

Chapter 9

IDENTIFYING UTILITY CONFLICTS

WisDOT EXPECTATIONS OF UTILITY CONFLICTS

Any utility facilities within the excavation limits are considered as being in conflict with the highway improvement project. Any buried facilities within 18 inches of the excavation limits are considered to be in conflict with the project. The Wisconsin Public Service Commission agrees with this 18-inch limit for safety and facility damage prevention reasons.

WisDOT expects the utility conflicts to be resolved in some way, they should either be:

1. Relocated outside of the excavation area, or
2. Relocated in coordination with the highway construction operations, or
3. Protected so that construction operations will not harm the utility facilities that are not in direct conflict with a proposed highway improvement, or
4. Assign utility company personnel to work with the contractor exposing and protecting the utility facility during construction operations in the area of the conflict.

Overhead lines that will conflict with construction operations, such as crane movement, can be utility conflicts if they restrict construction operations to the point where it is impossible to build the project with mechanical equipment. Restricting crane operations to 180-degree horizontal movements is not an unrealistic expectation. Restricting crane operations to less than 180 degrees is an unrealistic expectation. It may be possible to use equipment other than cranes to accomplish the construction task, if that is the case, the utility obstruction should be clearly identified in the special provisions so that the contract bidders take the obstruction into account when planning their method of operation and any additional costs would be included when they submit their bid.

IDENTIFYING UTILITY CONFLICTS

The utility company is ultimately responsible for determining the exact location of their facilities and for resolving conflicts with the highway improvement project. However, the highway designer is the person with the most knowledge about the highway project and is thus the best person to identify conflicts between the highway facilities and utility facilities. This assumes that the utility company provides the highway designer with accurate information about the location of their facilities. **Identifying utility conflicts should be a joint effort by the highway designer and the utility company.**

It is recommended that the highway designer provide the utility company with a list of potential utility conflicts based on the designer's knowledge of the location of the utility facilities. The designer is not taking on any liability by doing this; he/she is merely using their knowledge of the project to help the utility company get a head start on identifying the conflicts. **The utility is responsible for verifying these potential conflicts and identifying any other conflicts that might exist.**

On projects where the location and/or size of the buried utility facility is questionable and as a result it may or may not be in conflict, steps should be taken to determine the exact location of the facility. The designer should work with the utility company to determine whether the utility facility is in conflict. This may require exposing the utility facility and taking measurements that can be used to locate the facility on project plans.

This will generally mean obtaining x, y, and z, coordinates for the facility using the appropriate County Coordinate system. Design team survey crews can be used to obtain this information after the facility has been exposed. There are various methods that can be used to expose the facility. Vacuum excavation is one example.

CURB AND GUTTER CLEARANCE RESTRICTIONS

Contractors have been complaining when there is less than 3 feet of clearance between the back of curb and any above ground OR buried utility facility. Some curb and gutter paving machines require about a 3-foot clearance. Therefore, anytime there is less than 3 feet of clearance between the back of curb and the utility facility, this must be pointed out in the Special Provisions of the highway contract. The contractor can then incorporate any handwork required into his/her bid price.

There have been times when buried facilities have been in conflict with paving machines because the contractor has had to excavate to a depth below ground that uncovers the cable or pipe, or reduces the cover over the cable or pipe to an insufficient depth for safety reasons. Check the pavement structure depth and add at least two feet to that depth to determine if buried facilities are likely to be in conflict. If they are in conflict, they must be relocated.

COMMON CONFLICTS

Listed below are some common conflicts that are often missed when reviewing a highway improvement plan looking for utility conflicts. This list is not all-inclusive.

1. Cuts or fills for side roads or driveways.

- a. Cuts for driveways may not be shown on the cross sections.
- b. They can go beyond our right-of-way acquisition areas. Sometimes these are handled with temporary easements or construction permits outside the project limits. Easements are the preferred way, because we can't pay a utility to relocate based on a construction permit.
- c. Utility lines must be buried extra deep near driveways in cut sections to assure proper cover during and after construction.
- d. Check the side road cross sections. People some times look only at the mainline cross sections and miss conflicts caused by the new side road profile.
- e. Fills for side roads or driveways can also cause clearance problems for overhead facilities. Or, the weight of the fill section may be too much for a buried facility, causing a relocation.

2. Commitments to property owners.

Review the commitments to property owners before looking for conflicts. Real Estate agents should not be making commitments that affect utility relocations, such as promising that a certain tree, shrub or other landscaping on WisDOT right-of-way will not be affected by the highway project. However, if they do make a commitment that might impact the work of a utility, the utility must be made aware of the commitment so that they can honor it when they do their plans and construction work.

3. Excavation below subgrade (EBS).

The actual limits of EBS are determined during construction and are defined by the limits of the material being removed. Estimates of the location are placed on the plan sheets, but the excavation may end up being wider or deeper than originally shown on the plans. Avoid placement of new facilities near an EBS area. Relocate existing utility facilities that are in or near the EBS area. Utility company staff many not fully realize what EBS is and what its impact could be on their facilities.

