



KERALA STATE ELECTRICITY BOARD LTD.

(Incorporated under the Companies Act, 1956)

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ABSTRACT

Kerala Fibre Optic Network (K-FON) Project – Guidelines/Safety Procedure for drawing ADSS Optic Fibre cables through the distribution poles of KSEBL –Sanctioned-Orders issued.

CORPORATE OFFICE (IT&CR)

B.O. (FTD) No 81/2020 (CE-IT&CR/RITU/KFON /2019-20) dated TVPM.

04.02.2020

- Read:**
1. B.O.(FTD) No.2079/2015(D(D&S)/D5/GI/1942/2014) Thiruvananthapuram Dated 22.08.2015.
 2. Letter No. KSITIL/MD/KFON/19/2588 dated 9.08.2019 of the Managing Director, KSITIL.
 3. Note No. CSC/Safety/General KFON/ 2019-20/356 dated 24.09.2019 of Chief Safety Commissioner, KSEBL.
 4. Note No. CE(IT&CR/RITU/KFON/2019-20/281 dated 04.11.2019 submitted to the Full Time Directors through the Director (D, IT & HRM).
 5. Letter No. CSC/Safety/General/ 2019-20/458 dated 26.11.2019 of Chief Safety Commissioner, KSEBL.
 6. Note No.D(D&IT)/D5/Cable-Poles/2019-20/0010 dtd.12.12.2019 of Director(D, IT & HRM).
 7. Note No. CE-IT&CR/RITU/KFON/2019-20/357 dated 20.01.2020 submitted to the Full Time Directors. (Agenda No 89/1/20)

ORDER

The KFON (Kerala Fibre Optic Network) project, the mega infrastructure project of Government of Kerala which aims to build a high speed, reliable and scalable fibre network across the state to provide connectivity to all Government and Educational institutions leveraging the Transmission and Distribution infrastructure of KSEBL and is progressing at a fast pace. The KSITIL is the nodal agency for executing the project and the work is being executed by M/s Bharath Electronics Ltd.

As part of this project, in the distribution network, KFON will lay ADSS cable through the KSEBL's poles as per the guidelines of KSEBL and by observing safety procedures. Accordingly, Guidelines/Safety procedures for laying Optical Fibre Cable through distribution poles of KSEBL applicable to KFON project has been formulated with the suggestions recommended by the Chief Safety Commissioner, KSEBL. The Chief Engineer (IT, CR & CAPs) placed the matter before the Full Time Directors as per note read (7) above through Director (D, IT & HRM).

Having considered the matter in detail the Full Time Directors in the meeting held on 30.01.2019 resolved to approve the revised Guidelines/Safety procedures for laying Optic Fibre Cable through Distribution poles of KSEBL for KFON project, (**Annexure** to this order), and for providing the same to KFON/KSITIL.

Orders are issued accordingly.

By Order of the Full Time Directors

SD/-

LEKHA. G

COMPANY SECRETARY (I/C)

To

The Chief Engineer (IT,CR&CAPs).

Copy to:

1. All Chief Engineers (Distribution).
2. All Chief Engineers (Transmission/T-SO/Transgrid).
3. All Deputy Chief Engineers (Distribution/Transmission/Transgrid/SOC).
4. All Executive Engineers (Distribution).
5. The T.A. to Chairman & Managing Director/Director (D,IT&HRM)/ Director. (T,SO,S,CP&REES)/Director (G-E&SCM)/ Director (G-C).
6. The P.A. to Director (Finance)/ Senior CA to Secretary (Admn).
7. The Financial Adviser/ Chief Internal Auditor.
8. The Fair Copy Superintendent/ Library/ Stock File.

