

# ITU-Standard Optical Cable Solution BIRD\*

## Connecting the Unconnected People at Remote Areas

\* Broadband Infrastructure for Rural-Area Digitalization

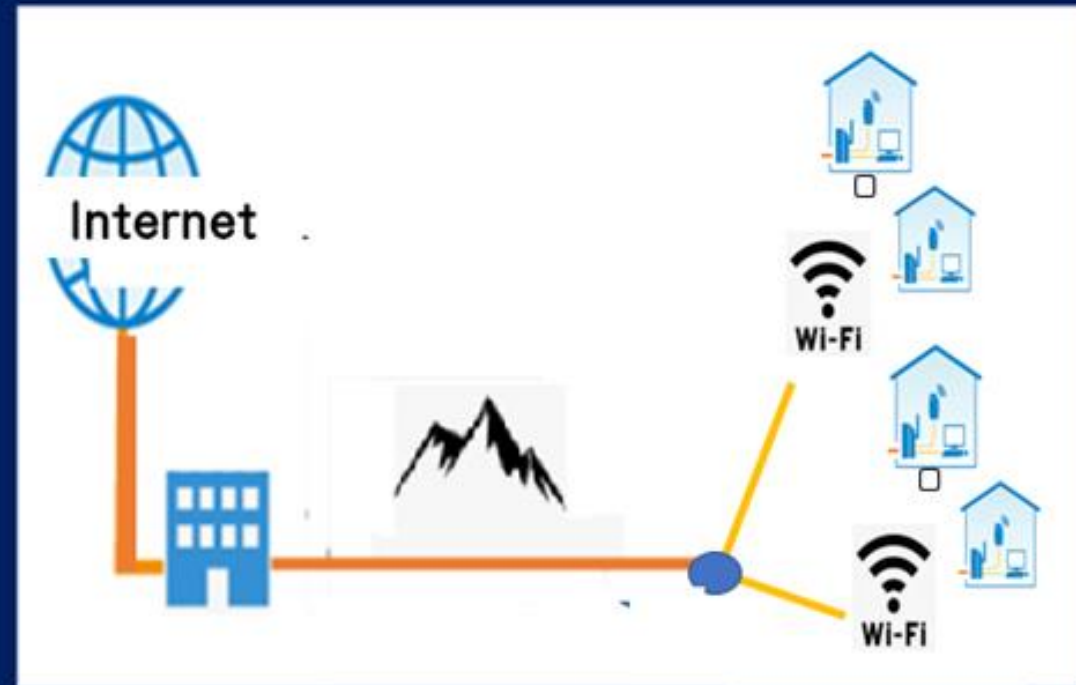


EACO congress, 26 June 2023  
Haruo Okamura, Japan

# LEO or Fibre for Backhaul ?



\* Low-Earth orbit Satellite



\*\* Optical Fibre Cable

**Data Rate 1**  
**Huge Investment**  
(e.g., 10 B US\$, Amazon's Plan)  
**Life 5-7 Years**



**>>1000**



**DIY Installation**

e.g., 8.3 kUS\$/km



**25 Years**

# Conventional Cable Installation

## Optical Cables with overlapped thin metal tape



**High Cost using  
Heavy Machinery !!**

**DIY** is already happening  
now it is fastest in Wales UK, June 2018

*Hard Working !!*



# The 1st voices of the New ITU leadership

-Secretary-General; “connecting the unconnected”

Mar. 23 2023, ITU Sec. Gen. received IEEE President’s Award for making the commitment to close the digital divide globally (@1’33”)



-TSB Director: “happy to work together in the future to connect the unconnected”



-BR Director “ITU role is bringing connectivity to all”



-BDT Director

“double the efforts to get 2.7 Billion people online”



