# Version date: 3/12/19

**[INSTRUCTIONS]:**

* Yellow highlighted areas include instructions that are deleted prior to executing contract/WOC.
* Blue highlighted areas indicate text or fields that need information provided or revised.
* Quantities. When entering quantities, the best practice is to use only the Arabic numeral and not spell out the numeral followed by the digit in parenthesis.
* Delete text of any tasks that do not apply to the Project and label as “RESERVED” next to the task title.. Contingency tasks that do not apply to a given Project can be deleted without marking as “RESERVED”, provided task numbering is revised if necessary.

# TASK 2 SURVEY

Consultant shall survey the Project for the areas as described in Section A of this SOW unless otherwise noted in specific tasks. Consultant shall adhere to the standards stipulated by Oregon Revised Statute (“ORS”) 672.047, subsections (1) through (7). Consultant's Professional Land Surveyor, registered in the State of Oregon, shall review and stamp as “Approved” all survey related deliverables and shall perform all land surveying Services under this SOW in conformance with all state statutes pertaining to survey and land boundary laws. These include, but are not limited to, the following state statutes: ORS Chapters 92, 93, 209 and 672.

The Services provided under this task must be accomplished according to the following manuals and standards:

* ODOT Survey Policy and Procedure Manual
* ODOT Basemap Standards, Data Collection and Drafting Procedures
* ODOT Right of Way (“R/W”) Engineering Manual
* ODOT Highway Design Manual (R/W Section)
* ODOT Contract Plans Development Guide (Base Maps)
* ODOT Global Navigation Satellite System (“GNSS”) Guidelines
* ODOT Monumentation Policy
* ODOT Survey Filing Map Standards - (Control Recovery and Retracement Surveys)
* ODOT Survey Filing Map Standards - (R/W Monumentation Surveys)
* ODOT Manual for Survey Control Data Sheets for Construction Plans
* [ODOT ProjectWise User’s Manual](http://transnet.odot.state.or.us/hwy/ProjectWise/SiteAssets/SitePages/Home/ODOT%20ProjectWise%20User%20Manual.pdf) [Delete if not applicable]

Consultant shall conform to applicable requirements in Agency manuals and standards for all authorized contingency tasks/deliverables.

## Prior to Commencing Survey

## Consultant shall schedule meeting with Region Survey Office to review SOW and discuss any specific questions.

## Limits of Consultant Survey

Consultant shall provide surveying Services for XXXXXX.

## Limits of Agency Survey

Agency will provide surveying Services for the following XXXXXX.

## Task 2.1 Survey Control

Consultant shall create a Survey Control Plan Sheet relative to horizontal and vertical datum, map projection, and coordinate systems.

### Horizontal Control

Consultant shall establish horizontal control according to Agency standards as specified in manuals above with Agency approved coordinate system prior to establishing control.

### Vertical Control

Consultant shall establish Project vertical control based on current Agency standards or other datum as approved by Agency, using procedures as specified in manuals above.

**Deliverables**

Consultant shall submit the following items (per the due date included in the table at end of Task 2) prior to filing control survey with the County.

* Raw Data
  + Horizontal
  + Vertical
  + Scanned copy of the original field notes, including processing edits in red color, electronic copy (.pdf).
* Narrative of RAW data. For the levels electronically processed, submit 1 copy of each of the following: original raw file as collected in the field, adjustment report file showing level closure data. and file showing the level rod readings not shown in the field notes.
* A report of adjustment of control using Agency approved methods as specified in manuals.
* A text file containing point numbers, adjusted northing and easting coordinates, elevations, and descriptors. Primary GPS network; provide geodetic coordinates.
* Survey Control Plan Sheet to be submitted as part of Draft DAP deliverables in format specified in Draft DAP task.

### **Task C2.1.1 Additional Control for Changes to Project Limits** (**CONTINGENCY TASK; See section F**)

## [Add task language and deliverables if the contingency task is included in the SOW.]

## Task 2.2 Recovery and Retracement

Consultant shall identify the location of the existing Centerline(s), R/W lines, Property line(s) (Resolve), to perpetuate the location of the monuments found and document the control used for this Project area. Consultant shall produce Survey Filing Maps (“SFM”) as deliverables.

These tasks must address the requirements of ORS 209.150 and 209.155 and other survey related statutes.

### Tools

The MicroStation seed file, drafting menus, and other tools are available on the ODOT FTP site: (<ftp://ftp.odot.state.or.us/isb/appeng/MicroStation/V8i/>)

The seed file (seedRW2d.dgn) is used to create the “key number”ret.dgn or appropriate Projectwise naming convention, which is a single Microstation file containing multiple models to produce the maps. “The Survey Filing Map Borders” model contains ODOT borders the extra models not needed, can be removed from the file.

