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,
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Name and contact details of individual dealing with the submission

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List of documents submitted in support of the Qualifications File

1. Competency-based curriculum (Annexure 1)
2. Advertisements of different organisations for posts relevant to NTC in the trade

Model Curriculum to be added which will include the following:

- **Indicative list of tools/equipment to conduct the training:** Enclosed with curricula
- **Trainers qualification:** Indicated in the curriculum
- **Lesson Plan:** All NCVT 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 with support of Reference Books and IMPs developed by DGT.
- **Distribution of training duration into theory/practical/OJT component:** Indicated in the curriculum.

SUMMARY

1	**Qualification Title**	Civil Engineering Assistant
2	**Qualification Code, if any**	DGT/1088
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)**	- National Trade Certificate; to train the 10th class pass students in 'Civil Engineering Assistant' trade and thus changing a non-worker to worker. - Long Term Qualification
5	**Body/bodies which will award the qualification**	**National Council for Vocational Training (NCVT)** affiliates the ITIs as per guidelines issued time to time.
6	**Body which will accredit providers to offer courses leading to the qualification**	National Council for Vocational Training (NCVT)
7	**Whether accreditation /affiliation norms are already in place or not , if applicable (if yes, attach a copy)**	Yes. The accreditation/ affiliation norms for all training providers are as per DGT guidelines issued from time to time with approval of NCVT. **This is available in DGT website – www.dget.nic.in**
8	**Occupation(s) to which the qualification gives access**	Civil Engineering Assistant has a wide scope of Employability ranging from self-employment, contractual employment to Industrial jobs. On successful completion of this course, the candidates shall be gainfully employed in the industries for following occupations: • Civil Engineering Technicians • Overseer, Civil Engineering
9	**Job description of the occupation**	The individual in this job supervises construction of buildings, roads, canals etc. according to specifications/drawings and attends to their repair and maintenance under guidance of Engineer In Charge. Inspects site, prepares rough estimates, undertakes contour surveys, conducts levelling operations, marks lay out according to plan and instructions and commences work under his guidance and supervision. 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**	N/A
11	**Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided)**	N/A

<table>
<tr><td>12</td><td>Level of the qualification in the NSQF</td><td>Level 5</td></tr>
<tr><td>13</td><td>Anticipated volume of training/learning required to complete the qualification</td><td>
<table>
<tr><th>Sl. No.</th><th>Course Element</th><th>Notional Training Hours</th></tr>
<tr><td>1.</td><td>Professional Skill (Trade Practical)</td><td>2680</td></tr>
<tr><td>2.</td><td>Professional Knowledge(trade theory)</td><td>558</td></tr>
<tr><td>3.</td><td>Workshop Calculation & Science</td><td>186</td></tr>
<tr><td>4.</td><td>Employability Skills</td><td>110</td></tr>
<tr><td>5.</td><td>Extracurricular activities /lib.</td><td>186</td></tr>
<tr><td>6.</td><td>In plant trg./Project work</td><td>120</td></tr>
<tr><td>7.</td><td>Revision & Examination</td><td>320</td></tr>
<tr><td></td><td>Total</td><td>4160</td></tr>
</table>
</td></tr>
<tr><td>14</td><td>Indicative list of training tools required to deliver this qualification</td><td>As per Annexure - I enclosed with the curriculum</td></tr>
<tr><td>15</td><td>Entry requirements and/or recommendations and minimum age</td><td>Passed 10th Class under 10+2 System of education with Science and Mathematics or its equivalent</td></tr>
<tr><td>16</td><td>Progression from the qualification (Please show Professional and academic progression)</td><td>• Can take admission in Diploma course in notified branches of Engineering by lateral entry.
• Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC).
• Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming an instructor in ITIs.
• Can join as Assistant supervisor in construction site of high Rise Buildings/Architect's office/Builders
• Start own agency for construction equipments contract /own building maintenance contract</td></tr>
<tr><td>17</td><td>Arrangements for the Recognition of Prior learning (RPL)</td><td>1. At present the students who have passed 10th class with minimum 3 years' experience in relevant field can appear for NCVT theory and practical semester examination directly.</td></tr>
</table>

		2. The students who have passed SCVT examination in 'Civil Engineering Assistant' can also appear for the NCVT Examination in the relevant semester and Trade directly.
18	**International comparability where known (research evidence to be provided)**	1. Existence of any official document suggesting the comparability of the qualification with the qualifications in other countries is not known. 2. However, ITI passed out trainees are getting employment in many Gulf countries, European countries, Australia, New Zealand, Singapore etc.
19	**Date of planned review of the qualification.**	January 2023
20	**Formal structure of the qualification** **Mandatory components**	

	Title of component and identification code / NOSs / Specific Learning outcomes	**Estimated size (learning hours)**	**Level**
SPECIFIC LEARNING OUTCOMES			
SEMESTER – I			
1.	Recognize & comply safe working practices, environment regulation and housekeeping.	40	4
2.	Draw free hand sketches of hand tools used in civil work with proper layout and folding of drawing sheets.	40	4
3.	Draw Symbols, Lettering, Numbering, plane figure applying drawing instruments and practice dimensioning Technique as per BIS.	40	5
4.	Construct plain scale, comparative scale, diagonal scale and vernier scale	40	5
5.	Draw orthographic projections of different objects with proper lines and dimensioning.	80	5
6.	Draw Isometric, oblique and perspective views of different solid, hollow and cut sections with proper lines and dimensions as per standard convention.	40	5
7.	Draw component parts of a single storied residential building with suitable symbol and scales.	40	5
8.	Create objects on CAD workspace using Toolbars, Commands, Menus, formatting layer and style.	80	4
9.	Identify different types of building materials i.e. Stones, Bricks, Lime, Pozzolanic, Cement, Sand, Clay Products, Mortar their characteristic, types, use & function.	40	5
10.	Mark different types of Foundation and Set out Foundation trenches.	80	5
11.	Demonstrate different types of brick masonry and Tools used in different bonds. Perform construction of wall - header bond, stretcher bond, English	40	5

	bond, Flemish bond		
12.	Perform different types of Plastering & Pointing, rendering & wall cladding.	40	5
13.	Identify the different types of Protective materials i.e. Paint, Varnish and their application	40	5
14.	Demonstrate Damp Proof Course in different position.	40	5
15.	Prepare different types of Flooring	40	5
16.	Perform site survey with Chain/Tape and prepare the site Plan.	40	5
17.	Perform the site survey using prismatic compass.	40	5
18.	Perform site survey with plane table and prepare a map.	40	5
19.	Prepare topography map by contours with levelling instruments.	40	5
20.	Perform a site survey with Theodolite and prepare site plan	40	5
21.	Perform a site survey with Total Station and prepare site plan.	40	5
SEMESTER – II			
22.	Identify timber and perform sawing and planning using hand and power tools.	40	5
23.	Demonstrate surface finish with exact sizing by planning operation	40	5
24.	Prepare different wooden Joints. (Range of skill - framing joint, Housing joints, broadening joints, Lengthening joints)	120	5
25.	Make small wooden job as per drawing with schedule sizes of timber or alternatives of timber i.e. FRP, MDF, FOAM using various hardware.	40	5
26.	Make different types of doors and windows with fixing of component.	120	5
27.	Demonstrate joining of electrical wire and carry out soldering, crimping observing related safety precautions.	40	5
28.	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.)	120	5
29.	Demonstrate installation of electrical appliances, earthing and estimate costing of wiring	40	5
30.	Identify different type of transformers and test and use.	40	5
31.	Prepare a Simple pipe connection demonstrating cutting, joining of pipe with different method using different types of fittings.	120	5
32.	Prepare layout of soil pipe and waste pipe with different types of sanitary fittings	80	5

