



# Oregon

Theodore R. Kulongoski, Governor

Department of Transportation  
Technical Services  
Roadway Engineering Section  
355 Capitol Street NE, Room 222  
Salem, OR 97301-3871  
Telephone 503-986-3714  
FAX 503-986-3749

DATE: June 8, 2009

## Addenda No. 1

TO: PLAN HOLDERS

PREPARED BY: Calvin Seewood

APPROVED BY: Paul D Tappan P.E.

SUBJECT: McMinnville City Streets: Pavement Resurfacing and ADA Ramps  
Various City Streets  
Yamhill County  
Paving & Sidewalk Ramps Project  
(Bids to be opened and read June 18, 2009)

### The following changes are made to the Project Bid Booklet:

1. DESCRIPTION OF WORK page - The paragraph under COMPLETION TIME LIMIT is replaced with the following:

Complete all Work to be done under the Contract not later than May 28, 2010.

2. The following changes are made to the Project Bid Items:

- a. Quantity changes:

<u>Number</u>	<u>Item</u>	<u>Quantity</u>	
		<u>Original</u>	<u>New</u>
0220	Concrete Sidewalk Ramps	144.00	142.00

- b. Added items:

<u>Number</u>	<u>Item</u>	<u>Unit</u>	<u>Quantity</u>
270	Construction Survey Work	LUMP SUM	ALL
280	Remove And Reinstall Existing Signs	LUMP SUM	ALL

Make a copy of and use the new attached Bid Sheets. A Bid **not** including these new Bid Sheets **will be rejected as non-responsive.**

**The following changes are made to the Project Special Provisions:**

1. DESCRIPTION OF WORK page - The second paragraph under PROJECT INFORMATION is replaced with the following:

Paul Christiansen, Project Manager, 422 Gateway Ave., Suite 230, Astoria 97103; Phone (503) 325-4732 Ext. 12

2. DESCRIPTION OF WORK page - The paragraph under COMPLETION TIME LIMIT is replaced with the following:

Complete all Work to be done under the Contract not later than May 28, 2010.

3. WORK TO BE DONE page - Delete paragraph under AUTHORITY OF CONSULTANT and the title AUTHORITY OF CONSULTANT.

4. Subsection **00150.15(b) Agency Responsibilities** - This subsection is added before subsection 00150.35(c):

**00150.15(b) Agency Responsibilities** - Replace this subsection, except for the subsection number and title, with the following:

The Engineer will perform the responsibilities described in 00305.04.

5. Subsection **00150.15(c) Contractor Responsibilities** - This subsection is added before subsection 00150.35(c):

**00150.15(c) Contractor Responsibilities** - Replace this subsection, except for the subsection number and title, with the following:

The Contractor shall perform the responsibilities described in 00305.05.

6. Subsection **00180.50(h) Contract Time** - This subsection is replaced with the following subsection:

**00180.50(h) Contract Time** - Complete all Work to be done under the Contract not later than May 28, 2009.

7. Subsection **00195.10 Payment for Changes in Materials Costs** - This subsection is added before subsection 00195.12(d):

**00195.10 Payment for Changes in Materials Costs** - Replace this subsection with the following subsection:

**00195.10 Asphalt Cement Material Price Escalation/De-escalation** - An asphalt cement escalation/de-escalation clause will be in effect during the life of the Contract.

The Agency reserves all of its rights under the Contract, including, but not limited to, its rights for suspension of the Work under 00180.70 and its rights for termination of the Contract under 00180.90, and this escalation/de-escalation provision shall not limit those rights.

**(a) Monthly Asphalt Cement Material Price (MACMP)** - The Monthly Asphalt Cement Material Price (MACMP) will be established by the Agency each month. For information regarding the calculation of the MACMP, and for the actual MACMP, go to the Agency website at:

[http://www.oregon.gov/ODOT/HWY/ESTIMATING/asphalt\\_fuel.shtm](http://www.oregon.gov/ODOT/HWY/ESTIMATING/asphalt_fuel.shtm)

If the Agency selected index ceases to be available for any reason, the Agency in its discretion will select and begin using a substitute price source or index to establish the MACMP each month. The MACMP will apply to all asphalt cement including but not limited to paving grade, polymer modified, and emulsified asphalts, and recycling agents. The Agency does not guarantee that asphalt cement will be available at the MACMP.

**(b) Base Asphalt Cement Material Price (Base)** - The Base asphalt cement material price for this Project is the MACMP published on the Agency website for the month immediately preceding the bid opening date.

**(c) Monthly Asphalt Cement Adjustment Factor** - The Monthly Asphalt Cement Adjustment Factor will be determined each month as follows:

- If the MACMP is within  $\pm 5\%$  of the Base, there will be no adjustment.
- If the MACMP is more than 105% of the Base, then:

$$\text{Adjustment Factor} = (\text{MACMP}) - (1.05 \times \text{Base})$$

- If the MACMP is less than 95% of the Base, then:

$$\text{Adjustment Factor} = (\text{MACMP}) - (0.95 \times \text{Base})$$

**(d) Asphalt Cement Price Adjustment** - A price adjustment will be made for the items containing asphalt cement listed below. The price adjustment as calculated in (c) above will use the MACMP for the month the asphalt is incorporated into the Project. The price adjustment will be determined by multiplying the asphalt incorporated during the month for subject Pay Items by the Adjustment Factor.

The Pay Items for which price adjustments will be made are:

**Pay Item(s)**

PG 64-22 Asphalt in HMAC

8. Subsection **00220.02 Public Safety and Mobility** - The following paragraph is added after the paragraph that begins "Do not place...":

- Do not allow traffic to drive on cold planed surfaces for more than 7 calendar days.

9. Subsection **00220.40(f) Limited Duration Street Closure** - The paragraph that begins with the words "The Contractor will be supplied ...." is replaced with the following:

The Contractor will be supplied with notices commonly called "door hangers" (herein referred to as "Final Notice") after the preconstruction conference. Notices supplied will contain the following information provided at the preconstruction conference:

10. Subsection **00220.40(f) Limited Duration Street Closure** - The following paragraph is added after the paragraph that begins "in addition at...":

Once work has begun on Linfield Avenue, it shall be completed within 30 Calendar days. Coordinate the schedule of work on Linfield Avenue with Linfield College to minimize conflicts with school activities to the maximum extent possible. The contact at Linfield College is Brad Sinn, Director of Facilities & Auxiliary Services, at phone 971-241-8947.

11. Subsection **00225.02 General Requirements** - The paragraph that begins with the words "Install all signs..." is replaced with the following:

Install all signs on temporary or portable sign supports, unless Engineer approves use of other methods.

12. Subsection **00225.02 General Requirements** - The paragraph that begins with the words "Install a type..." is replaced "(CG20-8S-54) with (CG20-8SU-54).

13. Section **00305 - CONSTRUCTION SURVEY WORK** - This Section is added after Section 00290. See attachment for full text.

