

**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/Q0803- Annexure 2

## QUALIFICATION FILE SUMMARY

<b>Qualification Title</b>	Senior Technician Pre Stress - QP CON/Q0803		
<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>	6		
<b>Anticipated volume of training/learning required to complete the qualification.</b>	1000 hrs		
<b>Entry requirements / recommendations.</b>	Preferably 12th standard		
<b>Progression from the qualification.</b>	Engineer (Pre-stressing works)/ Engineer Civil Structures / Engineer Reinforcement Steel Works		
<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/N0807: Ensure installation of embedded components is as per drawing	Mandatory	220	6
CON/N0808: Monitor storage and laying of tendons	Mandatory	220	6
CON/N0809: Carry out stressing of tendons using jacks	Mandatory	400	6
CON/N8003: Supervise, monitor and evaluate performance of subordinates at workplace	Mandatory	80	6
CON/N9002: Manage workplace for safe and healthy work environment	Mandatory	80	6

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/Q0803- 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

### Senior Technician - Pre Stress

#### CON/Q0803

#### 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/N0807: Ensure installation of embedded components is</b>	PC1. check reinforcement bars in anchorage zone with respect to drawing in following aspects and <ul style="list-style-type: none"> <li>• diameter of the bar</li> <li>• shape of bending of the bar</li> <li>• dimension of bends and hooks</li> <li>• number and spacing of the bars</li> <li>• clear cover to the anchorage</li> </ul>		7	3.5	3.5

as per drawing	<ul style="list-style-type: none"> <li>tying of bar</li> </ul>	100			
	<p>PC2. check reinforcement bars, duct supports and sheathing ducts throughout the span of laying with respect to drawing in following aspects</p> <ul style="list-style-type: none"> <li>clear cover of the bars from the sheathing duct</li> <li>duct supports are provided at specified interval as per applicable planning/ schematics</li> <li>duct supports used conforms to approved specification and of appropriate dimension</li> <li>diameter of ducts are as per drawing</li> <li>physical condition of the sheathing ducts – free from cracks, tampering, moisture, corrosion</li> <li>x-y orientation (elevation and position) of the ducts are maintained as per drawing/ schematics</li> <li>joints of ducts – provided with suitable sealants, free from water/ slurry leakage, sealed properly against ingress of contaminants</li> <li>locking of ducts with duct supports are adequate</li> </ul>		7	3.5	3.5
	PC3. check the location of sleeves for gout vents and ensure that the sleeves are closed against dust/ moisture by using suitable material		5	2.5	2.5
	PC4. ensure that the supports are not placed directly underneath the duct joints or sleeves for grout vents		6	3	3
	PC5. read and interpret applicable drawing, specification to determine details of works and applicable limit of tolerance		6	3	3
	PC6. ensure proper survey points, level markings are provided at specified locations		6	3	3
	PC7. carry out necessary measurements to ascertain location of embedded components		6	3	3
	PC8. inspect and cross check locations of markings with respect to the established survey points/ levels		7	3.5	3.5
	PC9. check dimensions of templates and ensure their fixing as per drawing		5	2.5	2.5
	PC10. check alignment and elevation of the anchorage guide cones are as per drawing		5	2.5	2.5
	PC11. check and ensure anchorages of right specification are fixed at appropriate locations as per marking/ instruction		5	2.5	2.5
	PC12. ensure required number of anchorage guides are fixed at respective locations as per drawing		5	2.5	2.5
	PC13. check spacing of anchorage cones and ensure it is as per drawing		5	2.5	2.5
	PC14. check and ensure that proper clearance is kept from concrete edge as per drawing		5	2.5	2.5
	PC15. ensure locking of guides cones are rigid and water tight		5	2.5	2.5
	PC16. ensure connection of ducts to the guide cones is as per drawing/ schematics		5	2.5	2.5
	PC17. ensure proper sealant is applied to the joint of anchorage guide cones and ducts		5	2.5	2.5
	PC18. ensure appropriate reinforcement bars are provided to the joint of anchorage cone and ducts		5	2.5	2.5
			<b>Total</b>	<b>100</b>	<b>50</b>

