



7-85.1 General

WisDOT policy, [FDM 9-5-1.1](#), the contractor is to take all reasonable measures to assure that no survey monuments will be destroyed, disturbed, removed or buried to the degree that they are no longer usable. If survey monuments are discovered by the contractor, contact the WisDOT Geodetic Surveys Unit (GSU), Surveying and Mapping Section; toll free number 866-568-2852 or via email geodetic@dot.wi.gov for specific disposition instructions.

7-85.2 Geodetic Control Station Monuments

The U.S. Coast & Geodetic Survey, U.S. Geological Survey (USC&GS), National Geodetic Survey, Wisconsin Department of Transportation, and various county and local agencies have established thousands of geodetic survey control stations throughout Wisconsin.

Every reasonable effort should be put forth to protect geodetic control station monuments. Geodetic control station monuments are expensive to replace (as much as \$25,000 each) and use of the station is lost until it is replaced. When one of these geodetic survey control station monuments will be disturbed (moved more than 1/16th of an inch) or destroyed during construction, the department and the contractor must notify the agency that established the monument. Notification of endangered Wisconsin Height Modernization Program (HMP) stations must be made to GSU as stated above.

If it is not certain whether the station is an HMP station, assume it is and call the toll-free number. The GSU will provide instructions for establishing a replacement monument and for submitting the disk of the destroyed station. Contact the GSU at least one year before planned construction activities in the area of a HMP geodetic survey control station so that planning can be made for the protection or destruction of the station(s). If a HMP geodetic survey control station is located on a construction project but was not noted on the construction plans, notify the GSU immediately. Changes to the contract may be required if a station was discovered that was not identified in original contract documents. GSU will work with design and/or construction personnel to identify the HMP geodetic survey control station and if the geodetic survey control station will be disturbed by construction activities. Figures 1 and 2 show examples of HMP geodetic survey control stations in the field.

Figure 1 HMP Monument Marking



A geodetic survey control station surrounded by three white posts (left) indicates the mark is a vertical control point with a high ordered leveled elevation. A geodetic survey control station surrounded by three orange 4" x 4" guard posts (right) indicates the mark is a 3-Dimensional control point with a precise horizontal position and elevation.

Figure 2 Bronze Survey Disks



A bronze survey disk embedded in the top of a 16-inch diameter concrete post (left) along with a view above the concrete geodetic survey control station (right). The concrete extends 8 feet below grade to maximize stability.



A bronze survey disk set in the top of a bridge abutment (left) and a bronze survey disk set in the top of a box culvert wing wall (right). The location of the bronze survey disk is identified by a pink spray paint can. Whenever possible, a bronze survey disk set in a concrete structure is marked with a single white witness post (vertical control point).



A stainless steel rod driven to refusal monument may be capped by grinding the top of the steel rod to a smooth domed finish (left) or by fastening a bronze survey disk to the top of the rod (right). A stainless steel rod geodetic survey control station is either surrounded by white witness posts (vertical only) or orange 4" x 4" guard posts (horizontal and vertical) depending on the survey accuracy.

7-85.2.1 Geodetic Survey Control Station Replacement Procedure

When an geodetic survey control station will be disturbed or destroyed during construction, it must be replaced and reestablished as specified in the Geodetic Survey Control Station Replacement Procedure. The Geodetic Survey Control Station Replacement Procedure describes the roles, responsibilities, and funding necessary to ensure the replacement and reestablishment of a geodetic survey control station is performed to the same specification and survey accuracy of the station it is replacing.

The Geodetic Survey Control Station Replacement Procedure can be found here:

<http://wisconsin.gov/Documents/doing-bus/eng-consultants/cnslt-rsrcs/tools/wiscors/geodetic-control-replacement-procedure.pdf>

For Geodetic Survey Control Stations that are to be destroyed due to Transportation Improvement Project(s): Steps are outlined in the Geodetic Survey Control Station Replacement Procedure regarding the retrieval of the survey disk and other necessary steps to ensure that the station is properly removed and accounted for.

For Geodetic Survey Control Stations that are not to be destroyed due to Transportation Improvement Project(s): Prior to construction activities, the GSU will verify that the necessary orange or white protective guard posts are installed around the geodetic survey control station in question.

The project manager, project engineer or inspector shall notify the GSU by phone 866-568-2852 or email geodetic@dot.wi.gov two weeks prior to construction activities if any of these posts are missing. The GSU will replace any reported missing posts.

