USH 10
SPECIAL PROVISIONS
· 3D ROADWAY MODEL DATA
· CONSTRUCTION STAKING, BASE

C Construction
Apply the paint a minimum thickness of 15 mils and position it on the pavement centered on the centerline of the outfall.

D Measurement
The department will measure Pavement Marking Outfall in place as units.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
646.0805.S	Pavement Marking Outfall	Each

Payment is full compensation for furnishing all materials; preparing the surface; applying and protecting the work; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the contract work.
646-035 (20030820)

46. 3D Roadway Model Data.

In addition to but separate from the contractor staking packet, the department will provide detailed 3D proposed roadway model data for 6350-06-76. The department will provide the data prior to project LET date within 5 business days of a contractor request submitted as follows: by email to Kevin Garrigan at Kevin.Garrigan@dot.wi.gov.

The roadway model data consists of LandXML v1.2 files containing reference line and proposed profile information as well as AutoCAD 2010 DWG files containing TIN Civil

3D surfaces as follows:

- Existing ground.
- Proposed top.
  - Top of topsoil outside the roadway subgrade shoulder points extended to the slope intercepts.
  - Top of shoulder and top of pavement within the roadway subgrade shoulder points.
- Proposed datum.
  - Top of topsoil outside the roadway subgrade shoulder points extended to the slope intercepts.
  - Subgrade surface within the roadway subgrade shoulder points.
- Proposed base course.
  - Top of base course within the roadway edges of traveled way.

47. Construction Staking Base, Item 650.5000

Conform to subsection 650 of the standard specifications as modified in this special provision.

Replace subsection 650.3.4 of the standard specifications with the following:

650.3.4 Base

650.3.4.1 General

(1) Under the Construction Staking Base bid item the contractor may substitute global positioning system (GPS) machine guidance for conventional base staking on all or part of the base for hot mix asphalt (HMA) pavement. The engineer may require the contractor to revert to conventional base staking methods for all or part of the base for hot mix asphalt (HMA) pavement at any point during construction if, in the engineer's opinion, the GPS machine guidance is producing unacceptable results.

(2) Use GPS machine guidance for base in all areas where GPS machine guidance was used on subgrade under HMA pavement. GPS machine guidance is not required for base on short side road, driveway, or field entrance tie-ins of 200 feet or less.

650.3.4.2 Base Staking

(1) Set construction stakes or marks at 100-foot intervals for rural sections and 50-foot intervals for urban sections. Set and maintain sufficient stakes at each cross section to match plan cross-section, achieve the required accuracy, and to support the method of operations. Set and maintain stakes as necessary to establish horizontal and vertical position along intersecting road radii, auxiliary lanes, vertical and horizontal curves, and curve transitions. Locate stakes within 0.25 feet horizontally and establish the grade elevation to within 0.03 feet vertically.

650.3.4.3 GPS Machine Guidance

650.3.4.3.1 General

(1) No base stakes are required for work completed using GPS machine guidance.

(2) Coordinate with the engineer throughout the course of construction to ensure that work performed using GPS machine guidance conforms to the contract tolerances and that the methods employed conform to the contractor's GPS work plan and accepted industry standards. Address GPS machine guidance issues at weekly progress meetings.

650.3.4.3.2 GPS Work Plan

(1) Submit a comprehensive written GPS work plan for department review at least 5 business days before the preconstruction conference. The engineer will review the plan to determine if it conforms to the requirements of this special provision.

(2) Construct the base as the contractor's GPS work plan provides. Update the plan as necessary during construction of the subgrade.

(3) The GPS work plan should discuss how GPS machine guidance technology will be integrated into other technologies employed on the project. Include, but do not limit the contents to, the following:

- Designate which portions of the contract will be done using GPS machine guidance and which portions will be done using conventional base staking.
- Describe the manufacturer, model, and software version of the GPS equipment.
- Provide information on the qualifications of contractor staff. Include formal training and field experience. Designate a single staff person as the primary contact for GPS technology issues.
- Describe how project control is to be established. Include a list and map showing control points enveloping the site.
- Describe site calibration procedures. Include a map of the control points used for site calibration and control points used to check the site calibration. Describe the site calibration and checking frequency as well as how the site calibration and checking information are to be documented.
- Describe the contractor's quality control procedures. Describe procedures for checking, mechanical calibration, and maintenance of equipment. Include the frequency and type of checks performed to ensure that the constructed base conforms to the contract plans.

650.3.4.3.3 Equipment

(1) Use GPS machine guidance equipment to meet the requirements of the contract.

(2) Perform periodic sensor calibrations, checks for blade wear, and other routine adjustments as required to ensure that the final base conforms to the contract plans.

