects

PC4. identify and transfer the required levels and markings using appropriate tools

PC5. mark correct dimensions on the stone before cutting/dressing

PC6. cut the stone block as per specifications/instructions

PC7. chisel and dress all sides of the cut stone member to ensure maximum fit while laying and fixing

PC8. dress the face stone on all beds and joints so as to give them approximately rectangular block shape for coursed rubble masonry

PC9. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions

Lay and fix stones for repairing/reconstruction of wall in coursed/uncoursed/ashlar masonry in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC10. lay and fix the stones for coursed/uncoursed/ashlar masonry as per specification while ensuring the line, level and alignment

PC11. level the courses at plinth, windowsills, lintel and roof levels

PC12. provide bond/ through stones in walls as per drawings/ sketch / instructions

PC13. lay and compact the lime mortar between joints as per specifications

PC14. maintain joints as per specification/instructions

PC15. check vertical and horizontal alignment using appropriate tools and maintain the same as per requirements

Carry out pointing and curing of finished masonry

To be competent, the user/individual on the job must be able to:

PC16. carry out pointing on all exposed joints with lime mortar as per specifications / instructions

PC17. finish the joints at the time of laying as per specifications / drawings/ sketches

PC18. carry out curing and protection of finished masonry surface

Repair, re-build / reconstruct of arches and domes

To be competent, the user/individual on the job must be able to:

PC19. carry out structural strengthening of masonry arches as per specifications/instructions

PC20. ensure scaffolding is erected at site for masonry works

PC21. install arch masonry unit by laying and aligning stones as per specifications/instructions

Repair, re-build / reconstruct of staircases ,beams and columns

To be competent, the user/individual on the job must be able to:

PC22. maintain the set out of tread and riser of staircase as specification/instructions

PC23. erect the masonry column as per drawings/ sketches / instructions

PC24. follow the historic joints and jointing techniques as per specifications/ instructions

PC25. lay and finish the stone on staircase as per specifications/ instructions

PC26. maintain that the rise of stone work is in line and level

PC27. ensure proper curing of reconstructed masonry structure

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. traditional practices for repair ,reconstruction and re-building of stone masonry walls in heritage buildings and sites

KU2. traditional practices for reconstruction and rebuilding of arches, domes, staircases, beams and columns in historic buildings and sites

KU3. the traditional methods, tools and equipment in heritage buildings and sites.

KU4. personal protection including the use of related safety gears &equipment

KU5. maintenance of tools and equipment

KU6. drawings/ sketches for conservation works

KU7. basic principles and units of measurements

KU8. standard specifications of all masonry tools and equipment, their care and maintenance

KU9. use of basic leveling tools in the masonry trade such as spirit level, water level, plumb bob, line thread, etc

KU10. selection and use of tools and equipment such as measuring tape, trowels, floats, brushes, shovels, wheel-barrows, joint rules, masons square, etc.

KU11. process to determine vertical and horizontal alignment using appropriate tools to provide vertical datum lines for building measurements

KU12. use of the Triangulation method (3-4-5 method) for squaring corners
KU13. type and size of stones in heritage buildings
KU14. defects in stones like cavities, cracks, flaws, sand holes, injurious veins and patches of loose or soft materials
KU15. various techniques/ procedures for cutting/ chiseling/ dressing different types of stone
KU16. type of lime mortar used in heritage buildings and sites
KU17. properties of mortar and the knowledge of mix proportions
KU18. use of stones chips (pinning stones) for filling interstices between adjacent stones in restricted to minimum basic knowledge of water lime ratio
KU19. knowledge about how to lay and fix hard stones in position of the historic works
KU20. knowledge about the size and nature of joints
KU21. method of curing new stone masonry works after execution
KU22. various pointing and raking tools and techniques and method of pointing the masonry joint as per specifications
KU23. how to lay and fix stone slab/ block in position
KU24. arch, dome and vault construction techniques, its component & terminology
KU25. staircase construction techniques, its component & terminology
KU26. process of removing the decayed stones and relaying and fixings new stones for staircases, domes, arches, chajjas, beams and columns
KU27. importance of appropriate joint spacing & gauging in arches
KU28. techniques for repairing & finishing masonry works for different purposes
KU29. Process of curing and protection of finished masonry

