Curriculum

for

Local Road Supervisor (LRS)

Council for Technical Education and Vocational Training

Curriculum Development Division

Sanothimi, Bhaktapur

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Introduction

This curriculum for Local Road Supervisor is designed to produce lower level technical workforce equipped with knowledge and skills related to local road supervision. It makes the trainees able to get opportunities for wage and self-employment in the related occupational field.

Aim

To produce lower level road construction workers (Local Road Supervisors) able to provide local road supervision services in the community being even an entrepreneur/employee/self-employed.

Objectives

After the completion of this training program, the trainees will be able:

- To handle/maintain tools/materials/equipment
- To enforce safety rules
- To assist for field survey
- To perform simple calculations/estimations
- To read/Interpret/ prepare drawings /sketches
- To perform setting out/layout
- To supervise earth road construction
- To supervise gravel road construction
- To supervise metalled road construction
- To supervise wall construction
- To supervise cross drainage construction
- To supervise roadside drain construction
- To supervise bio-engineering works
- To perform road maintenance works
- To perform plumbing works
- To perform welding works
- To manage construction works
- To manage health/environment
- To communicate with others
- To maintain records
- To grow professionally
- To develop entrepreneurial skills
- To facilitate for social mobilization

Course description

This curriculum provides skills & knowledge necessary for Local Road Supervisor. There will be both demonstration by instructors/trainers and opportunity by trainees to perform skills/tasks specified in this curriculum. Trainees will practice & learn skills using typical tools, materials, equipment & machines necessary for the program.

After successful completion of this program the trainees will be equipped with the knowledge and skills related to handle/maintain tools/materials/equipment, enforce safety rules, assist for field survey, perform simple calculations/estimations, read/Interpret/ prepare drawings /sketches, perform setting out/layout, supervise earth road construction, supervise gravel road construction, supervise metalled road construction, supervise wall construction, supervise cross drainage construction, supervise roadside drain construction, supervise bio-engineering works, perform road maintenance works, plumbing, welding, manage construction works, manage health/environment, communicate with others, maintain records, grow professionally, develop entrepreneurial skills, and facilitate for social mobilization,

Course structure of Local Road Supervisor

			Time (Hours)			Marks		
	Modules/sub modules	Nature	Th.	Pr.	Tot.	Th.	Pr.	Tot.
1. Tools, materials, equipment, and safety (18)		**T + P**	**5**	**13**	**18**	**3**	**12**	**15**
11	1. Tools, materials and equipment	T + P	2	9	11			
7	2. Enforcing safety rules	T + P	3	4	7			
2. Field survey(15)		**T + P**	**9**	**36**	**45**	**7**	**28**	**35**
3. Calculations and drawings(13)		**T + P**	**2**	**10**	**12**	**2**	**10**	**12**
6	1. Calculations/estimations	T + P	1	4	5			
7	2. Drawings /sketches	T + P	1	6	7			
4. Setting out/layout(10)		**T + P**	**6**	**24**	**30**	**5**	**20**	**25**
5. Supervising road construction(24)		**T + P**	**9**	**37**	**46**	**8**	**30**	**38**
12	1. Supervising earth road construction	T + P	4	15	19			
5	2. Supervising gravel road construction	T + P	3	12	15			
7	3. Supervising metalled road construction	T + P	2	10	12			
6. Supervising wall, drainage and drain(31)		**T + P**	**14**	**57**	**71**	**10**	**40**	**50**
15	1. Supervising wall construction	T + P	5	18	23			
9	2. Supervising cross drainage construction	T + P	5	22	27			
7	3. Supervising roadside drain construction	T + P	4	17	21			
7. Supervising bio-engineering works(5)		**T + P**	**2**	**8**	**10**	**2**	**8**	**10**
8. Road maintenance works(5)		**T + P**	**3**	**12**	**15**	**2**	**8**	**10**
9. Plumbing		**T + P**	**5**	**25**	**30**	**4**	**18**	**22**
10. Welding		**T + P**	**6**	**30**	**36**	**4**	**14**	**18**
11. Management(51)		**T + P**	**12**	**49**	**61**	**10**	**40**	**50**
6	**1.** Managing construction works	T + P	2	8	10			
8	**2.** Managing health/environment	T + P	2	6	8			
10	**3.** Communicating with others	T + P	2	8	10			
11	**4.** Maintaining records	T + P	2	9	11			
10	**5.** Growing professionally	T + P	2	8	10			
6	6. Developing entrepreneurial skills	T + P	2	10	12			
12. Social mobilization(8)		**T + P**	**8**	**8**	**16**	**3**	**12**	**15**
	(180) Sub- total:		**81**	**309**	**390**	**60**	**240**	**300**
13. On the job training (OJT)		**P**	**0**	**160**	**160**		**100**	**100**
	Total:		**81**	**469**	**550**	**60**	**340**	**400**

Duration
The total duration of the course will be of550 hrs. [390 hours (three months) in house plus 160 hrs. (One month) OJT]

Target group
All interested individuals in the field of road construction with educational prerequisite of class eight pass.

Group size
Maximum of thirty

Medium of instruction
Nepali or English or both

Pattern of attendance

- 80% attendance in theory
- 90% in practical/ performance

Focus of curriculum
This curriculum emphasizes on competency /performance. 80% time is allocated for performance and only 20% for related technical knowledge. So the focus will be on performance of the specified competencies in the curriculum

Entry criteria

- Minimum of eight class pass or equivalent
- Age range: 18 to 35 years old
- Physically fit
- Should pass entrance examination

Follow up suggestions
In order to assess the success of this program and collect feedbacks/ inputs for the revision of the curriculum a schedule of follow up is suggested as follows:

- First follow up: - Six months after the completion of the program
- Second follow up: - Six months after the completion of the first follow up
- Follow up cycle: - In a cycle of one year after the completion of the second follow up for five years

Certificate
The related training institute will provide the certificate of **"Local Road Supervisor ".** Again, individuals who complete module (s) of the curriculum will receive a certificate of completion of the particular module(s).

Grading

- Distinction: passed with 80% or above
- First division: passed with 75% or above
- Second division: passed with 65% or above
- Third division: passed with 60% or above

Students evaluation

- Continuous evaluation of the trainees' performance is to be done by the related instructor/ trainer to ensure the proficiency over each competency under each of the sub-module.
- Related technical knowledge learnt by trainees will be evaluated through written or oral tests.
- Trainees must secure minimum marks of 60% in an average of practical evaluations.

- There will be one internal evaluation in each module.
- The entrance test will be conducted by the concerned Institute.

Trainers qualification

- Diploma in civil engineering. or equivalent in related field
- Good communicative and instructional skills
- Experience in related field

Trainer-trainees ratio

- 1:10 for practical classes
- For theory, as per the class room situation

Suggestions for instructor

Suggestions for instruction

1. **Select objectives**
   - Write objectives of cognitive domain
   - Write objectives of psychomotor domain
   - Write objectives of affective domain
2. **Select subject matter**
   - Study subject matter in detail
   - Select content related to cognitive domain
   - Select content related to psychomotor domain
   - Select content related to affective domain
3. **Select instructional methods**
   - Teacher centered methods: like lecture, demonstration, questions answer inquiry, induction and deduction methods.
   - Student initiated methods like experimental, field trip/excursion, discovery, exploration, problem solving, and survey methods.
   - Interaction methods like discussion, group/team teaching, microteaching and exhibition.
   - Dramatic methods like role play and dramatization
4. Select Instructional method (s) on the basis of objectives of lesson plans and KAS domains
5. Select appropriate educational materials and apply at right Time and place.
6. Evaluate the trainees applying various tools to correspond the KAS domains
7. Make plans for classroom / field work / workshop organization and management.
8. Coordinate among objectives, subject matter and instructional methods.
9. Prepare lesson plan for Theory and Practical classes.
10. Deliver /conduct instruction / program
11. Evaluate instruction/ program

Suggestion for the performance evaluation of the trainees

1. Perform task analysis
2. Develop a detail task performance checklist
3. Perform continuous evaluation of the trainees by applying the performance checklist.

Suggestion for skill training

Demonstrate performance

1. Demonstrate task performance in normal speed
2. Demonstrate slowly with verbal description of each and every step in the sequence of activity of the task performance using question and answer techniques.
3. Repeat 2 for the clarification on trainees demand if necessary
4. Perform fast demonstration of the task.

Provide trainees the opportunities to practice the task performance demonstration

1. Provide trainees to have guided practice
2. Create environment for practicing the demonstrated task performance
3. Guide the trainees in each and every step of task performance
4. Provide trainees to repeat and repeat as per the need to be proficient on the given task performance
5. Switch to another task demonstration if and only trainees developed proficiency in the task performance.

Other suggestions

1. Apply principles of skill training
2. Allocate 20% Time for Theory classes and 80% Time for task performance while delivering instructions
3. Apply principles of adult learning
4. Apply principles of intrinsic motivation
5. Facilitate maximum trainees involvement in learning and task performance activities
6. Instruct the trainees on the basis of their existing level of knowledge, skills and attitude.

Tools, equipment and materials

- Stationary
- Marker pen
- Brown paper
- Chalk duster
- Clear bag
- Photocopy bag
- Measuring tape
- Abney level
- Staff
- Ranging rod
- Plumbub
- Try square
- Sprit level
- level pipe
- Hammer (small+ big)
- Shovel
- AC Arc welding transformer
- Dry oven
- hand grinder
- Welding accessories
- Different size electrodes
- Arc welding machines
- Screw driver
- Slider rench
- Hammer
- Trovel (Karni)
- Khukuri
- Pick
- Wheelbarrow
- Pan
- Jumper
- Chisel
- Thread
- Calculator
- Graph paper
- Clutch Pencil
- Pencil lead
- Eraser
- Spadle
- Enamel + brush
- Cement
- Sand screener
- DC Arc welding rectifier
- Arc welding machines
- Black smithy vice
- Allen key
- Solar water heater
- Sand
- Concrete
- Stone
- Square
- Jebro Textile
- Helmet
- axe
- Gumboot
- Gloves
- Goggles
- Mask
- Record note pad
- Altimeter
- Theodolite
- Compass
- Industrial plugs
- Electrode holder
- Earth clamp
- Different size electrodes
- Hand grinder
- Work piece material and Safety equipment's
- Pump
- Gas geyser
- Basin braket
- Basin mixture/oillor cock

- Grip
- Screw
- Centre pinch
- Drill machine
- Drill bit
- Wash Basin
- Commode
- Connection pipe
- Angle valve
- White cement
- Adjustabele able wrench
- Monkey plaier
- Concrete drill bit
- Marker
- Waste couplin g
- Fine sand
- Brick
- Waste pipe
- Bath tub
- Battery
- Pipe cutter
- Gas cylinder
- Regulator
- Electric geyser
- Stop valve
- Solar water heater

Reading materials:

1. Highway Engineering – Khanne & Justo
2. Civil Engineering handbook – Khanna & Khanna
3. Surveying – B.C. Puania
4. Bio-Engineering. DOR
5. Best Practices : Green Road Construction – GTZ
6. DOLIDAR Approaches Manual for District Transport Master Plan, Norms, Specification
7. Engineering Method – Sushil Guman
8. Construction Supervision Manual – DOLIDAR
9. Gramin Sadaka Tatha Samhar Pustika (u|fld)f ;*s tyf ;+ef/ k'l:tsf)– DOLIDAR
10. Technical Curriculum
11. Nepal Road Standards
12. Ley men working Guideline
13. Concrete technology
14. Social Mobilization manual
15. Batawaran Pustika (aftfj/)f k'l:tsf)

Facilities:

- Well equipped enough class/ office rooms
- A / V room
- Transportation facilities/ Vehicle
- Laboratory / library
- OHP/computers with CD ROM attachment / pictures/
- Multimedia presentation set /Slide presenter
- Hostel/canteen /drinking water
- Electricity

Modules and sub-modules

- **Module: 1: Tools, materials, equipment, and safety**
  - Sub-module:1: Tools, materials and equipment
  - Sub-module:2: Enforcing safety rules
- **Module: 2: Field survey**
- **Module: 3: Calculations and drawings**
  - Sub-module:1: Calculations/estimations
  - Sub-module:2: Drawings /sketches
- **Module: 4: Setting out/layout**
- **Module: 5: Supervising road construction**
  - Sub-module:1: Supervising earth road construction
  - Sub-module:2: Supervising gravel road construction
  - Sub-module:3: Supervising metalled road construction
- **Module: 6: Supervising wall, drainage and drain**
  - Sub-module:1: Supervising wall construction
  - Sub-module:2: Supervising cross drainage construction
  - Sub-module:3: Supervising roadside drain construction
- **Module: 7: Supervising bio-engineering works**
- **Module: 8: Road maintenance works**
- **Module: 9: Plumbing**
- **Module: 10: Welding**
- **Module: 11: Management**
  - Sub-module:1: Managing construction works
  - Sub-module:2: Managing health/environment
  - Sub-module:3: Communicating with others
  - Sub-module:4: Maintaining records
  - Sub-module:5: Growing professionally
  - Sub-module:6: Developing entrepreneurial skills
- **Module: 12: Social mobilization**

Modules, sub-modules, objectives and tasks

Module: 1: Tools, materials, equipment, and safety

Sub-module:1: Tools, materials and equipment

Objective: Handle/maintain tools/materials/equipment

Tasks:

1. Handle measuring tape.
2. Handle pedometer.
3. Handle altimeter.
4. Level pipe/sprit level.
5. Handle surveyor compass.
6. Handle Abney level.
7. Handle auto level.
8. Handle calculator.
9. Operate computer.
10. Apply global positioning system.
11. Handle wheel barrow.

Sub-module:2: Enforcing safety rules

Objective: Enforce Safety Rules

Tasks:

12. Maintain first aid kit box.
13. Perform simple/common first aids.
14. Enforce safety wares.
15. Maintain accidental records.
16. Orient/inform about possible risks/hazards.
17. Enforce to follow traffic signals.
18. Apply fire safety measures.

Module: 2: Field survey

Objective: Assist for Field Survey

Tasks:

19. Assist to fix Road Alignment.
20. Assist to fix Road Centre line.
21. Measure tentative Road Length.
22. Assist to Conduct L-section Survey.
23. Assist to conduct cross-section Survey.
24. Assist to fix Reference Points

25. Fix Bench mark.
26. Assist to investigate obligatory points.
27. Assist to conduct Traverse Survey.
28. Conduct Labor Availability Survey.
29. Conduct Local Construction Materials Survey.
30. Assist to conduct Household Survey.
31. Assist to perform cadastral Survey.
32. Perform Traffic/vehicle count.
33. Count trees/cross-drainage hard rock.

Module: 3: Calculations and drawings

Sub-module:1: Calculations/estimations

Objective: Perform Simple Calculations/Estimations

Tasks:

34. Calculate area/volume of various geometrical figures.
35. Use government norms/rates.
36. Read/interpret specifications.
37. Estimate/cost materials.
38. Estimate/cost equipment/tools.
39. Estimate human resources.

Sub-module:2: Drawings /sketches

Objective: Read/Interpret/ prepare drawings /sketches

Tasks:

40. Prepare drawing/sketch of Rectangular section.
41. Prepare sketch/drawing of Trapezoidal section.
42. Read/Interpret plan of road alignment.
43. Read/Interpret section of road alignment.
44. Read/Interpret deviation of geometrical figures.
45. Prepare sketch/drawings of triangular section.
46. Prepare sketches/drawings of circular section.

Module: 4: Setting out/layout

Objective: Perform setting out/Layout

Tasks:

47. Prepare check list.
48. Collect/Identify tools/equipment/materials.
49. Perform Measurements.

50. Apply 3-4-5 method of layout.
51. Perform setting out of centerline (road alignment).
52. Perform setting out of formation width.
53. Perform setting out of retaining/breast walls.
54. Perform setting out of cross drainage structures.
55. Perform setting out of bio engineering works.
56. Locate road centerline.

Module: 5: Supervising road construction

Sub-module:1: Supervising earth road construction

Objective: Supervise Earth Road Construction

Tasks:

57. Perform site clearance.
58. Supervise top soil removal work.
59. Perform benching.
60. Maintain borrow pit.
61. Maintain fill/cut slopes.
62. Manage safe disposal of surplus materials.
63. Maintain Formation width.
64. Maintain camber/upper elevation (S.E.).
65. Maintain longitudinal slope/grade.
66. Maintain vertical curves.
67. Maintain horizontal curves.
68. Maintain compaction density.

