**Version Date: 8/16/2022**

**[INSTRUCTIONS]:**

* Yellow highlighted areas include instructions that should be deleted prior to release.
* Blue highlighted areas indicate text or fields that need information provided or revised.
* “Agency” means the Certified LPA as defined in the Contract.
* **If an entire subtask is not needed, leave the subtask number, add “RESERVED” after the subtask title, and delete all subtask text.**
* Agency should reference the Right of Way services agreement between ODOT and the Agency prior to identification of consultant tasks. The reference to Consultant, Agency and ODOT throughout SOW and the process will need revision on a case by case basis.

**Delete instructions** throughout the document before executing Contract or amendment. Deletions can be automated as follows:

* From the “Edit” menu select “Replace”;
* With cursor in the “Find what” field, click “More” button, then “Format” then “Font”, then in the font field select “**Times New Roman**” text;
* Leave the “Replace with” field blank;
* Click “Replace All”. This will delete all yellow highlighted text.

**TASK 2 SURVEY**

Consultant shall survey this Project for the areas as described in Section A of this SOW unless otherwise noted in specific tasks. An exhibit of the area to be surveyed should be provided as a helpful reference and definition of the area. Deliverables are to be scheduled as per task 1 Project Management.

Consultant shall adhere to the standards stipulated by the Oregon Revised Statute (“ORS”) 672. Consultant's Professional Land Surveyor, registered in the State of Oregon, shall review and stamp as “Approved” all survey related deliverables and shall be responsible for all land surveying services including conformance to all state statutes pertaining to survey and land boundary laws under this SOW. These include, but are not limited to, the following state statutes: ORS Chapters 92, 93, 209 and 672.

Use the following list when working on an ODOT facility.

The work in this task must be accomplished according to the following ODOT manuals and standards:

* Survey Policy and Procedures Manual
* Right of Way (“R/W”) Engineering Manual
* Highway Design Manual (Right of Way Section)
* Contract Plans Development Guide (Base Maps)
* Survey Filing Map Standards - (Control, Recovery, and Retracement Surveys)
* Survey Filing Map Standards - (Right of Way Monumentation Surveys)
* Manual for Survey Control Data Sheets for Construction Plans

**2.1 Researc****h**

Consultant shall obtain the research data for the area as described in Section A of this SOW.

Consultant shall perform data research as necessary to prepare for and support Project activities, and to produce Project maps and reports as called for in subsequent tasks. The typical records required for research are, but not limited to; vesting deeds, land sales contracts, County assessor plats and road records, subdivision plats, General Land Office plats, Agency or ODOT R/W drawings, as applicable, railroad maps, county surveys, related easements, road dedications and vacations.

Existing Water Way Data

Consultant shall research and obtain maps and data about rivers, creeks, and streams, springs or flowing water in or near the Project area from Agency, Federal, State and other governmental agencies. Consultant shall include items such as but not limited to: FEMA Flood maps, tide gage data and stream navigability per Division of State Lands designation.

**2.1 Consultant Deliverables and Schedule**

Consultant shall incorporate information from this task into the deliverables listed in Tasks 2.2, 2.4, 2.5 and 2.7 as required for delivery of documents in subsequent tasks.

**2.2 Horizontal and Vertical Control Network**

The purpose of this task is to provide the means by which the Project can be located relative to horizontal and vertical datum, map projection, and coordinate systems. Consultant shall establish a horizontal and vertical control network using the datum associated with the Project area or as approved by the Agency.

Existing Horizontal/Vertical Control Stations

Consultant shall research and obtain data about horizontal and vertical control points as required for the Project area including triangulation stations, Global Navigation Satellite System (“GNSS”) stations, vertical benchmarks, and prior Project control surveys from Agency, Federal, State and other governmental agencies.

Consultant shall establish horizontal control according to Agency/ODOT standards using Terrestrial (Total Station), GNSS (Static or Rapid Static) or a combination of both. Consultant shall set and adjust control points in conformance with Agency/ODOT guidelines.

Consultant shall use monuments that comply with ORS 92.060 and ORS 209.250, or 5/8” Rebar with plastic or brass caps, or other Agency approved control points, for the GNSS and network points. Consultant shall establish a minimum of 3 GNSS control points through the length of the survey. A minimum of at least 3 inter-visible control points is required through the Project area.

Consultant shall establish vertical control using differential leveling. Consultant shall get Agency approval before using other methods such as trigonometric leveling and elevations derived from GNSS and identify with Agency the accuracies of determined methods prior to proceeding.