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site
GS2. read and follow in one or more languages, preferably the local language at the site
GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags
GS4. speak in one or more languages, preferably one of the local language on the site
GS5. effectively communicate with team members
GS6. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work
GS7. decide on the workability of lime mortar /concrete
GS8. plan work and organize required resource in coordination with team members and supervisors
GS9. complete work as per the agreed time schedule and quality
GS10. ensure the mix of the additives and lime mortar to achieve the desired consistency, texture and colour
GS11. resolve and solve any conflict within the team
GS12. optimize resources efficiently

GS13. assess quantity and quality of materials for day work
GS14. minimize wastage in the workplace
GS15. start and finish levels for day work
GS16. evaluate the complexity of the task and seek assistance and support wherever required
GS17. bring to the notice of the superiors any requirement of the requisite material and resources
GS18. check for quality of scaffolding/ working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out preparatory works for stone masonry	**9**	**26**	**-**	**-**
PC1. select tools and tackles for work and ensure they are in working condition	1	2	-	-
PC2. set out the layouts as per instructions	1	3	-	-
PC3. identify and select stone matching the existing masonry on heritage building and sites and ensure they are free from defects	1	3	-	-
PC4. identify and transfer the required levels and markings using appropriate tools	1	2	-	-
PC5. mark correct dimensions on the stone before cutting/dressing	1	2	-	-
PC6. cut the stone block as per specifications/instructions	1	3	-	-
PC7. chisel and dress all sides of the cut stone member to ensure maximum fit while laying and fixing	1	4	-	-
PC8. dress the face stone on all beds and joints so as to give them approximately rectangular block shape for coursed rubble masonry	1	4	-	-
PC9. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions	1	3	-	-
Lay and fix stones for repairing/reconstruction of wall in coursed/uncoursed/ashlar masonry in heritage buildings and sites	**8**	**14**	**-**	**-**
PC10. lay and fix the stones for coursed/uncoursed/ashlar masonry as per specification while ensuring the line, level and alignment	3	4	-	-
PC11. level the courses at plinth, windowsills, lintel and roof levels	1	2	-	-
PC12. provide bond/ through stones in walls as per drawings/ sketch / instructions	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. lay and compact the lime mortar between joints as per specifications	1	2	-	-
PC14. maintain joints as per specification/instructions	1	2	-	-
PC15. check vertical and horizontal alignment using appropriate tools and maintain the same as per requirements	1	2	-	-
Carry out pointing and curing of finished masonry	**3**	**7**	**-**	**-**
PC16. carry out pointing on all exposed joints with lime mortar as per specifications / instructions	1	3	-	-
PC17. finish the joints at the time of laying as per specifications / drawings/ sketches	1	2	-	-
PC18. carry out curing and protection of finished masonry surface	1	2	-	-
Repair, re-build / reconstruct of arches and domes	**4**	**11**	**-**	**-**
PC19. carry out structural strengthening of masonry arches as per specifications/instructions	2	4	-	-
PC20. ensure scaffolding is erected at site for masonry works	1	2	-	-
PC21. install arch masonry unit by laying and aligning stones as per specifications/instructions	1	5	-	-
Repair, re-build / reconstruct of staircases ,beams and columns	**6**	**12**	**-**	**-**
PC22. maintain the set out of tread and riser of staircase as specification/instructions	1	2	-	-
PC23. erect the masonry column as per drawings/ sketches / instructions	1	2	-	-
PC24. follow the historic joints and jointing techniques as per specifications/ instructions	1	2	-	-
PC25. lay and finish the stone on staircase as per specifications/ instructions	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC26. maintain that the rise of stone work is in line and level	1	2	-	-
PC27. ensure proper curing of reconstructed masonry structure	1	2	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5108
NOS Name	Reconstruct stone masonry walls, stone domes, brackets, arches, column and beams in heritage buildings and sites
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

CON/N5109: Lay and fix stone for flooring in heritage building and sites

Description

This unit describes the skills and knowledge required by a mason to lay and fix stone in floor, staircase, dado and for plinth protection in heritage buildings and sites

