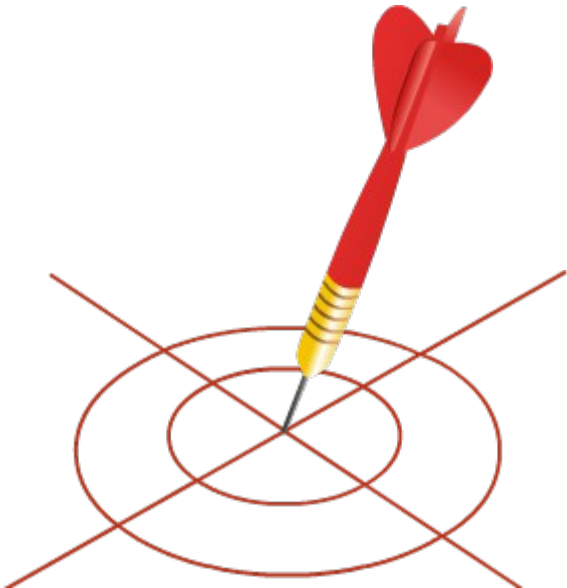

Welcome to the Session on
Miscellaneous Activities of Technical Helper

Learning Objectives

By the end of this session, you will be able to:

- Explain the role of a technical helper in the excavation process
- Explain the trenchless laying process of the HT underground cable
- Explain the miscellaneous activities of a technical helper



