

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR PLUMBING

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 – Groundwater Engineer

SECTOR: PLUMBING INDUSTRY

SUB-SECTOR: Consultants

OCCUPATION: Plumbing

REFERENCE ID: PSC/ Q0202

ALIGNED TO: NCO-2004/2142.72

Groundwater Engineer: Groundwater Engineer is an important job role in 'consultants' segment of plumbing industry. This job role requires the individual to prepare basic drawings of related to groundwater systems in plumbing projects as per instructions.

Brief Job Description: A Groundwater Engineer is responsible for design of groundwater extracting and recharging systems such as bore wells, etc. in a region..

Personal Attributes: He should be able to work independently on his assignment. He should have problems solving skills through creative and innovative thinking. He should be a good team leader. He should be result oriented and positive in attitude.

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Job Details	Qualifications Pack Code	PSC/ Q0202		
	Job Role	Groundwater Engineer		
	Credits(NVEQF/NVQF/NSQF) [OPTIONAL]	TBD	Version number	0.1
	Sector	Plumbing	Drafted on	01/09/13
	Sub-sector	Consultants	Last reviewed on	30/10/13
	Occupation	Plumbing	Next review date	30/04/14

Job Role	Groundwater Engineer
Role Description	Responsible for design of groundwater extracting and recharging systems such as bore wells, etc. in a region.
NVEQF/NVQF level	7
Minimum Educational Qualifications*	Diploma in Civil / Mech. Engg.
Maximum Educational Qualifications*	N.A.
Training (Suggested but not mandatory)	On-the-job training.
Experience	Minimum 3 years of relevant experience of working on bore well projects.
Applicable National Occupational Standards (NOS)	Compulsory: <ol style="list-style-type: none"> 1. PSC/ N 0215 (Design of groundwater extracting and recharging systems) 2. PSC/ N 0211 (Work effectively with colleagues) 3. PSC/ N 0212 (Maintain a healthy, safe and secure working environment) Optional: <ol style="list-style-type: none"> 4. N.A.
Performance Criteria	As described in the relevant OS units

Definitions

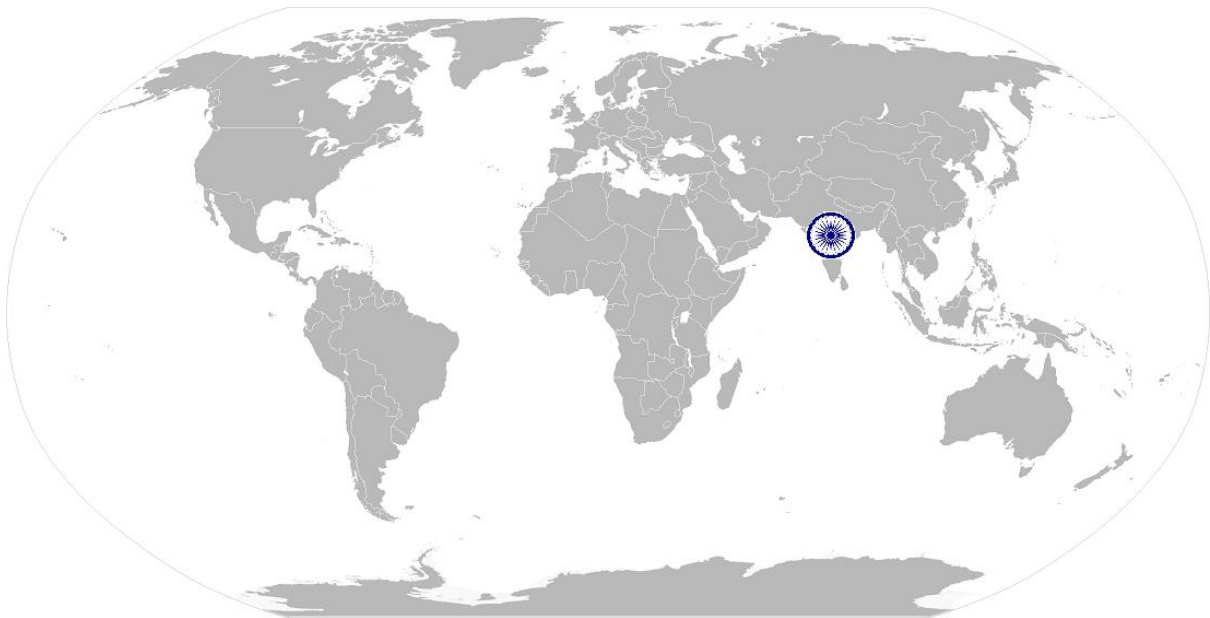
Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further 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.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
Job Role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
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 that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
NOS	NOS are Occupational Standards which apply uniquely in the Indian context.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Qualifications Pack	Qualifications Pack comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification 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.
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 or 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
	IPSC	Indian Plumbing Skills council
	NOS	National Occupational Standards
	NSQF	National Skills Qualification Framework
	NVEQF	National Vocational Educational Qualification Framework
	NVQF	National Vocational Qualification Framework
	OS	Occupational Standards
	PC	Performance Criteria
	QP	Qualification Pack
	SSC	Sector Skills Council