**2.2 Consultant Deliverables and Schedule**

Consultant shall:

* Place control points in the ground at the Project location.
* Incorporate the information listed below into the deliverables listed in Tasks 2.4 and 2.5 as required for delivery of documents in subsequent tasks.
* An adjustment report for one or more of the following, Least Squares adjustment for networks, an approved traverse adjustment method for traverses and/or a GNSS adjustment report when using GNSS.
* AnASCII file containing the coordinates for every network point set and found.
* If the levels were electronically processed then one copy each of the following: original raw level file as collected in the field, ASCII file showing level closure data, ASCII file with elevations on all network points and/or an ASCII file showing the level rod readings.
* Original field notes for the control network and one scanned copy of the original field notes in “.pdf” format.
* A MicroStation Connect/Civil 3D design file (\*.dgn/\*.dwg) containing all the set and tied control points to show elevations.
* An OpenRoads/Civil 3D file (\*.alg/\*.dwg) containing all vertical and horizontal control points stored as cogo points to show elevations.

**2.3 Monument Recovery**

The purpose of this task is to address the requirements of ORS 209.140, ORS 209.150 and 209.155, and other survey related statutes for construction Projects.

Consultant shall survey for but not limited to: Government corners, geodetic control stations, benchmarks, R/W monuments, property boundary markers, and roadway alignment markers.

Identify, Search and Recover Monuments

Consultant shall recover existing monuments to preserve the locations of any monuments of record that are endangered by any activity related to the Project and to resolve roadway and property lines. Consultant shall provide a record (field notes) of monuments searched for, the date of the search and the results of the search.

Field Survey of Recovered Monuments

Consultant shall locate, measure and document the location of survey markers and monuments of record for property boundaries and/or R/W needed within the areas.

**2.3 Consultant Deliverables and Schedule**

Consultant shall incorporate the information gathered in this task including field notes into the deliverables listed in Tasks 2.4 and 2.5 as required for delivery of documents in subsequent tasks.

**2.4 Topographic Data, Detailed Base Map And Digital Terrain Model (DTM)**

The purpose of this task is to collect the existing topographic features and create a detailed basemap and DTM for the Project.

Existing Utility Records

Consultant shall research and obtain available facility maps and as-built construction plan data pertaining to utilities in or near the Project area from the Agency, One-Call Service, State or other governmental agencies and utility companies.

Topographic Data Collection

Consultant shall collect topographic data between the boundaries described in Section A of this SOW. Consultant shall collect and tie topographic data of man-made and/or natural features using a variety of Agency approved methods. These methods include but are not limited to: collecting the data using terrestrial (Total Station), GNSS (RTK), 3D Laser Scanning (Mobile or Static), or station and offset.

Consultant shall contact Oregon Utility Notification Center to request pre-survey utility locates. Consultant shall keep the locate request number and ticket information within the Project file.

Consultant shall record in the field notes the utility ownership, if available, when describing the line data points. Consultant shall record all visible utility identifications in the field notes, such as numbers shown on power and/or telephone poles, vault tags, telephone pedestals (aka risers), cabinets, meters, fences or screened enclosures for gas regulators, and sanitary sewer pump stations. This data is needed for the Agency or Consultant to communicate where the facilities may be in conflict with the Project.

Consultant shall measure and record all utility facility structures (e.g. concrete pads, top slab of vaults, pump station housing, barrier screens or fenced enclosures). Consultant shall make a request to the utility owner to pull the cover whenever a manhole is found locked or bolted.

Consultant shall collect the hydraulic, bridge and culvert information in accordance with the “ODOT Hydraulics Manual” on streams and rivers that pass under or are parallel to any roadways in the area. Consultant shall provide for the hydraulic feature, a profile of the thread \_\_\_\_\_\_ feet up and \_\_\_\_ feet down stream of the Project. Consultant shall provide cross sections \_\_\_\_\_\_ feet up and down stream of the structure or utilize hydrographic surveying techniques to collect required data. A DTM is also acceptable.

Consultant shall tie environmental and archaeological features that have been identified within the Project area. These features include, but are not limited to, wetlands, high water mark, T&E species, hazmat sites, archaeology sites and sensitive plants.

Detailed Basemap

Consultant shall take applicable topographic data collected in this subtask and create a detailed basemap file. A detailed basemap has all features drafted to Agency provided criteria. Consultant shall imbed the sign pictures in the Basemap file.

Digital Terrain Model (“DTM“)

Consultant shall create a 3 dimensional digital terrain surface using all relevant topographical data collected in this subtask.

Consultant shall collect the topographical data to create points and break lines in adequate quantity and in proper placement, to accurately represent the surface of the ground. Consultant shall collect confidence points in the field and generate a confidence point report, as outlined in the ODOT Survey Policy and Procedure Manual. The topographical data and confidence points must meet Agency/ODOT Criteria. Consultant shall generate 0.2 foot minor contours and 1 foot major contours throughout the DTM for a QC analysis of the surface.

**2.4 Consultant Deliverables and Schedule**

Consultant shall provide the following deliverables electronically (.PDF) to the APM within 30 days of NTP:

* + 1 copy of field notes
	+ Copy of the MicroStation Connect /Civil 3D CADD Files (\*.dgn/\*.dwg) Detailed Base Map with OpenRoads/Civil 3D DTM
	+ All files for the network control points in (ASCII) format
	+ Files of listing kits
	+ Files of survey research
	+ Files of tax maps
	+ Confidence Point Report

Control Point Worksheet within construction documents showing locations of identified control points in relation to the Project, including datum, description, and whether found or set.