The GSU will install orange snow fence around the geodetic survey control station guard posts as a protective measure during construction operations. An opening may be available around the geodetic survey control station to allow individuals access to continue to utilize the geodetic survey control station while construction activities are ongoing.

When the project has been completed and the geodetic survey control station is no longer in danger of being disturbed or destroyed by construction activities, the GSU shall be notified by phone 866-568-2852 or email geodetic@dot.wi.gov. The GSU will remove the orange snow fence upon notification of project completion or when punch list items are being completed on site.

7-85.2.2 Other Geodetic Survey Control Station Monuments

Other government and private entities can create their own geodetic networks with geodetic survey control station monuments (i.e. NGS, USGS, etc). Many counties have established a county User Densification Network (UDN) as an extension of the Wisconsin HMP. Some county or other local geodetic survey control network stations have been incorporated into the HMP. Whenever any type of geodetic survey control station is or will be endangered, contact the GSU by phone 866-568-2852 or email geodetic@dot.wi.gov. The GSU will contact the appropriate agency if the monument is not an HMP monument. The procedure for replacing a non-HMP station will be provided by the affected agency.

7-85.3 Boundary Monuments

Wis. Stat. s. 59.74 states in part, "no landmark, monument, corner post of the government survey or survey made by the county surveyor or survey of public record may be destroyed, removed, or covered by any material that will make the landmark, monument, or corner post inaccessible for use, without first having erected witness or reference monuments . . . and making a certified copy of the field notes of the survey setting forth all the particulars of the location of the landmark with relation to the reference or witness monuments"

The statutes also state in part, "Whenever it becomes necessary to destroy, remove or cover up . . . any landmark, monument of survey, or corner post . . . the person including employees of government agencies who intend to commit such act shall serve written notice at least 30 days prior to the act upon the county surveyor, or the city or village engineer" WisDOT policy, [FDM 9-5-1.5](#), states that the written notice must be served at least 60 days prior to the act.

7-85.3.1 Locating Landmarks

Survey crews need to locate all survey monuments on or near the proposed right-of-way. When a landmark is found that will be disturbed by construction operations, the construction contract should include provisions for the proper referencing of the landmark by the contractor under a Landmark Reference Monument bid item. The location of the landmark will generally be shown on both the right-of-way plat and the plan sheet. Even though the plan may not indicate any existing landmark, the engineer should be aware of the possibility that one may exist, and if discovered during construction, it must be preserved until the statutory referencing has been accomplished. The reference monuments can be erected by the contractor as extra work under an appropriate contract change order. Contact the WisDOT region survey coordinator for further guidance if additional monuments are found along a project.

Questions may arise as to the definition or identification of landmarks, and the nature or category of stakes, monuments, corners, etc., that require perpetuation under the law. Generally, landmarks established by governmental agencies, county surveyors, city or village engineers, land surveyors, etc., including but not limited to section corners, fractional section corners, platted subdivision corners, monuments established by public or private surveyors from which property descriptions have been written, and any other points considered to be in the public interest to within the construction limits shall be perpetuated provided they are physically evidenced by a monument. It is not necessary to attempt to perpetuate vague or indeterminate locations like the ones frequently referred to in metes and bounds descriptions, such as "the edge of a stream," or "the center of the road," which may be difficult to establish or be subject to personal judgment.

[FDM 9-5-5](#) and [FDM 9-25-1](#) state that although the position of every lot corner monument will not normally be perpetuated by a monument provided by the department, the position of every monument which is found must be recorded in the department's files so that it may readily be reestablished. In some instances, it has been necessary to engage the services of county surveyors or private surveyors to locate or restore lost corners from which right-of-way descriptions and plats can be developed. As stated above, WisDOT or other agents will preserve by referencing only those landmarks that are presently monumented-

Property owners should be given every reasonable opportunity to relocate their land parcel corner monuments within the newly acquired right-of-way. To avoid property owner ill will, contact each owner before construction. Have them show the location of property corners affected by construction, and then reference the property corners even though they fall inside our new right-of-way.

7-85.3.2 Placing Monuments

Landmarks that will be disturbed or destroyed by construction must be perpetuated by the contractor in accordance with the following described procedure. For each landmark, four or more reference monuments must be constructed at locations outside the construction limits. It should be noted that the law requires the contractor to erect the reference monuments before the landmark is covered or destroyed. Specifics on the requirements for the monuments are detailed in s. 59.74 and in [FDM 9-5-1](#) and [FDM 9-25-1](#).

7-85.3.3 Type of Monuments

SDD 16A1, [FDM 9-25-6](#), and [FDM 9-25-10](#) detail requirements for Landmark Reference Monuments and Covers, and types of monuments.

