

**NSQF QUALIFICATION FILE**

**Approved in 24<sup>th</sup> NSQC Dated 27<sup>th</sup> Feb, 2020**

**NSDA Code**

**2020/CON/DGT/03681**

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

Directorate General of Training (DGT)  
Government of India, Ministry of Skill Development and Entrepreneurship,  
1st and 2nd Floor, CIRTES Building  
Next to Pusa ITI, Pusa Campus  
New Delhi - 110012

**Name and address of submitting body:**

Directorate General of Training (DGT)  
Government of India, Ministry of Skill Development and Entrepreneurship,  
1st and 2nd Floor, CIRTES Building  
Next to Pusa ITI, Pusa Campus  
New Delhi - 110012

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

Name: Shri Deepankar Mallick

Position in the organisation: Deputy Director General (C & P)

Address if different from above:

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

**1. Competency-based curriculum with following details:**

Model Curriculum to be added which will include the following:

- a) Indicative list of tools/equipment to conduct the training: Enclosed with curriculum
- b) Trainers qualification: Indicated in the curriculum
- c) Lesson Plan: All DGT curricula are designed indicating specific practical to be carried out during training along with details of trade theory. Based on this the concerned instructor prepares the Lesson Plan and Demonstration Plan with support of IMPs developed by NIMI, DGT.
- d) Distribution of training duration into theory/practical Indicated in the curriculum.

**2. Curriculum for Core Skills (Workshop calculation & science and Employability Skills)**

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- SUMMARY

1	Qualification Title	<b>‘CIVIL ENGINEERING ASSISTANT’</b>
2	Qualification Code, if any	<b>DGT/1088</b>
3	NCO code and occupation	3112.9900 - Civil Engineering Technicians 3112.0100 - Overseer, Civil Engineering
4	Nature and purpose of the qualification (Please specify whether qualification is short term or long term)	Prepare skilled Technician to undertake the job roles of Civil Engineering Assistant and will enable the trainee to construct, survey and related fields of civil engineering. It is long term qualification.
5	Body/bodies which will award the qualification	Directorate General of Training (DGT).
6	Body which will accredit providers to offer courses leading to the qualification	Directorate General of Training (DGT) accredits the Training providers (ITIs/ NSTIs/MSTIs/BTCs/BTPs / Industries / Establishments).
7	Whether accreditation /affiliation norms are already in place or not , if applicable (if yes, attach a copy)	Yes. The accreditation/ affiliation norms and any amendments made from time to time are available on DGT web portal.
8	Occupation(s) to which the qualification gives access	<ul style="list-style-type: none"> <li>3112.9900 - Civil Engineering Technicians</li> <li>3112.0100 - Overseer, Civil Engineering</li> </ul>
9	Job description of the occupation	The individual in this job supervises construction of buildings, roads, etc. according to specifications/drawings and attends to their repair and maintenance under guidance of Engineer In Charge. Checks materials to ensure their conformity with prescribed specifications. Measures completed portion of work and gets them checked and approved by the engineer concerned. Maintains accounts of departmental work and records of day to day measurements, labour engaged, materials used etc.
10	Licensing requirements	NOT REQUIRED
11	Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided)	NOT APPLICABLE
12	Level of the qualification in the NSQF	Level 5

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13	Anticipated volume of training/learning required to complete the qualification	<b>Sl. No.</b>	<b>Course Element</b>	<b>Notional Training Hours</b>
		1.	Professional Skill (Trade Practical)	2240
		2.	Professional Knowledge(Trade Theory)	560
		3.	Workshop Calculation & Science	160
		4.	Employability Skills	240
			<b>Total</b>	<b>3200</b>
14	Indicative list of training tools required to deliver this qualification	As per Annexure I of curriculum		
15	Entry requirements and/or recommendations and minimum age	Passed 10 <sup>th</sup> class examination with Science and Mathematics or its equivalent.  Minimum age 14 years as on first day of academic session		
16	Progression from the qualification (Please show Professional and academic progression)	An Individual can proceed for:		
		Professional <ul style="list-style-type: none"> <li>• Technician</li> <li>• Senior Technician</li> <li>• Supervisor</li> <li>• Manager</li> <li>• Entrepreneur</li> </ul>	Technical / Academic <pre>                 graph TD                 A[Technical / Academic] --&gt; B[ATS / CITS]                 A --&gt; C[Diploma / Advance Diploma (Vocational)]                 </pre>	
17	Arrangements for the Recognition of Prior learning (RPL)	Yes (For more details refer “Guidelines for Private candidate” in DGT website MIS portal).		
18	International comparability where known (research evidence to be provided)	-----		
19	Date of planned review of the qualification.	5 Yrs from the Date of Approval		

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20	Formal structure of the qualification	Estimated size (learning hours)		Level
		Skills	Knowledge	
	<b>Mandatory components</b>			
	<b>Title of component and identification code / NOSs / Learning outcomes</b>			
<b>TRADE SPECIFIC</b>				
(i)	Prepare free hand sketches of hand tools used in civil work with proper layout and folding of drawing sheets following safety precaution.	56	12	4
(ii)	Prepare Symbols, Lettering, Numbering, plane figure applying drawing instruments and practice dimensioning Technique as per BIS.	28	6	5
(iii)	Construct plain scale, comparative scale, diagonal scale and vernier scale.	28	6	5
(iv)	Draw orthographic projections of different objects with proper lines and dimensioning.	56	12	5
(v)	Draw Isometric, oblique and perspective views of different solid, hollow and cut sections with proper lines and dimensions as per standard convention.	28	6	5
(vi)	Draw component parts of a single storied residential building with suitable symbol and scales.	28	6	5
(vii)	Create objects on CAD workspace using Toolbars, Commands, Menus, formatting layer and style.	28	6	4
(viii)	Identify different types of building materials i.e. Stones, Bricks, Lime, Pozzolanic, Cement, Sand, Clay Products, Mortar their characteristic, types, use & function.	28	6	5
(ix)	Mark different types of Foundation and Set out Foundation trenches.	28	6	5
(x)	Demonstrate different types of brick masonry and Tools used in different bonds. Perform construction of wall - header bond, stretcher bond, English bond, Flemish bond.	28	6	5
(xi)	Perform different types of Plastering & Pointing, rendering & wall cladding.	28	6	5
(xii)	Identify the different types of Protective materials i.e. Paint, Varnish and their application.	28	6	5
(xiii)	Demonstrate Damp Proof Course in different position.	28	6	5
(xiv)	Prepare different types of Flooring.	28	6	5
(xv)	Perform site survey with Chain/Tape and prepare the site Plan.	28	6	5
(xvi)	Perform the site survey using Prismatic Compass.	28	6	5
(xvii)	Perform site survey with plane table and prepare a map.	28	6	5