<b>CON/N0808: Monitor storage and laying of tendons</b>	PC1. check and ensure that pre-stressing tendons are stored on an elevated platform having adequate ground clearance	<b>100</b>	6	3	3
	PC2. check and ensure that proper cover and protective arrangement is provided to the tendon storage area		6	3	3
	PC3. ensure that tendons are not exposed to water, heat or any abrasive acts		6	3	3
	PC4. ensure that the storage area has adequate ventilation to prevent condensation		6	3	3
	PC5. check and ensure that manufacturers supplied test certificates and identification labels/ tags are fixed with every tendon coil		6	3	3
	PC6. ensure tendons are being handled as per applicable handling norms during storing, uncoiling, cutting and laying		6	3	3
	PC7. check and inspect tendons visually for corrosion, breakages or any visible deviation which would restrict its usability		7	3.5	3.5
	PC8. read and interpret drawing and specification to determine cutting length of tendons and prepare suitable chart/ table for cutting		7	3.5	3.5
	PC9. ensure tendons are cut using appropriate cutting tools and having smooth cut edges		7	3.5	3.5
	PC10. check and ensure cutting length of the tendons are as per drawing		6	3	3
	PC11. ensure tendons of appropriate specifications are passed through designated ducts and anchorages		6	3	3
	PC12. monitor bulb preparation of tendons and check bulb dimensions using appropriate measuring tools		7	3.5	3.5
	PC13. check tendons at blind ends for specified anchorage		6	3	3
	PC14. check and ensure the sheathing ducts are not damaged or dislocated while passing tendons through the same		6	3	3
	PC15. check threading and extension of tendons through the ducts		6	3	3
	PC16. check proper fixing of grips, bearing plates to anchorage cones and pre-stressing tendons		6	3	3
	<b>Total</b>	<b>100</b>	<b>50</b>	<b>50</b>	
<b>CON/N0809: Carry out stressing of tendons using jacks</b>	PC1. check stressing jacks visually for any visible damages such as, dislocation of accessories, breakage/ cracks etc.	<b>100</b>	5	2.5	2.5
	PC2. check and ensure the pressure gauges which are fixed with the jacks are properly calibrated		5	2.5	2.5
	PC3. check the hose pipes and it's end fittings are intact and are connected correctly with the pump & jack		4	2	2
	PC4. check and ensure hydraulic systems and oil connections are in good working conditions		5	2.5	2.5
	PC5. check grips are in good working condition and tendons are secured against slipping while in tension		5	2.5	2.5
	PC6. read and interpret stressing drawing, stressing schedule, load application schedules		4	2	2
	PC7. carry out marking of tendons using paint or suitable markings to stress out elongation during stressing		4	2	2

	PC8. check and ensure stressing jacks and power packs are working within the tolerance limit		4	2	2
	PC9. apply initial stressing to the tendons to remove slackness of tendons and jacks (as per applicability of work method)		5	2.5	2.5
	PC10. carry out stressing of tendons as per approved work method and stressing schedule		5	2.5	2.5
	PC11. control application of loads as per stressing schedule		4	2	2
	PC12. ensure increment of tensile load is graduated as per schedule and thus evenly distributed to the tendons		5	2.5	2.5
	PC13. monitor gauge pressure and elongation of tendons under stressing		5	2.5	2.5
	PC14. follow correct sequence of tendons to be stressed as per stressing schedule		4	2	2
	PC15. carry out necessary measurements to tress out elongation of tendons as per standard practice		4	2	2
	PC16. ensure that desired elongation has been achieved to each tendons as per stressing schedule		4	2	2
	PC17. communicate/ provide signals with co-workers/ superiors to maintain synchronization while multiple stressing equipments are in action		4	2	2
	PC18. ensure sheathing/ tendon ducts are closed in all aspect after completion of stressing, against ingress of dust, moisture or foreign contaminants		4	2	2
	PC19. ensure all faults, deviations and alterations to the stressing system are brought to the notice of concerned authority as per applicable reporting procedure		4	2	2
	PC20. ensure all faults, deviations and alterations are duly addressed and prescribed action/ approval has been taken for further progress of work		4	2	2
	PC21. ensure stressing platform/ gantry is safely erected and stable during stressing/ jack operating activities		4	2	2
	PC22. check and ensure that appropriate barricading, signage has been erected surrounding the stressing point and the location is safely restricted against movement of unauthorized person, vehicle or unwanted materials		4	2	2
	PC23. ensure appropriate PPEs are used by self and subordinates while carrying out stressing work		4	2	2
		<b>Total</b>	<b>100</b>	<b>50</b>	<b>50</b>
<b>CON/N8003: Supervise, monitor and evaluate performance of subordinates at workplace</b>	PC1. fix expected targets for the respective gang as per site requirements and allocate work to subordinates	<b>100</b>	15	7.5	7.5
	PC2. establish expected performance standards and expectations for the respective gang of workers to meet the desired outcomes		15	7.5	7.5
	PC3. inspect assigned work to the respected gang of workers through progressive checking		20	10	10
	PC4. observe and verify the work activities performed by the subordinates at the construction site		20	10	10
	PC5. monitor overall performance of subordinates on the designed measures to ensure quality requirements set by the concerned authority		15	7.5	7.5
	PC6. ensure adherence to the organizational policies and procedures for all relevant construction activities by the		15	7.5	7.5