14. Section **00490 - WORK ON EXISTING SEWERS AND STRUCTURES** - This Section is replaced with the following Section:

#### **SECTION 00490 - WORK ON EXISTING SEWERS AND STRUCTURES**

Comply with Section 00490 of the Standard Specifications modified as follows:

**00490.90 Payment** - Add the following paragraph:

Item (d) includes adjusting boxes and removing and replacing existing boxes with new boxes supplied by others as shown.

15. Subsection **00759.40 Removal** - This subsection is added after subsection 00759.00:

Add the following subsection:

**00759.40 Removal** - Perform removal work according to Section 00310.

16. Subsection **00759.90 Payment** - The following paragraph is added after the paragraph that begins "No separate or...":

No separate or additional payment will be made for repair, removal, and replacement of retaining walls.

17. Section **00905 - REMOVAL AND REINSTALLATION OF EXISTING SIGNS** - This Section is added after Section 00867:

**SECTION 00905 - REMOVAL AND REINSTALLATION OF EXISTING SIGNS**

Comply with Section 00905 of the Standard Specifications.

**The following changes are made to the Project Plans:**

1. Plan sheets 2B-2 and 2B-3 are replaced with revised plan sheets 2B-2 and 2B-3.

These changes will be included in the Contract for this Project. It is understood that your Bid will be submitted accordingly.

Make copies of the new Bid Sheets to replace the Special Provisions Bid Schedule Sheets.

CRL: \_\_\_\_\_

Attachments: New Bid Sheets  
Revised Plan Sheets  
New Special Provisions Section

BID SCHEDULE

CONTRACT ID: 14067

PROJECT: MCMINNVILLE CITY STREETS: PAVEMENT  
RESURFACING AND ADA RAMPS

PROJECT KEY: 16525

ADDENDUM NUMBER: 1

ITEM NO	ITEM DESCRIPTION	QUANTITY AND UNITS	UNIT PRICE (IN FIGURES)	BID AMOUNT (IN FIGURES)
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SECTION 0001 TEMPORARY FEATURES AND APPURTENANCES

0010	0210-0100000A MOBILIZATION	LS	ALL	
0020	0225-0100000A TEMPORARY PROTECTION AND DIRECTION OF TRAFFIC	LS	ALL	
0030	0225-0102000J TEMPORARY SIGNS	SQFT	1,693.00	
0040	0225-0105000E TEMPORARY BARRICADES, TYPE III	EACH	29.00	
0050	0225-0149000E TEMPORARY FLEXIBLE PAVEMENT MARKERS	EACH	400.00	
0060	0225-0168000T FLAGGERS	HOUR	470.00	
0070	0280-0100000A EROSION CONTROL	LS	ALL	
0080	0280-0114000E INLET PROTECTION	EACH	16.00	
0090	0290-0100000A POLLUTION CONTROL PLAN	LS	ALL	

SECTION 0002 ROADWORK

0100	0310-0106000A REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	ALL	
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SECTION 0003 DRAINAGE AND SEWERS

BID SCHEDULE

CONTRACT ID: 14067

PROJECT: MCMINNVILLE CITY STREETS: PAVEMENT  
RESURFACING AND ADA RAMPS

PROJECT KEY: 16525

ADDENDUM NUMBER: 1

ITEM NO	ITEM DESCRIPTION	QUANTITY AND UNITS	UNIT PRICE (IN FIGURES)	BID AMOUNT (IN FIGURES)
0110	0490-0100000E ADJUSTING BOXES	EACH 12.00		

SECTION 0004 BASES

0120	0610-0103000A RECONDITIONING EXISTING ROADWAY	LS ALL		
0130	0620-0112000J COLD PLANE PAVEMENT REMOVAL, 2 - 4 INCHES DEEP	SQYD 29,000.00		
0140	0620-0120000J COLD PLANE PAVEMENT REMOVAL, 2 INCHES DEEP	SQYD 14,900.00		
0150	0640-0100000M AGGREGATE BASE	TON 810.00		

SECTION 0005 WEARING SURFACES

0160	0745-0202000M LEVEL 2, 1/2 INCH DENSE HMAC	TON 5,000.00		
0170	0745-0620000M PG 64-22 ASPHALT IN HMAC	TON 300.00		
0180	0748-0107000J 14 INCH ASPHALT CONCRETE PAVEMENT REPAIR	SQYD 50.00		
0190	0748-0110000J 18 INCH ASPHALT CONCRETE PAVEMENT REPAIR	SQYD 300.00		
0200	0759-0103000F CONCRETE CURBS, CURB AND GUTTER	FOOT 100.00		
0210	0759-0128000J CONCRETE WALKS	SQFT 900.00		

BID SCHEDULE

CONTRACT ID: 14067

PROJECT: MCMINNVILLE CITY STREETS: PAVEMENT  
RESURFACING AND ADA RAMPS

PROJECT KEY: 16525

ADDENDUM NUMBER: 1

ITEM NO	ITEM DESCRIPTION	QUANTITY AND UNITS	UNIT PRICE (IN FIGURES)	BID AMOUNT (IN FIGURES)
0220	0759-0153000E CONCRETE SIDEWALK RAMPS	142.00 EACH		

SECTION 0006 PERMANENT TRAFFIC SAFETY AND GUIDANCE DEVICES

0230	0860-0200000F LONGITUDINAL PAVEMENT MARKINGS - PAINT	4,100.00 FOOT		
0240	0867-0107000E PAVEMENT LEGEND, TYPE B: "STOP"	8.00 EACH		
0250	0867-0145000J PAVEMENT BAR, TYPE B	780.00 SQFT		

SECTION 0007 RIGHT OF WAY DEVELOPMENT AND CONTROL

0260	1070-0100000E SINGLE MAILBOX SUPPORTS	1.00 EACH		
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SECTION 0008 ADDED BID ITEMS

0270	0305-0100000A CONSTRUCTION SURVEY WORK	ALL LS		
0280	0905-0101000A REMOVE AND REINSTALL EXISTING SIGNS	ALL LS		
	TOTAL BID			

# MCMINNVILLE CITY STREETS: PAVEMENT RESURFACING AND ADA RAMPS

## VARIOUS CITY STREETS

### YAMHILL COUNTY

19TH ST. CORRIDOR	QUADRANT			
INTERSECTION	NE	NW	SE	SW
NW 19TH & N MICHELBOOK	1,2,7	1,2	1,2,7	1,2
NW 19TH & NW THOMSEN	1,2	1,2	1,2	1,2
NW 19TH & NW FIR	1,2	1,2		
NW 19TH & NW ELM	1,2,7	1,2	1,2	1,2,8
NW 19TH & NW YAMHILL	1,2	1,2		
NW 19TH & NW BIRCH	1,2	1,2,7	1,2	1,2
NW 19TH & NW ALDER			1,2,8	1,2
NW 19TH & NW ADAMS	1,2	1,2	1,2	1,2
NE 19TH & NE BAKER		1,2		1,2
NE 19TH & NE GALLOWAY	5	5		
NE 19TH & NE HEMBREE	1,2	5		
NE 19TH & NE IRVINE				1,2
NE 19TH & NE JOHNSON				1,2,8
NE 19TH & NE MCDONALD	1,2	1,2	1,2	1,2,8
NE 19TH & NE MCDANIEL				1,2
NE 19TH & NE LAFAYETTE		1		1