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(xviii)	Prepare topography map by contours with levelling instruments.	28	6	5
(xix)	Perform a site survey with Theodolite and prepare site plan.	28	6	5
(xx)	Perform a site survey with Total Station and prepare site plan.	28	6	5
(xxi)	Identify timber and perform sawing and planning using hand and power tools.	28	6	5
(xxii)	Demonstrate surface finish with exact sizing by planning operation.	28	6	5
(xxiii)	Prepare different wooden Joints. (Range of skill - framing joint, Housing joints, broadening joints, Lengthening joints )	56	12	5
(xxiv)	Make small wooden job as per drawing with schedule sizes of timber or alternatives of timber i.e. FRP, MDF, FOAM using various hardware.	28	6	5
(xxv)	Make different types of doors and windows with fixing of component.	56	12	5
(xxvi)	Demonstrate joining of electrical wire and carry out soldering, crimping observing related safety precautions.	28	6	5
(xxvii)	Demonstrate Electrical wiring with fixing of accessories conforming ISI rules (Range of skills - different types of Electrical wiring, joining of Fuses, fixing of MCB, connection of lamp with switch and different fitting, etc.)	56	12	5
(xxviii)	Demonstrate installation of electrical appliances, earthing and estimate costing of wiring.	40	6	5
(xxix)	Identify different type of transformers and test and use.	16	6	5
(xxx)	Prepare a Simple pipe connection demonstrating cutting, joining of pipe with different method using different types of fittings.	56	12	5
(xxxi)	Prepare layout of soil pipe and waste pipe with different types of sanitary fittings.	56	12	5
(xxxii)	Prepare a water supply system in residential buildings using different types of valves, fittings and appliances.	40	6	5
(xxxiii)	Create objects on 3D Modelling concept in CAD.	16	6	4
(xxxiv)	Demonstrate test and analysis of cement, aggregate, sand, effect of water cement ratio.	56	16	5
(xxxv)	Prepare concrete, carry out simple form work and reinforcement with the application of modern Power Tools.	56	16	5
(xxxvi)	Prepare reinforcement of different R.C.C. members i.e. Foundation, beams, columns, slabs, Retaining Wall, etc.	112	32	5
(xxxvii)	Erect scaffolding and make intricate form work at different locations	84	24	4
(xxxviii)	Prepare a bar bending schedule and demonstrate	84	24	5

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	bar bending and calculate the estimated quantity of materials.			
(xxxix)	Make different types of arches and lintels with chajja.	56	16	5
(xl)	Lay out different types of vertical movement according to shape, location, materials by using stair, lift, ramp and escalator.	84	24	5
(xli)	Explain pile foundation.	56	16	4
(xlii)	Prepare a Single Storied Residential Building Plan as per local by law using CAD.	84	24	5
(xliii)	Demonstrate ArchiCAD and 3D Max for Solid Modelling of Architectural / Civil 3D Drawing.	28	8	5
(xliv)	Prepare Solid Modelling of Architectural /Civil 3D Drawing using 3d Max and Revit software.	28	8	5
(xlv)	Work out rate analysis of different item of works with detailed Specification.	28	8	5
(xlvi)	Prepare a detail estimate of one room building by centre line method and separate wall method, calculate the quantities of materials involved from the above estimated quantities & prepare a abstract of cost for the above item of works.	84	24	5
(xlvii)	Perform repair Plastering, white washing, painting flooring, replacing of glass, repolishing of floor, stain removal from floor, wooden works.	28	8	5
(xlviii)	Perform field training of Foundation failure, Strengthening of foundation, Rectification of leaking roof, Repair of expansion joint.	28	8	5
(xlix)	Demonstrate anti - termite treatment and Market survey for different materials used in anti termite treatment.	28	8	5
(l)	Layout of house plumbing and drainage plan, repairing of service main, waist outlet cleaning of sanitary installation, scrapping and painting of pipes of a new site.	56	16	5
(li)	Demonstrate use of Adhesive in timber, tile fixing, jointing in concrete, joint filler & sealing compound.	28	8	5
(lii)	Demonstrate different types of construction equipments in Excavation, Hoisting, Conveying, Drilling.	56	16	5
(liii)	Demonstrate Construction Management i.e. manpower, materials, machines and economy.	56	16	5
<b>CORE SKILL- EMPLOYABILITY SKILLS</b>				
(i)	Apply safe working practices.	--	30	5
(ii)	Comply with environment regulation and housekeeping.	--	30	5
(iii)	Interpret & use formal and technical communication.	--	30	5

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(iv)	Apply the concept in productivity & quality management in day to day work to improve productivity & quality.	--	30	5
(v)	List and interpret various acts of labour welfare legislation.	--	30	5
(vi)	Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	--	30	5
(vii)	Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	--	30	5
(viii)	Utilize computer applications and internet to take benefit of IT developments in the industry.	--	30	5
<b>WORKSHOP CALCULATION &amp; SCIENCE</b>				
(i)	Demonstrate mathematical concept and principles to perform practical operations.	--	80	5
(ii)	Explain science in the field of study including simple machine.	--	80	5
<b>TOTAL</b>			<b>3200</b>	

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21	<p><b>Body/Bodies which will carry out assessment:</b> Controller of Examinations, DGT</p>
22	<p><b>How will RPL assessment be managed and who will carry it out?</b> DGT will carry out the RPL assessment following the below mentioned eligibility criteria for Trainee: Applicants aspiring to appear as Private Candidates in the AITT under CTS for award of NTC, have been categorized based on their educational background and experience. Subsequently 'Private Candidates' may be admitted under one of the following categories. Category wise 'eligibility criteria' for appearing as 'Private Candidate' in AITT under CTS has been listed below: Category I: Ex-trainees (successful pass-outs) of ITI A. Ex-trainees of ITI who already possess NTC in one of the trades under CTS, are eligible for applying as Private candidate for an allied trade, provided he/ she fulfils all the conditions regarding educational qualification etc. prescribed for that allied trade. B. In addition, the applicant should possess minimum of 1 year experience (as on date of submission of application) post the date of AITT result declaration in the desired allied trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.  Category II: 'Ex-trainees (successful pass-outs) and current trainees under CoE scheme A. The applicant should have the minimum prescribed entry qualification and should fulfil eligibility criteria for the desired trade under CTS, in which he/she intends to appear for AITT as Private Candidate. CoE candidates must register as 'Private Candidate' under CTS in the relevant/mapped CTS trade only. B. There should be a minimum gap of 1 year between successful completions of CoE training i.e. from the date of result declaration to the date of submission of application for 'Private Candidate' certification. C. During this gap of 1 year, the candidate must have undergone Industry training or gained experience in desired trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.</p>



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	<p>Category III: SCVT Candidates (admitted till August 2018 session)</p> <p>A. No special provisions have been made for SCVT Trainees to enrol as 'Private Candidate'. Going forward, SCVT trainees have been granted equivalence vide G.S.R 186(E) dated 2nd March 2017 for undergoing apprenticeship training under the Apprentices Act 1961 to obtain 'NAC'.</p> <p>B. Only for SCVT trainees admitted till August 2018 batch, provision has been made for obtaining NTC by appearing in AITT under 'Private Candidate'. Such trainees will continue to be governed by old guidelines for 'Private Candidate'.</p> <p>Category IV: Other Candidates (candidate not falling in any of the above 3 categories, including SCVT trainees enrolled from admission session 2019 onwards)</p> <p>A. The applicant should have the minimum prescribed entry qualification and should fulfil eligibility criteria for the relevant trade under CTS, in which he/she desires to appear for AITT as Private Candidate.</p> <p>B. Applicant should be minimum 21 years of age on the date of submission of application. There is no upper age limit.</p> <p>C. The applicant should possess minimum of 3 years' experience (on the date of submission of application) in the relevant trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.</p> <p>For detail and updated information please refer to DGT web portal.</p>
23	<p><b>Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.</b></p> <p><b>(1) Assessment process:</b></p> <p>The assessment for the qualification is carried out by conducting formative assessments, and end of year examinations (Summative). The formative assessments in respect of each Learning Outcome for practical and related theory are conducted by the concerned instructors for evaluating the knowledge and skill acquired by trainees and the behavioural transformation of the trainees. This formative assessment is primarily carried out by collecting evidence of competence gained by the trainees by evaluating them at work based on assessment criteria, asking questions and initiating formative discussions to assess understanding and by evaluating records and reports. Summative assessment is carried out by All India Trade Test on Trade Theory, Trade practical, Workshop Calculation &amp; Science and Employability Skills. The question papers for the theory Examinations contain objective type questions.</p>

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The marking pattern and distribution of marks for the qualification are as under:

Marking Pattern				
Sl. No.	Type of assessment	Subject for the trade test	Marks for the 1st Year	Marks for the 2nd Year
1	Summative Assessment	Practical	250	250
2		Trade Theory	100	100
3		Employability Skills	50	50
4		Workshop Calculation and Science.	50	50
6	Formative assessment based on Learning Outcomes		200	200
TOTAL:			650	650

**(2) Minimum pass marks:**

The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%. There will be no Grace marks.

