

IDENTIFICATION OF THE EXACT UNDERGROUND FIBER ROUTES

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ABSTRACT

Underground communication cable system is an important part of the communication world which is the fastest and most reliable medium. In Sri Lanka Telecom Plc. an underground system is used for the metro areas to avoid complexity and congestion. But in practice finding the underground routes is difficult because of the poor finding techniques and the new road developments. In maintenance situations, employees of Sri Lanka Telecom Plc. faced difficulties in finding the exact location of the cables from huge number of cores. The fiber cables' characteristics can be used to find the location of them from huge cores. Man holes detecting method is a very elementary method. It makes many mistakes and huge wastage of time, cost, and manpower. The new system contains a current transmitter, which supplies the current to the guard wire of the underground fiber optic cable with a specific frequency. It create a magnetic flux around the cable. Then the magnetic flux detector can detect the magnetic flux from the fiber cable and helps to find the cable easily.

Keywords: Man-Hole (MH), Underground (UG), Current Transmitter, Flux detector, Fiber Cables, Fiber to the Home (FTTH).

1. INTRODUCTION

Sri Lanka Telecom Plc. Headquarters ANP (Access Network Project) is the main responsible division for the FTTH (Fibre to the Home). FTTH is the latest technology wire line connection with high speed communication. In that project fibre optics are used as the communication media. The prime difficulty of FTTH is underground routes be identified after few road development projects. The suggested system will help to avoid the time, money and human power wasting with accuracy. Underground fibre optic cables have their own guard wire or a metallic sheath. Therefore it can be used as a part of the system. Then the system helps to detect the exact location of the cable route accurately.

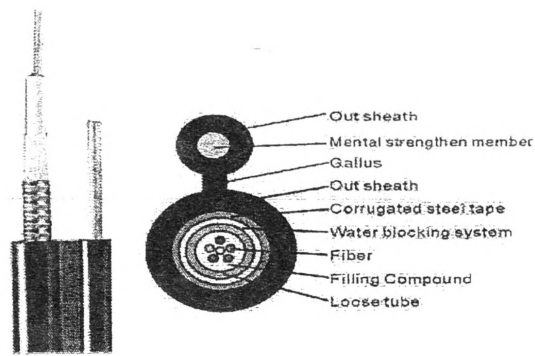


Figure 1: Fiber Cable with Steel Guard wire

2. EXPERIMENTAL

The suggested route finding system should be developed as two units.

- Current transmitter⁴.
- The magnetic flux³ detector.

The current transmitter should be connected to the guard wire¹ in a proper manner. One end of the cable should be earthed. Since the current loop should be completed by contacting with the ground.

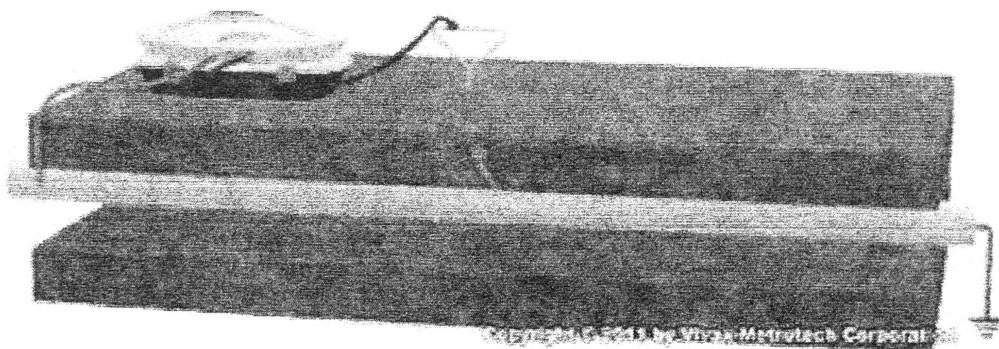


Figure 2: Current Transmitter in application

But the supply current frequency should be known. The guard wire produce magnetic flux around it due to the current. The flux detector can detect the cable's flux with a correct directions and well accurate manner.

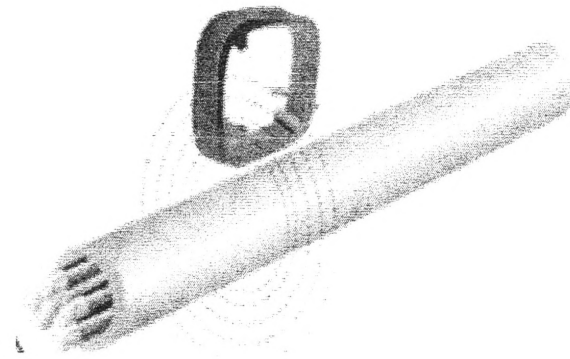


Figure 3: Detecting magnetic flux using the coil

After detecting the magnetic flux underground route can be identified correctly. Even when the route buried under several layers of road developments (tar carpet, concrete etc.)

The suggested equipment will be able to detect the magnetic flux and produce a result with considering the detected flux form blink the LED. Using that element (In Figure 3)the exact location can be found.

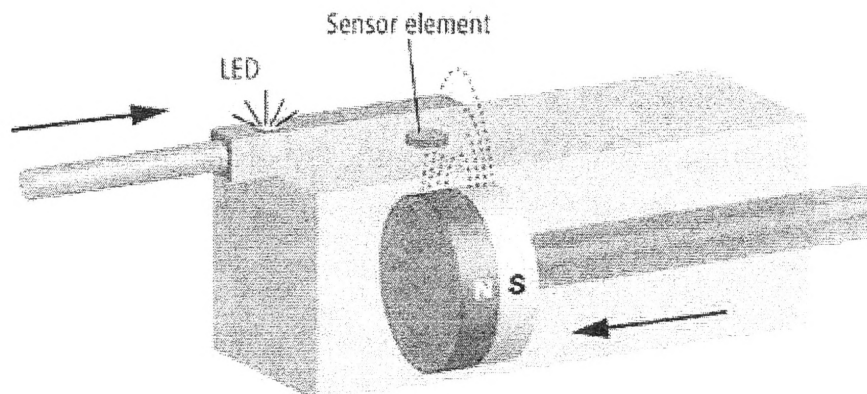


Figure 4: Flux Detecting Element

3. RESULTS AND DISCUSSION

The underground fibre cable detecting method is developed for the communication world for identification their UG cable path appropriately. Final outcome of this project is to

successfully identify the path with the suggested method. It is created with concepts that can be trusted with accuracy. That suggested system is much better than the older method, The MH detecting system is the method the SLT is using today. It has less accuracy to identify the exact location so this method do not fulfil requirement of accuracy. Another process should be followed to do the cable path identification. All the difficulties can be avoided using the suggested method. The suggested equipment costs around more than Rs.20000.00. Because the accuracy depend on the equipment quality.

4. CONCLUSION

With the lack of cable network maps the detection of Man Holes has become almost impossible task in urban areas (to find the cable routes), especially when the area was undergone development projects. But using “Locating the exact underground fiber routes” method it locating of cable routes would be easier and more precisely. Therefore manpower will not be wasted on unwanted digging. This can be done easily without disturbances for development projects. Furthermore this system can be utilized to detect pipeline and detect splicing defects in the fiber cables by using high-end actuators.

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