Sub-module:2: Supervising gravel road construction

Objective: Supervise Gravel Road Construction

Tasks:

69. Control Traffic.
70. Maintain gravel sizing.
71. Maintain compaction.
72. Maintain thickness
73. Maintain edging.

Sub-module:3: Supervising metalled road construction

Objective: Supervise Metalled Road Construction

Tasks:

74. Maintain penetration macadam work.
75. Maintain ottaseal.
76. Maintain asphalt concrete work.
77. Maintain single surface treatment work.

78. Maintain double surface treatment work.
79. Maintain concrete pavement.
80. Maintain stone soling pavement.

Module: 6: Supervising wall, drainage and drain

Sub-module:1: Supervising wall construction

Objective: Supervise wall Construction

Tasks:

81. Layout walls.
82. Maintain foundation excavation.
83. Maintain soling work.
84. Maintain foundation PCC/RCC work.
85. Maintain Construction joints.
86. Maintain weep hole.
87. Maintain filter materials.
88. Maintain wall dimension.
89. Maintain retaining walls.
90. Maintain breast wall.
91. Maintain toe wall.
92. Maintain revetment wall.
93. Maintain dry/masonry/composite walls.
94. Maintain gabion wall/construction.
95. Maintain gabion crate/box weaving.

Sub-module:2: Supervising cross drainage construction

Objective: Supervise Cross Drainage Construction

Tasks:

96. Assist for layout.
97. Maintain foundation excavation.
98. Manage dewatering dimension.
99. Maintain line/level of formwork.
100. Inspect staging.
101. Maintain line level of sub-structure.
102. Maintain line level of super-structure.
103. Maintain line/level of formwork.
104. Maintain protection works.

Sub-module:3: Supervising roadside drain construction

Objective: Supervise Roadside Drain Construction

Tasks:

105. Layout for roadside drain.
106. Assure/monitor quality of concrete work.
107. Maintain dimension of masonry work.
108. Maintain dimensions/slopes.
109. Supervise plastering.
110. Supervise curving.
111. Maintain surface/sub-surface drainage.

Module: 7: Supervising bio-engineering works

Objective: Supervise Bio-engineering Works

Tasks:

112. Supervise preparation of live stakes grass slips.
113. Perform layout.
114. Supervise plantation work.
115. Supervise caring of plants.
116. Protect plants.

Module: 8: Road maintenance works

Objective: Perform Road Maintenance Works

Tasks:

117. Supervise routine maintenance.
118. Supervise recurrent maintenance.
119. Supervise periodic maintenance.
120. Supervise emergency maintenance.
121. Supervise rehabilitation maintenance.

Module: 9: Plumbing

Tasks:

122. Install solar water.
123. Install the electric Geyser.
124. Install the gas geyser.
125. Install bathtub.
126. Install kitchen sink.
127. Install commode.
128. Install wash basin.
129. Repair the gas geyser.

130. Repair and maintain solar water heater.
131. Repair and maintain the pump.

Module: 10: Welding

Tasks:

132. Strike/maintain the arc.
133. Strike/maintain the arc.
134. Perform straight bead in flat position.
135. Grind off welding surfaces.
136. Weld fillet lap joint in flat position.
137. Weld fillet tee joint in flat position.
138. Weld fillet corner joint in flat position.
139. Weld square butt joint in flat position.
140. Weld single V-butt joint in flat position (single/multi run)
141. Weld double bevel joint in flat position.

Module: 11: Management

Sub-module:1: Managing construction works

Objective: Manage Construction Works

Tasks:

142. Prepare follow schedule.
143. Manage labor force/road building groups.
144. Manage materials.
145. Manage machine.
146. Manage money.
147. Manage minute/documents.

Sub-module:2: Managing health/environment

Objective: Manage Health/Environment

Tasks:

148. Maintain waste disposal system.
149. Manage safe/healthy drinking water.
150. Be familiar with communicable diseases.
151. Create safe working environment.
152. Be familiar with the management of HIV/STD.
153. Minimum noise/dust pollution.
154. Enforce to manage quarry site.
155. Facilitate to dispose unwanted oil.

Sub-module:3: Communicating with others

Objective: Communicate with others

Tasks:

156. Make telephone calls.
157. Receive telephone calls.
158. Write letters.
159. Write simple reports.
160. Communicate with seniors.
161. Communicate with juniors/labors.
162. Communicate with peers.
163. Communicate with contractors.
164. Communicate with user's committee.
165. Communicate with user's groups.

Sub-module:4: Maintaining records

Objective: Maintain Records

Tasks:

166. Keep records of attendance.
167. Maintain muster roll.
168. Keep record of tools/equipment/material used.
169. Maintain log book.
170. Maintain simple A/C books.
171. Identify/facilitate to apply various formats of records.
172. Apply fire safety measures.
173. Maintain daily diary.
174. Keep records work progress.
175. Prepare work progress record.
176. Submit record/report to the concerned.

Sub-module:5: Growing professionally

Objective: Grow Professionally

Tasks:

177. Attend meetings/seminars/workshops.
178. Consult experts.
179. Consult professional books/manuals.
180. Participate in professional organizations.
181. Follow professional rules/regulations/ethics.
182. Consult professional journals/magazine
183. Discuss with peers.
184. Attend professional trainings.
185. Seek/attend for higher education.
186. Browse www

Sub-module:6: Developing entrepreneurial skills

Objective: Develop Entrepreneurial Skills

Tasks:

187. Develop small business planning skills.
188. Develop small business organizing skills.
189. Develop small business direction skills.
190. Develop small business controlling skills.
191. Prepare a small business plan.
192. Prepare a budget for a small business.

Module: 12: Social mobilization

Objective: Facilitate for Social Mobilization

Tasks:

193. Facilitate to form users committee.
194. Prepare participation schedule.
195. Facilitate to form users' group.
196. Facilitate to minute decisions.
197. Facilitate users' committee meetings.
198. Motivate users for participation.
199. Facilitate to carry out public audit.
200. Facilitate to minimize conflict.

Details of modules and sub-modules

Module: 1: Tools, materials, equipment, and safety

Description: It deals with the knowledge and skills related to the handling of the tools, materials and equipment; and enforcing safety rules necessary for supervising local roads.

Objectives:

- To handle tools, materials and equipment
- To enforce safety rules

Sub-modules:

1. Tools, materials and equipment
2. Enforcing safety rules

Sub-module:1: Tools, materials and equipment

Description: It deals with the knowledge and skills related to the handling of the tools, materials and equipment necessary for supervising local roads.

Objectives:

- To handle measuring tape
- To handle pedometer
- To handle altimeter
- To handle pipe/sprit level
- To handle surveyor compass
- To handle Abney level
- To handle autolevel
- To handlecalculator
- To operate computer
- To apply global positioning system
- To handle wheel barrow

Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.

		11 hrs. = 2 hrs,(Th,) + 9 hrs,(Pr,)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Handle measuring tape	Handling measuring tape: • Identification of measuring tape • Functions of measuring tape • Uses/applications of measuring tape • Handling of measuring tape • Care/maintenance of measuring tape • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.9	1.1
2.	Handle pedometer	Handling pedometer:	0.2	0.9	1.1

		• Identification of pedometer • Functions of pedometer • Uses/applications of pedometer • Initial setting or zero setting • Handling of pedometer • Care of pedometer • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
3.	Handle altimeter	<u>Handling altimeter</u>: • Identification of altimeter • Functions of altimeter • Uses/applications of altimeter • Initial setting • Handling of altimeter • Care/maintenance of altimeter • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1.0
4.	Handle pipe/sprit level	<u>Handling pipe/sprit level</u>: • Identification of pipe/sprit level • Functions of pipe/sprit level • Uses/applications of pipe/sprit level • Handling of pipe/sprit level • Care/maintenance of pipe/sprit level • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1.0
5.	Handle surveyor compass	<u>Handling surveyor compass</u>: • Identification of surveyor compass • Functions of surveyor compass • Types of surveyor compass • Uses surveyor compass • Handling of surveyor compass • Care/maintenance of surveyor compass	0.2	0.8	1.0

		• Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
6.	Handle Abney level	Handling Abney level: • Identification of Abney level • Functions of Abney level • Uses/applications of Abney level • Handling/setting of Abney level • Care/maintenance of Abney level • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1.0
7.	Handle auto level	Handling auto level : • Identification of auto level • Functions of auto level • Uses/applications of auto level • Handling of auto level • Care/maintenance of auto level • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1.0
8.	Handle calculator	Handling calculator: • Identification of calculator • Functions of calculator • Uses/applications of calculator • Handling of calculator • Care/maintenance of calculator • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1.0
9.	Operate computer	Operating computer: • Identification of computer • Functions of computer • Uses/applications of computer • Handling of • Operating computer	0.2	0.8	1.0

		• Care/maintenance of computer • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
10.	Apply global positioning system	Applying global positioning system: • Concept of global positioning system • Functions of global positioning system • Uses/applications of global positioning system • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.1	0.8	0.9
11.	Handle wheel barrow	Handling wheel barrow: • Identification of wheel barrow • Functions of wheel barrow • Uses/applications of wheel barrow • Handling of wheel barrow • Care/maintenance of wheel barrow • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.1	0.8	0.9
	Sub-total:		2	9	11
	Sub-module:2: Enforcing safety rules				
	Description: It deals with the knowledge and skills related to enforcing safety rules necessary for supervising local roads.				
	Objectives: • To maintain first aid kit box • To perform simple/common first aids • To enforce safety wares/personal protective equipment(PPE) • To maintain accidental records • To orient/inform about possible risks/hazards • To enforce to follow traffic signs • To apply fire safety measures				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		7 hrs. = 3 hrs,(Th,) + 4 hrs,(Pr,)	Time (hours)		

SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Maintain first aid kit box	Maintaining first aid kit box: • Concept of first aid kit box • Identification of first aid kit box • Functions of first aid kit box • Uses/applications of first aid kit box • Maintaining first aid kit box Care/maintenance of first aid kit box • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.4	0.5	0.9
2.	Perform simple/common first aids	Performing simple/common first aids: • Concept of simple/common first aid • Need and importance of simple/common first aids • Principles and proceduresfor simple/common first aids • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	1.0	1.6
3.	Enforce safety wares/personal protective equipment	Enforcing safety wares: • Concept and functions of safety wares • Need and importance ofsafety wares • Identification of safety wares • Enforcing safety wares • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.4	0.5	0.9
4.	Maintain accidental records	Maintaining accidental records: • Concept and uses of accidental records • Why, when, and how of maintaining accidental records • Format for accidental records	0.4	0.5	0.9

		• Precautions to be taken while carrying out this task • Reporting to concerned officials • Keeping records of the activities related to this task			
5.	Orient/inform about possible risks/hazards	Orienting/informing about possible risks/hazards: • Concepts and definitions of risks and hazards • Identification and analysis of possible risks/hazards • Why, when, and how of orienting/informing about possible risks/hazards • Precautions to be taken while carrying out this task • Reporting to concerned officials • Keeping records of the activities related to this task	0.4	0.5	0.9
6.	Enforce to follow traffic signs	Enforcing to follow traffic signs: • Concept of traffic signs • Types of traffic signs • Identification of traffic signs • Interpretation of traffic signs • Why, when, and how of enforcing to follow traffic signs • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.4	0.5	0.9
7.	Apply fire safety measures	Applying fire safety measures: • Concept of fire safety measures • Identification of fire safety measures • Why, when, and how of applying fire safety measures • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.4	0.5	0.9
	Sub-total:		3	4	7
	Module: 2: Field survey				

	Description: It deals with the knowledge and skills related to field survey necessary for supervising local roads.				
	Objectives: • To assist to fix road alignment • To assist to fix road centre line • To measure tentative alignment length (proposed road) • To assist to conduct L-section survey • To assist to conduct cross-section survey • To assist to fix reference points • To fix bench mark • To assist to investigate obligatory points • To assist to conduct traverse survey • To conduct labor availability survey • To conduct local construction materials survey • To assist to conduct household survey • To assist to perform cadastral survey • To perform traffic/vehicle count • To count trees/cross-drainage/hard rock locations				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		45 hrs. = 9 hrs,(Th,) + 36 hrs,(Pr,)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Assist to fix Road Alignment	<u>Assisting to fix Road Alignment</u>: • Concept and importance of fixing road alignment • Why and when of fixing road alignment • Principle and procedure for fixing road alignment • Assisting to fix road alignment • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
2.	Assist to fix Road Centre line	<u>Assisting to fix Road Centre line</u>: • Concept and importance of fixing road centre line • Why and when of fixing road centre line • Principle and procedure for fixing road centre line • Assisting to fix road centre line • Precautions to be taken while	0.6	2.4	3

		carrying out this task • Keeping records of the activities related to this task			
3.	Measure tentative Road Length	Measuring tentative Road Length: • Concept and importance of measuring tentative road length • Why and when of measuring tentative road length • Principle and procedure for measuring tentative road length • Measuring tentative road length • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
4.	Assist to Conduct L-section Survey	Assisting to Conduct L-section Survey: • Concept and importance of conducting L-section survey • Why and when of conducting L-section survey • Principle and procedure for conducting L-section survey • Assisting to conduct L-section survey • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
5.	Assist to conduct cross-section Survey	Assisting to conduct cross-section Survey: • Concept and importance of conducting cross-section survey • Why and when of conducting cross-section survey • Principle and procedure for conducting cross-section survey • Assisting to conduct cross-section survey • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3

6.	Assist to fix Reference Points	<u>Assisting to fix Reference Points</u>: • Concept and importance of fixing reference points • Why and when of fixing reference points • Principle and procedure for fixing reference points • Assisting to fix reference points • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
7.	Fix Bench mark	<u>Fixing Bench mark</u>: • Concept and importance of fixing bench mark • Why and when of fixing bench mark • Principle and procedure for fixing bench mark • Fixing bench mark • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
8.	Assist to investigate obligatory points	<u>Assisting to investigate obligatory points</u>: • Concept and importance of obligatory points • Why and when of investigating obligatory points • Principle and procedure for investigating obligatory points • Assisting to investigate obligatory points • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
9.	Assist to conduct Traverse Survey	<u>Assisting to conduct Traverse Survey</u>: • Concept and importance of conducting traverse survey	0.6	2.4	3

		• Why and when of conducting traverse survey • Principle and procedure for conducting traverse survey • Assisting to conduct traverse survey • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
10.	Conduct Labor Availability Survey	<u>Conducting Labor Availability Survey</u>: • Concept and importance of conducting labor availability survey • Why and when of conducting labor availability survey • Principle and procedure for conducting labor availability survey • Conducting labor availability survey • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
11.	Conduct Local Construction Materials Survey	<u>Conducting Local Construction Materials Survey</u>: • Concept and importance of conducting local construction materials survey • Why and when of conducting local construction materials survey • Principle and procedure for conducting local construction materials survey • Conducting local construction materials survey • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
12.	Assist to conduct Household Survey	<u>Assisting to conduct Household Survey</u>: • Concept and importance of conducting household survey • Why and when of conducting household survey	0.6	2.4	3

		• Principle and procedure for conducting household survey • Assisting to conduct household survey • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
13.	Assist to perform cadastral Survey	<u>Assisting to perform cadastral Survey</u>: • Concept and importance of cadastral survey • Why and when of performing cadastral survey • Principle and procedure for performing cadastral survey • Assisting to perform cadastral survey • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
14.	Perform Traffic/vehicle count	<u>Performing Traffic/vehicle count</u>: • Concept and importance of traffic/vehicle count • Why and when of performing traffic/vehicle count • Principle and procedure for performing traffic/vehicle count • Performing traffic/vehicle count • Format for traffic count • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
15.	Count trees/cross-drainage/hard rock	<u>Counting trees/cross-drainage/hard rock area:</u> • Concept and importance of counting trees/cross-drainage/hard rock • Why and when of counting trees/cross-drainage/hard rock area • Principle and procedure for	0.6	2.4	3

		counting trees/cross-drainage/hard rock • Counting trees/cross-drainage/hard rock • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
	Sub-total:		9	36	45
	Module: 3: Calculations and drawings				
	Description: It deals with the knowledge and skills related to simple calculations/estimations and reading/interpreting/ preparing drawings /sketches necessary for supervising local roads.				
	Objectives: • To perform simple calculations/estimations • To read/Interpret/ prepare drawings /sketches				
	Sub-modules: 1. Calculations/estimations 2. Drawings /sketches				
	Sub-module:1: Calculations/estimations				
	Description: It deals with the knowledge and skills related to simple calculations/estimations necessary for supervising local roads.				
	Objectives: • To calculate area/volume of various geometrical figures • To use government norms/rates • To read/interpret specifications • To estimate/cost materials • To estimate/cost equipment/tools • To estimate human resources				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		5 hrs. = 1 hrs,(Th,) + 4 hrs,(Pr,)	Time (minutes)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Calculate area/volume of various geometrical figures	<u>Calculating area/volume of various geometrical figures</u>: • Concept and importance of calculating area/volume of various geometrical figures • Why and when of calculating area/volume of various geometrical figures • Principle and procedure for calculating area/volume of various geometrical figures	10	40	50