NE 27TH ST. CORRIDOR	QUADRANT			
INTERSECTION	NE	NW	SE	SW
NE 27TH & NE DAVIS		1,2		
NE 27TH & NE 27TH			1,2	1,2
NE 27TH & NE EVANS	1,2	1,2	1,2,8	1,2
NE 27TH & NE FORD			1,2	1,2
NE 27TH & NE HEMBREE	1,2			1,2
NE 27TH & NE JOHNSON			1,2	
NE 27TH & NE MCDONALD	1,2	1,2	1,2	1,2
NE 27TH & NE NEWBY	5	5	4	
NE 27TH & NE LEATHERS	1,2	1,2		
NE 27TH & NE MCDANIEL			1,2	1,2
NE 27TH & NE 27TH CT.	1,2	1,2		
NE 27TH & NE MELODY	1,2	5		
NE 27TH & NE FLAINE	1,2	5,8,9		4

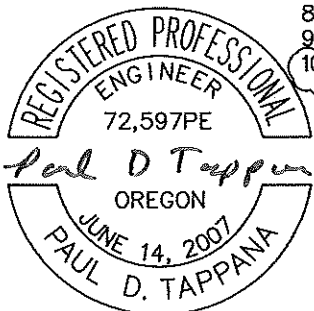
SW FELLOWS ST. CORRIDOR	QUADRANT			
INTERSECTION	NE	NW	SE	SW
SW FELLOWS & SW MYRTLE	5	5,8,8	5,8	5
SW FELLOWS & SW SITKA	5	5,8,8		5
SW FELLOWS & SW HAWTHORNE	5	5		5
SW FELLOWS & SW WESTVALE	5	5		5
SW FELLOWS & SW FILBERT	5	5		
SW FELLOWS & SW APPLE	5	5,10		
SW FELLOWS & SW DOVE	5	5,10		
SW FELLOWS & SW WARBLER	5	5,10		
SW FELLOWS & SW ORIOLE	5	5,10		
SW FELLOWS & SW CYPRESS	1,2,10	1,2,10	1,2,10	1,2,8,10
SW FELLOWS & SW AGEE	1,2,10	1,2		
SW FELLOWS & SW PATRICIA			1,2,8	1,2
SW FELLOWS & SW GOUCHER	1,2	1,2,10	1,2,10	1,2
SW FELLOWS & SW FELLOWS CT.	1,2	1,2,10		
SW FELLOWS & SW FLEISHOUER	1,2	1,2		1,2
SW FELLOWS & SW BROCKWOOD		1,2	1,2,7,10	1,2
SW FELLOWS & SW CEDARWOOD	5	1,2,10	5,10	1,2

LINFIELD AVE. CORRIDOR	QUADRANT			
INTERSECTION	NE	NW	SE	SW
LINFIELD & SW GILORR			5,10	1,2
LINFIELD & SW BLAINE	1,2,7	1,2		
LINFIELD & SW MELROSE			5,10	1,2
LINFIELD & RENSHAW			5	1,2
LINFIELD & PIONEER	5	3	5	4
LINFIELD & LEVER				
LINFIELD & SE COWLS	1,2		1,2,10	
LINFIELD & SE DAVIS			1,2	1,2

MIDBLOCK RAMPS	St. Side	
	N	S
NE 19TH BETWEEN NE MCDONALD & NE MCDANIEL	4,6	
NE 19TH BETWEEN NE MCDONALD & NE MCDANIEL	4	
NE 19TH BETWEEN NE MCDONALD & NE MCDANIEL	4	
NE 19TH BETWEEN NE MCDONALD & NE MCDANIEL	5	
NE 19TH BETWEEN NE MCDONALD & NE MCDANIEL	5	
LINFIELD BETWEEN RENSHAW & LEVER	3	3

**CONST. CONCRETE SIDEWALK RAMP AS SHOWN BELOW:**

- 1 - OREGON STD. DRG. RD757, OPTION K
- 2 - CONST. CURB AT BACK OF RAMP PER SECTION B-B, SEE OREGON STD. DRG. RD755
- 3 - OREGON STD. DRG. RD755, PERPENDICULAR SIDEWALK RAMP DETAIL
- 4 - OREGON STD. DRG. RD755, PARALLEL SIDEWALK RAMP DETAIL
- 5 - SEE DETAILS ON SHEETS 2B-4 THROUGH 2B-8
- 6 - NO CURB AT BACK OF WALK
- 7 - SHIFT RAMP THROAT TO AVOID CATCH BASIN
- 8 - ADJUST WATER VALVE BOX WITH NEW BOX, SEE SPECIAL PROVISIONS SEC. 00150.50
- 9 - REPLACE MAILBOX AS DIRECTED BY THE ENGINEER
- 10 - REMOVE AND REINSTALL EXISTING SIGN, COORDINATE WITH CITY FOR LOCATION