PSC/N0215 Design of groundwater extracting and recharging systems

National Occupational Standard



Overview

This unit is about design of groundwater extracting and recharging systems such as bore wells, etc. in a region.



PSC/N0215 Design of groundwater extracting and recharging systems

Unit Code	PSC/N0215
Unit Title (Task)	Design of groundwater extracting and recharging systems
Description	This OS unit is about design of groundwater extracting and recharging systems such as bore wells, etc. in a region
Scope	<p>This unit/task covers the following:</p> <p>Inspection and layout preparation</p> <ul style="list-style-type: none">inspection and evaluation of the site for the proposed systempreparation of preliminary layout of the system as per requirement <p>System design</p> <ul style="list-style-type: none">preparation of detailed bore well system design as per layout and in adherence to the applicable laws and regulations
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Inspection and layout preparation	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. inspect and evaluate a site/location for tube well or other similar systems</p> <p>PC2. access existing documents, design standards, templates and design tools from organization's knowledge base</p> <p>PC3. identify, analyse and prioritise relevant technical, environmental and cost factors which are likely to influence design and execution of the tube well and similar systems</p> <p>PC4. choose suitable techniques for investigation, calculation, and testing to be used in preparation of a detailed system design</p> <p>PC5. analyse design concepts to identify best fit with the design requirements and constraints</p> <p>PC6. guide drafting engineer(s) in preparing initial layout based on selected/ approved design process</p>
System design	<p>PC7. determine the depths of groundwater table, its fluctuations and flow directions</p> <p>PC8. determine the presence/absence of any obstacle that can impede boring</p> <p>PC9. identify the depth till which boring has to be done</p> <p>PC10. identify the boring technology to be used</p> <p>PC11. estimate the type and capacity of the pump based on water requirement</p> <p>PC12. estimate the optimum capacity of the overhead tank considering the pump capacity and water requirement</p>



