



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
- Solution 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 – Fire Protection Systems Design Engineer

SECTOR: PLUMBING INDUSTRY

SUB-SECTOR: Consultants

OCCUPATION: Plumbing

REFERENCE ID: PSC/ Q 0205

ALIGNED TO: NCO-2004/2142.45

Fire Protection Systems Design Engineer: Fire Protection Systems Design Engineer is an important job role in 'consultants' segment of plumbing industry. This job role requires the individual to design of hydraulic fire-fighting system of a building/structure.

Brief Job Description: A Fire Protection Systems Design Engineer is responsible for design of hydraulic fire-fighting system of a building/structure.

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.





Job Details

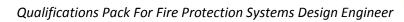
Qualifications Pack Code	PSC/ Q 0205		
Job Role	Fire Protection Systems Design Engineer		
Credits(NVEQF/NVQF/NSQF) [OPTIONAL]	TBD	Version number	0.1
Sector	Plumbing	Drafted on	01/09/13
Sub-sector	Consultants	Last reviewed on	30/10/13
Occupation	Plumbing	Next review date	30/04/14

Job Role	Fire Protection Systems Design Engineer	
Role Description	Responsible for design of hydraulic fire-fighting system of a building/structure	
NVEQF/NVQF level	7	
Minimum Educational Qualifications*	Diploma in Civil / Mechanical Engineering	
Maximum Educational Qualifications*	N.A.	
Training (Suggested but not mandatory)	On-the-job training.	
Experience	Minimum 4 years of relevant experience of working on fire- fighting projects	
Applicable National Occupational Standards (NOS)	 Compulsory: PSC/ N 0208 (Design of hydraulic fire protection systems) PSC/ N 0202 (Supervision and review of drawing works in a project) PSC/ N 0209 (Management of a design project) PSC/ N 0211 (Work effectively with colleagues) PSC/ N 0212 (Maintain a healthy, safe and secure working environment) Optional:	
	6. N.A.	
Performance Criteria	As described in the relevant OS units	





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

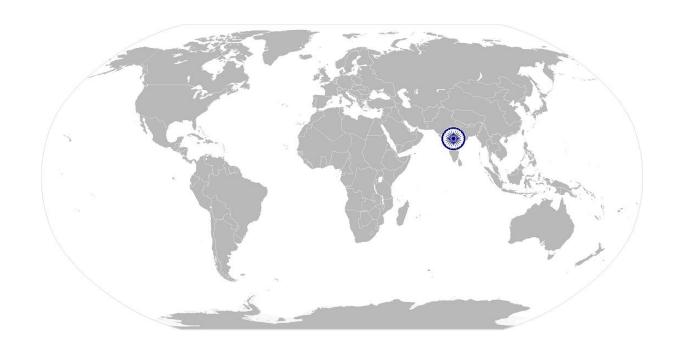
Keywords /Terms	Description
IPSC	Indian Plumbing Skills council
NOS	National Occupational Standards
NSQF	National Skills Qualification Framework
NVEQF	National Vocational Educational Qualification Framework
NVQF	National Vocational Qualification Framework
OS	Occupational Standards
PC	Performance Criteria
QP	Qualification Pack
SSC	Sector Skills Council







National Occupational Standard



Overview

This unit is about design of hydraulic fire protection systems as per the requirement of housing / commercial / institutional setups and in adherence to the applicable laws and regulations.







Unit Code	
	PSC/N0208
Unit Title (Task)	Design of hydraulic fire protection systems
Description	This OS unit is about design of hydraulic fire protection systems as per the
	requirement of housing / commercial / institutional setups and in adherence to the
	applicable laws and regulations
Scope	This unit/task covers the following:
	Review and inspection
	 inspection and evaluation of a building for the hydraulic fire-fighting system
	requirement
	 inspection and evaluation of any installed hydraulic fire-fighting system for
	any renovation work
Layout preparation	
	preparation of preliminary layout of the system as per requirement
	Fire-fighting system design
	 preparation of detailed hydraulic fire-fighting system design as per layout and
	in adherence to the applicable laws and regulations
Performance Criteria	a(PC) w.r.t. the Scope
Element	Performance Criteria

