

What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack – Construction DPT Tester

SECTOR: CONSTRUCTION

SUB-SECTOR: Real Estate and Infrastructure Construction

OCCUPATION: QUALITY ASSURANCE AND QUALITY CONTROL

REFERENCE ID: CON/Q0406

ALIGNED TO: NCO-2004/3111.10

This job role performs non-destructive tests (dye penetration test) on structural steel welded sections at a construction site.

Brief Job Description: This job role is responsible for performing dye penetration test non-destructive tests on structural steel components and welded sections. The individual should possess sound technical knowledge, should be able to monitor and maintain safe and quality working practices.

Personal Attributes: This job role requires the individual to be physically and mentally strong enough to oversee the quality control work at a construction site. The individual should be having strong organizational, interpersonal and communication skills, along with comprehensive technical knowledge of quality assurance and quality control operations.

Job Details	Qualifications Pack Code	CON/Q0406		
	Job Role	Construction DPT Tester		
	Credits (NSQF)	TBD	Version number	1.0
	Sector	Construction	Drafted on	07/08/2015
	Sub-sector	Real Estate and Infrastructure Construction	Last reviewed on	23/08/2015
	Occupation	Quality Assurance and Quality Control	Next review date	23/08/2017
	NSQC Clearance on	NA		

Job Role	Construction DPT Tester
Role Description	This job role is responsible for performing dye penetration test on structural steel welded sections.
NSQF level	3
Minimum Educational Qualifications	Preferably 10 th standard, or ASNT level 1 qualified
Maximum Educational Qualifications	N.A
Training (Suggested but not mandatory)	Recommended training period of 2-4 weeks as per QP of Construction DPT Tester Recommended training in basic computer literacy
Minimum Job Entry Age	18 years
Experience	Desirable: 1. Trained worker : Nil
Applicable National Occupational Standards (NOS)	<p>Compulsory:</p> <ol style="list-style-type: none"> CON/N0413: Perform liquid /dye penetration test on structural steel welded joints CON/N9001: Work according to personal health, safety and environment protocol at construction site <p>Optional: N.A.</p>
Performance Criteria	As described in the relevant OS units

Definitions	Keywords / Terms	Description
	Sector	Sector is 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 organization.
	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 they need to meet the standard consistently. Occupational Standards are applicable both in the Indian contexts.
	Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
	Qualifications Pack (QP)	Qualifications Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A Qualification Pack is assigned a unique qualification pack code
	Qualification Pack Code	Qualification Pack Code is a unique reference code that identifies a qualifications pack.
	National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context.
	Scope	Scope is the 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 the quality of performance required.
	Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard
	Organizational Context	Organizational Context includes the way the organization 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	Core Skills or Generic Skills are a group of skills that are key to learning and working 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.	
Acronyms	Keywords /Terms	Description
	CON	Construction
	NSQF	National Skill Qualifications Framework
	QP	Qualification Pack
	OS	Occupational Standards
	TBD	To Be Decided
	DPT	Dye Penetration Test

CON/N0413 Perform liquid /dye penetration test on structural steel welded joints

National Occupational Standard



Overview

This NOS covers the skills and knowledge required by a workman to be proficient in performing liquid /dye penetration test on structural steel welded joints.

