

ITU-Standardized Affordable All-Terrain Optical Fibre Connectivity

April 20, 2022



US Telecom CEO (Dec. 2019)

**5G is Wired Wireless
Let's lay lots (and lots) of fiber**



<https://www.ustelecom.org/5g-is-wired-wireless/>



**Optical Cable
backhaul**





**WSIS
FORUM 2022**

Starting on 15 March
Final week 30 May - 3 June

Conventional Cable Installation using Conventional Optical Cables



**High Cost using
Heavy Machinery !!**



**WSIS
FORUM 2022**

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ITU-T Study Group 15 Networks, Technologies and Infrastructures for Transport, Access and Home





**WSIS
FORUM 2022**

Starting on 15 March
Final week 30 May - 3 June

ITU-T Recommendations for Affordable DIY Fibre Connectivity

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

L.1700

(06/2016)

Affordability-First Concept for Closing Digital Divide

EFFICIENCY, ENERGY EFFICIENCY;
CONSTRUCTION, INSTALLATION AND PROTECTION
OF CABLES AND OTHER ELEMENTS OF OUTSIDE
PLANT

Requirements and framework for low-cost
sustainable telecommunications infrastructure
for rural communications in developing
countries

Published 2016



ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

L.110

(08/2017)

Lightweight Robust Opt. Cable for Direct Surface Application

EFFICIENCY,
CONSTRUCTION, INSTALLATION AND PROTECTION
OF CABLES AND OTHER ELEMENTS OF OUTSIDE
PLANT

Optical fibre cables for direct surface
application

Published 2017



ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

L.163

(11/2018)

L.110 Cable Installation in DIY (Do-It-Yourself)

EFFICIENCY,
CONSTRUCTION, INSTALLATION AND PROTECTION
OF CABLES AND OTHER ELEMENTS OF OUTSIDE
PLANT

Optical fibre cables – Guidance and installation technique.

Criteria for optical fibre cable installation with
minimal existing infrastructure.

Published 2018





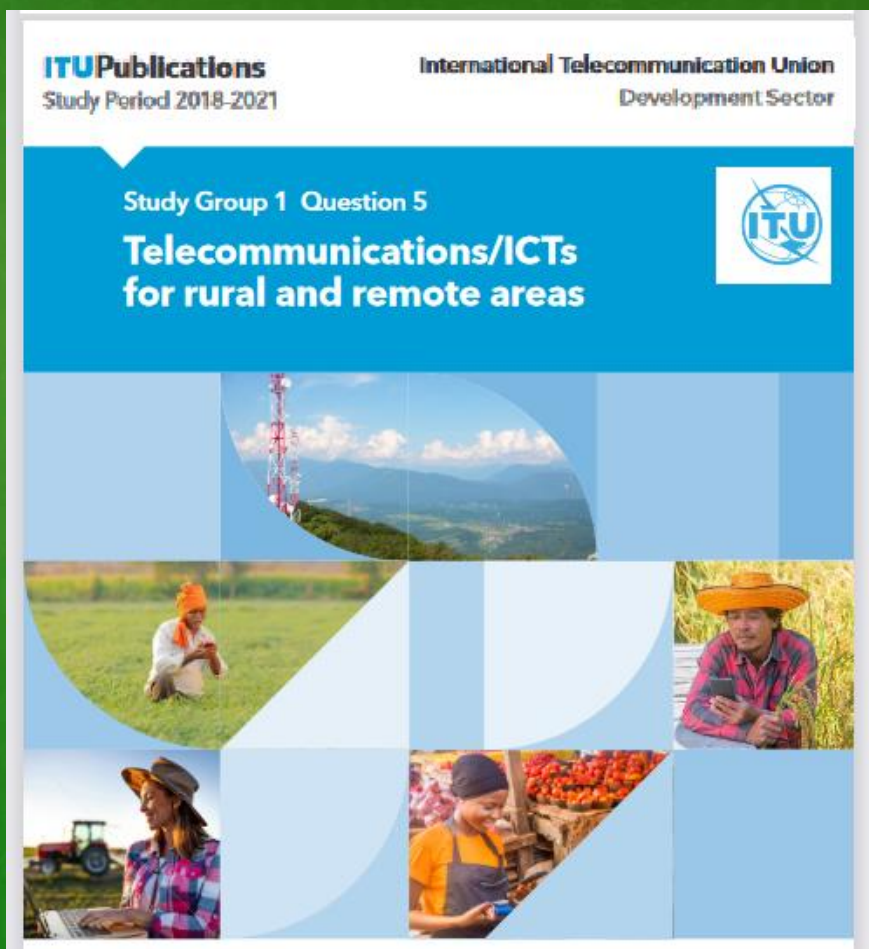
**WSIS
FORUM 2022**

Starting on 15 March
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ITU-D SG1 Q5 (Rural Connectivity) Final Report (2018-2021)



