

1. **Name of Work:** - As per tender notice.

2. **Tender Document:** -

The tender shall be governed by General Indian Railways Standard General Condition of Contract, October-2020 with all correction slips up to date, instructions to tender and special conditions of the contract. Wherever special conditions of contract differ from general conditions of contract and instructions to the tenderer, the provisions of special Conditions of contract shall override.

3. **Scope of Works:** -

The scope of work involves following activities-

Trenching and laying of OFC, power and quad cables in station area mainly along the track and involving track crossing & road crossing, as per standard practices, with bricks, DWC HDPE pipes with provision of cable route markers etc. and terminating the cables at appropriate places as per requirement.

- Excavation of Normal Trench
- Trenchless Trenching.
- Supply and making of Jointing of Quad cable with straight jointing kit.
- Supply and making of Jointing of OFC with Jointing enclosure.
- Supply and installation of STM-1 along with MUX.
- Supply of the material as mentioned in the tender schedule.

(The scope is not exhaustive. For full details please refer to the schedule.)

4. **Materials to be supplied by Contractor:** -

1. All materials as mentioned in the schedule of the works.
2. Any petty material required for completion of the work not mentioned in the schedule of the works.

## **TECHNICAL SPECIFICATIONS & SPECIAL CONDITIONS**

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1. Cable and other materials required for execution will be supplied by either concerned SSE/S&T or any store/depot of SSE/S&T of division. Transportation of material from any store/depot of division to the site will be done by contractor. No transportation charges will be paid by railways. Released material, if any, will be transported by contractor to the store of concerned SSE/S&T at his own cost, no additional charges will be paid by the Railways.
2. Trenching, cable laying & laying of HDPE pipe including supply shall be treated as one item for the purpose of payment, wherever provision of HDPE pipe is given. No individual separate payment for the supply of HDPE pipe shall be admissible.
3.
  - i) Items shall be inspected by RDSO/RITES/Consignee etc. as per inspection clause.
  - ii) Contractor shall submit OEM's invoice, Test Certificate, Delivery challan, Warranty certificate etc. along with the supply of material.
4. Rates quoted by the tenderer shall be inclusive of all charges/taxes such as transportation charges, octroi charges, toll tax etc. and also taxes as per CGST regime. All incidental charges may be included in the rates quoted. Claim of any additional Taxes/Charges shall not be entertained at a later stage.
5. Petty material like screw, nails, nut/bolts, gutties etc. required for execution of works shall be arranged by the contractor at his own cost.
6. All items shall be offered for inspection to the inspecting authority i.e RDSO/RITES/Consignee as the case may be before supply of the material. The contractor shall transport the equipment/material to different sites of work, to/from store of consignee at his own cost.
7. Material supplied and the work done by the contractor shall be under warranty for one year after certified date of completion of work. Certificate of which will be given by officers in-charge of work.
8. Workmanship of the items of work shall be of good quality and to the satisfaction of the Railway Engineer at site.
9. Railway reserves the right to reject any material/portion of the work found not as per specification.
10. Work shall be executed as per directions/instructions of the Railway Engineer in charge of the work and any other person deputed by him in this regard. Contractor shall be required to nominate his Engineers/Supervisors who will supervise the work and shall take instructions from Railway Engineer.
11. All tools, instrument, components and other items required for the execution of the work have to be arranged by the contractor on his own cost.
12. The contractor shall not execute the work, which may interfere with train traffic until adequate protection has been arranged as per the instruction of the site -in-charge. Contractor will be himself responsible for the safety of his personnel during execution of the

work. Railway will not be responsible for making payment of any type of compensation.

13. Normal 230V AC Supply shall be provided by Railway. Suitable adapter if required shall be provided by Contractor.

14. Any other hardware software requirement arising during execution of various items will be made with by the Contractor without any additional charges.

15. Credentials:

- i. At least one Office /Service Unit of the contractor should be available in the State of Delhi, Chandigarh, Haryana, Punjab, Himachal Pradesh, J&K, Uttarakhand or Uttar Pradesh. He shall furnish the details of his establishments nearest to Firozpur with address, Telephone Nos. and Manpower availability at the center.
- ii. Supportive documents/certificate from the organizations worked with whom they worked/are working should be enclosed.

16. **PAYMENT TERMS:** - The payment to the tenderer would be made through EFT/ECS/LC. If the tenderer opts for payment through LC (Letter of credit) following conditions shall be applicable-

- (i) For all the tenders having advertised cost of Rs 10 lakh or above, the contractor shall have the option to take payment from Railways through a letter of credit (LC) arrangement.
- (ii) This option of taking payment through LC arrangement has to be exercised in IREPS (Indian Railway Electronic Procurement System - the e-application on which tenders are called by Railways) by the tenderer at the time of bidding itself, and the tenderer shall affirm having read over and agreed to the terms and conditions of the LC option.
- (iii) The option so exercised, shall be an integral part of the bidder's offer.
- (iv) The above option of taking payment through LC arrangement, once exercised by tenderer at the time of bidding, shall be final and no change shall be permitted, thereafter, during execution of contract.
- (v) In case tenderer opts for payment through LC, following shall be the procedure to deal release of payment through LC:
  - (a) The LC shall be a sight LC.
  - (b) The contractor shall select his Advising/Negotiating bank for LC. The incidental cost towards issue of LC and its operation thereof shall be borne by the contractor.
  - (c) SBI, New Delhi, Main Branch will be the nodal branch for issue of LCs based on online requests received from Railway Accounts Units for tenders opened in financial year 2018-19. SBI branches where the respective Railway Accounts Office has its Account (local SBI branch) will be the issuance/reimbursing branch for LC issued under this arrangement. The Bank shall remain same for this tender till completion of contract. The incidental cost @0.15% per annum of LC value, towards issue of LC and operation thereof shall be borne by the contractor and shall be recovered from his bills.
  - (d) The LC shall be opened initially for duration of 180 to 365 days in consultation with contractor. The LC shall be extended time to time as per the progress of the contract, on the request of the contractor.
  - (e) The value of LC to be opened initially as well as extended thereafter shall be finalised by the engineer in consultation with the contractor on

the basis of expected progress of work, shall be considered as reasonable compensation and paid by contractor.