**Testing and certifications for the course:**

Controller of examinations, DGT carries out the assessment and issues National Trade Certificate (NTC) following the norms and guidelines issued by the Directorate from time to time.

**Overall assessment strategy:**

Assessment of the qualification evaluates trainees to show that they can integrate knowledge, skills and values for carrying out relevant tasks as per the defined learning outcomes and assessment criteria. The trainees may choose the preferred language for assessment. The underlying principle of assessment is fairness and transparency. While assessing the trainee, assessor is directed to assess as per the defined assessment criteria against the learning outcomes. The evidence of the competence acquired by the trainees can be obtained by conducting theory and practical examinations, observing the trainees at work, asking questions and initiating discussions to assess, understand and evaluate records and reports. The ultimate objective of the assessment is to assess the candidates as per the defined assessment criteria for the learning

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outcomes.

**Specific Arrangements for assessment:**

- Assessment is outcome-based.
- There are formative and summative assessments in Theory and Practical.
- Assessment is carried out in Trade theory, Trade Practical, Workshop Calculation and Science and Employability Skills.
- While Trade Theory and Trade Practical are used for assessing Trade-related jobs, Workshop Calculation and Science is used to test trainee's numerical skills and Employability skills is used to test the communication, professional language, leadership, entrepreneurship and team-work abilities of the trainee.
- In addition to demonstration of theory and practical knowledge, trainees get a chance to present total personality.

**Quality assurance activities:**

Question papers are set by external paper setters  
Evaluation of Theory Examinations is done by third-party agency. Third party evaluator is selected for three years by open bidding process.  
Trade Practical is examined by External Examiner (as explained above).

**24. ASSESSMENT EVIDENCE****Title of Component: Formative Assessment Breakup**

( on half yearly average of the learning assessment covered)

**Means of assessment**

Assessment will be evidence based comprising the following for each Learning Outcome:

Serial No.	Terminal Competency	Maximum Weightage (%)
1	Safety consciousness	15
2	Workplace hygiene	5
3	Attendance/ Punctuality	10
4	Ability to follow Manuals/ Written instructions	5
5	Application of Knowledge	10
6	Skills to handle tools / equipment/ Instruments/ Devices	10
7	Economical use of materials	5
8	Working Strategy	10
9	Quality in workmanship/ Performance	15
10	VIVA	15
	Total Maximum Weightage (%)	100

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**Pass/Fail**

The minimum pass percentage is 60% marks for formative assessment.

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**ASSESSMENT CRITERIA**

<b>LEARNING OUTCOMES (TRADE SPECIFIC)</b>	
<b>ASSESSABLE OUTCOME</b>	<b>ASSESSMENT CRITERIA</b>
<b>FIRST YEAR</b>	
1. Prepare free hand sketches of hand tools used in civil work with proper layout and folding of drawing sheets following safety precaution.	Ensure data and information received are sufficient for preparation of drawing.
	Sketch horizontal lines from left to right, vertical lines downward, inclined lines in different angles by freehand.
	Draw freehand sketches of tools (viz. hoe, head pan, trowel, wooden float, plumb bob, sand screener).
	Check the drawings to confirm their compliance with the supplied design / object.
2. Prepare Symbols, Lettering, Numbering, plane figure applying drawing instruments and practice dimensioning Technique as per BIS.	(a) prepare Layout of drawing sheet, (b) prepare a Title block, (c) set and fix drawing paper on the drawing board, (d) mark and fold on the designated drawing Sheet
	(a) draw parallel lines using T-square and set-square (b) draw angles of 15° increments by combination of set-squares and check by protractor.
	(a) construct different types of geometrical figures from given data (b) construct ellipse with the given conditions and parabolic curves using the various conditions given
	Add dimensions as per the drawing requirements provided and use relevant and appropriate symbols as per drawing requirement to provide details in the drawings
	(a) Prepare lettering in full scale 25 mm. height size in Vertical & Italic system in 7:4 & 5:4 single stroke & double stroke method both in small & Capital letter. (b) Prepare Numbering in full scale 25 mm. height size in Vertical & Italic system in 7:4 & 5:4 single stroke & double stroke method both. (c) Draw different figures showing different dimensioning system Aligned & Unidirectional
	Check the drawings to confirm their correctness.
3. Construct plain scale, comparative scale, diagonal scale and vernier scale.	Read and interpret the drawing requirements. Ensure data and information received is sufficient for preparation of drawing.
	Draw different types of scales.
	Find out R.F of the scale, calculate the length of scale on drawing.
	Construct plain scales, comparative scales, diagonal scales and vernier scales, mark the distance on the scale.
	Check the drawings to confirm their correctness.

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4. Draw orthographic projections of different objects with proper lines and dimensioning.	Read and interpret the drawing requirements. Ensure data and information received are sufficient for preparation of drawing.
	Carry out necessary calculations to compute dimensions of Various components/ parts of drawings.
	(a) develop view in orthographic projection by placing object between horizontal and vertical plane of axes, (b) Generate side view of blocks in different inclination on VP and HP by auxiliary vertical plane.
	(a) write name of the drawing on heading at centre alignment, (b) write individual title for every projection drawing, (c) Construct drawing views, construction lines and dimension lines as per standard.
	Check the drawings to confirm their compliance with the supplied design / object.
	Draw orthographic projection of line in different plane and in different Position.
	Draw orthographic projection of Plane figure in different plane and in different Position.
	Draw orthographic projection of Solid figure in different plane and in different Position.
	Draw orthographic projection of Section of Solid in different plane and in different Position.
5. Draw Isometric, oblique and perspective views of different solid, hollow and cut sections with proper lines and dimensions as per standard convention.	Read and interpret the drawing requirements. Ensure data and information received are sufficient for preparation of drawing.
	Carry out necessary calculations to compute dimensions of Various components/ parts of drawings.
	Construct an Isometric scale to a given length. Draw the isometric projection of regular solids.
	Draw the isometric views for the given solids with hollow and cut sections.
	Draw three views of different isometric objects to Orthographic.
	Draw the oblique views for the given solids with hollow and cut sections.
	Draw the perspective views for the given solids with hollow and Cut sections.
	Check the drawings to confirm their compliance with the Supplied design / object.
6. Draw component parts of a single storied residential building with suitable symbol and scales.	Read and interpret the drawing requirements such as rough sketches, specifications, drawing brief, RFD etc. ensure data and information received are sufficient for preparation of drawing
	Construct parts of a building and list the sequence of construction.

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	Draw and indicate the levels of different parts of building.
	Draw dressing and varieties of finishes, artificial stones, natural bed of stone
	Draw RCC used in different component parts of a building.
	Draw timber joints used in doors, windows and arches.
	Draw steel framing for pre-cast concrete.
	Use codes and other references that follow the required conventions.
	Draw the appropriate signs and symbols for showing different types of openings used in drawing.
	Draw the signs and symbols of various types of doors windows and ventilators.
	Check the drawings to confirm their compliance with the up plied design / object.
7. Create objects on CAD workspace using Toolbars, Commands, Menus, formatting layer and style.	Ensure that computer system is correctly operating. Check that all required peripheral devices are connected and correctly operating.
	Start up the software and adjust the page size, measurement unit, scale and plot area before starting the work
	Set drawing parameters like, colour, layer, line type, line weight, text font etc. prepare title block for the drawing covering specification required.
	Draw 2D drafting by using CAD toolbars and from set of tool icons in ribbon.
	Draw drawing using sort cut keyboard command, creating templates, inserting drawings, Layers, Modify Layers
	Customize Dimension and Text styles.
	Provide title and dimension on object drawing.
	Add Symbols and specifications and use codes and other references as per the drawing requirement.
	Check drawings to confirm their compliance with the required design.
	Create layout space and viewports,
	Plot the drawing with required scale.
8. Identify different types of building materials i.e. Stones, Bricks, Lime, Pozzolanic, Cement, Sand, Clay Products, Mortar their characteristic, types, use & function.	Identify different types of building materials i.e. Stones, Bricks, Lime, Pozzolanic, Cement, Sand, Clay Products, Mortar.
	Carry out task according to their characteristic, types, use & function in different civil engineering structure.
9. Mark different types of Foundation and Set out Foundation trenches.	Read and interpret the drawing, ensure data and information received are sufficient for completion of task.
	Carry out necessary calculations to compute dimensions of Various components/ parts of drawings.