		• Calculating area/volume of various geometrical figures • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
2.	Use government norms/rates	Using government norms/rates: • Concept and importance of using government norms/rates • Why and when of using government norms/rates • Principle and procedure for using government norms/rates • Using government norms/rates • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	10	40	50
3.	Read/interpret specifications	Reading/interpreting specifications: • Concept and importance of reading/interpreting specifications • Why and when of reading/interpreting specifications • Principle and procedure for reading/interpreting specifications • Reading/interpreting specifications • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	10	40	50
4.	Estimate/cost materials	Estimating/costing materials: • Concept and importance of estimating/costing materials • Why and when of estimating/costing materials • Principle and procedure for estimating/costing materials • Estimating/costing materials • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	10	40	50

5.	Estimate/cost equipment/tools	Estimating/costing equipment/tools: • Concept and importance of estimating/costing equipment/tools • Why and when of estimating/costing equipment/tools • Principle and procedure for estimating/costing equipment/tools • Estimating/costing equipment/tools • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	10	40	50
6.	Estimate human resources	Estimating human resources: • Concept and importance of estimating human resources • Why and when of estimating human resources • Principle and procedure for estimating human resources • Estimating human resources • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	10	40	50
	Sub-total(hours):		1	4	5
	Sub-module:2: Drawings /sketches				
	Description: It deals with the knowledge and skills related to drawings and sketches necessary for supervising local roads.				
	Objectives: • To prepare drawing/sketch of rectangular section • To prepare sketch/drawing of trapezoidal section • To prepare sketch/drawings of triangular section • To prepare sketches/drawings of circular section • To read/interpret plan of road alignment • To read/interpret section of road alignment • To read/interpret deviation of geometrical figures				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		7 hrs. = 1 hrs,(Th,) + 6 hrs,(Pr,)	Time (minutes)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1	Prepare drawing/sketch of	Preparing drawing/sketch of	8	50	58

	Rectangular section	Rectangular section: • Concept and importance of preparing drawing/sketch of rectangular section • Why and when of preparing drawing/sketch of rectangular section • Principle and procedure for preparing drawing/sketch of rectangular section • Preparing drawing/sketch of rectangular section • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
2.	Prepare sketch/drawing of Trapezoidal section	Preparing sketch/drawing of Trapezoidal section: • Concept and importance of preparing sketch/drawing of trapezoidal section • Why and when of preparing sketch/drawing of trapezoidal section • Principle and procedure for preparing sketch/drawing of trapezoidal section • Preparing sketch/drawing of trapezoidal section • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	8	50	58
3.	Prepare sketch/drawings of triangular section	Preparing sketch/drawings of triangular section: • Concept and importance of preparing sketch/drawings of triangular section • Why and when of preparing sketch/drawings of triangular section • Principle and procedure for	8	50	58

		preparing sketch/drawings of triangular section • Preparing sketch/drawings of triangular section • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
4.	Prepare sketches/drawings of circular section	<u>Preparing sketches/drawings of circular section</u>: • Concept and importance of preparing sketches/drawings of circular section • Why and when of preparing sketches/drawings of circular section • Principle and procedure for preparing sketches/drawings of circular section • Preparing sketches/drawings of circular section • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	8	50	58
5.	Read/Interpret plan of road alignment	<u>Reading/Interpreting plan of road alignment</u>: • Concept and importance of reading/interpreting plan of road alignment • Why and when of reading/interpreting plan of road alignment • Principle and procedure for reading/interpreting plan of road alignment • Reading/interpreting plan of road alignment • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	8	50	58

6.	Read/Interpret section of road alignment	Reading/Interpreting section of road alignment: • Concept and importance of • Why and when of reading/interpreting section of road alignment • Principle and procedure for reading/interpreting section of road alignment • Reading/interpreting section of road alignment • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	8	50	58
7.	Read/Interpret deviation of geometrical figures	Reading/Interpreting deviation of geometrical figures: • Concept and importance of reading/interpreting deviation of geometrical figures • Why and when of reading/interpreting deviation of geometrical figures • Principle and procedure for reading/interpreting deviation of geometrical figures • Reading/interpreting deviation of geometrical figures • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	12	60	72
	Sub-total(hours):		1	6	7
	Module: 4: Setting out/layout				
	Description: It deals with the knowledge and skills related to setting out/layout necessary For supervising local roads.				
	Objectives: • To task statements • To prepare check list • To collect/identify tools/equipment/materials • To perform measurements • To apply 3-4-5 method of layout • To perform setting out of centerline (road alignment)				

	• To perform setting out of formation width • To perform setting out of retaining/breast walls • To perform setting out of cross drainage structures • To perform setting out of bio engineering works • To locate road centerline				
	Tasks: Each task consists of related technical knowledge and time allocation for both the Theoretical and practical aspects of it.				
		30 hrs. = 24 hrs,(Th,) + 30 hrs,(Pr,)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot
1.	Prepare check list	Preparing check list: • Concept and importance of check list • Why and when of preparing check list • Principle and procedure for preparing check list • Preparing check list • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
2.	Collect/Identify tools/equipment/materials	Collecting/Identifying tools/equipment/materials: • Concept and importance of tools/equipment/materials • Why and when of collecting/identifying tools/equipment/materials • Principle and procedure for • Collecting/identifying tools/equipment/materials • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
3.	Perform Measurements	Performing Measurements: • Concept and importance of measurements • Why and when of taking measurements • Principle and procedure for taking measurements • Performing measurements	0.6	2.4	3

		• Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
4.	Apply 3-4-5 method of layout	Applying 3-4-5 method of layout: • Concept and importance of 3-4-5 method of layout • Why and when of applying 3-4-5 method of layout • Principle and procedure for applying 3-4-5 method of layout • Applying 3-4-5 method of layout • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
5.	Perform setting out of centerline (road alignment)	Performing setting out of centerline (road alignment): • Concept and importance of setting out of centerline (road alignment) • Why and when of setting out of centerline (road alignment) • Principle and procedure for setting out of centerline (road alignment) • Performing setting out of centerline (road alignment) • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
6.	Perform setting out of (cross section for) formation width	Performing setting out of formation width: • Concept and importance of setting out (cross section) of formation width • Why and when of setting out of formation width • Principle and procedure for setting out of formation width • Performing setting out of formation width • Precautions to be taken while	0.6	2.4	3

		carrying out this task • Keeping records of the activities related to this task			
7.	Perform setting out of retaining/breast walls	<u>Performing setting out of retaining/breast walls</u>: • Concept and importance of setting out of retaining/breast walls • Why and when of setting out of retaining/breast walls • Principle and procedure for setting out of retaining/breast walls • Performing setting out of retaining/breast walls • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
8.	Perform setting out of cross drainage structures	<u>Performing setting out of cross drainage structures</u>: • Concept and importance of setting out of cross drainage structures • Why and when of setting out of cross drainage structures • Principle and procedure for setting out of cross drainage structures • Performing setting out of cross drainage structures • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
9.	Perform setting out of bio engineering works	<u>Performing setting out of bio engineering works</u>: • Concept and importance of setting out of bio engineering works • Why and when of setting out of bio engineering works • Principle and procedure for setting out of bio engineering works • Performing setting out of bio engineering works • Precautions to be taken while	0.6	2.4	3

		carrying out this task • Keeping records of the activities related to this task			
10.	Locate road centerline	Locating road centerline: • Concept and importance of locating road centerline • Why and when of locating road centerline • Principle and procedure for locating road centerline • Locating road centerline • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
	Sub-total:		6	24	30
	Module: 5: Supervising road construction				
	Description: It deals with the knowledge and skills related to supervising earth, gravel, and metalled roads construction necessary for supervising local roads.				
	Objectives: • To supervise earth road construction • To supervise gravel road construction • To supervise metalled road construction				
	Sub-modules: 1. Supervising earth road construction 2. Supervising gravel road construction 3. Supervising metalled road construction				
	Sub-module:1: Supervising earth road construction				
	Description: It deals with the knowledge and skills related to the supervision of earth road construction.				
	Objectives:				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		19 hrs. = 4 hrs,(Th,) + 15 hrs,(Pr,)	Time (minutes)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Perform site clearance	Performing site clearance: • Concept and importance of performing site clearance • Why and when of performing site clearance • Principle and procedure for performing site clearance • Performing site clearance	20	75	95

		• Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
2.	Supervise top soil removal work	Supervising top soil removal work: • Concept and importance of supervising top soil removal work • Why and when of supervising top soil removal work • Principle and procedure for supervising top soil removal work • Supervising top soil removal work • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	75	95
3.	Perform benching	Performing benching: • Concept and importance of performing benching • Why and when of performing benching • Principle and procedure for performing benching • Performing benching • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	75	95
4.	Maintain borrow pit	Maintaining borrow pit: • Concept and importance of maintaining borrow pit • Why and when of maintaining borrow pit • Principle and procedure for maintaining borrow pit • Maintaining borrow pit • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	75	95
5.	Maintain fill/cut slopes	Maintaining fill/cut slopes:	20	75	95

		• Concept and importance of maintaining fill/cut slopes • Why and when of maintaining fill/cut slopes • Principle and procedure for maintaining fill/cut slopes • Maintaining fill/cut slopes • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
6.	Manage safe disposal of surplus materials	<u>Managing safe disposal of surplus materials</u>: • Concept and importance of managing safe disposal of surplus materials • Why and when of managing safe disposal of surplus materials • Principle and procedure for managing safe disposal of surplus materials • Managing safe disposal of surplus materials • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	75	95
7.	Maintain Formation width	<u>Maintaining Formation width</u>: • Concept and importance of maintaining formation width • Why and when of maintaining formation width • Principle and procedure for maintaining formation width • Maintaining formation width • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	75	95
8.	Maintain camber/upper elevation (S.E.)	<u>Maintaining camber/upper elevation (S.E.):</u> • Concept and importance of	20	75	95

		maintaining camber/upper elevation (S.E.) • Why and when of maintaining camber/upper elevation (S.E.) • Principle and procedure for maintaining camber/upper elevation (S.E.) • Maintaining camber/upper elevation (S.E.) • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
9.	Maintain longitudinal slope/grade	Maintaining longitudinal slope/grade: • Concept and importance of maintaining longitudinal slope/grade • Why and when of maintaining longitudinal slope/grade • Principle and procedure for maintaining longitudinal slope/grade • Maintaining longitudinal slope/grade • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	75	95
10.	Maintain vertical curves	Maintaining vertical curves: • Concept and importance of maintaining vertical curves • Why and when of maintaining vertical curves • Principle and procedure for maintaining vertical curves • Maintaining vertical curves • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	75	95
11.	Maintain horizontal curves	Maintaining horizontal curves: • Concept and importance of	20	75	95

		maintaining horizontal curves • Why and when of maintaining horizontal curves • Principle and procedure for maintaining horizontal curves • Maintaining horizontal curves • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
12.	Maintain compaction density	<u>Maintaining compaction density</u>: • Concept and importance of maintaining compaction density • Why and when of maintaining compaction density • Principle and procedure for maintaining compaction density • Maintaining compaction density • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	75	95
	Sub-total(hours):		4	15	19
	Sub-module:2: Supervising gravel road construction				
	Description: It deals with the knowledge and skills related to the supervision of gravel road construction.				
	Objectives: • To control traffic • To maintain gravel sizing • To maintain compaction • To maintain thickness • To maintain edging				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		15 hrs. = 3 hrs,(Th,) + 12 hrs,(Pr,)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Control Traffic	<u>Controlling Traffic</u>: • Concept and importance of controlling traffic • Why and when of controlling traffic • Principle and procedure for controlling traffic • Controlling traffic	0.6	2.4	3

		• Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
2.	Maintain gravel sizing	Maintaining gravel sizing: • Concept and importance of maintaining gravel sizing • Why and when of maintaining gravel sizing • Principle and procedure for maintaining gravel sizing • Maintaining gravel sizing • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
3.	Maintain compaction	Maintaining compaction: • Concept and importance of maintaining compaction • Why and when of maintaining compaction • Principle and procedure for maintaining compaction • Maintaining compaction • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
4.	Maintain thickness	Maintaining thickness: • Concept and importance of maintaining thickness • Why and when of maintaining thickness • Principle and procedure for maintaining thickness • Maintaining thickness • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
5.	Maintain edging	Maintaining edging:	0.6	2.4	3

		• Concept and importance of maintaining edging • Why and when of maintaining edging • Principle and procedure for maintaining edging • Maintaining edging • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
	Sub-total:		3	12	15
	Sub-module:3: Supervising metalled road construction				
	Description: It deals with the knowledge and skills related to the supervision of metalled road construction.				
	Objectives: • To task statements • To maintain penetration macadam work. • To maintain ottaseal • To maintain asphalt concrete work • To maintain single surface treatment work • To maintain double surface treatment work • To maintain concrete pavement • To maintain sand seal • To maintain stone soling pavement				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		12 hrs. = 2 hrs,(Th,) + 10 hrs,(Pr,)	Time (Minutes)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Maintain penetration macadam work.	<u>Maintaining penetration macadam work</u>: • Concept and importance of maintaining penetration macadam work • Why and when of maintaining penetration macadam work • Principle and procedure for maintaining penetration macadam work • Maintaining penetration macadam work • Precautions to be taken while carrying out this task	15	75	90

		• Keeping records of the activities related to this task			
2.	Maintain ottaseal	Maintaining ottaseal: • Concept and importance of maintaining ottaseal • Why and when of maintaining ottaseal • Principle and procedure for maintaining ottaseal • Maintaining ottaseal • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	15	75	90
3.	Maintain asphalt concrete work	Maintaining asphalt concrete work: • Concept and importance of maintaining asphalt concrete work • Why and when of maintaining asphalt concrete work • Principle and procedure for maintaining asphalt concrete work • Maintaining asphalt concrete work • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	15	75	90
4.	Maintain single surface treatment work	Maintaining single surface treatment work: • Concept and importance of maintaining single surface treatment work • Why and when of maintaining single surface treatment work • Principle and procedure for maintaining single surface treatment work • Maintaining single surface treatment work • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	15	75	90

5.	Maintain double surface treatment work	Maintaining double surface treatment work: • Concept and importance of maintaining double surface treatment work • Why and when of maintaining double surface treatment work • Principle and procedure for maintaining double surface treatment work • Maintaining double surface treatment work • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	15	75	90
6.	Maintain concrete pavement	Maintaining concrete pavement: • Concept and importance of maintaining concrete pavement • Why and when of maintaining concrete pavement • Principle and procedure for maintaining concrete pavement • Maintaining concrete pavement • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	15	75	90
7.	Maintain sand seal	Maintaining sand seal: • Concept and importance of maintaining sand seal • Why and when of maintaining sand seal • Principle and procedure for maintaining sand seal • Maintaining sand seal • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	15	75	90
8.	Maintain stone soling pavement	Maintaining stone soling pavement:	15	75	90

		• Concept and importance of maintaining stone soling pavement • Why and when of maintaining stone soling pavement • Principle and procedure for maintaining stone soling pavement • Maintaining stone soling pavement • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
	Sub-total(hours):		2	10	12
	Module: 6: Supervising wall, drainage and drain				
	Description: It deals with the knowledge and skills related to the supervision of wall, drainage and drain construction necessary for supervising local roads.				
	Objectives: • To supervise wall construction • To supervise cross drainage construction • To supervise roadside drain construction				
	Sub-modules: 1. Supervising wall construction 2. Supervising cross drainage construction 3. Supervising roadside drain construction				
	Sub-module:1: Supervising wall construction				
	Description: It deals with the knowledge and skills related to the supervision of walls construction.				
	Objectives: • To layout walls • To maintain foundation excavation • To maintain soling work • To maintain foundation PCC/RCC work • To maintain construction joints • To maintain weep hole • To maintain filter materials • To maintain wall dimension • To maintain retaining walls • To maintain breast wall • To maintain toe wall • To maintain revetment wall • To maintain dry/masonry /composite walls • To maintain gabion wall/construction • To maintain gabion crate/box weaving				