## RAMP DESIGN TABLE

**NOTE:**  
PLACE 2 INCHES OF 3/4"-0 AGGREGATE BASE UNDER CONCRETE SIDEWALK RAMPS, CONCRETE CURBS, AND CONCRETE WALKS.

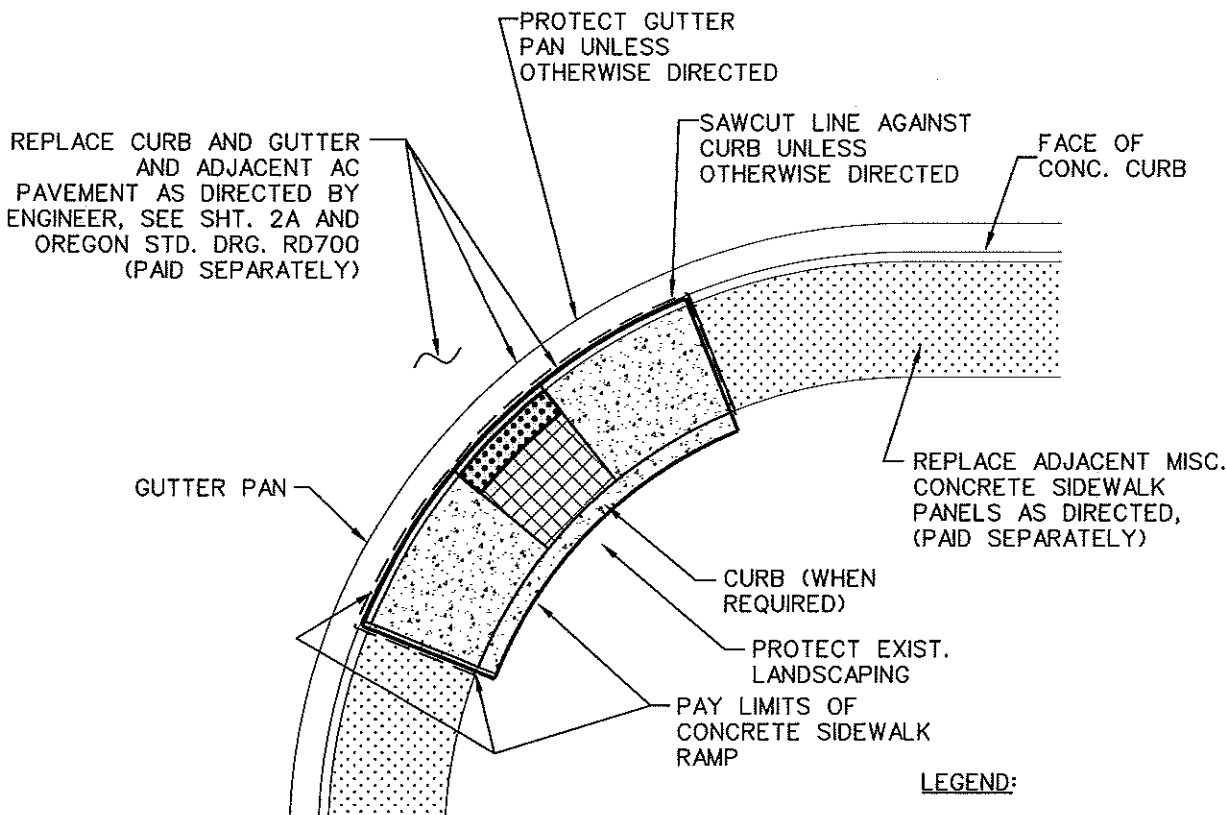
- 1 NOTE 10 ADDED TO TABLES
- 2 ADDED TEXT TO NOTE 8
- 3 REMOVED OR SWITCHED RAMP




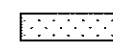
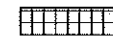

DESIGNED BY: GS	SHEET No. <b>2B-2</b>
DRAFTED BY: DL	

THIS IS THE FILENAME LOCATION P:\City of McMinnville\034853\Design\Drawings\Civil\Combined Project Plans

# MCMINNVILLE CITY STREETS: PAVEMENT RESURFACING AND ADA RAMP VARIOUS CITY STREETS YAMHILL COUNTY



**LEGEND:**

-  TRUNCATED DOME DETECTABLE WARNING SURFACE
-  SIDEWALK
-  ADA RAMP THROAT
-  CONCRETE ADA RAMP & WING

**NOTES:**

1. SEE SHEET 2B-2 FOR RAMP LOCATIONS
2. MATCH EXISTING CURB HEIGHT
3. ~~ADJUST WATER VALVE BOXES TO FINISHED GRADE~~
4. INSTALL FILTER INSERT INLET PROTECTION AT NEARBY RECEIVING CATCH BASINS



## GENERAL SIDEWALK RAMP DETAIL



EXPIRES 06/30/10



ALTERED NOTE 4 FROM BIO-BAGS TO FILTERS



DESIGNED BY: PT  
DRAFTED BY: PQ

SHEET No.

2B-3

## SECTION 00305 - CONSTRUCTION SURVEY WORK

Section 00305, which is not a Standard Specification, is included for this Project by Special Provision.

### Description

**00305.00 Scope** - This work consists of all surveying activities necessary to control the many phases of work required to construct the Project to the lines and grades as shown, specified, or established.

Make all supporting computations and field notes required for control of the work and as necessary to establish the exact position, orientation, and elevation of the work from control stations, including furnishing and setting construction stakes and marks, reference marks, and additional control stations.

Plans, specifications and other data necessary to lay out the work will be available for inspection at the Project Manager's office.

### 00305.01 Definitions:

**Confidence Points** - Random points measured in the field within the boundary of a digital terrain model (DTM), the purposes of which are to verify the accuracy of the DTM and to provide evidence just prior to construction that the DTM is a reasonable representation of the original ground for computation of volumes and pay quantities. Similarly, confidence points are used to verify that a constructed grade has been built according to the design DTM. Additional information is available from the Engineer.

Confidence point locations follow these guidelines:

- Randomly selected without regard for the location of DTM points or triangles
- Evenly distributed over the entire DTM area to be validated
- Proportionately distributed between confidence point classifications as applicable
- At a density sufficient to validate the surface, generally ten per instrument location as used in collecting DTM data or if not applicable, as in data collected photogrammetrically, 2% of DTM points

**Control Network** - An array of control stations either established by the Contractor or provided by the Agency.

**Control Station** - Any item identified in the Project records as having a position and/or elevation on the Project datum and intended to be used to control the many phases of the construction work.

**Digital Terrain Model (DTM)** - An electronic computer model of the shape of the ground.

**Reference Stakes** - Stakes set away from but with information relating back to the intended location and/or grade.

**Slope Catch** - The location where a design slope intersects the existing ground and where excavation or embankment work should begin to provide the intended earthwork.

**Slope Staking** - The process of using measurements and calculations in the field to determine the slope catch. Slope staking shall normally include setting stakes to mark the slope catch and setting a reference stake for every catch stake.

**Stakes** - Stakes, nails, marks, string lines, or other devices or mechanisms set or established for the purpose of indicating or controlling the location, orientation, or grade of any feature intended for construction, or for the purpose of limiting or influencing the construction work.

**Staking** - The act of placing stakes.

**Survey Marker** - Any survey monument, control station, or stake.

**Survey Monument** - Any natural or man-made item specified or identified in a property deed, boundary survey, government document, or other instrument of public record, when the purpose of said item is to mark or reference a property boundary, geographical location, elevation, or other position.

**Surveyor** - The individual designated by the Contractor and licensed in the state of Oregon as a Professional Land Surveyor and placed in "responsible charge" of the survey work as defined in ORS 672.002(6)(b).

**Temporary Bench Mark (TBM)** - A control station established for the purpose of providing vertical control for the Project. A TBM may or may not have an established horizontal position.

**00305.02 Mandatory Pre-Survey Conference** - The prime Contractor, subcontractors, surveyor, survey crew leader, and all surveying personnel who are to be involved in the survey work shall meet with the Project Manager two weeks prior to beginning survey work. The purpose of this meeting will be to discuss methods and practices of accomplishing required survey work.

**00305.03 Review by the Engineer** - The Engineer may periodically review the notes, calculations and layout work, including field locations, for compliance with these specifications. Survey work that does not meet the tolerances in 00305.40 may be rejected, and the work redone at the Contractors expense to meet the tolerances.