Consultant shall draft all coordinate correct line work and elements in the “Design” model of the Bentley Microstation .dgn file, contained in the electronic R/W seed file. The scale will vary on whether it is an urban or rural area. The scale typically will be either 1 inch = 50 feet in an urban area or 1 inch = 100 feet in a rural area.

### **Research**

Consultant shall perform data research as necessary to prepare for and support all Project activities, and to produce Project maps and reports as called for in subsequent tasks.

### **Monument Recovery**

Consultant shall survey all features necessary to complete Monument Recovery for this Project.

Consultant shall notify County Surveyor of any public land survey corner or accessories in danger of being destroyed due to the impending Project, pursuant to ORS 209.140.

### **Existing R/W & Boundary Resolution**

Consultant shall resolve the R/W centerlines alignments, R/W lines and property boundaries abutting the highway along the proposed route of construction at the following location XXXXXX.

Consultant shall submit the retracement and narrative to the ODOT Region Surveyor for review prior to drafting the SFM.

### Control, Recovery, Retracement Survey Filing Map (“SFM”)

Consultant shall create an SFM in accordance with Agency “Survey Filing Map Standards”, County and ORS requirements.

Consultant shall submit a 20% deliverable of the Control, Recovery or Retracement survey(s) for review of the first stages of drafting. This submittal must show the sheet layout with the portions of the survey cut out within the sheets, alignments, R/W lines, and property lines. Consultant shall submit a monument station and offset report with the 20% review.

Consultant shall submit an 80% deliverable of the Control, Recovery or Retracement survey(s) for review of the last stages of drafting. This submittal must show the data for the survey filing as complete except details and R/W computed points.

Consultant shall submit a 99% deliverable to Agency a copy of the Control, Recovery or Retracement survey(s) sent to the County for review. If the County does not review before filing then this will be Agency’s last review before filing with the County.

Consultant shall submit the following with the Draft SFM package:

* “Trio listing kit” with Property Vesting Deeds in electronic format for each property within the Project site
* Ownership List in Microsoft Excel spreadsheet
* Electronic version of all existing R/W maps (in pdf format)
* County Assessor Maps in.pdf in format.
* General Land Office Plats in.pdf format.
* County Road establishment records in electronic format.
* County Road vacation records in electronic format.
* Subdivision and Land Partition Plats in electronic format.
* County Surveys of record in electronic format.
* Maps and Data related to Government Public Lands – Survey Corners and any references in electronic format.
* Copies of all field survey notes in electronic .pdf format
* Current maps, data sheets, surveys, etc in electronic format.
* Geodetic Survey Mark Report (ODOT Form 734-2802) for all recovered marks owned or appearing set by a government agency.
* Scanned copy of the original field notes in .pdf format.
* ASCII file containing the following information in this order, Point number, Northing, Easting, Elevation, alpha feature code, and any attributes collected.
* Bentley MicroStation .dgn file - this must have centerlines, R/W lines, property lines and ownerships of properties abutting our highway and all tied monuments.
* Bentley Inroads .alg file - this must consist of the centerlines, control and monument data.
* Narrative document - this must explain the procedures used to resolve the R/W centerline, using the examples in the SFM Drafting Standards as a guide to the type of content in the narrative.
* Bentley Inroads Reports of alignment(s) .xml - this must have alignment and curve reports that show coordinates, bearings, stations etc per Bentley Inroads standard reports.
* Report of Monument Location - this is the station and offset report, which must show the relationship of the monuments to the retraced alignment(s).

**Deliverables/Schedule:** Consultant shall provide Draft and Final SFM packages per the due dates included in the table at end of Task 2.

**[Add dates to deliverables table]**

* 20% Draft SFM - 20% draft of the Control, Recovery or Retracement Survey(s) in Bentley MicroStation .dgn and Bentley Inroads .alg file format and a pdf copy of the draft map.
* 80% Draft SFM - 80% Draft SFM of the Control, Recovery or Retracement Survey(s) in Bentley MicroStation .dgn and Bentley Inroads .alg file format and a pdf copy of the draft map.
* 99% Final SFM - Draft Final of the Control, Recovery or Retracement Survey(s). This copy must be submitted to the county for review if that county does reviews. This must be in Bentley MicroStation .dgn and Bentley Inroads .alg file format and a pdf copy of the draft map.
* Final SFM of the Control, Recovery or Retracement Survey(s). This must be in Bentley MicroStation .dgn and Bentley Inroads .alg file format.
* A pdf copy of the recorded survey as approved by the county.

## Task 2.3 Topographic Data and Basemap

Consultant shall collect the existing topographic features and create a basemap used to design this Project. Consultant shall collect topographical data to accurately represent the surface of the ground to be included in the Digital Terrain Model.

Consultant shall collect topographic data of constructed and natural features within the Project limits using Agency approved methods and standards, including all file naming and coding formats.