Element	Performance Criteria	
Review and	To be competent, the user/individual on the job must be able to:	
inspection	PC1. inspect and evaluate a building (housing, commercial or institutional) and	
	other systems for the hydraulic fire-fighting system requirement	
	PC2. inspect and evaluate any installed system such as detection system and	
	sprinkler system for any renovation requirement	
	PC3. access existing documents, design standards, templates and design tools from	
	organization's knowledge base	
Layout preparation	PC4. identify, analyse and prioritise relevant technical, environmental and cost	
	factors which are likely to influence design and execution of the hydraulic fire-	
	fighting system	
	PC5. choose suitable techniques for investigation, calculation, and testing to be	
	used in preparation of a detailed system design	
	6. analyse design concepts to identify best fit with the design requirements and	
	constraints	
	PC7. guide drafting engineer(s) in preparing initial layout based on selected/	







approved design process	approved design process	
Fire-fighting system PC8. estimate total water requirement as per the size of building		
design PC9. develop detailed system design including network design, det	tections system	
design, fire alarm system design and sprinkler system design		
PC10. develop detailed network design indicating location, type, len	ngth and	
diameter of various pipes and its accessories		
PC11. estimate the capacity of water mains		
PC12. conform to applicable laws, codes and regulations		
PC13. select products which meet required project criteria and indu	stry standards,	
balancing cost and quality		
PC14. provide the project stakeholders with enough relevant and ac	ccurate	
information to agree on the detailed system design		
PC15. review documents with appropriate people and incorporate t	heir inputs	
PC16. prepare bills of materials (BOMs) for finalized system design i	f required in the	
próject	-	
Knowledge and Understanding (K)		
A. Organizational The user/individual on the job needs to know and understand:		
Context KA1. company's policies on: quality and delivery standards, design norms, sa		
and hazards, integrity, laws and codes, compliances, and guid	lelines for	
knowledge sharing		
KA2. the purpose and scope of the work to be carried out and the	importance of	
keeping within those boundaries		
KA3. who to involve when developing network designs and their ro	oles and	
responsibilities		
KA4. the importance of verifying data and other information obtain	ned for the	
design		
KA5. risk and impact of not following defined codes and norms		
B. Technical The user/individual on the job needs to know and understand:		
Knowledge KB1. various site/other system evaluation techniques		
KB2. probable issues that can occur during execution because of fa	aulty design	
KB3. fire protection engineering methods and practices		
KB4. safety practices to be followed in structures where hazardous	s solids, liquids,	
or gases are to be manufactured, used or stored		
KB5. applicable building codes and fire-fighting system designing n	orms	
KB6. fire-fighting equipments, its uses and limitations		
KB7. comprehensive knowledge of various materials used in hydra	aulic fire-	







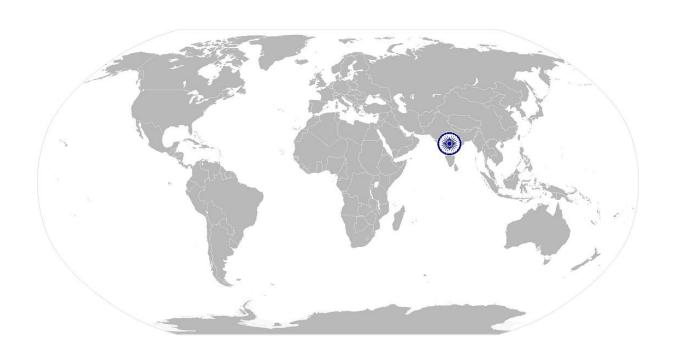
		KB8. the nature and characteristics of fire and related hazards		
		KB9. manual and automatic fire detection systems		
		KB10. hydraulic principles related to design of fire-fighting system such as fluid		
		mechanics, flow dynamics, etc.		
		KB11. various designing parameters such as amount of water flow, pressure,		
		velocity, etc.		
		KB12. various design techniques that can be used, their constraints and impacts		
		KB13. different types of manual drawing tools		
		KB14. software related to drawings and design such as AutoCAD, Microsoft Project,		
		etc.		
		KB15. design codes and norms related to hydraulic fire-fighting system design		
		KB16. drawing and system design terminologies		
		KB17. the importance of collating feedback on designs		
Ski	ills (S)			
Α.	Core Skills/	Communication skills		
	Generic Skills	The user/individual on the job needs to know and understand how to:		
		SA1. communicate in Hindi, English and/quegional 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		
В.	Professional Skills	Software usage		
٥.	Troncosional Ciano	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 network and its associated systems 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