Scope

This scope covers the following:

- carry out preparatory work for laying the stone in floor, staircase, and dado and plinth protection.
- lay, place and fix the stone for flooring works.
- carry out finishing works on stone flooring in heritage buildings and sites

Elements and Performance Criteria

Carry out preparatory work for laying the stone in floor, staircase, dado and plinth protection

To be competent, the user/individual on the job must be able to:

PC1. check basic attributes of the floor, staircase, dado and plinth and ensure surface is free from any debris or obstructions

PC2. check level and compactness of surface using appropriate tools

PC3. measure dimensions of surface and ensure its adequacy for laying of stones

PC4. carry out necessary markings of surface to provide direction for laying of stone as per drawings/ sketches / instructions

PC5. check surface for completion of embedded services and make necessary provisions for the same as per applicability

PC6. identify and select stone matching the existing masonry on heritage building and sites and ensure they are free from defects

PC7. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions

Lay, place and fix the stone for flooring works

To be competent, the user/individual on the job must be able to:

PC8. lay and set the stones in place as per drawings/ sketches / instructions

PC9. fill any depressions/ gaps with lime mortar as per specification/instructions

PC10. lime slurry/ lime mortar to join the stone as per specification/instructions

Carry out finishing works on stone flooring in heritage buildings and sites

To be competent, the user/individual on the job must be able to:

PC11. the surface by rubbing and grinding using appropriate tools, as per specification

PC12. polish the stone as per specification

PC13. carry out curing and protection of finished surface

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. traditional practices for laying and fixing stone in heritage buildings and site
KU2. traditional practices for laying and fixing stone in heritage buildings and site
KU3. personal protection including the use of related safety gears & equipment
KU4. maintenance of tools and equipment
KU5. drawings/ sketches for conservation works
KU6. basic principles and units of measurements
KU7. standard specifications of all masonry tools and equipment, their care and maintenance
KU8. use of basic leveling tools in the masonry trade such as spirit level, water level, plumb bob, line thread, etc
KU9. selection and use of tools and equipment such as measuring tape, trowels, floats, brushes, shovels, wheel-barrows, joint rules, masons square, etc.
KU10. how to determine vertical and horizontal alignment using appropriate toolsto provide vertical datum lines for building measurements
KU11. use of the Triangulation method (3-4-5 method) for squaring corners
KU12. type and size of stones in heritage buildings
KU13. defects in stones like cavities, cracks, flaws, sand holes, injurious veins and patches of loose or soft materials
KU14. various techniques/ procedures for cutting/ chiseling/ dressing different types of stone
KU15. type of lime mortar used in heritage buildings and sites
KU16. properties of mortar and the knowledge of mix proportions
KU17. estimate any special requirements, as per the site to cut, lay and fix the stone
KU18. basic knowledge of water lime ratio
KU19. basic properties, use & applications of different types of stone like granite, marble, limestone and kota stone used in flooring works
KU20. methods and techniques of preparing bed mortar, lime slurry and lime paste required as per types of surface and stone
KU21. method of laying and fixing stones for flooring works
KU22. methods and techniques of finishing & polishing stone
KU23. process of curing and protection

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site
GS2. read and follow in one or more languages, preferably the local language at the site
GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags
GS4. speak in one or more languages, preferably one of the local language on the site
GS5. effectively communicate with team members
GS6. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work
GS7. decide on the workability of lime mortar /concrete

GS8. plan work and organize required resource in coordination with team members and supervisors

GS9. complete work as per the agreed time schedule and quality

GS10. ensure the mix of the additives and lime mortar to achieve the desired consistency, texture and colour

GS11. resolve and solve any conflict within the team

GS12. optimize resources efficiently

GS13. assess quantity and quality of materials for day work

GS14. minimize wastage in the workplace

GS15. start and finish levels for day work

GS16. evaluate the complexity of the task and seek assistance and support wherever required

GS17. bring to the notice of the superiors any requirement of the requisite materialand resources