Review by the Engineer does not constitute approval or acceptance of the work, nor does it relieve the Contractor of responsibility for performing work in conformance with the plans and specifications.

**00305.04 Agency Responsibilities:**

- Provide copies of plans and specifications.
- Establish initial horizontal and vertical control stations in the proximity of the Project.
- Provide horizontal and vertical alignment data.
- Provide cross section finish grade elevations.
- Perform measurements and calculations for pay quantities.
- Perform final "as constructed" measurements.

**00305.05 Contractor Responsibilities** - Perform or provide the following items of work:

- Make calculations, field notes and survey drawings for the layout and control of the work as are necessary to construct the Project as specified.
- Provide original or copies of notes, calculations and drawings as requested.
- Preserve survey monuments and control stations according to 00305.70 and as governed by applicable law.
- Replace and augment control stations as necessary to control the Project.
- Establish additional control stations as necessary to control the Project.
- Perform slope staking necessary for construction of earthwork including intersections and matchlines.
- Set stakes defining limits for clearing. Set stakes defining approximate right-of-way and easements.
- Set stakes to define construction centerline, centerline offsets, detour lines, or other lines necessary for control of the Project work.
- Set stakes to define the work, that may include but is not limited to the following:
  - Roadway location and grade.
  - Fences and gates.
  - Guardrail, barrier, barricades, and associated features.
  - Traffic delineators, reflectors, and guide devices.
  - Temporary and permanent signing \*
  - Temporary and permanent pavement striping and pavement marking devices.
  - Poles and footings, cabinets, junction boxes, sensors, and other features associated with illumination and signal facilities \*
  - Curbs, walks, stairs, walls, mailboxes, and other miscellaneous structures \*
  - Pipes, manholes, inlets, weirs, settlement basins and other drainage and water quality structures and facilities \*
  - Landscaping items.
  - Earthwork features including guardrail flares and mounds, berms, and mounds
  - Buildings and other structures and facilities.
  - Environmental impact mitigation features.

\* Including field verification of fit and functionality or as instructed by the Engineer.

- Remove and dispose of all flagging, lath, stakes and other temporary staking material after the Project is completed

**00305.06 Survey Methods** - Survey procedures shall be appropriate for the equipment being used and be according to current Agency practices.

New survey procedures that are not according to current Agency practices shall be submitted to the Engineer for review 21 days prior to conducting the work. The surveyor may be required to demonstrate the capabilities, accuracy, and reliability of the intended procedure. The Engineer will evaluate the procedure and intended application and provide approval or rejection within 21 days. Work may proceed immediately upon approval of procedures by the Engineer.

Test and adjust survey equipment according to Agency's procedures and maintain records of test results and submit copies to the Engineer upon request. Information on Agency test procedures may be obtained from the Engineer.

**00305.07 Survey Work Records** - Contractor's survey personnel shall maintain a Project daily record of work performed by the survey crew. The daily record shall contain the date, crew names, type and location of work, and work accomplished. Upon request, furnish a copy of diary entries to the Engineer. Furnish a final copy of the diary when the Project is complete.

Contractor's survey personnel shall make all field notes and calculations in a manner consistent with current Agency practices and on forms provided or approved by the Engineer. Computations, survey notes and other records necessary to accomplish the work shall be neat, legible and complete. Furnish copies of computations, notes and other records when requested by the Engineer.

When a Project affects any permanent change to vertical clearances within the traveled way, complete and submit a Standard Vertical Clearance form (Form No. 734-2614) within 30 days of the change to the vertical clearance.

When a Project temporarily restricts any vertical clearances, complete and submit a Standard Vertical Clearance form (Form No. 734-2614) 28 days before the restriction takes effect.

Upon completion of construction staking and prior to final acceptance of the Contract, furnish to the Engineer, computations, survey notes, Project records and other data used to accomplish the work. Include an itemized list of the data.

All data and original documentation associated with this Project will become the property of the Agency.

**00305.08 Communication With the Surveyor** - The Engineer has the right to communicate directly with the surveyor.

**00305.09 Electronic Data** - The Engineer will not be responsible for any data translations. Compressed data provided by the Engineer or the Contractor will be in a "self-expanding executable" format. The method of exchange of electronic data will be mutually agreed upon at the pre-survey conference.

**(a) Data Formats Provided by the Engineer:**

- **CAD (graphics) Files** - Microstation Design File (.DGN) format.
- **Horizontal Control Coordinates** - ASCII Coordinate File format.
- **Elevations** - ASCII Elevation File format.
- **Horizontal Alignments** - Intergraph Inroads ASCII Horizontal Alignment format.
- **Vertical Alignments** - Intergraph Inroads ASCII Vertical Alignment format.
- **DTM Data** - Intergraph DTM or Microstation Design File (.DGN) format.
- **Cross Section Data** - Cross Section or Station, Offset and Elevation (SOE) File Format.

**(b) Data Formats Provided by the Contractor:**

- **DTM Data** - Intergraph DTM or Microstation Design File (.DGN) format.
- **CAD (graphics) Files** - Microstation Design File (.DGN) format.
- **"As Staked" Coordinate Data** - ASCII Coordinate File format.
- **Confidence Points** - ASCII Coordinate File format.
- **Vertical Control Point Elevations** - ASCII Elevation File format.
- **Coordinates of Miscellaneous Survey Points Set** - ASCII Coordinate File format.

**(c) Data Format Details** - Data exchanged between the Agency and the Contractor will be in the following formats as referred to in this subsection:

**(1) ASCII Coordinate File Format:**

Point ID	Northing	Easting	Elevation	Feature	Description
----------	----------	---------	-----------	---------	-------------

- Point IDs are alphanumeric up to 8 characters long.
- Coordinates/Elevations are decimal numbers in the units required by the Project.
- Feature names are up to 8 character alphanumeric codes.
- Descriptions may be up to 27 characters and may contain any combination of printable ASCII characters.
- Columns may be separated by spaces or commas.
- Name all ASCII coordinate files with an extension of .CRD.

Example: 105 216473.675 576231.905 102.562 SET\_NTW 1/2 inch iron rod

**(2) ASCII Elevation File Format:**

Point ID	Elevation	Description
----------	-----------	-------------

- Point IDs are alphanumeric up to 8 characters long.
- Elevations are decimal numbers in the units required by the Project.
- Descriptions may be up to 27 characters and may contain any combination of printable ASCII characters.

- Columns may be separated by spaces or commas.
- Name all ASCII elevation files with an extension of .ELV.

Example: 425 542.768 TBM12, n.w. bolt on lum.

**(3) Cross Section or Station, Offset and Elevation (SOE) File Format:**

Station    Offset    Elevation    Pen Up (Pen Down)

- The station values should be in ascending order.
- For each station, the offsets should be in ascending order from left to right.
- The pen up (pen down) column distinguishes one cross section from the next.
- The first point in each cross section should have a value of 1 in the pen column.
- The final point in each cross section should have a value of 2 in the pen column.
- All intermediate cross section points should have a value of 0 in the pen column.
- Name all cross section data files with an extension of .SOE.

