

**NSDA Reference**  
*To be added by NSDA*

**QUALIFICATION FILE – CONTACT DETAILS OF SUBMITTING BODY**

**Name and address of submitting body:**

**IPSC**

**Indian Plumbing Skills Council**

**B-168/169, Ground Floor,**

**Okhla Indl. Area Phase 1,**

**DDA Sheds, New Delhi-110020.**

**T: +91 11 41513580, 41400556**

**Name and contact details of individual dealing with the submission**

**Name: Harpreet Singh**

**Position in the organisation: Vice President**

**Address if different from above**

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**List of documents submitted in support of the Qualifications File**

- 1 Composition of the Technical Committee
- 2 RFP for development of Occupational Standards
- 3 Selection process of the Consultants to develop Occupational Standards
- 4 Occupational Map
- 5 Draft MoU with Industry
- 6 Qualification Pack annexure-I
- 7 Career map annexure –II
- 8 List of assessment bodies-Annexure III

## 1. QUALIFICATION FILE SUMMARY

<b>Qualification Title</b>	Fire Protection Systems Design Engineer PSC/ Q0205		
<b>Body/bodies which will assess candidates</b>	IPSC		
<b>Body/bodies which will award the certificate for the qualification.</b>	IPSC		
<b>Body which will accredit providers to offer the qualification.</b>	IPSC		
<b>Occupation(s) to which the qualification gives access</b>	A Fire Protection Systems Design Engineer is responsible for design of hydraulic fire-fighting system of a building/structure		
<b>Proposed level of the qualification in the NSQF.</b>	Level-7		
<b>Anticipated volume of training/learning required to complete the qualification.</b>	480 Hrs		
<b>Entry requirements / recommendations.</b>	Diploma in Civil / Mechanical Engineering		
<b>Progression from the qualification.</b>	Level -8 Public Health Systems Design Engineer, Wastewater Systems Design Engineer		
<b>Planned arrangements for RPL.</b>	RPL arrangements and policies are under development		
<b>International Comparability</b>	The Technical parts of the NOSs are comparable to Canadian, British and Australian standards. However Numeracy, literacy and basic science levels are lower to match with the existing Indian conditions. Apart from this the Qualification pack, as per the NSDC policy for our country, is for a job role and on a trade or occupation. Following the same there cannot be qualification pack comparability.		
<b>Formal structure of the qualification</b>			
<b>Title of unit or other component</b> (include any identification code used)	<b>Mandatory/ Optional</b>	<b>Estimated size (learning hours)</b>	<b>Level</b>
1. PSC/ N 0208 (Design of hydraulic fire protection systems)	<b>Mandatory</b>	<b>168 Hrs</b>	<b>7</b>
2. PSC/ N 0202 (Supervision and review of drawing works in a	<b>Mandatory</b>	<b>160 Hrs</b>	<b>7,8</b>

project)			
3. PSC/ N 0209 (Management of a design project)	<b>Mandatory</b>	<b>56 Hrs</b>	<b>7,8</b>
4. PSC/ N 0211 (Work effectively with colleagues)	<b>Mandatory</b>	<b>40 Hrs</b>	<b>Common across level 3,5,6-8</b>
5. PSC/ N 0212 (Keep the working environment healthy, safe and secure)	<b>Mandatory</b>	<b>56 Hrs</b>	<b>Common across level 3,5,6-8</b>

Please attach any document giving further detail about the structure of the qualification – eg a Curriculum or Qualification Pack.

Give details of the document here:

## **SECTION 1**

### **ASSESSMENT**

#### **Name of assessment body:**

If there will be more than one assessment body for this qualification, give details.

[http://ipsc.in/training\\_assesement\\_partners.php](http://ipsc.in/training_assesement_partners.php)- Annexure III

#### **Will the assessment body be responsible for RPL assessment?**

#### **Give details of how RPL assessment for the qualification will be carried out and quality assured.**

RPL will be based on the same approved Qualification Pack and Assessment Criteria mentioned in the Qualification Pack.

The process of RPL assessment is under development.

#### **Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:**

#### **PURPOSE OF ASSESSMENT**

The purpose of the assessment is to identify if the learner has completely comprehended the technicalities of the job role of a Bathroom & Kitchen Designer and thus, allows learners to progress to the LEVEL 7 and above. It also builds up the personal attributes of the learner to undertake work independently, become a good team player by being a competent listener, apt at taking instructions, and overall develop into a result oriented and positive person comfortable with laborious task of the trade.

#### **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 theory part will be based on knowledge bank of questions created by the SSC
3. Individual assessment agencies will create unique question papers for theory part for

each candidate at each examination/training center (as per assessment criteria below)

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

5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS

6. 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

**SCALING METHODS** Pass mark: 70%

Unit Knowledge learning outcome	Approximate coverage	Valuation
Knowledge of hydraulic fire-fighting system ,detection system and sprinkler system of housing, commercial or institutional projects	Assignments Practical Field work	20%
Knowledge of detailed network design indicating location, type, length and diameter of various pipes and its accessories	Assignments and Practical Field work	20%
Understanding of drawing works in a project and application of relevant codes as related to buildings and plumbing design	Assignments and Practical Field work	20%
Understanding of receiving work instructions and discussing the project/design with seniors	Assignments and Practical Field work	20%
Knowledge of time management for the work	Assignments and Practical Field work	10%
Understanding of various safety measures and equipments	Assignments and Practical Field work	10%

Please attach any documents giving further information about assessment and/or RPL.  
Give details of the document(s) here:

The assessment comprises of a combination three assessment techniques i.e.