- (f) The LC terms and conditions shall inter-alia provide that Railways will issue a Document of Authorisation after passing the bill for completed work, to enable contractor to claim the authorized amount from their bank.
- (g) The acceptable, agreed upon document for payments to be released under the LC shall be the Document of Authorisation.
- (h) The Document of Authorisation shall be issued by Railway Accounts Office against each bill passed by Railways.
- (i) On issuance of Document of Authorisation, a copy of Document of Authorisation shall be posted on IREPS for download by the contractor. A digitally signed copy of Document of Authorisation shall also be sent by Railway Accounts Office to Railway's bank (Local SBI Branch).
- (j) The contractor shall take print out of the Document of Authorisation available on IREPS and present his claim to his bank (advising Bank) for necessary payments as per LC terms and conditions. The claim shall comprise of copy of Document of Authorisation, bill of exchange and Bill.
- (k) The payment against LC shall be subject to verification from Railway's Bank (Local SBI Branch).
- (l) The contractor's bank (advising bank) shall submit the documents to the Railway's Bank (Local SBI Branch).
- (m) The railway's bank (issuing bank) shall, after verifying the claim so received w.r.t the digitally signed Document of Authorisation received from Railway Accounts Office, release the payment to contractor's bank (advising bank) for crediting the same to contractor's account.
- (n) Any number of bills can be dealt within one LC, provided the sum total of payments to contractor is within the amount for which LC has been opened.
- (o) The LC shall be closed after the release of final payment including P VC amount, if any, to the contractor.
- (p) The release of performance guarantee or security deposit shall be dealt directly by railway with the contractor i.e., not through LC.

Further, item wise payment shall be as under:

**Payment terms for Supply items-**

- i. 90% of the accepted cost of material supplied will be paid when the materials are supplied subject to furnishing of Inspection certificate and receipt order by the nominated consignee.
- ii. 100% will be paid for spares and for items, which are not required to be erected by the contractor on receipt of the equipment and its inspection certificate.

**Payment terms for execution items other than supply-**

- i. On account payment will be on the basis of measurements recorded.
- ii. For combined items involving supply and erection/installation - 70% payment shall be made when the materials are supplied subject to furnishing of Inspection certificate and receipt order by the nominated consignee.
- iii. Balance 30% of the cost of the material supplied shall be paid as under:
  - a. 20% cost held up shall be paid after successful commissioning of the system.

b. Balance 10% of the cost of the material held up shall be paid after successful completion of system.

For the item of designing 100% payment will be made after completion of activity, acceptable to the Railways.

Whenever the Central/State statutory rules make it obligatory for the Railway to deduct any amount towards sales tax: works contract tax or any other tax, the same will be deduct in addition to the income tax and remitted to concerned authority.

C. Maintenance period of the work shall be 12 months from the date of commissioning of work.

**17. Provisions of Payments of Wages Act:** The Contractor shall be responsible to ensure compliance with the provision of the **Minimum Wages Act, 1948** (hereinafter referred to as the “said Act”) and the Rules made thereunder in respect of any employees directly or through petty Contractors or sub-contractors employed by him for the purpose of carrying out this contract.

(i) Contractor is to abide by the provisions of Payment of Wages act & Minimum Wages act in terms of clause 54 and 55 of Indian Railways General Condition of Contract. In order to ensure the same, an application has been developed and hosted on website ‘[www.shramikkalyan.indianrailways.gov.in](http://www.shramikkalyan.indianrailways.gov.in)’. Contractor shall register his firm/company etc. and upload requisite details of labour and their payment in this portal. These details shall be available in public domain.

The Registration/ updation of Portal shall be done as under:

- (a) Contractor shall apply for onetime registration of his company/firm etc. in the Shramikkalyan portal with requisite details subsequent to issue of Letter of Acceptance. Engineer shall approve the contractor's registration in the portal within 7 days of receipt of such request.
- (b) Contractor once approved by any Engineer, can create password with login ID (PAN No.) for subsequent use of portal for all LoAs issued in his favour.
- (c) The contractor once registered on the portal, shall provide details of his Letter of Acceptances (LoA) / Contract Agreements on shramikkalyan portal within 15 days of issue of any LoA for approval of concerned engineer. Engineer shall update (if required) and approve the details of LoA filled by contractor within 7 days of receipt of such request.
- (d) After approval of LoA by Engineer, contractor shall fill the salient details of contract labours engaged in the contract and ensure updating of each wage payment to them on shramikkalyan portal on monthly basis.
- (e) It shall be mandatory upon the contractor to ensure correct and prompt uploading of all Salient details of engaged contractual labour & payments made thereof after each wage period.

(ii) While processing payment of any ‘On Account bill’ or ‘Final bill’ or release of ‘Advances’ or ‘Performance Guarantee / Security deposit’, contractor shall submit a certificate to the Engineer or Engineer’s representatives that “I have uploaded the correct details of contract labours engaged in connection with this contract and payments made to them during the wage period in Railway’s Shramikkalyan portal at ‘[www.shramikkalyan.indianrailways.gov.in](http://www.shramikkalyan.indianrailways.gov.in)’ till Month, Year.”

**Provisions of “The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996” and “The Building and Other Construction Workers’ Welfare Cess Act, 1996”:**

The tenderers, for carrying out any construction work, shall get themselves registered with the Registering Officer under Section-7 of the Building and Other Construction Workers Act, 1996 and rules made thereto by the concerned State Govt., and submit certificate of Registration issued from the Registering Officer of the concerned State Govt. (Labour Dept.). The Cess shall be deducted from contractor's bills as per provisions of the Act

- 2.5.2 The junction points of electrified and non-electrified areas, the cabling as also the linking arrangements of circuits from electrified to non-electrified section may also present special problems.
- 2.5.3 The survey party should inspect and report to railways, such problems at the very outset so that suitable solutions can be worked out.

