1.0 General

Utility construction is comprised of many different components. Smaller items are detailed in section 1. More specific items are detailed in sections 2-5.

1.1 Permit at the Job Site

A complete copy of the permit WisDOT issued to a utility for its proposed work shall be in the possession of the utility's on-site work force, consultant, contractor or subcontractor at all times when work is being performed within the right-of-way (ROW). This includes a copy of WisDOT's approval for a service connection under an expedited service connection permit (see HMM 09-15-20) when appropriate

1.2 Use of Highway Median

Any use of a highway median is prohibited unless specifically authorized by a permit. See HMM 09-15-25, 7.1 for specific conditions that shall be met if median work is permitted.

1.3 Use of Temporary Guard Poles

No guard pole shall be set within the ROW unless specifically authorized by a permit. By definition, a guard pole is used to prevent aerial lines from falling onto the traveled way. Any guard poles permitted in the clear zone shall comply with HMM 09-15-25, 3.1

1.4 Unexpected Field Conditions

Any modification of the terms of the approved permit to meet changed or unexpected field conditions shall require prior approval from WisDOT.

1.5 Blasting

Blasting on the ROW is prohibited unless specifically authorized by a permit.

1.6 Traffic Signs

Do not remove any traffic sign (Figure 1) unless approved in a permit. This includes guide signs, warning signs, route markers, street names, etc. If needed, erect temporary traffic signs to guide motorists while the utility work is occurring.

Figure 1: Improper Sign Removal

1.7 Work Site Cleanup

Remove all debris, refuse and waste resulting from the utility's activities from the site and the motorists' view unless otherwise provided by the permit. Do not burn cuttings, brush or other debris within the ROW limits. Trees and other vegetation may be chipped and used as mulch if approved in a utility's permit.

1.8 Work Start and Completion Notices

If checked at the bottom of a utility's approved permit, contact the WisDOT utility permit coordinator listed on the permit form at least three days prior to starting the work. File written (email or fax okay) notice of completion of the permitted work and restorations within ***10 calendar days*** with the same person. WisDOT may use the sample form in Attachment 1 to assist with these notices.

2.0 Tree/Vegetation Control

Chemically treating, removing, trimming or damaging trees/vegetation on WisDOT ROW is prohibited to aid with utility installation unless specifically authorized by permit or except as provided under maintenance type activities (HMM 09-15-15, 3.0). At WisDOT's discretion, trees/vegetation proposed to be damaged or destroyed may have to be replaced (e.g., living snowfence). Remove each stump and properly backfill the hole when tree removal is permitted. Cutting the stump flush with the ground may also be allowed upon WisDOT approval.

Compensate WisDOT $200 for each tree ≥ 2" DBH (diameter at breast height) damaged or destroyed on electric transmission line projects unless specified in a utility's permit. Compensation is ***not*** required for trees that are dead, diseased, dying, located in the clear zone, or an invasive species as defined in Wis. Admin. Code Ch. 40. Upon WisDOT approval, a utility may plant prairie and/or pollinator seed mixtures in lieu of payment to restore ROW where trees have been removed provided the restoration and compensation values are comparable.

Be aware of rare or endangered plant species, animal and insect species that feed off of native vegetation, and invasive species that must be protected or avoided by law. Contact a local Department of Natural Resources (DNR) office or a region utility permit coordinator to receive assistance in identifying these areas in the ROW. The Karner Blue Butterfly, for example, is currently an endangered species that feeds off the wild lupine plant. In addition, exercise special care when handling ash trees due to the Emerald Ash Borer.

