



# QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR CONSTRUCTION INDUSTRY

## 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 MPT Tester

**SECTOR:** CONSTRUCTION

**SUB-SECTOR:** Real Estate and Infrastructure Construction

**OCCUPATION:** QUALITY ASSURANCE AND QUALITY CONTROL

**REFERENCE ID:** CON/Q0405

**ALIGNED TO:** NCO-2004/3111.10

This job role performs non destructive test (Magnetic Particle test) on welded sections at a construction site.

**Brief Job Description:** This job role is responsible for performing Magnetic Particle test on structural steel welded sections.

**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	<b>Qualifications Pack Code</b>	CON/Q0405		
	<b>Job Role</b>	Construction MPT Tester		
	<b>Credits (NSQF)</b>	TBD	<b>Version number</b>	1.0
	<b>Sector</b>	Construction	<b>Drafted on</b>	07/08/2015
	<b>Sub-sector</b>	Real Estate and Infrastructure Construction	<b>Last reviewed on</b>	23/08/2015
	<b>Occupation</b>	Quality Assurance and Quality Control	<b>Next review date</b>	23/08/2017
	<b>NSQC Clearance on</b>	NA		

<b>Job Role</b>	<b>Construction MPT Tester</b>
<b>Role Description</b>	This job role is responsible for performing Magnetic Particle test, on structural steel welded sections.
<b>NSQF level</b>	3
<b>Minimum Educational Qualifications</b>	Preferably 10 <sup>th</sup> standard, or ASNT level 1 qualified
<b>Maximum Educational Qualifications</b>	N.A
<b>Training</b> (Suggested but not mandatory)	Recommended training period of 2-4 weeks as per QP of Construction MPT Tester Recommended training in basic computer literacy
<b>Minimum Job Entry Age</b>	18 years
<b>Experience</b>	Desirable: 1. Trained worker : Nil
<b>Applicable National Occupational Standards (NOS)</b>	<b>Compulsory:</b> 1. <a href="#">CON/N0412: Perform Magnetic Particle test on structural steel welded joints</a> 2. <a href="#">CON/N9001: Work according to personal health, safety and environment protocol at construction site</a>  <b>Optional:</b> N.A.
<b>Performance Criteria</b>	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
	MPT	Magnetic Particle Test



# National Occupational Standard



## Overview

This NOS covers the skills and knowledge required by a workman to be proficient in performing Magnetic Particle test on structural steel welded joints.

CON/N0412

Perform Magnetic Particle test on structural steel welded joints

National Occupational Standard

<b>Unit Code</b>	CON/N0412
<b>Unit Title (Task)</b>	Perform Magnetic Particle test on structural steel welded joints
<b>Description</b>	This unit describes the skills and knowledge required to perform Magnetic Particle test on structural steel welded joints.
<b>Scope</b>	The scope covers the following: <ul style="list-style-type: none"> <li>Perform Magnetic Particle test on structural steel welded joints to detect deformities present on the surface, or originating from the surface</li> </ul>
<b>Performance Criteria (PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Perform Magnetic Particle test on structural steel welded joints to detect deformities present on the surface, or originating from the surface</b>	<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 materials 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 that the surface to be tested can be magnetized</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 the temperature of the test specimen is within applicable limits prescribed in the test procedure</p> <p>PC8. ensure proper storage of consumables to avoid contamination</p> <p>PC9. ensure that lighting arrangements are appropriate and compatible to type of indicator used</p> <p>PC10. apply suspended magnetic particles to the test surface using appropriate method</p> <p>PC11. apply dry powder indicators to the surface of the test specimen</p> <p>PC12. select the suitable method for application of magnetic field to the test specimen</p> <p>PC13. apply the magnetic fields in two directions perpendicular to each other of required or instructed magnitude</p> <p>PC14. check the proper application of magnetic field</p> <p>PC15. clean the particulate matter after getting approval from the seniors</p> <p>PC16. setup reverse magnetic field to demagnetized the component or structure under inspection</p>
<b>Knowledge and Understanding (K)</b>	