33.	Prepare a water supply system in residential buildings using different types of valves, fittings and appliances.	120	5
34.	Create objects on 3D Modelling concept in CAD	40	4
SEMESTER – III			
35.	Demonstrate test and analysis of cement, aggregate, sand, effect of water cement ratio.	80	5
36.	Prepare concrete; carry out simple form work and reinforcement with the application of modern Power Tools.	80	5
37.	Prepare reinforcement of different R.C.C. members i,e., Foundation, beams, columns, slabs, Retaining Wall, etc.	160	5
38.	Erect scaffolding and make intricate form work at different locations	160	4
39.	Prepare a bar bending schedule and demonstrate bar bending and calculate the estimated quantity of materials.	120	5
40.	Make different types of arches and lintels with chajja.	80	5
41.	Lay out different types of vertical movement according to shape, location, materials by using stair, lift, ramp and escalator.	160	5
SEMESTER – IV			
42.	Explain pile foundation.	80	4
43.	Prepare a Single Storied Residential Building Plan as per local by law using CAD	120	5
44.	Demonstrate Archi CAD and 3D Max for Solid Modelling of Architectural / Civil 3D Drawing.	40	5
45.	Prepare Solid Modelling of Architectural /Civil 3D Drawing using 3d Max and Revit software	40	5
46.	Work out rate analysis of different item of works with detailed Specification.	40	5
47.	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.	120	5
48.	Perform repair Plastering, white washing, painting flooring, replacing of glass, repolishing of floor, stain removal from floor, wooden works.	40	5
49.	Perform field training of Foundation failure, Strengthening of foundation, Rectification of leaking roof, Repair of expansion joint.	40	5
50.	Demonstrate anti - termite treatment and Market survey for different materials used in anti termite treatment.	40	5
51.	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.	80	5

52.	Demonstrate use of Adhesive in timber, tile fixing, jointing in concrete, joint filler & sealing compound.	40	5
53.	Demonstrate different types of construction equipments in Excavation, Hoisting, Conveying, Drilling	80	5
54.	Demonstrate Construction Management i.e. manpower, materials, machines and economy.	200	5
55.	**Project Work, Revision, Examination**	440	5
	Sub Total (A)	**4160**	**5**
	Optional components	**N/A (All components are compulsory)**	

	Title of component and identification code/NOSs/ Learning outcomes	**Estimated size (learning hours)**	**Level**
	Sub Total (B)		

Total (A+B)	**4160**	**5**

SECTION 1
ASSESSMENT

21	**Body/Bodies which will carry out assessment:** National Council for Vocational Training (NCVT)
22	**How will RPL assessment be managed and who will carry it out?** 1. At present the students who have passed 10th class with minimum 3 years' experience in relevant field can appear for NCVT theory and practical semester examination directly. 2. The students who have passed SCVT examination in 'Civil Engineering Assistant' trade can also appear for the NCVT Examination in the relevant semester and Trade directly. NCVT will carry out the assessment and State Directorates advertise in newspapers for informing the prospective candidates.
23	**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.** **(1) Assessment process:** The assessment for the semester-based qualification is carried out by conducting formative assessments, and end-of-semester examinations. The internal assessments for theory subjects and practical are conducted by the concerned instructors for evaluating the knowledge and skill acquired by trainees and the behavioural transformation of the trainees. This internal 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, and sessional marks are awarded to them. Examinations are conducted in practical and Theory viz. Trade theory, Workshop Calculation & Science, and Employability Skills. The question papers for the theory Examinations contain objective type questions. Trade practical examinations are conducted by the respective State Governments. However, the question papers for the Trade practical are prepared by NCVT. The marking pattern and distribution of marks for the qualification are as under:

Marking Pattern		
Sl. No.	Subject for the trade test	Maximum marks for the each subject
a)	Practical	300
b)	Trade Theory	200 Objective type Written test of 200 marks (Trade Theory 150 marks & Employability Skills 50 marks)
c)	Employability Skills	
d)	Work shop Calculation and Science.	100 Objective Type Written test of 100 marks

e)	Internal assessment	100
	TOTAL:	700

(2) Minimum pass marks:

40% for each Theory Examination and 25% for each part/section of the Examination separately, and 60% marks for each Trade practical Examination.

(3) Testing and certifications for the course:

- OMR sheet based question paper.
- A panel of expert paper setters, who are graduates in the concerned field with minimum 5-7 years experience, is prepared for setting question papers for the Trade. The panel is vetted by the Member Secretary, NCVT.
- Paper setters are appointed from the panel after the approval of the competent authority for setting the question paper.
- The question papers are then moderated by the Board of Moderation to see if the paper is set as per the requirement and syllabus.
- The manuscripts of the moderated question papers are sent to Government Printing Presses for printing.
- Printed question papers, packed in sealed covers, are despatched to Banks/Police Stations for keeping in safe custody.
- The question papers are handed over to the Chairman/Principal of the Testing Centre two hours before the commencement of the Examination.
- An Examination Board consisting of representatives of industry/Employer/State Government are set up to supervise and monitor the conduct of Examinations at every Centre.
- Theory and practical Examinations are carried out with invigilators/examiners with the overall supervision of the Examination Board.
- Examiners called for evaluation of practical should have minimum technical qualification of a Diploma in the respective engineering field. However, when diploma holders not available, the qualification is suitably relaxed.
- Examiners for practical Examinations are appointed preferably from Polytechnics /Engineering colleges/Industry of repute. Government Departments or from amongst retired qualified personnel possessing requisite qualifications and sufficient experience in the trade/discipline.
- Each State Directorate prepares a panel of Examiners according to the norms as mentioned above and the Examiners are appointed from the panel.
- Flying squads from State Governments as well as the Central Government are constituted to check malpractices during the conduct of Examinations.
- OMR based answer sheets are evaluated by the third party evaluator only. Third party evaluator is selected for three years by open bidding process.
- Evaluation of every practical examination is carried out by the concerned examiner (from industry/ polytechnics) with the overall supervision of the Examination Board in a free and fair manner as per the assessment criteria.
- Till 2014, the marks were compiled by the State Governments as per NCVT guidelines and the results were declared by the State Governments. At present, the marks are compiled by NCVT on its portal www.ncvtmis.gov.in and the results are declared by the State Governments.

