

To: All HQ Directors: Operations, Planning and Major Projects
All Regional Directors
All District Managers

Subject: Vertical Inlaid Fibre Systems

Background

Vertical Inlaid Fibre (VIF) is a fibre optic cable deployment system which consists of a narrow “ribbon” conduit technology that is installed in the roadway at a shallow depth using saw cut technology. This technique provides an alternative to traditional trench technology. The major components typically consist of:

- Vertical Deflecting Conduit (VDC) which is approximately 10mm wide and up to 84 mm high. The system is designed for placement into a 12.5mm wide saw cut to a depth of 300mm and can accommodate several fibre optic cables.
- Vertical Inlaid Fibre (VIF) Cable at 4mm in diameter which are placed in the VDC
- Cylindrical Access Node (CAN) which is approximately 230mm in diameter by 500mm in height and is designed to house slack cable for maintenance and branching. CANs are placed to provide breakout points to current applications and where network expansion is anticipated with a typical spacing of 200 to 300 metres.

Policy

The Ministry has determined that this use may be accommodated within the roadway prism but outside the paved surface where there are no existing utility structures, including utility poles or telecommunications conduit, that can be used for cable location and attachment; and, where the proposed use complies with the technical criteria contained in this circular. The principles of shared use of both overhead and underground utility structures contained in Technical Circular 12/94, “Single Pole Line Policy” apply.

Scope and Application

It has been determined that the installation method used for this technology in the paved portion of the roadway will have an unavoidable impact on pavement structures. Further, the installation the CANs will complicate future rehabilitation and maintenance work. In detail, the VIF systems employ an open saw cut technology to install a continuous VDC. The cut is backfilled and a binding agent is used to seal the cut. Anticipated impacts of the VIF systems include differential

settlement and insufficient strength of the binding agent that may result in pavement cracking which will impact the life of the pavement structure and ride quality.

Should it be necessary to install this system within the roadway prism, the following locations and standards are to be applied when an application to install and operate a VIF system is granted:

Open Shoulder Roadways:

- Installation will be within a gravel shoulder with a minimum 50mm offset from the pavement edge for any class of highway. Saw cut technology will be used with a minimum trench depth of 300mm measured from the top of the VDC to the ground surface.
- No longitudinal installation within the pavement is permitted
- Transverse pavement cuts will only be permitted on low volume roads with an Average Daily Traffic (ADT) not exceeding 200 vehicles (TAC Geometric Design Guide 2007 edition)
- Transverse pavement cuts should only be considered where the Ministry Representative has determined that other options such as the use of adjacent utility poles, telecommunications conduit are not available or directional drilling is impractical.
- Transverse pavement cuts will be installed through the use of saw cut technology, backfilled and capped, to match existing pavement conditions with a Ministry approved high grade patching compound.
- Transverse cuts should be limited both in the number of cuts and, where possible to intersections.
- Tracer material will be installed in all trenches prior to backfilling.
- CANs will be installed inline with the VDC when placed in the gravel shoulder installed to a minimum of 100mm below the existing grade to avoid damage and conflict with highway maintenance equipment.
- CANs will be installed at grade within pavement surface (typically a transverse crossing), however, whenever possible placement should be in the gravel shoulder

Roadways with Enclosed Drainage (concrete curb and gutter):

- Preferred location for longitudinal VDC installations will be between the concrete curb and sidewalk
- Gravel shoulders will be used for the installation.
- Transverse pavement cuts should only be considered where the Ministry Representative has determined that options such as the use of adjacent utility poles or telecommunications conduit are not available or directional drilling is impractical.
- Offsets and depth of bury will be the same as open shoulder highways

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The Ministry representative will make a final determination on the location and number of transverse cuts based on local conditions.

Contact:

John Shaw
Senior Project Manager, Utilities Services
Properties and Business Management Branch
Phone: 250 356-1357
Email: John.Shaw@gov.bc.ca

Dirk Nyland
Chief Engineer
Engineering Branch