**2.5 R/W - Boundary Resolution**

The purpose of this task is to identify the location of the existing Centerline(s), R/W lines and property line(s) as necessary, to perpetuate the location of the monuments found, to document the control used for this Project area, and establish property lines for area calculations when new R/W is acquired. This task addresses the requirements of ORS 209.150 and 209.155 and other survey related statutes.

Existing Vesting Deeds and Property Ownerships

Consultant shall obtain a “Trio listing kit” (typically provided by a Title Company). Consultant shall identify property ownership within and adjacent to the Project site by investigating property deeds and county tax records. Consultant shall itemize and report property ownership and owner contact information to Agency. Consultant shall submit each deed in its own electronic file. Consultant shall include all vesting deeds referenced in the Property Vesting Deeds if needed to resolve the property boundary.

Existing R/W Records

Consultant shall research and obtain copies of surveys, subdivision plats, and land partition plats filed in the county surveyor’s office related to the properties potentially impacted by the Project. This information is used to find monuments that might be impacted from the Project and establish property lines for area calculations when new R/W is acquired.

Consultant shall research and obtain copies of county assessor maps, General Land Office plats, and county road records related to the properties potentially impacted by the Project.

Consultant shall research and obtain available data about Government Public Lands Survey Corners and their references in the Project area as defined in the SOW.

Resolve R/W and Property Boundaries

Consultant shall resolve the location of the R/W within the present limits as described in this SOW.

Consultant shall resolve identified R/W centerlines alignments, R/W lines and property boundaries abutting the roadway and along the proposed route of construction, using accepted concepts and rationale methods of survey professional judgment. Consultant shall evaluate the available evidence for relevance, adequacy, and reliability; use professional judgment in determining the type and quantity of evidence available, and the influence given each factor; and determine a best-fit with the evidence and probable location of R/W alignments and property boundaries for the area as described.

**2.5. Consultant Deliverables and Schedule**

Consultant shall provide the following deliverables electronically (.PDF) to the APM within xx days of NTP:

* Itemized property ownership and owner contact information to Agency. Consultant shall submit each deed in its own electronic file.
* A detailed narrative of available evidence, desirable evidence not available, rationale for decisions made, and a summary of the conclusions in the establishment of the R/W centerline, R/W lines (including all jogs) and property boundary lines.

**2.6 Record of Survey / Control, Recovery, Retracement**

Control, Recovery, Retracement Record of Survey

The destruction of found monuments necessitates a record of survey (ORS 209.150,155).

If the Project will impact property or existing survey monuments, Consultant shall create a Record of Survey (“ROS”) which meets County and ORS requirements. The survey(s) must be prepared for 18-inch by 24-inch sheet plots. The “**Control**” survey must consist of Geodetic and Terrestrial points set for the Project. The “**Recovery**” is the documentation of the monuments recovered for the Project. The “**Retracement**” is a record of resolved R/W centerlines, R/W lines and/or property boundaries. These surveys may be combined or separate surveys as directed by Agency.

Consultant shall submit a draft ROS to Agency for review. Consultant shall address comments received from Agency and submit the final ROS for filing to the appropriate County in the format required.

**2.6 Consultant Deliverables and Schedule**

Consultant shall provide:

* Draft ROS to APM within 30 days of NTP.
* Final ROS to the appropriate County for filing within 2 weeks of receipt of comments from the Agency.
* Copy of Final ROS to APM upon acceptance by County for filing.

**2.7 R/W Engineering (Mapping & Descriptions)**

The purpose of this subtask is to prepare R/W engineering products used in the acquisition of property. The estimated number of R/W files is \_\_\_\_\_\_\_\_. These products are:

Consider certain acquisitions/jurisdictions, and agencies require specialized survey maps (railroad, forest service, BLM) and are considerably more detailed than the typical sketch map.

1. R/W acquisition map
2. MicroStation Connect /Civil 3D CADD Files used to prepare the acquisition map
3. R/W legal descriptions and exhibits
4. R/W basemap and alignment file (.alg)

Consultant shall prepare the R/W acquisition map, exhibits, and legal descriptions in accordance with Agency/ODOT Right of Way Engineering Manual.

**2.7 Consultant Deliverables and Schedule**

Consultant shall provide the following deliverables within xx days or xx weeks of NTP or environmental approval for R/W:

* Legal descriptions and exhibits in electronic (.PDF) and hard copy to the APM.
* R/W staking
* Final R/W acquisition map in electronic (.PDF and CADD) and hard copy to the APM.

[If monuments are disturbed or destroyed during the construction activities of this Project then Task CE-4.3 in the CA/CEI SOW must be included. If the utility relocation or clearing activities disturb or destroy monuments prior to or during construction due to the Project needs, then this task must be accomplished.