GS18. check for quality of scaffolding/ working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out preparatory work for laying the stone in floor, staircase, dado and plinth protection	**10**	**31**	**-**	**-**
PC1. check basic attributes of the floor, staircase, dado and plinth and ensure surface is free from any debris or obstructions	2	6	-	-
PC2. check level and compactness of surface using appropriate tools	1	4	-	-
PC3. measure dimensions of surface and ensure its adequacy for laying of stones	1	4	-	-
PC4. carry out necessary markings of surface to provide direction for laying of stone as per drawings/ sketches / instructions	1	4	-	-
PC5. check surface for completion of embedded services and make necessary provisions for the same as per applicability	1	4	-	-
PC6. identify and select stone matching the existing masonry on heritage building and sites and ensure they are free from defects	2	6	-	-
PC7. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions	2	3	-	-
Lay, place and fix the stone for flooring works	**13**	**25**	**-**	**-**
PC8. lay and set the stones in place as per drawings/ sketches / instructions	7	11	-	-
PC9. fill any depressions/ gaps with lime mortar as per specification/instructions	3	7	-	-
PC10. lime slurry/ lime mortar to join the stone as per specification/instructions	3	7	-	-
Carry out finishing works on stone flooring in heritage buildings and sites	**7**	**14**	**-**	**-**
PC11. the surface by rubbing and grinding using appropriate tools, as per specification	3	7	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. polish the stone as per specification	2	4	-	-
PC13. carry out curing and protection of finished surface	2	3	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5109
NOS Name	Lay and fix stone for flooring in heritage building and sites
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

CON/N5110: Lay and fix decorative elements in heritage building

Description

This unit describes the skills and knowledge required by a stone mason to carefully lay and fix decorative elements including brackets, chajja (sun shade), cornices, eavesand jaali (stone screens) in heritage buildings

Scope

This scope covers the following:

- Carry out preparatory works for fixing of hajji (sun shade), cornices, eaves and jaali (stone screens)
- Lay and fix stone chajja (sunshade) in heritage buildings.
- Lay and fix brackets, copings, cornices and eaves in heritage buildings.
- Lay and fix jaali (stone screens) in heritage buildings.
- Carry out pointing and curing of decorative elements

Elements and Performance Criteria

Carry out preparatory works for fixing of hajji (sun shade),cornices, eaves and jaali (stone screens)

To be competent, the user/individual on the job must be able to:

PC1. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions

PC2. identify and select stone matching the existing masonry on heritage building and sites and ensure they are free from defects

PC3. ensure that the stone slabs being used are hard, sound, durable and free from any damage or cracks

PC4. chisel dress all exposed sides of stone and rough dress the unexposed side

Lay and fix stone chajja (sunshade) in heritage buildings

To be competent, the user/individual on the job must be able to:

PC5. dress and finish the stone slab as per specification

PC6. fix the stone in position as per specification / instructions

PC7. provide slope and bearing as per specifications / drawings/ sketches / instructions

Lay and fix copings, cornices and eaves in heritage buildings

To be competent, the user/individual on the job must be able to:

PC8. dress and finish the stones for copings, cornices and eaves as per specifications

PC9. ensure to obtain carved stones from stone carver are as per drawing, design or specification

PC10. .lay the stone in lime mortar of specified mix and fix as per drawings/ sketches or as per instructions

Lay and fix jaali (stone screens) in heritage buildings

To be competent, the user/individual on the job must be able to:

PC11. chisel cut the stone carefully into slabs of required thickness

PC12. dress and finish the stones for jaali as per specifications

PC13. ensure to obtain jaali design as per pattern from stone carver for any ornamentation/ carving pattern as per drawings/ sketches / instructions

PC14. fine tool all exposed faces of jaali to a uniform and smooth finish

PC15. fix the jaali in coordination with the stone carver as per the drawing/ sketches or as per instructions

Carry out pointing and curing of decorative elements

To be competent, the user/individual on the job must be able to:

PC16. carry out pointing on the joints as per specification

PC17. carry out curing and protection of the exposed surface

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. traditional practices for laying and fixing different elements in stone masonry in heritage buildings and sites

KU2. the traditional methods, tools and equipment

KU3. personal protection including the use of related safety gears & equipment

KU4. maintenance of tools and equipment

KU5. drawings/ sketches for conservation works

KU6. basic principles and units of measurements

KU7. standard specifications of all masonry tools and equipment, their care and maintenance

KU8. how to use basic leveling tools in the masonry trade such as spirit level, water level, plumb bob, line thread, etc.

