

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

Address if different from above:

Same as above

Tel number(s): +91-11-46584466

E-mail address: standards@csdcindia.org

List of documents submitted in support of the Qualifications File

1. Career Map of Surveying Occupation - Annexure 1
2. QP CON/Q0902- Annexure 2

QUALIFICATION FILE SUMMARY

Qualification Title	Surveyor - QP CON/Q0902		
Body/bodies which will assess candidates	<ul style="list-style-type: none"> • MCG • Star Projects 		
Body/bodies which will award the certificate for the qualification.	CSDCI		
Body which will accredit providers to offer the qualification.	CSDCI		
Occupation(s) to which the qualification gives access	Surveying		
Proposed level of the qualification in the NSQF.	6		
Anticipated volume of training/learning required to complete the qualification.	1000 hrs		
Entry requirements / recommendations.	Diploma in civil / land surveying		
Progression from the qualification.	Manager Survey Works		
Planned arrangements for RPL.	Work is under progress		
International Comparability	Comparable with UK Standard and Australia Standard		
Formal structure of the qualification			
Title of unit or other component (include any identification code used)	Mandatory/ Optional	Estimated size (learning hours)	Level
CON/N0903: Carry out temporary adjustment of survey instruments by standard methods	Mandatory	75	6
CON/N0904: Conduct linear measurements using survey instruments and tools	Mandatory	175	6
CON/N0905: Carry out leveling and cross sectioning survey	Mandatory	250	6
CON/N0906: Carry out setting out works	Mandatory	250	6
CON/N0907: Carry out topographic survey	Mandatory	150	6
CON/N7001: Plan, arrange and manage resources for execution of relevant work	Mandatory	50	6
CON/N9002: Manage workplace for safe and healthy work environment	Mandatory	50	6

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

Give details of the document here:

1. QP CON/Q0902- 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

Surveyor

CON/Q0902

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.

		Marks Allocation			
Assessable Outcome	Assessment criteria	Total Marks	Out Of	Theory	Practical Skills
CON/N0903: Carry out temporary adjustment of survey instruments	PC1. locate the station mark on the ground surface	100	4	2	2
	PC2. fix the instrument on the tripod head using bottom screws		4	2	2
	PC3. use plumb bob, optical plummet or laser pointer as available in the instrument to place the instrument accurately over the station mark		5	2.5	2.5
	PC4. approximately level the instrument by adjusting the legs of tripod both circumferentially and side ways		5	2.5	2.5

by standard methods	PC5. check that the instrument is still centered accurately over the station mark after approximate leveling is done		5	2.5	2.5	
	PC6. press the legs of the tripod in the ground so as to avoid accidental movement of the instrument		5	2.5	2.5	
	PC7. ensure that the legs of tripod are sufficient distance apart to provide stability to the instrument		5	2.5	2.5	
	PC8. ensure that the height of instrument is such that it is convenient to take readings		5	2.5	2.5	
	PC9. confirm that the instrument is properly centered and approximately leveled		4	2	2	
	PC10. allow the free movement of the instrument about its vertical axis		5	2.5	2.5	
	PC11. swing the instrument such that the horizontal bubble tube is parallel to any 2 foot/leveling screw		5	2.5	2.5	
	PC12. using both hands turn the screws in same direction(i.e. either towards or away from each other) to bring the bubble in exact center of the bubble tube		5	2.5	2.5	
	PC13. turn the instrument by 90° in clock wise direction so that the bubble tube is parallel to the third foot screw		5	2.5	2.5	
	PC14. turn the third screw such that bubble is brought to the center		5	2.5	2.5	
	PC15. rotate the instrument to bring back the bubble tube in original position and bring the bubble in the center		5	2.5	2.5	
	PC16. repeat the procedure until the bubble is in center for both orientations		5	2.5	2.5	
	PC17. rotate the instrument by 180° and check that the bubble is still in center		5	2.5	2.5	
	PC18. confirm that the instrument is properly centered and approximately leveled		4	2	2	
	PC19. check that the cross hairs are visible in the telescope		5	2.5	2.5	
	PC20. hold a white paper or cloth in front of the telescope and adjust the eye piece till the cross hairs are clearly visible		5	2.5	2.5	
	PC21. sight any object and turn the focusing screw such that the image is clear and sharp		4	2	2	
		Total	100	50	50	
	CON/N0904: Conduct linear measurements using survey instruments and tools	PC1. read and understand site drawings, layout plans, boundary maps etc	100	3	1.5	1.5
		PC2. estimate the optimal length of chain required for measuring the required distance		3	1.5	1.5
		PC3. select suitable tools and instruments for conducting required works based upon the scope of work and requirements		3	1.5	1.5
PC4. identify the start point for measurement as per work requirement		3		1.5	1.5	
PC5. monitor subordinates while they unfold the chain or tape as per standard practice		3		1.5	1.5	
PC6. check that the subordinates have collected appropriate tools such as arrows, pegs etc. in required number		3		1.5	1.5	
PC7. check that the ranging rods are vertical and of appropriate length to avoid any errors in ranging		3		1.5	1.5	
PC8. observe that the chain or tape is placed at the exact point for measuring the required distance		3		1.5	1.5	

