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400.01 General

The Washington State Department of Transportation (WSDOT) is permitted, by an agreement with the Board of Registration for Professional Engineers and Land Surveyors, to practice land surveying “under the direct supervision of a licensed professional land surveyor OR a licensed professional engineer” (see [Exhibit 400-1](#), Interagency Agreement).

400.02 References

400.02(1) *Federal/State Laws and Codes*

[Revised Code of Washington \(RCW\) 58.09](#), Surveys – Recording

[RCW 58.20.120](#), System designation – Permitted uses

[RCW 58.24.040\(8\)](#), “. . . temporary removal of boundary marks or monuments”

[Washington Administrative Code \(WAC\) 332-120](#), Survey monuments – Removal or destruction

[WAC 332-130](#), Minimum standards for land boundary surveys and geodetic control surveys and guidelines for the preparation of land descriptions

Interagency Agreement Between the Washington State Department of Transportation and the Board of Registration for Professional Engineers and Land Surveyors (1990)

400.02(2) *Design Guidance*

[Construction Manual](#), M 41-01, WSDOT

[Highway Surveying Manual](#), M 22-97, WSDOT

[Plans Preparation Manual](#), M 22-31, WSDOT

WSDOT Survey Monument Database

www.wsdot.wa.gov/monument/

400.03 Procedures

For WSDOT projects, it is recommended that surveying activities include (if appropriate) but not be limited to the following items.

400.03(1) *Project Definition Phase*

During the Project Definition phase, perform the following:

- (a) Record any pertinent surveying information as detailed in the Design Documentation Checklist: www.wsdot.wa.gov/design/projectdev/
- (b) Conduct research to find recorded survey monuments existing within the project area.
- (c) Determine and prioritize project survey needs and tasks to be completed. Needs and tasks may include the following issues:
 - Cadastral
 - Right of way
 - Geodetic
 - Photogrammetry
 - Other issues as needed
- (d) Contact city, county, state, and federal agencies, the Region Survey Office, and the GeoMetrix Geodetic Survey section for potential impact to existing monuments.

400.03(2) *Design and Development of the Plans, Specifications, and Estimates*

During the design and development of the Plans, Specifications, and Estimates (PS&E), perform the following:

- (a) The project manager and project surveyor hold a preliminary survey meeting, regarding:
 - Project schedule.
 - Anticipated survey requests.

For preliminary survey meeting specifics and roles and responsibilities of the project manager and project surveyor, see the *Highway Surveying Manual*.

- (b) Perform field reconnaissance, mark existing recorded survey monuments, and determine the location of possible new survey monuments. Also, mark found unrecorded monuments for preservation if practical.
- (c) Contact the GeoMetrix Geodetic Survey section by email, memo, or other written notification for assistance in determining the impact to state and federal geodetic monuments.
- (d) Refer to the *Highway Surveying Manual* to:
 - Convert Washington State Plane Coordinates to project datum.
 - Document the procedure and combined factor used for converting between datums.
 - Determine survey collection methods.
 - Collect primary, secondary, and tertiary survey data.
 - Process and import secondary, tertiary, or other survey data into design software for use by designers.

- (e) Apply to the Department of Natural Resources (DNR) for permits for monuments that will be disturbed or removed (see [Chapter 410](#)).
- (f) The GeoMetrix Geodetic Survey section will archive new primary survey control data in the WSDOT Monument Database for future retrieval.
- (g) Ensure that all survey monuments within the project right of way are shown on the contract plans in order to avoid accidental damage.
- (h) Develop a Record of Survey ([RCW 58.09](#)) or a Monumentation Map as required (see [Chapter 410](#)).

400.03(3) After Construction is Completed

- (a) Complete a post construction survey as described in the [Highway Surveying Manual](#).
- (b) Have the DNR Completion Report signed and stamped by the appropriate professional in direct charge of the surveying work, then file with DNR as described in [Chapter 410](#).

400.04 Datums

A datum is a geometrical quantity (or set of quantities) that serves as a reference, forming the basis for computation of horizontal and vertical control surveys in which the curvature of the earth is considered. Adjusted positions of the datum, described in terms of latitude and longitude, may be transformed into State Plane Coordinates.

All engineering work (mapping, planning, design, right of way, and construction) for WSDOT projects is based on a common datum.