PSC/N0215 Design of groundwater extracting and recharging systems

	<p>PC13. develop detailed tube well and similar system design indicating type, length and size of pipes and related accessories</p> <p>PC14. conform to applicable laws, codes and regulations</p> <p>PC15. select products which meet required project criteria and industry standards, balancing cost and quality</p> <p>PC16. provide the project stakeholders with enough relevant and accurate information to agree on the detailed system design</p> <p>PC17. review documents with appropriate people and incorporate their inputs</p> <p>PC18. prepare bills of materials (BOMs) for finalized system design if required in the project</p>
Knowledge and Understanding (K)	
A. Organizational Context	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. company's policies on: quality and delivery standards, design and environmental norms, safety and hazards, integrity, laws and codes, compliances, and guidelines for knowledge sharing</p> <p>KA2. the purpose and scope of the work to be carried out and the importance of keeping within those boundaries</p> <p>KA3. who to involve when developing network designs and their roles and responsibilities</p> <p>KA4. the importance of verifying data and other information obtained for the design</p> <p>KA5. risk and impact of not following defined codes and norms</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. various evaluation techniques for the site</p> <p>KB2. probable issues that can occur during execution because of faulty design</p> <p>KB3. depth of groundwater table and flow characteristics</p> <p>KB4. applicable system designing norms and environmental regulations</p> <p>KB5. boring equipments, its uses and limitations</p> <p>KB6. comprehensive knowledge of various materials used in a tube well/boring system and their market rates</p> <p>KB7. hydraulic principles related to design of the system such as fluid mechanics, flow dynamics, etc.</p> <p>KB8. hydro-geological principles</p> <p>KB9. various design techniques that can be used, their constraints and impacts</p> <p>KB10. different types of manual drawing tools</p> <p>KB11. software related to drawings and design such as AutoCAD, WaterCAD, Microsoft Project, etc.</p>



PSC/N0215 Design of groundwater extracting and recharging systems

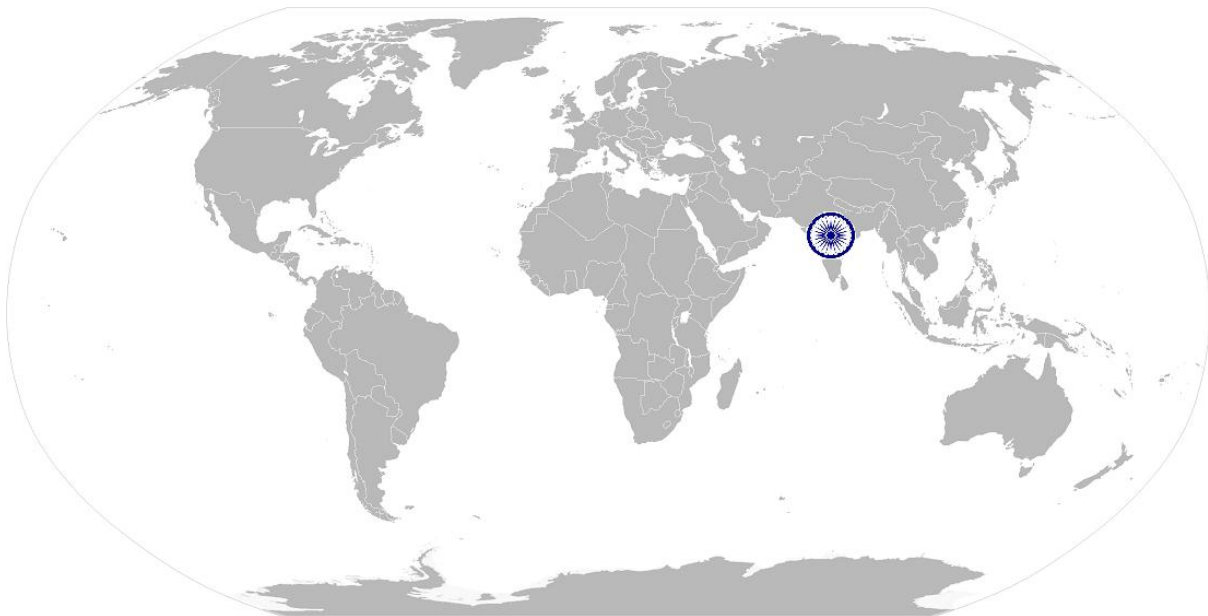
	KB12. drawing and system design terminologies KB13. the importance of collating feedback on designs
Skills (S)	
A. Core Skills/ Generic Skills	Communication skills
	The user/individual on the job needs to know and understand how to: SA1. communicate in Hindi, English and/or regional language
	Measurement/calculation skills
	SA2. perform measurements/testing as per requirements SA3. perform calculations pertaining to drawing and design
	Teamwork
	SA4. accept and interpret instructions and requirements correctly SA5. follow the instructions of the reporting authority SA6. co-ordinate with co-workers SA7. supervise sub-ordinates SA8. prioritize and complete necessary tasks in a fast-paced environment
	B. Professional Skills
	Software usage
	The user/individual on the job needs to know and understand how to: SB1. use relevant software and produce output in terms of drawings and layouts as per instructions SB2. produce 3D network layouts as required SB3. debug and modify common errors in drawings/layout preparation
	Designing skills
	SB4. design the tube well/boring system manually considering all design parameters SB5. adhere to relevant codes and regulations while preparing the design SB6. use relevant designing software
	Manual sketching
	SB7. produce output in form of manual drawings and sketches SB8. ensure accuracy and scale in the manual sketches SB9. do a preliminary review of drawings and layouts for compliance of norms