# Proposed Solution “BIRD”

\* Broadband Infrastructure for Rural-Area Digitalization

Expensive, Narrow Band, Skilled Engineers  
Not suitable for Remote Areas

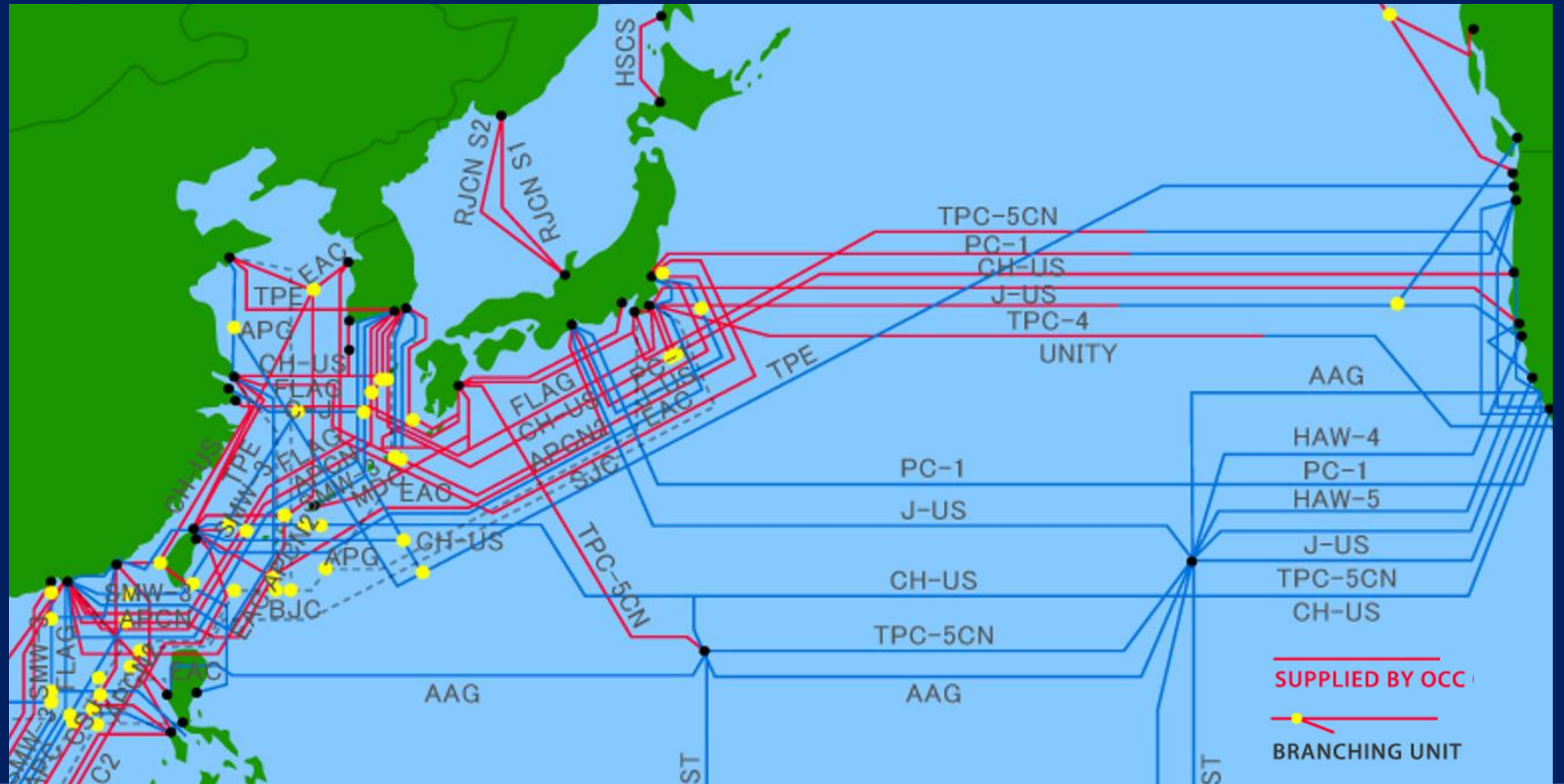


Affordable, Broadband, Reliable  
DIY by non-skilled Engineers  
Suitable for Remote Areas

# Lightweight, Thin, Robust Cable Technology

BIRD

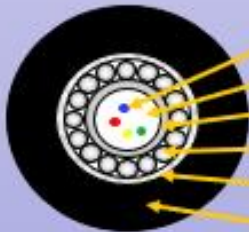
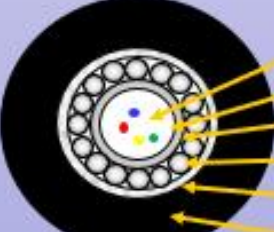
# OCC Inc., Japanese Optical Cable Manufacturer