	workmen subordinations				
		<b>Total</b>	<b>100</b>	<b>50</b>	<b>50</b>
<b>CON/N9002: Manage workplace for safe and healthy work environment</b>	PC1. ensure proper housekeeping at workplace	<b>100</b>	5	2.5	2.5
	PC2. implement safe handling , stacking methods at workplace / store		5	2.5	2.5
	PC3. insure that health and safety plan is followed by all subordinates		5	2.5	2.5
	PC4. identify any hazard in workplace and notify them to appropriate authority		5	2.5	2.5
	PC5. ensure that all safety and protection installation are correctly placed & adequate		5	2.5	2.5
	PC6. ensure safe access is available at work place for movement of workers & materials		5	2.5	2.5
	PC7. ensure safe use of tools and tackles by the workmen as per applicability		5	2.5	2.5
	PC8. ensure appropriate use of following Personal Protective Equipment (PPE) as per applicability:		10	5	5
	• Head Protection (Helmets)				
	• Ear Protection				
	• Fall Protection				
	• Foot Protection				
	• Face and Eye Protection,				
	• Hand &Body Protection				
	• Respiratory Protection				
	PC9. maintain entrances & exit from confined spaces , excavated pits and other location in concurrence with safety parameters or instruction form safety personals.		5	2.5	2.5
	PC10. ensure organizational policies and procedures are followed for health , safety and welfare, in relation to:		10	5	5
	• methods of receiving or sourcing information				
	• dealing with accidents and emergencies associated with the work and environment				
	• reporting				
• stooping work					
• evacuation					
• fire risks and safe exit procedures					
PC11. follow procedures for accident recording and reporting as per organizational and statutory requirements	5	2.5	2.5		
PC12. ensure effective adherence to response to emergency procedures / protocols	7.5	3.75	3.75		
PC13. report any case of emergency / risks to the concern people at the construction site	7.5	3.75	3.75		
PC14. report any perceived risk hazards to the superiors / concerned EHS	7.5	3.75	3.75		
PC15. demonstrate the use of fire protection equipments for different type of fire hazard	7.5	3.75	3.75		
PC16. implement control measures to reduce risk & meet legal requirement as per organizational policies	5	2.5	2.5		
	<b>Total</b>	<b>100</b>	<b>50</b>	<b>50</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.

<b>Senior Technician - Pre Stress QP CON/Q0803</b>					
<b>Process required</b>	<b>Professional Knowledge</b>	<b>Professional Skills</b>	<b>Core Skills</b>	<b>Responsibility</b>	<b>Level</b>
<p>The job role is expected to exhibit special technical skills, problem solving skills and resource managing skills related to pre-stressing works. Individual at this level heads an allocated part of construction by ensuring installation of embedded parts/ components is as per drawing, carrying out critical activities, ensuring specified safety and quality checks have been carried out to completed/ongoing activities. Moreover, the job holder also monitors performance of subordinates, suggest remedial/ corrective measures and coordinates among concerned authorities to achieve assigned work milestones as per applicable</p>	<p>The job holder should have thorough and broad knowledge of guidelines/ specifications of material and work methods to be adopted, sequence and timelines of each activity/ work progress status, management of resources and planning of activities in co-ordination with superior personnel. Individual should also know applicable quality parameters to be followed in each step of pre-stressing works in RCC structures and detailed function of stressing equipments/ machineries used for said purpose.</p> <p>The knowledge is acquired by practising domain specific operations in a vast range of</p>	<p>The job holder is expected to carry out stressing of pre-stressing tendons by using hydraulic jacks, monitor expansion of tendons under applied load and note results. It is ensured that increment of load on tendons is as per specification/ applicable scheme and safe working procedure, by the job holder. Individual should be able to monitor laying of ducts/ tendons or other embedded components as per drawing and ensure their fixing as per drawing within limit of tolerance by conducting various tests. Job holder should also be able to carry out remedial actions for faulty works and report to senior if otherwise.</p> <p>A range of practical and problem solving skills as mentioned above are required to be demonstrated during various stages of construction</p>	<p>The job holder is expected to provide instructions to subordinates verbally and in written to meet the work requirement. Individual in this job role collects required data, prepare status/ note sheets, fill up check lists/ quality formats, seeks inputs from superior and subordinates, manage resources by coordinating with concerned authorities, as per agreed plan. The job holder carries out arithmetical and geometrical calculations relevant to conversion of units, material requirement as and when necessary.</p>	<p>The job holder is responsible for own work (ref. professional skills column) and fully responsible for subordinates works. Individual at this job role is expected to check for defects, faults in completed works, suggest or take remedial/ corrective actions as per agreed quality norms, oversee lifting and erection works by providing instructions to subordinates and gather inputs from them in order to monitor progress, unresolved issues and ensure timely action by self or concerned authorities. The job holder is also responsible for implementation of prescribed work methodology, applicable quality and safety norms</p>	6

safety and quality norms.	application over a long period of time and by studying applicable documents as required for execution of rigging operations.	process by the job holder.		at workplace under supervision.	
<b>Level 6</b>	<b>Level 6</b>	<b>Level 6</b>	<b>Level 6</b>	<b>Level 6</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.

