Core Bore/Vacuum/Flowable Fill Process

A specific core bore process has been approved by PENNDOT, subject to the following:

Process. The "Core Bore Process" is demonstrated in a PowerPoint document (available upon request) and involves the following steps – which combine several technologies into one process:

1. Pavement is saw cut full depth, with a bit ranging from 10" to 18" in diameter; resulting in a "core".
2. The core is removed and saved for reuse (if structurally sound).
3. A protective steel ring is placed to protect the edge of opening from damage.
4. Vacuum equipment is used to excavate compacted material from bottom of base course down to beneath utility facility.
5. Utility work is performed (e.g., leak repair, service connection).
6. Utility facility is protected with fine material.
7. Self-mixing flowable fill material is placed from top of fine material to bottom of base course (fill is designed to be traffic-bearing in 90 minutes).
8. Non-shrink grout is placed (grout is designed to be traffic-bearing in about 90 minutes).
9. The removed core (or a generic equivalent replacement core) is placed in the remaining opening (original alignment and orientation is maintained if removed core is used) forcing the grout to the surface to fill the annular space and core extraction hole.
10. The restored opening is sealed.

Benefits. There are several benefits to this process compared to traditional utility opening and highway restoration methods:

1. Overall process (repair and restoration) time reduced
2. Less time to excavate roadway surface and base
3. Less inconvenience to vehicular traffic during work (e.g., typically only one lane is closed)
4. Reduced exposure time of workers and traveling public within work zone
5. Controlled size of opening (by bit diameter)
6. Elimination of callbacks due to trench subsidence
7. Technologically advanced tools and equipment lower chance of collateral damage to roadway
8. Road openings are smaller in size
9. Circular hole prevents stress cracks due to elimination of corners
10. A more controlled operation, with less variability in the materials and the overall process
11. No excavation settlement due to non-shrink characteristics of flowable fill
12. No cutback necessary due to prevention of excavation settlement and collateral damage.
13. Less intrusive due to the involvement of less equipment and personnel in the process
14. Existing material (original core) placed back in bore hole whenever feasible

Modifications. Several Chapter 459 regulatory requirements that apply to traditional utility opening restorations are not necessary for this new process and may be modified upon request, as discussed below.

Pavement cutback. Because (1) a steel ring is used to protect the edge of the opening, (2) material is excavated using vacuum technology, and (3) the opening is restored with flowable fill, it is reasonable to waive the regulatory requirement for the pavement to be cut back one foot, under authority of Section 459.12, when the "Core Bore Process" uses a core bit larger than 10" (c.f., 459.8(h) & (i)). When a 10" bit is used, the opening is a "test hole" by definition and a one foot cutback may already be eliminated under Regulation 459.8(g)(6).

Bituminous pavement overlay. Because of the benefits associated with the "Core Bore Process" compared to traditional restoration methods, it is reasonable to waive the regulatory requirement for a bituminous pavement less than five years old to be overlayed if there are four or more emergency openings within 100 linear feet (cf., 459.8(n)(2)). If the pavement is older than five years, District staffs should continue to exercise their discretion and not require an overlay, under Regulation 459.8(n)(3).

Extending opening to pavement joint. Because of the benefits associated with the "Core Bore Process" compared to traditional restoration methods, it may be reasonable to waive the regulatory requirement for the opening to be extended up to three feet to a bituminous concrete pavement joint (cf., 459.8(n)(5)). This determination will be made by District staff on a case-by-case basis (considering age and condition of pavement).

Applicability. The approved "Core Bore Process" may be used by any Utility that requests to use this process on its Permit application, including applications for emergency work.

Any Utility may propose another non-propriety restoration process utilizing other technology, provided it agrees to participate in a pilot to demonstrate to the Department's satisfaction that both the public safety and the highway infrastructure will be improved.