https://www.itu.int/dms_pub/itu-d/opb/stg/D-STG-SG01.05.1-2021-PDF-E.pdf



ITU-T Recommendations

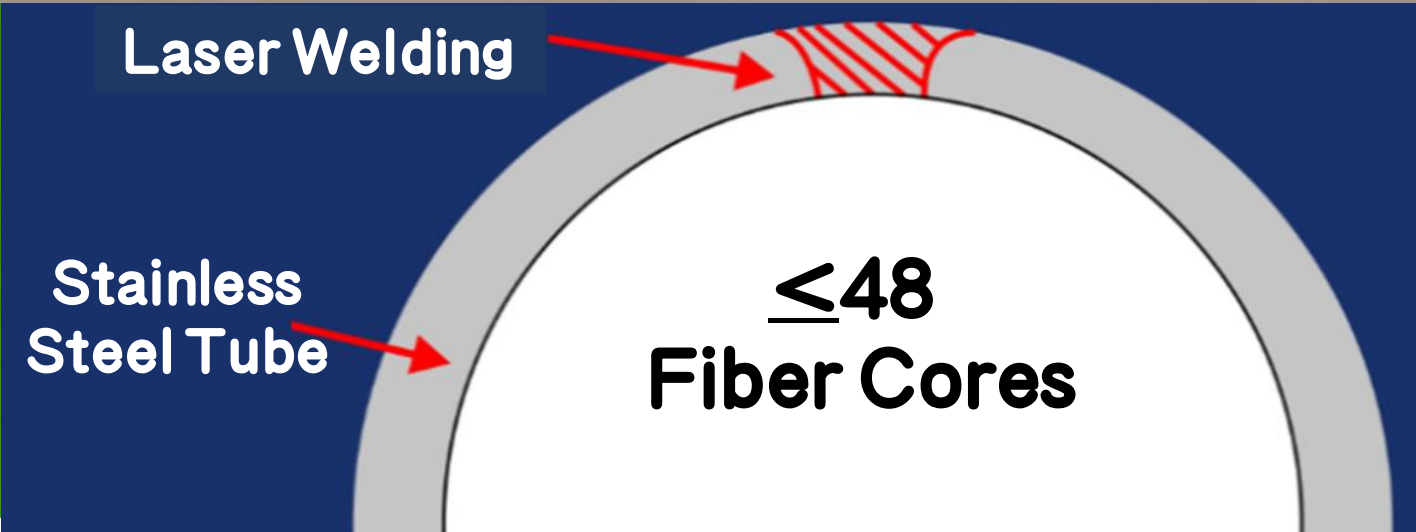
L.1700, L.110, L.163

Most Popular
and Useful
for
Rural Connectivity

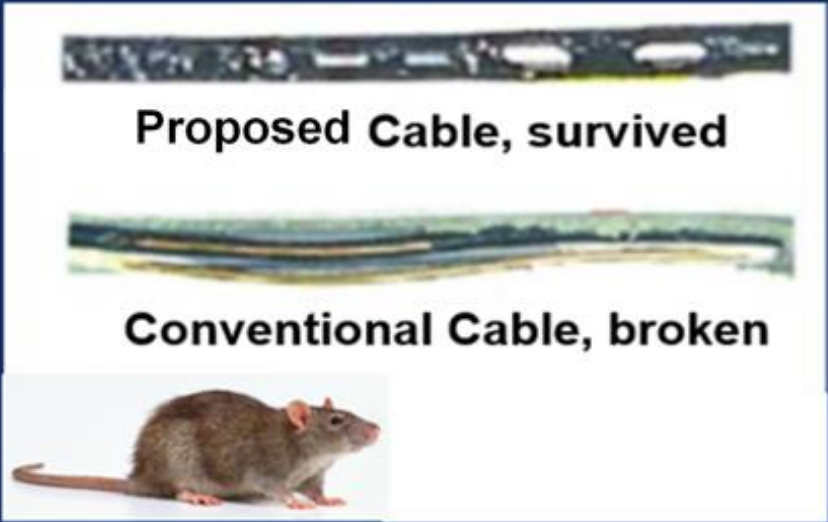
On-Surface Optical Cable for DIY Lightweight, Thin Cable with a Steel Tube