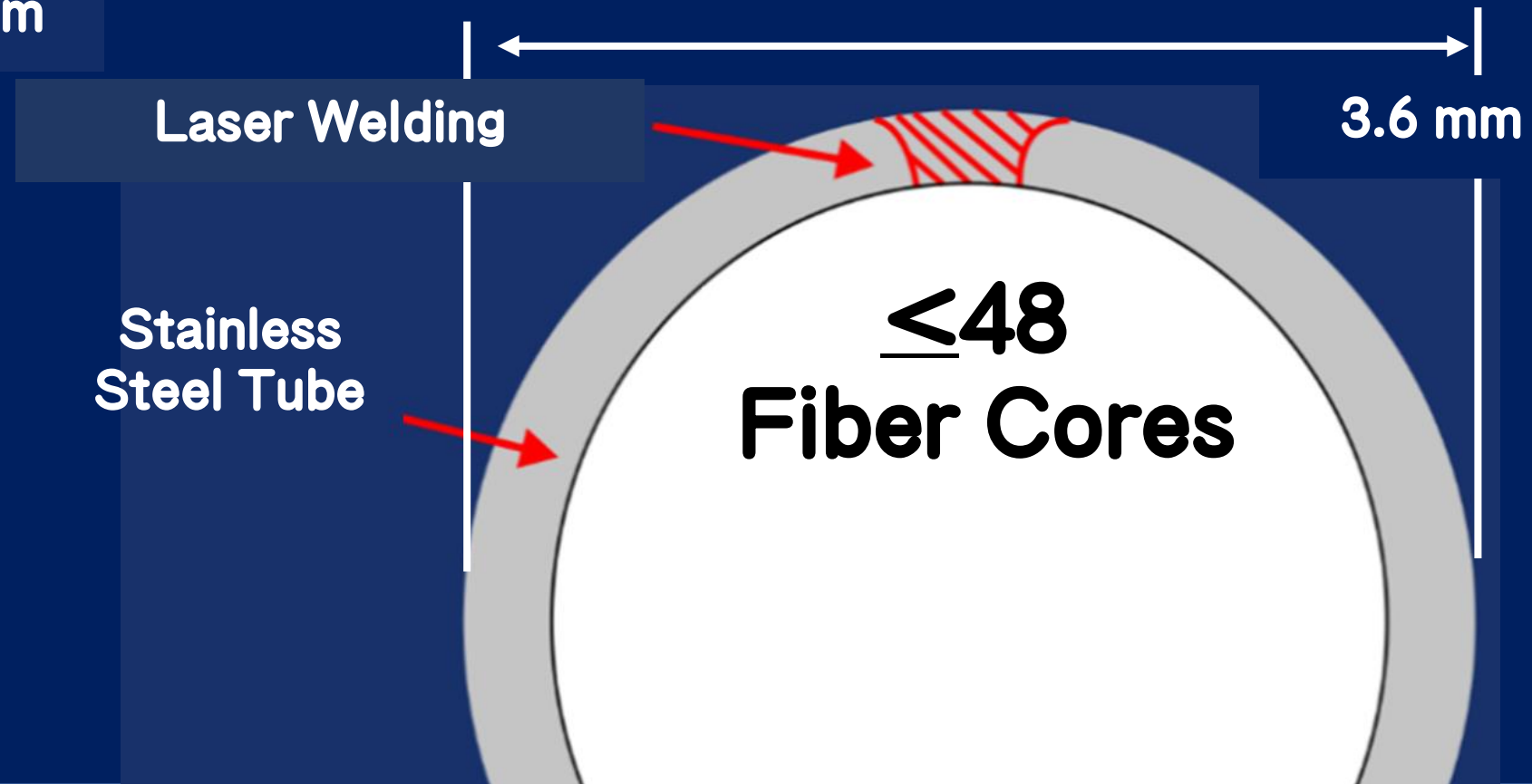
# Supply Record of the **BIRD Cable** by OCC Inc.,

Market	Cable Length	Application
India	76km	Land cable in Submarine network (for Chennai to Andaman and Nicobar Islands)
Overseas	11,700km~	OPGW, Rural area network, Temperature sensor etc.
Domestic (Japan)	14,600km~	Communication network, Railway signal control, Power & Communication composite cable, Mobile communication, Display, Temperature sensor, Disconnection detecting sensor, Event use etc.
Total	26,400km~	

