

# Quarterly Report on Monitoring of ICT Infrastructure

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**Bhutan InfoComm and Media Authority**

**Royal Government of Bhutan**



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# **Monitoring of ICT Infrastructure-FTTH Network and Communication cable layout in Haa, Paro, Wangduephodrang and Punakha**

## **1. Background**

As a part of monitoring of ICT Infrastructure, the team from Authority has carried out monitoring of FTTH network and communication cable layout in Haa, Paro, Wangduephodrang and Punakha town and its peripheral areas. The division is carrying out monitoring of FTTH and communication cable layout as a part of monitoring of ICT Infrastructure in this financial year because the monitoring of Fiber network Infrastructure was completed in the last financial year. The monitoring of the FTTH network is to record the type of equipment or Infrastructure deployed for the FTTH network and type of services offered using the FTTH network. The team also monitored the communication cable layout in above mentioned places to ascertain the implementation of rules and regulation related to communication cable layout and ADSS fiber cable layout.

## **2. Monitoring of FTTH network and Communication cable layout at Haa Town and its peripheral areas**

### **2.1 Monitoring of FTTH Network of BTL at Haa town**

Only Bhutan Telecom Limited(BTL) has FTTH network deployed at Haa Town for distribution of internet leased line services to its customers and Tashi InfoComm Limited (TICL) does not have FTTH network since they use radio networks for internet leased line services.

There is one FTTH(GPON) equipment installed at Haa BTL Exchange office. The single cabinet of GPON equipment is of Nokia brand and has 8 ports with each port having the capacity to distribute to 64 FTTH customers. Out of 8 ports, only 6 ports have been utilized for the distribution of internet leased line services to customers of BTL in Haa town area.



*Figure 1: Nokia GPON equipment installed at Haa BTL office as part of FTTH part network*

The FTTH network splitters are used for splitting and distribution of fiber network at customer end as shown in figure below;

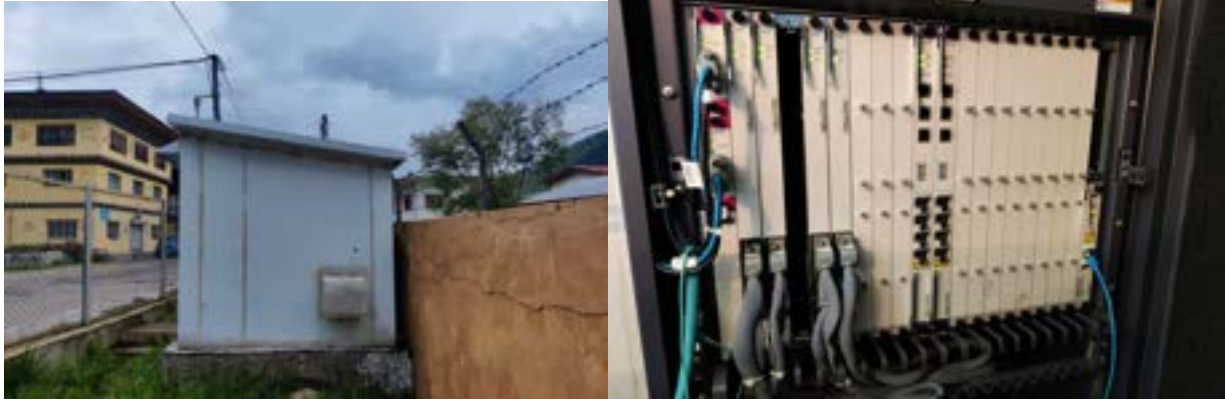


*Figure 2 : FTTH splitters at various locations at Haa Town for fiber network distribution.*

There is no underground duct system at Haa town and all cable layout of fiber cables and copper cables are done through aerial using the overhead poles as shown in the above figure.

## **2.2 Monitoring of FTTC (Fiber to the cabinet) system in Haa town and its peripheral areas**

FTTC equipment of BTL is based on fiber line connection between main FTTC equipment and FTTC equipment located at remote stations and the Copper wire line connection between remote FTTC equipment to the customers end. BTL has implemented the FTTC network for distribution of fixed line services and broadband internet services.



*Figure 3 : FTTC cabinet in Haa town below Ugyen Dorji High school.*



*Figure 4: FTTC equipment of BTL at Damthang BTS*



*Figure 5: FTTC equipment of BTL at Gjenkana*

### **2.3 Monitoring of communication cable layout at Haa Town and its peripheral areas**

The team carried out the monitoring of communication cable layout of BTL and Leki Cable service in Haa town and its peripheral areas. The findings of the monitoring are as follows;

1. Multiple rooftop to rooftop cable road crossover of Leki cable service with non usage of common poles for cable road cross over at Haa town.



*Figure 6: multiple cable road crossover with non usage of common poles for cable road cross over*

2. Hanging cables over other cables of Leki cable service at Haa town. Such cable layout may have safety hazards.



*Figure 7 : Hanging cables over other cables of Leki cable service at Haa town*

3. Low hanging cable of Leki cable and non usage of common poles at near road point diversion toward Chungdu school



*Figure 8: Low hanging cable of Leki near road point diversion towards chungdu school*

4. Low cable road cross over of BTL cable near Bji gewog Office, Haa



*Figure 9 : Low cable road cross over of BTL cable near Bji Gewog Office, Haa*

### **3. Monitoring of FTTH network and Communication cable layout in Paro town and its peripheral areas**

#### **3.1 Monitoring of FTTH equipment and its network in Paro town**

Only BTL has FTTH network implemented in Paro town, TICL does not have FTTH network at Paro town and they use radio network for internet leased line services. There are 3 FTTH(GPON) equipment in Paro BTL office of Nokia brand with each equipment cabinet having 16 ports each. Out of a total 48 ports, 47 ports have been utilized. Each port has the capacity to distribute 64 fiber to Home customers. The FTTH network of BTL in Paro is used in distribution of internet leased lines to its customers.



