



No.2021/Sig/WP/Action Plan

New Delhi,

Date:04.10.2023

**The General Manager,
All Zonal Railway.**

Sub: Requirement of OFC cables for Modern S&T works

Presently a number of modern Signaling and Telecom works like ABS, Kavach, LTE-4G, IPMPLS etc. involving laying of OFC cable, are ongoing on various Zonal Railways. Further, with ingress of technology, various other departments will also be requiring communication networks on OFC back bone. A tentative list of such applications of various departments is attached (Annexure). The list is not exhaustive.

2. It is seen that during execution of the works, the OFC cable laying activities are being carried out mainly specific to the work being executed, without an overview of all the works sanctioned in the same section resulting in repetitive OFC cable activities. In view of above, the issue of OFC cable laying has been reviewed by Board and in order to avoid duplicity of OFC cable laying works, the following has been decided:

- (i) There should be 2 OFC cables of 48 fibers each (96 fibers) on each side of the track.
- (ii) Zones shall carry out section wise gap analysis for provision of 2×48 fibers (96 Fibers) on each side of track duly taking in account the already laid OFC cable in last 10 years in the section and existing various provisions of OFC already covered in sanctioned works.
- (iii) The balance quantity of OFC, worked out based on above, is to be covered by the zonal railways through revision in the estimates of already sanctioned works of Kavach/ABS/LTE etc. The same shall be done in terms of **Advance Correction Slip No. 59 & 60 to Para No. 1110 & 1112 of Indian Railway Code of Engineering, issued vide Board's letter No. 2022/CE-I/CT/5/Engg. Code Revision dated 26.09.22 & 20.10.22 respectively i.e. without treating it as "Material Modification"**. However, target of these works shall not be delayed on this account.
- (iv) Once sanction for entire provision is available to avoid duplicity/multiplicity of works, laying of balance 2×48 OFC (96 Fibers) on both side of track shall be planned by Zonal Railway.
- (v) The proposed scheme of 96-Fiber OFC cables (2x48) on each side of the track shall be implemented in Phased manner preferably in the order of priority as below:
 - a. **1st Priority:** To sections & works of Kavach/ABS/LTE/IP-MPLS on GQ/GD routes where work is already in progress i.e. DLI-MMCT, DLI-HWH sections (~3000 Rkm)
 - b. **2nd Priority:** To balance section and works of Kavach/ABS/LTE/IP-MPLS on GQ/GD routes.
 - c. **3rd Priority:** To sections & works of Kavach/ABS/LTE//IP-MPLS on other than

GQ/GD on HDN, HUN routes.

d. **4th Priority:** To balance sections & works of Kavach/ABS/LTE//IP-MPLS on other routes.

This issues with the concurrence of Finance Directorate and approval of full Board (CRB & CEO, M/F., MI, M/T&RS, M/O&BD).

श्याम वर्मा /Shyam Verma
कार्यकारी निदेशक/सिग्नल (विकास)
Executive Director/Signal (Dev.)

No.2021/Sig/WP/Action Plan

New Delhi, Dated: 04.10.2023

1. The Principal Director of Audit, All Indian Railways
2. The PFAs, All Indian Railways
3. Dy. Comptroller and Auditor General of India (Railways), Room No.224, Rail Bhavan, New Delhi.

For Member (Finance)/Railway Board

Copy To:

1. PSOs/Sr. PPSs/PPSs/PSs to CRB & CEO, MF, MI, M/T&RS, MOB&D, AM/Sig., AM/Tele, PED/S&T/Dev, PED/SM, Railway Board.
2. PCSTEs, All Indian Railways
3. F(x)-II & Budget Branch
4. MD/CMDs of All PSU's

Annexure

The tentative list of various applications identified for data communications on OFC backbone across various disciplines :