Role of Technical Helper

Technical Helper Assisting Lineman

Technical helper holding the ladder firmly

Lineman climbs up the pole with safety PPE and rope

Helper is providing tools and tackles

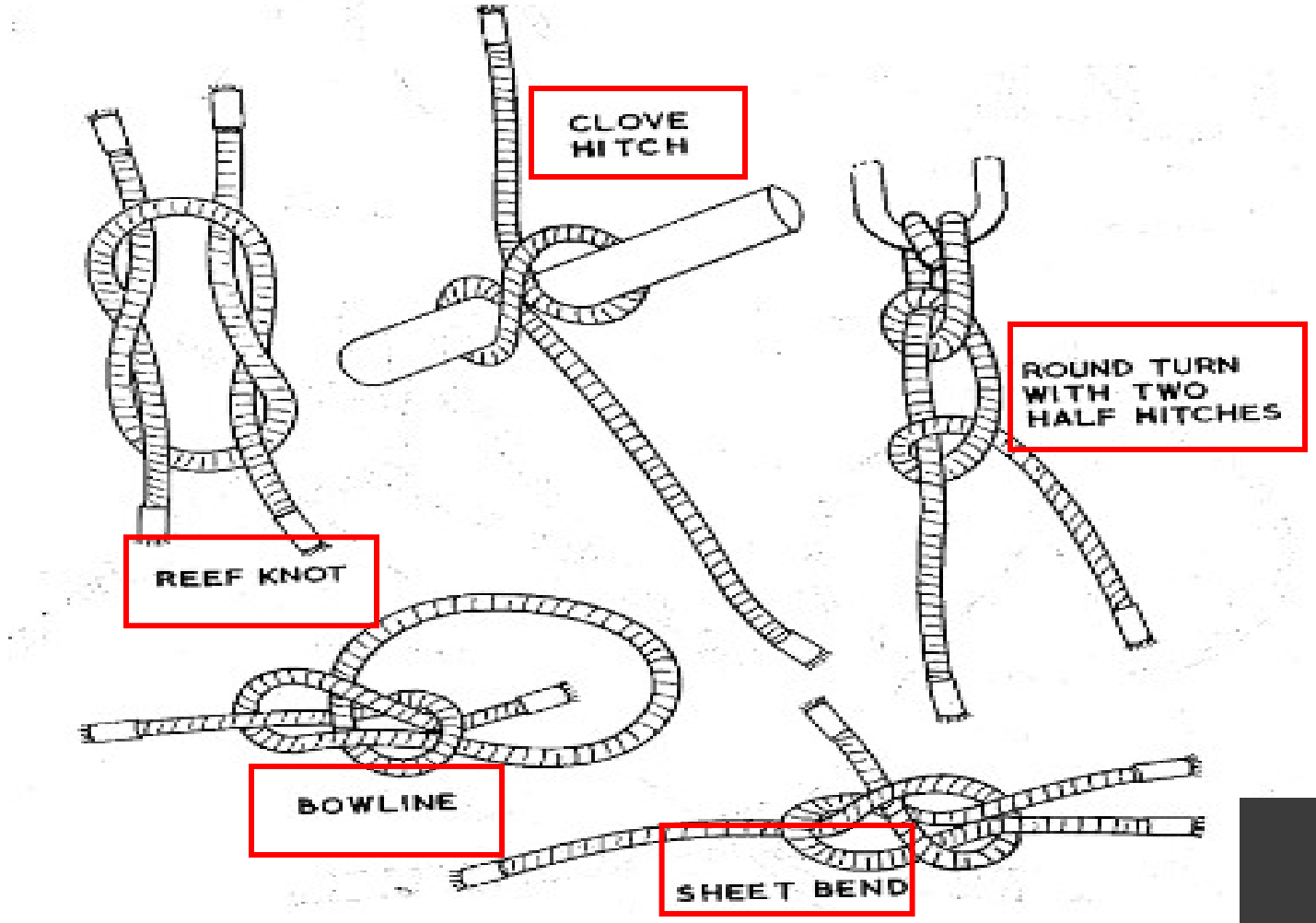
Technical Helper Assisting Lineman

The knot is tied in such a way that the hook is gripped

Providing ring spanner with the help of rope

Lineman can easily untie the rope knot

Different Types of Rope Knots



5 different types of knots

Approach of Technical Helpers to Pull AB Cables

Fixing the pulley to the hook on the pole at different locations

Inserting AB cable on the roller of the pulley

Approach of Technical Helpers to Pull AB Cables

Technical helpers pulling cable with the help of rope

Other gang of technical helpers lifting the cable from the other side

Approach of Technical Helpers to Pull AB Cables

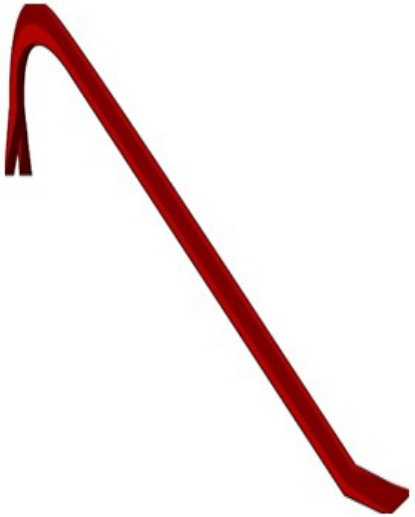
Complete AB cable has been drawn and hooked up

