



SECTION 1

**GENERAL
SIGNING
GUIDELINES**



I. SAFETY & TRAINING

A. PERSONNEL SAFETY

All Department of Transportation (DOT) personnel are required to follow the safety policies stated in the DOT Transportation Administrative Manual (TAM). These safety policies are strongly encouraged to be followed by county and contractor personnel. This Safety Manual is located under Sub Part "E" of the TAM Manual. All personnel *should* be familiar with the important safety guidelines and policies listed below.

Safety Guidelines and Policies

Transportation Administrative Manual

TAM SD30 - Foot Protection (See Exhibit 1)

TAM SD36 - Eye Protection (See Exhibit 2)

TAM SD51 - Protective Headgear - Hard Hats (See Exhibit 3)

TAM SD57 - High Visibility Safety Apparel (See Exhibit 4)

Hazard Warning Information - Treated Wood Management (See Exhibit 5)

(Material Safety Data Sheets *should* be requested from the wood post vendor)

Vehicle Lighting Schemes (See Exhibit 6)

Traffic and Worker Safety Schemes (See Exhibits 7 through 9)

Barricades and Signs for Mainline Closures Standard Detail Drawings

(See Standard Detail Drawings 15C2-4 A through C)

Signing Guideline Pocket Manual (Currently being developed)

Flagger Handbook

B. WORKER VISIBILITY

All personnel exposed to traffic **shall** wear a reflectorized safety vest at all times while on or along the roadway. Special attention **shall** be made to make sure the vests are in good condition and still very visible. It is highly recommended that reflective safety pants be worn during nighttime hours and whenever higher worker visibility is desired. (See Exhibit 4)

C. EMPLOYEE TRAINING RECOMMENDATIONS

All agencies doing work for the DOT *should* make sure their employees are properly trained in the following areas.

1. Field Operations Awareness. DOT personnel on field assignment **shall** be instructed on the required use of safety vests, head protection and safety shoes, as well as any other Department policies and/or practices guiding field crew operations. All counties and contractor personnel **shall** also be required to use

safety vests and recommend use of head protection and safety shoes as well as any other safety devices.

2. Shop Tools. Shop personnel *should* receive proper instruction prior to using any shop power tools or power equipment such as power saws, drills, welders, chipping hammers, etc.
3. Major Equipment Operations. Personnel *should* be thoroughly trained before they attempt to operate digger derricks, forklifts, cranes, or other aerial devices.
4. Utilities Locate. All employees *should* be instructed on how to use Wisconsin Diggers Hotline One Call System.
5. Retraining. Personnel *should* receive retraining on major equipment, digger derricks, cranes, aerial devices and forklifts through on the job training and refresher courses.

D. VEHICLE SAFETY

1. Licensing. Drivers will be required to meet all State and Federal regulations pertaining to licensing and operation of State vehicles. The requirement of the Commercial Drivers License *may* apply to certain personnel.
2. Pre-trip Inspections. Vehicle operators *should* perform a pre-trip inspection each day.
 - a. The following are example items that *should* be inspected on ALL vehicles.
 - Brakes
 - Tires
 - Engine cooling system - radiator and fan belts
 - Fluid levels - engine oil, transmission fluid and radiator coolant
 - Fire extinguisher(s)
 - First aid kit
 - Back-up alarm
 - Safety warning devices (lights, signs and cones) - check for cleanliness and suitability for use in the field.
 - b. The following are example items that *should* be inspected on digger derricks, cranes and bucket trucks.
 - Winch lines
 - Boom out-of-cradle warning lights and buzzers
 - Hydraulic lines and fittings - check for leaks or loose fittings

REPAIR OF HYDRAULIC LINES TO DOT OWNED VEHICLES IS TO BE PERFORMED BY TRAINED SERVICE TECHNICIANS OR DEALER MECHANICS.

3. Equipment Inspections Equipment **shall** be inspected as required by law. The booms and buckets on digger derricks and aerial personnel buckets **shall** be inspected by a contractor specializing in the testing and inspection of this kind of equipment.

E. WORK AREA TRAFFIC CONTROL

All traffic control **shall** be in compliance with the MUTCD and the Wisconsin Supplement and Departmental policies.