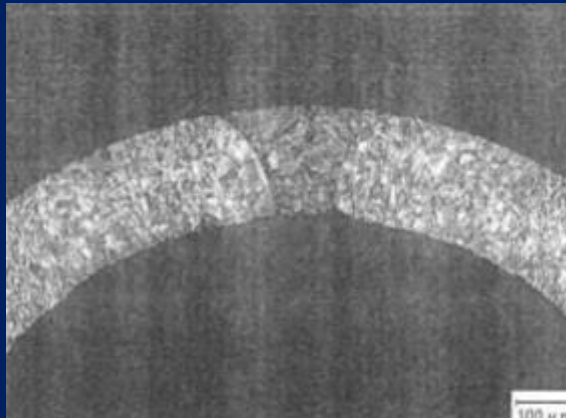
Parameters		Type A	Type B
Fiber Count (Single Mode)		1 ~ 24	1 ~ 48
Nominal Outside Diameter		7.1 mm	8.4 mm
Outer Sheath		LDPE	LDPE
Approximate Unit Weight		90 kg/km	115 kg/km
Allowable Tensile Strength		1,890 N	2,360 N
Allowable Lateral Pressure		6,000 N/100mm	5,000 N/100mm
Allowable Bending Radius	Static	75 mm	84 mm
	Dynamic	150 mm	170 mm
Temperature Range		-30 to 60 <u>degC</u>	-30 to 60 <u>degC</u>
Cross Section		 <ul style="list-style-type: none"> <li>Optical Fiber</li> <li>Jelly</li> <li>Stainless Steel Tube</li> <li>Wire Armored</li> <li>Wrap Tape</li> <li>Outer Sheath (PE)</li> </ul>	 <ul style="list-style-type: none"> <li>Optical Fiber</li> <li>Jelly</li> <li>Stainless Steel Tube</li> <li>Wire Armored</li> <li>Wrap Tape</li> <li>Outer Sheath (PE)</li> </ul>



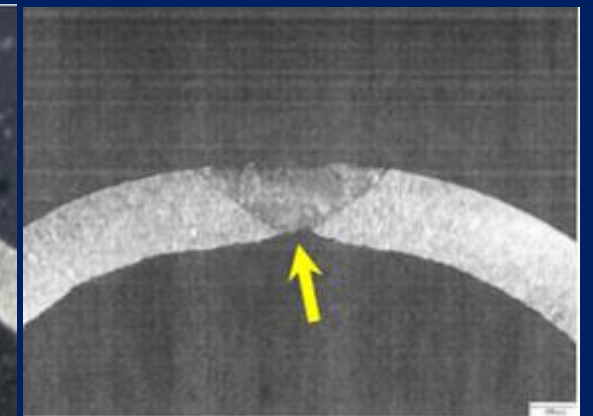
Submarine  
Optical Cable  
used for  
All-Terrain