11 mm



Rodent Proof Test

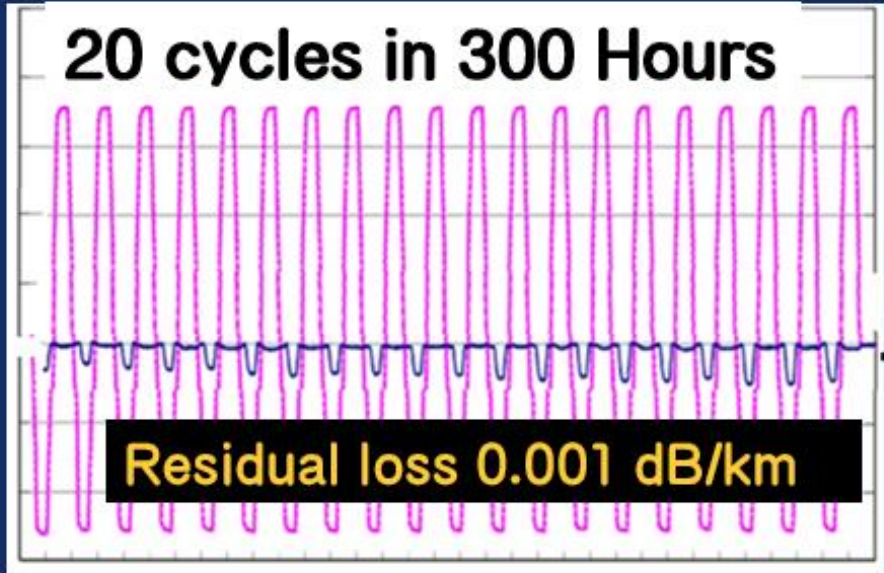


After 1180°C, 15 min
Loss <0.05 dB



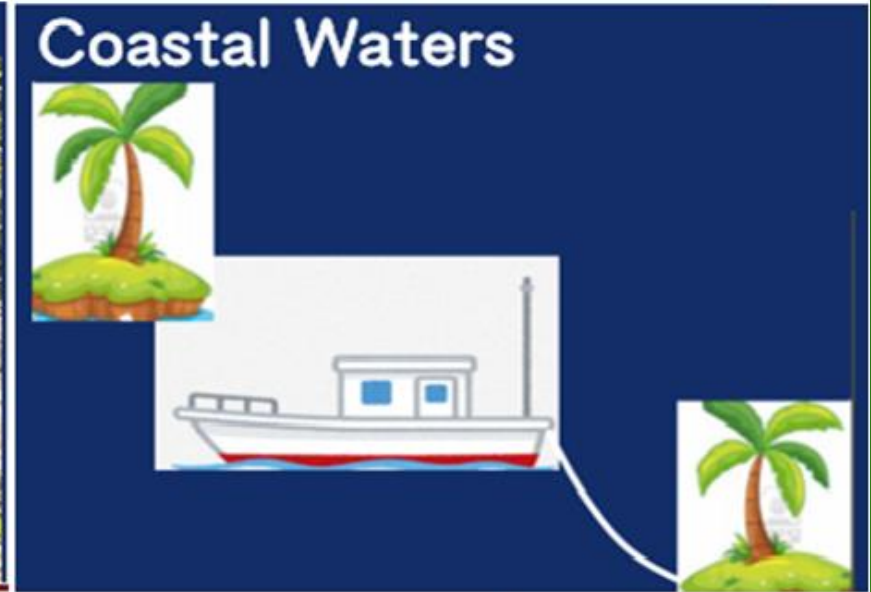
Crush Resistance (2 tons/10 cm)