1. **Instructions for Excavation & Back Filling of Trenches.**

- 1.1 The Representative of Engineer Incharge of the work will mark the route of the cable in white chalk or lime as per the instructions given.
- 1.2 The Railway will provide the following to the tenderer:
- 1.2.1 Necessary permission for track crossing or approvals for road crossing in Railway boundary as required, before cable laying is done.
- 1.2.2 The exact location for the termination of cables and the cable laying route.
- a) Trenches for Telecommunication cable shall be dug to a depth of 1.0/0.8 metre as specified. The wide of the trench shall be adequate at the bottom to accommodate cables and their protection. Normally width of approx. 250-300mm at the bottom is sufficient. At places where underground pipes, electric main etc. come in the route The same shall be intimated to the railway Engineer and certified by him, trenches deeper than 1 metre shall be dug as necessary and DWC/HDPE/G.I. pipes shall be placed to protect the cables. The payment will be made on prorata of the relevant standard depth, in case excavation upto one meter is not possible due to local conditions or excavation is required to be done in excess of 1 mtr. due to local condition, depth of excavation is to be certified by the Inspector /Engineer.
- b) The cable laying work includes transportation from Rly. Store to the site, including loading/ unloading of cable drums, laying of cable in trenches/ DWC/HDPE/G.I. pipes as required. While taking cable from store, the firm may test the cables for specified parameters.
- c) The contractor shall take care of all materials and shall be responsible for safe custody of all the materials issued to him for execution at site.
- d) In case of supply of cable by Railways, the cab. shall be supplied to the contractor up to an extent of cable length at a time that is in correspondence to the trenching. In case of the cable issued to the contractor is in excess of the cable laid and not countered for, the cost of such cable shall be recovered from the contractor and in this respect the decision of Railway Engineer shall be final. The bottom of the trench shall be horizontal and shall in no case be undulating. When the cable bed changes from soft surface or from the bridge to soft soil, tapered fill at the transition point shall be provided so that cable is not pressed against the edge of a hard surface.
- e) The Contractor shall arrange supply and distribution of Second Class bricks of standard size at site along the excavated trench and after uniformly covering the cable laid in the trenches by Stone- free sieved soil up to 50mm height above the cable, he shall arrange to place the bricks flat and position them breadth wise so that on an average, 8(eight) bricks shall be laid in a meter length.



The purpose of the detailed survey is to undertake the closer study of the various existing telecommunication facilities to workout the exact requirement of 6 Quad and Derivation /PIJF cables and materials required for different items of work, as also to examine in the details collected during preliminary survey to effect necessary changes/modification, if any.

The cable length is worked out on following basis to arrive at the location of the straight joints:

- a) Route length as per actual measurement plus contour allowances of 2.5%.
- b) Extra length for track crossing including 2 & 1/2 meter loop on each side etc.
- c) Extra length on Approach /crossing of the bridges and culverts as per measurement in the detailed survey.
- d) 10 Metre of cable to be kept on either side of major steel bridges and 5 meters on minor bridges.
- e) At every joint a loop of 10 metres on either side.
- f) In cable hut/near ASM room where the cable will terminate a loop of 10 meters in the cable pit.

#### 2.4.1 Size and lengths of derivation cables & route charts:

The Derivation cable are required to be laid from ASM office to ASM, Cabin, Depot, Electrical location, Supervisor's residence etc, for extending control tapping. The plan & requirement of different sizes PIJF/derivation cables shall be suitably worked out. As far as possible derivation/PIJF cables shall be laid in the trenches for main telecom. Cable and branched off at suitable locations.

#### 2.4.2 Preparation of joint schedules:

2.4.2.1 The details of type and number of joints in main 6 Quad cable is required to be worked out based upon the location of obligatory locations etc. V.F. Transformer (1Quad/2T) 470.1120 shall be used where ever required.

2.4.2.2 The jointing schedule shall be made as straight line diagram indicating the locations of various joints.

2.4.2.3 The cables are meant for direct burial in the underground at a depth of 1M and laying of 2<sup>nd</sup> class bricks of standard size along the excavated trenches is required in a culverts. Crossing of tracks, level crossings and roads etc. special protection for the cable is required.

2.4.2.4 Actual measurement should be made for the length for which special protection is necessary and requirement of materials for the protective works should be worked out. The requirement of materials based on the actual measurement should be shown in the cable route plan at the appropriate place.

#### 2.5.1 Communication arrangement in Major Yards & Stations:

In big yards and major stations involving large number of Cabins /Depot /Tapping points, it may not be practicable to lay independent derivation cables for various locations. Therefore one main cable shall be laid to traverse in a zig zag way through the yard involving frequent tapping points .6 quad or higher size PIJF cable may be laid for this purpose. The circuits should preferably be tapped through V.F. Transformers.



wood. The spindle should be minimum of 55mm. diameter. The bottom of the cable drum should be at least 5 to 10cm. above the ground.  
IF ANY DAMAGE IS DETECTED AT THE SEALING END, THE CABLE SHOULD BE TESTED FOR INSULATION BEFORE LAYING.

- 3.4 The defective end should be carefully preserved and Engineer in Charge informed about it immediately.
- 3.5 While rolling a cable drum for laying, the drum shall be supported on an axle running through its centre, the height of the axle being such that the end Frames are free to rotate and do not touch the ground at any point. The cable shall be carefully uncoiled by gently pulling the cable as necessary by carefully turning the drums, quick pulling of the cable or turning the drums shall be avoided at all costs. Each cable drum shall be braked while laying is in progress to prevent sharp bending or buckling, particularly when the cable coils are sticking together.