**CON/N0412**

**Perform Magnetic Particle test on structural steel welded joints**

<p><b>A. Organizational Context</b> (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"> <li>KA1. standard practices for quality control works</li> <li>KA2. safety rules and regulations for handling and storing required tools, equipment and materials</li> <li>KA3. personal protection including the use of related safety gears &amp; equipments</li> <li>KA4. service request procedures for tools, materials and equipments</li> <li>KA5. statutory compliance requirement related to working at height</li> <li>KA6. statutory compliance requirement related to workmen engagement</li> </ul>
<p><b>B. Technical Knowledge</b></p>	<p>The user/individual on the job needs to know and understand:</p> <ul style="list-style-type: none"> <li>KB1. principle of magnetic particle test</li> <li>KB2. standard procedure for conducting the magnetic particle test</li> <li>KB3. fundamentals and concepts of magnetic field</li> <li>KB4. concept of flux leakage</li> <li>KB5. different equipments and methods used for creating a magnetic field, their limitations and advantages, areas of application</li> <li>KB6. methods of measuring magnetic field, various instruments used for the same, their range, principle of operation, area of operation and limitations</li> <li>KB7. limitations of magnetic particle method</li> <li>KB8. type of defects inspected by magnetic particle test</li> <li>KB9. precautions to be taken while conducting magnetic particle test</li> <li>KB10. importance of cleaning the surface before and after conducting magnetic particle test</li> <li>KB11. different methods of cleaning metal surface</li> <li>KB12. different types of indicators, their application and auxiliary items required by them</li> <li>KB13. what is carrier, its properties and effects</li> <li>KB14. interpretation of magnetic patterns developed by particles on the surface of test specimen</li> </ul>
<b>Skills (S)</b>	
<p><b>A. Core Skills/ Generic Skills</b></p>	<p><b>Writing Skills</b></p>
	<p>The user/ individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> <li>SA1. write in at least two language, preferably in the local language of the site and basic English</li> <li>SA2. provide clear and simple instructions, details &amp; sketches to sub-ordinate</li> <li>SA3. record and document daily productivity report, daily labour attendance &amp; details regarding work</li> <li>SA4. prepare basic status updates for the superiors in the prescribed format</li> </ul>
	<p><b>Reading Skills</b></p>

CON/N0412

**Perform Magnetic Particle test on structural steel welded joints**

	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA5. read one or more language, preferably in the local language of the site</p> <p>SA6. read drawing, specification and standards related to relevant work</p> <p>SA7. read key documents including quality standards and standard working methods</p> <p>SA8. read various, sign boards, safety rules and safety tags , instructions related to exit routes during emergency at the workplace</p>
	<p><b>Oral Communication (Listening and Speaking skills)</b></p> <p>The user/ individual on the job needs to know and understand how to:</p> <p>SA9. speak in one or more language, preferably in one of the local languages of the site</p> <p>SA10. listen and follow instructions clearly given by the superior</p> <p>SA11. provide clear instructions to subordinates for completion of task as per work plan, time schedule and quality</p>
<b>B. Professional Skills</b>	<p><b>Decision Making</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. estimate required material, time and resources for work</p> <p>SB2. determine the location of joint / segment for testing</p> <p>SB3. determine whether the surface to be tested can be magnetized</p> <p>SB4. determine appropriate method for applying suspended metal particles to the test surface</p> <p>SB5. determine appropriate method for applying magnetic field to the test specimen</p> <p>SB6. determine and check for proper application of magnetic field</p>
	<p><b>Plan and Organise</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. plan work targets, allocate time schedule to sub-ordinates and organize completion of task within allocated time</p>
	<p><b>Customer centricity</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB8. ensure completion of work as per agreed time schedule and quality</p>
	<p><b>Problem solving</b></p> <p>The user/individual on the job needs to know and understand how to:</p> <p>SB9. report to superiors in case of any defects or shortage in tested components and sections</p>
	<p><b>Analytical Thinking</b></p>

