

REQUEST FOR PROPOSAL
I-405, Brickyard to SR 527 Improvement Project

Surveys and Mapping

2.5 Surveys and Mapping

2.5.1 General

The Design-Builder shall perform all Work necessary to complete the land surveying and survey mapping. This Work includes at a minimum, records of surveys, permits to destroy and remove monuments, replacing or resetting monuments, land corner records, and all other land surveying services necessary to complete the Project.

2.5.2 Mandatory Standards

The following is a list of Mandatory Standards that shall be followed for all Work related to this Section as referenced in Section 2.2, *Mandatory Standards*.

1. Special Provisions (Appendix B)
2. Standard Specifications M 41-10 (Appendix B)
3. WSDOT *Highway Surveying Manual* M 22-97 (Appendix D)
4. WSDOT *Design Manual* M 22-01 (Appendix D)
5. WSDOT *Plans Preparation Manual* M 22-31 (Appendix D)
6. Standard Plans M 21-01 (Appendix D)
7. City of Kirkland Pre-Approved Plans (Appendix D)
8. City of Bothell Standard Details (Appendix D)

2.5.2.1 Reference Documents

WSDOT has provided mapping for the Project using 2017 aerial photogrammetry from approximately MP 20.9 to MP 27.6. In addition, design files from the adjacent I-405, NE 132nd Street Interchange Project have been provided. Primary and secondary survey horizontal and vertical controls were established by WSDOT in the Washington State Coordinate System, North Zone. Horizontal controls are based on the North American Datum of 1983 (NAD 83/91) and vertical controls are based on North American Vertical Datum of 1988 and as specified as <0.005M (\pm linear uncertainty).

WSDOT has provided an electronic digital terrain model (InRoads format) and 2D MicroStation.dgn files comprised of photogrammetric and topographic survey data in Geographic Coordinate System NAD 83/91 High Accuracy Reference Network/Washington North Zone (Appendix A).

Existing WSDOT geodetic primary survey monumentation can be found at the following website: www.wsdot.wa.gov/monument

2.5.3 *Performance Requirements*

2.5.3.1 General

The Design-BUILDER is responsible for the accuracy of content and completeness of all survey information used in the design and construction of the Project. WSDOT does not warrant the accuracy of the survey information provided in the Request for Proposal except as described in this Section.

The Design-BUILDER shall verify the location, accuracy, and datum of all survey data and survey information, regardless of the source. The Design-BUILDER shall document verification in accordance with Section 2.28, *Quality Management Plan*.

The Design-BUILDER shall perform all field survey Work, design, and construction in project datum. The conversion to project datum shall be completed using a combined factor of 0.999958508.

2.5.3.2 Survey Manager

The Design-BUILDER shall designate a Survey Manager for the Project. The Survey Manager shall ensure all survey work is performed by or under the supervision of persons licensed to practice surveying in the State of Washington. The Survey Manager shall be the single point of contact for all survey activities.

2.5.4 *Design Requirements*

2.5.4.1 General

The Design-BUILDER shall prepare field survey Work, so it meets the Technical Requirements of the Contract and the Washington State Board of Registration for Engineers and Land Surveyors.

2.5.5 *Construction Requirements*

2.5.5.1 General

The Design-BUILDER shall maintain detailed survey records, including a description of the Work performed on each shift, and the methods and control points used. The survey records shall include the following:

- Adequate detail to allow the survey to be reproduced
- Graphic notes depicting control points used and relationship to other control points or reference points
- Description
- Coordinates
- Location description

Benchmarks and temporary benchmarks shall also have graphic notes depicting description, elevation, coordinates, and location. A data collector printout of the day's activities shall not be considered an acceptable record. When requested, the

Survey Manager shall provide a copy of each day's record to the WSDOT Engineer within 5 Calendar Days.

All permanent secondary control points shall be shown on a *Report of Survey Mark Form* (Appendix F) and shall be tied to the Right of Way (ROW) centerline alignment labeled on a post-construction record of survey. Permanent secondary control points shall be established in accordance with the *WSDOT Highway Surveying Manual*.

The Design-BUILDER shall provide staking and layout to adequately locate, construct, and check all types of construction work.

Upon request, the Design-BUILDER shall provide the WSDOT Engineer with copies of all calculations and staking data prior to staking.

2.5.5.2 Monumentation

2.5.5.2.1 General

Except for WSDOT geodetic primary control monuments, the Design-BUILDER shall document all WSDOT and governmental monumentation and property corners that will be modified, disturbed, or destroyed during the Contract. The Design-BUILDER shall follow the procedures as set forth in Chapter 16 of the *WSDOT Highway Surveying Manual* relating to the destruction and replacement of monumentation. Consistent with Chapter 16 of the *WSDOT Highway Surveying Manual*, the Design-BUILDER shall reference or reset all existing General Land Office corner monuments that will be disturbed by construction activity.

2.5.5.2.2 WSDOT Monumentation

The Design-BUILDER shall note all WSDOT geodetic and highway alignment monuments found within the Project limits on a record of survey or monumentation map. The Design-BUILDER shall notify the WSDOT Engineer prior to any Work that may cause WSDOT geodetic or highway alignment monuments to be disturbed or destroyed. The WSDOT Engineer will determine the monuments to be replaced within 14 Calendar Days.

