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Stabilizer channels for trenches

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ABSTRACT

This disclosure describes a trench profile that includes horizontal stabilizer channels along the sides of the trench. The trench profile enables greater robustness of a trench seal to environmental conditions during a sealant application process. When a sealant is applied, the horizontal stabilizer channels in the sidewalls of the trench create a locking key that prevents the solidified sealant from rising above grade under conditions when the sealant is incompletely secured to the sidewall. The horizontal stabilizer channels prevent solidified sealant from sinking below grade as a result of compression of filler material or the filler rod in the trench. The use of stabilizer channels can reduce repair costs due to sealant failures and mitigate safety hazards that can arise from changes in sealant elevation.

KEYWORDS

- Fiber optic cable
- Trench
- Sealant
- Green construction
- Narrow-trenching
- Micro-trenching
- Stabilization

BACKGROUND

Trenching is a commonly utilized method for laying cables and optical fibers that carry data. A trench is created by manual or mechanized excavation, and the fiber or cable is laid inside the trench. In many urban areas, narrow-trenching or micro trenching techniques are utilized. A trench measuring about ½ inch to 2 inches wide and a total depth of 6-8 inches is cut into the asphalt or concrete to enable the laying of the cable. A sealant (e.g. a two-part sealant) is applied to seal the trench.

Current trench designs depend on sidewalls to be dirt and dust free to ensure sealant adhesion to the trench surfaces. The presence of water or residue in the trench can also affect trench sealing properties.

Less than ideal environmental conditions such as the presence of dust, dirt, moisture, etc. during application prevent the sealant from sticking to the entire sidewall surface and can lead to breaches in the trench seal. The breaches can lead to water ingress into the trench. Freezing and expansion of water can lead to sealant expansion above grade and creation of a public safety hazard.

Improperly adhering sealants can also be subject to the rapid changes in temperature over short periods of time, leading to sealant expansion. Settling of filler material or backer rod can cause improperly adhered sealants to sink below grade creating a safety hazard.

DESCRIPTION

This disclosure describes a trench profile that includes horizontal stabilizer channels along the sides of a trench. The trench profile enables greater robustness of the trench seal to environmental conditions during the sealant application process.

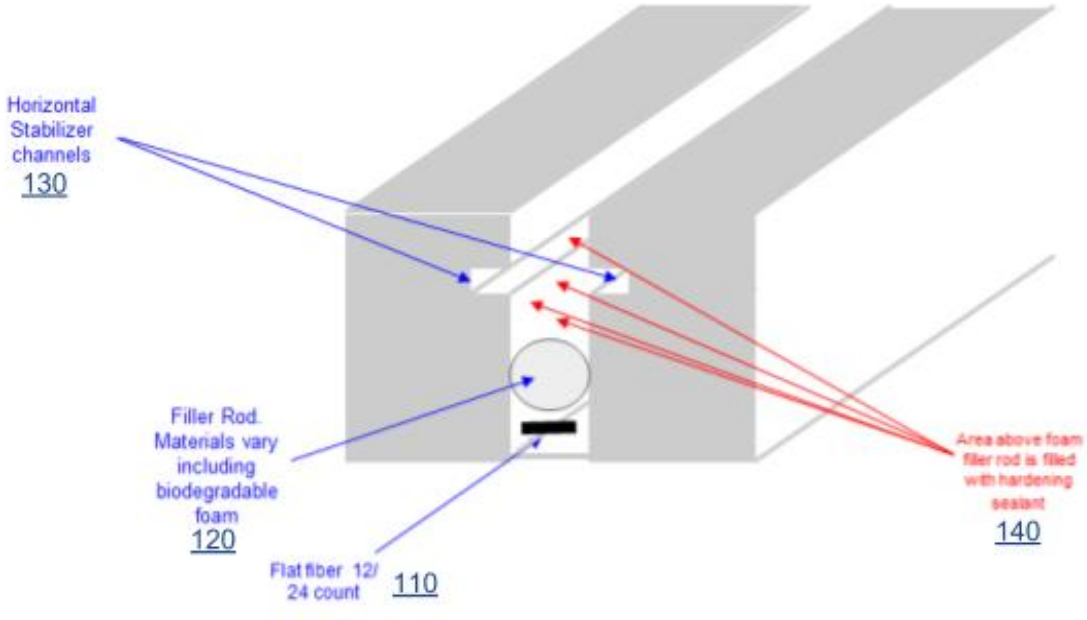

Fig. 1: Horizontal stabilizer channels are provided along the sides of a trench

Fig. 1 illustrates an example of horizontal stabilizer channels provided along the sides of a trench. A flat fiber optic cable (110) and a filler rod (120) are shown placed in the trench. Horizontal stabilizer channels (130) are provided along the sides of the trench wall. When a sealant is applied, the horizontal stabilizer channels in the sidewalls of the trench create a locking key that prevents the solidified sealant from rising above grade under conditions when the sealant is incompletely secured to the sidewall. The horizontal stabilizer channels also prevent solidified sealant from sinking below grade as a result of compression of filler material or the filler rod in the trench.

Fig. 2: Views of the horizontal stabilizer channel

Fig. 2 depicts views of the horizontal stabilizer channel. A cutaway view (200) of the sidewall of the trench reveals the horizontal stabilizer channel. The horizontal stabilizer is also seen in the trench (the dotted line) between the concrete (white block) and the asphalt (black block) surfaces (210).

The use of stabilizer channels can reduce repair costs due to sealant failures and mitigate safety hazards that can arise from changes in sealant elevation. Robustness of sealant application to environmental factors such as depth, sidewall dust, residual moisture, etc. can reduce operational cost of trench preparation in sidewall dust removal and enable reduced wait-times for sealant application.

Variations on the shape of the stabilizer channel key can also be employed effectively to provide stability to the solidified sealant.

The techniques described in this disclosure can also be used as part of the remediation measures that are taken to repair previously laid sections with sealant failure (including failure due to noncompliance with depth requirements). Adding horizontal stabilizer locking key channels in trench sidewalls that are greater than one inch in depth can allow replacement sealant to be secure and stable.

CONCLUSION

This disclosure describes a trench profile that includes horizontal stabilizer channels along the sides of a trench. The trench profile enables greater robustness of the trench seal to environmental conditions during sealant application process. When a sealant is applied, the horizontal stabilizer channels in the sidewalls of the trench create a locking key that prevents the solidified sealant from rising above grade under conditions when the sealant is incompletely

secured to the sidewall. The horizontal stabilizer channels also prevent solidified sealant from sinking below grade as a result of compression of filler material or the filler rod in the trench. The use of stabilizer channels can reduce repair costs due to sealant failures and mitigate safety hazards that can arise from changes in sealant elevation. The robustness of sealant application to environmental factors such as depth, sidewall dust, residual moisture, etc. can reduce operational cost of trench preparation in sidewall dust removal and enable reduced wait-times for sealant application.