	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		23 hrs. = 5 hrs,(Th,) + 18 hrs,(Pr,)	Time (minutes)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Layout walls	Laying out walls: • Concept and importance of laying out walls • Why and when of laying out walls • Principle and procedure for laying out walls • Laying out walls • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
2.	Maintain foundation excavation	Maintaining foundation excavation: • Concept and importance of maintaining foundation excavation • Why and when of maintaining foundation excavation • Principle and procedure for maintaining foundation excavation • Maintaining foundation excavation • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
3.	Maintain soling work	Maintaining soling work: • Concept and importance of maintaining soling work • Why and when of maintaining soling work • Principle and procedure for maintaining soling work • Maintaining soling work • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
4.	Maintain foundation PCC/RCC work	Maintaining foundation PCC/RCC work: • Concept and importance of	20	72	92

		maintaining foundation PCC/RCC work • Why and when of maintaining foundation PCC/RCC work • Principle and procedure for maintaining foundation PCC/RCC work • Maintaining foundation PCC/RCC work • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
5.	Maintain Construction joints	<u>Maintaining Construction joints</u>: • Concept and importance of maintaining construction joints • Why and when of maintaining construction joints • Principle and procedure for maintaining construction joints • Maintaining Construction joints • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
6.	Maintain weep hole	<u>Maintaining weep hole</u> : • Concept and importance of maintaining weep hole • Why and when of maintaining weep hole • Principle and procedure for maintaining weep hole • Maintaining weep hole • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
7.	Maintain filter materials	<u>Maintaining filter materials</u>: • Concept and importance of maintaining filter materials • Why and when of maintaining filter materials	20	72	92

		• Principle and procedure for maintaining filter materials • Maintaining filter materials • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
8.	Maintain wall dimension	Maintaining wall dimension : • Concept and importance of maintaining wall dimension • Why and when of maintaining wall dimension • Principle and procedure for maintaining wall dimension • Maintaining wall dimension • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
9.	Maintain retaining walls	Maintaining retaining walls: • Concept and importance of maintaining retaining walls • Why and when of maintaining retaining walls • Principle and procedure for maintaining retaining walls • Maintaining retaining walls • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
10.	Maintain breast wall	Maintaining breast wall: • Concept and importance of maintaining breast wall • Why and when of maintaining breast wall • Principle and procedure for maintaining breast wall • Maintaining breast wall • Precautions to be taken while carrying out this task	20	72	92

		• Keeping records of the activities related to this task			
11.	Maintain toe wall	Maintaining toe wall: • Concept and importance of maintaining toe wall • Why and when of maintaining toe wall • Principle and procedure for maintaining toe wall • Maintaining toe wall • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
12.	Maintain revetment wall	Maintaining revetment wall: • Concept and importance of maintaining revetment wall • Why and when of maintaining revetment wall • Principle and procedure for maintaining revetment wall • Maintaining revetment wall • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
13.	Maintain dry/masonry /composite walls	Maintaining dry/masonry /composite walls: • Concept and importance of maintaining dry/masonry /composite walls • Why and when of maintaining dry/masonry /composite walls • Principle and procedure for maintaining dry/masonry /composite walls • Maintaining dry/masonry /composite walls • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92

14.	Maintain gabion wall/construction	Maintaining gabion wall/construction: • Concept and importance of maintaining gabion wall/construction • Why and when of maintaining gabion wall/construction • Principle and procedure for maintaining gabion wall/construction • Maintaining gabion wall/construction • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
15.	Maintain gabion crate/box weaving	Maintaining gabion crate/box weaving: • Concept and importance of maintaining gabion crate/box weaving • Why and when of maintaining gabion crate/box weaving • Principle and procedure for maintaining gabion crate/box weaving • Maintaining gabion crate/box weaving • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	72	92
	Sub-total(hours):		5	18	23
	Sub-module:2: Supervising cross drainage construction				
	Description: It deals with the knowledge and skills related to the supervision of cross drainage construction necessary for supervising local roads.				
	Objectives: • To assist for layout • To maintain foundation excavation • To manage dewatering /diversion of water • To maintain line/level of formwork • To inspect staging • To maintain line level of sub-structure • To maintain line level of super-structure				

	• To maintain line/level of formwork • To maintain protection works				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		27 hrs. = 5 hrs,(Th,) + 22 hrs,(Pr,)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Assist for layout	<u>Assisting for layout</u>: • Concept and importance of layout • Why and when of layout • Principle and procedure for layout • Assisting for layout • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3.0
2.	Maintain foundation excavation	<u>Maintaining foundation excavation</u>: • Concept and importance of maintaining foundation excavation • Why and when of maintaining foundation excavation • Principle and procedure for maintaining foundation excavation • Maintaining foundation excavation Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3.0
3.	Manage dewatering /diversion of water	<u>Managing dewatering diversion of water</u>: • Concept and importance of managing dewatering and diversion of water • Why and when of managing dewatering and diversion of water • Principle and procedure for managing dewatering and diversion of water • Managing dewatering and diversion of water • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3.0

4.	Maintain line/level of formwork	Maintaining line/level of formwork: • Concept and importance of maintaining line/level of formwork • Why and when of maintaining line/level of formwork • Principle and procedure for maintaining line/level of formwork • Maintaining line/level of formwork • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3.0
5.	Inspect staging	Inspecting staging : • Concept and importance of inspecting staging • Why and when of inspecting staging • Principle and procedure for inspecting staging • Inspecting staging • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3.0
6.	Maintain line level of sub-structure	Maintaining line level of sub-structure: • Concept and importance of maintaining line level of sub-structure • Why and when of maintaining line level of sub-structure • Principle and procedure for maintaining line level of sub-structure • Maintaining line level of sub-structure • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.5	2.5	3.0
7.	Maintain line level of super-structure	Maintaining line level of super-structure: • Concept and importance of	0.5	2.5	3.0

		maintaining line level of super-structure • Why and when of maintaining line level of super-structure • Principle and procedure for maintaining line level of super-structure • Maintaining line level of super-structure • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
8.	Maintain line/level of formwork	<u>Maintaining line/level of formwork</u>: • Concept and importance of maintaining line/level of formwork • Why and when of maintaining line/level of formwork • Principle and procedure for maintaining line/level of formwork • Maintaining line/level of formwork • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.5	2.5	3.0
9.	Maintain protection works	<u>Maintaining protection works</u>: • Concept and importance of maintaining protection works • Why and when of maintaining protection works • Principle and procedure for maintaining protection works • Maintaining protection works • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.5	2.5	3.0
	Sub-total:		5	22	27
	Sub-module:3: Supervising roadside drain construction				
	Description: It deals with the knowledge and skills related to the supervision of roadside drain construction necessary for supervising local roads.				
	Objectives:				

	• To layout for roadside drain • To assure/monitor quality of concrete work • To maintain dimension of masonry work • To maintain dimensions/slopes • To supervise plastering • To supervise curving • To maintain surface/sub-surface drainage				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		21 hrs. = 4 hrs,(Th,) + 17 hrs,(Pr,)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Layout for roadside drain	Laying out for roadside drain:	0.5	2.4	2.9
2.	Assure/monitor quality of concrete work	<u>Assuring/monitoring quality of concrete work</u>: • Concept and importance of assuring/monitoring quality of concrete work • Why and when of assuring/monitoring quality of concrete work • Principle and procedure for assuring/monitoring quality of concrete work • Assuring/monitoring quality of concrete work • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.5	2.4	2.9
3.	Maintain dimension of masonry work	<u>Maintaining dimension of masonry work</u>: • Concept and importance of maintaining dimension of masonry work • Why and when of maintaining dimension of masonry work • Principle and procedure for maintaining dimension of masonry work • Maintaining dimension of masonry work • Precautions to be taken while carrying out this task • Keeping records of the activities	0.6	2.4	3.0

		related to this task			
4.	Maintain dimensions/slopes	Maintaining dimensions/slopes: • Concept and importance of maintaining dimensions/slopes • Why and when of maintaining dimensions/slopes • Principle and procedure for maintaining dimensions/slopes • Maintaining dimensions/slopes • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3.0
5.	Supervise plastering	Supervising plastering: • Concept and importance of supervising plastering • Why and when of supervising plastering • Principle and procedure for supervising plastering • Supervising plastering • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3.0
6.	Supervise curving	Supervising curving: • Concept and importance of supervising curving • Why and when of supervising curving • Principle and procedure for supervising curving • Supervising curving • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.5	3.1
7.	Maintain surface/sub-surface drainage	Maintaining surface/sub-surface drainage: • Concept and importance of maintaining surface/sub-surface	0.6	2.5	3.1

		drainage • Why and when of maintaining surface/sub-surface drainage • Principle and procedure for maintaining surface/sub-surface drainage • Maintaining surface/sub-surface drainage • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
	Sub-total:		4	17	21
	Module: 7: Supervising bio-engineering works				
	Description: It deals with the knowledge and skills related to the supervision of bio-engineering works.				
	Objectives: • To supervise preparation of live stakes grass slips • To perform layout • To supervise plantation work • To supervise caring of plants • To protect plants				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		10 hrs. = 2 hrs.(Th,) + 8 hrs.(Pr,)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Supervise preparation of live stakes grass slips	<u>Supervising preparation of live stakes grass slips</u>: • Concept and importance of supervising preparation of live stakes grass slips • Why and when of supervising preparation of live stakes grass slips • Principle and procedure for supervising preparation of live stakes grass slips • Supervising preparation of live stakes grass slips • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.4	1.6	2
2.	Perform layout	<u>Performing layout</u>:	0.4	1.6	2

		• Concept and importance of layout • Why and when of layout • Principle and procedure for layout • Performing layout • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
3.	Supervise plantation work	Supervising plantation work: • Concept and importance of supervising plantation work • Why and when of supervising plantation work • Principle and procedure for supervising plantation work • Supervising plantation work • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.4	1.6	2
4.	Supervise caring of plants	Supervising caring of plants: • Concept and importance of caring of plants • Why and when of caring of plants • Principle and procedure for caring of plants • Supervising caring of plants • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.4	1.6	2
5.	Protect plants	Protecting plants: • Concept and importance of protecting plants • Why and when of protecting plants • Principle and procedure for protecting plants • Protecting plants • Precautions to be taken while carrying out this task • Keeping records of the activities	0.4	1.6	2

		related to this task			
	Sub-total:		2	8	10
	Module: 8: Road maintenance works				
	Description: It deals with the knowledge and skills related to road maintenance works necessary for supervising local roads.				
	Objectives: • To supervise routine maintenance • To supervise recurrent maintenance • To supervise periodic maintenance • To supervise emergency maintenance • To supervise rehabilitation maintenance				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		15 hrs. = 3 hrs.(Th,) + 12 hrs.(Pr,)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Supervise routine maintenance	<u>Supervising routine maintenance</u>: • Concept and importance of routine maintenance • Why and when of routine maintenance • Principle and procedure for routine maintenance • Supervising routine maintenance • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
2.	Supervise recurrent maintenance	<u>Supervising recurrent maintenance</u>: • Concept and importance of recurrent maintenance • Why and when of recurrent maintenance • Principle and procedure for recurrent maintenance • Supervising recurrent maintenance • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
3.	Supervise periodic maintenance	<u>Supervising periodic maintenance</u>: • Concept and importance of periodic maintenance	0.6	2.4	3

		• Why and when of periodic maintenance • Principle and procedure for periodic maintenance • Supervising periodic maintenance • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
4.	Supervise emergency maintenance	<u>Supervising emergency maintenance</u>: • Concept and importance of emergency maintenance • Why and when of emergency maintenance • Principle and procedure for emergency maintenance • Supervising emergency maintenance • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
5.	Supervise rehabilitation maintenance	<u>Supervising rehabilitation maintenance</u>: • Concept and importance of rehabilitation maintenance • Why and when of rehabilitation maintenance • Principle and procedure for rehabilitation maintenance • Supervising rehabilitation maintenance • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.6	2.4	3
	Sub-total:		3	12	15

	Module: 9 : Plumbing	

Task Analysis

Total Hour : 3 hrs
Theory: 0.5 hrs
Practical: 2.5 hrs

Task 1: Install Solar water heater.

Steps	Terminal performance objective	Related Technical knowledge
1. Select a place for the installation of solar water heater 2. Collect necessary items and equipment for the installation 3. Orient and install the solar panel towards south 4. Fit hot water tank backside of solar panel 5. Put in the cold-water supply pipe into the hot water tank with necessary valve. 6. Connect the cold-water pipe from the hot water tank to the solar panel. 7. Connect the hot water pipe from the solar panel to the hot water tank. 8. Check the leakage by placing water in the solar water heater. 9. Check for hot water from solar water heater. 10. Clean around solar water heater.	**Given:** Necessary equipment for work , working site and required maps. **Task:** Install solar water heater **Standard:** • Implemented according to the map. • Adopted safety while working.	• Work-site map reading skills. • Information about solar water heater. • Information on pipe line connection. • Knowledge on connecting different valves. • Safety and Security.

Tools, Equipment and Materials:

- Solar water heater, Measuring tape, Insulation Materials, Pipe wrench, Adjustable wrench, Saw file, Hand Saw for metal, Die set, Oil can, Vice and necessary work items.

Safety and Precautions

- Selection of Safe place
- Exercise safety rules while installation.

Task Analysis

Total Hour : 3 hrs
Theory: 0.5 hrs
Practical: 2.5 hrs

Task 2: Install the Electric Geyser

Steps	Terminal performance objective	Related Technical knowledge
1. Select a place to connect the electric geyser. 2. Collect necessary tools and fittings. Mark a point where the geyser is to be fitted. 3. Drill holes as needed. 4. Place the grip on the perforated areas. (hole area) 5. Level the electric geyser and tighten it with screws. 6. Prepare pipe and fitting as required for the installation. 7. Connect the required valves in the cold pipeline. 8. Check if there is any leakage when water is supplied to the electric geyser. 9. Connect the line for electric supply. 10. Set the temperature as required in the electric geyser 11. Check if the water is hot. 12. Clean around Electric Geyser.	**Given:** Necessary equipment and tools for work , working site and required maps. **Task:** Connect Electric Geyser **Standard:** • Implemented according to the map. • Adopted safety while working.	• Information on Geyser Connection map . • Information about Electric Geyser. • Information on hot/cold pipe line connection. • Knowledge on connecting different valves. • Safety and Security.

Tools, Equipment and Materials:

- Electric geyser, Stop valve, Measuring tape, Marker, Burma, weed, Pipe wrench, Adjustable wrench, Die set, Oil can, Vice and necessary work items.

Safety and Precautions

- Selection of Safe place
- Exercise safety rules while installation.

Task Analysis

Total Hour : 3 hrs
Theory: 0.5 hrs
Practical: 2.5 hrs

Task 3: Install the Gas Geyser

Steps	Terminal performance objective	Related Technical knowledge
1. Select a place to connect the gas geyser. 2. Mark a point where the gas geyser is to be fitted. 3. Drill holes as needed. 4. Place the grip on the perforated areas. (hole area) 5. Level the gas geyser and tighten it with screws. 6. Connect the cold water pipeline to the gas geyser. Install Gas geyser telephone shower. 7. Connect gas pipeline to Gas geyser. 8. Put batteries in Gas geyser. 9. Check if there is any leakage in geyser. 10. Turn on the gas geyser to see of the water is hot or not. 11. Clean around Gas Geyser.	**Given:** Necessary equipment and tools for work , working site and required maps. **Task:** Connect Gas Geyser **Standard:** • Implemented according to the map. • No gas leakage • Water is hot • Adopted safety while working.	• Information on Gas Geyser Connection map . • Information about Gas Geyser. • Information on hot/cold and gas pipe line connection. • Knowledge on connecting different valves. • Safety and Security.

Tools, Equipment and Materials:

- Gas geyser, Gas cylinder, Regulator, Gas pipe, Connection pipe, Clamp, Batteries, Grip, Drill bit, Screw Driver, Measuring tape, Marker, Burma, weed, Pipe wrench, Adjustable wrench, Pipe cutter and necessary work items.

Safety and Precautions

- Selection of Safe place
- Exercise safety rules while installation.

Assignments

Perform the following assignments:
Connect water heating equipment.

- Gas geyser installation
- Electric geyser installation
- Solar water heater installation

Connect water heating equipment as required.

Task Analysis

Total Hour : 3 hrs
Theory: 0.5 hrs
Practical: 2.5 hrs

Task 4: Install Bathtub.

Steps	Terminal performance objective	Related Technical knowledge
1. Mark the correct height or mark at the height of 550 mm from the finishing level to connect the bathtub. 2. Connect the waste pipe in place of waste coupling and over flow of the bathtub and connect it to the exhaust pipe. 3. Lay bricks on the ground surface according to height. 4. Make the wall according to the height of the two walls of the bathtub. 5. Level the bathtub. 6. Connect the tap between the bathtub and waste water pipe. 7. Fill the gap between the bathtub and floor with the coarse sand properly. 8. Apply wall on the other two sides. 9. Check the leakage of water in the bathtub by putting water in it. 10. Clean around the bathtub 11. Note: The bathtub should have two side walls when connecting it.	**Given:** • Workplace or location • Site • Tools and Equipment • Materials • Maps • Notes **Task:** Install Bathtub **Standard:** • Bathtub connected according to the drawing. • No leakage • Well leveled bathtub • Adopted safety while working.	• Knowledge on height of bathtub. • Must have information regarding bathtub. • Must be able to use spirit level to level the bathtub. • Must have knowledge of measurement • Must have knowledge of Mason. • Safety and Security should be exercised.

