

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

**Name and address of submitting body:**

**Construction Skill Development Council of India**

**Address:-** 204, Aashirwad Complex, D-1, Green Park, New Delhi - 110016

Tel: +91-11-46584466

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

**Name:** Ms. Jancy Mathew

**Position in the organisation:** Head Standards and Research

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*Same as above*

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

1. Career Map of Pre Stressing Occupation - Annexure 1
2. QP CON/Q0802- Annexure 2

## QUALIFICATION FILE SUMMARY

<b>Qualification Title</b>	Technician Prestress- QP CON/Q0802		
<b>Body/bodies which will assess candidates</b>	<ul style="list-style-type: none"> <li>• MCG</li> <li>• Star Projects</li> </ul>		
<b>Body/bodies which will award the certificate for the qualification.</b>	CSDCI		
<b>Body which will accredit providers to offer the qualification.</b>	CSDCI		
<b>Occupation(s) to which the qualification gives access</b>	Pre Stressing		
<b>Proposed level of the qualification in the NSQF.</b>	4		
<b>Anticipated volume of training/learning required to complete the qualification.</b>	600 hrs		
<b>Entry requirements / recommendations.</b>	Preferably 10th standard		
<b>Progression from the qualification.</b>	Senior Technician - Prestress		
<b>Planned arrangements for RPL.</b>	Work is under progress		
<b>International Comparability</b>	Comparable with UK Standard and Australia Standard		
<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>
CON/N0804: Fix anchorage and lay ducts for installing pre-stressing systems	Mandatory	184	4
CON/N0805: Lay pre-stressing tendons through anchorages and bearing plates	Mandatory	184	4
CON/N0806: Assist in stressing of tendons and monitor pressure grouting works	Mandatory	168	4
CON/N8001: Work effectively in a team to deliver results at a construction site	Mandatory	24	4
CON/N8002: Plan and organize work to meet expected outcomes	Mandatory	16	4
CON/N9001: Work according to personal health, safety and environment protocol at construction site	Mandatory	24	4

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:

1. QP CON/Q0802- Annexure 2

## SECTION 1

### ASSESSMENT

**Name of assessment body:**

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

- MCG
- Star Projects

**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.

The RPL assessment will be carried out through screening, identifying the skills gaps, provide bridge training to cover the competency gap and then conduct final assessment of the candidates.

**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:**

Assessment is done through third parties who are affiliated to CSDCI as Assessment Body. Assessors are trained & certified by CSDCI through Training of Trainers program. The assessment involves two processes. The first process is gathering the evidence of the competency of individuals. The second part of the assessment process is the judgement as to whether a person is competent or not. The assessment plan contains the following information:

- What will be assessed, i.e. the competency based on each NOS
- How assessment will occur i.e. methods of assessment
- When the assessment will occur
- Where the assessment will take place i.e. context of the assessment (workplace/simulation)
- The criteria for decision making i.e. those aspects that will guide judgements and
- Where appropriate, any supplementary criteria used to make a judgement on the level of performance.

The assessment is conducted through theory, viva voce and practical.

Please attach any documents giving further information about assessment and/or RPL.

Give details of the document(s) here:

**Not Applicable**

### 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

### Technician – Prestress

### CON/Q0802

### Construction Skill Development Council Of India

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

		<b>Marks Allocation</b>			
<b>Assessable Outcome</b>	<b>Assessment criteria</b>	<b>Total Marks</b>	<b>Out Of</b>	<b>Theory</b>	<b>Practical Skills</b>
<b>CON/N0804: Fix anchorage and lay ducts for installing pre- stressing systems</b>	PC1. carry out necessary measurements to mark location of inserts on the formwork shutters	<b>100</b>	4	1	3
	PC2. mark location of the inserts, embedded components using appropriate marking tools/ paints		4	1	3
	PC3. cut opening in the shutter panels by using power cutting tools		5	2	3
	PC4. make wooden templates as pockets as per drawing within dimensional tolerance limit for fixing guide cones		5	2	3