CON/N0412

**Perform Magnetic Particle test on structural steel welded joints**

	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"><li>SB10. assess quantity of materials for day work</li><li>SB11. optimize resources</li><li>SB12. minimize wastages</li><li>SB13. assess whether the temperature of the specimen is within applicable range</li></ul>
	<p><b>Critical Thinking</b></p>
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"><li>SB14. assess complexity of the tasks and provide guidance for carrying out corrective action as per requirement</li><li>SB15. identify and assess how violation of any safety norms may lead to accidents</li></ul>



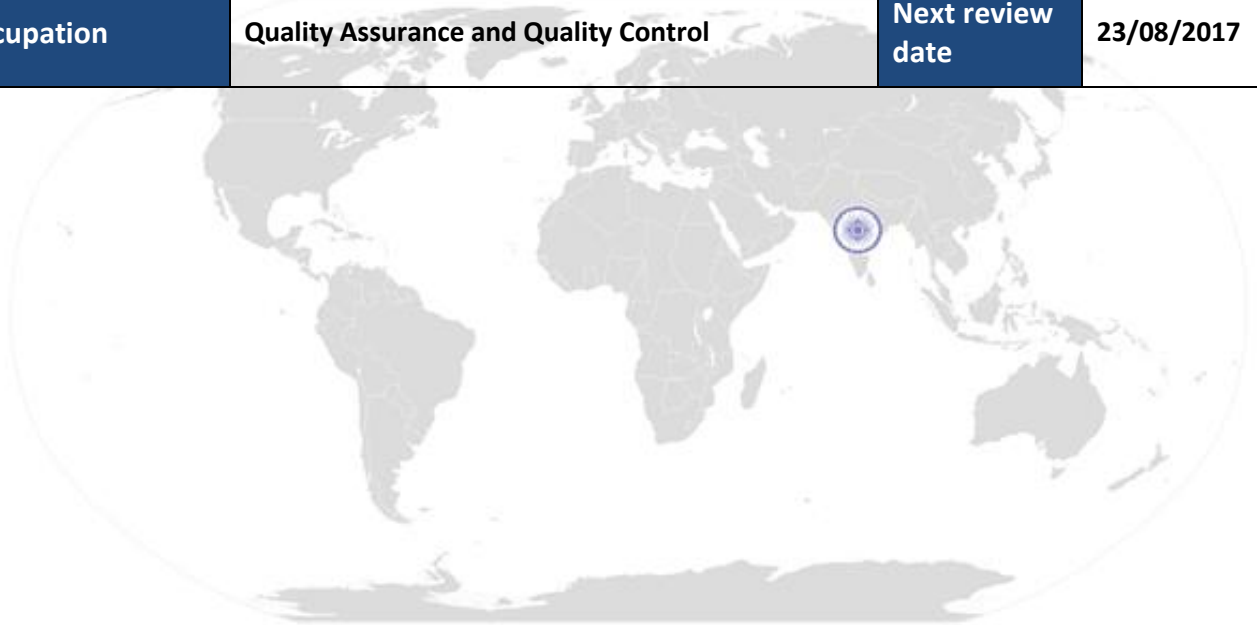


CON/N0412

Perform Magnetic Particle test on structural steel welded joints

## NOS Version Control

<b>NOS Code</b>	CON/N0412		
<b>Credits (NSQF)</b>	TBD	<b>Version number</b>	1.0
<b>Industry</b>	Construction	<b>Drafted on</b>	07/08/2015
<b>Industry Sub-sector</b>	Real Estate and Infrastructure Construction	<b>Last reviewed on</b>	23/08/2015
<b>Occupation</b>	Quality Assurance and Quality Control	<b>Next review date</b>	23/08/2017



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

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# 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