CON/N0413 Perform liquid /dye penetration test on structural steel welded joints

National Occupational Standard

Unit Code	CON/N0413
Unit Title (Task)	Perform liquid /dye penetration test on structural steel welded joints
Description	This unit describes the skills and knowledge required to perform liquid /dye penetration test on structural steel welded joints.
Scope	<p>The scope covers the following:</p> <ul style="list-style-type: none"> Perform liquid /dye penetration test on structural steel components and sections to detect deformities present on the surface, or originating from the surface
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Perform liquid /dye penetration test on structural steel components and sections to detect deformities present on the surface, or originating from the surface	<p>To be competent, the user / individual on the job must be able to:</p> <p>PC1. read and interpret the quality plan, WPS, fabrication shop drawings etc. to understand the technical specifications, locations of testing and method to be adopted</p> <p>PC2. identify the location of joint or section for conducting the test as per specification</p> <p>PC3. estimate the quantity of penetrants and developers and time required for completion of test</p> <p>PC4. read and interpret the standard specifications and perform the test in accordance to the same</p> <p>PC5. confirm the compatibility of penetrants and developers with each other, with base metal and with conditions of testing</p> <p>PC6. carry out pre-test cleaning activities using solvents, brushes, scrubs etc. to remove any paint, dust, oil, grease or scale etc. from the test surface</p> <p>PC7. ensure that area surrounding the test surface is also adequately cleaned and free from impurities</p> <p>PC8. identify and use suitable means to apply penetrant on the test surface</p> <p>PC9. apply the penetrant uniformly across the test specimen and allow it to sock into the flaw for instructed or specified period of time</p> <p>PC10. remove excess penetrant from the surface of test specimen using suitable means as per type of penetrant used and manufactures guidelines</p> <p>PC11. avoid direct application of removers/solvents to the test surface</p> <p>PC12. select and use appropriate developers based upon the type of penetrant and inspection condition</p> <p>PC13. apply the developer uniformly across the test specimen as per manufactures guidelines or standard procedure</p> <p>PC14. ensure that developer is not disturbed for specified period of time as per instructions for blotting action to take place correctly</p> <p>PC15. inform the superiors about the completion of blotting period and development of penetrant on the test surface</p>

CON/N0413 Perform liquid /dye penetration test on structural steel welded joints

	PC16. clean the developer and penetrant post inspection of seniors
Knowledge and Understanding (K)	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> KA1. standard practices for quality control works KA2. safety rules and regulations for handling and storing required tools, equipment and materials KA3. personal protection including the use of related safety gears & equipments KA4. service request procedures for tools, materials and equipments KA5. statutory compliance requirement related to working at height KA6. statutory compliance requirement related to workmen engagement
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> KB1. principle of dye penetration test KB2. different materials on which dye penetration test can be carried out KB3. how to select materials used in dye penetration test for various conditions of testing KB4. type of defects inspected by dye penetration test KB5. limitations of dye penetration test KB6. precautions to be taken while conducting dye penetration test KB7. importance of cleaning the surface before and after conducting dye penetration test KB8. different methods of cleaning metal surface KB9. different types of penetrants KB10. different methods of application of penetrants KB11. different types of developers KB12. different methods of application of developers KB13. manufacturers guidelines for application of and development time of various penetrants and developers KB14. safety parameters to be undertaken while conducting the dye penetration test
Skills (S)	
<p>A. Core Skills/ Generic Skills</p>	<p style="text-align: center;">Writing Skills</p>
	<p>The user/ individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SA1. write in at least two language, preferably in the local language of the site and basic English SA2. provide clear and simple instructions, details & sketches to sub-ordinate SA3. record and document daily productivity report, daily labour attendance & details regarding work SA4. prepare basic status updates for the superiors in the prescribed format

CON/N0413 Perform liquid /dye penetration test on structural steel welded joints

	Reading Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SA5. read one or more language, preferably in the local language of the site SA6. read drawing, specification and standards related to relevant work SA7. read key documents including quality standards and standard working methods SA8. read various, sign boards, safety rules and safety tags , instructions related to exit routes during emergency at the workplace
	Oral Communication (Listening and Speaking skills)
	<p>The user/ individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SA9. speak in one or more language, preferably in one of the local languages of the site SA10. listen and follow instructions clearly given by the superior SA11. provide clear instructions to subordinates for completion of task as per work plan, time schedule and quality
B. Professional Skills	Decision Making
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB1. estimate required material, time and resources for work SB2. decide alternate course of action in case of hindrance to work SB3. determine appropriate location of joint / segment for testing SB4. determine quantity of developers and penetrants and assess compatibility with base metal and testing conditions SB5. determine appropriate method for uniform application of penetrant and developer
	Plan and Organise
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB6. plan work targets, allocate time schedule to sub-ordinates and organize completion of task within allocated time
	Customer centricity
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB7. ensure completion of work as per agreed time schedule and quality
	Problem solving
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB8. report to superiors in case of any defects or shortage in tested components and sections SB9. check for impurities / dirt on test surface and rectify

CON/N0413 Perform liquid /dye penetration test on structural steel welded joints

	SB10. check for excess penetrant on the surface and remove the same
	SB11. ensure that removers / solvents are not directly applied to the test surface
	Analytical Thinking
	The user/individual on the job needs to know and understand how to:
	SB12. assess quantity of materials for day work
	SB13. optimize resources
	SB14. minimize wastages
Critical Thinking	
	The user/individual on the job needs to know and understand how to:
	SB15. assess complexity of the tasks and provide guidance for carrying out corrective action as per requirement
	SB16. identify and assess how violation of any safety norms may lead to accidents