2.1 Cutting/Spraying Guidelines

All permit applications for spraying require Central Office review, but submit them to the Region office initially. When submitting a permit application for spraying/cutting, explain or identify:

1) The highway side(s) the activity will be occurring (map highlighting is acceptable if it is on both sides)
2) The chemical(s) that will be sprayed and their active ingredients (provide list to WisDOT upon request)
3) How the chemicals will be applied (wand, broadcast)
4) The person(s) who will be applying the chemicals and their Wisconsin applicators license number(s)
5) How adjacent property owners will be notified prior to spraying (mail, door card, phone, in-person)?
6) If the spraying will occur near wetlands or waterways. If yes, has DNR been notified?
7) The type of cutting (trimming, selective cutting, whole tree removal)
8) What will be done with the cut wood (removed from site, given to nearby property owner, chipped/mulched)?
9) How will Oak Wilt and Emerald Ash Borer guidelines be handled, if applicable?
10) The types of equipment that will be used (bucket trucks, brushhogs, ATVs)
11) The names and cell phone numbers for the lead workers or supervisors on each crew or contractor working in the ROW. If it is not available now, provide when giving WisDOT the 3-day advance start notice.
12) How will traffic be handled, i.e., what type(s) of work zone traffic control will be used?

3.0 Construction Methods

Section 3 details various construction methods that a utility may use during its work.

3.1 Trenched Construction

Trenched construction and backfill shall provide for the:

1) Restoration of the structural integrity of the highway facility (see Attachment 2),
2) Security of the utility facility against deformation that may cause leakage,
3) Assurance against the trench entrapping excessive moisture or becoming a drainage channel, and
4) Assurance against highway drainage being blocked by the backfill.

When necessary, backfill trenches for underground utility facilities with pervious material and provide the necessary outlets to prevent water entrapment. This may also include the construction of underdrains.

The utility installation shall conform to WisDOT's applicable Standard Specifications for Highway and Structure Construction, current edition, for earthwork, culverts or other utility work within the ROW.

WisDOT may require that backfill and repaving be performed by county forces under its direction at the utility's expense.

3.2 Untrenched Construction

Use untrenched construction for all underground utility crossings of all highways that have a paved surface and are open to traffic unless specifically authorized in the permit. Special restoration methods are required if open cutting of pavement is allowed. See 5.2.

Accomplish untrenched installation of utility facilities by tunneling, driving, coring, directional boring and/or dry boring (augering). Water boring under a highway is prohibited unless specifically authorized in a permit. Specify the boring method on a utility permit application (see question 12). Using a manually tracked bore head is prohibited when crossing a major highway like an Interstate or other high-speed multi-lane highway.

Boring shall result in a close fit to the facility being installed. As a minimum, extend untrenched construction beneath the entire highway prism (from toe of inslope to toe of inslope or from back of curb to back of curb). Locate ground openings or pits for such work outside the clear zone and do not interfere with highway drainage.

When specifically authorized by WisDOT, the extent of the untrenched crossing may be reduced or eliminated where such construction methods are impractical or physically restricted by the terrain.

3.3 Potholing

Use potholing as a necessary means for the accurate vertical location of utilities. WisDOT allows air (vacuum) and water (jetting) methods. Within the pavement structure (lanes, shoulders, curb & gutter), use ***air*** only. Water may be allowed if the air method cannot penetrate frozen or densely compacted soil. Air or water may be used in other ROW areas beyond the pavement structure. Table 1 outlines the basic steps for potholing work.

Consult WisDOT prior to using water methods. If WisDOT agrees to its use, check the water jetting box on the permit application and show pothole locations on a drawing. Submit ***before*** pavement condition pictures at each pothole with the permit application, and provide pictures of the fully restored potholes ***after*** the job is completed. This provides documentation that the restoration was finished. Monitor the potholes over the next few years, until WisDOT is satisfied that no additional settling is occurring, or until a new resurfacing or pavement replacement project is done. A utility must repair any pothole settlement (Figure 2).

Numerous pictures are not needed. Pictures should be taken from the same angle and distance for the before and after conditions, and be far enough away to provide perspective for the location (i.e., not right next to the pothole). Send pictures to WisDOT in a .jpg or .pdf format. Pictures are not required for air potholing.

Use round cores for potholes within the pavement structure. Round cores are preferred since they prevent stress cracks due to elimination of corners. The maximum size of a pothole is 12" in diameter in the wheel paths and 16" in diameter outside the wheel paths. Beyond the pavement structure, the pothole size may be larger (18"-24") and square upon WisDOT approval.