	• The successful trainees are awarded National Trade Certificates. **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 assessable 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 assessable 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 formative discussions to assess understanding and evaluating records and reports. The ultimate objective of the assessment is to assess the candidates as per the defined assessment criteria for the assessable/ learning 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, Drawing is used to test the ability of the trainee to draw and read sketches 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-part agency. Third party evaluator is selected for three years by open bidding process. • Trade Practical is examined by External Examiner (as explained above).

Please attach most relevant and recent documents giving further information about assessment and/or RPL.
Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

24. ASSESSMENT EVIDENCE

Complete a grid for each component as listed in "Formal structure of the qualification" in the Summary.

NOTE: this grid can be replaced by any part of the qualification documentation which shows the same information – i.e. Learning Outcomes to be assessed, assessment criteria and the means of assessment.

Title of Component: Civil Engineering Assistant

Means of assessment 1 Assessment will be evidence based comprising the following: • Job carried out in labs/fields • Record book/ daily diary • Answer sheet of assessment • Viva-voce • Progress chart • Attendance and punctuality • Assignment • Project work
Means of assessment 2 Add boxes as required.
Pass/Fail The minimum pass percentage is 40% for each Theory Examination and 25% for each part/section of the Examination separately, and 60% marks for each Trade practical Examination.

GENERIC ASSESSABLE OUTCOMES

Outcomes to be assessed/NOSs to be assessed	Assessment criteria for the outcome
1. Recognize & comply safe working practices, environment regulation and housekeeping.	1.1 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.
	1.2 Recognize and report all unsafe situations according to site policy.
	1.3 Identify and take necessary precautions on fire and safety hazards and report according to procedures.
	1.4 Identify, handle and store / dispose off dangerous goods and substances according to site policy and procedures following safety regulations and requirements.
	1.5 Identify and observe site policies and procedures in regard to illness or accident.
	1.6 Identify safety alarms accurately.
	1.7 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.
	1.8 Identify and observe site evacuation procedures according to site policy.
	1.9 Identify Personal Productive Equipment (PPE) and use the same as per related working environment.
	1.10 Identify basic first aid and use them under different circumstances.
	1.11 Identify different fire extinguisher and use the same as per requirement
	1.12 Identify environmental pollution & contribute to the avoidance of instances of environmental pollution
	1.13 Deploy environmental protection legislation & regulations
	1.14 Take opportunities to use energy and materials in an environmentally friendly manner.
	1.15 Avoid waste and dispose waste as per procedure.
	1.16 Recognize different components of 5S and apply the same in the working environment.
2. Work in a team, understand and practice soft skills, technical English to communicate with required clarity.	2.1 Obtain sources of information and recognize information.
	2.2 Use and draw up technical drawings and documents.
	2.3 Use documents and technical regulations and occupationally related provisions.
	2.4 Conduct appropriate and target oriented discussions with higher authority and within the team.
	2.5 Present facts and circumstances, possible solutions &use English special terminology.
	2.6 Resolve disputes within the team
	2.7 Conduct written communication.
3. Demonstrate knowledge of concept and principles of basic arithmetic, algebraic, trigonometric, statistics, co-ordinate system and apply knowledge of specific area to perform practical operations.	3.1 Solve different problems like phase angle, etc. with the help of a calculator.
	3.2 Demonstrate conversion of Fraction to Decimal and vice versa.
4. Read and apply engineering drawing for different application in the field of work.	4.1 Read & interpret the information on drawings and apply in executing practical work.
	4.2 Read & analyse the specification to ascertain the material requirement, tools and assembly/maintenance parameters.
	4.3 Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to

	carry out the work.
5. Understand and explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality.	5.1 Explain the concept of productivity and quality tools and apply during execution of job.
	5.2 Explain basic concept of labour welfare legislation, adhere to responsibilities and remain sensitive towards such laws.
	5.3 Knows benefits guaranteed under various acts.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	6.1 Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution.
	6.2 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.	7.1 Explain personnel finance and entrepreneurship.
	7.2 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 & the available scheme.
8. Understand and apply basic computer working, basic operating system and uses internet services to get accustomed & take benefit of IT developments in the industry.	8.1 Explain the basic hardware of personal computer.
	8.2 Use common application software viz., word, excel, power point etc., in day to day work.
	8.3 Awareness about useful internet websites, search relevant information pertaining to the assigned tasks.
9. Understand and apply Management of Workers, Communication, Coordination and Team Management skills	9.1 Explain management of work, importance of communication and Coordination.
	9.2 Explain Principles of effective communication, Types of communication - verbal, non-verbal, written, email, talking on phone.

SPECIFIC ASSESSABLE OUTCOME:

LEARNING / ASSESSABLE OUTCOME	ASSESSMENT CRITERIA
SEMESTER-I	
10. Draw free hand sketches of hand tools used in civil work with proper layout and folding of drawing sheets.	10.1 Ensure data and information received are sufficient for preparation of drawing
	10.2 Sketch horizontal lines from left to right, vertical lines downward, inclined lines in different angles by freehand,
	10.3 Draw freehand sketches of tools (viz. hoe, head pan, trowel, wooden float, plumb bob, sand screener)
	10.4 Check the drawings to confirm their compliance with the supplied design / object.
11. Draw Symbols, Lettering, Numbering, plane figure applying drawing instruments and practice dimensioning Technique as per BIS.	11.1 (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
	11.2 (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.
	11.3 (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
	11.4 Add dimensions as per the drawing requirements provided and use relevant and appropriate symbols as per drawing requirement to provide details in the drawings
	11.5 (a) Prepare lettering in full scale 25 mm. height size in Vertical & Italic system in 7:4 & 5:4 single stroke & double stoke 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 stoke method both. (c) Draw different figures showing different dimensioning system Aligned & Unidirectional
	11.6 Check the drawings to confirm their correctness.
12. Construct plain scale, comparative scale, diagonal scale and vernier scale	12.1 Read and interpret the drawing requirements. Ensure data and information received are sufficient for preparation of drawing.
	12.2 Draw different types of scales,
	12.3 Find out R.F of the scale; calculate the length of scale on drawing.
	12.4 Construct plain scales, comparative scales, diagonal scales and vernier scales, mark the distance on the scale.
	12.5 Check the drawings to confirm their correctness.