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	<p>Mark different types of shallow and deep foundation.</p> <p>(a) Mark footing for column, (b) Mark footings for wall, (c) Mark stepped foundation and inverted arch foundation,</p> <p>(a) Mark grillage foundation (b) Mark raft foundation</p> <p>(a) Mark various types of pile foundation, (b) Mark pier foundation, (c) Mark well foundation (caisson),</p> <p>Check markings to confirm their compliance with the supplied drawing.</p>
10. Demonstrate different types of brick masonry and Tools used in different bonds. Perform construction of wall - header bond, stretcher bond, English bond, Flemish bond.	<p>Read and interpret the drawing, ensure data and information received are sufficient for completion of task.</p> <p>Arrange required materials to construct a wall.</p> <p>Perform construction of wall – (a) header bond, (b) stretcher bond, (c) English bond, (d) Flemish bond .</p> <p>Check the work to confirm their compliance with the supplied drawing.</p>
11. Perform different types of Plastering & Pointing, rendering & wall cladding.	<p>Plan for different types of Plastering &amp; Pointing.</p> <p>Arrange required materials to perform different types of Plastering &amp; Pointing, rendering &amp; wall cladding.</p> <p>Prepare surface for plastering, rendering &amp; wall cladding.</p> <p>Perform different types of Plastering &amp; Pointing, rendering &amp; wall cladding</p> <p>Examine defects and demonstrate remedies of plastering</p> <p>Check the work to confirm their compliance with the required quality.</p>
12. Identify the different types of Protective materials i.e. Paint, Varnish and their application.	<p>Identify different types of Protective materials i.e. Paint, Varnish, etc.</p> <p>Plan for application of different types of Protective materials.</p> <p>Arrange required materials for application of different types of Protective materials.</p> <p>Prepare surface for application of different types of Protective materials.</p> <p>Perform application of different types of Protective materials.</p> <p>Examine defects and demonstrate remedies in application of different types of Protective materials.</p> <p>Check the work to confirm their compliance with the required quality.</p>
13. Demonstrate Damp Proof Course in different position.	<p>Read and interpret the drawing and ensure data and information received are sufficient for D.P.C. in different position.</p>



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	Plan to perform D.P.C. in different position.
	Arrange required materials to perform D.P.C. in different position.
	prepare location to perform D.P.C. in different position.
	Perform D.P.C. in different position. <ul style="list-style-type: none"> <li>a. damp proofing in basement.</li> <li>b. damp proofing in external wall</li> <li>c. damp proofing in internal walls</li> <li>d. damp proofing by cavity wall.</li> <li>e. damp proofing in flat roof and parapet wall.</li> <li>f. damp proofing of flat roof by tar felting</li> <li>g. damp proofing by mud phuska terracing with tile,</li> <li>h. damp proofing in pitched roof.</li> </ul>
	Examine defects and demonstrate remedies in D.P.C. and termite treatment.
	Check the work to confirm their compliance with the required quality.
14. Prepare different types of Flooring.	Read and interpret the drawing and ensure data and information received are sufficient for flooring in different position.
	Plan to perform flooring in different position.
	Arrange required materials to perform flooring in different position.
	prepare location to perform flooring in different position.
	Perform flooring in different position. <ul style="list-style-type: none"> <li>a. flooring on timber ground floor.</li> <li>b. flooring on brick floor</li> <li>c. flooring on flag stone</li> <li>d. flooring on concrete floor.</li> <li>e. flooring on terrazzo floor.</li> <li>f. flooring of mosaic floor</li> <li>g. flooring by Tiles Floor,</li> <li>h. flooring on single joist timber floor.</li> </ul>
	Examine defects and demonstrate remedies in flooring.
	Check the work to confirm their compliance with the required quality.
	15. Perform site survey with Chain/Tape and prepare the site Plan.
perform surveying measuring distance by chain, tape and other accessories.	
Enter measured data in field book and plotting the same.	
Conduct the chain surveying and prepare the site map.	
Calculate the area of the plot.	
Add specifications and use codes and other references as per the drawing requirements.	
Check drawings to confirm their compliance with the required plan.	

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16. Perform the site survey using prismatic compass.	Interpret the drawing requirements.
	Observe the bearings of lines and conduct the traverse survey using compass and other accessories.
	Enter Field book, Compute the correct bearings and plotting
	Calculate area and check the traverse.
	Prepare the site map.
	Add specifications and use codes and other references as per the drawing requirements.
	Check drawings to confirm their compliance with the required plan.
17. Perform site survey with plane table and prepare a map.	Interpret the drawing requirements.
	Perform plane table survey by the following methods: a. Radiation b. Intersection c. Traversing d. Resection (Orientation)
	Prepare the traverse by any type of method,
	Calculate area.
	Prepare the site map.
	Add specifications and use codes and other references as per the drawing requirements
	Check drawings to confirm their compliance with the required plan.
18. Prepare topography map by contours with levelling instruments.	Interpret the drawing requirements.
	Set levelling instrument and adjust the horizontal control.
	Fix vertical control of points by levelling and booking readings in level book.
	Determine reduced levels and check.
	prepare a road project for a limited distance.
	prepare a plot by contours, fix contour interval, interpolate contour points and draw contour lines.
	Furnish all the details and complete the drawing
	Check drawings to confirm their compliance with the required design and take out the print.
19. Perform a site survey with Theodolite and prepare site plan.	Interpret the drawing requirements.
	Conduct reconnaissance survey, prepare key plan.
	Mark station points.
	Prepare reference sketches.
	Measure lengths and bearing.
	Measure angles, repetition.
	Compute co-ordinates, check angles, calculate bearings, find consecutive co-ordinates, find independent co-ordinates.
	Prepare the traverse.
	Calculate area.
	Add specifications and use codes and other references as per the drawing requirements.

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	Check drawings to confirm their compliance with the required design.
20. Perform a site survey with Total Station and prepare site plan.	<p>Interpret the drawing requirements. orientation-collect data-repeat same procedure at each stations.</p> <p>Adjust and fix the Total Station in an station point.</p> <p>Conduct reconnaissance survey-prepare key plan.</p> <p>Prepare reference sketches.</p> <p>Conduct traverse survey-set up the instrument over the first station-set job-set station-orient-collect data-take foresight to next station-shift instrument to next station-set up-back.</p> <p>Download and process the data, prepare plan/map.</p> <p>Measure remote distance and elevation.</p> <p>Calculate 2D / 3D area on field/site.</p> <p>Calculates surface volume of field/site.</p> <p>Add specifications and use codes and other references as per the drawing requirements</p> <p>Check drawings to confirm their compliance with the required one.</p>
21. Identify timber and perform sawing and planning using hand and power tools.	<p>Identify different wooden sample piece i.e.- soft wood &amp; hard wood, wooden grains etc. &amp; their applications Annual ring, knots, shakes &amp;chicks etc.)</p> <p>Demonstrate application of hand tools, measuring tools, and work holding devices</p> <p>Demonstrate use of different power tools, viz. saws, drills, etc.</p> <p>Perform sawing, planning, Moulding, Rebating, Chamfering, etc. using different types of saws, and plains.</p> <p>Sharpen and set different type saw bladeand planer blade/cutter.</p> <p>Check the product to confirm their compliance with the desired one.</p>
22. Demonstrate surface finish with exact sizing by planning operation.	<p>Read and Interpret the drawing requirements.</p> <p>Perform Planning face, face edge, etc.</p> <p>Demonstrate the use of marking, mortise gauge etc.</p> <p>Test the accuracy of flatness and twist-ness of the surface by using try square.</p> <p>Demonstrate the use of winding strips, cross planning, edge planning.</p> <p>Demonstrate portable power planer machine and its function.</p> <p>Check the product to confirm their compliance with the drawing.</p>
23. Prepare different wooden Joints. (Range of skill - framing joint, Housing joints,	<p>Read and Interpret the drawing requirements.</p> <p>Carry out necessary calculations to compute dimensions of Various components/ parts.</p> <p>Ascertain required timber, tools and other materials to carry out the performance.</p>