400.04(1) Horizontal

[WAC 332-130-060](#) states, "The datum for the horizontal control network in Washington shall be NAD83 (1991) [the North American Datum of 1983] as officially adjusted and published by the National Geodetic Survey of the United States Department of Commerce and as established in accordance with [Chapter 58.20 RCW](#). The datum adjustment shall be identified on all documents prepared; i.e., NAD83 (1991)." (See the [Highway Surveying Manual](#) for further information.)

400.04(2) Vertical

The North American Vertical Datum of 1988 (NAVD88) as defined by the National Geodetic Survey (NGS) is the official civilian datum for surveying and mapping activities in the United States. WSDOT has adopted this datum. (See the [Highway Surveying Manual](#) for further information.)

400.05 Global Positioning System

A Global Positioning System (GPS) uses a constellation of satellites and earth stationed receivers to determine geodetic positions (latitude and longitude) on the surface of the earth. WSDOT personnel use this survey technology. (See the [Highway Surveying Manual](#) for more detailed discussions.)

GPS technology is changing rapidly. The key point is for the designer and surveyor to select the best tool (GPS or conventional applications) for doing the survey fieldwork. Often, a combination of GPS and conventional (Total Station) surveying is appropriate.

400.06 WSDOT Survey Monument Database

The WSDOT Survey Monument Database provides storage and retrieval capabilities for data associated with survey control monuments set by WSDOT. This database supports and tracks the Report of Survey Mark and aids in fulfilling WSDOT's obligation to contribute to the body of public record, thereby minimizing the duplication of survey work. The Report of Survey Mark provides data on specific GPS stations. (See [Exhibit 400-2](#) for an example of a Report of Survey Mark.)

To access the WSDOT Survey Monument Database, see the following website:

www.wsdot.wa.gov/monument/

400.07 Geographic Information System

The Geographic Information System (GIS) is a compilation of information from many sources. Its purpose is to assemble data into a central database for the common good. The data is stored on many levels so the desired information can be selected and combined to achieve the desired product. Surveying and photogrammetric data are vital elements of this system.

400.08 Photogrammetric Surveys

Photogrammetric surveys are performed to furnish topographic or planimetric maps and cross sections for use in the reconnaissance, location, and preliminary design phases of highway work. To use photogrammetric surveys for final design and construction requires that the ground be nearly bare to obtain the necessary accuracy. By using well-planned aerial photography in stereoscopic plotters, contours and other physical features are delineated on map sheets to a scale consistent with the accuracies or detail required.

The usefulness of aerial photography is not limited to mapping. Taking the form of enlargements, mosaics, and digital images, it can be used as a visual communication tool (displays and exhibits) for planning, design, property acquisition, engineering, construction, litigation, and public relations.

To obtain information on preparation, procedure, and programming of aerial photography and photogrammetric mapping and applications, contact the HQ [GeoMetrix](#) Office. When requesting a photogrammetric survey, specify the desired units and check the units of the product. Allow for the time required to communicate the complex and detailed work request, develop the service, and accomplish the product.

400.09 Documentation

For documentation related to monuments, see [Chapter 410](#).

Primary and secondary survey control data are archived in the WSDOT Survey Monument Database and GIS when available.

For the list of documents required to be preserved in the Design Documentation Package and the Project File, see the Design Documentation Checklist:

www.wsdot.wa.gov/design/projectdev/

Exhibit 400-1 Interagency Agreement

INTERAGENCY AGREEMENT BETWEEN
THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
AND THE BOARD OF REGISTRATION FOR PROFESSIONAL
ENGINEERS AND LAND SURVEYORS

THE FOLLOWING Interagency Agreement is hereby entered into between the Washington State Department of Transportation (hereafter referred to as "WSDOT") and the Washington State Board of Registration for Professional Engineers and Land Surveyors (hereafter referred to as "BOARD").

I

DECLARATIONS OF THE PARTIES

- A. WHEREAS the BOARD has the exclusive authority to regulate the practice of engineering and land surveying in Washington; and
- B. WHEREAS WSDOT employees are required to practice land surveying as defined by [RCW 18.43.020](#) in carrying out the program of said agency; and
- C. WHEREAS WSDOT is exempted from necessarily using a licensed land surveyor to perform said surveys in accordance with the provisions of the Survey Recording Act, [RCW 58.09.090](#); and
- D. WHEREAS both the BOARD'S and WSDOT'S goals include the performance of land surveys in conformance with recognized standards of practice and relevant laws and administrative codes in order to safeguard life, health and property; and
- E. WHEREAS the parties to this Agreement agree to the following Principles of Agreement.