Tools, Equipment and Materials:
Bathtub, waste coupling, waste pipe, brick, sand, cement, fine sand, spirit level, plumb bob, hammer, chisel, measuring tape and other necessary work items.

Safety and Precautions

- Use of gloves
- Exercise safety rules while installation.

Task Analysis

Total Hour: 3 hrs
Theory: 0.5 hrs
Practical: 2.5 hrs

Task 5: Install Kitchen Sink.

	Steps	Terminal performance objective	Related Technical knowledge
1 2 3 4 5 6 7	Mark and sign the correct height (900 mm) as per drawing for connection of kitchen sink. Apply wall according to marked sign. Connect and level the kitchen sink to the slab which is above the wall. Connect the waste coupling to the sink. Connect the bottle trape/ waste pipe to waste coupling of the kitchen sink and connect it to the point of exit. Check the leakage in the sink by pouring some water. Clean around kitchen sink.	**Given:** • Workplace or location • Site • Tools and Equipment • Materials • Maps • Notes **Task:** Install kitchen sink **Standard:** • Kitchen sink is connected according to the drawing. • No leakage • Adopted safety while working.	• Must know about the working maps. • Must have knowledge of kitchen sink size and height. • Must have knowledge of measurement • Must have knowledge of marking tools. • Safety and Security should be exercised.

Tools, Equipment and Materials:
Kitchen sink, measuring tape, marker, sprit level, white cement, screw driver, hammer, chiseal, adjustable wrench, monkey plaier and other necessary working items.

Safety and Precautions

- Use of gloves
- Exercise safety rules while installation.

Task Analysis

Total Hour: 3 hrs
Theory: 0.5 hrs
Practical: 2.5 hrs

Task 6: Install Commode

	Steps	Terminal performance objective	Related Technical knowledge
1	Level the commode to the waste point and mark the hole to connect the commode according to the drawing.	**Given:** • Workplace or location • Site • Tools and Equipment • Materials • Maps • Notes **Task:** Install Commode **Standard:** • Commode is connected according to the drawing. • Commode should be fixed without moving. • Adopted safety while working.	• Must know about the working maps. • Must have knowledge of commode size and height. • Must have knowledge of measurement • Must have knowledge of marking tools. • Safety and Security should be exercised.
2	Remove the commode from the place and make a hole according to the required size in the marked place.		
3	Insert the grip on the perforated area.		
4	Connect the commode with the collar drain at the waste point.		
5	Screw on both side of commode.		
6	Seal all around on the floor touched by the commode.		
7	Connect a cistern or flash valve to flush the commode		
8	Connect cistern or flash valve's flash pipe to commode		
9	Connect seat cover to the commode		
10	Connect supply pipe to cistern or flash valce		
11	Check the commode by supplying water.		
12	Clean around the commode.		

Tools, Equipment and Materials:
Commode, measuring tape, marker, sprit level, grip, screw, connection pipe, angle valve, white cement, screw driver, drill machine, concrete drill bit, hammer, chiseal, adjustable wrench, monkey plaier and other necessary working items.

Safety and Precautions

- Use of safety glasses while drilling.
- Caution while dealing with electric lines.
- Use of safety gloves
- Exercise safety rules while installation.

Task Analysis

Total Hour: 3 hrs
Theory: 0.5 hrs
Practical: 2.5 hrs

Task 7: Install wash basin

Steps	Terminal performance objective	Related Technical knowledge
After connecting the drinking water and drainage pipe required for the wash basin, install basin at the correct height of about 850mm from the finishing floor as per the drawing. 1 Adjust the level to fit the basin bracket and make a hole in the wall according to the size. (Make hole size as required). 2 Insert the grip on the perforated area and fasten the basin bracket to the wall with the help of screw. 3 Connect necessary waste coupling, basin mixture or pillar cock to the wash basin. 4 Place the basin on the bracket and level it. 5 Connect the bottle trap to the basin connecting the waste pipe. 6 Send water to basin to check for leakage. 7 Apply white cement on the wall touched by the basin 8 Clean around the basin.	**Given:** • Workplace or location • Site • Tools and Equipment • Materials • Maps • Notes **Task:** Install wash basin **Standard:** • Basin is connected according to the drawing. • Basin should be fixed without moving. • Adopted safety while working.	• Must know about the working maps. • Must have knowledge to operate drill machine. • Must have knowledge of basin size and height. • Must have knowledge of measurement • Must have knowledge of marking tools. • Safety and Security should be exercised.

Tools, Equipment and Materials:
Wash basin, basin mixture/pillor cock, basin braket,grip, screw, hammer, center punch, measuring tape, marker, sprit level, grip, screw, white cement, screw driver, drill machine, concrete drill bit, chiseal, and other necessary working items.

Safety and Precautions

- Use of safety glasses while drilling.
- Caution while dealing with electric lines.
- Use of safety gloves
- Exercise safety rules while installation.

Task Analysis

Total Hour: 3 hrs
Theory: 0.5 hrs
Practical: 2.5 hrs

Task 8: Repair the Gas Geyser

Steps	Terminal performance objective	Related Technical knowledge
9 Observe and study the site. 10 Identify the problem. 11 Collect necessary tools and materials. 12 Check the inlet and outlet. 13 Check or replace the battery. 14 Clean the gas nozzle and regulator. 15 Check for electric fire or if necessary replace. 16 Replace if gas is exhausted. 17 Check for leakage by supplying water. 18 Check the hot water. 19 Keep records of maintenance work. 20 Clean all tools and equipment and keep in the relevant places. 21 Clean the work area.	**Given:** • Workplace or location • Site • Tools and Equipment • Materials • Maps • Notes **Task:** Repair Gas Geyser **Standard:** • No water leakage. • The water is hot. • Geyser in good and correct position.	• Information on gas geyser problems.

Tools, Equipment and Materials:
Screw driver, Wrench, hammer, chisel, measuring tape, pipe wrench,monkey plaier, allen key, gas geyserr and other necessary working items.

Safety and Precautions

- Check if water pressure is low / high.
- Check the leakage of gas to prevent from fire.
- Check the regulator.
- Use safety boots
- Use of safety gloves

Task Analysis

Total Hour: 3 hrs
Theory: 0.5 hrs
Practical: 2.5 hrs

Task 9: Repair and Maintain Solar Water heater

Steps	Terminal performance objective	Related Technical knowledge
1 Observe and study the site. 2 Identify the problem. 3 Collect necessary tools and materials. 4 Clean collector panel set and apply black paint. 5 Back wash the collector and boiler. 6 Clean the glass with surf water. 7 Lay glass with U-Rubber. 8 Check the air. 9 Circulate the water. 10 Check for leakages. 11 Keep recods of maintenance work. 12 Clean all tools and equipment and place them in the relevant places. 13 Clean the work area.	**Given:** • Workplace or location • Site • Tools and Equipment • Materials • Maps • Notes **Task:** Repair and Maintain Solar Water heater **Standard:** • No water leakage. • The water is hot. • Heater in good and correct position.	• Information on gas geyser problems. • Problem solving techniques.

Tools, Equipment and Materials:
Screw driver, Wrench, hammer, chisel, measuring tape, pipe wrench, monkey plaier, allen key, solar water heater and other necessary working items.

Safety and Precautions

- Can be burnt by hot water
- Can be cut by glass edges.
- Use safety boots
- Use of safety gloves

Task Analysis

Total Hour: 3 hrs
Theory: 0.5 hrs
Practical: 2.5 hrs

Task 10: Repair and Maintain the Pump

	Steps	Terminal performance objective	Related Technical knowledge
1	Observe and study the site.	**Given:** • Workplace or location • Site • Tools and Equipment • Materials • Maps • Notes **Task:** Repair the pump **Standard:** • No air and water leakage in the pipeline. • The water is drawn by the pump.	• Information on pump problems. • Knowledge on pump inspection method. • Problem solving techniques. • Knowledge on simple electric line inspection method.
2	Identify the problem.		
3	Collect necessary tools and materials.		
4	Disconnect the pipe line from the pump and open it.		
5	Repair or replace the general problems of pump (non-return valve, air leakage, water seal, electric problems)		
6	Install a new pump following the pump connection procedures if the pump does not work properly.		
7	Turn on pump to check it.		
8	Check for the leakage in the pipeline.		
9	Keep s of maintenance work		
10	Clean all the tools and equipment and keep them in relevant place.		
11	Clean the work area.		

Tools, Equipment and Materials:
Screw driver, Wrench, hammer, chisel, measuring tape, pipe wrench, monkey plaier, Allen key, pump and other necessary working items.

Safety and Precautions

- Protect the pump from water.
- Be careful while using electric lines.
- The suction pipe should not be touched on ground

	Module: 10: Welding	

Total Time: 3.6 hrs
Theory: 0.6 hrs.
Practical: 3 hrs.

1. Strike/maintain the arc.

Performance Steps	Terminal Performance Objective	Related Technical Knowledge
1. Check and plug in the electrical cable connections. 2. Set up electrode Holder and Earth clamp. 3. Change the electrode holder if the handle is broken. 4. Dry electrodes in Oven if damped. 5. Clear off the Welding table from unwanted metal pieces and welding spots. 6. Clean or change the glass of welding helmet as its necessary. 7. Keep the Welding tools close to the working place. 8. Set a welding current on the machine (amp). 9. Wear the safety apparel as provided and check the filter lens of the welding shield. 10. Fit grinding disc on hand grinder.	Condition (Given): Fully equipped workshop with Arc welding transformer, welding accessories and different electrodes. Tasks (What): Prepare AC, arc welding machine Tools & Equipment Standards (How well): Welding machine, tools and equipment's operated The AC machine and their working principle distinguished Welding tools and equipment's handled safely.	➢ Introduction of welding ➢ Welding machines • Single/three phase ➢ Welding accessories ➢ Tools and equipment used in welding's ➢ Safety precautions

Tools Equipment's:

AC Arc welding transformer, DC Arc welding rectifier, Industrial plugs, Electrode holder, Earth clamp, Different size electrodes, Dry oven. Hand grinder

Safety Precautions:

- Avoid using electrode holder with broken handle.
- Always use Chipping hammer and Wire brush to clean and to remove slags.
- Always check the connection of Holder, Shield, and Grips.
- Avoid using damp electrodes.
- While removing the slag wear safety goggles and chip off in opposite direction.
- Keep away the inflammable material.
- Always place the holder on hanger after welding.
- Keep the workplace dry.
- Use screens to protect bystanders.
- Use safety goggles while grinding

Total Time: 3.6 hrs.
Theory: 0.6 hrs.
Practical: 3 hrs.

2. Strike/maintain the arc.

Performance Steps	Terminal Performance Objective	Related Technical Knowledge
1. Obtain instruction and material. 2. Clean the metal surface with a wire brush and wipe off the oil and greases. 3. Mark the job according to the instruction. 4. Set the work-piece on the welding table in a flat position. 5. Set the arc welding transformer. 6. Select and insert electrode into the holder. 7. Set a welding current on a machine (amp). 8. Wear the safety apparel as provided and check the filter lens of the welding shield. 9. Strike the arc on the marked spots and observe the current setting. 10. Reset the current if necessary. 11. Remove the slag from the weld bead. 12. Practice the task as much as you are confident in developing an arc freely, without sticking and where desired 13. Clean tools,equipments, workpieces and the Working area.	Condition (Given): Fully equipped workshop with Arc welding transformer, welding accessories and different electrodes. Tasks (What): Strike / maintain the arc. Standards (How well): The distance of electrode developing plasma arc maintained.	➢ Arc welding machines ➢ Welding arc ➢ Welding current ➢ Striking method ➢ Striking procedure ➢ Safety precautions

Tools Equipment's:

Arc welding machines, Welding accessories, Different size electrodes, Safety equipment's and work piece material.

Safety Precautions:

- Avoid using electrode holder with broken handle and un-insulated wire
- Always use Chipping hammer and Wire brush to clean and to remove slags.
- Always check the connection of Holder, Shield, and Grips.
- Avoid using damp electrodes and floor.
- While removing the slag wear safety goggles and chip off in opposite direction.
- Keep away the inflammable material.
- Always place the holder on hanger after welding.
- Keep the workplace dry.
- . Use screens to protect bystanders.

Total Time: 3.6 hrs.
Theory: 0.6 hrs.
Practical: 3 hrs.

3, Perform Straight bead in flat position.

Performance Steps	Terminal Performance Objective	Related Technical Knowledge
1. Obtain instruction and material. 2. Obtain safety equipment's. 3. Collect welding accessories. 4. Clean the metal surface with a wire brush and wipe off the oil and grease. 5. Mark the job by chalk as the instruction. 6. Set the work-piece on the welding table as instruction in a flat position. 7. Select and insert electrode into the holder. 8. Set a welding current on the machine (amp). 9. Wear the complete safety apparel and check the filter lens of the welding shield. 10. Generate an arc at about 10 to 15 mm ahead of the starting point and return to the point. 11. Move the electrode in a wave motion as instruction to straight line holding 70-80 degrees against the welding direction and complete the bead at the other end of the plate. 12. Maintain correct: angle of the electrode, arc length, wave motion & travel speed. 13. Remove the slag from the weld bead. 14. Repeat the exercise till you achieve good result. 15. Clean tools, equipment's, workpieces and the working area.	Condition (Given): Fully equipped workshop with Arc welding transformer, welding accessories and different electrodes. Tasks (What): Perform straight bead in flat position. Standards (How well): Uniform bead wave, width and reinforcement.	➢ Formation and arc weaving method ➢ Types of welding ➢ Safety precautions ➢ Weld bead ed position procedure.

Tools Equipment's:

Arc welding machines, Welding accessories, Different electrodes and Safety equipment's and work piece material.

Safety Precautions:

- Avoid using electrode holder with broken handle and un-insulated wire.
- Always use Chipping hammer and Wire brush to clean and to remove slags.
- Always check the connection of Holder, Shield, and Grips.
- Avoid using damp electrodes.
- While removing the slag wear safety goggles and chip off in opposite direction.
- Keep away the inflammable material.
- Always place the holder on hanger after welding.
- Keep the workplace dry.
- Use screens to protect bystanders.

Total Time: 3.6 hrs.
Theory: 0.6 hrs.
Practical: 3 hrs.

4, Grind off welding surfaces.

Performance Steps	Terminal Performance Objective	Related Technical Knowledge
1. Obtain instruction. 2. Obtain pre-welded workpiece material. 3. Obtain accessories and tools required. 4. Set the workpiece. 5. Wear safety equipment's. 6. Connect electrical line to machine. 7. Turn on the machine for a while to observe initial torque. 8. Hold workpiece into vice. 9. Start grinding from end of the beads. 10. Make clear surface grinding all welding spots. 11. Grind 45 degree on all surface corners. 12. Check the angle and even surface. 13. Grind to confirm even surface.	Condition : Fully equipped workshop with Arc welding transformer, welding accessories and different electrodes. Task : Grind off welding surfaces. Standards: The V- edges prepared for groove weld. Burrs chamfered The welding beads grinded to prepare re weld.	➢ Introduction of grinding ➢ Handling of Hand grinder ➢ Method of wheel exchange ➢ Grinding procedure ➢ Safety precautions

Tools Equipment's:

Black smithy vice, Hand grinder, Work piece material and Safety equipment's,

Safety Precautions:

- Do not touch on running grinding wheel.
- Do not try to stop the wheel by hand even after turning off the power.
- Avoid using loose electrical connection.
- Wear safety goggles and safety gloves.
- Keep away the inflammable material.
- Always place the guard to safe for other person.
- Keep the workplace dry.
- Hold or clamp the workpiece much as possible.

Total Time: 3.6 hrs.
Theory: 0.6 hrs.
Practical: 3 hrs.

5, Weld Fillet Lap Joint in flat position.