KU9. how to select and use tools and equipment such as measuring tape, trowels, floats, brushes, shovels, wheel-barrows, joint rules, masons square, etc.

KU10. type of mortar used in heritage buildings and sites

KU11. properties of mortar and the knowledge of mix proportions

KU12. estimate any special requirements, as per the site to cut, lay and fix the stone

KU13. techniques for repairing & finishing decorative elements

KU14. process of laying and fixing of decorative elements on heritage buildings and sites

KU15. jaali,chajjas which are used commonly in heritage buildings

KU16. various patterns on stone jaalis and chajjas

KU17. process of pointing

KU18. process of curing and protexcting finished decoartove stone elements

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site

GS2. read and follow in one or more languages, preferably the local language at the site

GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags

GS4. speak in one or more languages, preferably one of the local language on the site

GS5. effectively communicate with team members

GS6. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work

GS7. decide on the workability of lime mortar /concrete

GS8. plan work and organize required resource in coordination with team members and supervisors

GS9. complete work as per the agreed time schedule and quality

GS10. ensure the mix of the additives and lime mortar to achieve the desired consistency, texture and colour

GS11. resolve and solve any conflict within the team

GS12. optimize resources efficiently

GS13. assess quantity and quality of materials for day work

GS14. minimize wastage in the workplace

GS15. start and finish levels for day work

GS16. evaluate the complexity of the task and seek assistance and support wherever required

GS17. bring to the notice of the superiors any requirement of the requisite material and resources

GS18. check for quality of scaffolding/ working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out preparatory works for fixing of hajji (sun shade),cornices, eaves and jaali (stone screens)	**5**	**15**	**-**	**-**
PC1. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions	1	4	-	-
PC2. identify and select stone matching the existing masonry on heritage building and sites and ensure they are free from defects	1	4	-	-
PC3. ensure that the stone slabs being used are hard, sound, durable and free from any damage or cracks	1	4	-	-
PC4. chisel dress all exposed sides of stone and rough dress the unexposed side	2	3	-	-
Lay and fix stone chajja (sunshade) in heritage buildings	**7**	**18**	**-**	**-**
PC5. dress and finish the stone slab as per specification	1	4	-	-
PC6. fix the stone in position as per specification / instructions	3	7	-	-
PC7. provide slope and bearing as per specifications / drawings/ sketches / instructions	3	7	-	-
Lay and fix copings, cornices and eaves in heritage buildings	**6**	**14**	**-**	**-**
PC8. dress and finish the stones for copings, cornices and eaves as per specifications	3	7	-	-
PC9. ensure to obtain carved stones from stone carver are as per drawing, design or specification	1	4	-	-
PC10. .lay the stone in lime mortar of specified mix and fix as per drawings/ sketches or as per instructions	2	3	-	-
Lay and fix jaali (stone screens) in heritage buildings	**9**	**16**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. chisel cut the stone carefully into slabs of required thickness	2	3	-	-
PC12. dress and finish the stones for jaali as per specifications	2	3	-	-
PC13. ensure to obtain jaali design as per pattern from stone carver for any ornamentation/ carving pattern as per drawings/ sketches / instructions	1	4	-	-
PC14. fine tool all exposed faces of jaali to a uniform and smooth finish	2	3	-	-
PC15. fix the jaali in coordination with the stone carver as per the drawing/ sketches or as per instructions	2	3	-	-
Carry out pointing and curing of decorative elements	**3**	**7**	**-**	**-**
PC16. carry out pointing on the joints as per specification	2	3	-	-
PC17. carry out curing and protection of the exposed surface	1	4	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5110
NOS Name	Lay and fix decorative elements in heritage building
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

CON/N5111: Carry out veneering/ cladding with stone on walls and domes on heritage buildings and sites

Description

This unit describes the skills and knowledge required by a mason to lay and fix stone slabs as veneer/cladding on walls and domes in heritage buildings