Forwarded / By Order



Assistant Engineer

General Guide lines for Laying Optical Fiber (OF) cable through the Distribution Poles of KSEB Ltd

Part 1. General Conditions

1. In case of any difference or dispute relating to or arising out of the above agreement, the same shall be referred to the concerned Chief Engineer (Distribution) for decision and the decision thereon will be final and binding on the parties.
2. If any additional pole or transformer installed after the permission taken for drawal, the operator shall be responsible for making the standard arrangements for the new poles and for payment of the lease amount for the new poles also.
3. The operator will indemnify and keep harmless KSEBL against any expenses that may be occurred in connection with any suit or other proceedings filed in any court or before any authority in respect of any matter related to and/or arising out of the drawal of cables by such operator through the poles of KSEBL.
4. The KSEBL will not have any liability in respect of claims under Workmen's Compensation Act or otherwise made by the employees of operators consequent on any accident during their course of employment under him.
5. The operator alone shall be responsible for payment of compensations for the death/injury, if any, caused to any person including employees of KSEBL and for the loss caused to properties of any other person due to any accident that may occur by the malfunctioning/improper maintenance/ nonstandard construction of their network.
6. In case any financial loss is caused to KSEBL, while installing/carrying out maintenance of the cables resulting in any damage to KSEBL property or any type of damage to third party, the loss has to be borne by the operator.
7. Whenever maintenance works of electric lines by KSEBL are necessary, KSEBL has the right to direct the operators to remove cables temporarily so as to carry out the maintenance work within the time limits specified by KSEBL. After completion of the work the operator is liable to reconnect the same at their cost. In case the operator fails to remove the lines within the specified time limit, the KSEBL shall have the freedom to remove the same through suitable persons and to realize the cost from the operators. The operators who fail to remove the cables, in spite of the directions of the KSEBL officials are not entitled for reconnection of the cable without the permission of KSEBL.
8. In case the cables in any pole are required to be removed permanently for any bonafide use of KSEBL, the KSEBL has the right to direct the operators to remove the cables permanently within a specified time limit. If the operators fail to remove the cables in spite of the directions of KSEBL officials, they are not entitled for reconnection of the cables without permission of KSEBL.

9. In case, if the Cable is to be removed permanently for any bonafide purpose of KSEBL, the operator will not be eligible for any compensation for shifting of cable or any other work.
10. The KSEBL will not be responsible for any interruption and/or interference caused to the quality of the signals, due to the proximity of power lines/cables or other reasons.
11. In case, any shifting or alteration in the position of the laid cable is required due to shifting of poles because of widening of roads, construction of flyovers etc. the operator shall do the same at their own cost within a specified period. All operators concerned shall coordinate the alteration work if any, that need to be carried out on pole/poles in a particular location, in coordination with the Electrical Section office concerned to set right the existing network on cost sharing basis among the operators.
12. Written permission should be obtained from the concerned Electrical Section/ Electrical Sub Division before commencement of the work of drawing of Cables through utility poles. At the time of execution of such works the permit to work issued by Asst. Engineer/Asst. Executive Engineer concerned should be made available at the work site and should be produced on demand by the competent KSEBL staff or Officers. No maintenance of such cables shall be allowed on electric poles from 6 PM to 8 AM except on emergency situations with permission of concerned officials of KSEBL. The directions given by AE/AEE in this regard shall be complied with.
13. The Asst. Exe. Engineer concerned should ensure that the work has been done as per technical standards and guidelines specified and that the operators has adhered to the directions stipulated.
14. Unique Identification Number has to be provided to each Operator. The concerned cable operators shall tag their respective cables drawn through the distribution poles of KSEBL. The tag should contain the unique identification number provided by KSEBL due to privacy concerns. Tags should be provided at suitable intervals.
15. The operator has no right to transfer/sell/assign his right under the license/sanction issued by KSEBL to draw cable to any person under any circumstances without prior permission/sanction from KSEBL. In case the operator transfers his right under the license/sanction without the permission of KSEBL, KSEBL has the right to revoke/cancel the license/ sanctions issued to the operator.
16. In no circumstances, operators should interfere with the smooth functioning of the distribution of power by KSEBL.

PART .2 A General Technical Standards, Installation methods and Safety Guidelines