13. Draw orthographic projections of different objects with proper lines and dimensioning.	13.1 Read and interpret the drawing requirements. Ensure data and information received are sufficient for preparation of drawing.
	13.2 Carry out necessary calculations to compute dimensions of various components/ parts of drawings.
	13.3 (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.
	13.4 (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.
	13.5 Check the drawings to confirm their compliance with the supplied design / object.
	13.6 Draw orthographic projection of line in different plane and in different Position
	13.7 Draw orthographic projection of Plane figure in different plane and in different Position.
	13.8 Draw orthographic projection of Solid figure in different plane and in different Position.
	13.9 Draw orthographic projection of Section of Solid in different plane and in different Position.
14. Draw Isometric, oblique and perspective views of different solid, hollow and cut sections with proper lines and dimensions as per standard convention.	14.1 Read and interpret the drawing requirements. Ensure data and information received are sufficient for preparation of drawing.
	14.2 Carry out necessary calculations to compute dimensions of various components/ parts of drawings.
	14.3 Construct an Isometric scale to a given length. Draw the isometric projection of regular solids.
	14.4 Draw the isometric views for the given solids with hollow and cut sections.
	14.5 Draw three views of different isometric objects to orthoghraphic
	14.6 Draw the oblique views for the given solids with hollow and cut sections.
	14.7 Draw the perspective views for the given solids with hollow and cut sections.
	14.8 Check the drawings to confirm their compliance with the supplied design / object.
15. Draw component parts of a single storied residential building with suitable symbol and scales.	15.1 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
	15.2 Construct parts of a building and list the sequence of construction.
	15.3 Draw and indicate the levels of different parts of building.

	15.4 Draw dressing and varieties of finishes, artificial stones, natural bed of stone
	15.5 Draw RCC used in different component parts of a building.
	15.6 Draw timber joints used in doors, windows and arches.
	15.7 Draw steel framing for pre-cast concrete.
	15.8 Use codes and other references that follow the required conventions.
	15.9 Draw the appropriate signs and symbols for showing different types of openings used in drawing.
	15.10 Draw the signs and symbols of various types of doors windows and ventilators.
	15.11 Check the drawings to confirm their compliance with the applied design / object.
16. Create objects on CAD workspace using Toolbars, Commands, Menus, formatting layer and style.	16.1 Ensure that computer system is correctly operating. Check that all required peripheral devices are connected and correctly operating
	16.2 Start up the software and adjust the page size, measurement unit, scale and plot area before staring the work
	16.3 Set drawing parameters like, colour, layer, line type, line weight, text font etc. prepare title block for the drawing covering specification required.
	16.4 Draw 2D drafting by using CAD toolbars and from set of tool icons in ribbon.
	16.5 Draw drawing using shortcut keyboard command, creating templates, inserting drawings, Layers, Modify Layers
	16.6 Customize Dimension and Text styles.
	16.7 Provide title and dimension on object drawing.
	16.8 Add Symbols and specifications and use codes and other references as per the drawing requirement.
	16.9 Check drawings to confirm their compliance with the required design.
	16.10 Create layout space and viewports,
	16.11 Plot the drawing with required scale.
17. Identify different types of building materials i.e. Stones, Bricks, Lime, Pozzolanic, Cement, Sand, Clay Products, Mortar their characteristic, types, use & function.	17.1 Identify different types of building materials i.e. Stones, Bricks, Lime, Pozzolanic, Cement, Sand, Clay Products, Mortar.
	17.2 Carry out task according to their characteristic, types, use & function in different civil engineering structure.
18. Mark different types	18.1 Read and interpret the drawing, ensure data and information received are sufficient for completion of

of Foundation and Set out Foundation trenches.	task.
	18.2 Carry out necessary calculations to compute dimensions of various components/ parts of drawings.
	18.3 Mark different types of shallow and deep foundation
	18.4 (a) Mark footing for column, (b) Mark footings for wall, (c) Mark stepped foundation and inverted arch foundation,
	18.5 (a) Mark grillage foundation (b) Mark raft foundation
	18.6 (a) Mark various types of pile foundation, (b) Mark pier foundation, (c) Mark well foundation (caisson),
	18.7 Check markings to confirm their compliance with the supplied drawing.
19. Demonstrate different types of brick masonry and Tools used in different bonds. Perform construction of wall - header bond, stretcher bond, English bond, Flemish bond	19.1 Read and interpret the drawing, ensure data and information received are sufficient for completion of task.
	19.2 Arrange required materials to construct a wall.
	19.3 Perform construction of wall – (a) header bond, (b) stretcher bond, (c) English bond, (d) Flemish bond .
	19.4 Check the work to confirm their compliance with the supplied drawing.
20. Perform different types of Plastering & Pointing, rendering & wall cladding.	20.1 Plan for different types of Plastering & Pointing.
	20.2 Arrange required materials to perform different types of Plastering & Pointing, rendering & wall cladding.
	20.3 Prepare surface for plastering, rendering & wall cladding.
	20.4 Perform different types of Plastering & Pointing, rendering & wall cladding
	20.5 Examine defects and demonstrate remedies of plastering
	20.6 Check the work to confirm their compliance with the required quality.
21. Identify the different types of Protective materials i.e. Paint, Varnish and their application	21.1 Identify different types of Protective materials i.e. Paint, Varnish, etc.
	21.2 Plan for application of different types of Protective materials.
	21.3 Arrange required materials for application of different types of Protective materials.
	21.4 Prepare surface for application of different types of Protective materials.
	21.5 Perform application of different types of Protective materials.

	21.6 Examine defects and demonstrate remedies in application of different types of Protective materials.
	21.7 Check the work to confirm their compliance with the required quality.
22. Demonstrate Damp Proof Course in different position.	22.1 Read and interpret the drawing and ensure data and information received are sufficient for D.P.C. in different position.
	22.2 Plan to perform D.P.C. in different position.
	22.3 Arrange required materials to perform D.P.C. in different position.
	22.4 Prepare location to perform D.P.C. in different position.
	22.5 Perform D.P.C. in different position. a) Damp proofing in basement. b) Damp proofing in external wall c) Damp proofing in internal walls d) Damp proofing by cavity wall. e) Damp proofing in flat roof and parapet wall. f) Damp proofing of flat roof by tar felting g) Damp proofing by mud phuska terracing with tile, h) Damp proofing in pitched roof.
	22.6 Examine defects and demonstrate remedies in D.P.C. and termite treatment.
	22.7 Check the work to confirm their compliance with the required quality.
23. Prepare different types of Flooring	23.1 Read and interpret the drawing and ensure data and information received are sufficient for flooring in different position.
	23.2 Plan to perform flooring in different position.
	23.3 Arrange required materials to perform flooring in different position.
	23.4 Prepare location to perform flooring in different position.
	23.5 Perform flooring in different position. a) Flooring on timber ground floor. b) Flooring on brick floor c) Flooring on flag stone d) Flooring on concrete floor. e) Flooring on terrazzo floor. f) Flooring of mosaic floor g) Flooring by Tiles Floor, h) Flooring on single joist timber floor.
	23.6 Examine defects and demonstrate remedies in flooring.
	23.7 Check the work to confirm their compliance with the required quality.
24. Perform site survey with Chain/Tape and	24.1 Interpret the drawing requirements.
	24.2 Perform surveying measuring distance by chain, tape and other accessories.