Table 1: Basic Potholing Steps

1)	Saw cut pavement full-depth with a bit 12" to 16" in diameter resulting in a "core".
2)	Remove core and save for reuse if structurally sound.
3)	Place a protective steel ring to protect the edge of the opening from damage.
4)	Use vacuum equipment to excavate compacted material from the bottom of base course to beneath the utility facility.
5)	Perform utility work (e.g., watch bore head, leak repair, service connection).
6)	Protect utility facility with fine material.
7)	Place self-mixing flowable fill material from the top of the fine material to bottom of the base course (fill is designed to be traffic-bearing in ~90 minutes).
8)	Place non-shrink grout (grout is designed to be traffic-bearing in ~90 minutes).
9)	Place the removed core (or a generic equivalent replacement core) 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)	Seal the restored opening.

Figure 2: Improper pothole restoration

3.4 Nonmetallic Lines

Any nonmetallic pipe, cable or other kind of utility line that lacks a continuous and integral metallic component capable of detection by locating instruments shall be accompanied in its location by a continuous detectable metallic tracer wire or metallic tape.

3.5 Casing

WisDOT does not require casing. WisDOT recommends casing for facility protection, to aid in future expansion, and to eliminate future boring costs. When underground lines are cased, extend the casing at least two feet beyond the toe of slope, three feet beyond the ditch line, or two feet beyond the outer curbs in a curbed section.

4.0 Work Site Safety

The utility is responsible to secure its work site from any hazard to the public at all times until all work is done. Monitor vehicles, equipment and materials in active use at the work site to ensure consistently safe conditions.

WisDOT may require sheeting, shoring, bulkheads, temporary/permanent concrete barrier, etc. if considered necessary to protect the highway and the traveling public.

4.1 Equipment/Materials Storage

Store utility equipment and materials located at the work site but not in immediate (same day) use in a safe location off the ROW. If this not practical, then the equipment or materials may be stored beyond the clear zone and as close to the fence or ROW line as possible.

4.2 Vehicle/Equipment Visibility

Vehicles and equipment shall have their high intensity flashing (strobe or revolving) and hazard warning lights operating when they are within the clear zone during work operations.

4.3 Safety Garments

All WisDOT, county, utility, consultant and contractor personnel who are out of their vehicles and within the ROW shall wear Type 2 or 3 retro-reflective safety garments at all times.

5.0 ROW Restoration

A utility shall restore the highway and the adjacent ROW to its original (as close as possible) condition within ***two weeks*** after completing facility installation. Exceptions may be allowed (e.g., for bad weather) with prior approval from WisDOT. Failure of the utility to make prompt and satisfactory restorations of the highway or adjacent ROW may cause WisDOT to arrange for restoration by others at the utility's expense.

Restore any curb, gutter, pavement, shoulder, sidewalk, driveway, gravel base, ballast, or other highway element disturbed to the qualities, grades, compactions, conditions, etc., in accordance with WisDOT's Standard Specifications for Highway and Structure Construction, current edition. See 5.2 for additional requirements for pavement restoration. Any subsequent heavings, settlings, or other faultings attributable to the permitted work shall be repaired in a manner satisfactory to WisDOT at the utility's expense. Use Attachment 2 as a guide for backfilling excavations. Avoid situations as shown in Figure 3.

Figure 3: Examples of Improper ROW Restoration

Restore any disturbed turfed ROW area with at least 4" of topsoil, and reseed with perennial grass or sod to the satisfaction of WisDOT. See section 2.0 for details on trees or vegetation restoration. Once restored, the utility shall maintain turfed areas, trees and vegetation until they achieve sustained growth.

If, in WisDOT's opinion, the permitted works or facilities are found to obstruct highway drainage, unduly increase the difficulty of highway maintenance, or in any other manner adversely affect a highway interest, the utility shall, upon notice, cure the fault as directed and restore the highway facility to the satisfaction of WisDOT.