Example (This example shows metric units. Provide data in English units.):

Station	Offset	Elevation	Pen Up (Pen Down)
20+020	- 26.500	260.617	1
20+020	- 10.606	268.664	0
20+020	- 2.500	269.012	0
20+020	0.000	269.045	0
20+020	3.500	269.007	0
20+020	12.650	263.004	0
20+020	25.250	261.005	2

**(4) Intergraph Inroads ASCII Horizontal Alignment Format:**

Records beginning with an "\*" are ignored.  
 The record beginning with "{" defines the format.  
 Name all ASCII Horizontal Alignment files with an extension of .HAL.

Example (This example shows metric units. Provide data in English units.):

```
* INTERGRAPH HORIZONTAL ALIGNMENT TO ASCII
*
* Alignment name: FRS_CON
* Alignment description: 409 "FRS" construction centerline
* Alignment preference: ALI1
*
```

{	TYPE	STATION	RADIUS	X_CRD	Y_CRD	DIRECTION	SPI_LENGTH
LIN	0+000.000	0.0000	2299517.9122	160263.0134	320^03'23.5393"	0.0000	
SPI	0+025.455	0.0000	2299501.5693	160282.5292	320^03'23.5393"	25.0000	
CIR	0+050.455	-40.0000	2299483.6919	160299.8495	302^09'05.7873"	0.0000	
SPI	0+090.052	0.0000	2299445.7747	160302.3626	245^25'56.3948"	25.0000	
LIN	0+115.052	0.0000	2299425.7678	160287.5532	227^31'38.6429"	0.0000	
CIR	0+139.727	60.0000	2299407.5675	160270.8918	227^31'38.6429"	0.0000	
LIN	0+206.006	0.0000	2299345.7282	160259.0654	290^49'08.8378"	0.0000	
SPI	0+217.793	0.0000	2299334.7113	160263.2545	290^49'08.8378"	20.0000	
CIR	0+237.793	-45.0000	2299315.5846	160268.9480	278^05'12.2142"	0.0000	
SPI	0+265.317	0.0000	2299288.8537	160264.5055	243^02'29.0797"	20.0000	
LIN	0+285.317	0.0000	2299272.5967	160252.9315	230^18'32.4561"	0.0000	
LIN	0+319.254	0.0000	2299246.4821	160231.2576	230^18'32.4561"	0.0000	

**(5) Intergraph Inroads ASCII Vertical Alignment Format:**

Records beginning with an "\*" are ignored.  
 The record beginning with "{" defines the format.  
 Name all ASCII Vertical Alignment files with an extension of .VAL.

Example (This example shows metric units. Provide data in English units.):

```
* INTERGRAPH VERTICAL ALIGNMENT TO ASCII
*
* Alignment name: b1v1
* Alignment description: Bikepath Finish Grade
* Alignment preference: default
*
```

{	TYPE	STATION	ELEVATION	SLOPE	VC_LENGTH
LIN	10+006.142	32.6790	-0.002331	0.0000	
PAR	10+021.391	32.6435	-0.002331	15.0000	
LIN	10+036.391	32.4096	-0.028856	0.0000	
PAR	10+058.666	31.7668	-0.028856	20.0000	
LIN	10+078.666	31.4983	0.002002	0.0000	
PAR	10+123.970	31.5890	0.002002	44.3355	
LIN	10+168.305	32.7639	0.051001	0.0000	
PAR	10+183.208	33.5239	0.051001	25.0000	
LIN	10+208.208	34.1467	-0.001179	0.0000	
LIN	10+235.186	34.1149	0.000000	0.0000	

**(6) Microstation Design File Format:**

Bentley Systems, Inc. / Intergraph Corporation proprietary format.

**Materials**

**00305.10 Materials** - Furnish all materials including supplies, clothing, and incidentals required to accomplish the work. Use materials of good quality and suitable for the purpose intended. Stakes, hubs, and guinnies are to be of sufficient length to provide a solid set in

the ground. Mark the stakes in such a way as to remain legible for the intended duration. Provide and use safety equipment required by State and federal regulations.

### **Equipment**

**00305.20 Survey Equipment** - Furnish survey equipment required to accomplish the work that meets the following requirements:

- Components designed to work together.
- Suitable for the purpose intended.
- Capable of achieving specified tolerances.
- In good operating condition.
- Maintained to meet manufacturers specifications.
- Kept in proper adjustment throughout the duration of the Project.

Submit documentation on survey equipment that is new to the industry, to the Engineer for review 21 days prior to its use. The Engineer will evaluate the equipment and intended application and provide approval or rejection within 21 days. Equipment may be used immediately upon approval by the Engineer.

### **Labor**

**00305.30 Personnel** - Provide technically qualified personnel capable of performing required tasks in a timely and accurate manner. Perform work under the direction and review of the Surveyor.

The Surveyor is responsible for:

- Maintaining registration as a Professional Land Surveyor in the State of Oregon.
- Performing or validating requirements for procedures and testing of equipment.
- Maintaining familiarity with the site conditions and progress of the Project.
- Becoming familiar with the plans and specifications.
- Determining notes and documentation required for types of survey work.
- Determining the accuracy required for each survey stake.
- Using appropriate equipment and methods.
- Keeping close communication with the Project inspector(s), Project Manager, and Agency survey crews working on the Project.
- Being familiar with the varying construction survey requirements of each aspect of the Project, including the various bridge construction techniques when applicable.
- Notifying the Project inspector of conflicts and changes necessary due to utilities, match point variations, design revisions, or other variables.

The survey crew leader is responsible for:

- becoming familiar with the plans and specifications.
- keeping close communication with the Project inspector(s), Project Manager, and Agency survey crews working on the Project.

- Notifying the Project inspector of conflicts and changes necessary due to utilities, match point variations, design revisions, or other variables.

### Construction

**00305.40 Construction Staking Tolerances** - Set stakes or other devices at an adequate frequency and within the following tolerances:

Item	Horizontal	Vertical
Box Culverts	± 0.10 ft.	± 0.05 ft.
Bridge Substructures	± 0.03 ft.	± 0.03 ft.
Bridge Superstructures	± 0.02 ft.	± 0.02 ft.
Clearing and Grubbing Stakes	± 1.00 ft.	n/a
Construction Centerline Control Points	± 0.05 ft.	n/a
Construction Centerline Station Points	± 0.10 ft.	n/a
Curbs, Walks, and Bikepaths	± 0.03 ft.	± 0.02 ft.
Grade Stakes - Roadway Subgrade	± 0.20 ft.	± 0.05 ft.
Grade Stakes - Top of Rock	± 0.20 ft.	± 0.03 ft.
Grade Stakes - Roadway Finish	± 0.10 ft.	± 0.02 ft.
Manholes, Inlets, and Culverts	± 0.10 ft.	± 0.03 ft.
PCC Pavement	± 0.10 ft.	± 0.02 ft.
Slope Stakes and References	± 0.30 ft.	± 0.10 ft.
Traffic Markings	± 0.20 ft.	n/a
Walls - Retaining, MSE, Sound, etc.	± 0.10 ft.	± 0.05 ft.
Wetland Mitigation Control Stakes	± 0.20 ft.	± 0.20 ft.
Luminaire and Signal Poles (incl. ftgs.)	± 0.20 ft.	± 0.03 ft.