Performance Steps	Terminal Performance Objective	Related Technical Knowledge
1. Refer steps 1 to 4 of Straight bead welding 2. Mark the job to overlap the 2nd work piece by marking scriber with scale as per drawing. 3. Set the work-piece on the welding table aligning the top piece. 4. Hold the electrode, pointing at the corner of the joint at an angle of 45° to the plate surface. 5. Refer steps 6 to the end of Fillet T-joint welding. 6. Repeat the same exercise till you achieve good weld.	Condition (Given): Fully equipped workshop with Arc welding transformer, welding accessories and different electrodes. Tasks (What): Weld Fillet Lap Joint in flat position Standards (How well): The work aligned to weld lap joint. The advantage of joining lap joint in fabrication industries understood.	➢ Selection of electrodes and third metals ➢ Welding procedure ➢ Safety precautions

Tools Equipment's:

Arc welding machines, Welding accessories, Different electrodes Hand grinder, Safety equipment's and work piece material.

Safety Precautions:

- Avoid using electrode holder with broken handle and un-insulated wire.
- Always use Chipping hammer and Wire brush to clean and to remove slags.
- Always check the connection of Holder, Shield, and Grips.
- Avoid using damp electrodes.
- While removing the slag wear safety goggles and chip off in opposite direction.
- Keep away the inflammable material.
- Always place the holder on hanger after welding.
- Keep the workplace dry.
- Use screens to protector bystanders.

Total Time: 3.6 hrs.
Theory: 0.6 hrs.
Practical: 3 hrs.

6, Weld Fillet Tee Joint in flat position.

Performance Steps	Terminal Performance Objective	Related Technical Knowledge
1. Refer steps 1 to 4 of Straight bead welding. 2. Set the pieces in alignment, forming a 90° "T" on the welding table. 3. Weld tacks on the workpieces at both ends and in the center if necessary. 4. Clean tacks, check the alignment and reset the job if necessary. 5. Set the base material horizontally on the welding table (tack side down) 6. Deposit the first bead along the joint line with a correct and uniform travel speed. 7. Clean the other side of the joint and grind the tacks flush if necessary. 8. Set the joint in a flat position (weld side down) 9. Make a second weld along the joint line with the same setting and technique as used for the first bead. 10. Clean the weld thoroughly. 11. Repeat the same exercise until you can produce good welds.	Condition (Given): Fully equipped workshop with Arc welding transformer, welding accessories and different electrodes. Tasks (What): Weld Fillet Tee Joint in flat position. Standards (How well): Fillet welding performed. Two material in different angle positioned and joined. Unwanted welding distortions omitted.	➢ Welding tests and certification ➢ Welding procedure ➢ Safety precautions

Tools Equipment's:

Arc welding machines, Welding accessories, Different electrodes Hand grinder, Safety equipment's and work piece material.

Safety Precautions:

- Avoid using electrode holder with broken handle and un-insulated wire.
- Always use Chipping hammer and Wire brush to clean and to remove slags.
- Always check the connection of Holder, Shield, and Grips.
- Avoid using damp electrodes.
- While removing the slag wear safety goggles and chip off in opposite direction.
- Keep away the inflammable material.
- Always place the holder on hanger after welding.
- Keep the workplace dry.
- Use screens to protect bystanders.

Total Time: 3.6 hrs.
Theory: 0.6 hrs.
Practical : 3 hrs.

7, Weld Fillet Corner Joint in flat position.

Performance Steps	Terminal Performance Objective	Related Technical Knowledge
1. Refer step 1 to 4 of Straight bead welding. 2. Set up the work piece on the welding table ensuring the angle required. 3. Refer step 5 to end of Fillet Tee joint welding.	Condition (Given): Fully equipped workshop with Arc welding transformer, welding accessories and different electrodes. Tasks (What): Weld fillet corner joint in flat position. Standards (How well): The work aligned to weld corner joint. The advantage of joining corner joint in fabrication industries understood. ..	➢ Welding defects and their remedies ➢ Welding procedure ➢ Safety precautions

Tools Equipment's:

Arc welding machines, Welding accessories, Different electrodes Hand grinder, Safety equipment's and work piece material.

Safety Precautions:

- Avoid using electrode holder with broken handle and un-insulated wire.
- Always use Chipping hammer and Wire brush to clean and to remove slags.
- Always check the connection of Holder, Shield, and Grips.
- Avoid using damp electrodes.
- While removing the slag wear safety goggles and chip off in opposite direction.
- Keep away the inflammable material.
- Always place the holder on hanger after welding.
- Keep the workplace dry.
- Use screens to protect bystanders.

Total Time: 3.6 hrs.
Theory: 0.6 hrs.
Practical: 3 hrs.

8, Weld Square butt joint in flat position.

Performance Steps	Terminal Performance Objective	Related Technical Knowledge
1. Refer steps 1 to 4 of Straight bead. 2. Set the workpieces on the welding table as butt joint with gap alignment as per drawing. 3. Refer steps 7 to 10 of straight bead welding. 4. Tack weld on back side of both ends and also on center if necessary. 5. Check the alignment and reset if necessary. 6. Turn the work-piece tack side down. 7. Strike an arc on the tack welding and deposit the first bead along the joint line. 8. Chip off the slag from the bead and brushed out to clean 9. Clean the back side and grind the tacks flush. 10. Deposit the second bead using same setting. 11. Chip off the slag from the bead and brushed out to clean. 12. Practice the same exercise until you can produce a good result.	Condition (Given): Fully equipped workshop with Arc welding transformer, welding accessories and different electrodes. Tasks (What): Weld Square butt joint in flat position Standards (How well): Two materials performing root gap joined. Developing the penetration.	➢ Welding joints and symbols ➢ Welding procedure ➢ Safety precautions

Tools Equipment's:

Arc welding machines, Welding accessories, and Different electrodes, Hand grinder, Safety equipment's and work piece material.

Safety Precautions:

- Avoid using electrode holder with broken handle and un-insulated wire.
- Always use Chipping hammer and Wire brush to clean and to remove slags.
- Always check the connection of Holder, Shield, and Grips.
- Avoid using damp electrodes.
- While removing the slag wear safety goggles and chip off in opposite direction.
- Keep away the inflammable material.
- Always place the holder on hanger after welding.
- Keep the workplace dry.
- Use screens to protector bystanders.

Total Time: 3.6 hrs.
Theory: 0.6 hrs.
Practical: 3 hrs.

9, Weld single V- butt Joint in flat position (single / multi run).

Performance Steps	Terminal Performance Objective	Related Technical Knowledge
1. Obtain instruction and drawing. 2. Obtain tack welded material 3. Set the arc welding machine 4. Select and insert the electrode into the holder. 5. Set the current 6. Bend the joint outwards slightly (1° to 2°) from bead to ensure straightness after continues depositing. 7. Set the work-piece on the table. 8. Deposit the root gap along the joint line producing keyhole welding. 9. Chip off the slag from the bead and brushed out to clean. 10. Deposit second bead on the root gap bead line connecting with faces of angles side by side. 11. Deposit as much as required layer to filled in similar way. 12. Repeat the exercise till you achieve good result.	Condition (Given): Fully equipped workshop with Arc welding transformer, welding accessories and different electrodes. Tasks (What): Weld "V" butt joint in flat position. Standards (How well): Bevel-edge prepared. Two material performing root gap joined. The penetration developed.	➢ Welding position ➢ Welding wave ➢ Welding procedure ➢ Safety precautions

Tools Equipment's:

Arc welding machines, Welding accessories, Different electrodes Hand grinder, Safety equipment's and work piece material.

Safety Precautions:

- Avoid using electrode holder with broken handle and un-insulated wire.
- Always use Chipping hammer and Wire brush to clean and to remove slags.
- Always check the connection of Holder, Shield, and Grips.
- Avoid using damp electrodes.
- While removing the slag wear safety goggles and chip off in opposite direction.
- Keep away the inflammable material.
- Always place the holder on hanger after welding.
- Keep the workplace dry.
- Use screens to protect bystanders.

Total Time: 3.6 hrs.
Theory: 0.6 hrs.
Practical: 3 hrs.

10, Weld double bevel joint in flat position.

Performance Steps	Terminal Performance Objective	Related Technical Knowledge
1. Obtain instruction and drawing. 2. Prepare a material following the steps of Perform tack weld for V-butt joint. 3. Weld V-butt joint in flat position following previous task. 2. Grind off the over penetrated welding beads. 3. Refer steps 7 to 12 of weld V- butt joint welding.	Condition (Given): Fully equipped workshop with Arc welding transformer, welding accessories and different electrodes. Tasks (What): Weld double bevel groove joint in flat position. Standards (How well): Bevel-edge prepared Two material performing root gap joined The penetration developed.	➢ Term penetration, leg, Undercuts, Overlaps etc. ➢ Welding procedure ➢ Safety precautions

Tools Equipment's:

Arc welding machines, Welding accessories, Different electrodes Hand grinder, Safety equipment's and work piece material.

Safety Precautions:

- Avoid using electrode holder with broken handle and un-insulated wire.
- Always use Chipping hammer and Wire brush to clean and to remove slags.
- Always check the connection of Holder, Shield, and Grips.
- Avoid using damp electrodes.
- While removing the slag wear safety goggles and chip off in opposite direction.
- Keep away the inflammable material.
- Always place the holder on hanger after welding.
- Keep the workplace dry.
- Use screens to protect bystanders.

	Module: 11: Management				
	Description: It deals with the knowledge and skills related to managing construction works, managing health/environment, communicating with others, maintaining records, growing professionally, and developing entrepreneurial skills necessary for supervising local roads.				
	Objectives: • To manage construction works • To manage health/environment				
	• To communicate with others • To maintain records • To grow professionally • To develop entrepreneurial skills				
	Sub-modules: 1. Managing construction works 2. Managing health/environment 3. Communicating with others 4. Maintaining records 5. Growing professionally 6. Developing entrepreneurial skills				
	Sub-module:1: Managing construction works				
	Description: It deals with the knowledge and skills related to managing construction works necessary for supervising local roads.				
	Objectives: • To prepare/follow schedule • To manage labor force/road building groups • To manage materials • To manage machine • To manage money • To manage minute/document				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		10 hrs. = 2 hrs.(Th,) + 8 hrs.(Pr,)	Time (minutes)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot
1.	Prepare/follow schedule	<u>Preparing/following schedule</u>: • Concept and importance of preparing/following schedule • Why and when of preparing/following schedule • Principle and procedure for preparing/following schedule • Preparing/following schedule • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	80	100

2.	Manage labor force/road building groups	Managing labor force/road building groups: • Concept and importance of managing labor force/road building groups • Why and when of managing labor force/road building groups	20	80	100
		• Principle and procedure for managing labor force/road building groups • Managing labor force/road building groups • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
3.	Manage materials	Managing materials : • Concept and importance of managing materials • Why and when of managing materials • Principle and procedure for managing materials • Managing materials • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	80	100
4.	Manage machine	Managing machine: • Concept and importance of managing machine • Why and when of managing machine • Principle and procedure for managing machine • Managing machine • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	80	100

5.	Manage money	Managing money: • Concept and importance of managing money • Why and when of managing money • Principle and procedure for managing money • Managing money • Precautions to be taken while carrying out this task	20	80	100
		• Keeping records of the activities related to this task			
6.	Manage minute/document	Managing minute/document: • Concept and importance of managing minute/document • Why and when of managing minute/document • Principle and procedure for managing minute/document • Managing minute/document • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	20	80	100
	Sub-total(hours):		2	8	10
	Sub-module:2: Managing health/environment				
	Description: It deals with the knowledge and skills related to managing health /environment necessary for supervising local roads.				
	Objectives: • To maintain waste disposal system • To manage safe/healthy drinking water • To be familiar with communicable diseases • To create safe working environment • To be familiar with the management of hiv/std • To minimize noise/dust pollution • To enforce to manage quarry site • To facilitate to dispose unwanted oil				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		36 hrs. = 6 hrs.(Th,) + 30 hrs.(Pr,)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.

1.	Maintain waste disposal system	Maintaining waste disposal system : • Concept and importance of maintaining waste disposal system • Why and when of maintaining waste disposal system • Principle and procedure for maintaining waste disposal system • Maintaining waste disposal system • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.3	0.7	1
2.	Manage safe/healthy drinking water	Managing safe/healthy drinking water: • Concept and importance of managing safe/healthy drinking water • Why and when of managing safe/healthy drinking water • Principle and procedure for managing safe/healthy drinking water • Managing safe/healthy drinking water • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.3	0.7	1
3.	Be familiar with communicable diseases	Being familiar with communicable diseases: • Concept and importance of being familiar with communicable diseases • Why and when of being familiar with communicable diseases • Principle and procedure for being familiar with communicable diseases • Being familiar with communicable • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.3	0.7	1

4.	Create safe working environment	Creating safe working environment: • Concept and importance of creating safe working environment • Why and when of creating safe working environment • Principle and procedure for creating safe working environment • Creating safe working environment • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.3	0.7	1
5.	Be familiar with the management of HIV/STD	Being familiar with the management of HIV/STD: • Concept and importance of being familiar with the management of HIV/STD • Why and when of being familiar with the management of HIV/STD • Principle and procedure for being familiar with the management of HIV/STD • Being familiar with the management of HIV/STD • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
6.	Minimize noise/dust pollution	Minimizing noise/dust pollution: • Concept and importance of minimizing noise/dust pollution • Why and when of minimizing noise/dust pollution • Principle and procedure for minimizing noise/dust pollution • Minimizing noise/dust pollution • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1

7.	Enforce to manage quarry site	Enforcing to manage quarry site: • Concept and importance of enforcing to manage quarry site • Why and when of enforcing to manage quarry site • Principle and procedure for enforcing to manage quarry site • Enforcing to manage quarry site • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
8.	Facilitate to dispose unwanted oil	Facilitating to dispose unwanted oil : • Concept and importance of facilitating to dispose unwanted oil • Why and when of facilitating to dispose unwanted oil • Principle and procedure for facilitating to dispose unwanted oil • Facilitating to dispose unwanted oil • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
	Sub-total:		2	6	8
	Sub-module:3: Communicating with others				
	Description: It deals with the knowledge and skills related to communicating with others necessary for supervising local roads.				
	Objectives: • To make telephone calls • To receive telephone calls • To write letters • To write simple reports • To communicate with seniors • To communicate with juniors/labors • To communicate with peers • To communicate with contractors • To communicate with users' committee • To communicate with user's group				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		10 hrs. = 2 hrs.(Th,) + 8 hrs.(Pr.)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.

1.	Make telephone calls	Making telephone calls: • Concept and importance of making telephone calls • Why and when of making telephone calls • Principle and procedure for making telephone calls • Making telephone calls • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
2.	Receive telephone calls	Receiving telephone calls: • Concept and importance of receiving telephone calls • Why and when of receiving telephone calls • Principle and procedure for receiving telephone calls • Receiving telephone calls • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
3.	Write letters	Writing letters: • Concept and importance of writing letters • Why and when of writing letters • Principle and procedure for writing letters • Writing letters • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1

4.	Write simple reports	Writing simple reports: • Concept and importance of writing simple reports • Why and when of writing simple reports • Principle and procedure for writing simple reports • Writing simple reports • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
5.	Communicate with seniors	Communicating with seniors: • Concept and importance of communicating with seniors • Why and when of communicating with seniors • Principle and procedure for	0.2	0.8	1
		communicating with seniors • Communicating with seniors • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
6.	Communicate with juniors/labors	Communicating with juniors/labors: • Concept and importance of communicating with juniors/labors • Why and when of communicating with juniors/labors • Principle and procedure for communicating with juniors/labors • Communicating with juniors/labors • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1

7.	Communicate with peers	Communicating with peers: • Concept and importance of communicating with peers • Why and when of communicating with peers • Principle and procedure for communicating with peers • Communicating with peers • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
8.	Communicate with contractors	Communicating with contractors: • Concept and importance of communicating with contractors • Why and when of communicating with contractors • Principle and procedure for communicating with contractors • Communicating with contractors • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1

9.	Communicate with users' committee	Communicating with users' committee: • Concept and importance of communicating with users' committee • Why and when of communicating with users' committee • Principle and procedure for communicating with users' committee • Communicating with users' committee • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
10.	Communicate with user's group	Communicating with user's group: • Concept and importance of communicating with user's group • Why and when of communicating with user's group • Principle and procedure for communicating with user's group • Communicating with user's group • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
	Sub-total:		2	8	10
	Sub-module:4: Maintaining records				
	Description: It deals with the knowledge and skills related to maintaining necessary for supervising local roads				
	Objectives: • To keep records of attendance • To maintain muster roll • To keep records of tools/equipment/materials used • To maintain log book • To maintain simple a/c books • To identify/facilitate to apply various formats of records • To maintain records of applied fire safety measures • To maintain daily diary • To keep records of work progress				