PSC/N0215 Design of groundwater extracting and recharging systems

NOS Version Control

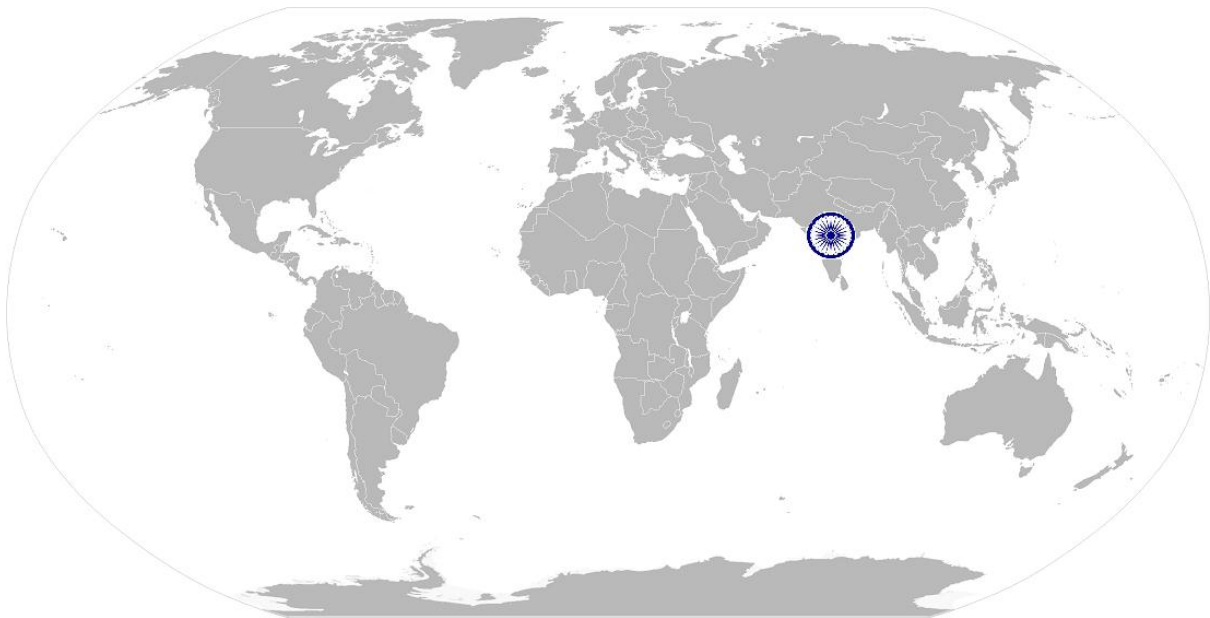
NOS Code	PSC/N0215		
Credits(NVEQF/NVQF/NSQF) [OPTIONAL]	TBD	Version number	0.1
Industry	Plumbing	Drafted on	01/09/13
Industry Sub-sector	Consultants	Last reviewed on	30/10/13
		Next review date	30/04/14





PSC/N0211 Work effectively with colleagues

National Occupational Standard



Overview

This unit is about working effectively with colleagues, either within team or in other working teams for a plumbing project.