7-85.3.4 Documentation of U.S. Public Land Survey System Corners

U.S. Public Land Survey Monuments that will be disturbed or destroyed must be referenced to nearby monuments and/or landmarks by a registered land surveyor before being disturbed or destroyed. Documentation relating to the establishing of witness monuments for landmarks must be filed by the surveyor in accordance with s. 59.74 and s. 59.45.

Information should include a description of the landmark, the material and size of witness monuments or location of offset marks, distances, and courses in terms of the true meridian the reference monument bears from the landmark and from each witness monument to at least one other witness monument. The notes may include ties to other objects, natural or manufactured, to aid in re-establishing the landmark location.

Documentation of government corners should also include department form [DT1291](#), U.S. Public Land Survey Monument Record, or an equivalent form as requested by the county surveyor. A sample completed form is shown in [Figure 3](#).

Figure 3 Example U.S. Public Land Survey Monument Record, form DT1291

***** EXAMPLE ONLY *****

U.S. PUBLIC LAND SURVEY MONUMENT RECORD
 DT1291 96 (Replaces ED716)

Wisconsin Department of Transportation
 T. 13 N.-R. 15 E.
 4th Principal Meridian
 Corner NE 4

County Name <u>Dodge</u>		Name of Township / City / Village (Circle One) <u>CHESTER</u>	
Surveyor Name <u>Michael C. Lanniff</u>			
Address, City, State, Zip Code <u>N6125 S. CRYSTAL LAKE ROAD, BEAVER DAM, WI, 53916</u>			
X (Easting) <u>00000, 000</u>	Y (Northing) <u>00000, 00</u>	Latitude	Longitude
Project ID <u>0000-00-00</u>		Coordinate ID	

HORIZONTAL DATUM UNITS COORDINATE SYSTEM
 NAD 27 English Geodetic
 NAD 83 (91) Metric State Plane _____ Zone
 County DODGE

Location Diagram, showing corner identification name, bearing and distance references to at least four witness monuments, fence or occupational lines, centerlines of roads, and other site details for reference. Also, show the bearings and distances between the witness monuments.

Azimuths are assumed

Indicate fd. = found or pl. = placed in the diagram above
 Bearings used in the location sketch and basis for monument location are assumed, unless as noted.
 Monumentation Legend / Description of Corner and Witness Monuments.

- Berntsen W & B ALLUM. MONUMENT SET
- 5/8" x 30" Rebar with BERNTSEN ACCESSORY CAP
- fd = Found
- pl = Placed

If applicable, show any discrepancy between the location of the corner as restored or re-established and the location of that corner as previously restored or re-established by bearing and distance. Also, show the bearings and distances between the previous corner and at least two of the witness monuments. See reverse.

Figure 3 Example U.S. Public Land Survey Monument Record, form DT1291 (cont'd)

***** EXAMPLE ONLY *****

Basis for Monument Location

1. Describe any record evidence, monument evidence, occupational evidence or any other material evidence including traverse measurements that you considered, and whether the monument was found or placed. Explain below, be specific, and attach a separate sheet if necessary.
2. Was the corner:
 - a) found perpetuated,
 - b) restored through acceptance of obliterated evidence,
 - c) relocated by witness testimony, or
 - d) accepted as a re-monumented corner of record and maintained with additional monumentation?
3. Was the corner re-established through lost corner proportionate methods? If so, show the method, including the directions and distances to other public land survey corners used as evidence or used in determining the corner location.

Please Type or Print

MAINTENANCE CORNER

I found a PK NL as set and certified to by (REGISTERED Land Surveyor) according to USPLS Land Record dated (____).

I verified the corner location and revised the corner monumentation and accessories as shown on the location sketch on the reverse side of this record.

T. 13 N. - R. 15 E.
4th Principal Meridian
Corner NE 4



Certification

I, Michael C. Canniff
(type or print name) certify that the corner location shown on this record was determined by me or under my direction and control and that this U.S. Public Land Survey Monument Record is correct and complete to the best of my knowledge and belief, in accordance with Chapter A-E 7.08 of the Wisconsin Administrative Code.

Section Control Data Sheets have been filed in the County Surveyor's office, showing final measurements by direction and distance between all re-monumented corners. Section Control Information is referenced by the following:

Date	Project ID	Sheet(s)
OCTOBER 9, 1991	0000-00-00	1 of 1

X Michael C. Canniff 10-9-91
(Registered Land Surveyor Signature and Number) (Date)