5.1 Poles and Anchor Rods

Completely remove replaced poles from the highway. No replaced pole shall be allowed to remain, in whole or in part, nor shall it be sawed off. The pole's hole shall be properly backfilled and compacted. All anchor rods shall be removed or cut off one foot below ground level.

5.2 Pavement Restoration Requirements

Sawcut all pavement full-depth when open cutting. Attachment 3 has examples when pavement is not sawcut.

Concrete pavement shall be restored in conjunction with WisDOT standard detail drawing 13C9. Avoid creating additional joints when possible. The minimum dimension for a patch will be 6' by the full lane or shoulder width. High early strength concrete may be specified when needed. Additional guidance on concrete pavement repair can be found in FDM 14-25-10, Exhibit 10.1.

The minimum dimension for an asphaltic concrete patch will be 6' by the distance to the nearest joint or seam. Use hot mix asphalt whenever possible. If cold patch is needed in an emergency, replace with hot mix as soon as possible. Figure 4 below shows improper asphaltic pavement restoration.

Figure 4: Both patches improperly backfilled/compacted, and not patched to nearest joint or seam

6.0 Temporary Driveways for Utility Construction

Do not build temporary driveways for utility construction unless WisDOT has granted prior approval. If a temporary driveway is needed, submit a separate STH connection permit application dt1504 for WisDOT review along with the utility permit application. The reason(s) for needing the temporary driveway should be included on both applications. A temporary driveway may not be approved, so a utility is advised to have a back-up access plan. Do not locate a temporary driveway within the functional area of an intersection. See Figure 5.

Existing driveways may be used for utility construction as long as permission is obtained from the property owner. A STH connection permit is not required unless there will be a significant change in use, e.g., an agricultural driveway will experience heavy truck traffic or a major increase in the number of vehicle trips per day. In this situation, submit a STH connection permit to make temporary modifications to the driveway.

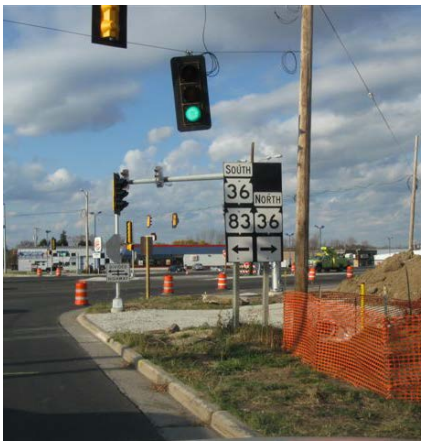


Figure 5: Temporary driveway within the functional area of an intersection

Note: When printing the sheet using this button, make sure that "current page" is checked; otherwise all 8 pages will print.

Attachment 1: Start and Work Completion Notice

Utility Permit Start Work Notice

Provide all information and email or fax to the utility permit coordinator or other region contact listed on the approved permit form a minimum three working days prior to the start of the work. When restoration is complete and ready for inspection, email or fax to the same contact.

WisDOT Utility Permit Number:

Utility Job Number:

Utility Company:

Utility Contractor Contact Name and 24-Hour Number:

Traffic Control Provider and 24-Hour Number:

Construction Start Date:

Construction Completion Date:

SOUTHWEST REGION
dotdtsdswutilitypermits@dot.wi.gov
Madison Office Fax: 608-243-3380
La Crosse Office Fax: 608-789-7896

SOUTHEAST REGION
dotdtsdseutilitypermits@dot.wi.gov
Fax: 262-521-4425

NORTHEAST REGION
dotdtsdneutilitycoordination@dot.wi.gov
Fax: 920-492-0144

NORTH CENTRAL REGION
dotdtsdncutilitypermits@dot.wi.gov
Wisconsin Rapids Office Fax: 715-423-0334
Rhinelander Office Fax: 715-365-5780