# Japanese Cable Quality

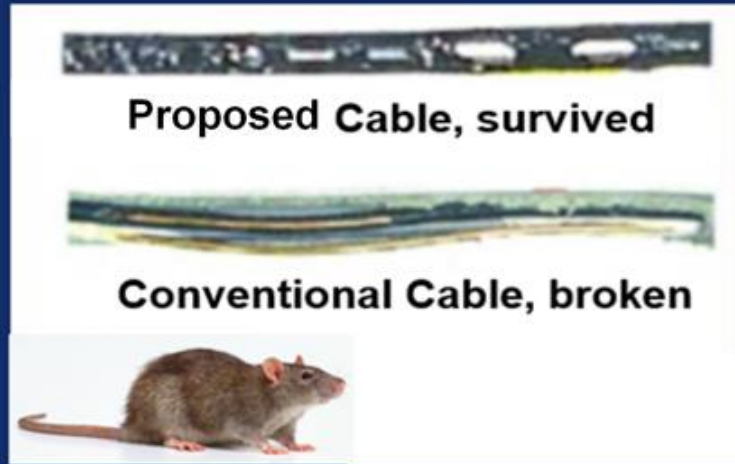


# Non-Japanese



# L.110 Optical Cable Durability

## Rodent Proof Test



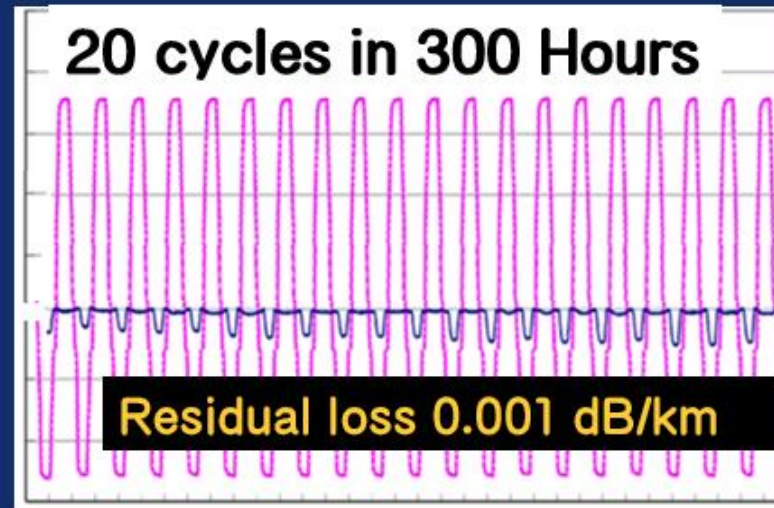
After 1180°C, 15 min  
Loss <0.05 dB



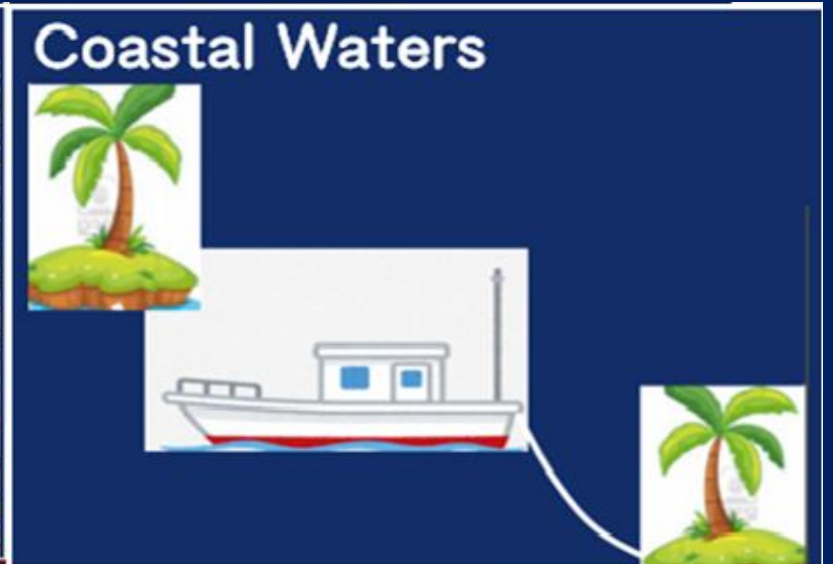
Crush Resistance (2 tons/10 cm)



Heat Cycle -50 °C to +70 °C



# Easy, Quick, Affordable DIY Installation



**ITU Standard**

**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

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

# ITU-T Recommendations

## Affordable DIY Fibre Connectivity

**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

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**Optical fibre cables for direct surface  
application**

**ITU-T**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**L.163**

(11/2018)

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

CONSTRUCTION AND PROTECTION  
OF CABLES AND OTHER ELEMENTS OF OUTSIDE  
PLANT

Optical fibre cables – Guidance and installation technique.