The following personnel shall be employed near the drum:

- a) Man: for handling the brakes.
  - b) Man: for permanent observation of the uncoiling of cable.
  - c) Man: for uncoiling close to the drums.
- 3.6 When drums are turned for change of direction, wooden blocks shall be carefully put under the drum bolts. Which stand out from the drum discs.
- 3.7 It is customary for the mate to stand in a commanding position where he view the entire route, and shout evenly timed calls to his men to pull. If there is proper synchronization between the mate's calls and the pulling by the men the cable will leave the drum without difficulty, it is important that the cable should be pulled with steady and even pulls and not be unnecessarily jerked or strained. On no account should a cable be allowed to twist or kink as this is likely to spring the armor and fracture the paper insulation and outer serving of the cable. When pulling cable around bends, a man shouts a warning whenever the cable cannot loose, separation kinks may result. The rate of pulling should also be slow to prevent possible damage to cable that is being carried while the paying out stops. The drum should be kept in shade where possible.
- 3.8 While laying the cable, employ adequate number of men such that the cable can be conveniently carried by them in both hands without stretched arms. The distance between any two persons carrying the cable shall be from 2 to 10 metres depending upon weight of cable such that the maximum sag of the cable between any two persons is not more than 0.5 meters.
- 3.9 The cable shall be laid gently by pulling the cable, which may be assisted, as required, by smoothly and slowly turning the winch. The cable shall not be twisted, on any account.
- 3.10 Before laying is commenced, the cable shall be uncoiled first in a straight line, supported by men and then carried to the trench and laid gently & carefully.
- 3.11 While the laying work is in progress one must continuously observe the cable and feed along its length in order to determine whether any indentations, holes or other damaged parts are apparent. Such damaged parts have to be protected immediately by the cable jointer, available with the laying party.
- 3.12 When two or three turns of cable are left on the drum the pulling should be



stopped and the inner end of the cable removed from the slot in the drum. Pulling should then be continued. If this is not done the cable end is likely to be stretched and damaged.

- 3.13 The ends of the telecommunication cable should have an overlap of 1 M at the end of each drum for jointing purpose.

- 3.14 The condition of the cable shall be visually inspected through out its length and in case any damage or defect is noticed, the trench shall not be filled up until the Engineer's representative is notified to examine and authorize filling of the trench.

4. **Track Crossing:**

All cable crossings across railway tracks shall be done in H.D.P.E./DWC/GI pipes, threading the cable through these pipes. The contractor shall do the trenching to the required depth wherever necessary such as approaches to track crossing and the length in between the adjustment to track crossing and the length in between the adjacent tracks. Two G.I. wires of 10 SWG size shall be threaded through H.D.P.E./DWC pipes, one to pull the cable and one for future use.

5. **Road Crossing:**

- 5.1 When crossing road ways, it is necessary to lay the cables in such a manner as to avoid the necessity of sharp bends and minimize the excavation of road surface as far as possible. Where cable is laid in surfaced trunking, the alignment should be curved down to the pipes and proper bricks or concrete joint should be made between trunking and pipe

- 5.2 The crossing of main roads often involves difficulties especially if traffic is heavy, precaution to avoid accidents to workman, pedestrians and vehicles shall be taken. On minor roads which can be temporarily closed to traffic, if it is possible to open up and cross the entire width of the road, pipes shall be installed quickly in the cutting which is then filled in, thereby reducing to a minimum time for which the road is closed.

- 5.3 Two such lengths of G.I. wire 10 SWG shall be laid through the pipe. One wire shall be used for leading in the cable and the other wire shall be kept with suitable overlay to enable cable pulled out at later stage, if required.

- 5.4 The contractor shall be responsible to repair the roads and pavements after the cable is laid so that no damage occurs to the vehicles or pedestrians passing by. Any such damage shall be made good by the contractor who shall also arrange for the supply of red barriers, signals and red lamps at his cost. These should be placed at the ends and sides of trench to protect it properly.

- 5.5 Surplus earth and road spoils must be removed within 48 hrs of the completion of the work, to the satisfaction of the authority concerned. Failure to remove the surplus earth, road spoils within specified times will result in a penalty of maximum of 10% of the cost of trenching plus the cost of temporary restoration done through other agencies and charged by the latter. Permanent restoration to pre-trenching state of surface is to be done within 7 days maximum after trenching, failure to which will invite penalty of maximum of 10%.

Note:- cable laying at Tracer /Road casings shall be done in treadles manner as provided in the schedule.

**6 Laying of other Telecom cables in the same trench :**

- 6.1 No other cable shall be laid in the trench for the telecommunication cable. Where, however, exceptional circumstances exist, the telecommunication cable may be laid along with another cables in the same trench provided a specific permission of each such case is obtained in writing from Engineer. When telecommunication cable, L.T. power cable and Signaling cables have to be laid in the same trench they shall be separated by placing a layer of brick between them vertically (approx. 16 bricks /meter) or laid in RCC/GI pipe. Relevant provision in Rly Telecom manual in this connection shall be complied.

**Laying of cable through pipes:**

- 7.1 The cable shall be laid through DWC/GI/HDPE at the locations marked on the tapping and route and as advised by the Engineer or his representative.
- 7.2 While laying the cable through pipes, galvanized steel wires of a cross section not less than 10 SWG shall be laid through the pipes, so that after the cable is laid through the pipe, the pipe with suitable overlay at two ends enable the cable to be pulled out at a later stage if required to do so.
- 7.3 On Arch bridges and culvert bridges the cables will be laid through GI/DWC/HDPE pipes etc. While laying the cable through these pipes the contractor shall do the trenching to the required depth wherever necessary for which no extra charge will be paid.

**8 Prevention of damage due to sharp edges:**

When cables are laid in trench, care should be taken to see that no ballast or stones have dropped inside the trenching. The trench should be cleared of all ballast and stones, before the cover is secured. When the ends of covers are joined together with cement plaster a piece of paper or wood should be placed under the joint to prevent the cement plaster from falling on the cables.

**9 Joints of OFC/6Quad Cable/50 pair/20 pair/10 pair PIJF telecomm cable:**

- 9.1 OFC/6 quad /50 pair/20 pair/10 pair PIJF telecomm cables are meant to provide communication between two block stations and the subscribers from exchanging. Accordingly only normal & derivation joints with or without transformers need to be provided. As the joint is always a weak link, efforts shall be made to club two or more joints in one if falling within 100 meters.
- 9.2 The straight through joints shall be provided for normal jointing of cable.