	PC5. cut holes/ grooves to the templates as per guide cone's dimension wooden appropriate hand and power tools		5	1.5	3.5
	PC6. check shape of reinforcement bars, centre to centre distance, covers, tying of bars at the location of fixing anchorages in reference to applicable drawing		5	1.5	3.5
	PC7. fix pockets, anchorage guide cones, inserts to the formwork shutters as per marking by using suitable hand tools		5	1.5	3.5
	PC8. fix foam sheets, stoppers to the inserts for making pockets as per applicability		5	1.5	3.5
	PC9. carry out suitable adjustments to the anchorage cones to maintain its alignment and level as per drawing		5	1.5	3.5
	PC10. ensure water tightness and leakage through the embedded components		4	1	3
	PC11. carry out measurement of distance among multiple anchorage cones to cross check the locations as per drawing		5	1.5	3.5
	PC12. use appropriate PPEs while working at height/ night		4	1	3
	PC13. check sheathing ducts visually for diameter, corrosion, distortion and cracks prior to laying		5	1.5	3.5
	PC14. check duct laying location for completion of preparatory works (reinforcement/ shuttering works, cleaning etc.) prior to start placing sheathing ducts		5	1.5	3.5
	PC15. place tendon/ duct supports at specified interval		5	1.5	3.5
	PC16. lock supports by tying with reinforcement or by suitable means as per approved method		5	1.5	3.5
	PC17. ensure supports are rigidly fixed and secured against movements		5	1.5	3.5
	PC18. lay ducts through the supports and join the duct terminals to the anchorage guide cones as per drawing/ specification		5	1.5	3.5
	PC19. tie sheathing ducts to the supports ensuring adequate tightness and rigidity		5	1.5	3.5
	PC20. connect sheathing ducts by screwing or sealant tapes as per applicability ensuring water tightness		5	1.5	3.5
	PC21. apply appropriate sealant to the joint of duct and anchorage cone		4	1	3
		<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>
<b>CON/N0805: Lay pre-stressing tendons through anchorages and bearing plates</b>	PC1. check exposed tendons for corrosion and any visible deviation	<b>100</b>	5	1.5	3.5
	PC2. monitor uncoiling and expansion of tendons		5	1.5	3.5
	PC3. place one or multiple tendons together and fix them at appropriate location		5	1.5	3.5
	PC4. carry out necessary measurements and mark required cutting lengths using appropriate marking tools		8	2.5	5.5
	PC5. cut tendons using abrasive cutting tools		5	1.5	3.5
	PC6. ensure smooth edge of tendons after completion of cutting		5	1.5	3.5
	PC7. use appropriate PPEs while unwinding coils and carry out cutting works		5	1.5	3.5
	PC8. pull and push tendons through sheathing ducts		5	1.5	3.5