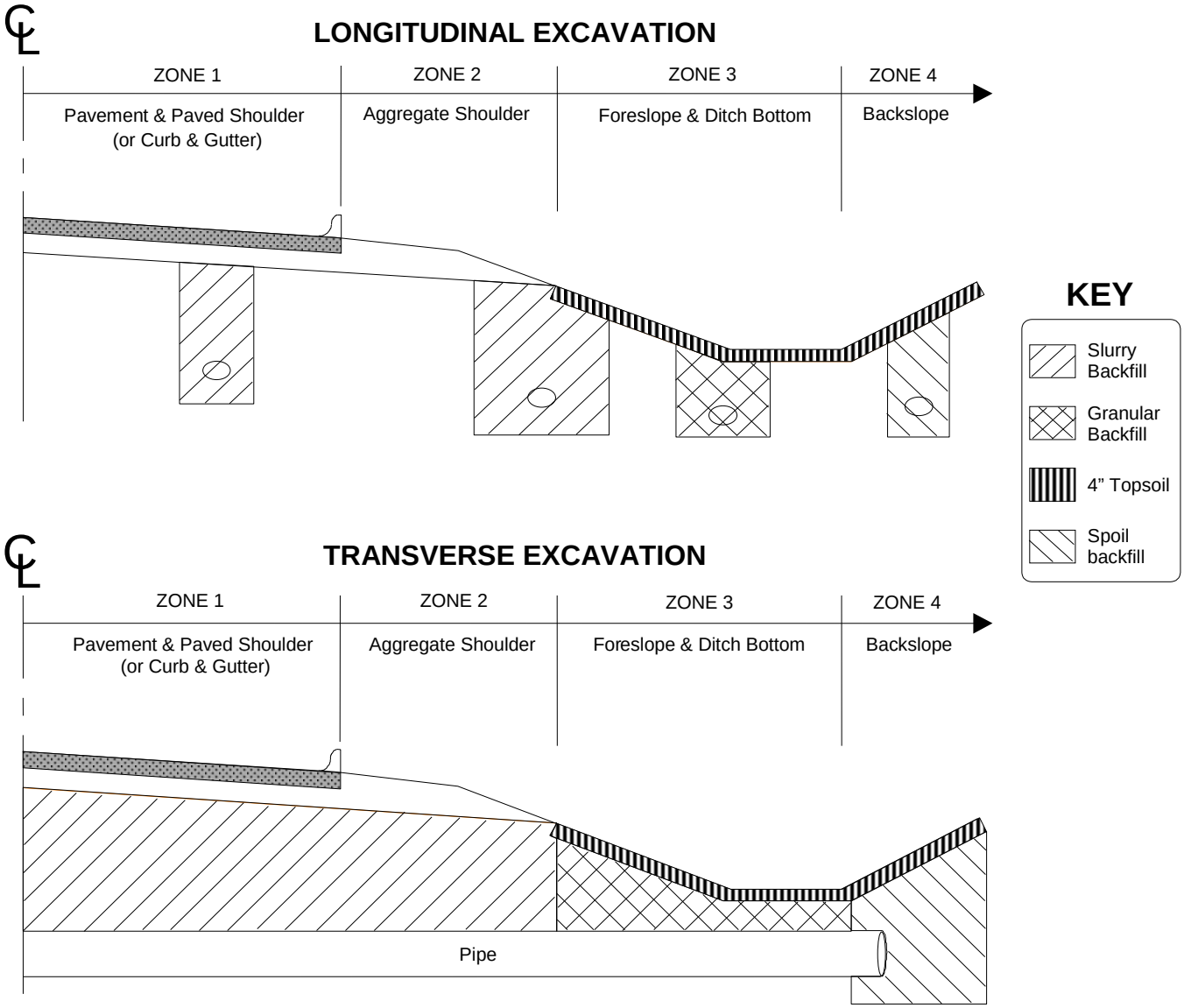
NORTHWEST REGION
dotdtsdnwecpermitcoordination@dot.wi.gov
Fax: 715-635-2309

Completion Notice

Restoration is complete and ready for inspection. File notices within 10 calendar days of restoration completion. Restore within two weeks from completion of utility construction.