**10 Termination of OFC/6Quad Cable/50 pair/20 pair/10 pair PIJF telecomm cable:**

- 10.1 All cables (OFC/Quad/PIJF) shall be terminated on C.T. Boxes/location boxes/DP boxes of suitable sizes. C.T. Boxes/DP boxes shall be mounted on the wall/post at a height of 1 to 1.5 mtr from the floor.



11 **Jointing Procedure:**

- 11.1 For jointing of cable, the pit surface shall be leveled by ramming the earth. In case of loose soil or mud, bricks or ballast may be used if necessary.
- 11.2 The two cable ends shall be bent slowly into an "S" shape taking care that the cables are not strained excessively and minimum overlap of 350 mm. is available.
- 11.3 Prepare the cable ends as per the detailed installation instructions for making heat shrinkable joints for 6 Quad/50pair/20 pair/10 pair PUF telecom cable.
- 11.4 Preliminary checks may be carried out using multimeter for continuity & breaks/crosses etc. if any. The insulation is measured between, all conductors bunched together and screen /armor by 100 V megger. The equivalent average insulation resistance /conductor/Km is obtained by multiplying the megger reading with the number of conductors and the length of cable in Km's.  
Slip the quad rings on a PE insulated quad at the cable end. Similarly, slip quad on the corresponding PE insulated quad of the other cable. Select a conductor. Slip a PE sleeve over it. Take the corresponding conductor of the cable from other side twist to make a joint and solder with the help of bit flat & blow lamp. Fold the twisted conductors along the main cable conductors and allow it to cool. Draw the PE sleeve over twisted joint in such a way that former projects equally on the two sides of the latter and equally covers the poly-ethylene insulation of the two conductors. It should be ensured that the PVC sleeve fits properly over the twisted joint and is not able to move easily over it.
- 11.6 The conductors of remaining PE quads should also be joined accordingly.
- 11.7 Complete the joint as per the detailed installation instructions for making heat shrinkable joints for 6 Quad/ Telecom Cable. To ensure that moisture ingress is avoided in the cable, before closing the joint, after putting the PVC tape on the hardener will be put on the joint so that whole of the joint is immersed in the hardener.

12. **Emergency socket and Rail post**

- 12.1 Complete fabricated unit including emergency socket and rail post shall be as per given drawing.
- 12.2 This item includes supply of emergency socket to latest RDSO Specs, Emergency socket box, GI pipe fabrication of complete set by welding/arranging MS sheet, fasteners as per given drawing and instructions of the engineer at site. Only rail post shall be supplied by the railways at the depot of concerned P-Way supervisor in the lengths available, contractor shall have to arrange cutting to the required lengths, transportation to the site and welding of smaller pieces if required etc as per site requirement, all other material has to be supplied by the contractor.
- 12.3 This also includes finishing of the fabricated post, provision of minimum two coating of good quality primer and minimum two coatings of enamel as per given drawing.
- 12.4 This also includes testing and ensuring satisfactory communication from the socket to the nearest feeding point/control office.

- 12.5 Emergency circuit shall work on quad cable between station to station and shall be patched at every Amplifier/Equalizer or OFC/P-MUX locations to one of the omnibus channels. The circuit will work on 4 wire basis.
- 12.6 Emergency sockets shall be provided in socket boxes mounted on suitable rail post all along the route at an interval of 1 Km (max), generally in accordance with the approved tapping diagram.
- 12.7 The quad cable on which emergency circuit is to be provided shall be in drum length of approx. 1 Km. Hence emergency socket will be provided normally where the quad cable ends except at places where mandatory provision of emergency socket has to be made such as near feeding posts, sectioning posts, sub sectioning posts, approaches of bridges etc as per tapping chart/instructions of the engineer at site.
- The connection to emergency socket from the quad cable shall be given through a derivation transformer joint in the 6 quad cable.

### 13 Earthing of Cable:

- The earthing of the cable to be done at cabins/SM' office by using earth available and connecting it to the cable sheath /armour
- 13.1 The drums shall be unloaded by the side of the Railway Track by either a crane or any other suitable means very carefully so as not to cause any damage to the cable. The drums at site shall be protected until they are laid.
- 13.2 On each drum there are two ends, A&B. The 'B' end of one cable length shall meet 'A' end of the next cable at a joint. The 'A' end shall be normally on the top unless indicated otherwise on a drum.
- 13.3 The drums shall always be kept upright, i.e. axle in parallel position to the base. The drums shall not be set by jerks but shall be handled slowly and with care. The walls of the drums should not be damaged while the drums are moved if required for unrolling.
- 13.4 The drums shall normally be unrolled at the same place and the cable carried by workman near the trench. The drums shall not be dragged in any case, but where drums of cable have to be moved would always be rolled in the direction of the arrow, otherwise the coils tend to unwind and the cable may get battered. In case no direction arrow is marked on the drum, remove several battens and determine the direction in which the cable is coiled. The arrow should then be painted on the drum pointing in the opposite direction in which the upper cable end is coiled so that future handling of the cable drum is facilitated and then replace the battens carefully.
- 13.5 The drum should be properly mounted on jacks making sure that the spindle is large enough to carry the weight, without bending and that it is lying horizontally in the bearings so as to prevent the drum creeping to one side or the other, while it is being rotated. Before attempting to pull off the cable, remove the end protection box attached to the flange of the drum and cut the security ropes so as to leave the cable free to move.
- 13.6 If a portion of the cable only is taken out from the cable drum, the battens should be immediately restored back to prevent damage to the balance of the cable. This is important.



- 13.7 With armored cables having Hessian serving, it is possible under extreme conditions for the bitumen to soften and cause adjacent turns of the cable on the drum to stick to each other. In such cases, all care should be taken in handling cable drums with a view to ensure safety not of the cables but also of the working party handling them. The men should not be allowed to break the cable drum by standing in front but only from the side.

