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TRAVEL-LOG

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ROADWAY QUALITY MANAGEMENT PROGRAM

Part 2- Developing A Utility Control Program

Written by: Alan Kercher, P.E., T² Center Consultant

Part 1 discussed the importance of implementing a comprehensive roadway quality control program, as well as, what are adequate pavement design standards. Another important element of a roadway quality management program is the implementation of a Utility Control Program. Part 2 will discuss why a Utility Control Program is necessary and a brief overview of key components.

There are many reasons why a municipality should have a utility control program. The following are just a few examples:

1. Protect the Infrastructure

Not too many things can ruin a road quicker than poorly filled utility trenches. Cutting a pavement destroys the integrity of a pavement and creates a joint that allows water to penetrate into the pavement and subgrade below, leading to the potential for significant damage. Also, allowing a recently paved road to be cut for non-emergency work can be perceived by the general public as incompetence. Poor utility construction practices can lead to trench settlement and/or undermining of the surrounding pavement, and possibly damaging existing utilities or nearby buildings.

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ADA COMPLIANCE & CONSTRUCTION SITE SAFETY

Part 4 – Ensuring Pedestrian Safety Throughout the Course of Construction

Written by: Aaron D. Gerber, Kercher Engineering, Inc.

Construction activities within the public right-of-way can be particularly hazardous to pedestrians with visual, hearing, mobile, or cognitive impairments. This article will discuss the key components of construction site safety for pedestrians and the guidelines for providing safe and accessible routes for pedestrians during construction.

A construction site needs to have a continuous, safe, accessible path of travel for pedestrians at all times. A pedestrian facility should not be obstructed by construction activities without providing a temporary facility that meets the requirements of the Manual on Uniform Traffic Control Devices (MUTCD) and the Americans with Disabilities Act Accessibility Guidelines (ADAAG). The construction site should be adequately protected with barriers or barricades, and proper signage and delineation should be used to direct pedestrians safely and conveniently around the work.

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Roadway Quality Management Program

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Road destroyed by Utility Trenches

2. Liability

The following are a few utility construction situations that are potential liabilities: improperly controlled work sites within a right-of-way, trenches not properly braced, damage to utility lines, and poor safety practices relative to pedestrian traffic (open trenches). Not only can construction personnel and the public be injured, but serious damage to the infrastructure can occur.

It must be remembered that although someone else may be doing the work, they are still your streets and you have an obligation to see that they remain safe.

3. Traffic Delays

Poor planning or poor construction practices can lead to needless traffic delays, especially during peak travel times. For example, it is not uncommon to observe a routine maintenance procedure that takes two hours, being performed on a main thoroughfare during rush hour. Such activities should be required to be performed during off-peak hours, whenever possible.

After reading about some of the potential problems created by utility work, one might wonder why any utilities should be allowed within a right-

of-way. On the other hand, one must realize that the general public demands the services provided by utility companies. Road right-of-ways provide a convenient location for utility lines, as well as, helping to hold down costs by reducing the amount of additional right-of-ways that would have to be purchased by the utility companies.

As stated above, private utility companies along with municipal water and sewer departments need to be able to construct and maintain utilities. However, it must be realized that utilities in a roadway corridor are secondary to traffic movement. As such, a balance must be struck to allow utility work while protecting the general public's right to safe passage with a minimal amount of inconvenience, as well as, to protect the long-term integrity of the infrastructure. This can best be accomplished by developing a utility control program that will provide a reasonable framework that the municipality, the utility companies and contractors, and the general public can live with.

PARTS OF A UTILITY CONTROL PROGRAM

A comprehensive utility control program should include:

- An Ordinance
- Specifications
- Administrative Forms
- Review Process

THE ORDINANCE

The ordinance should describe the basic requirements as to how utility work within the right-of-way will be permitted. Items addressed in the ordinance should include:

- Definitions
- Permit Requirements
- Permit Conditions
- Emergency Situations
- General Conditions
- Insurance
- Fees

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- Security Bonds
- Safety
- Scheduled Maintenance
- Warranty
- Penalties
- Reserve Clause

Several important items that require special mention are as follows:

1. Permit Requirement

Permits should be required for all work performed within the rights-of-way. Not only should utility companies and contractors be required to abide by the ordinance, but also municipal sewer and water departments.

2. Emergency Situations

It should be stated what specifically constitutes an emergency and what the emergency procedures are. Also, the utility company must be required to substantiate that a true emergency situation existed.

3. Warranty

Poor trench restoration can lead to very expensive repairs. In order to protect the municipality (and ultimately the taxpayers) from potentially large repair costs, utility companies and contractors should be responsible for all pavement and trench repairs for a specified period of time. The taxpayers should not have to pay for shoddy work.