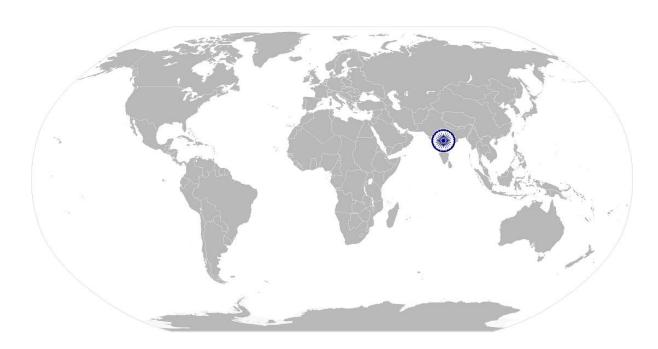






NOS Version Control

NOS Code	PSC/N0208		
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

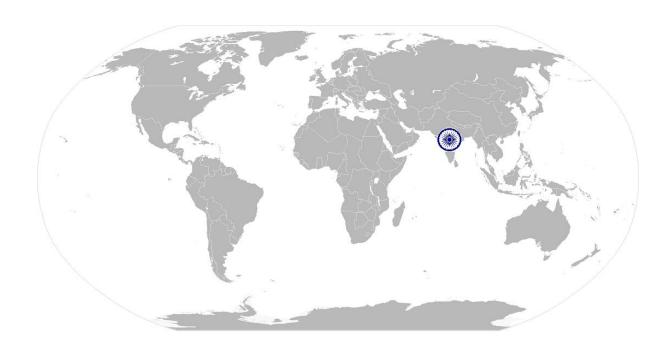








National Occupational Standard



Overview

This unit is about supervision and review of basic drawings prepared by draftsmen related to plumbing projects.







Unit Code	PSC/N0202		
Unit Title (Task)	Supervision and review of drawing works in a project		
Description	This OS unit is about supervision and review of basic drawings prepared by draftsmen related to plumbing projects		
Scope	This unit/task covers the following:		
	Supervision and review		
	supervision and review of drawings prepared by draftsmen		
Performance Criteria(P	PC) w.r.t. the Scope		
Element	Performance Criteria		
Supervision and	To be competent, the user/individual on the job must be able to:		
review	PC1. Instruct draftsmen regarding the project specification and corresponding		
	drawing preparation		
	PC2. supervise the work of a team of plumbing draftsmen		
	PC3. review final drawings in terms of project requirements and code compliance		
	PC4. answer internal and external queries related to drawings		
	PC5. maintain records and files of the previous drawing works		
Knowledge and Unders	standing (K)		
A. Organizational	The user/individual on the job needs to know and understand:		
Context	KA1. company's policies on: quality and delivery standards, safety and hazards,		
	integrity, code, compliance, etc.		
	KA2. risk and impact of not following defined codes and norms		
B. Technical	The user/individual on the job needs to know and understand:		
Knowledge	KB1. software related to drawings such as AutoCAD, Autodesk Revit, etc.		
	KB2. knowledge of plumbing principles		
	KB3. drawing codes and norms		
	KB4. drawing and design terminologies		
	KB5. common drawing errors and their resolution		
Skills (S)			
A. Core Skills/	Communication skills		
Generic Skills	The user/individual on the job needs to know and understand how to:		
	SA1. communicate in Hindi, English and/orregional language		
	Measurement/calculation skills		
	SA2. perform measurements as per requirement		
	SA3. perform basic and advance calculations pertaining to drawing and design		







		Teamv	vork
		SA4.	accept, interpret and provide instructions and requirements correctly
		SA5.	co-ordinate with co-workers and sub-ordinates
		SA6.	prioritize and complete necessary tasks in a fast-paced environment
В.	Professional Skills	Softwa	re usage
		The us	er/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 requirements
		SB2.	produce 3D layouts as required
		SB3.	debug and modify common errors in drawings
		Manua	al sketching
		SB4.	produce output in form of manual drawings and sketches
		SB5.	ensure accuracy and scale in the manual sketches
		Review and supervision	
		SB6. do a comprehensive review of drawings and layouts for compliance of nor	
		SB7.	instruct and continually guide and monitor drawing preparation by draftsmen

