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

Surveys and Mapping

4

2.5 Surveys and Mapping

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2.5.1 General

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

11

2.5.2 Mandatory Standards

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

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

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2.5.2.1 Reference Documents

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

31 WSDOT has provided an electronic digital terrain model (InRoads format) and
32 2D MicroStation.dgn files comprised of photogrammetric and topographic survey
33 data in Geographic Coordinate System NAD 83/91 High Accuracy Reference
34 Network/Washington North Zone (Appendix A).

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

1 **2.5.3 *Performance Requirements***

2 **2.5.3.1 *General***

3 The Design-Builder is responsible for the accuracy of content and completeness
4 of all survey information used in the design and construction of the Project.

5 WSDOT does not warrant the accuracy of the survey information provided in the
6 Request for Proposal except as described in this Section.

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

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

14 **2.5.3.2 *Survey Manager***

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

19 **2.5.4 *Design Requirements***

20 **2.5.4.1 *General***

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

24 **2.5.5 *Construction Requirements***

25 **2.5.5.1 *General***

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

29

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

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

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

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

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

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

12 **2.5.5.2 Monumentation**

13 **2.5.5.2.1 General**

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

22 **2.5.5.2.2 WSDOT Monumentation**

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

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

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

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

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

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

12 **2.5.5.2.3 *City of Kirkland Monumentation***

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

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

19 **2.5.5.2.4 *City of Bothell Monumentation***

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

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

26 **2.5.6 *Submittals***

27 **2.5.6.1 *Survey Records and Submittals***

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

30 **2.5.6.2 *Traffic Control Plan Submittal***

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

34 **2.5.6.3 *Monumentation Submittal***

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

1 14 Calendar Days prior to any removal, disturbance, or resetting to allow the
2 WSDOT Engineer to monitor survey work to preserve monuments.

3 **2.5.6.4 As Builts**

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

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

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

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

20 **2.5.6.5 Post Construction Record of Survey**

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

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

38 **2.5.6.6 Miscellaneous Submittals**

39 This Section is intentionally omitted.