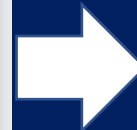
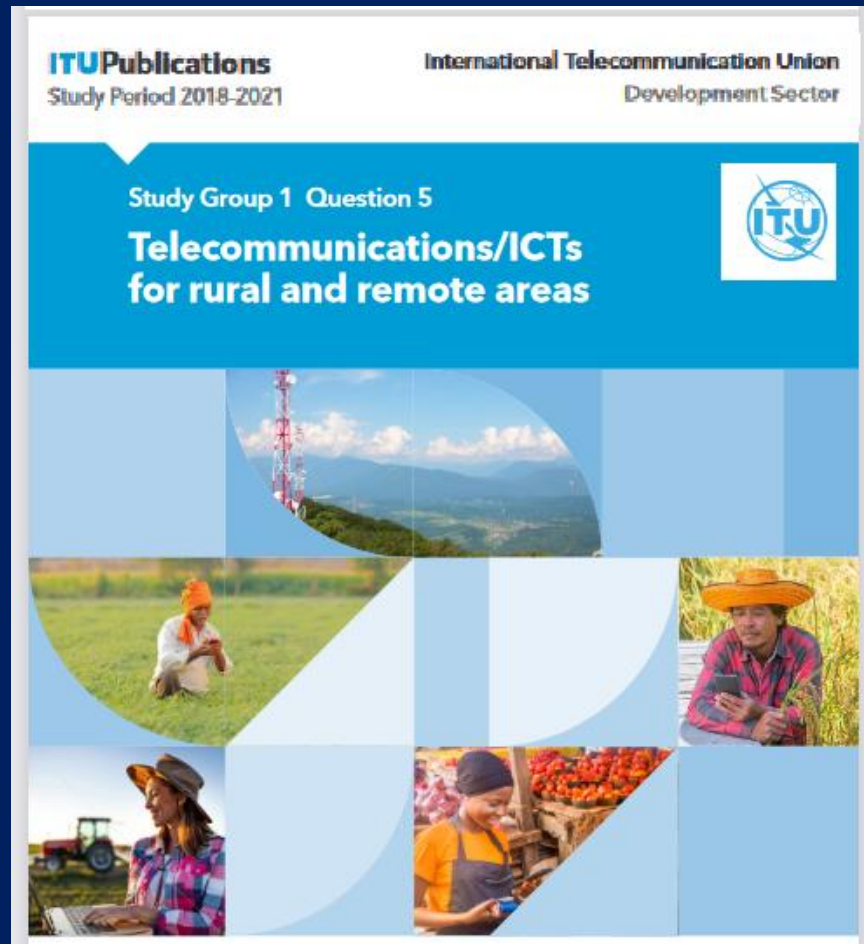
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**Criteria for optical fibre cable installation with  
minimal existing infrastructure.**