4. Safety

Simply stated, safety is paramount! Lives are at stake as well as liability for the municipality. The main hazards include trench cave-ins, striking existing utility lines, personnel working within a right-of-way, and traffic hazards for the traveling public.

All trenching must be in accordance with OSHA requirements. Temporary traffic control must be in accordance with DeDOT and MUTCD standards. Safety violations should carry fines and possible denial of future permits.

5. Scheduled Maintenance

Too often roads are overlaid and shortly thereafter, someone is cutting a hole in the new road. In order to minimize this problem, the utility companies should be required to notify the municipality in advance of scheduled replacement, repairs or planned expansions. Likewise, when a municipality generates its annual paving program, or even better, a long range plan, it should notify the utility companies of these plans as soon as possible. A pavement management system is a great tool that can assist municipalities with long range planning.

SPECIFICATIONS

The goal of the specifications should be to restore the right-of-way to its original condition. Therefore, trench and roadway restoration must be properly performed. This is accomplished with thorough specifications and a good inspection program.

Important items to be covered in the specifications should include:

- Pavement Cuts
- Backfilling
- Pavement Replacement
- Temporary Restoration
- Trenching/Open Cuts
- Temporary Erosion Control
- Landscaping and Lawn Replacement

Items of special note include:

1. Backfilling

Poor trench compaction can quickly ruin a road in good condition. Poorly compacted utility trenches are expensive to repair and may be an ongoing problem for many years to come. Additionally, they are a traffic hazard that can become a liability nightmare.

An alternative to standard backfilling with soil that should be considered is flowable fill. For example, the Town of Fenwick Island used flowable fill during the installation of its town-wide water distribution system. Ten years later, there has not been one trench settlement problem. For more information on flowable fill,



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please refer to the article entitled, “*Flowable Fill – What is it?*” in this newsletter.



Flowable fill being placed in Fenwick Island



As required by the Town’s utility ordinance, the road shown above was repaved at no cost to the municipality

2. Pavement Replacement

Asphalt pavements, at a minimum, should match the type and thickness of the existing pavement layers. In no case shall the surface course be less than one and one-half inches thick. Similar to proper pothole patching techniques, the existing pavement edge should be cut straight and vertical prior to replacing the pavement. All joints should be properly sealed after final compaction.

In areas where the utility cuts cover a significant portion of the pavement, the utility company should possibly be required to overlay a larger area to insure a smooth and longer lasting surface.



Significant portion of this road was damaged by a utility trench

Since specifications are typically revised from time to time, it is more convenient to keep the specifications separate from the ordinance (although the specifications must be referenced in the ordinance). This will allow for revisions to the specifications without having to go through the lengthy approval process necessary for an ordinance.

FORMS

It is important to create a paper trail for administrative and legal purposes. The four basic types of forms which should be required are:

- Application Forms
- Permit Forms
- Inspection Forms
- Completion Forms

REVIEW PROCESS

No matter how much diligence goes into the development, it is extremely difficult to develop a perfect ordinance. This is especially true in the dynamic world of the utility industry where technology is constantly undergoing many changes. Therefore, the ordinance should be reviewed periodically to ensure that it is meeting the needs of everyone involved.

To foster a spirit of cooperation and good will, the review process should include the utility companies and contractors who must obey the ordinance, as well as, the general public which must live with the consequences (good or bad) of the ordinance.

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TEMPORARY TRAFFIC CONTROL PLAN

A Temporary Traffic Control (TTC) plan should be developed prior to construction that describes how pedestrians will be safely directed around the work zone. Chapter 6 of the MUTCD suggests that the following should be considered when developing a TTC plan:

- Pedestrians should not be led into conflicts with work site vehicles, equipment, or operations. The TTC plan should describe in detail how this will be accomplished.
- Pedestrians should not be led into conflicts with vehicles moving through or around the work site. The TTC plan should describe in detail how this will be accomplished.
- Pedestrians should be provided with a reasonably safe, convenient, and accessible path that replicates the existing sidewalk or footpath.

TEMPORARY PEDESTRIAN ACCESS ROUTE CONSIDERATIONS

The following are some general considerations when providing a temporary pedestrian access route. Refer to Chapter 6 of the MUTCD and the ADAAG for more detailed explanations of the requirements.

Dimensions and Alignment

The temporary pedestrian access route shall have a minimum width of 48 inches and parallel the disrupted pedestrian access route when feasible. The temporary route should avoid excessive displacement of pedestrians.

Temporary Barriers

Barricades and channelizing devices shall be continuous, stable, non-flexible, and shall consist of a wall, fence, or enclosure as specified in the MUTCD. Provide a solid toe rail and top rail along the barrier.



Temporary Construction Barrier Treatment

Surface Requirements

The temporary pedestrian access route needs to have a smooth surface free of gaps and excessive vertical changes. The temporary surface needs to be well-delineated, continuous, and stable.