PC9. observe that the chain or tape is stretched appropriately to avoid any errors due to sagging of the same	3	1.5	1.5
PC10. provide direction to second point of measurement to subordinate	3	1.5	1.5
PC11. ensure that ranging rod is properly fixed at start point	3	1.5	1.5
PC12. align the leader with respect to ranging rod fixed at terminal station so that the line of measurement is as straight as possible	3	1.5	1.5
PC13. ensure that the peg is fixed at all station points of the survey	3	1.5	1.5
PC14. make representations using appropriate symbols on the field book	3	1.5	1.5
PC15. note the chainages or measured distance as applicable for respective points in the field book as per standard practice	3	1.5	1.5
PC16. instruct subordinates to use appropriate tools like plumb bob for transferring points on ground in case of measuring distance on sloping surface	3	1.5	1.5
PC17. identify the location of master control points & secondary control points to set up the instrument	3	1.5	1.5
PC18. identify the suitable benchmark as a reference to obtain a back-sight at station point	3	1.5	1.5
PC19. locate the exact position of the instrument w.r.t the back-sight and foresight points	3	1.5	1.5
PC20. setup the instrument exactly over the station point	3	1.5	1.5
PC21. carry out temporary adjustments of the instrument	3	1.5	1.5
PC22. input data regarding temperature and pressure bars into the total station	3	1.5	1.5
PC23. create job file in the instrument as per project requirements	3	1.5	1.5
PC24. input the data regarding survey job, station point, type of measurement etc. as required by the instrument	4	2	2
PC25. identify the location of staff point for measuring the horizontal distance as per the drawings or co-ordinates	3	1.5	1.5
PC26. instruct the subordinate to hold the staff exactly at the staff point	4	2	2
PC27. bisect the reflective prism mounted on the staff accurately by rotating the telescope in horizontal and vertical plane	3	1.5	1.5
PC28. make fine adjustments in bisecting with help of fine tune screw	3	1.5	1.5
PC29. operate the keypad to instruct the instrument to compute slop distance between 2 points	4	2	2
PC30. check the display of the instrument to confirm that data displayed is as per requirement as well as recording of the data	4	2	2
PC31. remove the data card from the instrument and transfer the same into compatible computer	3	1.5	1.5
PC32. inform the superiors for the completion of task and data collected	3	1.5	1.5
	Total	100	50
PC1. interpret the scope of survey and data to be collected	6	3	3