650.3.4.3.4 Geometric and Surface Information

650.3.4.3.4.1 Department Responsibilities

(1) At anytime after the contract is awarded the contractor may request the contractor staking packet. The department will provide the packet within 5 business days of receiving the contractor's request.

650.3.4.3.4.2 Contractor Responsibilities

(1) Develop and maintain the initial design surface DTM for areas of the project employing GPS machine guidance. Confirm that the design surface DTM agrees with the contract plans.

(2) Provide design surface DTM information to the department in LandXML v1.2, AutoCAD 2010 DWG, or other engineer-approved format.

650.3.4.3.4.3 Managing and Updating Information

(1) Notify the department of any errors or discrepancies in department-provided information. The department will determine what revisions may be required. The department will revise the contract plans, if necessary, to address errors or discrepancies that the contractor identifies. The department will provide the best available information related to those contract plan revisions.

(2) Revise the design surface DTM as required to support construction operations and to reflect any contract plan revisions the department makes. Perform checks to confirm

that the revised design surface DTM agrees with the contract plan revisions. Provide a copy of the resultant revised design surface DTM to the engineer in LandXML or other engineer-approved format. The department will pay for costs incurred to incorporate contract plan revisions as extra work.

650.3.4.3.5 Site Calibration

(1) Designate a set of control points, including a total of at least 6 horizontal and vertical points or 2 per mile, whichever is greater, for site calibration for the portion of the project employing GPS machine guidance. Incorporate the department-provided control framework used for the original survey and design.

(2) Calibrate the site by determining the parameters governing the transformation of GPS information into the project coordinate system. Use the full set of control points designated under 650.3.4.3.5 (1) for the initial site calibration. Provide the resulting site calibration file to the engineer before beginning base construction operations.

650.3.4.3.6 Construction Checks

650.3.4.3.6.1 Daily Calibration Checks

(1) In addition to the site calibration, perform site calibration checks. Perform these checks at individual control points not used in the initial site calibration. At a minimum, check the calibration at the start of each day as described in the contractor's GPS work plan. Report out-of-tolerance checks to the engineer. The measured position must match the established position at each individual control point within the following tolerances:

- Horizontally to 0.10 feet or less.
- Vertically to 0.05 feet or less.

(2 Discuss the previous week's daily calibration check results at the weekly progress meeting for monitoring the GPS work.

650.3.4.3.6.2 Final Base Elevation Checks

(1) Check the base against the plan elevation at randomly selected points on cross sections located at stations evenly divisible by 100. Conduct at least 20 random checks per stage, per project, or per roadway mile whichever results in the most tests. Also check the base at additional points as the engineer directs. Notify the engineer at least 2 business days before making base checks so the engineer can observe the process.

(2) In lieu of the tolerances specified in 301.3.4.1(2), ensure that no individual check is off by more than 0.10 foot vertically and at least 4 of any 5 consecutively tested random base points are within 0.06 foot vertically of the plan elevation. Notify the engineer if either criterion is exceeded.

(3) The department may conduct periodic independent base checks. The department will notify the contractor if any individual check differs by more than 0.06 foot from the design.

48. Traffic Control Covering Existing Signs, Item SPV.0060.01.

A. General
This work shall consist of covering existing signs, maintaining the sign covering and removing the sign covering as shown on the plan and as hereinafter provided. The covered sign message shall be unreadable during daytime and nighttime hours.

B Materials
Provide porous cloth covering material of sufficient durability to withstand the effects of weather and that does not allow light to reflect from the sign face at night. Tape, paper, plastic, or sheet metal covers will not be allowed.

C Construction
Fold porous cloth covers over the sign edges and secure to the back of the sign. When only a portion of the sign is to be covered, cover only the area of the sign designated to be covered with the cloth cover held tightly in place using a rope system or other system as approved by the engineer. Secure the cloth so that it will not flap against the sign face.

Do not apply any kind of tape to the face of the sign to fasten the covering material.

D Measurement
The department will measure Traffic Control Covering Existing Signs in units for each sign covered. Multiple covers on the same sign will be paid for separately. Multiple coverings and removals of sign coverings on the same sign will be paid for separately.

E Payment
The department will pay for measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0060.01	Traffic Control Covering Existing Signs	Each

Payment is full compensation for furnishing, installing, maintaining, and removing sign covers; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the contract work.

49. Reestablish Section Corner Monuments, Item SPV.0060.03.

A Description
This special provision describes reestablishing section corner monuments from existing reference monuments as shown in the plan details, as directed by the engineer and as hereinafter provided.