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broadening joints, Lengthening joints)	Make framing joint - Mortise and tenon Joint (Single and double, Plain hunched, Mitre corner, )
	Make Housing joints - Full housing, Bridle, Stopped housing
	Make broadening joints - Simple butt joint, Riveted butt joint, etc.
	Make Lengthening joints:End half lap joint, End over lap joint, End bends lap joint,slopping scarf, racking scared, half lapping scarf, table scarf joint etc.
	Check joints to confirm their compliance with the required design.
24. Make small wooden job as per drawing with schedule sizes of timber or alternatives of timber i.e. FRP, MDF, FOAM using various hardware.	Read and Interpret the drawing requirements.
	Carry out necessary calculations to compute dimensions of Various components/ parts.
	Ascertain required timber, tools and other materials to carry out the performance.
	Perform making of wooden job as per drawing.
	Check the job to confirm their compliance with the required design.
25. Make different types of doors and windows with fixing of component.	Read and Interpret the drawing requirements.
	Carry out necessary calculations to compute dimensions of Various components/ parts.
	Ascertain required timber, tools and other materials to carry out the performance.
	Perform making of different Types doors including panelled, glazed and flush door as per drawing.
	Perform making of Different types windows and ventilators as per drawing.
	Check the job to confirm their compliance with the required design.
26. Demonstrate joining of electrical wire and carry out soldering, crimping observing related safety precautions.	Read and Interpret the drawing requirements.
	Carry out necessary calculations to ascertain required wire and arrange tools and other materials to carry out the performance.
	Identify various types of cables and measure conductor size using SWG and micrometer.
	Prepare terminations of cable ends, perform skinning, twisting and crimping.
	Perform simple twist, married, Tee and western union joints.
	Perform britannia straight, britannia Tee and rat tail joints.
	Perform Soldering of joints / lugs.
	Check the job to confirm their compliance with the required design.
27. Demonstrate Electrical wiring with fixing of accessories conforming	Read and Interpret the drawing requirements.
	Carry out necessary calculations to ascertain required wire and arrange tools and other materials to carry out the

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ISI rules (Range of skills - different types of Electrical wiring, joining of Fuses, fixing of MCB, connection of lamp with switch and different fitting, etc.)	performance.
	Demonstrate different electrical wiring system with fixing of different accessories as per standard procedure.
	Make electrical Fuse joints, fixing MCB.
	Connect lamps with switches.
	Perform Stair case circuit wiring.
	Perform Godownwiring.
	Perform Hospital wiring.
	Check the performance to confirm their compliance with the required one.
28. Demonstrate installation of electrical appliances, Earthing and estimate costing of wiring.	Read and Interpret the drawing requirements.
	Carry out necessary calculations to ascertain required wire and arrange electrical appliances, tools and other materials to carry out the performance.
	Install and connect electrical appliances and take reading with Voltmeter.
	Install earthing in different position
	Prepare estimation and costing of materials and wiring.
	Check the performance to confirm their compliance with the requirement.
29. Identify different type of transformers and test and use.	Read and Interpret the drawing requirements.
	Carry out necessary calculations to ascertain required wire, transformer and arrange required tools and other materials to carry out the performance.
	Identify transformer, test and install.
	Check the performance to confirm its compliance with the requirement.
30. Prepare a Simple pipe connection demonstrating cutting, joining of pipe with different method using different types of fittings.	Read and Interpret the drawing requirements.
	Carry out necessary calculations to ascertain required pipe and arrange required tools and other materials to carry out the performance.
	Perform cutting, threading, drilling and taping on pipe.
	Prepare a simple pipe connection using different pipe fittings and joints.
	Perform Joining of pipe with thread joint.
	Perform Joining of pipe with lead joint.
	Perform Joining of pipe with flange joint.
	Perform Joining of pipe with cement joint.
	Perform Joining of pipe with D. Joint etc.
	Perform Fixing of ferrule on pipe.
	Check the performance to confirm its compliance with the drawing.
31. Prepare layout of soil	Read and Interpret the drawing requirements.

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pipe and waste pipe with different types of sanitary fittings.	Carry out necessary calculations to ascertain required pipe, sanitary fittings and arrange required tools and other materials to carry out the performance.
	Prepare Layout of soil pipe and waste pipe with different sanitary fitting.
	Perform fitting of I.W.C with high level cistern.
	Perform fitting of washbasin
	Perform fitting of E.W.C. with low level cistern.
	Perform fitting of kitchen sink.
	Perform fitting of bath tub.
	Perform fitting of urinal pot with auto cistern.
	Check the performance to confirm its compliance with the drawing.
32. Prepare a water supply system in residential buildings using different types of valves, fittings and appliances.	Read and Interpret the drawing requirements.
	Ascertain requirement of pipes, valves, fittings and appliances and arrange required tools and other materials to carry out the performance.
	Perform installation of water meter.
	Demonstrate removal of air lock.
	Demonstrate determination of pH by pH meter. Analysis and treatment of Effluent water
	Demonstrate reconditioning of taps, valves & flushing tank and test for correct functioning.
	Prepare a water supply pipe line system in residential buildings using different types of valves, fittings and appliances.
	Check the performance of water supply system
33. Create objects on 3D Modelling concept in CAD.	Interpret the drawing requirements.
	Prepare different objects on 3D Modelling using CAD
	Check the performance to confirm its compliance with the requirements.
<b>SECOND YEAR</b>	
34. Demonstrate test and analysis of cement, aggregate, sand, effect of water cement ratio.	Plan for test and analysis of Construction materials.
	Test cement for consistency, setting times & strength.
	Conduct field tests for adulteration
	Make proper arrangement to store cement at site
	Perform sieve analysis on aggregate.
	Determine grading, fineness modulus.
	Determine presence of silt and clay.
	Perform test to determine shape & size of aggregate.
	Perform test to determine bulking of sand.
Perform test and analyze the effect of water cement ratio (w/c) on strength of cement.	
35. Prepare concrete: carry	Read and Interpret the drawing requirements.