CON/N0413 Perform liquid /dye penetration test on structural steel welded joints

NOS Version Control

NOS Code	CON/N0413		
Credits (NSQF)	TBD	Version number	1.0
Industry	Construction	Drafted on	07/08/2015
Industry Sub-sector	Real Estate and Infrastructure Construction	Last reviewed on	23/08/2015
Occupation	Quality Assurance and Quality Control	Next review date	23/08/2017



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

National Occupational Standard



Overview

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

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

National Occupational Standard

Unit Code	CON/N9001
Unit Title (Task)	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	<p>The scope covers the following:</p> <ul style="list-style-type: none"> • Follow safety norms as defined by organization • Adopt healthy & safe work practices • Implement good housekeeping and environment protection process and activities
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Follow safety norms as defined by organization	<p>To be competent, the user / individual on the job must be able to:</p> <p>PC1. identify and report any hazards, risks or breaches in site safety to the appropriate authority</p> <p>PC2. follow emergency and evacuation procedures in case of accidents, fires, natural calamities</p> <p>PC3. follow recommended safe practices in handling construction materials, including chemical and hazardous material whenever applicable</p> <p>PC4. participate in safety awareness programs like Tool Box Talks, safety demonstrations, mock drills, conducted at site</p> <p>PC5. identify near miss , unsafe condition and unsafe act</p>
Adopt healthy & safe work practices	<p>PC6. use appropriate Personal Protective Equipment (PPE) as per work requirements including:</p> <ul style="list-style-type: none"> • Head Protection (Helmets) • Ear protection • Fall Protection • Foot Protection • Face and Eye Protection, • Hand and Body Protection • Respiratory Protection (if required) <p>PC7. handle all required tools, tackles , materials & equipment safely</p> <p>PC8. follow safe disposal of waste, harmful and hazardous materials as per EHS guidelines</p> <p>PC9. install and apply properly all safety equipment as instructed</p> <p>PC10. follow safety protocol and practices as laid down by site EHS department</p>

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

<p>Implement good housekeeping practices</p>	<p>PC11. collect and deposit construction waste into identified containers before disposal, separate containers that may be needed for disposal of toxic or hazardous wastes</p> <p>PC12. apply ergonomic principles wherever required</p>
<p>Knowledge and Understanding (K)</p>	
<p>A. Organizational Context (Knowledge of the company / organization and its processes)</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. reporting procedures in cases of breaches or hazards for site safety, accidents, and emergency situations as per guidelines</p> <p>KA2. types of safety hazards at construction sites</p> <p>KA3. basic ergonomic principles as per applicability</p>
<p>B. Technical Knowledge</p>	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. the procedure for responding to accidents and other emergencies at site</p> <p>KB2. appropriate personal protective equipment to used based on various working conditions</p> <p>KB3. importance of handling tools, equipment and materials as per applicable</p> <p>KB4. health and environments effect of construction materials as per applicability</p> <p>KB5. various environmental protection methods as per applicability</p> <p>KB6. storage of waste including the following at appropriate location:</p> <ul style="list-style-type: none"> • 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 <p>KB7. how to use hazardous material, in a safe and appropriate manner as per applicability</p> <p>KB8. safety relevant to tools, tackles, & requirement as per applicability</p> <p>KB9. housekeeping activities relevant to task</p>
<p>Skills (S)</p>	
<p>A. Core Skills/ Generic Skills</p>	<p>Writing Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. write in one or more language, preferably in the local language of the site</p> <p>SA2. fill safety formats for near miss, unsafe conditions and safety suggestions</p> <p>Reading Skills</p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA3. read in one or more language, preferably in the local language of the site</p> <p>SA4. read sign boards, notice boards relevant to safety</p>

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

	Oral Communication (Listening and Speaking skills)
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA5. speak in one or more language, preferably in one of the local language of the site</p> <p>SA6. listen instructions / communication shared by site EHS and superiors regarding site safety, and conducting tool box talk</p> <p>SA7. communicate reporting of site conditions, hazards, accidents, etc.</p>
B. Professional Skills	Decision Making
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. not create unsafe conditions for others</p> <p>SB2. keep the workplace clean and tidy</p>
	Plan and Organise
	SB3. N.A
	Customer centricity
	SB4. N.A
	Problem solving
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB5. 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</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB6. assess and analyze areas which may affect health, safety and environment protocol on the site</p>
Critical Thinking	
<p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. ensure personal safety behavior</p> <p>SB8. respond to emergency</p>	