1. Before starting the cable laying work ,the operator has to prepare a detailed route map showing the roads, Land marks, Pole number, details of existing cable where he is allowed to draw the cable and the route map with details is to be submitted to the concerned Assistant Executive Engineer, Electrical sub Division for approval, along with the details of the proposed cable(Data sheet showing type, Diameter , no. of fibres, kg/km etc).
2. Once the route is approved, a joint survey is to be conducted by the concerned distribution section officials and Cable operator for finalising the cable Drawing methods and modification work required in the distribution network like changing the X arms, street light position, insertion of pole if required for keeping the road crossing clearance etc...
3. The distribution network modification, if required, are to be carried out on deposit work basis before laying the cable.
4. X arms has to be provided with condition that the drawing of the cable may be carried out only on one side of the pole and the other side of the cross arm should be kept free for attending KSEBL works on such poles.
5. Written intimation shall be given to the Assistant Executive Engineer of the concerned distribution sub division before commencement of work for installation or maintenance of cable. Erection of cables and subsequent maintenance should be effected under the supervision of the authorized personnel of KSEBL adopting all safety procedures as required for power lines.
6. The operator shall draw Optical Fibre Cable following the Guidelines issued by Government of Kerala and KSEBL. Utmost care should be taken for the safety of the workmen of both the KSEBL and that of the operators and the general public as well. OPERATOR shall also ensure safety and security of all installations of the KSEBL for which they have been allowed to run their cable networks. OPERATOR shall also comply with the Central Electricity Authority (measures relating to Safety and Electricity Supply) Regulation, 2010 as amended from time to time and other relevant norms for safety and security related to such installations.
7. A minimum ground clearance of 3.05 m shall be maintained for the cable taken along the street concerned.
8. A minimum vertical clearance of 1.2 m shall be maintained for cable from the lowest power conductor i.e. any functional conductor including that of the street main or any earthed conductor.
9. When cables are drawn across the road, a minimum ground clearance of 5.8 m shall be maintained.

10. The Splice box, Cable loop etc are to be placed in the pole with standard hardware fittings, in such a way that it will not make any inconvenience to the line staff in carrying out maintenance activities.
11. In case of any accident to men/equipments occurring due to snapping of electric conductor over communication cable or on account of the communication cable coming into contact with any parts of the installation which have become live for any reason, KSEBL will not be held responsible and no compensation whatsoever can be claimed from KSEBL for damages either by Operators or by any of their subscribers.
12. In case of any accident to men/equipment due to rupturing of KSEBL poles or snapping of conductors along or across the road/street due to over tightening of cables on KSEBL support poles or due to the OF cables getting entangled with hooks on vehicles, the operator will be responsible for such accidents and will be bound to pay the entire compensation for such damages occurring to public/property/KSEBL equipment etc.'
13. Necessary arrangements must be made by operators to replace immediately any ruptured/deteriorated installations including cable.
14. Any other poles (GI or otherwise) installed by the operator near the KSEBL poles for drawing cables have to be removed.
15. Specifications and number of parallel cable and purpose of each cable drawn by each registered cable operator through KSEBL pole should be indicated and recorded. Copy of such records should be kept in section/Subdivision offices and periodic cross checking to be done by section office / Sub division authorities for authenticity. Copy of energisation certificate from electrical inspectorate should be produced by cable operator before charging at respective Electrical Section.
16. Any dangerous condition or abnormality of pole mounting or line alignment caused to drawing of cable lines should be brought to the notice of the operator and they have to rectify the defect within 12 hours, otherwise rectification will be carried out by KSEBL and the expense should be recovered from the concerned operator with fine.
17. Earthing of messenger wire, type of messenger wire, minimum clearance of the cable with power line, clearance from pole and other statutory clearances and other particulars related to safety should be verified by combined inspections and the same should be recorded. Necessary corrections as per report has to be carried out without any delay.
18. Easy and safe climbing of KSEBL authorities for maintenance activities has to be fulfilled by operators at all pole locations. Any difficulty identified shall be rectified by the operators.
19. Cables should be drawn only in alignment with power lines for stability.
20. Excess loop and unwanted loading of cables in between spans shall be avoided.
21. Operators shall be intimated to remove creepers and climbers binding to the cables timely so as to ensure a safe working environment

22. When crossing public/private property, necessary sanction from appropriate parties shall be obtained.
23. Necessary statutory clearances/licenses have to be obtained by the operator.
24. Safety clearance under the Electricity Act 2003, Central Electricity Authority (CEA) Safety Regulations 2010 or any other relevant statute shall be strictly adhered to with latest amendments.