	PC9. ensure no harm is caused to sheathing ducts during insertion and passing of tendons through the same		5	1.5	3.5
	PC10. place specified number of tendons of specified grade through each duct		6	1.5	4.5
	PC11. carry out threading of tendons using appropriate threading tools as and when necessary		8	2.5	5.5
	PC12. pass the tendons through anchorage cones and bearing plates and expose them out of the ducts		5	1.5	3.5
	PC13. insert the 'Bearing Ring' over the 'Bearing Plate' at both ends of the Tendon and press to fully to sit properly over the 'Guide Ring'		8	2.5	5.5
	PC14. insert the 'Pressure Plate' as per the orientation of the Bearing Plate Hole		5	1.5	3.5
	PC15. mount steel grips to the bearing plate holes and tighten them in prior to start tensioning		5	1.5	3.5
	PC16. prepare bulbs in tendon terminals using appropriate tools, in case of laying in blind (dead) end anchorage zone		5	1.5	3.5
	PC17. lock tendons by putting swaged sleeves and distribution plates in case of blind end anchorage (if applicable)		5	1.5	3.5
	PC18. close all the opening in ducts by using suitable/ approved material as per instruction		5	1.5	3.5
		<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>
<b>CON/N 0806: Assist in stressing of tendons and monitor pressure grouting works</b>	PC1. check stressing equipments( jacks/ power packs) visually for any visible damage or leakage prior to shifting	<b>100</b>	6	1	5
	PC2. shift stressing jacks, power packs and their accessories to the appropriate location of stressing		6	1	5
	PC3. erect signage and barricading to the pre-stressing points to restrict entry of unauthorized person or vehicle		6	2	4
	PC4. pass tendons through the jack as per instruction		6	2	4
	PC5. lock the tendons by using master grips prior to start stressing		6	2	4
	PC6. connect power pack, hydraulic jack through hose		6	2	4
	PC7. connect pre-stressing jacks and power pack units to electrical outlets		8	2	6
	PC8. monitor storing and stacking of grouting materials from store to work site		6	2	4
	PC9. check grouting material visually to ensure their usability		6	2	4
	PC10. check grouting pump visually for visible damages and dislocation/ breakage of accessories		6	2	4
	PC11. monitor fixing of grouting nozzles as per specification		6	2	4
	PC12. check connections of grouting nozzle and grouting hose for adequate tightness		6	2	4
	PC13. check and ensure grouting vent are closed appropriately using approved material against ingress of dust, moisture etc.		6	2	4
	PC14. ensure grouting materials are mixed in appropriate proportion		6	2	4

	PC15. monitor grout is applied in specified pressure by using appropriate grouting pump		8	2	6
	PC16. check pressure gauge and monitor pressure of grouting		6	2	4
		<b>Total</b>	<b>100</b>	<b>30</b>	<b>70</b>
<b>CON/N8001: Work effectively in a team to deliver desired results at the workplace</b>	PC1. pass on work related information/ requirement clearly to the team members	<b>100</b>	10	3	7
	PC2. inform co-workers and superiors about any kind of deviations from work		5	1.5	3.5
	PC3. address the problems effectively and report if required to immediate supervisor appropriately		5	1.5	3.5
	PC4. receive instructions clearly from superiors and respond effectively on same		5	1.5	3.5
	PC5. communicate to team members/subordinates for appropriate work technique and method		5	1.5	3.5
	PC6. seek clarification and advice as per requirement and applicability		10	3	7
	PC7. hand over the required material, tools tackles, equipment and work fronts timely to interfacing teams		30	9	21
	PC8. work together with co-workers in a synchronized manner		30	9	21
			<b>Total</b>	<b>100</b>	<b>30</b>
<b>CON/N8002: Plan and organize work to meet expected outcomes</b>	PC1. understand clearly the targets and timelines set by superiors	<b>100</b>	10	3	7
	PC2. plan activities as per schedule and sequence		10	3	7
	PC3. provide guidance to the subordinates to obtain desired outcome		10	3	7
	PC4. plan housekeeping activities prior to and post completion of work		10	3	7
	PC5. list and arrange required resources prior to commencement of work		10	3	7
	PC6. select and employ correct tools, tackles and equipment for completion of desired work		10	3	7
	PC7. complete the work with allocated resources		10	3	7
	PC8. engage allocated manpower in an appropriate manner		10	3	7
	PC9. use resources in an optimum manner to avoid any unnecessary wastage		5	1.5	3.5
	PC10. employ tools, tackles and equipment with care to avoid damage to the same		5	1.5	3.5
	PC11. organize work output, materials used, tools and tackles deployed,		5	1.5	3.5
	PC12. processes adopted to be in line with the specified standards and instructions		5	1.5	3.5
			<b>Total</b>	<b>100</b>	<b>30</b>
<b>CON/N9001: Work according to personal health, safety and environment protocol at</b>	PC1. identify and report any hazards, risks or breaches in site safety to the appropriate authority		5	1.5	3.5
	PC2. follow emergency and evacuation procedures in case of accidents, fires, natural calamities		5	1.5	3.5
	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		5	1.5	3.5