# 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](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**



WORLD SUMMIT ON THE INFORMATION SOCIETY PRIZES 2022

CHAMPION PROJECTS

## Champion Projects

WSIS Prizes 2022



AL C2. Information and communication infrastructure

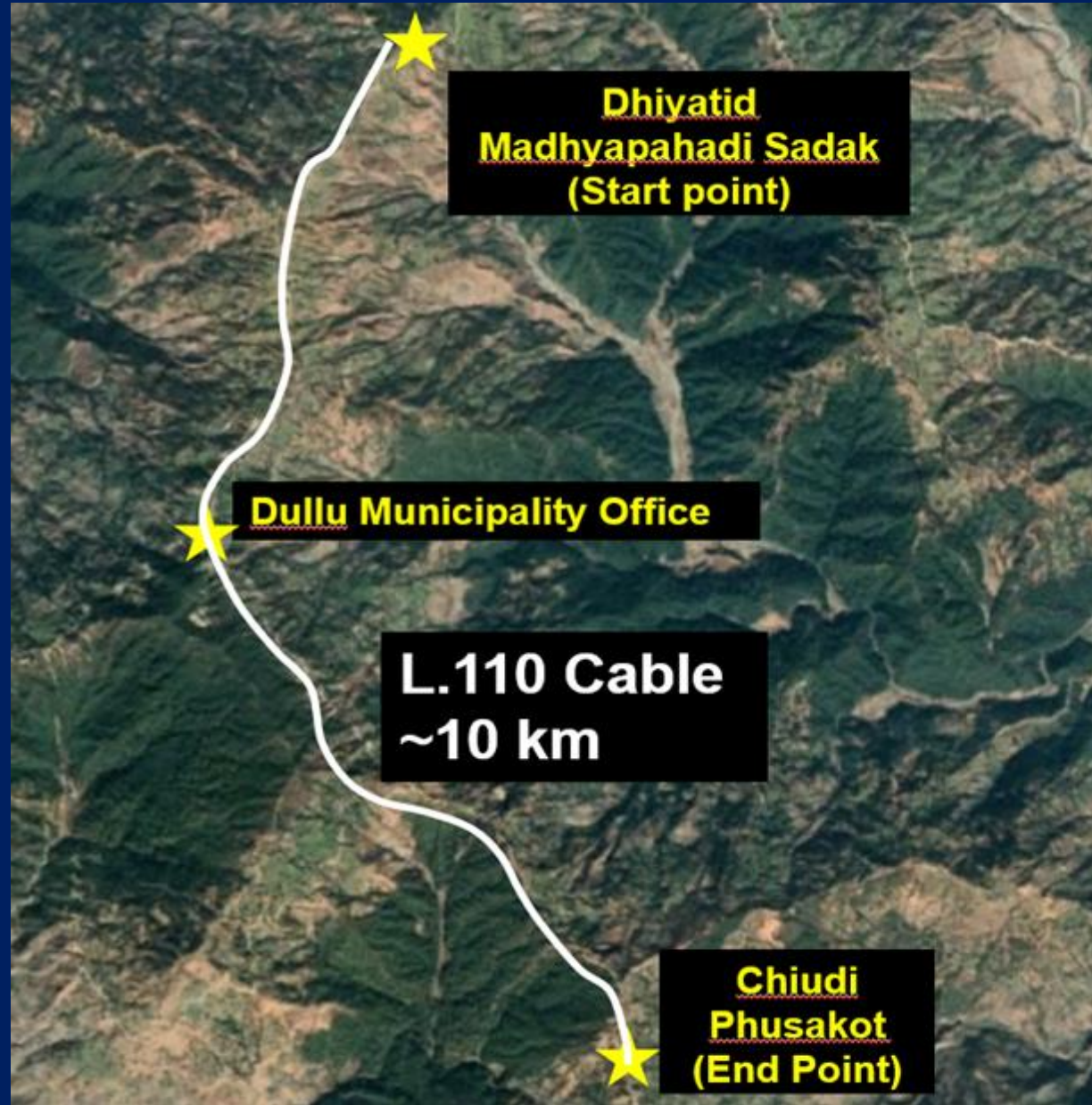


**Project BIRD (Broadband Infrastructure for Rural Area Digitalization)**

Global Plan Inc. — Japan

# Cables Installed

# 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





# Mongolia Terelj National park

20km

Sept. 20, 2022

# Cables under Installation

# Solution BIRD to the base camp of Mt. Everest





# The Cable route to Mt. Everest Base Camp



# Mt. Everest Base Camp Area, March 2023 @ 5300 m



Cable Drum

# Mt. Everest Base Camp Area, March 2023, Global Plan Inc.



**Excellent COST Reduction**

# CAPEX Reduction by >80%

Conventional  
Cable



72 k US\$/km

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

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



88% Cost Reduction

L.110 Cable  
Solution  
BIRD



8.3 k US\$/km

- 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

**Promotion**

# Connect the Unconnected



Global Plan



By, Fibre?  
LEO Satellite?  
Fixed Wireless?



WSIS2022  
Outcome



see p97

**Fibre Solution BIRD\***

ITU-Standard, DIY, All-Terrain → Affordable



\* Broadband Infrastructure for Rural-Area Digitalization



“BIRD” deployed in Himalayas  
(A WSIS’22 Champion Project)



**MWC**  
**Most Influential**  
**Connectivity Event**

**Mar. 2023, Baloceron**  
**Japan Pavilion**

# WSIS 2019

## Haruo Okamura

### President, Global Plan Inc.



A video player interface showing an interview. On the left, a woman with long brown hair, wearing a dark blazer, sits in a chair with her hands on a notebook. On the right, Haruo Okamura, wearing a dark suit and a striped shirt, sits in a chair and holds a tablet. Between them is a large green and white poster titled "WSIS-SDG MATRIX LINKING WSIS ACTION LINES WITH SUSTAINABLE DEVELOPMENT GOALS" with the URL www.wsis.org. The poster features a circular diagram at the top and a grid of icons below. The ITU logo is visible in the top right corner of the video frame. At the bottom of the video player, there is a red progress bar and a control bar with icons for play/pause, volume, and other video controls. The current time is 2:35 / 5:51.



WSIS Stocktaking  
Interview Series:  
The Coronavirus Response  
– ICT Case Repository