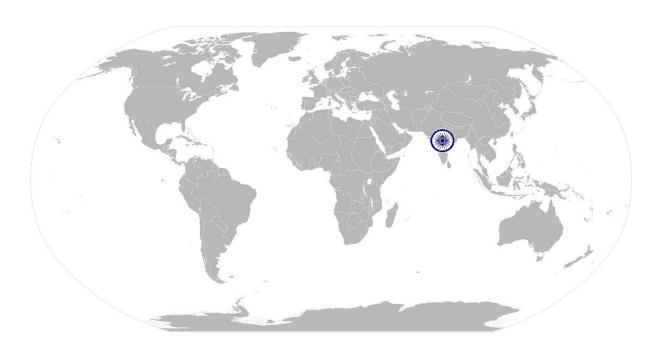






NOS Version Control

NOS Code	PSC/N0202		
Credits(NVEQF/NVQF/NSQF) [OPTIONAL]	TBD	Version number	0.1
Industry	Plumbing	Drafted on	15/07/13
Industry Sub-sector	Consultants	Last reviewed on	30/07/13
		Next review date	31/01/14

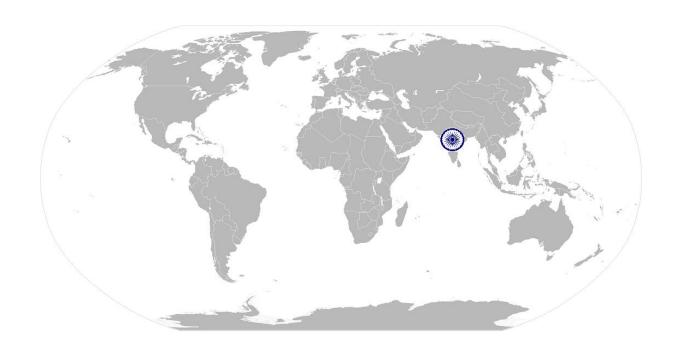








National Occupational Standard



Overview

This unit is about management of a design project during the designing phase of a project.







Unit Code	PSC/N0209	
Unit Title (Task)	Management of a design project	
Description	This OS unit is about management of a design project during the designing phase of a project	
Scope	This unit/task covers the following:	
Performance Criteria(F	Management of design project management of design work of various systems such as water/wastewater system, hydraulic fire protection system, rainwater harvesting system, groundwater extracting system, etc.	
Element	Performance Criteria	
Management of	To be competent, the user/individual on the job must be able to:	
design project	PC1. understand the nature of design work and requirement of the task PC2. assign the drafting task to draftsmen and/or drafting engineer	
	PC3. checking prepared drawings and design for accuracy PC4. validate the designs, ensuring that designs meet the site/project's	
	requirement PC5. understand and apply relevant codes as related to buildings and plumbing design PC6. do a quality check of all the completed design work to ensure its compliance with applicable codes and norms PC7. assist in preparing quantity and construction cost estimates as requested PC8. works to meet design schedules and complete tasks on budget	
Knowledge and Under	standing (K)	
A. Organizational	The user/individual on the job needs to know and understand:	
Context	KA1. company's policies on: quality and delivery standards, safety and hazards,	
	design codes and norms, integrity, dress code, etc.	
	KA2. importance of review of designs and plans	
	KA3. risk and impact of not following defined procedures/work plans	
	KA4. how to obtain previous designs and plans from organization existing database	
B. Technical	The user/individual on the job needs to know and understand:	
Knowledge	KB1. basic plumbing principles related to design, planning and execution	
	KB2. relevant designing and planning software such as AutoCAD, MS Office, etc.	
	KB3. design and plumbing terminologies	
	KB4. units of measurements	