PSC/N0211 Work effectively with colleagues

Unit Code	PSC/N0211
Unit Title (Task)	Work effectively with colleagues
Description	This OS unit is about working effectively with colleagues, either within team or in other working teams for a plumbing project
Scope	<p>This unit/task covers the following:</p> <p>Interact with seniors</p> <ul style="list-style-type: none"> receive work instructions, discuss task status and receive feedback <p>Interact with colleagues within and outside the team</p> <ul style="list-style-type: none"> communicate and discuss work flow, problems faced, possible solutions and pass on the learning within and outside the team
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Interaction with seniors	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. receive work instructions and discuss the project/design with seniors</p> <p>PC2. communicate to reporting senior about task status, repairs and maintenance of tools and equipment as required</p> <p>PC3. communicate any potential hazards and expected process disruptions</p> <p>PC4. get the work reviewed and handover completed task to seniors</p> <p>PC5. receive feedback from reporting senior</p> <p>PC6. report any anticipated reasons for delays</p>
Interact with colleagues within and outside the team	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC7. work as a team with colleagues and share work as per the work load and skills</p> <p>PC8. work with colleagues of other teams</p> <p>PC9. communicate and discuss work flow related difficulties in order to find solution with mutual agreement</p> <p>PC10. put team over individual goals</p> <p>PC11. resolve conflicts</p>
Knowledge and Understanding (K)	
A. Organizational Context	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. company's policies on: preferred language of communication, quality delivery standards and personnel management</p> <p>KA2. reporting structure</p>



PSC/N0211 Work effectively with colleagues

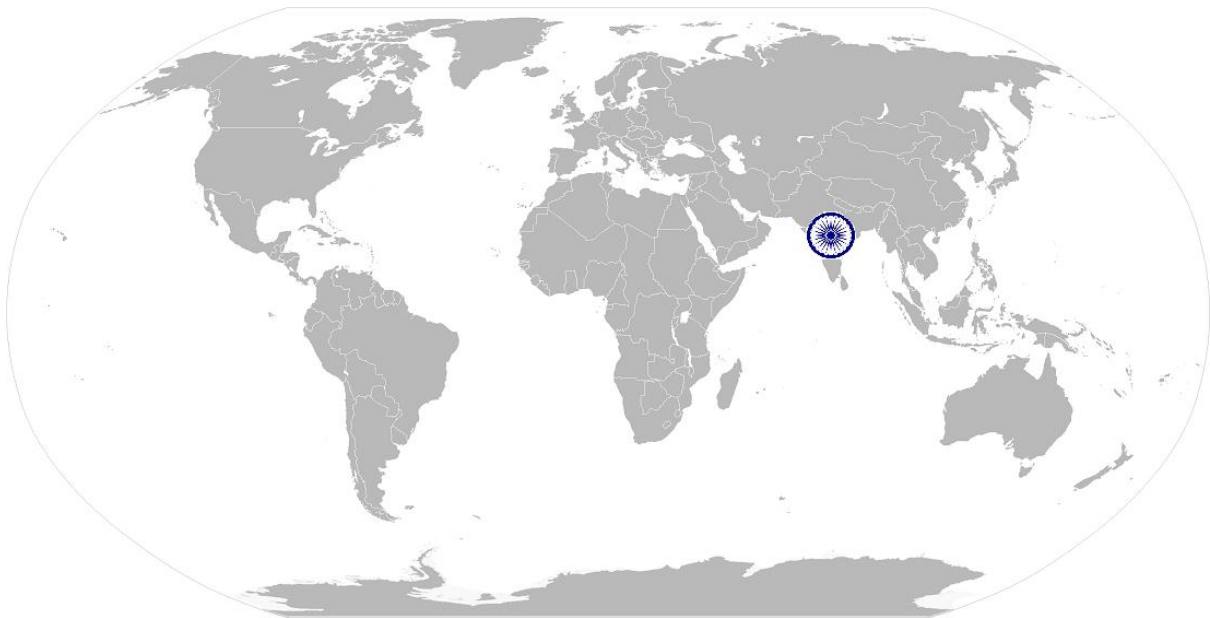
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. effective ways of communication KB2. building team co-ordination
Skills (S)	
C. Core Skills/ Generic Skills	Communication skills
	The user/individual on the job needs to know and understand how to: SA1. communicate in Hindi, English and/or regional language
	Teamwork
	SA2. share work load as required SA3. accept and interpret instructions and requirements correctly SA4. co-ordinate with co-workers and sub-ordinates
D. Professional Skills	Decision making
	The user/individual on the job needs to know and understand: SB1. how to spot and communicate potential areas of disruptions to work process and report the same SB2. when to report to supervisor and when to deal with a colleague individually, depending on the type of concern
	Reflective thinking
	SB3. improve work processes by interacting with others and adopting best practices