The Design-BUILDER shall complete all permits required by the Washington State Department of Natural Resources (DNR) and submit them to the WSDOT Engineer and shall allow 7 Calendar Days for Review and Comment. The Design-BUILDER shall submit and process forms to DNR, as required by DNR, for any WSDOT geodetic or highway alignment monuments that are disturbed, destroyed, or relocated. Before any survey monument is removed or disturbed, an approved DNR Application to Remove or Destroy a Survey Monument, together with an exhibit map of all found survey monuments, shall be provided to the WSDOT Engineer. Monuments removed or disturbed without an approved DNR Application to Remove or Destroy a Survey Monument and exhibit map will be replaced by WSDOT at the Design-BUILDER's cost.

WSDOT will replace any WSDOT geodetic monument within the Project that may be disturbed or destroyed. The Design-BUILDER shall replace all highway

alignment monuments and ROW monuments disturbed or destroyed unless Written approval is obtained from the WSDOT Engineer. The Design-Builder shall label all monuments removed, replaced, or set on the post-construction record of survey described in this Section, and a copy shall be sent to DNR to complete the permit process.

The Design-Builder shall work with the WSDOT Engineer to determine the best location, as near as possible to the original location, so that WSDOT may reset the geodetic monument.

Existing property corners within the Project limits that are verified by a recorded document shall be replaced at the intersection of the property line and the new ROW line.

2.5.5.2.3 *City of Kirkland Monumentation*

City of Kirkland street alignment monuments shall be placed at the intersections of the alignments of the constructed city streets. The Design-Builder shall label all City of Kirkland monuments removed, replaced or set on the Post-Construction Record of Survey described in this Section.

City of Kirkland Standard Plan CK-R.03 documents Monument Case and Cover. See City of Kirkland Pre-Approved Plans (Appendix D).

2.5.5.2.4 *City of Bothell Monumentation*

City of Bothell street alignment monuments shall be placed at the intersections of the alignments of the constructed city streets. The Design-Builder shall label all City of Bothell monuments removed, replaced or set on the Post-Construction Record of Survey described in this Section.

City of Bothell Standard Detail #360 documents Survey Control Monument. See City of Bothell Standard Details (Appendix D).

2.5.6 *Submittals*

2.5.6.1 Survey Records and Submittals

The Design-Builder shall deliver an electronic file of the survey records to the WSDOT Engineer within 30 Calendar Days of Substantial Completion.

2.5.6.2 Traffic Control Plan Submittal

The Design-Builder shall prepare a Temporary Traffic Control Plan whenever a survey crew, or a survey crew's vehicle, will be working within any roadway clear zone.

2.5.6.3 Monumentation Submittal

The Design-Builder shall submit the monumentation permits that are required for the removal, disturbance, and resetting of monuments to the WSDOT Engineer

14 Calendar Days prior to any removal, disturbance, or resetting to allow the WSDOT Engineer to monitor survey work to preserve monuments.

2.5.6.4 As Built

The Design-BUILDER shall produce reports documenting the location of all constructed elements. These include, at a minimum, the As Built alignments, profiles, drainage structures, Utilities, walls, bridges, and placement of the survey control monument. These reports shall include descriptive statements for the survey methods used to determine the As Built location of the feature being surveyed. Where WSDOT has provided data to the Design-BUILDER in x, y, z coordinate format, the Design-BUILDER shall provide the WSDOT Engineer with data in x, y, z coordinate format. Where WSDOT has provided data to the Design-BUILDER in x, y coordinate format only, or z coordinate format only, the Design-BUILDER shall provide the WSDOT Engineer with data in x, y coordinate format only, or z coordinate format only.

All x, y, and z coordinates shall be in State Plane.

The Design-BUILDER shall provide the WSDOT Engineer with an As Built survey basemap file in State Plane.

The Design-BUILDER shall deliver all As Built survey files to the WSDOT Engineer for the Project within 30 Calendar Days of Substantial Completion.

2.5.6.5 Post Construction Record of Survey

The Design-BUILDER shall provide the WSDOT Engineer with an electronic file of the Post Construction Record of Survey. A draft copy shall be submitted to the WSDOT Engineer for Review and Comment 7 Calendar Days prior to recording with the county where the survey was performed. A copy that includes the County's recording numbers, and an electronic file shall be delivered at the time of Substantial Completion. The electronic format shall be compatible with WSDOT's format. The Post Construction Record of Survey shall include, but is not limited to, the following:

- All monuments that have been removed by construction activities, with an indication showing if they have been replaced or not.
- All permanent secondary and tertiary horizontal and vertical control points established by the Design-BUILDER by State Plane Coordinates (x, y, and z), and by station and offset to the ROW centerline alignment.
- Report of Survey Mark documents or data sheets for all permanent control points.
- All monuments, remaining undisturbed and set during this Contract, defined by station and offset to the ROW centerline alignment.

2.5.6.6 Miscellaneous Submittals

This Section is intentionally omitted.

1

End of Section