prepare the site Plan.	24.3 Enter measured data in field book and plotting the same.
	24.4 Conduct the chain surveying and prepare the site map.
	24.5 Calculate the area of the plot.
	24.6 Add specifications and use codes and other references as per the drawing requirements.
	24.7 Check drawings to confirm their compliance with the required plan.
25. Perform the site survey using prismatic compass.	25.1 Interpret the drawing requirements.
	25.2 Observe the bearings of lines and conduct the traverse survey 25.3 Using compass and other accessories.
	25.4 enter Field book, Compute the correct bearings and plotting
	25.5 Calculate area and check the traverse.
	25.6 Prepare the site map.
	25.7 Add specifications and use codes and other references as per the drawing requirements.
	25.8 Check drawings to confirm their compliance with the required plan.
26. Perform site survey with plane table and prepare a map.	26.1 Interpret the drawing requirements.
	26.2 Perform plane table survey by the following methods: a) Radiation b) Intersection c) Traversing d) Resection (Orientation)
	26.3 Prepare the traverse by any type of method,
	26.4 Calculate area.
	26.5 Prepare the site map.
	26.6 Add specifications and use codes and other references as per the drawing requirements
	26.7 Check drawings to confirm their compliance with the required plan.
27. Prepare topography map by contours with levelling instruments.	27.1 Interpret the drawing requirements.
	27.2 Set levelling instrument and adjust the horizontal control.
	27.3 Fix vertical control of points by levelling and booking readings in level book.
	27.4 Determine reduced levels and check.
	27.5 Prepare a road project for a limited distance.
	27.6 Prepare a plot by contours, fix contour interval, interpolate contour points and draw contour lines.
	27.7 Furnish all the details and complete the drawing
	27.8 Check drawings to confirm their compliance with the required design and take out the print.
28. Perform a site survey with Theodolite and	28.1 Interpret the drawing requirements.
	28.2 Conduct reconnaissance survey, prepare key plan.

prepare site plan	28.3 Mark station points.
	28.4 Prepare reference sketches.
	28.5 Measure lengths and bearing.
	28.6 Measure angles, repetition.
	28.7 Compute co-ordinates, check angles, calculate bearings, find consecutive co-ordinates, find independent co-ordinates.
	28.8 Prepare the traverse.
	28.9 Calculate area.
	28.10 Add specifications and use codes and other references as per the drawing requirements.
	28.11 Check drawings to confirm their compliance with the required design.
29. Perform a site survey with Total Station and prepare site plan.	29.1 Interpret the drawing requirements. Orientation-collect data-repeat same procedure at each station.
	29.2 Adjust and fix the Total Station in a station point.
	29.3 Conduct reconnaissance survey-prepare key plan.
	29.4 Prepare reference sketches.
	29.5 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.
	29.6 Download and process the data, prepare plan/map.
	29.7 Measure remote distance and elevation.
	29.8 Calculate 2D / 3D area on field/site.
	29.9 Calculates surface volume of field/site.
	29.10 Add specifications and use codes and other references as per the drawing requirements
	29.11 Check drawings to confirm their compliance with the required one.
SEMESTER - II	
30. Identify timber and perform sawing and planning using hand and power tools.	30.1 Identify different wooden sample piece i.e.- soft wood & hard wood, wooden grains etc. & their applications Annual ring, knots, shakes & chicks etc.)
	30.2 Demonstrate application of hand tools, measuring tools, and work holding devices
	30.3 Demonstrate use of different power tools, viz. saws, drills, etc.
	30.4 Perform sawing, planning, Moulding, Rebating, Chamfering, etc. using different types of saws, and plains.
	30.5 Sharpen and set different type saw blade and planer blade/ cutter.
	30.6 Check the product to confirm their compliance with the desired one.
31. Demonstrate surface finish with exact	31.1 Read and interpret the drawing requirements.
	31.2 Perform Planning face, face edge, etc.
	31.3 Demonstrate the use of marking, mortise gauge etc.

sizing by planning operation	31.4 Test the accuracy of flatness and twist-ness of the surface by using try square.
	31.5 Demonstrate the use of winding strips, cross planning, edge planning.
	31.6 Demonstrate portable power planer machine and its function.
	31.7 Check the product to confirm their compliance with the drawing.
32. Prepare different wooden Joints. (Range of skill - framing joint, Housing joints, broadening joints, Lengthening joints)	32.1 Read and interpret the drawing requirements.
	32.2 Carry out necessary calculations to compute dimensions of various components/ parts.
	32.3 Ascertain required timber, tools and other materials to carry out the performance.
	32.4 Make framing joint - Mortise and tenon Joint (Single and double, Plain hunched, Mitre corner,)
	32.5 Make Housing joints - Full housing, Bridle, Stopped housing
	32.6 Make broadening joints - Simple butt joint, Riveted butt joint, etc.
	32.7 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.
	32.8 Check joints to confirm their compliance with the required design.
33. Make small wooden job as per drawing with schedule sizes of timber or alternatives of timber i.e. FRP, MDF, FOAM using various hardware.	33.1 Read and interpret the drawing requirements.
	33.2 Carry out necessary calculations to compute dimensions of various components/ parts.
	33.3 Ascertain required timber, tools and other materials to carry out the performance.
	33.4 Perform making of wooden job as per drawing.
	33.5 Check the job to confirm their compliance with the required design.
34. Make different types of doors and windows with fixing of component.	34.1 Read and interpret the drawing requirements.
	34.2 Carry out necessary calculations to compute dimensions of various components/ parts.
	34.3 Ascertain required timber, tools and other materials to carry out the performance.
	34.4 Perform making of different Types doors including panelled, glazed and flush door as per drawing.
	34.5 Perform making of Different types windows and ventilators as per drawing.
	34.6 Check the job to confirm their compliance with the required design.
35. Demonstrate joining of electrical wire and	35.1 Read and interpret the drawing requirements.
	35.2 Carry out necessary calculations to ascertain required

carry out soldering, crimping observing related safety precautions.	wire and arrange tools and other materials to carry out the performance.
	35.3 Identify various types of cables and measure conductor size using SWG and micrometer.
	35.4 Prepare terminations of cable ends; perform skinning, twisting and crimping.
	35.5 Perform simple twist, married, Tee and western union joints.
	35.6 Perform britannia straight, britannia Tee and rat tail joints.
	35.7 Perform Soldering of joints / lugs.
	35.8 Check the job to confirm their compliance with the required design.
36. 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.)	36.1 Read and interpret the drawing requirements.
	36.2 Carry out necessary calculations to ascertain required wire and arrange tools and other materials to carry out the performance.
	36.3 Demonstrate different electrical wiring system with fixing of different accessories as per standard procedure.
	36.4 Make electrical Fuse joints, fixing MCB.
	36.5 Connect lamps with switches.
	36.6 Perform Stair case circuit wiring.
	36.7 Perform Godown wiring.
	36.8 Perform Hospital wiring.
	36.9 Check the performance to confirm their compliance with the required one.
37. Demonstrate installation of electrical appliances, earthing and estimate costing of wiring	37.1 Read and interpret the drawing requirements.
	37.2 Carry out necessary calculations to ascertain required wire and arrange electrical appliances, tools and other materials to carry out the performance.
	37.3 Install and connect electrical appliances and take reading with Voltmeter.
	37.4 Install earthing in different position
	37.5 Prepare estimation and costing of materials and wiring.
	37.6 Check the performance to confirm their compliance with the requirement.
38. Identify different type of transformers and test and use.	38.1 Read and interpret the drawing requirements.
	38.2 Carry out necessary calculations to ascertain required wire, transformer and arrange required tools and other materials to carry out the performance.
	38.3 Identify transformer, test and install
	38.4 Check the performance to confirm its compliance with the requirement.
39. Prepare a Simple pipe connection demonstrating	39.1 Read and interpret the drawing requirements.
	39.2 Carry out necessary calculations to ascertain required pipe and arrange required tools and other materials to