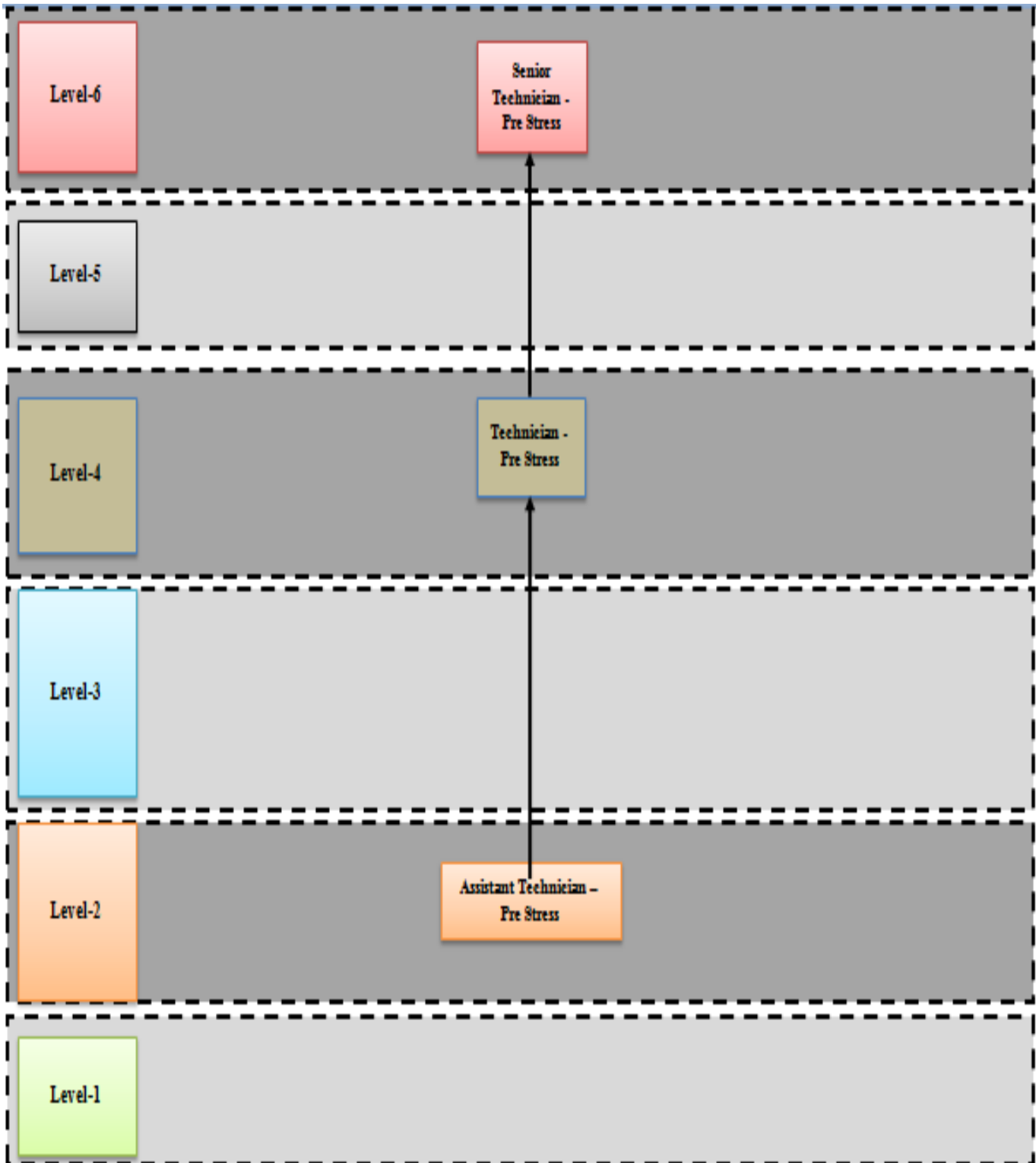
Please attach any documents giving further information about any of the topics above.

Give details of the document(s) here:

1. Annexure 1
  - Overall Career map
  - Career map of Pre Stressing Occupation
2. QP CON/Q0803- Annexure 2

Annexure 1

Career Map



Annexure 2- QP CON/Q0803