4. Environmental Areas

Archaeological sites, historical sites, contaminated sites, and endangered species habitats are listed on the plans, but their existence may not be apparent to the utility company designer. Review the utility work plan to make sure that their proposed facilities do not encroach upon any of the sensitive environmental areas on a project. Some environmentally sensitive projects may require additional permits from other agencies.

5. Temporary Diversion Channels

Box culvert diversion channels are not always clearly marked on the plan sets that are sent to utility companies. Utility designers generally focus on the final highway product and may not be aware of any temporary diversion channels that are required to construct a structure. Excavation required for a diversion can conflict with a utility facility. Sheet piling is often used to redirect a stream and the piling will interfere with any buried utility facility.

6. Storm sewer, culvert pipes, pipe underdrain and other drainage structures

The drainage system needs to be designed prior to sending the plans to utilities. The utilities need to be notified of any changes to the drainage system. Conflicts with drainage structures are often overlooked, especially storm sewer and underdrain conflicts. The exact vertical locations of the utility facility may be needed to determine if there is a conflict. The utility company and the highway designer should work together to obtain this information if it is not readily available.

7. DOT Directional Signs

Highway signs, especially the big green signs or the blue services signs on divided highways may conflict with overhead and buried facilities. Check the size and depth of the bases required for these signs and also check the above ground clearance from existing and proposed overhead utility lines. Electric transmission lines require larger clearances than you might expect.

8. Traffic Control Staging and Temporary Widening

Poles and pedestals may not be in conflict with the final roadway, but they may be in conflict with the temporary work that is required for a staged project.

9. Tree Planting, Lighting, Street Enhancements and Other Miscellaneous Structures

Some times these details are not available at the time plans are sent to utilities. However, each of these details can cause a conflict with utility facilities. It is important to send these details to the utility companies as soon as possible. Also, check for conflicts with these kinds of details when the utility work plan is returned.

10. Overhead Lines vs. Construction Equipment

Overhead utility lines may not be in conflict with the proposed highway, but they might be in conflict with the equipment needed to build the highway. We must provide a work area where equipment can operate without too much obstruction. A crane should be able to swing at least 180-degrees and equipment should be able to operate without violating OSHA clearances. If normal construction equipment cannot be used, or if there are some restrictions to full movement, the special provisions should inform the contractor of what the restrictions are. Special equipment may be needed, which can lead to additional costs that should be reflected in the bid prices. See "[Working Around Utility Facilities](#)" in this chapter for more guidance.

11. Lighting and Signal Bases and Poles

Bases for signal or light poles are generally larger than you expect and quite often are overlooked when identifying conflicts. Bases can be up to 16 feet deep and more than 7 feet in diameter. Check with the designer to find out how big the bases will be. Also, check the overhead conflicts. Make sure that existing or proposed overhead lines will not conflict with the signal or lighting poles and wiring.

12. Utility "Manholes," Vaults and Duct Packages

Buried utility facilities that appear on the plan as a manhole or just a buried cable could be an underground vault or a huge conduit system. Both of these types of facilities can be costly to relocate and they can have a very large footprint causing a lot of potential conflicts. Discussions

with utility companies during the early design stage can identify such facilities, which can become a design constraint if relocation is not practical. Even if they are abandoned in place prior to construction they can be costly to remove or work around. Large inactive facilities should be spelled out in the special provisions so the contractor is aware of their existence and can bid accordingly. Checking utility system maps can help to identify buried facilities.

13. Retaining Walls

Any wall other than a short gravity wall (usually found only in urban areas and less than 3 feet tall) will have some sort of anchoring system in the ground behind the wall. These anchoring systems can be of several types, usually either tie rods or geogrid (buried layers of mesh in between layers of backfill several feet deep that tie the wall and the soil behind it together). Utility facilities must stay well behind the furthest point out of either the tie rod anchors or the geogrid. If possible, the utility should be placed on the other side of the highway, or stay in front of the wall, although that might not be practical. Check with the designer for the design details of all retaining walls. Note that the excavation required to build the retaining wall may conflict with existing utility facilities that would otherwise not be thought to be in conflict. The designer should be able to provide a good approximation of the excavation limits.

14. Structures (Excavations for Footings, Foundations, Cut-off Walls, etc.)

While the footprint of a proposed structure may not interfere with an existing utility facility, the excavation limits needed to construct the structure may conflict with a utility facility that is several feet away from the footprint. The excavation limits are determined based on the depth of the structure in question and the soil types. In many cases a 1:1 slope is needed from the bottom of the excavation to the existing ground level. A footing that is 12 feet deep would require at least a 12-foot buffer around the footing footprint. The structure designer should be able to provide the approximate limits of excavation. They will know about the type of soil involved and what can be expected.

AIR SPACE CONFLICTS

Landing sites for aircraft have a restricted space around them to provide a safe landing area for aircraft using the facility. Above ground structures are not allowed in this restricted air space. There are about 100 publicly owned airports and 600 privately owned landing sites in Wisconsin. The Bureau of Aeronautics has a booklet called "[Airports by County](#)" that provides all of the landing site locations for each county in the state. This booklet is available on the WisDOT website. The designer should consult this booklet early in the design process to determine what, if any, landing sites are near the improvement project.