Miscellaneous items not listed above will have a horizontal and vertical tolerance of 0.20 foot, unless otherwise directed. Features that are to be constructed flush to another surface should take on the same tolerance as that surface.

Tolerances for special circumstances will be discussed at the pre-survey meeting.

**00305.41 Slope Stakes and References** - Set slope stakes and references on both sides of centerline at 50 foot stations and at terrain breaks and changes in the typical section. Establish slope stakes in the field as the actual point of intersection of the design roadway slope with the existing ground line. Direct staking of the theoretical (computer generated) slope stake catch point requires prior approval of the Engineer.

Set slope stake references farther out from centerline than the actual catch point. Include all reference point and slope stake information on the reference stakes.

If an automated slope staking routine is intended to be used, the system shall be able to perform the proper superelevation, lane transitions, and benching, as well as duplicate other details in the design surface. The system shall record field modifications made to the final catch slopes. Any modifications shall be recorded and provided to the Engineer.

Record the actual as staked (three dimensional) position of the slope and reference stakes. Prepare field notes showing slope stake and reference information, and provide to the Engineer.

**00305.42 Clearing Limits** - Set clearing limit stakes according to Section 00320. Space clearing limit stakes at intervals not greater than 50 feet or as directed.

**00305.43 Grade Stakes** - Set grade stakes or other control for grade elevation and horizontal alignment. Set grade stakes at each grade break line. Set additional points at intervals, as necessary, not to exceed the width of the grading equipment, or as approved by the Engineer. Set these rows at 50 foot stations or as required in special situations, as in road connections and other areas where conditions require tighter spacing of grade stakes to assure grade and alignment.

Measure and record confidence points upon completion of each course and prior to the placement of the next course. Location and spacing of these confidence points shall be such that they provide a reasonable record of the grade as constructed and placed at a nominal rate of one confidence point for every 2,000 square feet of grade.

Provide confidence point data in the form of an ASCII Coordinate File Format to the Engineer for analysis. The Engineer may request additional confidence points if quantity, distribution, or placement does not meet the stated criteria in this subsection and in the confidence point location guidelines in 00305.01. The Engineer may choose to collect additional confidence points using Agency personnel.

The Engineer will evaluate the grade using any combination of industry-standard techniques and the standard Agency confidence point analysis procedure. The confidence point analysis will use the tolerance value defined in 00305.40 for the particular course, and will be deemed unacceptable if less than two-thirds of all confidence points meet the tolerance or if any confidence points exceed the tolerance by a factor of three or more.

The Engineer will evaluate the grade and provide acceptance or rejection before the end of the first business day following receipt of the confidence point data. Do not begin placement of the next course until the Engineer has accepted the grade and approval is given to proceed.

**00305.47 Manholes and Inlets** - Determine the location of manholes, inlets, siphon boxes, slope protectors, and other similar structures. This may require an approved field adjustment to the planned location in order to avoid obstacles or assure placement at the low point. Determine the elevation of the center of the grate.

Set a stake referencing the center of the structure. Set a guard stake with the following information written on it:

- Type of structure
- Centerline station
- Centerline offset
- Reference distance

- Cut or fill to top of structure
- Center of structure elevation

Establish a reference line to control the alignment of the structure. Record data on the Culvert Data Sheet (Form 734-3247) containing staking information for the outlet pipe from the specific drainage structure.

**00305.49 Horizontal Control** - Establish horizontal control stations using Theodolite/EDM network or static GPS techniques. Least squares adjustments shall be applied to either method. The use of traverses will be permitted only if approved by the Engineer.

Preserve all Agency provided and Contractor established horizontal control stations for the life of the Project. If the horizontal control network cannot be preserved in its original position during construction or if the Agency provided control stations are not of adequate quantity or location, establish a secondary horizontal control network using the original control as a basis. This secondary control network may then be used by the Contractor to layout all construction items and may be used by the Agency for right-of-way monumentation and for other purposes.

**(a) General Specifications** - Horizontal control networks shall conform to these general requirements in addition to Theodolite/EDM or GPS specifications to follow.

**(1) Equipment:**

- Use tripods for all occupations with theodolite, target, or GPS antenna.
- Test all components and adjust according to manufacturer specifications.

**(2) Procedures:**

- Include in field notes a detailed point description and vicinity sketch for each control station and survey monument established or used.
- Perform a minimally and fully constrained Least Squares adjustment.
- The line used for the basis of bearing shall be greater than 1,000 feet unless approved by the Engineer.
- Prior to using 2 points for the basis of bearing, perform an analysis to verify that the points are actually those indicated in the record.
- Control station monuments shall conform to the requirements of the Agency "Right-of-Way Monumentation Policy" available from the Engineer.
- If available, include at least three existing control stations in establishing any control network.
- Establish a point identifier for each control point within the range of 1 - 399. Alphanumeric point identifiers up to eight characters may be used. Inscribe the point identifier on the monument.

**(3) Acceptance Standards** - A least squares adjustment shall be accepted base on the following criteria for all specified tolerances.

- Two-thirds of all values shall be within the total tolerance.

- 100% of all values shall be within 3 times the total tolerance.
- Tolerance for confidence regions at the 95% level is 0.05 feet + 50 ppm based on the shortest distance to the nearest unadjusted control station.

**(4) Data Requirements:**

- Field notes containing a detailed point description and vicinity sketch for each control station and survey monument established or used.
- Minimally and fully constrained least squares adjustment reports.

**(b) Theodolite/EDM Networks:**

**(1) Equipment:**

- Use Theodolites with a maximum angular standard of error no greater than  $\pm 6$  seconds.
- Use EDMs with a maximum distance standard error no greater than  $\pm 0.02$  feet  $\pm 5$  ppm.
- All components shall be of compatible accuracy and designed to be used together.

**(2) Field Procedures:**

- Include distance measurements with all observations unless impractical.
- Have at least one redundant observation for every point in the network.
- Triangulation, trilateration, and resection methods are acceptable.

**(3) Acceptance Tolerances:**

- Tolerance for angle residuals is  $\pm 3$  seconds.
- Tolerance for distance residuals is  $\pm 0.02$  feet  $\pm 2$  ppm.