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out simple form work and reinforcement with the application of modern Power Tools.	Plan for Preparation of concrete, carrying out form work and reinforcement.
	Demonstrate Batching, Mixing, Transportation, Placing and Compaction.
	Demonstrate all operations taking necessary precautions related to form work and reinforcement.
	Prepare concrete and lay at required place using power tools.
	Demonstrate Curing and Finishing.
	Test strength of concrete.
	Demonstrate removal of form work.
36. Prepare reinforcement of different R.C.C. members i.e, Foundation, beams, columns, slabs, Retaining Wall, etc.	Read and Interpret the drawing requirements.
	Plan for Preparation of reinforcement of different R.C.C. members
	Demonstrate structural arrangements of different RCC.
	Members: <ul style="list-style-type: none"> <li>a. Prepare reinforcement for Foundations.</li> <li>b. Prepare reinforcement for Rectangular beam.</li> <li>c. Prepare reinforcement for Column.</li> <li>d. Prepare reinforcement for Floor slab / roof slab.</li> <li>e. Prepare reinforcement for Lintel with chajja.</li> <li>f. Prepare reinforcement for stair.</li> <li>g. Prepare reinforcement for underground and overhead reservoir.</li> <li>h. Prepare reinforcement for Lift pit.</li> <li>i. Prepare reinforcement for septic tank.</li> <li>j. Prepare reinforcement for retaining wall.</li> </ul>
	Check the performance to confirm its compliance with the Drawing.
37. Erect scaffolding and make intricate form work at different locations.	Read and Interpret the drawing requirements.
	Plan for Erection of scaffolding and making intricate form work.
	Select appropriate material for form work at different locations.
	Erect scaffolding & make form work at different locations.
	Check, Identify defects & rectify form work.
38. Prepare a bar bending schedule and demonstrate bar bending and calculate the estimated quantity of materials.	Read and Interpret the drawing requirements.
	Make a plan for bar bending.
	Prepare a bar bending schedule of different RCC members.
	Demonstrate different operations in bar bending – <ul style="list-style-type: none"> <li>a. straightening of bars,</li> <li>b. cutting of bars,</li> <li>c. bending of bars,</li> <li>d. placing of bars,</li> <li>e. binding of bars,</li> <li>f. fixing of cover blocks.</li> </ul>

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	<p>Make an estimate for quantity of steel and binding wire required for a given job.</p> <p>Check to confirm their compliance with the drawing.</p>
39. Make different types of arches and lintels with chajja.	<p>Read and Interpret the drawing requirements.</p> <p>Plan for making different types of arches and lintels with chajja.</p> <p>Demonstrate making of shuttering &amp; supports with uprights and wedges for Arches, Lintels and Lintels with Chajjahs.</p> <p>Demonstrate cutting, bending &amp; placing of reinforcement.</p> <p>Demonstrate mixing, placing &amp; compacting concrete.</p> <p>Demonstrate spanning of opening with a semi-circular arch, making centering, cutting of templates for voussoirs &amp; preparing voussoirs, setting uprights of arch.</p> <p>Demonstrate Construction of arch &amp; removing centering.</p>
40. Lay out different types of vertical movement according to shape, location, materials by using stair, lift, ramp and escalator.	<p>Read and Interpret the drawing requirements for vertical movements.</p> <p>Plan for making layout of different types of vertical movement according to shape, location, materials.</p> <p>Demonstrate Layout of straight stairs made of wood.</p> <p>Demonstrate Layout of open well stairs made of brick.</p> <p>Demonstrate Layout of dog- legged stairs made of steel.</p> <p>Demonstrate Layout of geometrical and bifurcated stairs made of RCC.</p> <p>Demonstrate Layout of spiral stairs made of steel.</p> <p>Demonstrate Layout of Lift and Escalator.</p> <p>Check lay out to confirm their compliance with the required design.</p>
41. Explain pile foundation.	<p>Read and Interpret the drawing requirements for pile foundation.</p> <p>Make a plan for pile foundation.</p> <p>Make a schedule for materials required for pile foundation.</p> <p>Prepare a layout of pile foundation as per drawing.</p>
42. Prepare a Single Storied Residential Building Plan as per local by law using CAD.	<p>Read and interpret the drawing requirements such as rough sketches, specifications, drawing brief, RFD etc. ensure data and information received are sufficient for preparation of drawing. Draw size and position of rooms, wall thickness and number of openings.</p> <p>Carry out necessary calculations to compute dimensions of Various components/ parts of drawings</p> <p>Draw the line diagram of the Single Storied residential building.</p> <p>(a) Develop the sectional plan of building.</p> <p>(b) Prepare sectional elevation as per the section plan.</p> <p>(c) Draw the elevation of building.</p>



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	(d) Prepare working drawing of the building.
	Draw various interior and exterior furnishings details of a Single Storied residence.
	Create a site plan showing details.
	Prepare a key / location plan.
	Prepare area statement.
	Add Symbols and specifications and use codes and other references as per the drawing requirements.
	Check drawings to confirm their compliance with the required design.
43. Demonstrate ArchiCAD and 3D Max for Solid Modelling of Architectural / Civil 3D Drawing.	Demonstrate ArchiCAD and 3D Max for Solid Modelling of Architectural / Civil 3D Drawing.
	Apply Software in Civil Engineering field to prepare drawing with ArchiCAD and 3D Max for Solid Modelling of Architectural / Civil 3D.
	Check drawings to confirm their compliance with the required design.
44. Prepare Solid Modelling of Architectural /Civil 3D Drawing using 3d Max and Revit software	Read and interpret the drawing requirements such as rough sketches, specifications, drawing brief, RFD etc. ensure data and information received are sufficient for preparation of drawing.
	Carry out necessary calculations to compute dimensions of Various components/ parts of drawings.
	Prepare 3D model using 3d Max software.
	Create 3D model from 2D plane.
	Make Lighting and rendering.
	Prepare material editor using BIM software like Revit.
	Calculate quantity of materials.
45. Work out rate analysis of different item of works with detailed Specification.	Read and interpret the drawing requirements, specifications, etc. ensure data and information received are sufficient for preparation of rate analysis.
	Carry out necessary calculations to compute estimation and cost analysis.
	Calculate floor area and carpet area
	Calculate FAR
	Prepare rate analysis and identify the units of measurement.
	Calculate quantities of materials and prepare rate analysis from standard data.
	Calculate quantities of labour required for different item of work from standard data.
	Calculate the rate per unit of works of different items including labour charges from schedule of rate.
	Prepare rate analysis of works for Plant machinery.

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	Prepare rate analysis of works for over head charge, Profit with the details specification.
	Check rate analysis to confirm their compliance with the design.
46. Prepare a detail estimate of one room building by centre line method and separate wall method, calculate the quantities of materials involved from the above estimated quantities & prepare a abstract of cost for the above item of works.	<p>Read and interpret the drawing requirements, specifications, etc. ensure data and information received are sufficient for preparation of estimation.</p> <p>Carry out necessary calculations to compute estimation and cost analysis.</p> <p>Prepare detailed estimate of a building by centre line method and separate wall method.</p> <p>Prepare a detailed estimate for – boundary wall, septic tank, underground and overhead reservoir.</p> <p>Calculate the quantities of materials in the standard format.</p> <p>Prepare abstract of estimate.</p> <p>Check estimation and cost analysis to confirm their compliance with the design.</p>
47. Perform repair Plastering, white washing, painting flooring, replacing of glass, repolishing of floor, stain removal from floor, wooden works.	<p>Identify the cracks and defect of Plastering, walls for white washing and painting, area for flooring, replacing of glass, repolishing of floor, stain removal from floor, wooden works and remedy of the defects.</p> <p>Prepare estimation and cost analysis for the identified work.</p> <p>Make scaffolding for plastering or white washing.</p> <p>Demonstrate removal of cracks and defect of Plastering.</p> <p>Perform white washing and painting on walls.</p> <p>Demonstrate removal of cracks and defect of flooring</p> <p>Perform replacing of glass</p> <p>Demonstrate repolishing of floor and stain removal from floor</p> <p>Demonstrate wooden works and remedy of the defects.</p>
48. Perform field training of Foundation failure, Strengthening of foundation, Rectification of leaking roof, Repair of expansion joint.	<p>Identify the Foundation failure, defects in structure, leaking roof, defects in expansion joint.</p> <p>Prepare estimation and cost analysis for the identified work.</p> <p>Demonstrate Strengthening of foundation.</p> <p>Demonstrate repairing of defects in structure.</p> <p>Perform rectification of leaking roof.</p> <p>Demonstrate repair of expansion joint.</p>
49. Demonstrate anti - termite treatment and Market survey for different materials used in anti termite	<p>Identify locations for Anti-termite treatment.</p> <p>Plan to perform Anti-termite treatment.</p> <p>Make a Market survey for different materials used in anti termite treatment and Prepare an estimate.</p> <p>Arrange required materials for anti - termite treatment</p> <p>Perform anti - termite treatment in different position - Pre construction treatment</p>