cutting, joining of pipe with different method using different types of fittings.	carry out the performance.
	39.3 Perform cutting, threading, drilling and taping on pipe.
	39.4 Prepare a simple pipe connection using different pipe fittings and joints.
	39.5 Perform Joining of pipe with thread joint
	39.6 Perform Joining of pipe with lead joint
	39.7 Perform Joining of pipe with flange joint
	39.8 Perform Joining of pipe with cement joint
	39.9 Perform Joining of pipe with D. Joint etc.
	39.10 Perform Fixing of ferrule on pipe
	39.11 Check the performance to confirm its compliance with the drawing.
40. Prepare layout of soil pipe and waste pipe with different types of sanitary fittings	40.1 Read and interpret the drawing requirements.
	40.2 Carry out necessary calculations to ascertain required pipe, sanitary fittings and arrange required tools and other materials to carry out the performance.
	40.3 Prepare Layout of soil pipe and waste pipe with different sanitary fitting.
	40.4 Perform fitting of I.W.C with high level cistern.
	40.5 Perform fitting of washbasin
	40.6 Perform fitting of E.W.C. with low level cistern.
	40.7 Perform fitting of kitchen sink.
	40.8 Perform fitting of bath tub.
	40.9 Perform fitting of urinal pot with auto cistern.
	40.10 Check the performance to confirm its compliance with the drawing.
41. Prepare a water supply system in residential buildings using different types of valves, fittings and appliances.	41.1 Read and interpret the drawing requirements.
	41.2 Ascertain requirement of pipes, valves, fittings and appliances and arrange required tools and other materials to carry out the performance.
	41.3 Perform installation of water meter.
	41.4 Demonstrate removal of air lock.
	41.5 Demonstrate determination of pH by pH meter. Analysis and treatment of Effluent water
	41.6 Demonstrate reconditioning of taps, valves & flushing tank and test for correct functioning.
	41.7 Prepare a water supply pipe line system in residential buildings using different types of valves, fittings and appliances.
	41.8 Check the performance of water supply system
42. Create objects on 3D Modelling concept in CAD	42. 1. Interpret the drawing requirements.
	42. 2. Prepare different objects on 3D Modelling using CAD
	42. 3. Check the performance to confirm its compliance with the requirements.

SEMESTER - III	
43. Demonstrate test and analysis of cement, aggregate, sand, effect of water cement ratio.	43.1 Plan for test and analysis of Construction materials.
	43.2 Test cement for consistency, setting times & strength.
	43.3 Conduct field tests for adulteration
	43.4 Make proper arrangement to store cement at site
	43.5 Perform sieve analysis on aggregate.
	43.6 Determine grading, fineness modulus.
	43.7 Determine presence of silt and clay.
	43.8 Perform test to determine shape & size of aggregate.
	43.9 Perform test to determine bulking of sand.
	43.10 Perform test and analyse the effect of water cement ratio (w/c) on strength of cement.
44. Prepare concrete; carry out simple form work and reinforcement with the application of modern Power Tools.	44.1 Read and interpret the drawing requirements.
	44.2 Plan for Preparation of concrete, carrying out form work and reinforcement.
	44.3 Demonstrate Batching, Mixing, Transportation, Placing and Compaction.
	44.4 Demonstrate all operations taking necessary precautions related to from work and reinforcement.
	44.5 Prepare concrete and lay at required place using power tools.
	44.6 Demonstrate Curing and Finishing.
	44.7 Test strength of concrete.
	44.8 Demonstrate removal of form work.
45. Prepare reinforcement of different R.C.C. members i, e, Foundation, beams, columns, slabs, Retaining Wall, etc.	45.1 Read and interpret the drawing requirements.
	45.2 Plan for Preparation of reinforcement of different R.C.C. members
	45.3 Demonstrate structural arrangements of different RCC.
	45.4 Members: (a) Prepare reinforcement for Foundations. (b) Prepare reinforcement for Rectangular beam. (c) Prepare reinforcement for Column. (d) Prepare reinforcement for Floor slab / roof slab. (e) Prepare reinforcement for Lintel with chajja. (f) Prepare reinforcement for stair. (g) Prepare reinforcement for underground and overhead reservoir. (h) Prepare reinforcement for Lift pit. (i) Prepare reinforcement for septic tank. (j) Prepare reinforcement for retaining wall.
	45.5 Check the performance to confirm its compliance with the Drawing.
46. Erect scaffolding and make intricate form work at different	46.1 Read and interpret the drawing requirements.
	46.2 Plan for Erection of scaffolding and making intricate form work.
	46.3 Select appropriate material for form work at different

locations	locations.
	46.4 Erect scaffolding & make form work at different locations.
	46.5 Check, Identify defects & rectify form work.
47. Prepare a bar bending schedule and demonstrate bar bending and calculate the estimated quantity of materials.	47.1 Read and interpret the drawing requirements.
	47.2 Make a plan for bar bending.
	47.3 Prepare a bar bending schedule of different RCC members.
	47.4 Demonstrate different operations in bar bending – (a) straightening of bars, (b) cutting of bars, (c) bending of bars, (d) placing of bars, (e) binding of bars, (f) Fixing of cover blocks.
	47.5 Make an estimate for quantity of steel and binding wire required for a given job.
	47.6 Check to confirm their compliance with the drawing.
48. Make different types of arches and lintels with chajja	48.1 Read and interpret the drawing requirements.
	48.2 Plan for making different types of arches and lintels with chajja.
	48.3 Demonstrate making of shuttering & supports with uprights and wedges for Arches, Lintels and Lintels with Chajjahs.
	48.4 Demonstrate cutting, bending & placing of reinforcement.
	48.5 Demonstrate mixing, placing & compacting concrete.
	48.6 Demonstrate spanning of opening with a semi-circular arch, making centering, cutting of templates for voussoirs & preparing voussoirs, setting uprights of arch.
	48.7 Demonstrate Construction of arch & removing centering.
49. Lay out different types of vertical movement according to shape, location, materials by using stair, lift, ramp and escalator.	49.1 Read and interpret the drawing requirements for vertical movements.
	49.2 Plan for making layout of different types of vertical movement according to shape, location, materials.
	49.3 Demonstrate layout of straight stairs made of wood.
	49.4 Demonstrate layout of open well stairs made of brick.
	49.5 Demonstrate layout of dog- legged stairs made of steel.
	49.6 Demonstrate layout of geometrical and bifurcated stairs made of RCC.
	49.7 Demonstrate layout of spiral stairs made of steel.
	49.8 Demonstrate layout of Lift and Escalator.