<b>construction site</b>	at site				
	PC5. identify near miss , unsafe condition and unsafe act		5	1.5	3.5
	PC6. use appropriate Personal Protective Equipment (PPE) as per work requirements including: <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>	<b>100</b>	10	3	7
	PC7. handle all required tools, tackles , materials & equipment safely		5	1.5	3.5
	PC8. follow safe disposal of waste, harmful and hazardous materials as per EHS guidelines		5	1.5	3.5
	PC9. install and apply properly all safety equipment as instructed		15	4.5	10.5
	PC10. follow safety protocol and practices as laid down by site EHS department		15	4.5	10.5
	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>



## SECTION 2

### EVIDENCE OF NEED

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

Please refer to the attached list of job roles and occupations identified in construction sector. These job roles have been derived through extensive industry interactions facilitated from 10 workshops and various site visits conducted and interaction with 500+representatives from different construction sector organizations all over the country.

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

As per survey the incremental Manpower Gap between 2008 and 2022 found out to be 459000 under Pre Stressing Occupation

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

QPs for Job Roles of various related SSC's were studied to ensure that there is no duplicity.

**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?**

Standards department of CSDCI will do periodic review and monitor the industry feedbacks, Training Partners feedback on the qualification and will incorporate them appropriately at the designated revision time.

The revision of this qualification is scheduled after 2 years i.e. 23/08/2017

Please attach any documents giving further information about any of the topics above.

Give details of the document(s) here:

1. List of job roles

## SECTION 3

### SUMMARY EVIDENCE OF LEVEL

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.

### Technician – Prestress QP CON/Q0802

Process required	Professional Knowledge	Professional Skills	Core Skills	Responsibility	Level
<p>The job holder is expected to select and use specific tools and tackles to fix anchorages/ ducts at their designated locations, lay tendons as per applicable work methods/ standard practices and assist in stressing of tendons at construction sites. The functions require application of standard and safe work methods on regular basis as applicable to construction of pile foundations at sites.</p>	<p>The job holder is expected to know the use of tools, materials components and their accessories required for construction of pile foundations. Individual at this level should have the basic concept of sequential steps and standard methods of activities involved in construction of pile foundations. Moreover, the job holder should be aware of safety norms as applicable to bored cast in-situ pile construction.</p>	<p>The job holder is expected to recall and demonstrate skills to fix anchorages/ ducts to their designated positions by carrying out measurements and using appropriate tools. Individual should be able to cut tendons/ ducts and lay them as per applicable drawing and specifications within specified limit of tolerance, assist in stressing of tendons and monitor pressure grouting works in pre-stressing ducts in RCC structures.</p> <p>The nature of work requires skills to be applied in a narrow range repeatedly adhering to applicable safety and quality norms.</p>	<p>The job holder is expected to communicate clearly and concisely to guide a crew of pre-stressing workers to get assigned tasks done, provide direction to the subordinates while monitoring grouting works and prepare measurement notes or technical details as per work requirement. The individual of this job role is also expected to apply arithmetic and geometric principle while reading drawings, carrying out measurement or related activities. The job holder always adheres to applicable working methods, quality guidelines, general/ trade specific safe working procedures while performing heavy lifting or erection of structural steel assemblies.</p>	<p>The job holder is responsible for fixing components of pre-stressing arrangement and assist in stressing of tendons as per specified drawing and quality norms using optimum quantity/ amount of resources. Individual is expected to ensure implementation of applicable quality and safety norms by carrying out visual checks/ inspection to the tendons, ducts, grouting activities and completed works which are under his/ her direct supervision.</p> <p>The job holder is also expected to learn new techniques of pre-stressing works in RCC structures and use of modern stressing equipments as the nature of work involves working with sophisticated equipments and tensile loads.</p>	4
<b>Level 4</b>	<b>Level 4</b>	<b>Level 4</b>	<b>Level 4</b>	<b>Level 4</b>	

**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): **Not applicable.**

## **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?**

Please refer to attached career path as per annexure 1 which clearly define the clear career path.