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treatment.	Post construction treatment
	Check the work to confirm their compliance with the required quality.
50. Layout of house plumbing and drainage plan, repairing of service main, waist outlet cleaning of sanitary installation, scrapping and painting of pipes of a new site.	Layout the house plumbing and drainage plan.
	Plan for repairing of service main, waist outlet cleaning of sanitary installation, scrapping and painting of pipes.
	Demonstrate house plumbing and drainage.
	Perform repairing of service main, waist outlet cleaning of sanitary installation.
	Demonstrate scrapping and painting of pipes.
	Prepare estimation and cost analysis for the identified work.
	Check the work to confirm their compliance with the required quality.
51. Demonstrate use of Adhesive in timber, tile fixing, jointing in concrete, joint filler & sealing compound.	Demonstrate use of adhesive in timber.
	Demonstrate tile fixing.
	Demonstrate jointing in concrete, joint filler & sealing compound.
	Check the work to confirm their compliance with the required quality.
52. Demonstrate different types of construction equipments in Excavation, Hoisting, Conveying, Drilling	Identify the different types of construction equipments in Excavation, Hoisting, Conveying, Drilling.
	Dramatize operation of construction equipments in Excavation.
	Dramatize operation of construction equipments in Hoisting.
	Dramatize operation of construction equipments in Conveying.
	Dramatize operation of construction equipments in Drilling.
53. Demonstrate Construction Management i.e. manpower, materials, machines and economy.	Prepare and demonstrate a schedule of work in construction site.
	Demonstrate the technique of handling different site problems, solve the problem properly.
	Demonstrate the technique of controlling manpower.
	Demonstrate the technique of handling materials and payment of different items.
	Prepare and demonstrate register book to record the different purchase of materials, labour payment, tools & equipments.

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LEARNING OUTCOME(CORE SKILL)	
LEARNING OUTCOME	ASSESSMENT CRITERIA
<b>EMPLOYABILITY SKILLS</b>	
1. Apply safe working practices	Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy.
	Recognize and report all unsafe situations according to site policy.
	Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	Identify, handle and store / dispose off dangerous goods and substances according to site policy and procedures following safety regulations and requirements.

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	Identify and observe site policies and procedures in regard to illness or accident.
	Identify safety alarms accurately.
	Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	Identify and observe site evacuation procedures according to site policy.
	Identify Personal Protective Equipment (PPE) and use the same as per related working environment.
	Identify basic first aid and use them under different circumstances.
	Identify different fire extinguisher and use the same as per requirement.
2. Comply with environment regulation and housekeeping	Identify environmental pollution & contribute to the avoidance of instances of environmental pollution.
	Deploy environmental protection legislation & regulations
	Take opportunities to use energy and materials in an environmentally friendly manner.
	Avoid waste and dispose waste as per procedure
	Recognize different components of 5S and apply the same in the working environment.
3. Interpret & use formal and technical communication.	Obtain sources of information and recognize information.
	Use and draw up technical drawings and documents.
	Use documents and technical regulations and occupationally related provisions.
	Conduct appropriate and target oriented discussions with higher authority and within the team.
	Present facts and circumstances, possible solutions & use English special terminology.
	Resolve disputes within the team.
	Conduct written communication.
4. Apply the concept in productivity & quality management in day to day work to improve productivity & quality.	Explain the concept of productivity and apply during execution of job.
	Explain the concept of quality tools and apply during execution of job.
5. List and interpret various acts of labour welfare legislation.	Explain basic concept of labour welfare legislation, adhere to responsibilities and remain sensitive towards such laws.
	Knows benefits guaranteed under various acts.
6. Explain energy conservation, global warming and pollution	Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution.

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and contribute in day to day work by optimally using available resources.	Explain standard procedure for disposal of waste.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	<p>Explain personnel finance and entrepreneurship.</p> <p>Explain role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the policies/ programmes, procedure &amp; the available scheme.</p> <p>Prepare a report to become an entrepreneur for submission to financial institutions.</p>
8. Utilize computer applications and internet to take benefit of IT developments in the industry.	<p>Explain the hardware of personal computer.</p> <p>Use common application software viz., word, excel, power point etc., in day to day work.</p> <p>Awareness about useful internet websites, search relevant information pertaining to the assigned tasks.</p>
<b>WORKSHOP CALCULATION &amp; SCIENCE</b>	
1. Demonstrate mathematical concept and principles to perform practical operations.	<p>Solve different problems like phase angle, etc. with the help of a calculator.</p> <p>Demonstrate conversion of Fraction to Decimal and vice versa.</p> <p>Explain BCD code, conversion from decimal to binary and vice-versa, all other conversions.</p>
2. Understand and explain science in the field of study including simple machine.	<p>Explain concept of science related to the field such as Material science, Mass, weight, density, speed, velocity, heat &amp; temperature, force, motion, pressure, heat treatment, centre of gravity, friction.</p> <p>Explain levers and its types.</p> <p>Explain relationship between Efficiency, velocity ratio and Mechanical Advantage.</p> <p>Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.</p> <p>Solve simple problems on lifting tackles like crane-Solution of problems with the aid of vectors.</p>

## NSQF QUALIFICATION FILE

Approved in 24<sup>th</sup> NSQC Dated 27<sup>th</sup> Feb, 2020SECTION 2

## 25. EVIDENCE OF LEVEL

## OPTION A

Title/Name of qualification/component: Civil Engineering Assistant		Level: 5	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Process	<p><b>Requires Well Developed Skill</b></p> <ul style="list-style-type: none"> <li>• Create objects on CAD workspace using Toolbars, Commands, Menus, formatting layer and style.</li> <li>• Mark different types of Foundation and Set out Foundation trenches.</li> <li>• Identify the different types of Protective materials i.e. Paint, Varnish and their application</li> <li>• Prepare topography map by contours with levelling instruments.</li> </ul> <p><b>Clear choice of procedures in familiar context</b></p> <ul style="list-style-type: none"> <li>• Prepare reinforcement of different R.C.C. members i.e, Foundation, beams, columns, slabs, Retaining Wall, etc.</li> <li>• Erect scaffolding and make intricate form work at different locations</li> <li>• Prepare a bar bending schedule and demonstrate bar bending and calculate the estimated quantity of materials.</li> </ul>	<p>The learner requires to demonstrate a well-developed skill for example in ‘Perform a site survey with Total Station and prepare site plan; Prepare topography map by contours with levelling instruments.’ as indicated in the learning outcomes to achieve the tolerance levels and accuracy demanded as per the job.</p> <p>The learner requires to apply clear choice of procedures in familiar context as indicated in the learning outcomes like in “Erect scaffolding and make intricate form work at different locations.” where the learner has to apply ones knowledge and decide what needs to be done to either meet the client’s requirement or identify a fault and decide how to rectify it or plan as per requirements and resources available.</p> <p>Hence NSQF Level is 5 for this descriptor.</p>	5