Temporary Surface Treatment

Signage

Signs and markings should explicitly designate the temporary pedestrian access route. The MUTCD and ADAAG have specific requirements for sign placement including minimum and maximum mounting heights and depth of protrusion into the path of travel. Placement of detour signs along the pedestrian route in advance of the temporary access route is also specified in the MUTCD.



The above photo is an example of poor planning and signage. The sign at the right hand curb ramp states that the ramp is closed and pedestrians are to use the other side of the road. However, the other side of the crosswalk is also under construction.

RELATED RESOURCES

Refer to Chapter 6 of the MUTCD for specific guidelines for the design of temporary pedestrian facilities. Also, the Americans with Disabilities Act Accessibility Guidelines contain specific design requirements for pedestrian facilities. For additional information related to Construction Site Safety and ADA Compliance, please contact the Delaware T² Center.

FLOWABLE FILL - What is It?

Written by: Alan Kercher, P.E., T² Center Consultant

Since proper backfilling techniques can be quite time consuming and difficult to achieve in many situations, flowable fill is becoming a popular alternative. The following are answers to commonly asked questions about flowable fill.

1. WHAT IS FLOWABLE FILL?

Flowable fill (also known as controlled density fill, controlled low-strength materials, or unshrinkable fill) is a semi-fluid material consisting of a mixture made of several materials. It is a low strength material that is stable and prevents settlement problems. Although there are many variations, flowable fill typically consists of some combination of cement, fly ash,* fine aggregate and water.

* - *Fly ash is a fine powder residue that results from the combustion of pulverized coal in power plants.*



Placing of Flowable Fill

2. STRENGTH REQUIREMENTS

The minimum strength at 24 hours should be 10 to 25 psi (pounds per square inch) depending on the support strength required for the specific application. This strength is sufficient for most highway applications and allows for construction to continue the following day. The maximum strength after 28 days is typically limited to 50 to 100 psi (3 to 5 percent cement

for fly ash flowable fill). Since backfill material in most cases must be able to be removed easily for maintenance purposes, it is important to have good specifications and inspection to insure that the maximum strength not be exceeded. The maximum limit specified herein would allow for removal by hand tools, if necessary.

3. ADVANTAGES

Advantages of flowable fill include:

- Consistent performance
- No compaction required
- Easy to mix and place with commonly used equipment
- No soils testing and less inspection
- Reduces time and labor
- Reduces worker exposure to hazardous conditions
- Fly ash flowable fill is lightweight

4. CONSTRUCTION APPLICATIONS

Flowable fill can totally replace labor-intensive backfill methods in the following applications:

- Backfill for walls, culverts and pipe trenches
- Backfill for bridge abutments and retaining walls
- Filling abandoned underground structures or void spaces
- Backfilling irregular areas and hard-to-reach places
- Low density fill over weak, highly compressible soils

Caution must be used when placing flowable fill under lightweight pipes or empty tanks. The fluid-like material may cause objects to float or shift. Therefore lightweight objects should be anchored in place.

If your municipality would like more information regarding the use of flowable fill, please contact the T² Center.



Other Upcoming Events

- October 30, 2007 Must We Keep Meeting Like This?
(How to have more effective meetings)
Kent Poly Tech High School, Woodside, DE
- November 15, 2007 Geosynthetics for Local Governments Workshop
Kent Poly Tech High School, Woodside, DE
- January 13-17, 2008 Transportation Research Board Annual Meeting
Washington, DC
<http://gulliver.trb.org>
- March 31-April 2, 2008 2008 Roadway Management Conference
Oglebay Resort, Wheeling, WV.

Most T² Center events are free to state and local transportation agencies in Delaware.
For more information, contact us at 302-831-6241.

T² Center Request Form

___ Please add my name to the T² Travel-Log mailing -- subscriptions are free

___ I have an idea for a future newsletter article on the topic of _____

___ I would like to submit a newsletter article, please contact me.

___ Please consider these topics for future training sessions

Name: _____

Address: _____

Municipality: _____

Please return this form to:

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Delaware T² Center

The Technology Transfer (T²) Program is a nationwide effort financed jointly by the Federal Highway Administration and individual state departments of transportation. Its purpose is to interchange the latest state-of-the-art technology into terms understood by local and state highway or transportation personnel.

The Delaware T² Center Travel-Log is published semi-annually by the Delaware Technology Transfer Center at the University of Delaware. T² Center articles also appear semi-annually in the TransSearch - the newsletter of the Delaware Center for Transportation. Any opinions, findings conclusions or recommendations presented in this newsletter are those of the authors and do not necessarily reflect views of the University of Delaware, Delaware Department of Transportation, or the Federal Highway Administration. Any product mentioned in the newsletter is for information purposes only and should not be considered a product endorsement.

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