		1		
	KB5. basic runtime errors and their resolution ensuring minimal deviation from the			
			design/plan	
	KB6. how to calculate material requirements as per drawing/layout			
Ski	ills (S)			
A.	Core Skills/	Comm	unication and reading skills	
	Generic Skills	The use	er/individual on the job needs to know and understand how to:	
		SA1.	communicate in Hindi, English and/or regional language	
		SA2.	read designs and plans	
		Estima	tion skills	
		SA3.	perform mathematical calculations	
	SA4. basic quantity and time estimations from the prepared design/plan		basic quantity and time estimations from the prepared design/plan	
В.	Professional Skills	Critical thinking and decision making		
		The user/individual on the job needs to know and understand how to:		
		SB1.	spot signs of deviation from codes/norms and take appropriate action	
		SB2. learn from past errors		
		Quality	r check	
		SB3.	ensure quality at work-in-progress stage according to design requirements	
		SB4.	check for quality in the final system design	
		Co-ordination and supervision		
		SB5. allocate work to sub-ordinates as required		
	SB6. communicate instructions and requirements correctly		communicate instructions and requirements correctly	
		SB7.	co-ordinate with co-workers, sub-ordinates and seniors for design/plan	
		1	related compliance	
		7.		

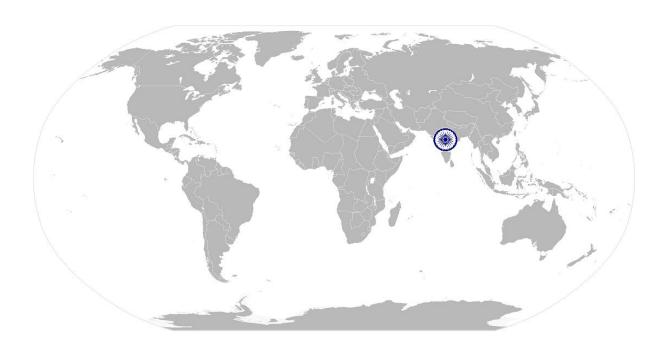






NOS Version Control

NOS Code	PSC/N0209		
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

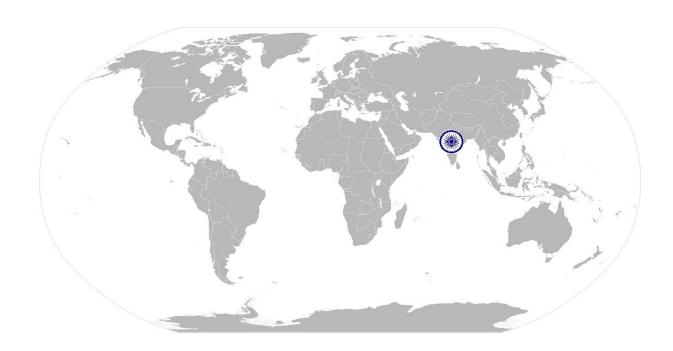








National Occupational Standard



Overview

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







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	This unit/task covers the following:	
	Interact with seniors	
	receive work instructions, discuss task status and receive feedback	
	Interact with colleagues within and outside the team	
	communicate and discuss work flow, problems faced, possible solutions and	
	pass on the learning within and outside the team	
Performance Criteria(P	C) w.r.t. the Scope	
Element	Performance Criteria	
Interaction with	To be competent, the user/individual on the job must be able to:	
seniors	PC1. receive work instructions and discuss the project/design with seniors	
	PC2. communicate to reporting senior about task status, repairs and maintenance	
	of tools and equipment as required	
	PC3. communicate any potential hazards and expected process disruptions	
	PC4. get the work reviewed and handover completed task to seniors	
	PC5. receive feedback from reporting senior	
	PC6. report any anticipated reasons for delays	
Interact with	To be competent, the user/individual on the job must be able to:	
colleagues within and	PC7. work as a team with colleagues and share work as per the work load and skills	
outside the team	PC8. work with colleagues of other teams	
	PC9. communicate and discuss work flow related difficulties in order to find	
	solution with mutual agreement	
	PC10. put team over individual goals	
	PC11. resolve conflicts	
Knowledge and Unders	standing (K)	
A. Organizational	The user/individual on the job needs to know and understand:	
Context	KA1. company's policies on: preferred language of communication, quality delivery	
	standards and personnel management	
	KA2. reporting structure	