CON/N0905: Carry out leveling and cross sectioning survey	PC2. identify and locate the first station point to set up the instrument	100	6	3	3
	PC3. identify and locate the benchmark on the field as instructed by the surveyor		6	3	3
	PC4. setup the instrument exactly over the station point		6	3	3
	PC5. carry out temporary adjustments of the instrument		4	2	2
	PC6. input data regarding temperature and pressure bars into the total station		4	2	2
	PC7. input the data regarding survey job, station point, type of measurement, RL of benchmark etc. as required by the instrument		4	2	2
	PC8. instruct the subordinate to hold the reflective staff exactly over the benchmark of known elevation		4	2	2
	PC9. bisect the reflective prism mounted on the staff with the help of tangent screw and fine tune screw		6	3	3
	PC10. bisect the prism using the input panel on the total station to compute the reduced level at the station point from the RL earlier fed in the instrument using the telescope		6	3	3
	PC11. identify the direction and position of the terminal point		6	3	3
	PC12. locate the first staff point and along the identified direction of terminal station at a fixed distance from the instrument		6	3	3
	PC13. obtain the RL of the staff point by bisecting the reflective prism and instructing the instrument to calculate the RL		6	3	3
	PC14. follow the standard procedure to obtain readings at multiple staff points at fixed interval		4	2	2
	PC15. transfer the instrument to the next point as per requirement and take a back sight reading at the previous intermediate point or staff point		6	3	3
	PC16. also take staff readings at fixed interval on multiple points normal to the center line on both sides		4	2	2
	PC17. check the display of the instrument to confirm that data displayed is as per requirement		6	3	3
	PC18. remove the data card from the instrument and transfer the same into compatible computer		6	3	3
	PC19. inform the superiors for the completion of task and data collected		4	2	2
			Total	100	50
CON/N0906: Carry out setting out works	PC1. identify and obtain work instructions, including plans, specifications, quality requirements and operational details	5	2.5	2.5	
	PC2. plan the sequence to be adopted for setting out works	5	2.5	2.5	
	PC3. identify the required tools and instruments and check the same for their servisiability	5	2.5	2.5	
	PC4. report any errors or faults observed in the instruments or tools to the seniors	5	2.5	2.5	
	PC5. estimate the requirements of materials such as rails and profiles and ensure that they comply with work requirements	5	2.5	2.5	
	PC6. locate and identify the survey pegs marking the boundary or control point and connect them with string or line dori to correctly demark the boundary	6	3	3	
	PC7. refer site drawings to calculate the distance and direction of first building line from the boundary or base	5	2.5	2.5	

	line as applicable				
	PC8. carry out liner and angular measurements to locate the first building line on field from the boundary or baseline as applicable		6	3	3
	PC9. ensure that enough space is available for erection of hurdles/profiles		5	2.5	2.5
	PC10. oversee the erection of profile/ hurdles such that it is wide enough for marking out footings in accordance with site drawings on both the ends of the line	100	6	3	3
	PC11. mark the location of line with nails on the profile and connect the nails with strings or dori so as to represent the true alignment of line w.r.t boundary or baseline		6	3	3
	PC12. determine the corner of building on set building line to true measurement from adjacent boundary and mark the same with peg in accordance with job drawings and specifications		6	3	3
	PC13. set out right angle to the building line from the identified corner point using TS, theodolite or triangulation principals		6	3	3
	PC14. install hurdles/profiles at required distance from the line at approximate level of other hurdles and string/dori is set taut to right angled alignment		6	3	3
	PC15. hurdles for other offsets/ building lines of the building are installed to appropriate locations, approximately level with established hurdles		6	3	3
	PC16. carry out accurate measurement of the remaining building lines and mark the same on the hurdle using nails, connect the nails using strings/dori		6	3	3
	PC17. recheck all the measurements accurately using TS or triangulation methods and confirm the same with drawings		6	3	3
	PC18. remove any excess materials or tools on site and record the same		5	2.5	2.5
		Total	100	50	50
CON/N0907: Carry out topographic survey	PC1. identify the boundaries of the area to be surveyed		4	2	2
	PC2. establish control points to initiate the survey		4	2	2
	PC3. identify a suitable location for setting up a total station such that maximum points or features are visible from this point		4	2	2
	PC4. set up the instrument at identified point and carry out necessary adjustments		4	2	2
	PC5. measure distances and angles to nearing permanent objects or control points to fix the instrument location		5	2.5	2.5
	PC6. identify or locate a temporary or permanent bench mark		4	2	2
	PC7. take the back sight from instrument point to BM and set the readings as 0 for this point		5	2.5	2.5
	PC8. instruct the subordinate to place the staff at all relevant feature points like corners of buildings, trees, pillars etc		5	2.5	2.5
	PC9. bisect the reflective prism mounted on the staff with the help of tangent screw and fine tune screw in clockwise direction from the BM		5	2.5	2.5
	PC10. with the telescope exactly bisecting the prism use the input panel on the total station to compute the angles, distance and elevation at respective points	100	5	2.5	2.5
	PC11. check the display of the instrument to confirm that		5	2.5	2.5