Dr. Haruo Okamura

#WSIS

**WSIS Stocktaking Interview Series: The Coronavirus Response – ICT Cas...**



A step-by-step approach  
Local-Net to Intra-Net to Inter-Net  
With BIRD

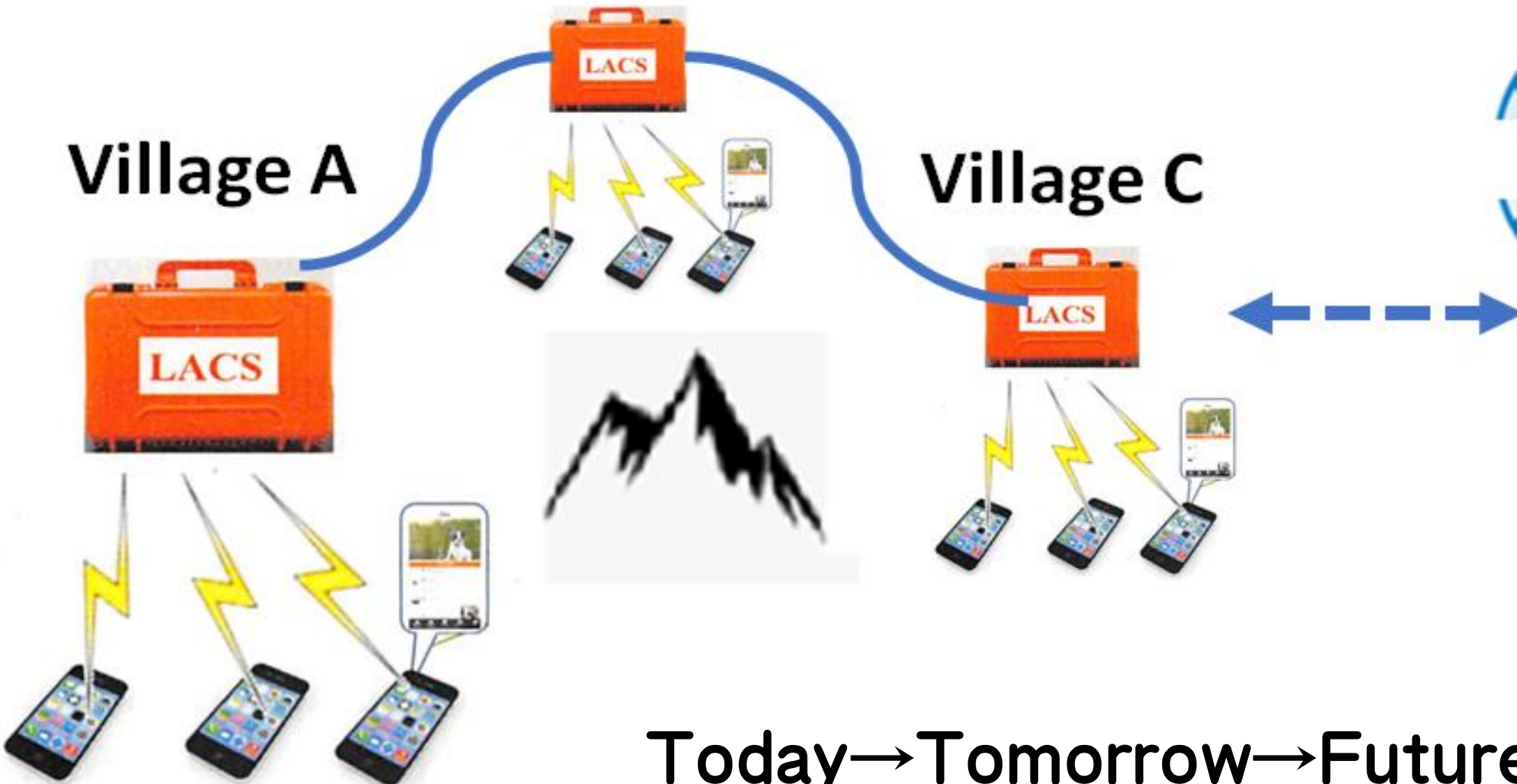


Effectively, Affordably and Quickly  
improve regional Connectivity  
and Digital literacy

# Village B

## Village A

## Village C



Today → Tomorrow → Future

# Affordable Intra-Net capable Atash case

256 smartphones within 100 meters can use Wi-Fi with SSID



# Remote Tourism

BIRD Cable



Remote Tourism Business



BIRD Cable



Social development  
eHealth, eEducation, eCommerce

Backbone



# Solution BIRD\*, Summary,

\* Broadband Infrastructure for Rural-Area Digitalization

ITU-Compatible\* Lightweight, Robust, Reliable  
Optical Cable for Surface, Underground, Air, water.

\* ITU-T L.1700 (Concept), L.110 (Cable) and L.163 (Installation)

Step-by-step, affordable, DIY approach  
to

affordably and quickly catch up the digital world

**Thank you !!**

**Haruo Okamura, Japan**

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**President, Global Plan Inc.**  
<https://www.globalplan.jp>

**I am ready to discuss anytime**  
**Connecting the Unconnected in EACO countries**