PSC/N0211 Work effectively with colleagues

NOS Version Control

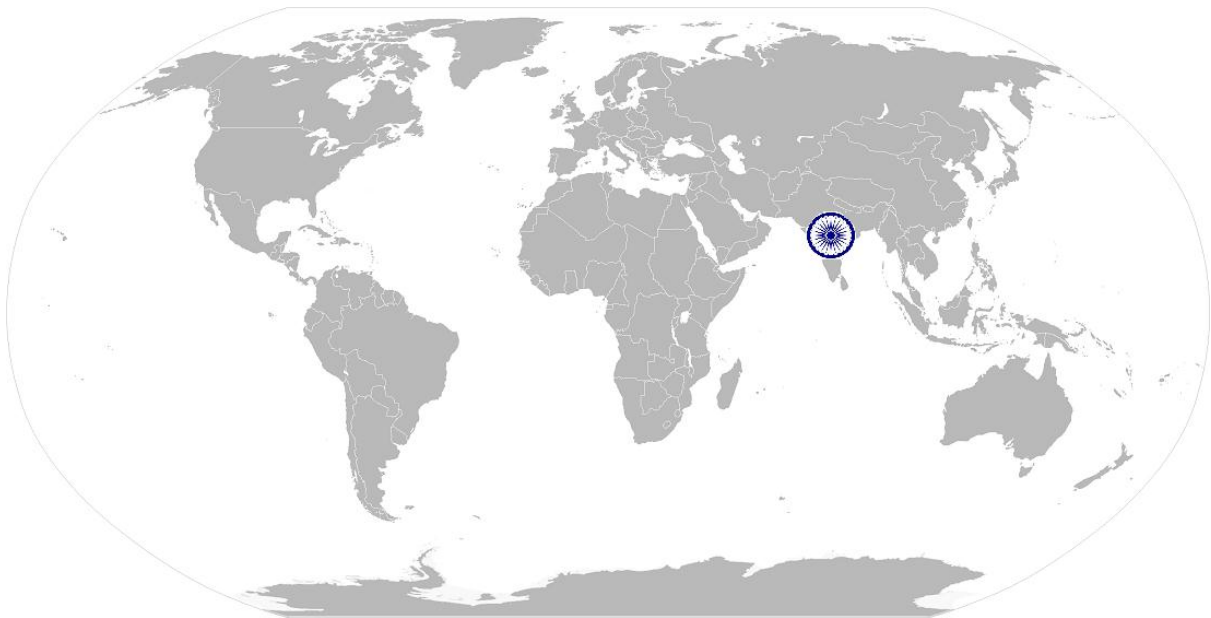
NOS Code	PSC/N0211		
Credits(NVEQF/NVQF/NSQF) [OPTIONAL]	TBD	Version number	0.1
Industry	Plumbing	Drafted on	01/09/13
Industry Sub-sector	Consultants / Manufacturers	Last reviewed on	30/10/13
		Next review date	30/04/14





PSC/N0212 Maintain a healthy, safe and secure working environment

National Occupational Standard



Overview

This unit is about being aware of, communicating and taking steps towards minimizing potential hazards and dangers of accidents on the job and maintaining occupational health and safety.