II

PRINCIPLES OF AGREEMENT

- A. The practice of land surveying performed by WSDOT employees shall be under the direct supervision of a licensed professional land surveyor OR licensed professional engineer. Said licensee shall hold a valid Washington license issued in conformance with [RCW 18.43](#).
- B. All surveys performed by WSDOT employees shall be performed in accordance with the Survey Standards promulgated under Chapter [332-130 WAC](#).
- C. When a survey has been performed by WSDOT employees a survey map shall be prepared and filed with the county engineer in compliance with [RCW 58.09.090\(1\)\(a\)](#). Said map's contents shall be in conformance with the requirements of [RCW 58.09.060](#) and [WAC 332-130](#). Furthermore, said map shall contain the stamp and signature of the licensee who was in direct responsible charge of the work.

Exhibit 400-1 Interagency Agreement (continued)

- D. A record of corner information shall be filed in accordance with RCW 58.09.040(2) and 58.09.090(2) where WSDOT employees replace or restore an existing or obliterated general land office corner. Said record of corner information shall be signed and stamped by the professional land surveyor or professional engineer responsible for said work.
- E. The temporary removal or destruction of any section corner or any other land boundary mark or monument shall be permitted if performed in compliance with RCW 58.24.040(7)(8).
- F. Whether performed by a licensed professional engineer or a licensed professional land surveyor, any surveys performed by WSDOT shall be in accordance with the standards generally expected of those practicing professional land surveying.

IN WITNESS WHEREOF: The Washington State Department of Transportation and the Board of Registration have signed this Agreement.

_____/S/_____
 Ed W. Ferguson, PE
 DEPUTY SECRETARY
 Department of Transportation


_____/1/5/90_____
 Date

This Agreement approved by motion of the Board dated January 19, 1990.

_____/S/_____
 Wesley E. Taft, PE
 CHAIRMAN, Board of Registration

_____/1/19/90_____
 Date

Exhibit 400-2 Report of Survey Mark Example



Geographic Services

Report of Survey Mark


SURVEY INFORMATION SYSTEM

GENERAL MONUMENT INFORMATION

<p>Designation: GP29530-21</p> <p>Monument ID: 8</p> <p>State: WASHINGTON</p> <p>County: SNOHOMISH</p> <p>Region: NW</p> <p>Nearest Town: ARLINGTON</p> <p>Usgs Quad: ARLINGTON WEST</p>	<p>T.R.S: 31N, 5E, 2</p> <p>Corner Code:</p> <p>State Route: 530</p> <p>Mile Post: 20.590</p> <p>Station:</p> <p>Offset:</p> <p>Owner: GS</p> <p>Bearing: M</p>	<p><u>ACCOUNTS INFORMATION</u></p> <p>BOOK PROJECT INVOICE</p> <p>49 0L2030 23-94042</p>
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Description

TO REACH THE STATION FROM THE INTERSECTION OF SR 530 AND SR 009 AT ARLINGTON, GO WEST 0.2 MILES ALONG SR 530 TO THE STATION ON THE RIGHT. IT IS LOCATED 1.1 METERS SOUTH OF A WITNESS POST, 33.5 METERS WEST OF THE APPROXIMATE CENTERLINE OF DIKE ROAD AND 1.2 METERS NORTH OF A GUARD RAIL. THE STATION IS A STANDARD WSDOT BRASS DISK SET IN A ROUND CONCRETE MONUMENT PROJECTING 0.2 FEET ABOVE THE GROUND. NOTE: 'POSITION UP-DATE BY OCCUPYING WITH G.P.S.' NOTE: TIED TO HPN 4/94. THIS IS A NAVD88 UPDATE.



CURRENT SURVEY CONTROL

<u>DATUM</u>	<u>LATITUDE</u>	<u>UNIT</u>	<u>LONGTITUDE</u>	<u>UNIT</u>	<u>NETWORK</u>	<u>METHOD</u>	<u>ACCURACY</u>
NAD 83/91	48 11 54.567381	N	122 08 03.530464	W	PRIMARY	GPS	2 CM

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