1. Vehicle Warning Lights. It is necessary to provide a high degree of visibility in order to alert the motoring public of sign crew operations on and along the highway. Therefore, vehicles used in highway signing operations **shall** be equipped with at least two (2) yellow, high intensity rotating beacons, clearly visible from the front, rear and both sides of the vehicle. These beacons **shall** be placed as high as possible on each vehicle. Vehicles **shall** have all warning lights operating when stopped, or moving slowly along any highway. Warning lights *should* NOT be displayed while the vehicle is traveling at highway speeds or when traveling between jobs. See Exhibit 6 for examples of vehicle lighting schemes.
2. Work Area Schemes For the safety of the traveling public as well as workers, it is necessary to give the traveling public advance warning of conditions they are approaching. Schemes for traffic control are located in Exhibits 7 through 9 of this manual. These schemes illustrate proper vehicle placement, and the use of signing and cones in an ideal work area environment. Some conditions that *should* be considered for the quantity and placement of warning devices are listed below.
 - Traffic Volumes at the time the work is being performed.
 - Speed of the traffic.
 - Visibility. Check visibility in advance of the work area from both directions; especially around curves and over hills. Position workers and work vehicles to provide for maximum visibility.
 - Weather conditions.
 - Length of time activity will take.
 - Location of equipment and personnel.

It is important to consider all of these conditions when setting up the work area. When conditions are less than ideal, additional advance warning signs or devices *should* be added to the traffic control layouts. In some cases, the work *should* be deferred until the conditions are more favorable.

All lane closures on two lane roadways require flagging of traffic as well as advance signing and cone placement in the work area. (See Flaggers manual for proper flagging procedures. One is provided on the inside of the front cover of this manual.) Remember that all flaggers **shall** use stop/slow paddles, in accordance with the Flagging Handbook.

An encroachment into a lane of traffic *may* require cones and/or flagging. The amount of encroachment, the volume and speed of passing vehicles will determine traffic control measures required. For example, a cone *may* be sufficient to mark the point where an outrigger makes contact with the pavement outside the overall width of the truck. (See Exhibit 7 through 9)

F. PUBLIC SAFETY

When performing sign work or any activity along the highway, it is necessary to make an effort to stay out of the motoring public's way. Workers *should* park vehicles off the road as far as practical. Care *should* be taken to not block the vision of existing traffic control devices such as stop signs and signals. Workers *should* be aware of the potential for blocking the vision of motorists entering highways at crossroad intersections or driveways. Work activities *should* be performed with an assumption the motorist does not know what the workers are going to do. Preplanning the work activity minimizes confusion to the motorist and reduces the risk of creating unnecessary hazards to the public and to the crew.

G. UTILITIES

1. Utility Locates. Prior to any digging operations it is the responsibility of the crew or authorized personnel to contact Diggers Hotline. Personnel **shall** be familiar with Diggers Hotline requirements for digging.

A UTILITY LOCATE SHALL BE MADE BEFORE ANY DIGGING IS PERFORMED!

State law requires all underground facilities become members of the one call system, Diggers Hotline. The initial contact will usually be to "Diggers Hotline", which coordinates the locating of many of the utilities having underground service lines throughout the state.

Wisconsin Statutes, Section 182.0175, requires that "ANYONE" who engages in or is responsible for the preparation of plans and specifications for non-emergency excavation or demolition must provide reasonable advance notice, **NOT LESS THAN THREE (3) WORKING DAYS** prior to the start of excavation or demolition of the intent to excavate or demolish and the start date, to the owners

of the transmission facilities in and near the construction area, whose facilities *may* be affected by excavation or demolition.

The following is a five-point plan for utility locates before digging in the highway right-of-way, which covers the routine steps required by Diggers Hotline:

- a. Prepare a plan or work location sketch or drawing. Indicate the radius around the stake or lath for "MARKING INSTRUCTIONS" for the Diggers Hotline contact.
- b. At each locate site, mark with a stake or by painting on the pavement or shoulder of the highway. Use WHITE paint on the pavement where it is not possible to use a stake. White is the approved color for ribbon, flags or paint when marking sign locations for utility locates. It is recommended that the Regions use the "WDOT SIGN" ribbon when marking sign locations for utility locates.
- c. Identify the exact location by measuring the distance from the nearest intersecting street or highway. Indicate which side of the highway the locate is on.
- d. Contact Diggers Hotline to request the area to be located. Retain ticket number for a minimum of six years after work is completed. It is recommended that you keep this ticket information while borings are being done, so if you encounter a problem you have the information readily available. It is also recommended that all who are unfamiliar with Diggers Hotline practices make an initial contact with Diggers. First study the TICKET FORMAT to become acquainted with the process. Diggers Hotline has several ways to submit locate requests.
- e. Investigate the possibility of other utilities having services at the locate site.