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Title/Name of qualification/component: Civil Engineering Assistant		Level: 5	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Professional knowledge	<p><b>Knowledge of facts in the field of work or study</b></p> <ul style="list-style-type: none"> <li>• Different types of projection views: Orthographic, Isometric, Oblique and Perspective.</li> <li>• Types, thickness in different position, materials, tools used, defects and remedies, surface preparation for rendering &amp; wall cladding.</li> </ul> <p><b>Knowledge of Principles and general concepts in the field of work or study</b></p> <ul style="list-style-type: none"> <li>• Auto level, dumpy Level, Tilting Level - introduction, definition components parts, accessories used.</li> </ul> <p><b>Knowledge of processes in the field of work or study</b></p> <ul style="list-style-type: none"> <li>• Scaffolding &amp; form work</li> <li>• Basic concept of lift and Escalator</li> <li>• Pile foundation</li> <li>• Estimating and costing</li> <li>• Special repair</li> <li>• Adhesive and joint filler</li> <li>• Construction equipments</li> </ul>	<p>The learner demonstrates knowledge of facts, principles, processes and general concepts in the field of civil engineering work or study related to construction of various structures viz. Architectural Symbols, Sketching Techniques, Types of projections, Foundation, Carpentry Joints, Structural Drawings etc.</p> <p>Hence NSQF Level is 5 for this descriptor</p>	5
Professional skill	<ul style="list-style-type: none"> <li>• Draw orthographic projections of different objects with proper lines and dimensioning.</li> <li>• Create objects on CAD workspace using Toolbars, Commands, Menus, formatting</li> </ul>	<p>The learning outcomes for example 'Create objects on CAD workspace using Toolbars, Commands, Menus, formatting layer and style, Prepare topography map by contours with</p>	5



**NSQF QUALIFICATION FILE**

**Approved in 24<sup>th</sup> NSQC Dated 27<sup>th</sup> Feb, 2020**

Title/Name of qualification/component: Civil Engineering Assistant		Level: 5	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
	<p>layer and style.</p> <ul style="list-style-type: none"> <li>• Prepare different types of Flooring</li> <li>• Prepare topography map by contours with levelling instruments.</li> <li>• Perform a site survey with Total Station and prepare site plan.</li> <li>• Demonstrate surface finish with exact sizing by planning operation.</li> </ul>	<p>levelling instruments”, “Perform a site survey with Total Station and prepare site plan” etc. require cognitive and practical skills to accomplish tasks that involve understanding requirements; then as per requirements deciding which operations/procedure will achieve desired result; planning the sequence of operations to maximum effectiveness; constantly checking and reviewing Information &amp; communication system etc., all of which involve problem solving and decision making.</p> <p>Hence NSQF Level is 5 for this descriptor.</p>	
Core skill	<p><b>Desired Mathematical Skills</b></p> <ul style="list-style-type: none"> <li>• Demonstrate mathematical concept and principles to perform practical operations.</li> <li>• Explain science in the field of study including simple machine.</li> </ul> <p><b>Understanding of social/political</b></p> <ul style="list-style-type: none"> <li>• Apply the concept in productivity &amp; quality management in day to day work to improve productivity &amp; quality.</li> <li>• Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.</li> </ul>	<p>The learning outcomes for example ‘Demonstrate mathematical concept and principles to perform practical operations’ and ‘Apply the concept in productivity &amp; quality management in day to day work to improve productivity &amp; quality ’ display the learning outcomes where the learner needs to display desired mathematical skill; understanding of social, political; and some skill of collecting and organising information, communication.</p> <p>Hence NSQF Level is 5 for this descriptor.</p>	5

**NSQF QUALIFICATION FILE**

**Approved in 24<sup>th</sup> NSQC Dated 27<sup>th</sup> Feb, 2020**

Title/Name of qualification/component: Civil Engineering Assistant			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
	<p><b>Organizing information and communication</b></p> <ul style="list-style-type: none"> <li>Utilize computer applications and internet to take benefit of IT developments in the industry.</li> </ul>		
Responsibility	<ul style="list-style-type: none"> <li>Perform a site survey with Theodolite and prepare site plan.</li> <li>Demonstrate surface finish with exact sizing by planning operation</li> <li>Prepare a water supply system in residential buildings using different types of valves, fittings and appliances.</li> <li>Prepare Solid Modelling of Architectural /Civil 3D Drawing using 3d Max and Revit software.</li> <li>Work out rate analysis of different item of works with detailed Specification.</li> <li>Demonstrate Construction Management i.e. manpower, materials, machines and economy.</li> </ul>	<p>The role of Civil Engineering Assistant is independently responsible to perform the work as per specifications followed by analysis of what needs to be done based on their understanding of various processes, principles and standards for Civil Engineering Construction work to achieve the desired performance standard/accuracy level. While “Prepare Solid Modelling of Architectural /Civil 3D Drawing using 3d Max and Revit software” shows some responsibility for other’s works and learning as well.</p> <p>Hence NSQF Level is 5 for this descriptor.</p>	5

## NSQF QUALIFICATION FILE

Approved in 24<sup>th</sup> NSQC Dated 27<sup>th</sup> Feb, 2020**SECTION 3****EVIDENCE OF NEED**

26	<p><b>What evidence is there that the qualification is needed? What is the estimated uptake of this qualification and what is the basis of this estimate?</b></p> <table border="1"> <thead> <tr> <th data-bbox="339 465 831 584">Basis</th> <th data-bbox="831 465 1493 584">In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</th> </tr> </thead> <tbody> <tr> <td data-bbox="339 584 831 1066">Need of the qualification</td> <td data-bbox="831 584 1493 1066">Construction Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labour intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.</td> </tr> <tr> <td data-bbox="339 1066 831 1585">Industry Relevance</td> <td data-bbox="831 1066 1493 1585">The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/ NSTIs/ MSTIs/ BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.</td> </tr> <tr> <td data-bbox="339 1585 831 1742">Usage of the qualification</td> <td data-bbox="831 1585 1493 1742">The Proposed qualification will create skilled Technician for various establishments in different Sectors.</td> </tr> <tr> <td data-bbox="339 1742 831 1845">Estimated uptake</td> <td data-bbox="831 1742 1493 1845">The present seating capacity is approximately 208</td> </tr> </tbody> </table>	Basis	In case of other Awarding Bodies (Institutes under Central Ministries and states departments)	Need of the qualification	Construction Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labour intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.	Industry Relevance	The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/ NSTIs/ MSTIs/ BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.	Usage of the qualification	The Proposed qualification will create skilled Technician for various establishments in different Sectors.	Estimated uptake	The present seating capacity is approximately 208
Basis	In case of other Awarding Bodies (Institutes under Central Ministries and states departments)										
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Usage of the qualification	The Proposed qualification will create skilled Technician for various establishments in different Sectors.										
Estimated uptake	The present seating capacity is approximately 208										
27	<p><b>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences</b></p> <p>The qualification, originally designed for Craftsman Training Scheme is in</p>										

**NSQF QUALIFICATION FILE**

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	existence for many years and approved by DGT (Regulatory Body) under Ministry of Skill Development and Entrepreneurship, Govt. of India.
28	<p><b>What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF? Give justification for presenting a duplicate qualification</b></p> <p>The qualification is originally designed and approved by DGT for the Craftsman Training Scheme and is in existence for many years. No such duplicate qualification of same duration and competencies exists.</p>
29	<p><b>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? Specify the review process here</b></p> <ul style="list-style-type: none"> <li>• The research wing of CSTARI &amp; DGT reviews and updates the qualification, in consultation with industries and other stakeholders, on a regular basis by conducting trade committee meetings.</li> <li>• DGT will monitor any duplicity by comparing existing qualifications with upcoming ones in the National Qualifications Register (NQR) and relevant sectors.</li> </ul>

**SECTION 4**

**EVIDENCE OF PROGRESSION**

30	<p><b>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? Show the career map here to reflect the clear progression</b></p> <p>On completion of the training the trainee will have an opportunity to move in vertical/horizontal pathways to promote to higher designations. The learner can further undergo other specialised courses to excel in the relevant field.</p> <pre> graph LR     A[Technician] --&gt; B[Senior Technician]     B --&gt; C[Supervisor]     C --&gt; D[Manager]     B --&gt; E[Entrepreneur]             </pre>
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