- 1 Practical Assessment
- 2 Viva/ Structured Interview
- 3 Written Assessments

### **ASSESSMENT EVIDENCE**

**Complete the following grid for each grouping of NOS, assessment unit or other component as per the assessment criteria. Insert the required number of rows.**

**CRITERIA FOR ASSESSMENT OF TRAINEES**

**Fire Protection Systems Design Engineer**

**205**

**IPSC**

**Guidelines for Assessment**

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		<b>Marks Allocation</b>			
		<b>Total Mark (550 MARKS)</b>	<b>Out Of</b>	<b>Theory</b>	<b>Skills Practical</b>
1. PSC/ N 0208 (Design of hydraulic fire protection systems)	PC1. Inspect and evaluate a building (housing, commercial or institutional) and other systems for the hydraulic fire-fighting system requirement	<b>150</b>	5	3	2
	PC2. Inspect and evaluate any installed system such as detection system and sprinkler system for any renovation requirement		5	2	3
	PC3. Access existing documents, design standards, templates and design tools from organization's knowledge		10	5	5

	base
	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
	Pc6. 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
	Pc8. Estimate total water requirement as per the size of building
	Pc9. Develop detailed system design including network design, detections system design, fire alarm system design and sprinkler system design
	Pc10. Develop detailed network design indicating location, type, length and diameter of various pipes and its accessories

10	5	5
10	5	5
10	5	5
10	5	5
10	5	5
10	5	5
10	5	5



	Pc11. Estimate the capacity of water mains		10	5	5
	Pc12. Conform to applicable laws, codes and regulations		10	5	5
	Pc13. Select products which meet required project criteria and industry standards, balancing cost and quality		10	5	5
	Pc14. Provide the project stakeholders with enough relevant and accurate information to agree on the detailed system design		10	5	5
	Pc15. Review documents with appropriate people and incorporate their inputs		10	5	5
	Pc16. Prepare bills of materials (boms) for finalized system design if required in the project		10	5	5
		<b>Total</b>	150	75	75
2. PSC/N0202 (Supervision and review of drawing works in a project)	Pc1. Instruct draftsmen regarding the project specification and corresponding drawing	100	20	10	10
	Pc2. Supervise the work of a team of plumbing draftsmen		20	10	10
	Pc3. Review final drawings in terms of project requirements and code compliance		20	10	10
	Pc4. Answer internal and external queries related to drawings		20	10	10
	Pc5. Maintain records and files of the previous drawing works		20	10	10
		<b>Total</b>	100	50	50

3. PSC/N0209 (Management of a design project)	Pc1. Understand the nature of design work and requirement of the task	100	10	5	5
	Pc2. Assign the drafting task to draftsmen and/or drafting engineer		10	5	5
	Pc3. Checking prepared drawings and design for accuracy		10	5	5
	Pc4. Validate the designs, ensuring that designs meet the site/project's requirement		20	10	10
	Pc5. Understand and apply relevant codes as related to buildings and plumbing design		10	5	5
	Pc6. Do a quality check of all the completed design work to ensure its compliance with applicable codes and norms		20	10	10
	Pc7. Assist in preparing quantity and construction cost estimates as requested		10	5	5
	Pc8. Works to meet design schedules and complete tasks on budget		10	5	5
		<b>Total</b>	100	50	50
4. PSC/N0211 (work effectively with colleagues)	Pc1. Coordinate all work instructions and discuss with various concerned departments	100	5	2	3
	Pc2. Communicate and coordinate task status, repairs and maintenance of tools and equipment as required with various departments		5	3	2
	Pc3. Manage any potential hazards and expected process disruptions		10	5	5

	Pc4. Get the work reviewed and handover completed task to the concerned department		10	5	5
	Pc5. Receive feedback from the concerned department		10	5	5
	Pc6. Report any anticipated reasons for delays to the organization		10	5	5
	Pc7. Work as a team with colleagues and share work as per the work load and skills		10	5	5
	Pc8. Work with colleagues of other teams		10	5	5
	Pc9. Communicate and discuss work flow related difficulties in order to find solution with mutual agreement		10	5	5
	Pc10. Put team over individual goals		10	5	5
	Pc11. Resolve conflicts		10	5	5
		<b>Total</b>	100	50	50
5.PSC/N0212Keep the working environment healthy, safe and secure	Pc1. Comply with organization's current health, safety and security policies and procedures	<b>100</b>	10	5	5
	Pc2. Communicate any identified breaches in health, safety, and security policies and procedures to the designated person		15	7	8
	Pc3. Identify and remove any hazards that can be dealt safely, competently and within the limits of individual's authority		15	8	7

	PC4. Communicate hazards to the relevant person in line with organizational procedures and warn other people who may be affected	15	7	8
	PC5. Follow organization's emergency procedures promptly, calmly, and efficiently	15	8	7
	PC6. Identify and recommend opportunities for improving health, safety, and security to the designated person	15	7	8
	PC7. Complete any health and safety records legibly and accurately	15	8	7
	<b>Total</b>	100	50	50

## **SECTION 2**

### **EVIDENCE OF NEED**

**What evidence is there that the qualification is needed?**

- 70 Job roles identified by the Industry including our Governing Board.
- 30-32 job roles were scrutinized and given the project to IMaCS
- 25 job roles finalized after industry interaction during the workshops and individual meetings.