PART .2 B Technical Standards and Safety Guidelines for Ariel OFC cable supported by GI wire

1. Keeping in view of ground and line clearances, the specifications regarding Network isolation and distortions caused by unwanted signals as per IS 13420 part(I):1994 and IEC:728-1:1986 with latest amendments for "Cabled Distribution Systems" and to prevent co-channel and cross channel interferences and RF ingress, only one RF cable per electric poles shall be permitted subject to feasibility.
2. High tensile, stranded bare hot dip galvanized steel wire having minimum breaking strength of 350 kg shall be used as bearer wire. Alternately PVC insulated GI wire or RF cable with messenger of wire of the same breakage strength shall be used. Slotted angle X arm with Porcelain tension and pin insulators suitable for medium voltage installation shall be used for stringing the bearer wire using standard hardware fittings. Simply binding the OF cable to the distribution poles, and hanging the splice box etc. will not be permitted.
3. The bearer wire shall be sectionalised and shall not exceed four spans. Each section of the bearer wire shall be provided with duplicate earthing, by earthing the beginning and end of each section. Sectionalising shall also be done at all places where interlinking are given for power lines.
4. Dielectric support wires having adequate strength can also be used as bearer wire.
5. No. 8 SWG GI wires shall be used for earthing. Earthing shall be done using proper contacts at both ends of the GI wire. Earth electrodes shall be of 38 mm diameter and 2500 mm long, Class – B. GI pipe. The earth wire shall be connected to the pipe using GI bolts, nuts and washers for proper contact. The connection to the bearer wire for earthing shall be made by Britannia joint.
6. The pole clamp assembly shall be fixed to the utility pole, such that a minimum horizontal clearance of 130 mm is maintained between the bearer wire and pole. The clamps shall be hot dip galvanized to resist corrosion.
7. The cables shall be bound or lashed to the bearer wire using PVC coated GI wire or spiral band at intervals of 1250 mm.

cables for use in cabled distribution systems" or, its equivalent International Specification. of IEC or ASTM or DIN or BSS.

9. The optical fibre cable shall be all die electric, aerial type suitable for outdoor installation using support wire.
10. The cable shall be mechanically sturdy, lightweight, electrically insulated and of low resistance and low attenuation at higher frequencies. The electrical insulation shall be rated for 650 V. The cables shall maintain a minimum clearance of 130 mm from the utility pole, support bracket etc. A minimum clearance of 1200 mm shall be maintained from 11 kV distribution transformer, switch gear etc. Expansion loops shall be provided at supports to prevent unrestrained movement of cables.
11. As per Electrical Inspectorate guidelines, usage of a higher voltage above 110 Volt line Amplifiers is hazardous and dangerous for the network TV subscribers. Therefore, the booster amplifier used in the Network shall be powered by independent KSEB power connections. The operating voltage of the amplifier shall not exceed 110 Volts and powered by low voltage double wound isolation transformers of 240 Volts single phase and controlled by an MCB. The power cubicle with separate KSEB meter shall be effectively earthed using standard earth electrodes.
12. Customer drop Cables shall be taken only through standard tap-off box installed at the support poles, and the drop cable shall be supported on separate bearer wire tied to the poles. The bearer wire carrying the drop cable shall be strung to suitable non-metallic point of the consumer's premises. The bearer wire carrying the drop cable shall be connected to the main bearer using Britannia Joint. Under no circumstances shall the drop cable be taken along the trunk sub distribution RF cable and teed without isolation tap-off.
13. The connectors used shall be tropicalised and weather proof and made of material with lowest coefficient of expansion to avoid loose contacts. Connectors to the customer premises shall be fully insulated and shock proof.
14. AC Power block shall be provided to drop cable brought to the customer's premises to make the connection shock proof. The capacitors used for AC blocking shall be 2 KVAR rating and the capacitance value shall be 220 pf to 470 pf.

PART .2 C Technical Standards and Safety Guidelines for ADSS Optical Fiber Cable

1. All Die Electric Self Supporting [ADSS] optical fiber cable shall be of non- metallic Aerial type designed with required tensile strength for installation on 11 kV/ 440V Power distribution poles suitable for span lengths of 100 mts suitable for Aerial installation.
 2. The OF cable [main cable and Drop cable if used] shall be installed using Cross arms and standard Suspension and Dead-End hardware fittings for the installation of ADSS OF Cable, without any supporting wires. Simply binding the of cable to the distribution poles, and hanging the splice box etc. will not be permitted.
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