NOTE: Utilities are required to update the Diggers maps once a year, so if you have a location with an area that looks like the ground has been disturbed, check to see if there *may* have been a new utility installed. This utility information *may* have not gotten into the computer files yet.

- Check Utility Identification List with Regional Utility Coordinator. All Regions have Utility Identification Lists available through their Utility Coordinators.
- Call other public utilities of sewer and water.
- Check with DOT electrical crews for relocations of signal or flasher cable locations.

2. Utility Damage Procedure. Damage prevention is the ultimate goal. As stated above it is essential to get clearance from utilities before doing any digging.

The following is a list of crew priorities:

- ❑ BEFORE YOU DIG, CONFIRM UTILITIES HAVE BEEN LOCATED

IF UTILITY DAMAGE OCCURS:

- ❑ CALL THE UTILITY FROM A SAFE LOCATION AS SOON AS POSSIBLE.
- ❑ CLEAR AREA IF NECESSARY.
- ❑ EXTINGUISH ALL FIRE SOURCES; BE MINDFUL OF LOSS OF LIFE.
- ❑ NOTIFY EMERGENCY SERVICES (IF NECESSARY).
- ❑ NOTIFY SUPERVISOR.
- ❑ BE AVAILABLE ON OR NEAR THE SITE UNTIL REPAIR CREW ARRIVES.

Crews *should* carry a telephone list of utilities that have lines in their area. *Should* damage occur to a utility during the course of digging, the following outlines the emergency procedures crews *should* use:

If the utility is:

a. Natural gas:

1. STOP, remove all ignition sources (turn off truck engine, all lights, all power tools or equipment) and prohibit smoking. Keep area clear of bystanders.
2. Call the local fire department or emergency services.
3. Call the affected natural gas line company. Leave a crewmember at the site to keep the area clear and to keep bystanders away.
4. Notify supervisor of damage and status.
5. Warn bystanders to stay away from site and upwind of the leak.

6. If ignition occurs, let it burn unless lives are in danger. Putting out the fire without shutting off the source of the leak *may* make the situation more dangerous.

b. Telephone, cable TV, sewer or water etc.:

1. Where cables are cut, DO NOT REACH OR LOOK INTO THE HOLE OR TOUCH THE DAMAGED LINES. Treat any line or cable as if it were live power.
2. Call utility repair service. Leave a crewmember at the site to maintain security of the area.
3. Do not back-fill or fill in the hole.
4. Notify supervisor of damage and status
5. Warn bystanders to stay clear of area

c. Overhead and Underground Electrical

1. DO NOT TOUCH LINE OR LOOK INTO HOLE. Do not touch equipment and ground at the same time. Remain on the platform if at all possible. Jump clear only in an emergency.
2. Notify utility
3. Notify supervisor
4. Warn bystanders to stay clear of area

H. PLANNING FOR SPECIAL CONDITIONS

Crews *may* encounter special problems with traffic control due to unforeseen traffic volumes or unusual sign site locations (concrete or black top shoulders or terraces, etc.). Crews *should* be prepared to deal with these or determine the best course of action relative to personal and public safety and the Department's responsibilities. Crews *should* follow the Traffic and Worker Safety Schemes as closely as possible (See Exhibits 7 through 9) particularly as they relate to lane closures.

I. MAJOR EQUIPMENT OPERATIONS

It is recommended that field operations that involve digger derricks or bucket trucks will NOT be performed with fewer than two crew persons on the job site.

Personnel operating digger derricks, bucket trucks, fork lifts and any other cranes or lifting devices *should* receive training before operating such equipment.

Signing crews using digger derricks need to be alert that bystanders or other crew personnel are clear of the area before starting and during operations.

HAVING A UTILITY LOCATE CLEARANCE DOESN'T NECESSARILY MEAN ALL DANGER HAS BEEN REMOVED.