PSC/N0212 Maintain a healthy, safe and secure working environment

Unit Code	PSC/N0212
Unit Title (Task)	Maintain a healthy, safe and secure working environment
Description	This OS unit is about monitoring your working environment and making sure it meets requirements for health and safety
Scope	<p>This unit/task covers the following:</p> <p>Emergency procedures to be followed in case of</p> <ul style="list-style-type: none"> • accidents • fires • illness • breach of security • other reasons to evacuate the premises
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Emergency procedures	<p>To be competent, the user/individual on the job must be able to:</p> <p>PC1. comply with organization's current health, safety and security policies and procedures</p> <p>PC2. report any identified breaches in health, safety, and security policies and procedures to the designated person</p> <p>PC3. identify and remove any hazards that can be dealt safely, competently and within the limits of individual's authority</p> <p>PC4. report hazards to the relevant person in line with organizational procedures and warn other people who may be affected</p> <p>PC5. follow organization's emergency procedures promptly, calmly, and efficiently</p> <p>PC6. identify and recommend opportunities for improving health, safety, and security to the designated person</p> <p>PC7. complete any health and safety records legibly and accurately</p>
Knowledge and Understanding (K)	
A. Organizational Context	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. company's policy on: safety and hazards, personnel management, role and responsibilities</p> <p>KA2. reporting structure</p> <p>KA3. what is meant by a hazard, including the different types of health and safety hazards that can be found in the workplace</p> <p>KA4. organization's emergency procedures for different emergency situations and</p>



PSC/N0212 Maintain a healthy, safe and secure working environment

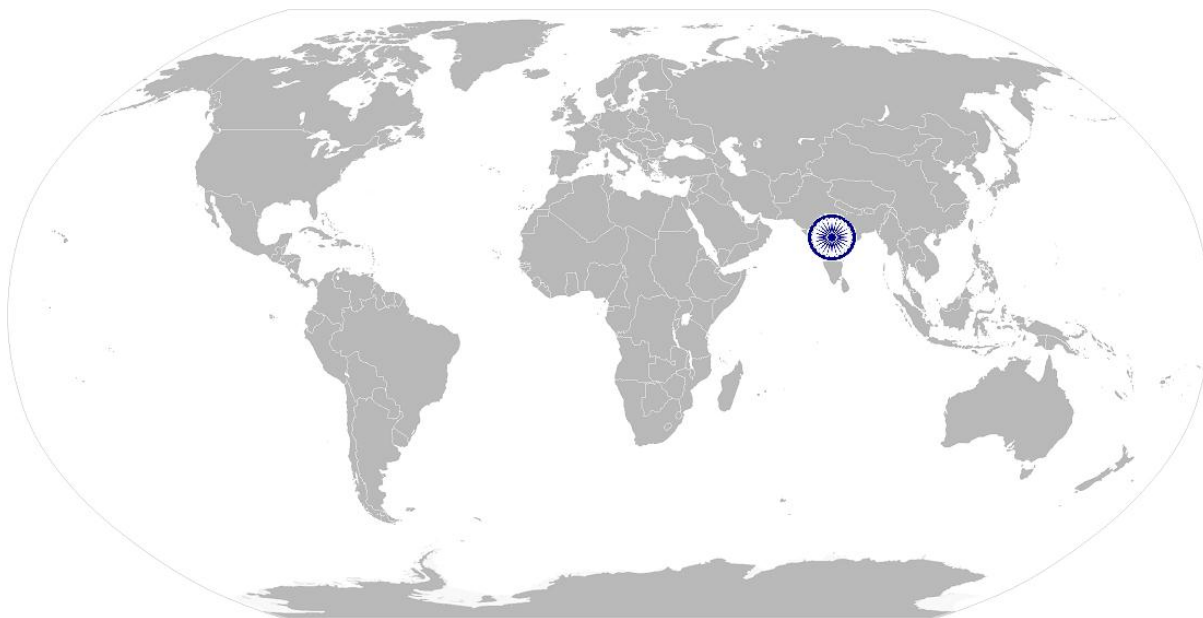
	<p>the importance of following these</p> <p>KA5. importance of maintaining high standards of health, safety and security</p> <p>KA6. implications that any non-compliance with health, safety and security may have on individuals and the organization</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. different types of breaches in health, safety and security and how and when to report these</p> <p>KB2. evacuation procedures for workers and visitors</p>
Skills (S)	
A. Core Skills/ Generic Skills	Communication skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA1. effectively communicate the danger</p>
	Organising skills
	<p>SA2. keep the work environment safe and clean</p>
B. Professional Skills	Decision making
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. report potential sources of danger</p> <p>SB2. follow prescribed procedure in the event of an accident</p> <p>SB3. plan and organize your work to meet health, safety and security requirements</p>
	Reflective thinking
	<p>SB4. learn from past mistakes and apply balanced judgments to different situations</p>