Digging Process – Tools of Technical Helper

Hoe

Pickaxe

Shovel



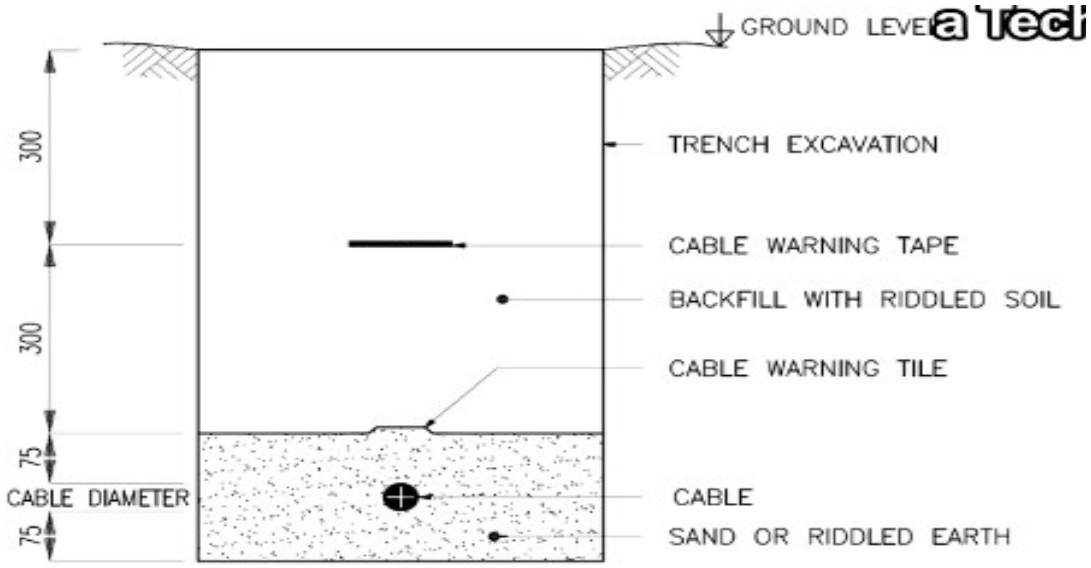
Crowbar

Digging Process

Excavation of a pit with hoe and pickaxe

Safety zone has been barricaded by cones and caution tape

Digging Process



CABLE LAYING DETAIL
DIRECT BURIED CABLES
415V CABLES

- The depth of the pit must be one sixth of the length of the pole
- For HT 11m PCC pole, the depth is 183cm (6 feet)
- For LT 9m pole, it is 153cm (5 feet)
- The dimension of the pit is about 1.2m X 0.6m

Digging Process

Excavation of test pit

Digging Process

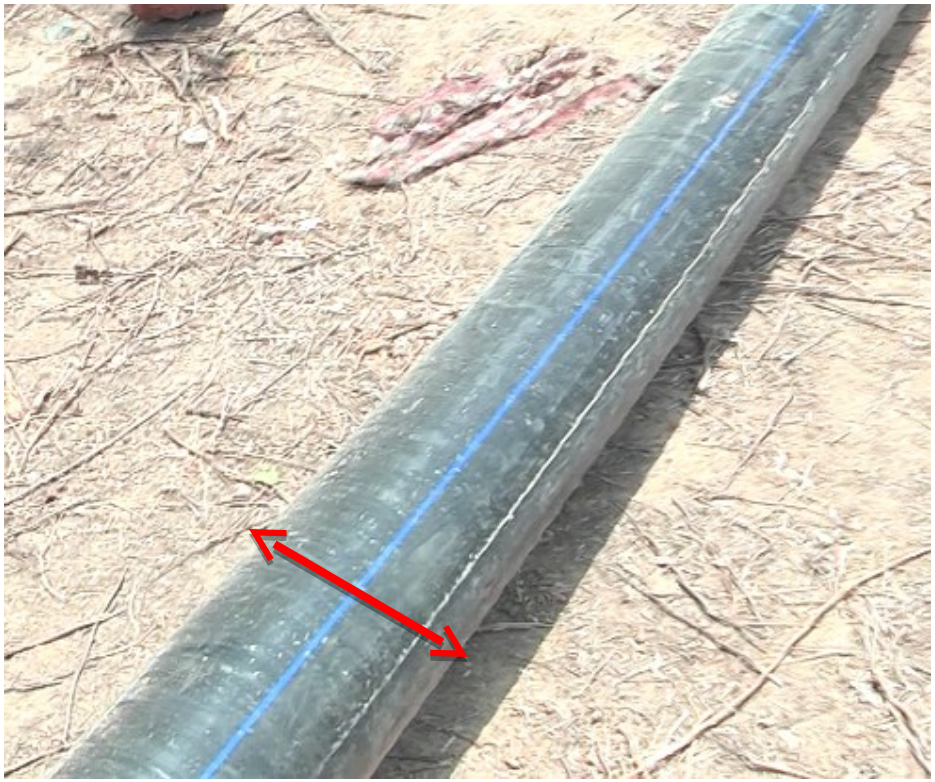
Role of Technical Helper in Cable Laying Process