<b>Unit Code</b>	<b>CON/N9001</b>
<b>Unit Title (Task)</b>	<b>Work according to personal health, safety and environment protocol at construction site</b>
<b>Description</b>	This NOS covers the skill and knowledge required for an individual to work according to personal health, safety and environmental protocol at construction site
<b>Scope</b>	<p>The scope covers the following:</p> <ul style="list-style-type: none"> <li>• Follow safety norms as defined by organization</li> <li>• Adopt healthy &amp; safe work practices</li> <li>• Implement good housekeeping and environment protection process and activities</li> </ul>
<b>Performance Criteria (PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Follow safety norms as defined by organization</b>	<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>
<b>Adopt healthy &amp; safe work practices</b>	<p>PC6. use appropriate Personal Protective Equipment (PPE) as per work requirements including:</p> <ul style="list-style-type: none"> <li>• Head Protection (Helmets)</li> <li>• Ear protection</li> <li>• Fall Protection</li> <li>• Foot Protection</li> <li>• Face and Eye Protection,</li> <li>• Hand and Body Protection</li> <li>• Respiratory Protection (if required)</li> </ul> <p>PC7. handle all required tools, tackles , materials &amp; 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><b>Implement good housekeeping practices</b></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><b>Knowledge and Understanding (K)</b></p>	
<p><b>A. Organizational Context</b> (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>B. Technical Knowledge</b></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"> <li>• non-combustible scrap material and debris</li> <li>• combustible scrap material and debris</li> <li>• general construction waste and trash (non-toxic, non-hazardous)</li> <li>• any other hazardous wastes</li> <li>• any other flammable wastes</li> </ul> <p>KB7. how to use hazardous material, in a safe and appropriate manner as per applicability</p> <p>KB8. safety relevant to tools, tackles, &amp; requirement as per applicability</p> <p><b>KB9.</b> housekeeping activities relevant to task</p>
<p><b>Skills (S)</b></p>	
<p><b>A. Core Skills/ Generic Skills</b></p>	<p><b>Writing Skills</b></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><b>Reading Skills</b></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**

	<b>Oral Communication (Listening and Speaking skills)</b>
	<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>B. Professional Skills</b>	<b>Decision Making</b>
	<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>
	<b>Plan and Organise</b>
	SB3. N.A
	<b>Customer centricity</b>
	SB4. N.A
	<b>Problem solving</b>
	<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>
	<b>Analytical Thinking</b>
	<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>
<b>Critical Thinking</b>	
<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

<b>NOS Code</b>	<b>CON/N9001</b>		
<b>Credits (NSQF)</b>	TBD	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	Construction	<b>Drafted on</b>	<b>07/08/2015</b>
<b>Industry Sub-sector</b>	Real Estate and Infrastructure Construction	<b>Last reviewed on</b>	<b>23/08/2015</b>
<b>Occupation</b>	Quality Assurance and Quality Control	<b>Next review date</b>	<b>23/08/2017</b>



*Assessment Criteria for Construction MPT Tester*

**CRITERIA FOR ASSESSMENT OF TRAINEES**

**Job Role** Construction MPT Tester

**Qualification Pack** CON/Q0405

**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/N0412: Perform Magnetic Particle 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	<b>100</b>	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 materials 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 that the surface to be tested can be magnetized		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 MPT Tester*

	PC7. ensure that the temperature of the test specimen is within applicable limits prescribed in the test procedure		6	2	4
	PC8. ensure proper storage of consumables to avoid contamination		6	2	4
	PC9. ensure that lighting arrangements are appropriate and compatible to type of indicator used		6	2	4
	PC10. apply suspended magnetic particles to the test surface using appropriate method		6	2	4
	PC11. apply dry powder indicators to the surface of the test specimen		6	2	4
	PC12. select the suitable method for application of magnetic field to the test specimen		6	2	4
	PC13. apply the magnetic fields in two directions perpendicular to each other of required or instructed magnitude		7	2	5
	PC14. check the proper application of magnetic field		7	2	5
	PC15. clean the particulate matter after getting approval from the seniors		7	2	5
	PC16. setup reverse magnetic field to demagnetized the component or structure under inspection		7	2	5
		<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>
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	<b>100</b>	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"> <li>• requirements including:</li> <li>• Head Protection (Helmets)</li> <li>• Ear protection</li> <li>• Fall Protection</li> <li>• Foot Protection</li> <li>• Face and Eye Protection,</li> <li>• Hand and Body Protection</li> </ul> Respiratory Protection (if required)		10	3	7
	PC7. handle all required tools, tackles , materials & equipment safely		5	2	4
	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		15	5	11





*Assessment Criteria for Construction MPT Tester*

instructed				
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
	<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>