S. No.	Application Details	Data Communication requirements
1	Electrical (RS/General):	
1a)	Power Controls, Lobbies, Running Rooms, Workshops, Sheds, PUs, Training Centers, interconnection network of in-motion/desktop based Simulators shall have data communication provisions.	These are Bandwidth requirements in actual and provided by last mile connectivity of OFC to be provisioned by end user with Router/Power supply in estimate. No additional fibre required.
1b)	<p>i) On Board Loco/EMU/MEMU/VB data communications (REMMLOT, Data of ESMON, On Board real time locomotives/Rolling Stock location, Condition monitoring systems – used by loco/EMU/MEMU/VB sheds, trip sheds, workshops to be maintained with CRIS).</p> <p>ii) Way side locomotive/RS condition monitoring data communications and systems (real time wheel measurement system, Pantograph condition monitoring and similar assembly/subassembly system).</p> <p>iii) Real time external and cab video and voice recording system. (CVVRS, EVRS, Railway Driver Assistance System)</p>	<ul style="list-style-type: none"> • Data communicated through RTIS or in built 4G-SIMs. Data being captured through 4G SIMs to shift to LTE-R once rolled out on IR network. • Data to be taken to the nearest ‘Network Point’ on last mile OFC • Provision of Ethernet connectivity in the Edge Devices to be ensured • IP networking to be setup by S&T in mid section network point. • Provision of last mile OFC, networking Router etc. needs to be done by end user in estimate • Two Fiber to be earmark in OFC on each side for path redundancy (for item ii, iii).
1c)	SCADA – Data Communication	Two Fibres are earmark in OFC on each side for path redundancy.
1d)	Other General Services – Data Communication (Water pumps, Lifts, Escalators etc.)	A local requirement at station and no data to central server. No additional fiber reqd.
2	Mechanical:	
	WILD, HAHW, OMRS - Data is currently maintained by OEMs. For OMRS, data is stored centrally at Data Control Centre at Delhi Kishanganj/NR. Data should be centrally maintained with CRIS	<ul style="list-style-type: none"> - Data is communicated through in built 4G-SIM till LTE-R SIM’s rolled out. - Data to be taken to nearest to the ‘Network Point’ on last mile OFC. - Provision of Ethernet connectivity in the Edge Devices to be ensured. - Provision of last mile OFC, networking Router etc. needs to be done by end user in estimate. - IP networking to be setup by S&T in mid section network point

		- Two Fibres to be earmark in OFC on each side for path redundancy.
3	Bridges & Structures:	
	Water level monitoring system – Local Need Bridge Health Monitoring System - Futuristic	Data requirement is local in application, which can be thro. in built 4G-SIM till LTE-R SIM is rolled out. Data can be transmitted to central server & action as pointed out in para 2 above. No additional fiber reqd.
4	Track :	
4a)	Broken Rail Detection system	Data communication is very similar to WILD/OMRS and similar action as at item no.2 would serve the purpose. - Two Fibres to be earmark in OFC on each side for path redundancy.
4b)	Track Health Monitoring system (futuristic)	Provision for two fibres, as mentioned in 4a) above will serve the purpose.
4c)	Vehicle mounted track monitoring systems – TRC, OMS , UABAMS, Instrumented Revenue Train Mounted system.	Data is communicated through in built 4G-SIM/ DVD Recording and will continue with LTE-R through LTE-R SIMs/DVD.
4d)	Track Management System	No additional fibre reqd.
5	C&IS Dte :	
	No separate requirement of OFC cable other than RLDA-DC cloud to CRIS-HQ (which is last mile) is conveyed other than the bandwidth required for connecting data centres.	Requirement of bandwidth for connecting Data Centres would be available through IP-MPLS network being built on IR. Edge devices/last miles are required to be connected to nearest station/mid section network point (LC gate hut, Auto Hut) on local OFC to be provisioned by end user with Router/Power supply in estimate.
6	Signal & Telecom Dte :	
		2 x 48 Fibre OFC cables on each side of the track (i.e. 96-Fiber each side). One 48-fiber cable for short haul (i.e. terminated at every LC, IBS, ABS hut in block section) and other 48-fiber cable for long haul (i.e. station to station).