Derrick operators must be aware of overhead lines to be certain the boom or its attachments remain the required distance away from the overhead lines.

Operators *should* remain on the derrick operator's platform during any digging or lifting operations. In the event of a contact with an electrical cable the operator is grounded to the truck. If the operator makes contact with the ground and the truck at the same time he or she *may* receive an electrical shock. Exercise additional caution when using a remote controlled digger.

Operators **shall** employ the equipment's outrigger systems before lifting the boom of derricks, buckets or cranes from the stow cradle supports.

Warning devices *should* be maintained operational to alert the operator that the boom is out of cradle. Special devices have been installed to advise the operator whenever the boom is out of cradle and the power takeoff (PTO) has been disengaged.

Digger derricks, buckets and cranes *should* NOT be moved with the boom out of cradle. These units **SHALL NOT EVER BE MOVED WHEN THE PTO IS ENGAGED**. To do so endangers the operator and the equipment, as the equipment is not designed to function in this condition.

II. SIGN TYPES

There are three types of signs that are installed and maintained for the DOT.

Type I signs consist of demountable copy message on extruded aluminum base material, typically mounted on steel I-beams. Examples include large green freeway interchange guide signs, and supplemental freeway traffic generator guide signs.

Type II signs consist of direct applied message on either plywood or sheet aluminum base material, typically mounted on wood or steel posts. Examples include ground-mounted regulatory and warning signs, and smaller guide signs for conventional highways.

Type III signs consist of demountable copy message on either plywood or sheet aluminum base material, typically mounted on wood or steel posts. Type III signs are normally used for temporary guide signing on improvement projects. These signs are destination-orientated and usually have white lettering on green background. Examples include temporary interchange guide signs used during a construction project.

III. SIGN CLASSIFICATIONS

A. REGULATORY SIGNS

Regulatory signs give notice of traffic laws and convey the rules of the road. Regulatory signs typically have a red or white background.

B. WARNING SIGNS

Warning signs alert the attention of the driver to special conditions on or adjacent to a highway or street that *may* require an important driving decision or action. Warning signs typically have a yellow background.

C. SCHOOL SIGNS

School signs are used to alert the motorist to school locations and the posted school speed limit. School Signs typically have a fluorescent yellow/green background.

D. GUIDE SIGNS

These signs are directional and informational. They are used to direct the motorist to their destination and to inform them about various service facilities and other points of interest along the highway. Guide Signs typically have a green background, and directional assemblies are typically black on white background or white on blue background.

E. RECREATIONAL SIGNS

These signs are informative for the traveling public not familiar to an area to get to their destination. Recreational Signs typically have a brown background.

F. TOURIST INFORMATION SIGNS

These signs are informative signs used to guide motorists to service type areas. Tourist Informational Signs typically have a blue background.

IV. STORAGE & HANDLING OF SIGNS

Signs **shall** be shipped with the sign face protected either by cardboard or slip-sheeting paper taped to the sign. Signs **shall** be shipped in bundles no more than three feet in height.

For storage of signs, signs **shall** be stored vertically on edge with slip-sheeting paper between each sign to protect the face of each sign. The Region Sign Shops are encouraged to minimize the amount of inventory on hand, which will result in less dollars being stored on the shelves and less manpower to maintain. In addition, a smaller inventory will help to rotate stock properly to ensure that signs are placed out in the field as soon as possible and not aging in the shop.

Guidance as to what types of signs *should* be stored at the Region Sign Shops and the Central Office Sign Shop are shown in Exhibit 24.

V. OPERATIONAL STANDARDS & GUIDELINES

This section sets forth the Standard Policies in detail for specific problem areas of signing operations.

These manuals are available on the Wisconsin DOT website in the “Traffic Operations Manuals Library.”

Sign crews **shall** be familiar with the following manuals:

- Manual on Uniform Traffic Control Devices (MUTCD)
also available at: <http://mutcd.fhwa.dot.gov/>
- Wisconsin Supplement to the MUTCD
- Wisconsin Traffic Guidelines Manual (TGM)
- Standard Design Details
- Standard Sign Plates
- Standard Sign Installation Details (SDD Section)
- Wisconsin DOT Standard Specification for Highways and Structure Construction