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

NOS Version Control

NOS Code	CON/N9001		
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Industry	Construction	Drafted on	07/08/2015
Industry Sub-sector	Real Estate and Infrastructure Construction	Last reviewed on	23/08/2015
Occupation	Quality Assurance and Quality Control	Next review date	23/08/2017



Assessment Criteria for Construction DPT Tester

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Construction DPT Tester

Qualification Pack CON/Q0406

Sector Skill Council Construction

Guidelines for Assessment

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 50%. To pass the Qualification Pack, every trainee should score a minimum of 50% 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.

Assessment outcomes	Assessment Criteria for outcomes	Total Mark	Out Of	Marks Allocation	
				Theory	Skills Practical
CON/N0413: Perform liquid /dye penetration test on structural steel welded joints	PC1. Read and interpret the quality plan, WPS, fabrication shop drawings etc. to understand the technical specifications, locations of testing and method to be adopted	100	6	2	4
	PC2. identify the location of joint or section for conducting the test as per specification		6	2	4
	PC3. estimate the quantity of penetrants and developers and time required for completion of test		6	2	4
	PC4. Read and interpret the standard specifications and perform the test in accordance to the same		6	2	4
	PC5. confirm the compatibility of penetrants and developers with each other, with base metal and with conditions of testing		6	2	4
	PC6. carry out pre-test cleaning activities using solvents, brushes, scrubs etc. to remove any paint, dust, oil, grease or scale etc. from the test surface		6	2	4

Assessment Criteria for Construction DPT Tester

	PC7. ensure that area surrounding the test surface is also adequately cleaned and free from impurities	6	2	4
	PC8. identify and use suitable means to apply penetrant on the test surface	6	2	4
	PC9. apply the penetrant uniformly across the test specimen and allow it to sock into the flaw for instructed or specified period of time	6	2	4
	PC10. remove excess penetrant from the surface of test specimen using suitable means as per type of penetrant used and manufactures guidelines	6	2	4
	PC11. avoid direct application of removers/solvents to the test surface	6	2	4
	PC12. select and use appropriate developers based upon the type of penetrant and inspection condition	6	2	4
	PC13. apply the developer uniformly across the test specimen as per manufactures guidelines or standard procedure	7	2	5
	PC14. ensure that developer is not disturbed for specified period of time as per instructions for blotting action to take place correctly	7	2	5
	PC15. inform the superiors about the completion of blotting period and development of penetrant on the test surface	7	2	5
	PC16. clean the developer and penetrant post inspection of seniors	7	2	5
	Total	100	30	70
CON/N9001: Work according to personal health, safety and environment protocol at construction site	PC1. identify and report any hazards, risks or breaches in site safety to the appropriate authority	5	2	4
	PC2. follow emergency and evacuation procedures in case of accidents, fires, natural calamities	5	2	4
	PC3. follow recommended safe practices in handling construction materials, including chemical and hazardous material whenever applicable	10	3	7
	PC4. participate in safety awareness programs like Tool Box Talks, safety demonstrations, mock drills, conducted at site	5	2	4
	PC5. identify near miss , unsafe condition and unsafe act	5	2	4
	PC6. use appropriate Personal Protective Equipment (PPE) as per work <ul style="list-style-type: none"> • requirements including: • Head Protection (Helmets) • Ear protection • Fall Protection • Foot Protection • Face and Eye Protection, • Hand and Body Protection Respiratory Protection (if required)	10	3	7
	PC7. handle all required tools, tackles , materials & equipment safely	5	2	4
	100			

Assessment Criteria for Construction DPT Tester

PC8. follow safe disposal of waste, harmful and hazardous materials as per EHS guidelines		5	2	4
PC9. install and apply properly all safety equipment as instructed		15	5	11
PC10. follow safety protocol and practices as laid down by site EHS department		15	5	11
PC11. collect and deposit construction waste into identified containers before disposal, separate containers that may be needed for disposal of toxic or hazardous wastes		10	3	7
PC12. apply ergonomic principles wherever required		10	3	7
	Total	100	30	70