When a project is within one mile of a landing facility, the designer should check with the Bureau of Aeronautics to determine what affect the landing facility will have on the highway improvement project and its related street lighting, signing or utility facility relocations. If one of the larger public airports is involved, check with the Bureau of Aeronautics when the project is within 3 miles of the airport. The Bureau would like to work with the designer and the utility companies to locate any above ground structures so that they are not a hazard to air navigation. Contact the Bureau at (608) 267-5273 or you can contact the project manager assigned to the airport in question from the Bureau website at: <http://www.dot.wisconsin.gov/business/engrserv/airports/project-managers.htm>

HYDROELECTRIC PLANT (DAM) CONFLICTS

Hydroelectric dams have topographic restrictions around them that might be violated by a highway improvement project. Any filling or changing of natural or man-made topographic features can affect the Federal Energy Regulatory Commission requirements regarding containment around a hydroelectric dam. A change in elevation of a roadway can affect the flood elevations and backwater of a dam. Excavation, either cutting or filling, could also affect the discharge characteristics of a nearby dam. If your project is in the vicinity of a dam, contact the dam owner to determine if there are any

potential conflicts. A site visit to the dam can help you determine the owner of the dam in most cases. The Department of Natural Resources or the Federal Energy Regulatory Commission can also be contacted for assistance in determining who owns the dam.

CELL TOWER CONFLICTS

Cell towers are obviously expensive to move. If at all possible, avoid direct conflict with the cell tower and its anchors. A ballpark cost of relocating a cell tower is \$500,000 to \$1 million.

Cell towers generally have a lease rather than a fee title ownership in the land they occupy. The leased land area meets the required standards for towers. The leased area is often larger than the fenced area around the tower itself. Avoid taking any part of the leased property if possible. Any reduction of the leased area could put the tower into a non-conforming status, which may require relocation of the tower. Relocation options are generally restricted by the technology demands of the system. They must be within a certain radius of the existing location.

Each county has its own ordinances regarding the location of towers, fall zones, and associated requirements that may further restrict relocation options. Review the local ordinances to determine what impact any change in the leased area may have on the tower.

A long-term lease is an interest in property and needs to be recorded at the County Register of Deeds Office if it is for more than one year. Therefore, a long-term lease should show up in a title search of a property. The terms of the lease should be examined to determine what financial impact the lease has on the property. The termination of the lease may require payment to the underlying property owner and the payment of damages to the tower owner, including relocation assistance. The real estate people working on the project should handle this lease similar to other leased properties.

Several utility companies may have facilities connecting to and on the tower. If these facilities require relocation they would be handled as a normal utility relocation handled by the Region Utility Coordinator.

WORKING AROUND UTILITY FACILITIES

There are times when it is not practical to relocate utility facilities for a highway improvement project. There are two general types of situations involved:

1. The first situation is generally **large, high cost facilities, or facilities that cannot be taken out of service** without endangering the local economy, the safety of the public, or placing an unreasonable burden on the utility customers.

In these cases, the designer should determine whether the project could be built with the utility in place. Is it possible to construct the project with the utility as an obstruction? The designer should consult with people familiar with construction machinery and construction practices to determine whether it is feasible to build around the utility line. It may cost more to use alternate construction practices. The additional highway project costs may be justifiable in the big picture. Those additional costs should be part of the decision-making process when considering the feasibility of leaving the line in place.

If the designer does not have access to qualified construction personnel, or if the design team has questions regarding their decision, there is a list of industry “experts” that have volunteered to be available to review specific projects and give their opinion on the constructability of a project. See [Figure 9-1](#) for a list of experts that can be consulted.

2. The second situation is on **projects where it is not possible to relocate the utility totally out of the excavation limits**. This often occurs in urban areas where the utility line serves the

properties adjacent to the project. The service laterals that go from the main line to the individual properties are often in conflict with the highway construction operations and adjustments need to be made during construction. The contractor often has to be cautious when working around the laterals and if any adjustments are required, they may be completed during construction. This is especially true for valve assemblies and valve or manhole covers.

A variation of this situation is when the main line crosses excavation required for storm sewer or similar construction. Quite often installation of storm sewer requires working around other utility lines. As long as the utility lines are not in direct conflict with the storm sewer facilities, relocation of the utility lines is not required.

Areas where the right-of-way is congested with a lot of utility facilities, generally in urban areas, will often require the contractor to work around numerous utility facilities. As long as it is possible to complete the work, this is an acceptable condition. Due to the unknown accuracy of depth information on utility as-built plans and the susceptibility of locating equipment to error caused by site conditions, it is often a good idea to expose utility facilities to determine actual locations, and then determine whether conflicts exist. In some of these areas the conflicts are best resolved by changing the design of the storm sewer.

In both of the above situations, it is important that the special provisions of the highway contract clearly state that the contractor must work around the utility facility. This will affect the construction operations and the construction costs.

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