В.	Technical	The use	er/individual on the job needs to know and understand:			
	Knowledge	KB1.	effective ways of communication			
		KB2.	B2. building team co-ordination			
Ski	lls (S)					
A.	Core Skills/	Commi	unication skills			
	Generic Skills	The use	er/individual on the job needs to know and understand how to:			
		SA1.	communicate in Hindi, English and/or regional language			
		Teamw	vork			
		SA2.	share work load as required			
		SA3. accept and interpret instructions and requirements correctly				
		SA4. co-ordinate with co-workers and sub-ordinates				
B.	Professional Skills	Decision making				
		The use	The user/individual on the job needs to know and understand:			
		SB1. how to spot and communicate potential areas of disruptions to work process				
		12	and report the same			
		SB2.	when to report to supervisor and when to deal with a colleague individually,			
		6	depending on the type of concern			
		Reflect	ive thinking			
		SB3.	improve work processes by interacting with others and adopting best			
			practices			







NOS Version Control

NOS Code	PSC/N0211		
Credits(NVEQF/NVQF/NSQF) [OPTIONAL]	ТВD	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

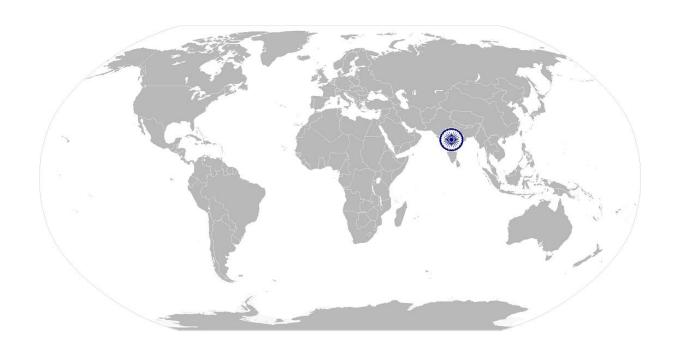








National Occupational Standard



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.







Unit Code	PSC/N0212			
Unit Title	Maintain a healthy, safe and secure working environment			
(Task)				
Description	This OS unit is about monitoring your working environment and making sure it meets requirements for health and safety			
Scono	This unit/task covers the following:			
Scope	This unity task covers the following.			
	Emergency precedures to be followed in case of			
	Emergency procedures to be followed in case of			
	accidents			
	• fires			
	• illness			
	breach of security			
	other reasons to evacuate the premises			
Performance Criteria(P	C) w.r.t. the Scope			
Element	Performance Criteria			
Emergency	To be competent, the user/individual on the job must be able to:			
procedures	PC1. comply with organization's current health, safety and security policies and			
	procedures			
	PC2. report any identified breaches in health, safety, and security policies ar			
	procedures to the designated person			
	PC3. identify and remove any hazards that can be dealt safely, competently and			
	within the limits of individual's authority			
	PC4. report hazards to the relevant person in line with organizational procedures			
and warn other people who may be affected				
	PC5. follow organization's emergency procedures promptly, calmly, and efficiently			
	PC6. identify and recommend opportunities for improving health, safety, and			
	security to the designated person			
	PC7. complete any health and safety records legibly and accurately			
Knowledge and Unders	Knowledge and Understanding (K)			
A. Organizational	The user/individual on the job needs to know and understand:			
Context	KA1. company's policy on: safety and hazards, personnel management, role and			
	responsibilities			
	KA2. reporting structure			
	KA3. what is meant by a hazard, including the different types of health and safety			
	hazards that can be found in the workplace			
	KA4. organization's emergency procedures for different emergency situations and			







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







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



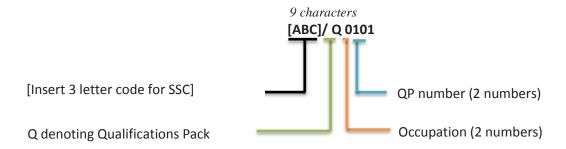




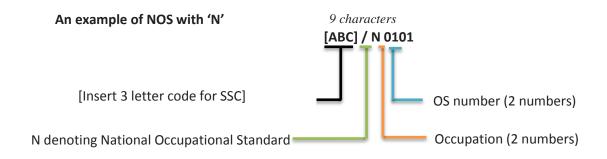
Annexure

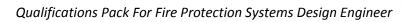
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard









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 Q P or N OS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01