

**TECHNICAL SPECIFICATIONS FOR
AB CABLING WORKS**

SCOPE

AB Cabling works

The contractor will provide different size conductors and different size AB Cables only. Also other items required for construction of New lines, up gradation or replacement of conductors, AB cabling works with inter posing of poles, repair of old damaged poles, replacement of damaged X-arms, Post insulators with GI pin, replacement of tension fittings with Insulators(70KN), Mid-span joint, Al. tape, H/W fittings armoured rods concreting materials etc, along with suspension clamp , 'Eye' hook with shackle insulators, insulation piercing connector (IPC) and dead end clamps reqd. for AB Cables etc. are to be supplied by contractor.

Stringing of Aerial Bunched Cable (ABC)

Fixing of Suspension & Tension/ Dead end fittings to the Poles

The suspension clamp is to be hung on eye hook/ suspension hook, which is fixed to the pole at a minimum distance of 0.15 mt. from top end of the pole. The messenger wire of bunched cable resting on a pulley is separated from the cable by separating wedges and inserted in the conductor groove of the suspension clamp. The bolt is tightened to a torque of 20 N after which the pulley and wedges are to be removed. The cable is tied to the messenger wire with nylon tie on both sides of clamps. Pole clamps 50 x 8 mm flat shall be used. Eye hook of 20mm dia. MS rod to be used. The pole clamp shall be made to suite the pole width. This shall be installed as per the REC Construction Standard.

Fittings & Accessories

The following hardware fittings and accessories shall be used to install, erect & join the aerial bunched cable.

- a) Suspension Clamp with Eye-Hook – The Contractor shall install the suspension clamp with eye hook. This hook shall be used to attach the AB cable on the pole by means of a dead end clamp in terminal poles and for attaching a suspension clamp suitable for holding AB cables of size 35mm² to 95mm² in straight lines and angle up to 90 Deg.-
- b) Suspension fittings & the corresponding eye hook shall be as per REC Construction Standard . The eye hooks shall be made from minimum 20mm dia. MS rods with eye on one end and the other end being suitably flattened with two holes for M16 bolt & nut to fix with the back clamps made from minimum 50x8mm flats. The eye hook, back clamp and bolts & nuts are to be hot dip galvanized.
- c) Dead End fittings shall be bolted type as per REC Construction Standard & the corresponding eye hook shall be as specified above. The dead clamps are to be anchored with the pole with similar arrangement of eye hook & back clamp. In this case, the back clamp shall have two nos. of holes on both sides for M16 bolts. One side of the clamp

shall be used for holding the eye hook with dead end clamp and the other side shall be used for anchoring the Stay.

- d) Connectors- The contractor shall supply connector. These shall be used as non-tension aluminum to aluminum connections for conductor joints.
- e) Plastic Covers for Connectors- The contractor shall install Plastic Covers for Connectors. These covers shall be used with aluminum/aluminum connectors to protect connectors against corrosion caused by climatic conditions.

Installation of Cable

The contractor shall be fully responsible for all activities related to installation of AB cable. His responsibilities consists of handling, pulling, stringing & jointing of the cable and effecting service connection to consumers as per direction of the Engineer-in-charge. The total no. of consumers per KM in urban area and rural area is approximately&nos. respectively. But payment shall be made as per actual use of piercing connectors to effect service connection to the consumers.

Handling of AB Cable

The contractor shall observe following precautions while handling the AB Cable:

- The cable drums must be stored and transported in an upright position.
- While loading/unloading, the drums shall not be thrown from transport vehicles.
- Cable contact with sharp articles shall be avoided.
- In order to prevent damage to the insulation, the cable shall not be dragged on the ground.
- Pulleys shall be used for this purpose.
- In order to prevent strands from spreading, always cut the cable with a cutter.
- Use nylon ties or electrical tape to prevent the cable from spreading away from messenger wire after the cutting. Staple the end of the cable on to the drum in order to prevent loosening.
- Do not remove the protective boards from the cable drum before the cable is pulled off the drum.
- While moving the drum by rolling it on ground, always roll the drum in the direction indicated by the arrow on the flange. When pulling the cable, the spinning direction must be opposite.
- Do not store the drums on wet soil, sandy or humid places.
- Store the accessories in good order for quick easy and correct handling.

Pulling the Cable

- The principle is to pull the cable under mechanical tension so that contact with the ground or any other obstacles is avoided. The cable drum should be perfectly in alignment with line to be strung and fixed about 15-20 mts. from the holding the first

pulley. Open the cover of the drum to check and ensure that the insulation is not damaged.

- The pulleys are directly hung to hook on the poles. The pulley tandem is to be used on angle poles if the line is deviating more than 60°. Pull the guiding rope through all the pulleys.
- Normal care shall be taken to assume a smooth passage of whole cable through the pulleys, especially in the first pole and on angle poles. One worker should act as brakeman at the cable drum so that the cable is not loosened during the pulling. One worker should follow the cable going through the pulleys and stop the pulling if anything goes wrong.