14. **Cable Route Marker**

- 14.1 Shall be as per given drawing  
14.2 Shall be prepared with Cement, Sand and Concrete in the ratio 1:3:6.  
14.3 Inscription on the marker shall be as per drawing and as per directive of the engineer at site.  
Quality of the cable route marker shall be ensured by proper compression and quenching etc as per civil engineering manual.  
14.5 Shall be provided at every 200 meter and location decided by engineer at site  
14.6 Depth to be buried in the ground shall be as given in the drawing

15. **GI Pipe**

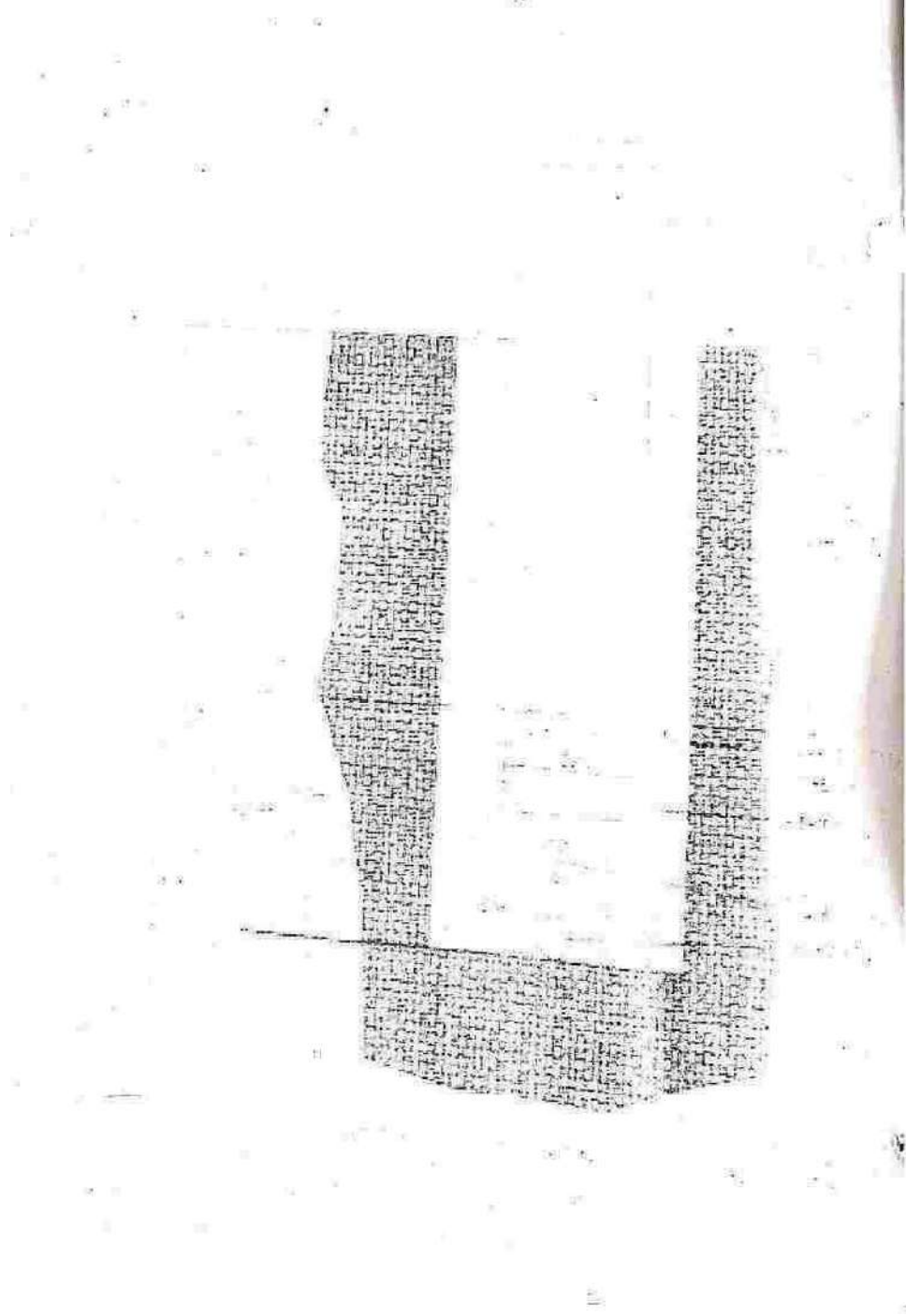
- 15.1 Shall be of good quality  
15.2 Shall be rust free  
15.3 Shall be perforated where required by drilling holes before installation as per directive of the engineer at site (minimum 20 holes of 3mm per meter).  
15.4 Pipe shall be fixed with the help MS clamps and nut/bolts as per site requirement, average distance between two clamps shall not be more than 1 meter.

16. **Masonry Pit**

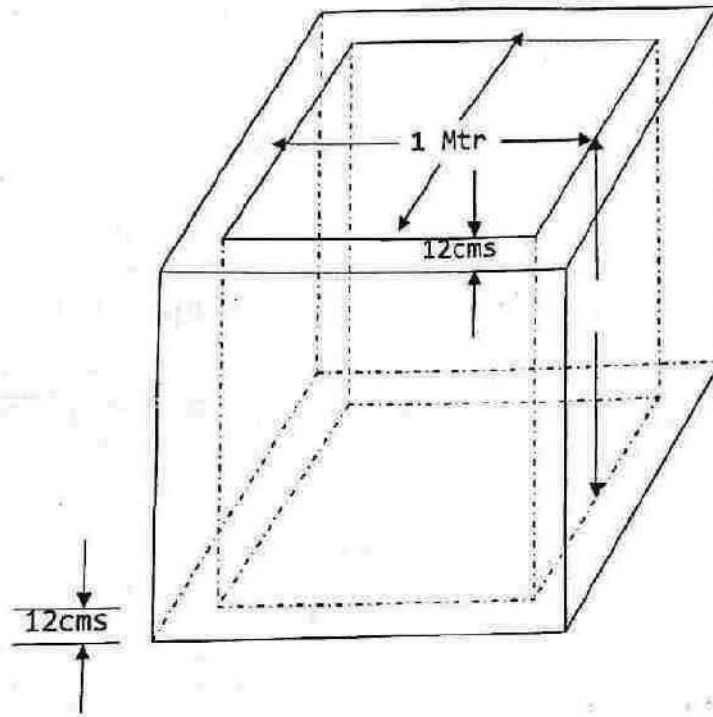
- 16.1 Shall be prepared as per Drg.  
16.2 Shall be prepared with bricks using cement and sand as per Railway Civil Engineering manual.  
16.3 Shall have inner dimension of 1Mx'Mx'M plastered from inside and shall having RCC cover (8cm thick) split in two halves.  
16.4 Shall be filled with sand inside.