	• To prepare work progress records • To submit records/reports to the concerned				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		11 hrs. = 2 hrs.(Th,) + 9 hrs.(Pr.)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Keep records of attendance	Keeping records of attendance: • Concept and importance of keeping records of attendance • Why and when of keeping records of attendance • Principle and procedure for keeping records of attendance • Keeping records of attendance • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.9	1.1
2.	Maintain muster roll	Maintaining muster roll: • Concept and importance of maintaining muster roll • Why and when of maintaining muster roll • Principle and procedure for maintaining muster roll • Maintaining muster roll • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.9	1.1
3.	Keep records of tools/equipment/materials used	Keeping records of tools/equipment/materials used: • Concept and importance of keeping records of tools/equipment/materials used • Why and when of keeping records of tools/equipment/materials used • Principle and procedure for keeping records of tools/equipment/materials used • Keeping records of tools/equipment/materials used • Precautions to be taken while	0.2	0.8	1.0

		carrying out this task • Keeping records of the activities related to this task			
4.	Maintain log book	Maintaining log book: • Concept and importance of maintaining log book • Why and when of maintaining log book • Principle and procedure for maintaining log book • Maintaining log book • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1.0
5.	Maintain simple A/C books	Maintaining simple A/C books: • Concept and importance of maintaining simple A/C books • Why and when of maintaining simple A/C books • Principle and procedure for maintaining simple A/C books • Maintaining simple A/C books • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1.0
6.	Identify/facilitate to apply various formats of records	Identifying/facilitating to apply various formats of records: • Concept and importance of identifying/facilitating to apply various formats of records • Why and when of identifying/facilitating to apply various formats of records • Principle and procedure for identifying/facilitating to apply various formats of records • Identifying/facilitating to apply various formats of records • Precautions to be taken while carrying out this task	0.2	0.8	1.0

		• Keeping records of the activities related to this task			
7.	Maintain records of applied fire safety measures	Maintaining records of applied fire safety measures: • Concept and importance of maintaining records of applied fire safety measures • Why and when of maintaining records of applied fire safety measures • Principle and procedure for maintaining records of applied fire safety measures • Maintaining records of applied fire safety measures • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1.0
8.	Maintain daily diary	Maintaining daily diary: • Concept and importance of maintaining daily diary • Why and when of maintaining daily diary • Principle and procedure for maintaining daily diary • Maintaining daily diary • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1.0
9.	Keep records of work progress	Keeping records of work progress: • Concept and importance of keeping records of work progress • Why and when of keeping records of work progress • Principle and procedure for keeping records of work progress • Keeping records of work progress • Precautions to be taken while carrying out this task • Keeping records of the activities	0.2	0.8	1.0

		related to this task			
10.	Prepare work progress records	<u>Preparing work progress records</u>: • Concept and importance of preparing work progress records • Why and when of preparing work progress records • Principle and procedure for preparing work progress records • Preparing work progress records • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.1	0.8	0.9
11.	Submit records/reports to the concerned	<u>Submitting records/reports to the concerned</u>: • Concept and importance of submitting records/reports to the concerned • Why and when of submitting records/reports to the concerned • Principle and procedure for submitting records/reports to the concerned • Submitting records/reports to the concerned • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.1	0.8	0.9
	Sub-total:		2	9	11
	Sub-module:5: Growing professionally				
	Description: It deals with the knowledge and skills related to growing professionally Necessary for supervising local roads.				
	Objectives: • To attend meetings/ seminars/work shops • To consult experts • To consult professional books/manuals/literature • To participate in professional organizations • To follow professional rules/regulations/ethics • To consult professional journals/magazine • To discuss with peers • To attend professional trainings				

	• To seek/attend for higher education • To browse www				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		10 hrs. = 2 hrs.(Th,) + 8 hrs.(Pr.)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Attend meetings/ seminars/work shops	Attending meetings/ seminars/work shops: • Concept and importance of attending meetings/ seminars/work shops • Why and when of attending meetings/ seminars/work shops • Principle and procedure for attending meetings/ seminars/work shops • Attending meetings/ seminars/work shops • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
2.	Consult experts	Consulting with experts: • Concept and importance of consulting with experts • Why and when of consulting with experts • Principle and procedure for consulting with experts • Consulting with experts • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
3.	Consult professional books/manuals/literature	Consulting professional books/manuals/literature: • Concept and importance of consulting professional books/manuals/literature • Why and when of consulting professional books/manuals/literature • Principle and procedure for	0.2	0.8	1

		consulting professional books/manuals/literature • Consulting professional books/manuals/literature • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
4.	Participate in professional organizations	Participating in professional organizations: • Concept and importance of participating in professional organizations • Why and when of participating in professional organizations • Principle and procedure for participating in professional organizations • Participating in professional organizations • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
5.	Follow professional rules/regulations/ethics	Following professional rules/regulations/ethics: • Concept and importance of following professional rules/regulations/ethics • Why and when of following professional rules/regulations/ethics • Principle and procedure for following professional rules/regulations/ethics • Following professional rules/regulations/ethics • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
6.	Consult professional	Consulting professional	0.2	0.8	1

	journals/magazine	journals/magazine: • Concept and importance of consulting professional journals/magazine • Why and when of consulting professional journals/magazine • Principle and procedure for consulting professional journals/magazine • Consulting professional journals/magazine • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
7.	Discuss with peers	Discussing with peers: • Concept and importance of discussing with peers • Why and when of discussing with peers • Principle and procedure for discussing with peers • Discussing with peers • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
8.	Attend professional trainings	Attending professional trainings: • Concept and importance of attending professional trainings • Why and when of attending professional trainings • Principle and procedure for attending professional trainings • Attending professional trainings • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
9.	Seek/attend for higher education	Seeking/attending for higher education: • Concept and importance of seeking/attending for higher	0.2	0.8	1

		education • Why and when of seeking/attending for higher education • Principle and procedure for seeking/attending for higher education • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
10.	Browse www	Browsing www: • Concept and importance of browsing www • Why and when of • Principle and procedure for • Browsing www • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.2	0.8	1
	Sub-total:		2	8	10
	Sub-module:6: Developing entrepreneurial skills				
	Description: It deals with the knowledge and skills related to developing entrepreneurial skills necessary for supervising local roads.				
	Objectives: • To develop small business planning skills • To develop small business organizing skills • To develop small business direction skills • To develop small business controlling skills • To prepare a small business plan • To prepare a budget for a small business				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		12 hrs. = 2 hrs.(Th,) + 10 hrs.(Pr.)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Develop small business planning skills	Developing small business planning skills: • Concept and importance of developing small business planning skills • Why and when of developing small business planning skills	0.4	1.6	2.0

		• Principle and procedure for developing small business planning skills • Developing small business planning skills • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
2.	Develop small business organizing skills	Developing small business organizing skills: • Concept and importance of developing small business organizing skills • Why and when of developing small business organizing skills • Principle and procedure for developing small business organizing skills • Developing small business organizing skills • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.4	1.6	2.0
3.	Develop small business direction skills	Developing small business direction skills: • Concept and importance of developing small business direction skills • Why and when of developing small business direction skills • Principle and procedure for developing small business direction skills • Developing small business direction skills • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.3	1.6	1.9
4.	Develop small business controlling	Developing small business controlling	0.3	1.6	1.9

	skills	skills: • Concept and importance of developing small business controlling skills • Why and when of developing small business controlling skills • Principle and procedure for developing small business controlling skills • Developing small business controlling skills • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
5.	Prepare a small business plan	Preparing a small business plan: • Concept and importance of preparing a small business plan • Why and when of preparing a small business plan • Principle and procedure for preparing a small business plan • Preparing a small business plan • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.3	2.0	2.3
6.	Prepare a budget for a small business	Preparing a budget for a small business: • Concept and importance of preparing a budget for a small business • Why and when of preparing a budget for a small business • Principle and procedure for preparing a budget for a small business • Preparing a budget for a small business • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	0.3	1.6	1.9

	Sub-total:		2	10	12
	Module: 12: Social mobilization				
	Description: It deals with the knowledge and skills related to social mobilization necessary for supervising local roads.				
	Objectives: • To facilitate to form users committee • To prepare participation schedule • To facilitate to form users' group • To facilitate to minute decisions • To facilitate users' committee meetings • To motivate users for participation • To facilitate to carry out public audit • To facilitate to minimize conflict				
	Tasks: Each task consists of related technical knowledge and time allocation for both the theoretical and practical aspects of it.				
		16 hrs. = 8 hrs.(Th,) + 8 hrs.(Pr.)	Time (hours)		
SN	Task statements	Related technical knowledge	Th.	Pr.	Tot.
1.	Facilitate to form users committee	<u>Facilitating to form users committee</u>: • Concept and importance of facilitating to form users committee • Why and when of facilitating to form users committee • Principle and procedure for facilitating to form users committee • Facilitating to form users committee • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	1	1	2
2.	Prepare participation schedule	<u>Preparing participation schedule</u>: • Concept and importance of preparing participation schedule • Why and when of preparing participation schedule • Principle and procedure for preparing participation schedule • Preparing participation schedule • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	1	1	2
3.	Facilitate to form users' group	<u>Facilitating to form users' group</u>:	1	1	2

		• Concept and importance of facilitating to form users' group • Why and when of facilitating to form users' group • Principle and procedure for facilitating to form users' group • Facilitating to form users' group • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
4.	Facilitate to minute decisions	<u>Facilitating to minute decisions</u>: • Concept and importance of facilitating to minute decisions • Why and when of facilitating to minute decisions • Principle and procedure for facilitating to minute decisions • Facilitating to minute decisions • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	1	1	2
5.	Facilitate users' committee meetings	<u>Facilitating users' committee meetings</u>: • Concept and importance of facilitating users' committee meetings • Why and when of facilitating users' committee meetings • Principle and procedure for facilitating users' committee meetings • Facilitating users' committee meetings • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	1	1	2
6.	Motivate users for participation	<u>Motivating users for participation</u>: • Concept and importance of motivating users for participation • Why and when of motivating users	1	1	2

		for participation • Principle and procedure for motivating users for participation • Motivating users for participation • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task			
7.	Facilitate to carry out public audit	<u>Facilitating to carry out public audit</u>: • Concept and importance of facilitating to carry out public audit • Why and when of facilitating to carry out public audit • Principle and procedure for facilitating to carry out public audit • Facilitating to carry out public audit • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	1	1	2
8.	Facilitate to minimize conflict	<u>Facilitating to minimize conflict</u>: • Concept and importance of facilitating to minimize conflict • Why and when of facilitating to minimize conflict • Principle and procedure for facilitating to minimize conflict • Facilitating to minimize conflict • Precautions to be taken while carrying out this task • Keeping records of the activities related to this task	1	1	2
	Sub-total:		8	8	16
	All total:		81	309	390

Appendices

Modules, sub-modules, tasks and time allocation

		Tasks			Time (hours)		
Modules	Sub-modules	SN	Task statements		Th.	Pr.	Tot.
1. Tools, materials, equipment, and safety	1. Tools, materials and equipment	12.	Handle measuring tape		0.2	0.9	1.1
		13.	Handle pedometer		0.2	0.9	1.1
		14.	Handle altimeter		0.2	0.8	1.0
		15.	Handle pipe/sprit level		0.2	0.8	1.0
		16.	Handle surveyor compass		0.2	0.8	1.0
		17.	Handle Abney level		0.2	0.8	1.0
		18.	Handle auto level		0.2	0.8	1.0
		19.	Handle calculator		0.2	0.8	1.0
		20.	Operate computer		0.2	0.8	1.0
		21.	Apply global positioning system		0.1	0.8	0.9
		22.	Handle wheel barrow		0.1	0.8	0.9
			Sub-total:		2	9	11
			11				
	2. Enforcing safety rules	8.	Maintain first aid kit box		0.4	0.5	0.9
		9.	Perform simple/common first aids		0.6	1.0	1.6
		10.	Enforce safety wares		0.4	0.5	0.9
		11.	Maintain accidental records		0.4	0.5	0.9
		12.	Orient/inform about possible risks/hazards		0.4	0.5	0.9
		13.	Enforce to follow traffic signals		0.4	0.5	0.9
		14.	Apply fire safety measures		0.4	0.5	0.9
			Sub-total:		3	4	7
			7				
2. Field survey		3.	Assist to fix Road Alignment		0.6	2.4	3
		4.	Assist to fix Road Centre line		0.6	2.4	3
		5.	Measure tentative Road Length		0.6	2.4	3
		6.	Assist to Conduct L-section Survey		0.6	2.4	3
		7.	Assist to conduct cross-section Survey		0.6	2.4	3
		8.	Assist to fix Reference Points		0.6	2.4	3
		9.	Fix Bench mark		0.6	2.4	3

		10.	Assist to investigate obligatory points		0.6	2.4	3
		11.	Assist to conduct Traverse Survey		0.6	2.4	3
		12.	Conduct Labor Availability Survey		0.6	2.4	3
		13.	Conduct Local Construction Materials Survey		0.6	2.4	3
		14.	Assist to conduct Household Survey		0.6	2.4	3
		15.	Assist to perform cadastral Survey		0.6	2.4	3
		16.	Perform Traffic/vehicle count		0.6	2.4	3
		17.	Count trees/cross-drainage hard rock		0.6	2.4	3
			Sub-total:		9	36	45
			15				
3. Calculations and drawings	1. Calculations/estimations	7.	Calculate area/volume of various geometrical figures		0.5	1.0	1.5
		8.	Use government norms/rates		0.3	1.0	1.3
		9.	Read/interpret specifications		0.3	1.0	1.3
		10.	Estimate/cost materials		0.3	1.0	1.3
		11.	Estimate/cost equipment/tools		0.3	1.0	1.3
		12.	Estimate human resources		0.3	1.0	1.3
			Sub-total:		2	6	8
			6				
	2. Drawings /sketches	8.	Prepare drawing/sketch of Rectangular section		0.3	1.7	2.0
		9.	Prepare sketch/drawing of Trapezoidal section		0.3	1.7	2.0
		1	Read/Interpret plan of road alignment		0.2	1.7	1.9
		1	Read/Interpret section of road alignment		0.3	1.7	2.0
		1	Read/Interpret deviation of geometrical figures		0.3	1.7	2.0
		1	Prepare sketch/drawings of triangular section		0.3	1.7	2.0
		1	Prepare sketches/drawings of circular section		0.3	1.8	2.1
			Sub-total:		2	12	14

			7				
4. Setting out/layout		11.	Prepare check list		0.6	2.4	3
		12.	Collect/Identify tools/equipment/materials		0.6	2.4	3
		13.	Perform Measurements		0.6	2.4	3
		14.	Apply 3-4-5 method of layout		0.6	2.4	3
		15.	Perform setting out of centerline (road alignment)		0.6	2.4	3
		16.	Perform setting out of formation width		0.6	2.4	3
		17.	Perform setting out of retaining/breast walls		0.6	2.4	3
		18.	Perform setting out of cross drainage structures		0.6	2.4	3
		19.	Perform setting out of bio engineering works		0.6	2.4	3
		20.	Locate road centerline		0.6	2.4	3
			Sub-total:		6	24	30
			10				
5. Supervising road construction	1. Supervising earth road construction	13.	Perform site clearance		0.5	2.5	3
		14.	Supervise top soil removal work		0.5	2.5	3
		15.	Perform benching		0.5	2.5	3
		16.	Maintain borrow pit		0.5	2.5	3
		17.	Maintain fill/cut slopes		0.5	2.5	3
		18.	Manage safe disposal of surplus materials		0.5	2.5	3
		19.	Maintain Formation width		0.5	2.5	3
		20.	Maintain camber/upper elevation (S.E.)		0.5	2.5	3
		21.	Maintain longitudinal slope/grade		0.5	2.5	3
		22.	Maintain vertical curves		0.5	2.5	3
		23.	Maintain horizontal curves		0.5	2.5	3
		24.	Maintain compaction density		0.5	2.5	3
			Sub-total:		6	30	36
			12				
	2. Supervising gravel road construction	6.	Control Traffic		0.6	2.4	3
		7.	Maintain gravel sizing		0.6	2.4	3
		8.	Maintain compaction		0.6	2.4	3
		9.	Maintain thickness		0.6	2.4	3
		10.	Maintain edging		0.6	2.4	3
			Sub-total:		3	12	15
			5				