*Figure 10: FTTH(GPON) equipment installed at Paro BTL Office*



The FTTH splitter is installed at multiple locations of Paro town to distribute the internet leased line service to customers via fiber to home network.



*Figure 11: FTTH splitter installed at multiple location at Paro town*

### **3.2 Monitoring of communication cable layout in Paro town and its peripheral areas.**

The monitoring of communication cable layout was carried out in Paro town to ascertain the implementation of rules and regulation related to communication cable layout by the relevant licensee. The findings of the monitoring are as follows;

1. Multiple hanging communications cable of BTL in Paro town. Some of the cables of BTL are seen hanging on the buildings at Paro town as shown in the figure below.



*Figure 12: Multiple hanging communications cable of BTL in Paro town*

2. Multiple hanging cables of TD metho cable at Paro town. Some of the cables of TD Metho are seen hanging on the buildings at Paro town as shown in figure below.



*Figure 13 : Multiple hanging cables of TD metho cable at Paro town*

3. Low hanging stray cables of TD Metho and Sigma cable service on the roads towards Dhopsahri Gewog center.



*Figure 14 : Low hanging stray cables of TD Metho(left) and Sigma cable service(right) on the roads towards Dhopsahri Gewog center.*

4. Low hanging cable of Sigma cable service near Zhiwa Ling Hotel, Satsam Chorten, Paro



*Figure 15: Low hanging cable of Sigma cable service near Zhiwa Ling Hotel, Satsam Chorten, Paro*

## **4. Monitoring of FTTH network communication cable layout at Bajo town, Wangdue Phodrang**

### **4.1 Monitoring of FTTH network of BTL at Wangdue BTL office and Bajo Town**

Only BTL has FTTH network implemented in Bajo town, TICL does not have FTTH network at Bajo town and they use radio networks for internet leased line services. There is one FTTH(GPON) equipment at Wangdue BTL office of Nokia brand having 8 ports . Out of 8 ports, 7 ports have been utilized as shown in the figure below. Each port has the capacity to distribute 64 fiber to Home customers. The FTTH network of BTL in Wangdue is used in distribution of internet leased lines to its customers.



*Figure 16 : FTTH(GPON- Nokia) installed at Wangdue BTL Office*

## 4.2 Monitoring of Communication cable layout at Bajo Town

The monitoring of communication cable layout was carried out in Bajo town to ascertain the implementation of rules and regulation related to communication cable layout by the relevant licensee. The findings of the monitoring are as follows;

1. Bajo town has a good underground duct system where there is a separate duct system for Power services and communication services . The underground duct system runs through space between two lines of buildings of Bajo town as shown in figure below. The Underground duct system for Communication services has been used by BTL, and two cable operators of Bajo town.



*Figure 17: Underground duct system for communication services at Bajo Town*

2. Hanging cables around the BTL pole sharing sites



*Figure 18: Hanging cables around the pole sharing sites.*

3. Hanging cables of TD cables, Phuntsho Ngaden cables and ISP at Bajo around the buildings at Bajo Town



*Figure 19: Hanging cables around the building at Bajo Town*

## **5. Monitoring of FTTH network and communication cable layout at Khuruthang town**

### **5.1 Monitoring of FTTH network of BTL at Khuruthang town, Punakha**

Only BTL has implemented the FTTH network in Khuru town, TICL does not have FTTH network at Khuru town and they use radio networks for internet leased line services. There is one FTTH(GPON) equipment at the Khuru BTS site of the Tejas brand having 8 ports. Out of 8 ports, 7 ports have been utilized as shown in the figure below. Each port has the capacity to distribute 32 fiber to Home customers. The FTTH network of BTL in Wangdue is used in distribution of internet leased lines to its customers.



*Figure 20 : FTTH equipment (Tejas) installed at Khuruthang BTS site*

The FTTH splitters are installed at multiple locations of the town for the distribution of fiber lines to the individual customers end. The FTTH splitters of BTL at Khuruthang town are installed at indoor buildings and as well as at outdoor aerial poles as shown in figure given below;



Figure 21 : FTTH splitters installed at indoor(right) and outdoor(left) locations.

### 5.2 Monitoring of communication cable layout at Khuruthang town

The monitoring of communication cable layout was carried out in Bajo town to ascertain the implementation of rules and regulation related to communication cable layout by the relevant licensee. The findings of the monitoring are as follows;

1. Low road cross over cable of BTL, Punap cable, Damchen cable and Budha cable in khuruthang Town



Figure 22: Low cable road cross over in Khuruthang Town

2. Low hanging cable of Budha Cable in Khuruthang town.



*Figure 23: Low hanging cable of Budha cable in Khuruthang town*

## **6. Actions Taken based on the field visit**

- Informed the relevant licensee especially on the communication cable layout and carry out necessary actions.
- Compiled report for recording and future references especially on FTTH network Infrastructure.
- Report provides clarity on the need to do further monitoring of ICT Infrastructure and communication cable layout.

## **7. Recommendation/ Way Forward**

- To carry out further detailed monitoring of ICT Infrastructure and communication cable layout and issue the cautionary letter if improvement is not done.
- To carry out the same monitoring in other thromdes, dzongkhag towns and its peripheral areas.