PSC/N0212 Maintain a healthy, safe and secure working environment

NOS Version Control

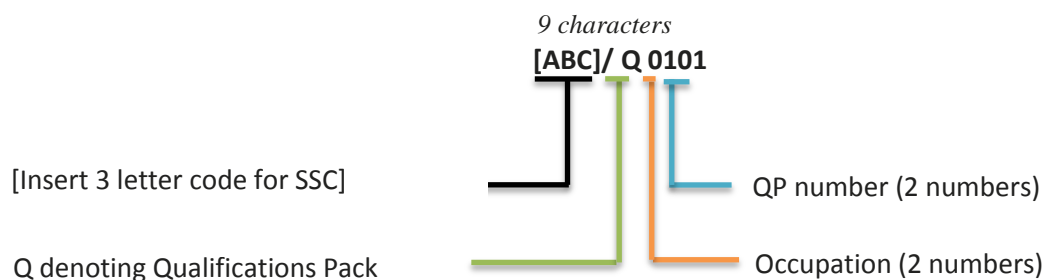
NOS Code	PSC /N0212		
Credits(NVEQF/NVQF/NSQF) [OPTIONAL]	TBD	Version number	0.1
Industry	Plumbing	Drafted on	15/07/13
Industry Sub-sector	Consultants / Manufacturers	Last reviewed on	30/07/13
		Next review date	31/01/14



Annexure

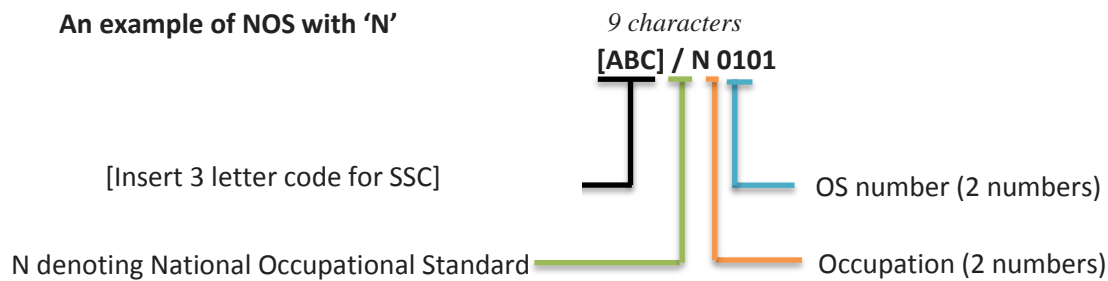
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



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The following acronyms/codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Contractors	01-30
Consultants	30-60
Manufacturers	60-90

Sequence	Description	Example
Three letters	Industry name	PSC
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01