	data displayed is as per requirement				
	PC12. remove the data card from the instrument and transfer the same into compatible computer		4	2	2
	PC13. inform the superiors for the completion of task and data collected		5	2.5	2.5
	PC14. transfer the data from the instrument to a compatible computer		4	2	2
	PC15. obtain approval from seniors regarding correctness of the collected data		4	2	2
	PC16. segregate the required information in desired formats using available software		4	2	2
	PC17. decide the scale for plotting the survey data		4	2	2
	PC18. plot different points such as boundary marks, staff points, station points etc with appropriate angles, and distances converted to scale using computer aided design system		5	2.5	2.5
	PC19. provide necessary information like dimensions, angles, distances, RL's etc. as per instruction		4	2	2
	PC20. confirm that the coordinates of all the points is in confirmation with survey data		4	2	2
	PC21. get approval from senior for confirming the correctness of the map		4	2	2
	PC22. store and save the map as per organizational norms		4	2	2
	PC23. report to seniors after completion of work		4	2	2
		Total	100	50	50
CON/N7001: Plan, arrange and manage resources for execution of relevant work	PC1. determine quantum and nature of work under assigned activity	100	5	2.5	2.5
	PC2. calculate requirement of manpower for assigned activities		8	4	4
	PC3. submit manpower requirement to superiors		5	2.5	2.5
	PC4. allocate and extract work as per plan		8	4	4
	PC5. provide clear instructions to workmen for execution of work		8	4	4
	PC6. ensure optimum utilization of manpower resources		8	4	4
	PC7. record the daily labour attendance		8	4	4
	PC8. record the daily productivity report		8	4	4
	PC9. estimate quantity of assigned work		8	4	4
	PC10. estimate requirement for material, components and fixtures		8	4	4
	PC11. estimate equipment, tools and accessories required		8	4	4
	PC12. submit material, equipment and tool requirement to superiors		8	4	4
	PC13. allocate material, equipment and tools to workmen and extract the work as per plan		8	4	4
	PC14. provide clear instructions for optimized use of resources		8	4	4
	Total	100	50	50	
CON/N9002: Manage workplace for safe and	PC1. ensure proper housekeeping at workplace		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				

healthy work environment	appropriate authority	100	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		5	2.5	2.5
	PC9. maintain entrances & exit from confined spaces , excavated pits and other location in concurrence with safety parameters or instruction form safety personals.				
	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		5	2.5	2.5
PC11. follow procedures for accident recording and reporting as per organizational and statutory requirements	7.5	3.75	3.75		
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		
	Total	100	50	50	

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 47000 under Surveying 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.

Surveyor QP CON/Q0902

Process required	Professional Knowledge	Professional Skills	Core Skills	Responsibility	Level
<p>The job holder at this level is expected to carry out wide range of technical activities such as carrying out set out works, conduct levelling survey for roads, bridges, buildings etc., measure horizontal and vertical distances, checking alignment for structures etc. these operations are conducted through special instruments and technique required for each operation is unique. Therefore the job holder must possess specialised technical skill set and in depth technical knowledge to work as a surveyor in construction sector.</p>	<p>the job holder is expected to possess factual and theoretical knowledge required for executing survey works such as knowledge of operating the modern and conventional instruments of surveying, methods and procedures involved in various operations of surveying like levelling, measurement (liner and angular), setting out, topography surveying etc.</p>	<p>The job holder at this level is expected to employ practical skill while performing surveying operations and solve related problems such as obtaining coordinates of unknown points, set out complex structures, establish benchmarks and boundaries etc. while performing a range of survey operations such as level transfer for building works, cross section for roads, rails, bridges, alignment and measurement etc. for various types of construction projects. The job role is expected to generate solutions for problems relating to methods and instruments while performing work</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 and compiles required data from field books and instrument, 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 at this level is responsible for quality of own work. He/she responsible for conducting proper survey for required area by applying appropriate methods, procedures, tools, instruments and materials. The individual is also responsible for optimal utilization of resources. Further, the individual is responsible for work performed by his subordinates as he is expected to supervise and guide them to obtain desired work. Thus the job holder is placed at this level</p>	6
Level 6	Level 6	Level 6	Level 6	Level 6	

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.