	49.9 Check lay out to confirm their compliance with the required design.
SEMESTER - IV	
50. Explain pile foundation.	50.1 Read and interpret the drawing requirements for pile foundation.
	50.2 Make a plan for pile foundation.
	50.3 Make a schedule for materials required for pile foundation.
	50.4 Prepare a layout of pile foundation as per drawing.
51. Prepare a Single Storied Residential Building Plan as per local by law using CAD	51.1 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.
	51.2 Carry out necessary calculations to compute dimensions of Various components/ parts of drawings
	51.3 (a) Draw the line diagram of the Single Storied residential building.
	51.4 (a) develop the sectional plan of building (b) Prepare sectional elevation as per the section plan (c) Draw the elevation of building. (d) Prepare working drawing of the building.
	51.5 Draw various interior and exterior furnishings details of a Single Storied residence.
	51.6 Create a site plan showing details.
	51.7 Prepare a key / location plan
	51.8 Prepare area statement.
	51.9 Add Symbols and specifications and use codes and other references as per the drawing requirements
	51.10 Check drawings to confirm their compliance with the required design.
52. Demonstrate ArchiCAD and 3D Max for Solid Modelling of Architectural / Civil 3D Drawing.	52.1 Demonstrate ArchiCAD and 3D Max for Solid Modelling of Architectural / Civil 3D Drawing.
	52.2 Apply Software in Civil Engineering field to prepare drawing with ArchiCAD and 3D Max for Solid Modelling of Architectural / Civil 3D.
	52.3 Check drawings to confirm their compliance with the required design.
53. Prepare Solid Modelling of Architectural /Civil 3D Drawing using 3d Max and Revit software	53.1 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.
	53.2 Carry out necessary calculations to compute dimensions of various components/ parts of drawings.
	53.3 Prepare 3D model using 3d Max software.
	53.4 Create 3D model from 2D plane.
	53.5 Make Lighting and rendering.

	53.6 Prepare material editor using BIM software like Revit.
	53.7 Calculate quantity of materials.
54. Work out rate analysis of different item of works with detailed Specification.	54.1 Read and interpret the drawing requirements, specifications, etc. ensure data and information received are sufficient for preparation of rate analysis.
	54.2 Carry out necessary calculations to compute estimation and cost analysis.
	54.3 Calculate floor area and carpet area
	54.4 Calculate FAR
	54.5 Prepare rate analysis and identify the units of measurement.
	54.6 Calculate quantities of materials and prepare rate analysis from standard data.
	54.7 Calculate quantities of labour required for different item of work from standard data.
	54.8 Calculate the rate per unit of works of different items including labour charges from schedule of rate.
	54.9 Prepare rate analysis of works for Plant machinery.
	54.10 Prepare rate analysis of works for over head charge, Profit with the details specification.
	54.11 Check rate analysis to confirm their compliance with the design.
55. 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.	55.1 Read and interpret the drawing requirements, specifications, etc. ensure data and information received are sufficient for preparation of estimation.
	55.2 Carry out necessary calculations to compute estimation and cost analysis.
	55.3 Prepare detailed estimate of a building by centre line method and separate wall method.
	55.4 Prepare a detailed estimate for – boundary wall, septic tank, underground and overhead reservoir.
	55.5 Calculate the quantities of materials in the standard format.
	55.6 Prepare abstract of estimate.
	55.7 Check estimation and cost analysis to confirm their compliance with the design.
56. Perform repair plastering, white washing, painting flooring, replacing of glass, repolishing of floor, stain removal from floor, wooden	56.1 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.
	56.2 Prepare estimation and cost analysis for the identified work.
	56.3 Make scaffolding for plastering or white washing.
	56.4 Demonstrate removal of cracks and defect of Plastering.

works.	56.5 Perform white washing and painting on walls.
	56.6 Demonstrate removal of cracks and defect of flooring
	56.7 Perform replacing of glass
	56.8 Demonstrate repolishing of floor and stain removal from floor
	56.9 Demonstrate wooden works and remedy of the defects.
57. Perform field training of Foundation failure, strengthening of foundation, Rectification of leaking roof, Repair of expansion joint.	57.1 Identify the Foundation failure, defects in structure, leaking roof, defects in expansion joint.
	57.2 Prepare estimation and cost analysis for the identified work.
	57.3 Demonstrate Strengthening of foundation.
	57.4 Demonstrate repairing of defects in structure.
	57.5 Perform rectification of leaking roof.
	57.6 Demonstrate repair of expansion joint.
58. Demonstrate anti - termite treatment and Market survey for different materials used in anti termite treatment.	58.1 Identify locations for Anti-termite treatment.
	58.2 Plan to perform Anti-termite treatment.
	58.3 Make a Market survey for different materials used in anti termite treatment and prepare an estimate.
	58.4 Arrange required materials for anti - termite treatment
	58.5 Perform anti - termite treatment in different position - a. Pre construction treatment b. Post construction treatment
	58.6 Check the work to confirm their compliance with the required quality.
59. 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.	59.1 Layout the house plumbing and drainage plan.
	59.2 Plan for repairing of service main, waist outlet cleaning of sanitary installation, scrapping and painting of pipes.
	59.3 Demonstrate house plumbing and drainage.
	59.4 Perform repairing of service main, waist outlet cleaning of sanitary installation.
	59.5 Demonstrate scrapping and painting of pipes.
	59.6 Prepare estimation and cost analysis for the identified work.
	59.7 Check the work to confirm their compliance with the required quality.
60. Demonstrate use of Adhesive in timber, tile fixing, jointing in concrete, joint filler & sealing compound.	60.1 Demonstrate use of adhesive in timber.
	60.2 Demonstrate tile fixing.
	60.3 Demonstrate jointing in concrete, joint filler & sealing compound.
	60.4 Check the work to confirm their compliance with the required quality.