Scope

The scope covers the following:

- carry out preparatory works for wall and dome cladding
- carry out laying and fixing of stone as veneer/cladding on walls and domes

Elements and Performance Criteria

carry outpreparatory works for wall and dome cladding

To be competent, the user/individual on the job must be able to:

PC1. identify and select stone matching the existing masonry on heritage building and sites and ensure they are free from defects

PC2. ensure that stone slabs are cut and finished as per specifications/instructions

PC3. dress the exposed surface and side(s) of the stone as per specifications / instructions

PC4. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions

Carry out laying and fixing of stone as veneer/cladding on walls and domes

To be competent, the user/individual on the job must be able to:

PC5. lay and fix the stone in position with lime mortar without the use of chips and underpinnings

PC6. secure the adjoining stones with the means of pins or anchors of specified materials as per applicability

PC7. secure the stone to the backing as per specification/ instructions

PC8. lay and fix the stone in courses as per specification/ instructions including backing of the surface

PC9. ensure that all joints are of uniform thickness as per evidence at site

PC10. finish the joints as per specifications / instructions

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. traditional practices for laying and fixing stone in heritage buildings

KU2. the traditional methods, tools and equipment

KU3. personal protection including the use of related safety gears & equipment

KU4. maintenance of tools and equipment

KU5. drawings/ sketches for conservation works

KU6. basic principles and units of measurements

KU7. standard specifications of all masonry tools and equipment, their care and maintenance

KU8. Use of basic leveling tools in the masonry trade such as spirit level, water level, plumb bob, line thread, etc..

KU9. Selection and use of tools and equipment such as measuring tape, trowels, floats, brushes, shovels, wheel-barrows, joint rules, masons square, etc.

KU10. how to determine vertical and horizontal alignment using appropriate tools to provide vertical datum lines for building measurements

KU11. how to use the Triangulation method (3-4-5 method) for squaring corners

KU12. standard specification of all tools and materials required for cladding work

KU13. different types of stones such as granite, marble, limestone, kota stone, sandstone, etc. used for veneering and cladding

KU14. process of handling, shifting and placing of stone

KU15. defects in stones like cavities, cracks, flaws, sand holes, injurious veins and patches of loose or soft materials

KU16. various techniques/ procedures for cutting/ chiseling/ dressing differenttypes of stone

KU17. type of mortar used in heritage buildings and sites

KU18. properties of mortar and the knowledge of mix proportions

KU19. basic knowledge of water lime rati

KU20. knowledge about how to lay and fix hard stones in position

KU21. knowledge about the size and nature of joints

KU22. method of curing stone masonry structures

KU23. how to lay and fix stone slab/ block in position

KU24. basic techniques and principles for preparation of vertical surfaces for cladding works

KU25. width of joints in cladding works

KU26. process of securing adjacent stones in cladding works

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write in one or more language, preferably the local language at the site

GS2. read and follow in one or more languages, preferably the local language at the site

GS3. follow instructions, guidelines, sign-boards, safety rules and safety tags

GS4. speak in one or more languages, preferably one of the local language on the site

GS5. effectively communicate with team members

GS6. decide whether work is adequately defined for the day, work front is clear, and adequate material and tools are available for performing the work

GS7. decide on the workability of lime mortar /concrete

GS8. plan work and organize required resource in coordination with team members and supervisors

GS9. complete work as per the agreed time schedule and quality

GS10. ensure the mix of the additives and lime mortar to achieve the desired consistency, texture and colour

GS11. resolve and solve any conflict within the team

GS12. optimize resources efficiently

GS13. assess quantity and quality of materials for day work

GS14. minimize wastage in the workplace

GS15. start and finish levels for day work

GS16. evaluate the complexity of the task and seek assistance and support wherever required

GS17. bring to the notice of the superiors any requirement of the requisite material and resources

GS18. check for quality of scaffolding/ working platform from all aspects of safety