Stringing operations

The contractor shall follow one of the following methods for stringing.

1. Sag Method

- Fix a dead end clamp on the neutral messenger wire at the pole. The messenger shall be bent behind the clamp to ensure sufficient friction between the messenger and the clamp in the initial stays during stringing.
- Bind the conductor together beside the dead end clamp using a nylon tie.
- Hand the clamp on the hook at the end pole. Rewind simultaneously the slack cable length on the cable drum.
- Attach the 'come along' on the neutral messenger wire at the first pole of the line.
- Tighten the cable by the shackle or the winch when required sag is obtained.
- Hand the dead end clamp on the hook and install it on the neutral messenger.
- Remove the 'come along'.
- Bind the conductors together on the messenger wire using a nylon tie.
- Check the length of the cable needed and cut it at an appropriate point.

2. Dynamometer Method

- Start the operation as above up to the stage of attaching the 'come along'.
- Install the dynamo meter on the come-along.
- Tighten the cable at the required value by reading the Dynamo meter.
- Finish the stringing as in the sag method operation.

Jointing of Cables

- Jointing of cable shall be in accordance with clause 12.3.3 of IS 1255:1993 and manufacturers' special instructions given hereunder. This joining is to be done by skilled personnel.

- Cable damage and repairs: If the cable is damaged for whatever reasons, it shall be brought to the notice of the engineer and shall not be used without his approval.
- No joint or splice shall be made in spans crossings over main roads, small rivers or in tension spans.
- Not more than one joint in the cable shall be allowed in one span.
- The stringing rate include rates for paving, stringing, clamping, jointing, tensioning and fitting of all necessary accessories.
- Insulated piercing connectors suitable for AB cable size from 16mm² to 95mm² and service connection cable of size 2.5mm² to 35mm² shall be used for effecting service connections to the consumers.

Final Checking, Testing and Commissioning

After stringing have been done as approved by the engineer, to ensure that everything is complete in all respects, the works shall be thoroughly inspected keeping in view the following main points.

All the bolts and nuts should be of hot dip galvanized materials as per relevant IS. The stringing of the cable has been done as per the approved sag and desired clearances are achieved.

No damage, minor or major to the cable, messenger wire and accessories The contractor shall submit a report to the above effect to the Engineer in Charge, who shall inspect and verify the correctness of the report. In case it is noticed that some or any of the above is not fulfilled, the engineer shall get such items rectified by the contractor no extra cost to the purchaser.

After final checking, the line shall be tested for insulation resistance in accordance with IS 1255:1983.

All arrangements for such testing or any other test desired by the Engineer-in-charge shall be done by the contractor and necessary labour, transport and equipment shall be provided by him. Any defect found out as a result of such tests shall be rectified by the contractor, forthwith at no extra cost to the purchaser.

In addition to the above, the contractor shall be responsible for testing and ensuring that the total and relative sags of the cable as within the specified tolerance. Such tests shall be carried out at selected points along the route as required by the Engineer-in-charge and the contractor shall provide all necessary equipment and labour to enable the tests to be carried out. After satisfactory test on the line and approval by the Engineer in Charge, the line shall be energized at full operating voltage before handing over. The cable shall be megger-tested before and after jointing.

The AB cable shall be tested for:

- i)** Continuity of messenger wire and conductors
- ii)** Absence of cross phasing
- iii)** Insulation resistance to earth

iv) Insulation resistance between conductors

v) DC Resistance

vi) Capacitance

as per IS 1255:1983 or the latest issue and as per manufacturer's instructions.

All poles are used strictly according to final approved drawing and are free of any defect or damage whatsoever.

The stringing of the conductors and earth wire has been done as per the approved sag and tension charts and desired clearances as clearly available.

All conductor and messenger wire accessories are properly installed.

All other requirements for completion of works such as fixing of danger plate and anti-climbing device have been fulfilled.

The insulation of the line as a whole is tested by the Contractor through provision of his own equipment, labour etc., to the satisfaction of the owner.

Proper earthing of the poles is installed.

HT/LT/Road Crossing Guarding

The contractor shall provide & install protective guarding as per REC construction standard for the line, The guarding shall be provided at all the crossing i.e. road, telecommunication & power lines, railway line, nallah etc.

The contractor is required to follow statutory regulations stipulated in Indian Electricity Rules 1956 as amended and other local rules and regulations referred to in these specifications.

Reference Standards

The codes and/or standards referred to in the specifications shall govern, in all cases wherever such references are made. In case of a conflict between such codes and/or standards and the specifications, latter shall govern. Such codes and/or standards, referred to shall mean the latest revisions, amendments/changes adopted and published by the relevant agencies unless otherwise indicated. Other internationally accepted standards which ensure equal or better performance than those specified shall also be accepted, subject to prior approval by the owner. In case no reference is given for any item in these specifications, latest REC specification & Construction Standards shall be referred to.