Two-dimensional features, if needed, must be mapped according to Agency standards.

**[Add list of specifics that we want them to map.]**

Consultant shall make field ties of all utility features including, but not limited to underground and overhead utility. Consultant shall collect 3D positions of overhead utility lines.

**Deliverables/Schedule:** Consultant shall provide the following per the due dates included in the table at end of Task 2.

* 1 electronic copy, in .pdf format, of the original field notes.
* Text file containing the following information in this order:
  + Point Number, Northing, Easting, Elevation, Alpa Code (PNEEC) withe suffix “ST” if point is the beginning of a line, and any additional feature information collected.
* Utility Request Documentation (.pdf), including Oregon Utility Notification tickets
* Provide any correspondence from the utility including emails or phone call logs.
* Base Map in MicroStation design file (.dgn) containing all the tied topographic features conforming to Agency file naming conventions.

## Task 2.4 Digital Terrain Model (“DTM”)

Consultant shall create a three-dimensional digital terrain surface using topographical data collected within the areas described in this SOW.

Consultant shall create the DTM that meets Agency’s criteria for surface triangulation. Consultant shall collect confidence points in the field and generate a confidence point report. The topographical data and confidence points must be gathered by techniques consistent with the construction of a DTM as defined by Agency standards.

**Deliverables/Schedule:** Consultant shall provide the following per the due dates included in the table at end of Task 2.

* InRoads .dtm file that is compatible with Agency’s current version of InRoads.
* Confidence point analysis report in .pdf format.
* MicroStation design file (.dgn), or model within Basemap dgn, displaying triangles and contours.

### **Task C2.4.1 BaseMap/DTM** **Revisions** (**CONTINGENCY TASK; See section F**)

### Consultant or Agency may initiate discussion regarding needed revisions and updates to the Basemap and DTM data due to Project changes as a result of design changes or design additions. Consultant shall perform needed revisions and updates to Basemap and DTM data according to Agency standards as specified in applicable survey manuals.

[Additional basemap and dtm data areas to be defined here.]

## Task 2.5 Right of Way (“R/W”) Engineering (Mapping and Descriptions)

Consultant shall perform the following Services under this Task:

* Determine the necessary R/W to accommodate the Project construction.
* Develop a R/W basemap.
* Develop the R/W acquisition maps.
* Prepare written property description and addendums or RITS data sheets.
* Prepare sketch map to accompany legal descriptions.
* Support the Project R/W acquisition.
* Map the existing highway accesses within the Project limits.

### **Tools**

See the R/W Engineering Internet Page for manuals and help documents:

<https://www.oregon.gov/ODOT/ETA/Pages/ROW-Engineering.aspx>

### **Task 2.5.1 R/W Basemap and New R/W Design/Layout for Project**

Consultant shall prepare the R/W basemap and new R/W Design/Layout according to Agency standards.

**Deliverables/Schedule:** Consultant shall provide the following deliverables per the due dates included in the table at end of Task 2.

* InRoads Alignment File(.alg).
* The Microstation file containing the R/W basemap/“Design” model, per Agency standards**.**

### **Task 2.5.2 Active R/W Acquisition Map**

Consultant shall prepare the R/W Acquisition Map according to Agency standards.

**Deliverables/Schedule:** Consultant shall provide the following deliverables per the due dates included in the table at end of Task 2:

* Microstation .dgn file with the appropriate MicroStation models that form the Active R/W Acquisition Map submitted in electronic format (\*rw.dgn).
* A pdf copy of the Active R/W Acquisition Map.

### **Task 2.5.3 R/W Descriptions and Sketch Maps**

Consultant shall use the Active R/W acquisition map to develop the descriptions and sketch maps for (X) parcel(s), according to Agency standards.

Consultant shall obtain from the Project access sub-team (Agency or Consultant) the access rights to be acquired with each conveyance for the Project. Consultant shall coordinate with Agency’s Right of Way and Access Management Sections to develop the specific access management strategy for the Project.

**Deliverables/Schedule:** Consultant shall provide the following deliverables per the due dates included in the table at end of Task 2:

* The electronic vesting documents for each property owner(s) submitted in single, independent electronic files for each individual property description to the Region Survey Unit with notification to the APM.
* The R/W Sketch map in electronic format (\*.pdf). The R/W Sketch map must have the topographic model referenced into it.

### **Task C2.5.4 Right of Way Descriptions Revisions due to Project Scope Changes** (**CONTINGENCY TASK; see section F**)

This Contingency Task is applicable to revising R/W documents related to changes made by Agency or other third parties after Consultant has completed work covered by Task 2. This task is not applicable to revisions to correct deliverable deficiencies, errors or omissions by Consultant, which must be corrected no cost to Agency.