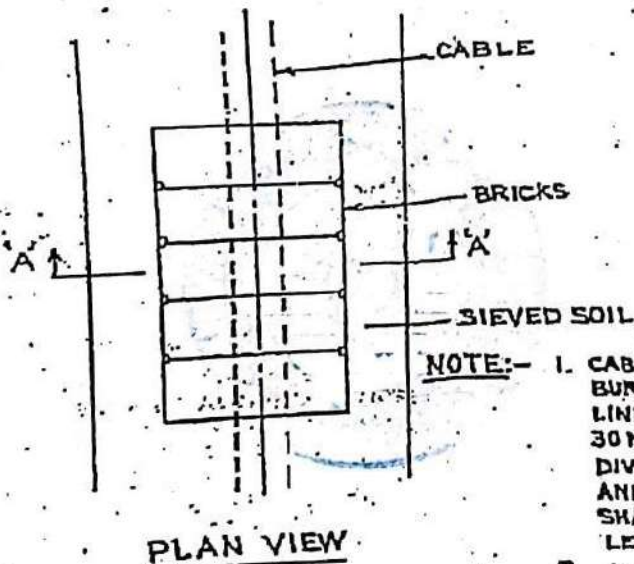
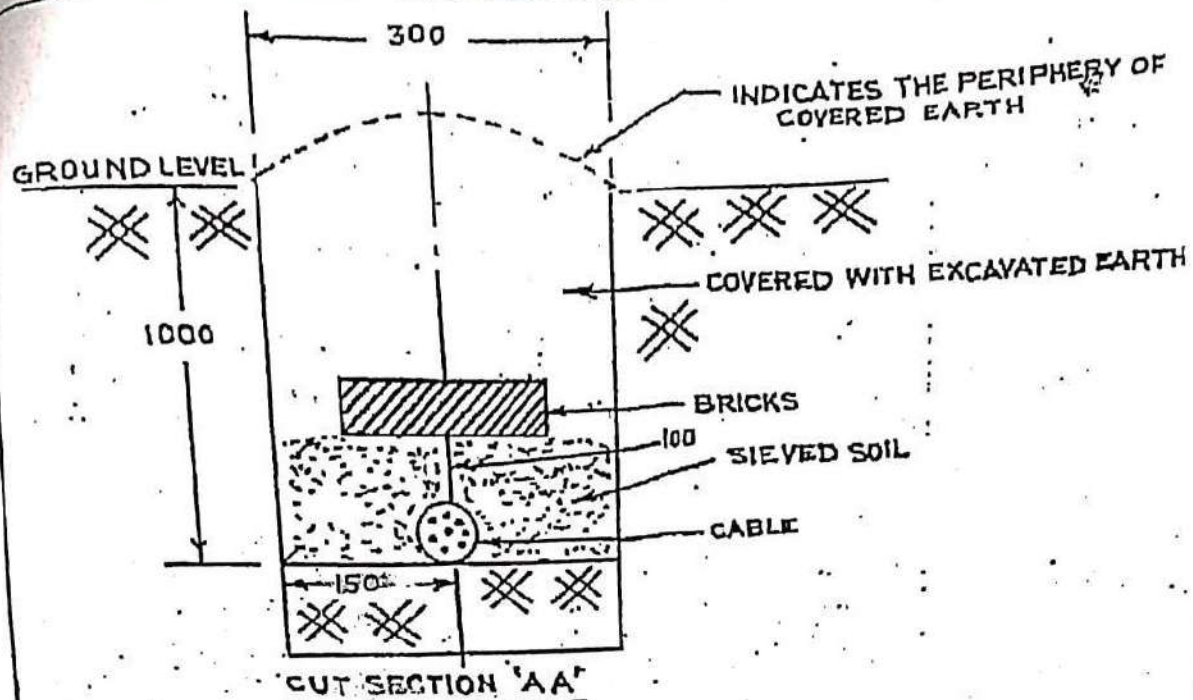
## CABLE ROUTE MARKER