Restoration Completion Date:

Attachment 2: Backfilling Excavation Detail Drawings



NOTES

1) Use slurry backfill to replace the excavated material in ZONES 1 and 2.

2) If the work area covers BOTH ZONES 2 & 3, use slurry backfill to replace the excavated material.

3) Use granular backfill to replace the excavated material in ZONE 3. Granular backfill placement and gradation shall conform to WisDOT's Standard Specifications for Road and Bridge Construction, current edition.

4) Place backfill in ZONES 3 & 4 to within 4" of the finished grade to allow for topsoil placement.

5) Suitable spoil backfill may be used in ZONE 4 at the discretion of WisDOT.

SLURRY BACKFILL

The materials shall be placed in a clean concrete mixer truck and thoroughly mixed in the following quantities FOR EACH CUBIC YARD REQUIRED:

- SAND 1,350 lbs
- #1 STONE 750 lbs
- #2 STONE 1,150 lbs
- WATER 25 gals (0 to -0.5 gal variance)

No additional water will be allowed. The above weights are damp weights. Just prior to placing the slurry backfill, the mixer shall be run at mixing speed for one full minute to assure an even mixture.

Attachment 3: Pavement Restoration Examples

Figure 1a: Excavation with planned sawcut[1]

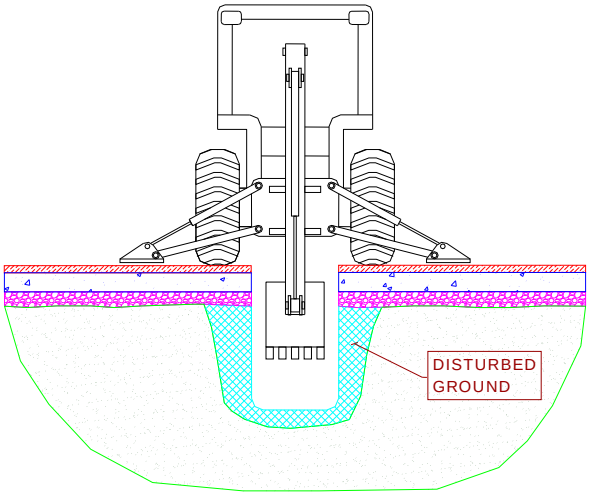


Figure 1b: Actual excavation without sawcut

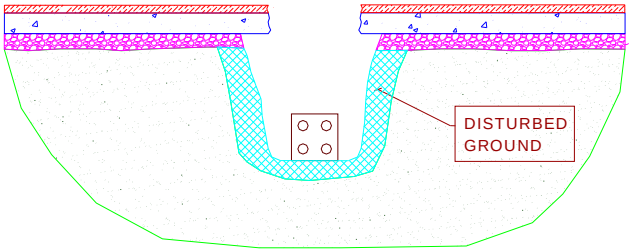


Figure 1c: Trench backfilling without slurry

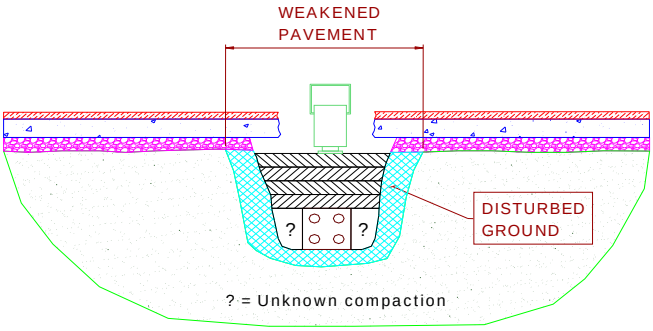


Figure 2: Concrete pavement repair without sawcut. Note top of pavement edge and missing dowel bar. In lower picture, dowel bars in gutter are bent and not ready to accept slurry.

[1] Drawings courtesy of CNA Consulting Engineers