### **Task C2.5.5 Railroad Exhibit Maps** (**CONTINGENCY TASK; see section F**)

### [Add task language and deliverable if the contingency task is included in the SOW.]

### **Task C2.5.6 Forest Service Plat Maps (CONTINGENCY TASK; see section F)**

### [Add task language and deliverable if the contingency task is included in the SOW.]

### **Task C2.5.7 Bureau of Land Management (“BLM”) Plat Maps (CONTINGENCY TASK; See section F)**

### [Add task language and deliverable if the contingency task is included in the SOW.]

### **Task C2.6 Staking (CONTINGENCY TASK; see section F)**

Consultant shall place stakes during Project development, construction or at other times of Agency need. This may include but is not limited to: existing R/W, proposed R/W, proposed easements, proposed environmental mitigation sites, construction grades, slope staking, and utility location and relocations.

**Deliverables/Schedule:** Consultant shall submit the following deliverables per the due dates included in the table at end of Task 2:

* Physical stakes placed and or paint marks.
* Original field notes and one scanned copy of the original field notes in .pdf format.
* Electronically stored point location “As-Staked” in the Point Number, Northing, Easting, Elevation, Alpa Code PNEEC format.
* Grade calculations in electronic .pdf format.

### **Task C2.7  Monumentation Surveys** (**CONTINGENCY TASK; see section F**)

Consultant shall prepare the monumentation survey according to Agency standards.

The purpose of the monumentation task is to document the location of the R/W Centerlines and R/W lines, at the end of construction.  These tasks are to address the requirements of ORS 209.155.

Consultant shall replace destroyed monuments that are not within areas of new R/W purchased, according to ORS 209.150 and 209.155.  Consultant shall place ODOT-provided caps or Company specific caps per ORS on all monuments replaced or referenced.

Consultant shall create SFMs in accordance with Agency “Survey Filing Map Standards”, County and ORS requirements.

**Deliverables/Schedule**

Consultant shall submit (per the due dates included in the table at end of Task 2):

### 99% Draft SFM of the Monumentation Survey(s).

Submit this copy to Region Survey Office through the APM for review. The submittal shall also include copies of the new Microstation file and Inroads Geometry file. The new Inroads Geometry file must include at a minimum:

* + a copy of all alignments that ODOT purchased R/W from,
  + COGO points for all monuments to be set,
  + all control points and monuments found and set

Note: Agency will return review comments to Consultant within X weeks of receiving the 99% deliverable of the SFMs.

### Final SFM - File the final SFM of the Monumentation Surveys with County after addressing any County comments.  The submittal shall include copies of the completed Microstation file and Inroads .alg file.

* County Survey Filing Record  - Provide an electronic copy of the recorded Final SFM from County in .pdf format.

**SURVEY TASK SUMMARY AND SCHEDULE TABLE**

[Edit dates and tasks as needed in deliverables table. For full service WOCs, the contents of this table should be moved to Task Summary and Schedule Table for all tasks at the end of the SOW.]

|  |  |  |
| --- | --- | --- |
| **Task Number** | **Task Title** | **Deliverables Due Dates** |
| 2.1 | Survey Control | XXXXXX |
| C2.1.1 | Additional Control for Changes to Project Limits (CONTINGENCY TASK) | Per agreed-to date specified in contingency NTP |
| 2.2 | Recovery and Retracement   * 20% Draft SFM * 80% Draft SFM * 99% Final SFM - Draft Final * FINAL SFM * A pdf copy of the recorded survey as approved by the county. | XXXXXX  XXXXXX  XXXXXX  XXXXXX  XXXXXX  XXXXXX |
| 2.3 | Topographic Data and Basemap | XXXXXX |
| 2.4 | DTM | XXXXXX |
| C2.4.1 | Task C2.4.1 BaseMap/DTM Revisions  (CONTINGENCY TASK) | Per agreed-to date specified in contingency NTP |
| 2.5.1 | R/W Basemap and New R/W Design/Layout for Project | XXXXXX |
| 2.5.2 | Active R/W Acquisition Map | XXXXXX |
| 2.5.3 | R/W Descriptions and Sketch Maps | XXXXXX |
| C2.5.4 | Task C2.4.1 BaseMap/DTM Revisions  (CONTINGENCY TASK) | Per agreed-to date specified in contingency NTP |
| C2.5.5 | Railroad Exhibit Maps  (CONTINGENCY TASK) | Per agreed-to date specified in contingency NTP |
| C2.5.6 | Forest Service Plat Maps  (CONTINGENCY TASK) | Per agreed-to date specified in contingency NTP |
| C2.6 | Staking (CONTINGENCY TASK) | Per agreed-to date specified in contingency NTP |
| C2.7 | Monumentation Surveys (CONTINGENCY TASK) | Per agreed-to date specified in contingency NTP |