## MASONRY PIT

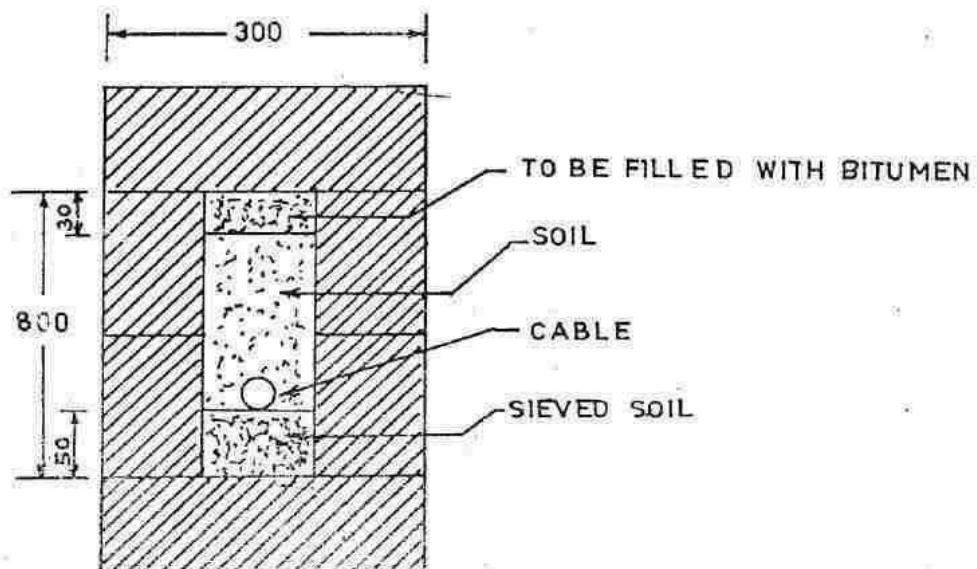


**DRAWINGS APPLICABLE IN TENDER**



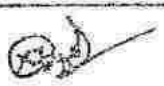
- NOTE:-**
1. CABLE MARKERS SHALL BE BURIED ALONG THE CENTRE LINE OF TRENCH AT EVERY 30 METRES AND ALSO ON DIVERSIONS AND CROSSINGS AND THE MARKER FACE SHALL BE 100 ABOVE GROUND LEVEL.
  2. ALL DIMENSIONS IN MM.

		 S E B. D. / L D H		No NR/S&T/CON/1-1/97-A
N. R.	CABLE TRENCH			
	NOT TO SCALE	DRN.	SE/C ASTE/SPL	

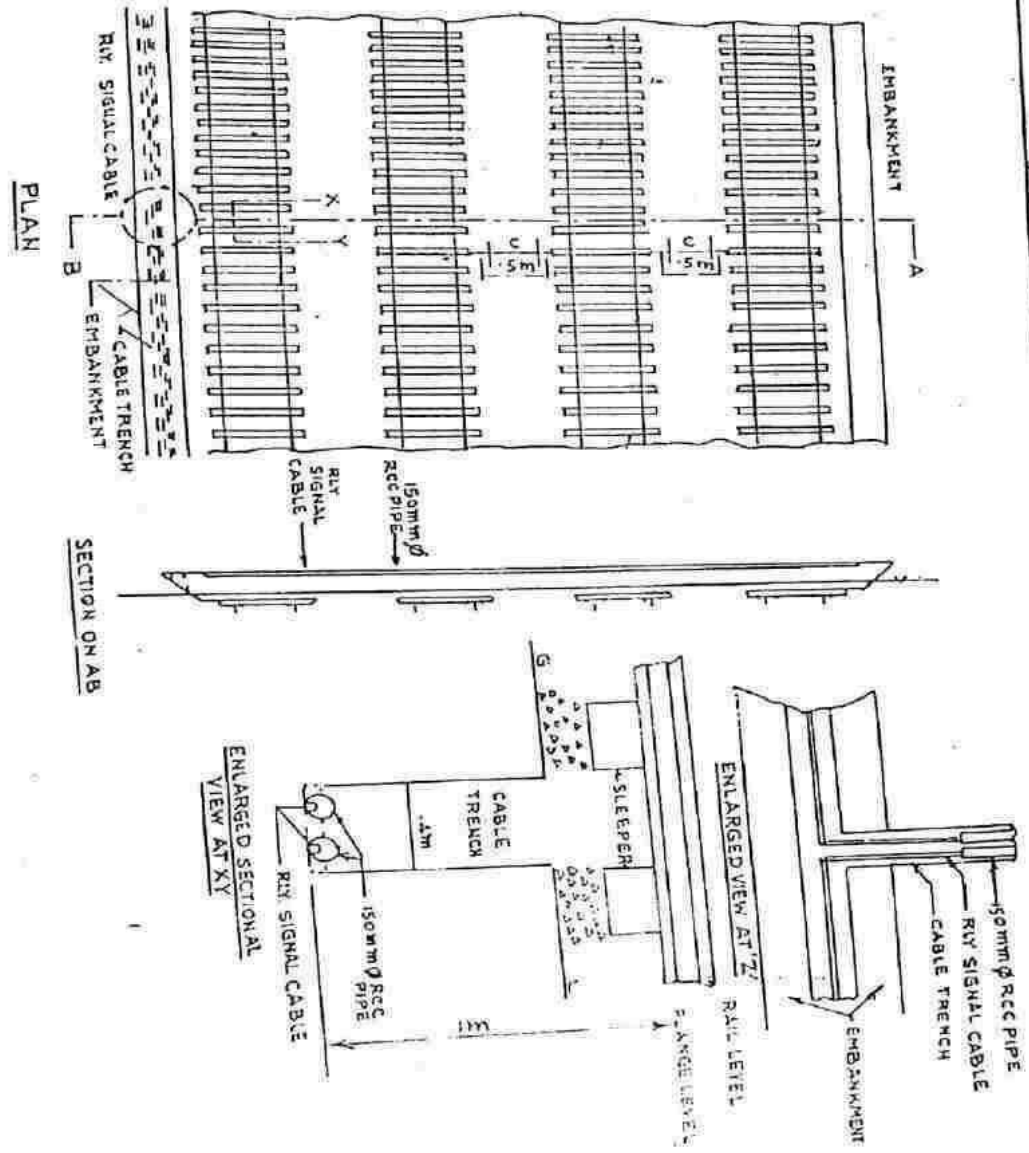


NOTES:-

- 1 MASONARY WORK TO BE DONE WITH 1:3 CEMENT MORTAR.
- 2 BRICK COVERING TO BE DONE AFTER THE CABLE IS LAID.
- 3 BRICK - SECOND CLASS.

 S.E/D & O/L DH	N. Mohd. DRN: Gm SE/SPL	BRICK MASONARY CHANNEL	Nº NR/S&T/CON/1-1/97
A.S.T.E/C/ SPL/TKJ	Yon	NOT TO SCALE	

Prep.



For KVA...

*Signature*

Proposed

*Signature*

SE/D & D/LDH

RCC PIPE UNDER TRACK CROSSING

*Handwritten notes and signatures*

No NR/S & T/CON/1.2/97

Asst. Secy. to Govt. Secy. (Sgt./Comm)  
N. Rly. Baroda House, New Delhi

NOT TO SCALE

DRR SE/D AST/CON