Releasing cable from the drum

Cable is loosened easily over the roller stools

Role of Technical Helper in Cable Laying Process

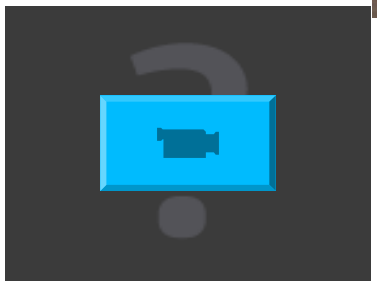
HT 11 kV 3X400 sq. mm XLPE cable



Circumference of the cable

Role of a Technical Helper in Cable Laying Process

Laying of double circuit in an open trench

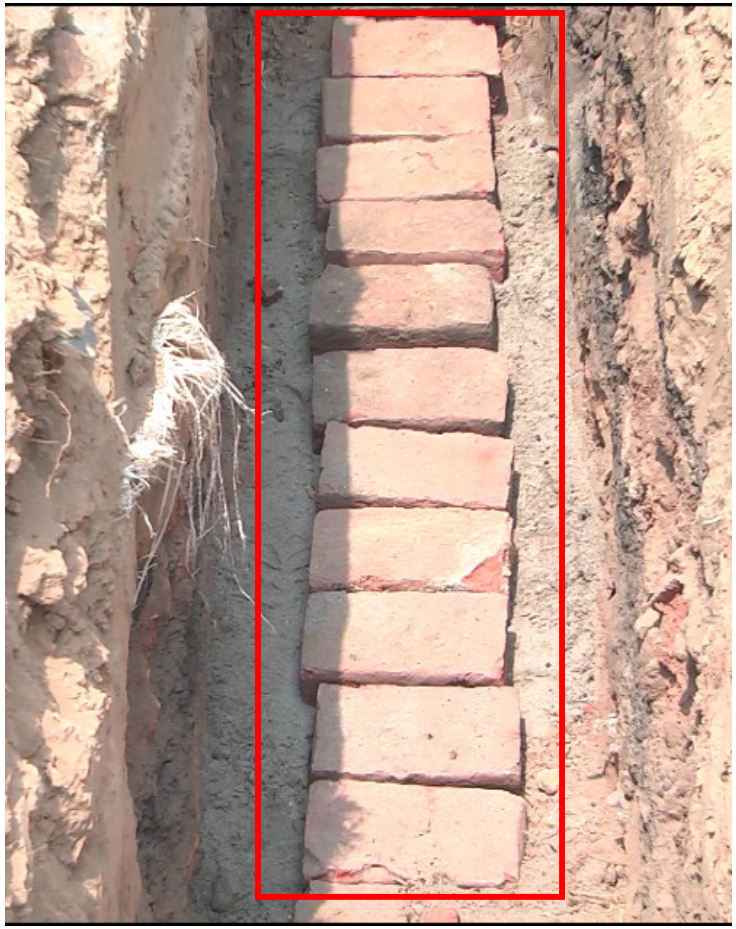


Depth of the cable is more than 1.2m

Role of Technical Helper in Cable Laying Process

- A layer of 7.5cm sand is laid over the cable
- The sand is used to provide additional thermal insulation
- Also protects the cable from the UV effect
- One of technical helpers properly levels the sand layer and ensures uniform layer over the cable

Role of Technical Helper in Cable Laying Process



Brick docketing

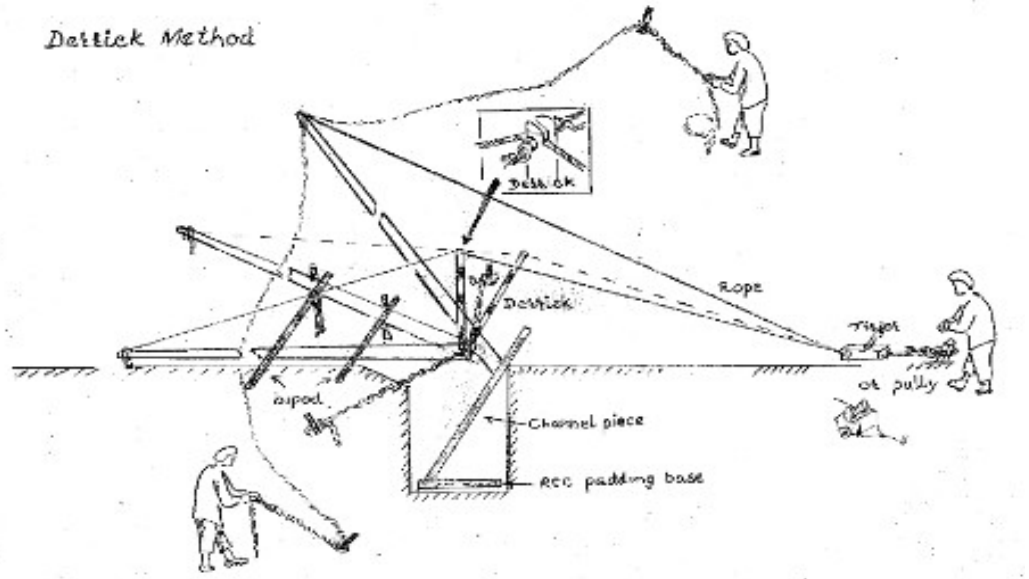
- Mechanical protection is given to the cables
- The sand bed is covered with brick or RCC docket
- Technical helpers place bricks in a row, so that no one can strike a pickaxe or crowbar over the docket
- HT cables remain protected from any damage