**What is the estimated uptake of this qualification and what is the basis of this estimate?**

25 Job roles were identified after understanding the market need and demand. Our Agency met with around 200 industry people while developing these Qualification Packs. Individual interactions, workshops, Group Discussion were done to identify market demand and need.

**What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?**

As mentioned, initially 70 job roles were identified but only 25 job roles finally identified to avoid overlapping. Job roles were approved on the basis of career progression of an Individual.

**What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated?**

- Detail Sustainability Plan available

Please attach any documents giving further information about any of the topics above. Give details of the document(s) here:

### SECTION 3

#### **SUMMARY EVIDENCE OF LEVEL**

Level of qualification: -7

Summary of Direct Evidence:

Justify the NSQF level allocated to the QP by building upon the five descriptors of NSQF. Explain the reasons for allocating the level to the QP.

Generic NOS is/are linked to the overall authority attached to the job role.

Process required	Professional Knowledge	Professional Skills	Core Skills	Responsibility	Level
Job holder performs works which requires skills developed from working experience and learning. Job holder is expected to have specialised theoretical and practical skill, involving routine and non routine works. The job holder is expected to design hydraulic fire protection systems, inspection and evaluation of a building for the hydraulic fire-fighting system requirement.	Job holder is expected to have factual and theoretical knowledge of fire protection engineering methods and practices, applicable building codes and fire-fighting system designing norms, fire-fighting equipments, its uses and limitations, hydraulic principles related to design of fire-fighting system such as fluid mechanics, flow dynamics,	Job holder is expected to demonstrate cognitive and practical skills for use relevant software and produce output in terms of drawings and layouts as per instructions, produce 3D layouts as required, debug and modify common errors in drawings. It is also expected from the job holder to design the network and its associated systems manually considering all	The workman at this level (i.e. 7), is expected to do mathematical calculations, understanding of social and political things and good in collecting data by organising information and logical communications. The person is expected to do calculations as per requirements, pertaining to drawing and design. Further it is expected to accept and	The job holder is responsible for inspect and evaluate a building (housing, commercial or institutional) and other systems for the hydraulic fire-fighting system requirement, identify, analyse and prioritise relevant technical, environmental and cost factors which are likely to influence design and execution of the hydraulic fire-fighting system, analyse design concepts to	7

<p>He/she is expected to supervise and review drawing works prepared by draftsmen in a project.</p> <p>It is also expected from the job holder to look into the management of design work of various systems such as water/wastewater system, hydraulic fire protection system, rainwater harvesting system, groundwater extracting system, etc. Considering above said points ore, it is justified to keep job holder at level 7</p>	<p>etc. It is also expected from him/her to have knowledge of software related to drawings such as AutoCAD, Autodesk Revit, etc., knowledge of plumbing principles, drawing codes and norms, drawing and design terminologies, common drawing errors and their resolution, how to calculate material requirements as per drawing/layout</p> <p>it is justified to keep job holder at level 7</p>	<p>design parameters, adhere to relevant codes and regulations while preparing the design, check for quality in the final system design.</p> <p>He/she should be able to make decisions on suitable courses of action, identify anomalies in data, apply problem-solving approaches in different situations, do a comprehensive review of drawings and layouts for compliance of norms, instruct and monitor drawing preparation by draftsmen</p> <p>Therefore Job holder is kept at Level 7</p>	<p>interpret instructions and requirements correctly, follow the instructions of the reporting authority, co-ordinate with co-workers, supervise subordinates, prioritize and complete necessary tasks in a fast-paced environment. Hence can be placed at level-7</p>	<p>identify best fit with the design requirements and constraints, prepare bills of materials (BOMs) for finalized system design if required in the project. He is responsible for output of the group as well as the further development</p> <p>He/she is further responsible for instructing draftsmen regarding the project specification and corresponding drawing preparation, supervise the work, answer internal and external queries related to drawings, maintain records, do a quality check of all the completed</p>	
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				design work, hence can be placed at level 7	
Level 7	Level 7	Level 7	Level 7	Level 7	

**OTHER EVIDENCE OF LEVEL** [This need only be filled in where evidence other than primary outcomes was used to allocate a level] **(Optional)**

Summary of other evidence (if used):

**SECTION 4**

**EVIDENCE OF RECOGNITION OR PROGRESSION**

**What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?**

**Horizontal and vertical mobility options have been articulated.**



Please attach any documents giving further information about any of the topics above.  
Give details of the document(s) here:

