**Graef-USA Inc.**

**M0697-21-79**

**Project ID 4085-48-00**

**Work Order # 6**

**HIGHWAY = STH 32**

**TITLE = Howards Grove - Kiel**

**PROJECT LIMITS = STH 32/57 South Junction – STH 67**

**Manitowoc County**

***SCOPE:***

The CONSULTANT shall complete an Alignment Survey, Topo/DTM Survey, Utility Survey, and a Cross Section Survey as described below.

**General Deliverables:**

* *All C3D dwg files that will be delivered with this contract will have the “Units and Zone” tab located within the “Drawing Settings” menu match the H & V datum of this contract.*
* *The datum of the Survey Data Base shall be “No Projection/No Datum”*
* The Survey-Data-Base is to encompass all the field survey activities included in this work order.
* SD-408548-WO9, Civil 3D Survey Database includes .sdbx, .sdxx, .sdbx., info & .log files) (C3D creates folder and associated files automatically from database name).
* Metadata- WO9-408548.docx
* Raw Data Survey files from office and field computers

 (JOB, VCE, DAT, JXL, etc.), if using Trimble products.

* Field Notes & Sketches in PDF format.
* **The final, accurate & complete,** Survey Database is to be delivered to the DEPARTMENT by September 1, 2017.
* The contract end date should be November 3, 2017

**General Point Number Convention**

For guidance, the CONSULTANT shall use the following;

* PLSS and property survey points shall be numbered 400-899
* Control points shall be numbered 900-999 (unless otherwise provided) HMOD use NGS data sheet PID as descriptor (control verification shots at the beginning and end of sessions shall use topo number continued)
* Benchmark Points shall be numbered 1000-1100
* Topo and utility points shall be numbered 2000 = > (except provided control point number range)
* Point numbers will be consecutive and there shall be no duplicate point numbers.

**H & V Datums & Adjustment, Geoid, Coordinate Reference System, Units;**

1. All work to be performed in and referenced to NAD83 (2011), NAVD 88 (2012), Geoid 2012A, **Wisconsin Coordinate Reference Systems (WISCRS) Manitowoc County Zone**, US Survey Feet.

**Horizontal Control**

The CONSULTAN shall show in the “topo- WO9-40854800.dwg” locations of the monuments used to tie into the Horizontal calibration

**Vertical Control**

* The CONSULTANT shall place three benchmarks within the steep slope areas near stations 839+00 – 850+00.
* The CONSULTANT shall place three benchmarks within the Beamguard Area 1 @ approximate stations 723+00 – 742+00
* The CONSULTANT shall place three benchmarks within the Beamguard Area 2 @ approximate stations 688+00 – 716+00
* The CONSULTANT is to choose exact locations as they see fit
* This location shall be designated with a benchmark symbol within the proposed delivery of the “topo- WO9-40854800.dwg” as called out below.
* The CONSULTANT is to prepare a tie sheet for each of the benchmarks set.

***Alignment***

The CONSULTANT shall perform a field survey to locate points of intersection, points on tangent, points of curvature, points of tangencies, and supplemental centerline shots. The CONSULTANT is to use this data to create an alignment as described below.

* The STH 32 alignment shall start approximately 1500 feet east of the STH 32/57 interchange thence west until the STH 32/67 round-a-bout splitter island. Both northbound and southbound lanes of traffic will have their own alignment created.
* The DEPARTMENT shall provide the electronic files showing the alignments for the STH 32/57 and STH 67 round about.
* The STH 32/57 interchange, on the east end of the project, alignments shall be created using plan F-02-4(16) sheet 5-99.
* Plans f02-4-16, 3369, 4322-08-71 shall assist the CONSULTANT with the creation of the alignment.
* The CONSULTANT is to create this alignment in Autocad C3D.

The CONSULTANT shall deliver:

* Align- WO9-40854800.dwg
* **The final, accurate & complete,** alignment drawing is to be delivered to the DEPARTMENT by September 1, 2017.

**TOPO/DTM SURVEY**

The CONSULTANT is to perform a TOPO/DTM field survey along STH 32 as described below. For sake of describing the limits of this scope, the stationing below if based on Plan 4085-06-71, provided to the CONSULTANT by the DEPARTMENT.

1. The CONSULTANT shall take cross sections along STH 32 at 12 locations throughout the project. The cross section shall occur across bot the north bound and the south bound lanes of STH 32. The cross section shots shall consist of centerline, fog line/ lane stripe, edge of paved shoulder, edge of gravel shoulder, any break lines between gravel shoulder and ditch bottom, ditch bottom, top back of slope. The cross section shall occur at the following stations;
	1. Cross Section #1 – 859+00
	2. Cross Section #2 – 843+00
	3. Cross Section #3 – 827+50
	4. Cross Section #4 – 816+00
	5. Cross Section #5 – 806+00
	6. Cross Section #6 – 787+50
	7. Cross Section #7 – 773+00
	8. Cross Section #8 – 761+00
	9. Cross Section #9 – 746+00
	10. Cross Section #10 – 721+00
	11. Cross Section #11 – 693+00
	12. Cross Section #12 – 686+00
2. The CONSULTANT shall perform a TOPO/DTM *Beam Guard Survey* at 2 locations and the following way;
	1. Beamguard Area 1 @ approximate stations 723+00 – 742+00
		1. The *Beam Guard Survey* shall start 500 feet before/down-station of the furthest end area treatment and end 500 feet past/up-station of the furthest end area treatment.
		2. The *Beam Guard Survey* shall be 125 feet on either side of the center of the median of STH 32 for a total width of 250 feet.
	2. Beamguard Area 2 @ approximate stations 688+00 – 716+00
		1. The *Beam Guard Survey* shall start 500 feet before/down-station of the furthest end area treatment and end 500 feet past/up-station of the furthest end area treatment.
		2. The Beam Guard Survey shall start from the median edge of pavement of north bound STH 32, thence southerly/left station to a point 125 feet from the edge of pavement of south bound STH 32 or to the edge of water or face of buildings, whichever comes first.
3. The CONSULTANT shall perform a TOPO/DTM survey of an area of steep slopes in the following manner.
	1. The TOPO/DTM survey should be completed from Stations 839+00 – 850+00 right.
	2. The TOPO/DTM survey shall start at the inside asphalt shoulder edge of northbound STH 32, thence easterly/station right to an end point being 125 feet from said inside asphalt shoulder edge.

Deliverables:

* A surface drawing named “surf-WO9-40854800.dwg”
* A topo drawing named “topo- WO9-40854800.dwg”
* **The final, accurate & complete,** surf- WO9-40854800.dwg, topo-WO9-40854800.dwg, is to be delivered to the DEPARTMENT by September 1, 2017

**Utility Survey**

The DEPARTMENT has submitted the DT-1077 forms requesting the systems maps from the utility companies serving this area. These systems maps will be provided to the CONSULTANT.

The CONSULTANT shall collect all overhead and underground utilities within the utility survey limits. Utilities include but are not limited to; Gas, Telephone, Communications, Cable TV, Fiber Optic, Electric, Water Sanitary Sewer, Storm Sewer, Storm Sewer Pipe Outfalls, Traffic Signal Facilities, FTMS/ITS facilities. In the delivered drawing, all utilities shall be represented by unique connecting line work representing the facilities and utility structures such as poles, pedestals, valves, vent pipes, transformers, etc., shall be obtained and shown. All utilities shall be represented on their own layer whose name is to coincide with the utility owner’s name.

The CONSULTANT shall provide to the DEPARTMENT a copy of all the Diggers Hotline Tickets that were called in to locate the utilities. The CONSULTANT shall provide a copy of all the systems maps that were received from the utility companies.

The CONSULTANT is to complete a WisDOT Diggers Hotline Ticket Assessment form for this work order. This form will assist in assessing the quality of the response received from the utility company and their locators. The DEPARTMENT will provide the template to be used.

The CONSULTANT is to perform a Utility field survey along STH 32 as described below. All stationing below if based on Plan 4085-06-71, provided to the CONSULTANT by the DEPARTMENT.

1. The CONSULTANT shall perform a Utility survey at 2 locations in the following way;
	1. Beamguard Area 1 @ approximate stations 723+00 – 742+00
		1. The Utility survey shall start 500 feet before/down-station of the furthest end area treatment and end 500 feet past/up-station of the furthest end area treatment.
		2. The Utility survey shall be 125 feet on either side of the median of STH 32 for a total width of 250 feet.
	2. Beamguard Area 2 @ approximate stations 688+00 – 716+00
		1. The Utility survey shall start 500 feet before/down-station of the furthest end area treatment and end 500 feet past/up-station of the furthest end area treatment.
		2. The Utility survey shall start from the median edge of pavement of north bound STH 32, thence southerly/left station to a point 125 feet from the edge of pavement of south bound STH 32 or to the edge of water or face of buildings, whichever comes first.
2. The CONSULTANT shall perform a Utility survey within the area of steep slopes in the following manner.
	1. The Utility survey should be completed from Stations 839+00 – 850+00.
	2. The Utility survey shall start at the inside asphalt shoulder edge of northbound STH 32, thence easterly/station right to an end point being 125 feet from said inside asphalt shoulder edge.

The CONSULTANT shall deliver:

* A utility drawing containing both the utilities and the cross culvert/inlet survey named “utility-WO9-40854800.dwg”
* **The final, accurate & complete,** “utility-WO9-40854800.dwg” is to be delivered to the DEPARTMENT by September 1, 2017.