Role of Technical Helper in Cable Laying Process

Refilling of open trench

- Technical helpers refills the trench after completing docketing
- They first fill the soft soil and then the hard soil excavated during the digging of the trench
- They ensure that the complete area is in its original condition
- They level the excavated soil to make it look neat and tidy

Role of a Technical Helper in Erection of the Pole



- Poles are erected using a bipod/wooden horse made of 15cm G.I. pipe 6m long post excavation
- The spread of the legs is 10m
- The tie wire for attachment of the bipod to the pole is about 6m long and is made of 7/10 SWG
- Stay wire of 3.15mm is attached to the pole at 8m
- The pole, tied with 3 ropes, is slid along the line route
- The rope at the bottom prevents the pole from being dragged in the direction of the pull

Role of Technical Helper in Erection of the Pole

- To prevent the support from moving aside when rising, two guy ropes are fixed on both sides and attached to the temporary anchor
- The bipod will be placed in position and will be attached to the pole by means of the tie wire
- The pull for lifting the poles is provided by the rope pulley
- When the pole has reached an angle of 35° to 40°, the derrick and the bottom holding rope will be released slowly
- When the pole assumes the vertical position, the holding ropes should be held tightly
- At the time of erection, it should be ensured that two men are shifting the bipod as required while the pole is rising
- When it is free at 40-degree angle, they will be joined by other two men who are holding the rope

Role of Technical Helper in Erection of the Pole

Chain is placed at the centre of the pole

Pole will be balanced vertically when lifted with the help of the hook

Role of a Technical Helper in Erection of the Pole

Fixing of anchor rope on lower side of the pole

Tight anchoring on both sides by technical helpers

Role of a Technical Helper in Erection of the Pole

Pole is being vertically lifted by crane

Technical helpers are firmly gripping the anchors

Role of Technical Helper in Erection of the Pole

Vertically lifted pole over the pit

Placing the pole at exact location

Pole still hooked to the crane

Role of Technical Helper in Erection of the Pole

- Technical helpers use tampers in addition to the hoe so that the soil firmly grips the PCC pole
- They fill both hard and soft soil in layers
- They use the brick lining and hard soil
- The hook of crane will be removed only after filling and tampering is complete

Refilling process of the pit

Role of a Technical Helper in Erection of the Pole

Paving the soil of the pit

Earth material is uniformly spreaded

Debrief

So far, we have seen:

- The trenchless laying process of the HT underground cable
- How the trenchless machine pulls the cable from one end
- The role of technical helpers in smooth movement of the HT cable over the roller stool
- The conventional method of the cable laying process by preparing open trench
- Erection of PCC pole in the conventional method, where the pole is erected manually by a team of technical helpers
- Erection of the PCC pole with the help of a crane

Tools and Tackles Used by Lineman

Tools and tackles used by a technical helper on daily basis

Tools and Tackles Used by a Lineman

Detailed list of tools and tackles in his tool box

Key Learning Outcomes

- A technical helper plays a significant role as a subordinate in assisting the lineman during his routine work
- The main duties of a technical helper include:
  - Ensuring good housekeeping
  - Maintaining tools and tackles
  - Digging and refilling trenches and pits
  - Pulling cables, erecting poles
  - Holding the ladder and providing the required tools and items from the ground to the lineman on the pole
  - Marking safety zones by placing cones, caution tapes and danger signs
  - Pulling the handcart, rickshaw, cable drum and bring all the required materials to the site or work station

Key Learning Outcomes

- Different kinds of rope knots used for activities include:
  - Reef knot
  - Clove hitch
  - Round turn with two half hitches
  - Bowline
  - Sheet bend
- The common tools used by technical helpers for digging and refilling are:
  - Hoe (For digging soft soil and refilling)
  - Pickaxe (For digging hard soil)
  - Shovel (For refilling clay)
  - Crowbar (For removing hard rock)
- In urban areas, poles are commonly erected with the help of a crane to save on labour and time
- In rural areas, where the crane facility may not be available, a joint team of technical helpers erects the poles with the help of bipod and ropes