61. Demonstrate different types of construction equipments in Excavation, Hoisting, Conveying, Drilling	61.1 Identify the different types of construction equipments in Excavation, Hoisting, Conveying, Drilling.
	61.2 Dramatize operation of construction equipments in Excavation.
	61.3 Dramatize operation of construction equipments in Hoisting.
	61.4 Dramatize operation of construction equipments in Conveying.
	61.5 Dramatize operation of construction equipments in Drilling.
62. Demonstrate Construction Management i.e. manpower, materials, machines and economy.	62.1 Prepare and demonstrate a schedule of work in construction site.
	62.2 Demonstrate the technique of handling different site problems, solve the problem properly.
	62.3 Demonstrate the technique of controlling manpower.
	62.4 Demonstrate the technique of handling materials and payment of different items.
	62.5 Prepare and demonstrate register book to record the different purchase of materials, labour payment, tools & equipments

SECTION 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	**Requires Well Developed Skill** • Create objects on CAD workspace using Toolbars, Commands, Menus, formatting layer and style. • Mark different types of Foundation and Set out Foundation trenches. • Identify the different types of Protective materials i.e. Paint, Varnish and their application • Prepare topography map by contours with levelling instruments. • Perform a site survey with Total Station and prepare site plan. • Identify timber and perform sawing and planning using hand and power tools. • 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.) **Clear choice of procedures in familiar context** • Prepare reinforcement of different R.C.C.	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. 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. Hence NSQF Level is 5 for this descriptor.	5

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**
	members i,e, Foundation, beams, columns, slabs, Retaining Wall, etc. • Erect scaffolding and make intricate form work at different locations • Prepare a bar bending schedule and demonstrate bar bending and calculate the estimated quantity of materials. • Work out rate analysis of different item of works with detailed Specification.		
Professional knowledge	**Knowledge of facts in the field of work or study** • Different types of projection views: Orthographic, Isometric, Oblique and Perspective. • Types, thickness in different position, materials, tools used, defects and remedies, surface preparation for rendering & wall cladding. **Knowledge of Principles and general concepts in the field of work or study** • Auto level , dumpy Level, Tilting Level - introduction, definition components parts, accessories used. **Knowledge of processes in the field of work or study** • Scaffolding & form work • Basic concept of lift and Escalator • Pile foundation • Estimating and costing	The learner requires to demonstrate 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. Hence NSQF Level is 5 for this descriptor	5

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**
	• Special repair • Adhesive and joint filler • Construction equipments		
Professional skill	• Draw orthographic projections of different objects with proper lines and dimensioning. • Create objects on CAD workspace using Toolbars, Commands, Menus, formatting layer and style. • Mark different types of Foundation and Set out Foundation trenches. • Perform different types of Plastering & Pointing, rendering & wall cladding. • Prepare different types of Flooring • Prepare topography map by contours with levelling instruments. • Perform a site survey with Total Station and prepare site plan. • Demonstrate surface finish with exact sizing by planning operation • Demonstrate installation of electrical appliances, Earthing and estimate costing of wiring • Prepare a water supply system in residential buildings using different types of valves, fittings and appliances. • Erect scaffolding and make intricate form work at different locations • Prepare a bar bending schedule and	The learning outcomes for example 'Create objects on CAD workspace using Toolbars, Commands, Menus, formatting layer and style, Prepare topography map by contours with 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 & communication system etc., all of which involve problem solving and decision making. Hence NSQF Level is 5 for this descriptor.	5

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**
	demonstrate bar bending and calculate the estimated quantity of materials.		
Core skill	**Desired Mathematical Skills** • Measure dimension of the components & record data to analyse the with given drawing/measurement • Mark as per specification applying desired mathematical calculation and observing standard procedure. **Understanding of social/political** • Understand and explain the concept in productivity, quality tools, and labour welfare legislation and apply such in day to day work to improve productivity & quality. **Organising information and communication** • Conduct appropriate and target oriented discussions with higher authority and within the team. • Resolve disputes within the team • Conduct written communication.	The learning outcomes for example 'Measure dimension of the components & record data' and 'Mark as per specification' 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. Hence NSQF Level is 5 for this descriptor.	5
Responsibility	• Construct plain scale, comparative scale, diagonal scale and vernier scale • Create objects on CAD workspace using Toolbars, Commands, Menus, formatting layer and style. • Mark different types of Foundation and Set out Foundation trenches.	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	5

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**
	• Perform different types of Plastering & Pointing, rendering & wall cladding. • Prepare different types of Flooring • Prepare topography map by contours with levelling instruments. • Perform a site survey with Theodolite and prepare site plan • Demonstrate surface finish with exact sizing by planning operation • Prepare a water supply system in residential buildings using different types of valves, fittings and appliances. • Prepare a bar bending schedule and demonstrate bar bending and calculate the estimated quantity of materials. • Make different types of arches and lintels with chajja. • Prepare Solid Modelling of Architectural /Civil 3D Drawing using 3d Max and Revit software • Work out rate analysis of different item of works with detailed Specification. • Demonstrate Construction Management i.e. manpower, materials, machines and economy.	standard/accuracy level. While “Perform different types of Plastering & Pointing, rendering & wall cladding.” shows some responsibility for other’s works and learning as well. Hence NSQF Level is 5 for this descriptor.	

OPTION B

Title/Name of qualification/component: Enter the title here number			**Level:** Add level
NSQF Domain	**Key requirements of the job role**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
Process			
Professional knowledge			
Professional skill			
Core skill			
Responsibility			

SECTION 3
EVIDENCE OF NEED

<table>
<tr><td>26</td><td>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?
<table>
<tr><th>Basis</th><th>In case of SSC</th><th>In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</th></tr>
<tr><td>Need of the qualification</td><td></td><td>The proposed qualification is running in the system for last few decades and passed out candidates are engaged in various related industries.</td></tr>
<tr><td>Industry Relevance</td><td></td><td>The job roles defined for the qualification is as per the National Qualification of Occupation 2015 which are developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. These justifies the qualification is very much relevance for industry.</td></tr>
<tr><td>Usage of the qualification</td><td></td><td>The Proposed qualification is running in ITI system across the country successfully over the period of time.</td></tr>
<tr><td>Estimated uptake</td><td></td><td>The present seating capacity is approximately 208</td></tr>
</table></td></tr>
<tr><td>27</td><td>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences</td></tr>
</table>

	This qualification is run by Ministry of Skill Development and Entrepreneurship and different industries under the related line ministry are also generally consulted before finalizing the curricula.
28	**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** The qualification is originally designed and approved by NCVT for the Craftsmen Training Scheme and is in existence for the last 60 years. NCVT has been entrusted with the responsibilities of prescribing standards and curricula for craftsmen training, advising the Government of India on the overall policy and programmes, conducting All India Trade Tests and awarding National Trade Certificates.
29	**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** • Mentor Council (MC) for the Construction, Construction Material And Real Estate sector was formed in 2014 to review the curriculum of this qualification under the sector. • CSTARI, the research wing of DGT, reviews and updates the qualification, in consultation with industries and other stakeholders, on a regular basis by conducting trade committee meetings. • DGT will keep on doing continuous comparative study in the trade by referring to relevant upcoming qualifications in the National Qualifications Register (NQR) and relevant sectors.

Please attach most relevant and recent documents giving further information about any of the topics above.
Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

SECTION 4
EVIDENCE OF PROGRESSION

30	**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*** • Qualifying trainee will obtain an NCVT Certificate in Civil Engineering Assistant trade which gives the following options of progression to the trainee: i) Can take admission in Diploma course in notified branches of Engineering by lateral entry. ii) Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC). iii) Can join Crafts Instructor Training Scheme (CITS) in the trade for

	becoming an instructor in ITIs. iv) Can join as Assistant supervisor in construction site of high Rise Buildings/Architect's office/Builders v) Start own agency for construction equipments contract /own building maintenance contract

Please attach most relevant and recent documents giving further information about any of the topics above.
Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.