Heat Cycle -50 °C to +70 °C

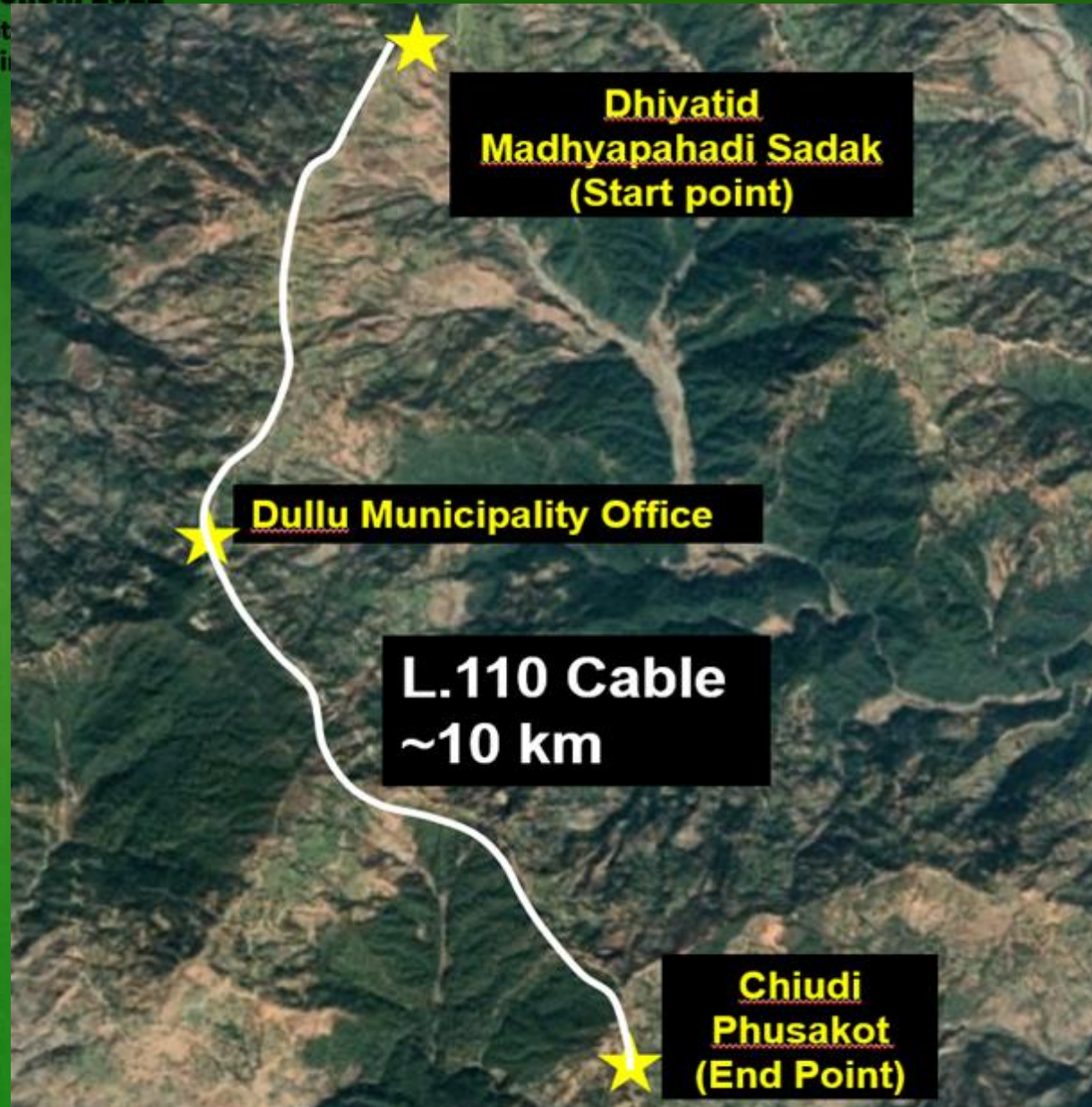


L.110 Optical Cable Durability

Ease of Installation



Solution BIRD in West Nepal, 2019



**Broadband Connectivity
in Dullu Municipality
With**

- Hospital
- Health Centers
- Municipality Office
- Ward Offices
- School
- Wi-Fi base stations

L.110 Cable installation Route



Dullu Municipality, West Nepal, 2019



WSSD
FORUM
Starting
the Final









**WSF
FORUM 2022**

Starting on 15 March
Final week 20-31 March

2.5 years after cable installation Dullu Municipality, West Nepal, Aug. 2021



**L.110-Compatible
φ 11mm Cable**



The cable
is surviving

- Erosion
- Weathering
- Deposition
- Flood

CAPEX Reduction By **DIY** Installation

Conventional Cable



Civil works	58	k US\$/km
Cable	~ 1	k US\$/km
Manhole	4.8	kUS\$/km
Pipe	8.0	kUS\$/km

72 k US\$/km

data by Korea Telecom, at UNESCAP, Sept. 2013, Baku



The cost of cable and its installation was reduced by 88%

L.110 Cable Solution BIRD



-Civil Works	3.3	k US\$/km
	100	US\$/head/day
	300	m/day (10 Workers)
-Cable	< 4-5	kUS\$/km
- No Manhole, No Duct		

8.3 k US\$/km

Good News: Mount Everest regions to get free wi-fi soon (with Optical Cable)



India TV News Desk

New Delhi

Updated on: February 09, 2017

Nepal Telecommunication Authority (NTA) Chairman;

“,,,,,we will set up free wi-fi zones along the Lukla-EBC area and Annapurna trail,”

“Service will operate on the Okamura Model with **low-cost optical cable** for high-speed internet.”





**WSIS
FORUM 2022**

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Mt. Everest Project



Mt. Everest

**Cable Route
42 km**

42 km

34 Cable drums at 2400 m for air-lifting





Difficult terrain L.110 Cable is to be installed



Remote tourism supports eHealth and eEducation of isolated communities



ITU-Standardized Affordable All-Terrain Optical Fibre Connectivity

ITU Standard !!

Lightweight, Robust, Reliable, Long Haul, Optical Cable

DIY Installation: Underground, Surface, Air, Water

Urban Areas, Desert, Mountains, Lakes/Rivers, Coastal islands

Terabit Capable, Backbone/Backhaul, Scalable, Green

Feasibility with low CAPEX/OPEX, confirmed **(Himalayas, Mongolia)**
(Cable, Equipment, Transportation, Installation)



Thank you

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