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
carry outpreparatory works for wall and dome cladding	**9**	**25**	**-**	**-**
PC1. identify and select stone matching the existing masonry on heritage building and sites and ensure they are free from defects	2	7	-	-
PC2. ensure that stone slabs are cut and finished as per specifications/instructions	1	4	-	-
PC3. dress the exposed surface and side(s) of the stone as per specifications / instructions	3	7	-	-
PC4. check and ensure the composition and consistency of prepared lime mortar is as per specifications/instructions	3	7	-	-
Carry out laying and fixing of stone as veneer/cladding on walls and domes	**21**	**45**	**-**	**-**
PC5. lay and fix the stone in position with lime mortar without the use of chips and underpinnings	5	10	-	-
PC6. secure the adjoining stones with the means of pins or anchors of specified materials as per applicability	5	10	-	-
PC7. secure the stone to the backing as per specification/ instructions	3	7	-	-
PC8. lay and fix the stone in courses as per specification/ instructions including backing of the surface	3	7	-	-
PC9. ensure that all joints are of uniform thickness as per evidence at site	2	4	-	-
PC10. finish the joints as per specifications / instructions	3	7	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N5111
NOS Name	Carry out veneering/ cladding with stone on walls and domes on heritage buildings and sites
Sector	Construction
Sub-Sector	Heritage Building Works
Occupation	Masonry-Heritage
NSQF Level	4
Credits	TBD
Version	1.0
Next Review Date	11/01/2022

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.

2. The assessment for the knowledge part will be based on knowledge bank of questions created by Assessment Bodies subject to approval by SSC

3. Individual assessment agencies will create unique question papers for knowledge/theory part for assessment of candidates as per assessment criteria given below

4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on assessment criteria.

5. The passing percentage for each QP will be 70%. To pass the Qualification Pack, every trainee should score a minimum of 70% individually in each NOS.

6. The Assessor shall check the final outcome of the practices while evaluating the steps performed to achieve the final outcome.

7. The trainee shall be provided with a chance to repeat the test to correct his procedures in case of improper performance, with a deduction of marks for each iteration.

8. After the certain number of iteration as decided by SSC the trainee is marked as fail, scoring zero marks for the procedure for the practical activity.

9. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack within the specified timeframe set by SSC.

10. Minimum duration of Assessment of each QP shall be of 4hrs/trainee.

Minimum Aggregate Passing % at QP Level : 70

(**Please note**: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CON/N5101.Carry out preparation of lime putty, lime mortar, lime concrete, lime plaster and lime wash for conservation of heritage buildings	30	70	-	-	100	12
CON/N5106.Carry out conservation of heritage buildings by removal of existing decayed lime works and cleaning and repairing of stone surfaces	30	70	-	-	100	8
CON/N8001.Work effectively in a team to deliver desired results at the workplace	30	70	-	-	100	6
CON/N8002.Plan and organize work to meet expected outcomes	30	70	-	-	100	6
CON/N9001.Work according to personal health, safety and environment protocol at construction site	30	70	-	-	100	10
Total	**150**	**350**	**-**	**-**	**500**	**42**

Elective: 1 Lime

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CON/N5102.Carry out laying of lime flooring and terracing in heritage buildings	30	70	-	-	100	15
CON/N5103.Carry out lime render and plaster on walls of heritage buildings	30	70	-	-	100	15
CON/N5104.Carry out pointing with lime in brick and stone work	30	70	-	-	100	12
CON/N5105.Carry out conservation of ornamental plaster work in lime for heritage buildings	30	70	-	-	100	16
Total	**120**	**280**	**-**	**-**	**400**	**58**

Elective: 2 Stone

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CON/N5107.Identify, cut, dress, lay and fix stone in heritage buildings and sites	30	70	-	-	100	12
CON/N5108.Reconstruct stone masonry walls, stone domes, brackets, arches, column and beams in heritage buildings and sites	30	70	-	-	100	12
CON/N5109.Lay and fix stone for flooring in heritage building and sites	30	70	-	-	100	10
CON/N5110.Lay and fix decorative elements in heritage building	30	70	-	-	100	10

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CON/N5111.Carry out veneering/ cladding with stone on walls and domes on heritage buildings and sites	30	70	-	-	100	14
Total	**150**	**350**	**-**	**-**	**500**	**58**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.

Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.