	3. Supervising metalled road construction	9.	Maintain penetration macadam work.		0.5	2.0	2.5
		10.	Maintain ottaseal		0.5	2.0	2.5
		11.	Maintain asphalt concrete work		0.5	2.0	2.5
		12.	Maintain single surface treatment work		0.5	2.5	3.0
		13.	Maintain double surface treatment work		0.5	2.5	3.0
		14.	Maintain concrete pavement		0.5	2.0	2.5
		15.	Maintain stone soling pavement		0.5	2.0	2.5
			Sub-total:		4	17	21
			7				
6. Supervising wall, drainage and drain	1. Supervising wall construction	16.	Layout walls		0.6	2.4	3
		17.	Maintain foundation excavation		0.6	2.4	3
		18.	Maintain soling work		0.6	2.4	3
		19.	Maintain foundation PCC/RCC work		0.6	2.4	3
		20.	Maintain Construction joints		0.6	2.4	3
		21.	Maintain weep hole		0.6	2.4	3
		22.	Maintain filter materials		0.6	2.4	3
		23.	Maintain wall dimension		0.6	2.4	3
		24.	Maintain retaining walls		0.6	2.4	3
		25.	Maintain breast wall		0.6	2.4	3
		26.	Maintain toe wall		0.6	2.4	3
		27.	Maintain revetment wall		0.6	2.4	3
		28.	Maintain dry/masonry /composite walls		0.6	2.4	3
		29.	Maintain gabion wall/construction		0.6	2.4	3
		30.	Maintain gabion crate/box weaving		0.6	2.4	3
			Sub-total:		9	36	45
			15				
	2. Supervising cross drainage construction	10.	Assist for layout		0.6	2.4	3.0
		11.	Maintain foundation excavation		0.6	2.4	3.0
		12.	Manage dewatering diversion		0.6	2.4	3.0
		13.	Maintain line/level of formwork		0.6	2.4	3.0
		14.	Inspect staging		0.6	2.4	3.0

		15.	Maintain line level of sub-structure		0.5	2.5	3.0
		16.	Maintain line level of super-structure		0.5	2.5	3.0
		17.	Maintain line/level of formwork		0.5	2.5	3.0
		18.	Maintain protection works		0.5	2.5	3.0
			Sub-total:		5	22	27
			9				
	3. Supervising roadside drain construction	8.	Layout for roadside drain		0.5	2.4	2.9
		9.	Assure/monitor quality of concrete work		0.5	2.4	2.9
		10.	Maintain dimension of masonry work		0.6	2.4	3.0
		11.	Maintain dimensions/slopes		0.6	2.4	3.0
		12.	Supervise plastering		0.6	2.4	3.0
		13.	Supervise curving		0.6	2.5	3.1
		14.	Maintain surface/sub-surface drainage		0.6	2.5	3.1
			Sub-total:		4	17	21
			7				
7. Supervising bio-engineering works		6.	Supervise preparation of live stakes grass slips		0.4	1.6	2
		7.	Perform layout		0.4	1.6	2
		8.	Supervise plantation work		0.4	1.6	2
		9.	Supervise caring of plants		0.4	1.6	2
		10.	Protect plants		0.4	1.6	2
			Sub-total:		2	8	10
			5				
8. Road maintenance works		7.	Supervise routine maintenance		0.6	2.4	3
		8.	Supervise recurrent maintenance		0.6	2.4	3
		9.	Supervise periodic maintenance		0.6	2.4	3
		10.	Supervise emergency maintenance		0.6	2.4	3
		11.	Supervise rehabilitation maintenance		0.6	2.4	3
			Sub-total:		3	12	15
			5				
9. Plumbing							
		1.	Install solar water heater.		0.5	2.5	3.0
		2.	Install the electric geyser.		0.5	2.5	3.0
		3.	Install the gas geyser.		0.5	2.5	3.0
		4.	Install bathtub.		0.5	2.5	3.0
		5.	Install kitchen sink.		0.5	2.5	3.0

		6.	Install commode.		0.5	2.5	3.0
		7.	Install washbasin.		0.5	2.5	3.0
		8.	Repair the gas geyser.		0.5	2.5	3.0
		9.	Repair and maintain solar water heater.		0.5	2.5	3.0
		10.	Repair and maintain the pump.		0.5	2.5	3.0
			Sub-total:		5	25	30
10. Welding							
		1.	Strike/maintain the arc.		0.6	3.0	3.6
		2.	Strike/maintain the arc.		0.6	3.0	3.6
		3.	Perform straight bead in flat position.		0.6	3.0	3.6
		4.	Grind off welding surfaces.		0.6	3.0	3.6
		5.	Weld fillet lap joint in flat position.		0.6	3.0	3.6
		6.	Weld fillet tee joint in flat position.		0.6	3.0	3.6
		7.	Weld fillet corner joint in flat position.		0.6	3.0	3.6
		8.	Weld square butt joint in flat position.		0.6	3.0	3.6
		9.	Weld single V-butt joint in flat position (single/multi run)		0.6	3.0	3.6
		10.	Weld double bevel joint in flat position.		0.6	3.0	3.6
			Sub-total:		6	30	36
11. Management	1. Managing construction works	7.	Prepare/follow schedule		0.5	2.5	3
		8.	Manage labor force/road building groups		0.5	2.5	3
		9.	Manage materials		0.5	2.5	3

		10.	Manage machine		0.5	2.5	3
		11.	Manage money		0.5	2.5	3
		12.	Manage minute/document		0.5	2.5	3
			Sub-total:		3	15	18
			6				
	2. Managing health/environment	9.	Maintain waste disposal system		0.3	0.7	1
		10.	Manage safe/healthy drinking water		0.3	0.7	1
		11.	Be familiar with communicable diseases		0.3	0.7	1
		12.	Create safe working environment		0.3	0.7	1
		13.	Be familiar with the management of HIV/STD		0.2	0.8	1
		14.	Minimize noise/dust pollution		0.2	0.8	1
		15.	Enforce to manage quarry site		0.2	0.8	1
		16.	Facilitate to dispose unwanted oil		0.2	0.8	1
			Sub-total:		2	6	8
			8				
	3. Communicating with others	11.	Make telephone calls		0.2	0.8	1
		12.	Receive telephone calls		0.2	0.8	1
		13.	Write letters		0.2	0.8	1
		14.	Write simple reports		0.2	0.8	1
		15.	Communicate with seniors		0.2	0.8	1
		16.	Communicate with juniors/labors		0.2	0.8	1
		17.	Communicate with peers		0.2	0.8	1
		18.	Communicate with contractors		0.2	0.8	1
		19.	Communicate with users' committee		0.2	0.8	1
		20.	Communicate with user's group		0.2	0.8	1
			Sub-total:		2	8	10
			10				
	4. Maintaining records	12.	Keep records of attendance		0.2	0.9	1.1
		13.	Maintain muster roll		0.2	0.9	1.1
		14.	Keep records of tools/equipment/materials used		0.2	0.8	1.0
		15.	Maintain log book		0.2	0.8	1.0

		16.	Maintain simple A/C books		0.2	0.8	1.0
		17.	Identify/facilitate to apply various formats of records		0.2	0.8	1.0
		18.	Maintain records of applied fire safety measures		0.2	0.8	1.0
		19.	Maintain daily diary		0.2	0.8	1.0
		20.	Keep records of work progress		0.2	0.8	1.0
		21.	Prepare work progress records		0.1	0.8	0.9
		22.	Submit records/reports to the concerned		0.1	0.8	0.9
			Sub-total:		2	9	11
			11				
	5. Growing professionally	11.	Attend meetings/ seminars/work shops		0.2	0.8	1
		12.	Consult experts		0.2	0.8	1
		13.	Consult professional books/manuals		0.2	0.8	1
		14.	Participate in professional organizations		0.2	0.8	1
		15.	Follow professional rules/regulations/ethics		0.2	0.8	1
		16.	Consult professional journals/magazine		0.2	0.8	1
		17.	Discuss with peers		0.2	0.8	1
		18.	Attend professional trainings		0.2	0.8	1
		19.	Seek/attend for higher education		0.2	0.8	1
		20.	Browse www		0.2	0.8	1
			Sub-total:		2	8	10
			10				
	6. Developing entrepreneurial skills	7.	Develop small business planning skills		0.4	1.6	2.0
		8.	Develop small business organizing skills		0.4	1.6	2.0
		9.	Develop small business direction skills		0.3	1.6	1.9
		10.	Develop small business controlling skills		0.3	1.6	1.9
		11.	Prepare a small business plan		0.3	2.0	2.3
		12.	Prepare a budget for a		0.3	1.6	1.9

			small business				
			Sub-total:		2	9.6	12
			6				
12. Social mobilization		9.	Facilitate to form users committee		1	1	2
		10.	Prepare participation schedule		1	1	2
		11.	Facilitate to form users' group		1	1	2
		12.	Facilitate to minute decisions		1	1	2
		13.	Facilitate users' committee meetings		1	1	2
		14.	Motivate users for participation		1	1	2
		15.	Facilitate to carry out public audit		1	1	2
		16.	Facilitate to minimize conflict		1	1	2
			Sub-total:		8	8	16
			8				
			All total:		81	309	390
			180				

List of duties and tasks: a product of job analysis
Duty: A: Assist for Field Survey

Tasks:

1. Assist to fix Road Alignment
2. Assist to fix Road Centre line
3. Measure tentative Road Length
4. Assist to Conduct L-section Survey
5. Assist to conduct cross-section Survey
6. Assist to fix Reference Points
7. Fix Bench mark
8. Assist to investigate obligatory points
9. Assist to conduct Traverse Survey
10. Conduct Labor Availability Survey
11. Conduct Local Construction Materials Survey
12. Assist to conduct Household Survey
13. Assist to perform cadastral Survey
14. Perform Traffic/vehicle count
15. Count trees/cross-drainage hard rock

Duty: B: Perform Simple Calculations/Estimations

Tasks:

16. Calculate area/volume of various geometrical figures
17. Use government norms/rates
18. Read/interpret specifications
19. Estimate/cost materials
20. Estimate/cost equipment/tools
21. Estimate human resources

Duty: C: Read/Interpret/ prepare drawings /sketches

Tasks:

22. Prepare drawing/sketch of Rectangular section
23. Prepare sketch/drawing of Trapezoidal section
24. Read/Interpret plan of road alignment
25. Read/Interpret section of road alignment
26. Read/Interpret deviation of geometrical figures
27. Prepare sketch/drawings of triangular section
28. Prepare sketches/drawings of circular section

Duty: D: Facilitate for Social Mobilization

Tasks:

29. Facilitate to form users committee
30. Prepare participation schedule
31. Facilitate to form users' group
32. Facilitate to minute decisions
33. Facilitate users' committee meetings
34. Motivate users for participation
35. Facilitate to carry out public audit
36. Facilitate to minimize conflict

Duty: E: Perform setting out/Layout

Tasks:

37. Prepare check list
38. Collect/Identify tools/equipment/materials
39. Perform Measurements
40. Apply 3-4-5 method of layout
41. Perform setting out of centerline (road alignment)
42. Perform setting out of formation width
43. Perform setting out of retaining/breast walls
44. Perform setting out of cross drainage structures
45. Perform setting out of bio engineering works
46. Locate road centerline

Duty: F: Supervise Earth Road Construction

Tasks:

47. Perform site clearance
48. Supervise top soil removal work
49. Perform benching
50. Maintain borrow pit
51. Maintain fill/cut slopes
52. Manage safe disposal of surplus materials
53. Maintain Formation width
54. Maintain camber/upper elevation (S.E.)
55. Maintain longitudinal slope/grade
56. Maintain vertical curves
57. Maintain horizontal curves
58. Maintain compaction density

Duty: G: Supervise wall Construction

Tasks:

59. Layout walls
60. Maintain foundation excavation
61. Maintain soling work
62. Maintain foundation PCC/RCC work
63. Maintain Construction joints
64. Maintain weep hole
65. Maintain filter materials
66. Maintain wall dimension
67. Maintain retaining walls
68. Maintain breast wall
69. Maintain toe wall
70. Maintain revetment wall
71. Maintain dry/masonry/composite walls
72. Maintain gabion wall/construction
73. Maintain gabion crate/box weaving

Duty: H: Supervise Cross Drainage Construction

Tasks:

74. Assist for layout
75. Maintain foundation excavation
76. Manage dewatering dimension
77. Maintain line/level of formwork
78. Inspect staging
79. Maintain line level of sub-structure
80. Maintain line level of super-structure
81. Maintain line/level of formwork
82. Maintain protection works

Duty: I: Supervise Roadside Drain Construction

Tasks:

83. Layout for roadside drain
84. Assure/monitor quality of concrete work
85. Maintain dimension of masonry work
86. Maintain dimensions/slopes
87. Supervise plastering
88. Supervise curving
89. Maintain surface/sub-surface drainage

Duty: J: Supervise Bio-engineering Works

Tasks:

90. Supervise preparation of live stakes grass slips
91. Perform layout
92. Supervise plantation work
93. Supervise caring of plants
94. Protect plants

Duty: K: Supervise Gravel Road Construction

Tasks:

95. Control Traffic
96. Maintain gravel sizing
97. Maintain compaction
98. Maintain thickness
99. Maintain edging

Duty: L: Supervise Metalled Road Construction

Tasks:

Maintain penetration macadam work.
Maintain ottaseal
Maintain asphalt concrete work
Maintain single surface treatment work
Maintain double surface treatment work
Maintain concrete pavement
106. Maintain stone soling pavement

Duty: M: Manage Construction Works

Tasks:

107. Prepare/follow schedule
108. Manage labor force/road building groups
109. Manage materials
110. Manage machine
111. Manage money
112. Manage minute/document

Duty: N: Handle/ maintain/tools/materials/equipments

Tasks:

113. Handle measuring tape
114. Handle pedometer.
115. Handle altimeter.
116. Level pipe/sprit level.
117. Handle surveyor compass.
118. Handle abney level.
119. Handle auto level.
120. Handle calculator
121. Operate computer.
122. Apply global positioning system.
123. Handle wheel barrow.

Duty: O: Manage health/environment.

Tasks:

124. Maintain waste disposal system.
125. Manage safe healthy drinking water.
126. Be familiar with communicable diseases.
127. Create safe working environment.
128. Be familiar with the management of HIV / STD.
129. Minimize noise / dust pollution
130. Enforce to manage quarry site
131. Facilitate to disposal unwanted oil.

Duty: P: Communicate with others.

Tasks:

132. Make telephone calls.
133. Receive telephone calls
134. Write letters
135. Write simple reports.
136. Communicate with seniors.
137. Communicate with juniors/labors.
138. Communicate with peers.
139. Communicate with contractors.
140. Communicate with user's committee.
141. Communicate with user's groups

Duty: **Q**: **Enforce safety.**

Tasks:

142. Maintain first aid kit box.
143. Perform simple/common first aids.
144. Enforce safety wares.
145. Maintain accidental records.
146. Orient/inform about possible risks/hazards.
147. Enforce to follow traffic signals.
148. Apply fire safety measures.

Duty: **R**: **Maintain records.**

Tasks:

149. Keep records of attendance.
150. Maintain muster roll.
151. Keep record of tools/equipment/material used.
152. Maintain log book.
153. Maintain simple A/C books.
154. Identify/facilitate to apply various formats of records.
155. Apply fire safety measures.
156. Maintain daily diary.
157. Keep records work progress.
158. Prepare work progress record.
159. Submit record/report to the concerned.

Duty: **S**: **Perform road maintenance works.**

Tasks:

160. Supervise routine maintenance.
161. Supervise recurrent maintenance.
162. Supervise periodic maintenance.
163. Supervise emergency maintenance.
164. Supervise rehabilitation maintenance.

Duty: **T**: **Plumbing.**

Tasks:

165. Install solar water.
166. Install the electric Geyser.
167. Install the gas geyser.
168. Install bathtub
169. Install kitchen sink.
170. Install commode.
171. Install wash basin.
172. Repair the gas geyser.
173. Repair and maintain solar water heater.
174. Repair and maintain the pump.

Duty: **U**: **Welding.**

Tasks:

175. Strike/maintain the arc.
176. Strike/maintain the arc.
177. Perform straight bead in flat position.
178. Grind off welding surfaces.
179. Weld fillet lap joint in flat position.
180. Weld fillet tee joint in flat position.
181. Weld fillet corner joint in flat position.
182. Weld square butt joint in flat position.
183. Weld single V-butt joint in flat position (single/multi run).
184. Weld double bevel joint in flat position.

Duty: **V**: **Grow Professionally.**

Tasks:

185. Attend meetings/seminars/workshops.
186. Consult experts.
187. Consult professional books/manuals.
188. Participate in professional organizations.
189. Follow professional rules/regulations/ethics.
190. Consult professional journals/magazine.
191. Discuss with peers.
192. Attend professional trainings.
193. Seek/attend for higher education.
194. Browse www.

Duty: **W: Develop Entrepreneurial skills.**

Tasks:

195. Develop small business planning skills.
196. Develop small business organizing skills.
197. Develop small business direction skills.
198. Develop small business controlling skills.
199. Prepare a small business plan.
200. Prepare a budget for a small business.