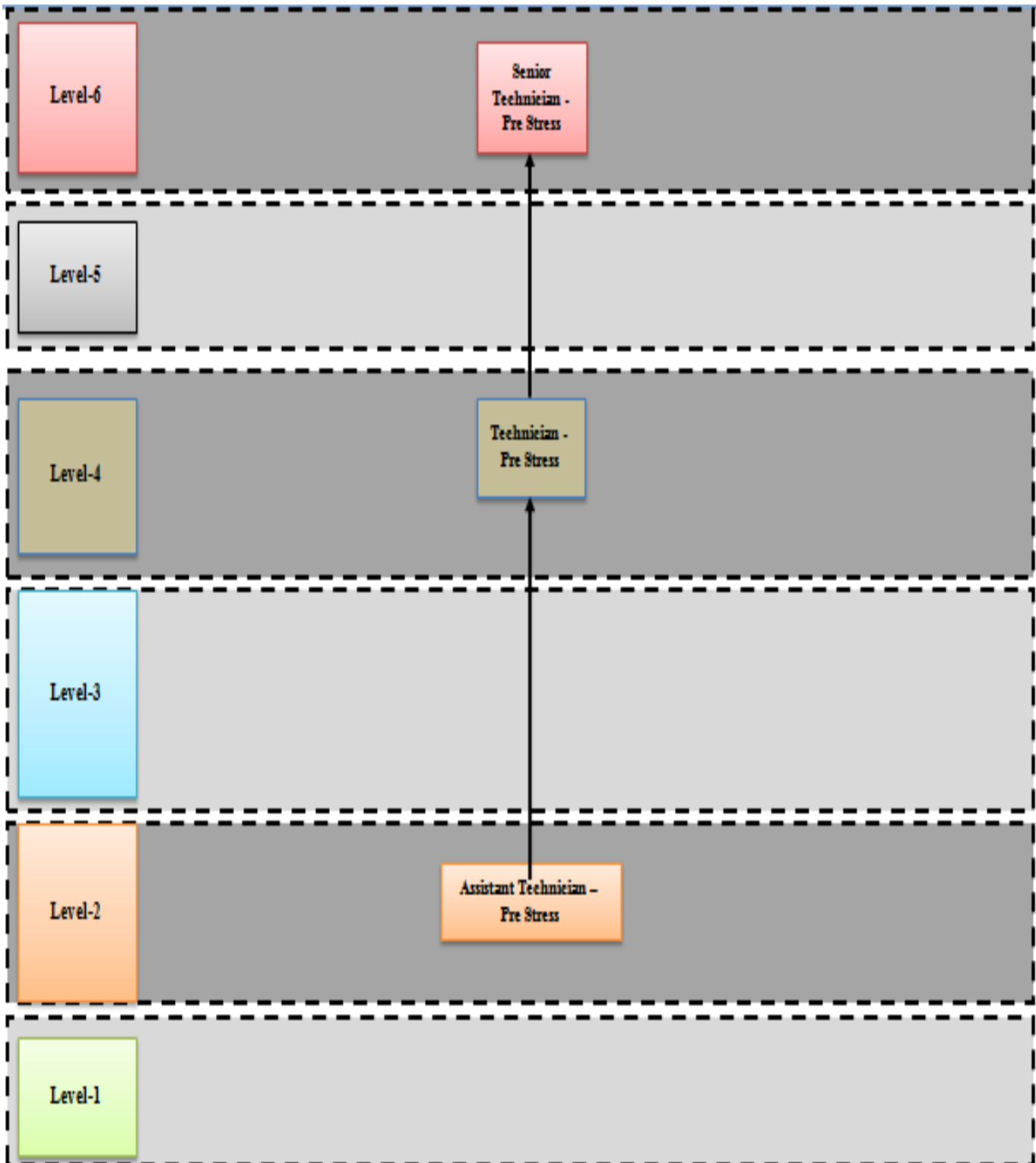
Please attach any documents giving further information about any of the topics above.

Give details of the document(s) here:

1. Annexure 1
  - Overall Career map
  - Career map of Pre Stressing Occupation
2. QP CON/Q0802- Annexure 2

Annexure 1

Career Map



Annexure 2- QP CON/Q0802