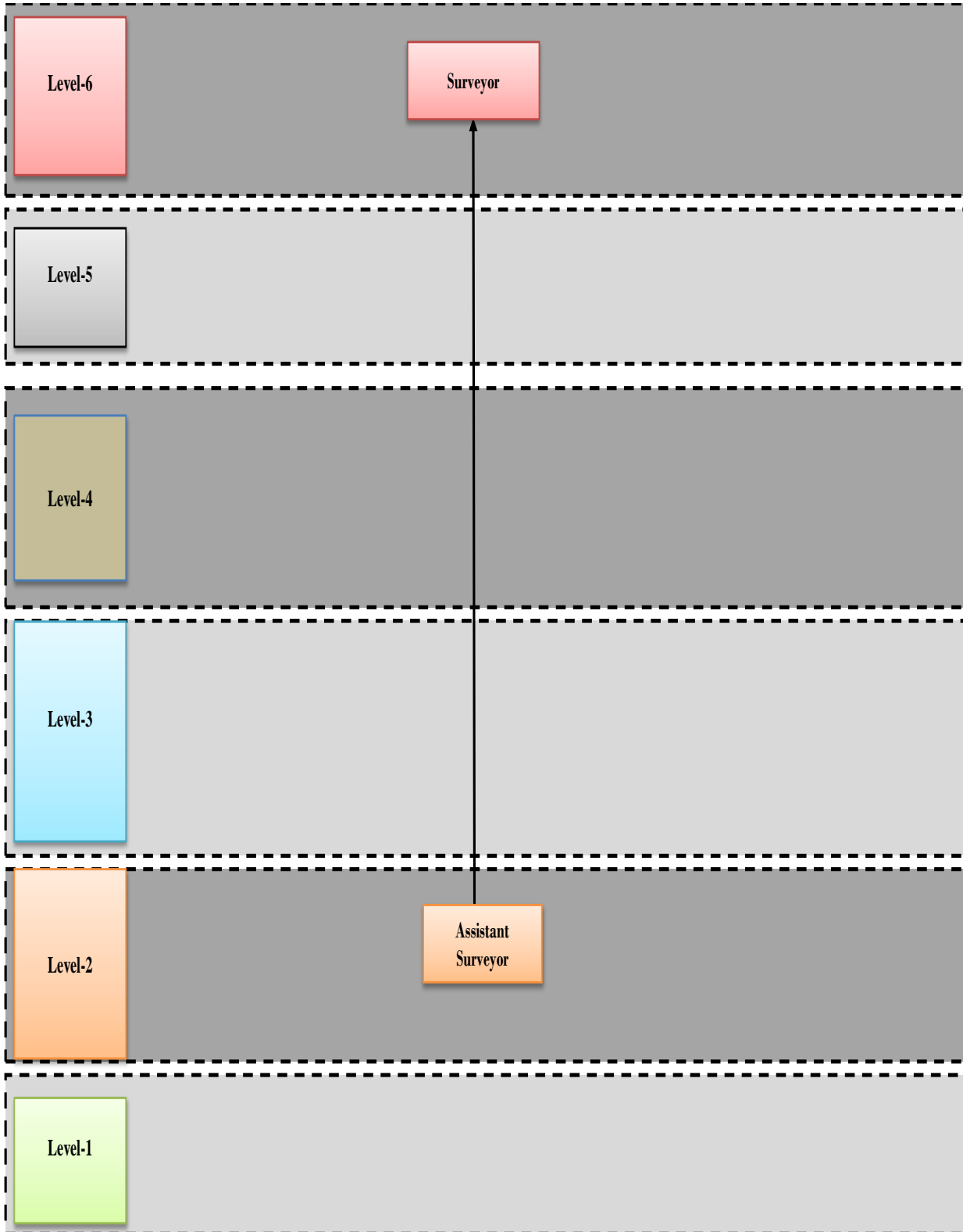
Please attach any documents giving further information about any of the topics above.

Give details of the document(s) here:

1. Annexure 1
 - Overall Career map
 - Career map of Surveying Occupation
2. QP CON/Q0902- Annexure 2

Annexure 1

Career Map



Annexure 2- QP CON/Q0902