**(4) Data Requirements** - Provide the following to the Engineer for each network or circuit established:

- **Raw Data Files** - These are electronic data files containing original measurements produced by the Theodolite (total station). The file shall contain:
  - Observation data for each measurement, including:
    - point identifier
    - direction, plate reading, or horizontal angle
    - vertical or zenith angle
    - slope distance
  - Supplemental measurement data, including:
    - distance units recorded

- angular units recorded
- curvature and refraction correction applied
- atmospheric correction applied
- prism correction applied
  
- Codes or instructions to the processing software on how to process the data.
- Atmospheric conditions at the time of the survey.
- Angular and distance units recorded, and whether the distance has been corrected for curvature and refraction and/or atmospheric conditions.
  
- **Set Reduction Report** - This report summarizes the reduction of the angle sets and mean distances.
  
- **Least Squares Adjustment Reports** - These reports contain details of the least squares adjustment, including a list of all angular and distance residuals, confidence region values at a 95% confidence level, and final adjusted coordinates.

**(c) GPS Networks:**

**(1) Equipment:**

- GPS receivers shall be dual frequency geodetic receivers with a manufacturer-specified accuracy of  $\pm 0.02$  feet  $\pm 1$  ppm or better.
- All components shall be of compatible accuracy and designed to be used together.

**(2) Field Procedures:**

- Ensure that satellite geometry during the field observation phase is sufficient to produce accurate results. The geometric dilution of precision (GDOP) shall not be greater than 8.
- The number of healthy satellites being observed at any time shall be four or more.
- The elevation mask shall be not less than 15 degrees.
- Horizontal survey measurements, once completed, shall form a closed figure, and shall be connected to at least two existing horizontal control stations.
- Network shall be comprised entirely of independent baselines.
- Adjacent stations shall have direct connections.
- Every station shall be connected to two or more stations.
- Receiver documentation shall be followed for observation times and epoch intervals.
- Each control station shall be occupied no less than twice, of which two occupations shall be separated from each other by time. Separation shall be measured start-time to start-time. Separation shall be 90 minutes or more from initial occupation and 90 minutes or more from any 12 hour multiple thereafter for 30 days. Additional occupations beyond two are not subject to time restrictions.

- Back-to-back occupations of 90 minutes or more shall be separated by off leveling and re-setting the tripod and rotation of the tribrach or leveling equipment by 120 degrees or more.
- Stations closer together than 1,500 feet shall be connected with terrestrial observations.
- Inter-visible stations closer together than 3,000 feet shall be connected with terrestrial observations.

**(3) Acceptance Tolerances:**

- Tolerance for linear residuals in latitude, longitude, and elevation is  $\pm 0.05$  feet.

**(4) Data Requirements** - Provide the following to the Engineer for each network established:

- **Receiver Independent Exchange (RINEX) Data Files** - These are industry-standard non-proprietary electronic data files containing original data collected by the receiver. The provided files shall contain all data supported by both the RINEX file format and the equipment and software employed in the survey. Files provided shall include as a minimum:
  - GPS observation data file
  - GPS navigation message file
- **Observation Log Sheet** - This log includes, for each observation, start and stop times, and antenna height including measurement procedure.
- **Least Squares Adjustment Reports** - These reports contain details of the least squares adjustment, including a list of all latitude, longitude, and height residuals, confidence region values at a 95% confidence level, and final adjusted coordinates.

**(d) Traverses:**

**(1) Equipment:**

- Identical to requirements for Theodolite/EDM networks.

**(2) Field Procedures:**

- Include distance measurements with all observations unless impractical.
- Close both traverse for angle and distance.

**(3) Acceptance Standards:**

Closure shall be a minimum of 1:20,000 after angular adjustment and prior to coordinate adjustment.

**(4) Data Requirements** - Provide the following to the Engineer for each traverse established:

- **Adjustment Report** - This report contains details of the traverse adjustment, including adjusted coordinates.
- **Other Reports** - All data required for Theodolite/EDM networks except least squares adjustment report.

**00305.50 Vertical Control** - Establish vertical control stations using differential leveling and third order or better equipment and techniques. The development of vertical control by techniques other than differential leveling must be approved by the Engineer. A least squares adjustment shall be applied to each network of acceptable level circuits.

The Agency provided and Contractor established vertical control stations shall be preserved for the life of the Project. If the vertical control network cannot be preserved in its original position during construction or if the Agency provided control stations are not of adequate quantity or location, establish a secondary vertical control network using the original control as a basis. This secondary control network would then be used to layout all construction items and may be used by the Agency for other purposes.

**(a) Field Procedures:**

- Use a compensated (or "automatic") optical level or compensated digital level.
- Use precise non-adjustable rod(s) unless otherwise directed. Do not use "Lenker" or self-computing rods.
- Use a rod level with each rod.
- Include a minimum of two published bench marks in each circuit unless otherwise directed.
- If the circuit between benches does not close within the tolerance stated below, close circuit back to the starting point.
- If the use of one benchmark is approved, close circuit back to the starting point.
- Select turning points that are firm, solid objects with a defined high point. Set a nail, spike, or stake if no existing items are acceptable. Turning plates with a weight of not less than 4.5 pounds may be used.
- Balance backsight and foresight distances to within 30 feet on each setup and to within 30 feet on the entire circuit.
- Make a record of the rod reading(s) and the observation distance on each sighting
- Set TBMs near significant construction items (bridges, intersections, and other locations where elevations will be needed) and not more than 1,000 feet apart throughout the Project.
- Select TBM monuments that are firm, solid objects with a defined high point, not likely to be moved by human or natural influences, readily identifiable, and out of the path of construction. Do not use fire hydrants, guardrails, highway signs, or nails or spikes in utility poles or fence posts.
- Include detailed point descriptions and vicinity sketch in field notes.
- Take field notes when recording measurements electronically. Include data and information not electronically measured and recorded.

- Apply a vertical least squares adjustment to allowable errors. The use of proportional distribution of error may be used if approved by the Engineer.

**(b) Acceptance Standards** - Each leveling circuit shall be accepted based on the "point-to-point" or "closed-loop" limits described below. A single least squares adjustment shall be applied to the observations in the leveling circuits meeting the acceptance standards

- Accept point to point circuit based on the following. Error of closure shall be no greater than:

$$\text{Allowable Error} = 0.05 \text{ ft. } \sqrt{D}$$

D = Shortest level line distance in miles

- If a closed loop, the error of closure shall be no greater than:

$$\text{Allowable Error} = 0.035 \text{ ft. } \sqrt{E}$$

E = Perimeter of level loop in miles

**(c) Data Requirements** - Provide the following to the Engineer for each network or circuit established:

- **Raw Data** - These are hand written field notes or hand written field notes accompanied by electronic data files containing original measurements produced by the level. The file shall contain:
  - Data for each measurement, including a:
    - point identifier (within a range of 400 - 499 and also inscribed on the monument)
    - rod reading
    - observation distance
  - Supplemental measurement data, including:
    - distance units recorded
    - curvature and refraction correction applied
- **Level Computation Report** - This report contains the computation of unadjusted elevations, observation distance imbalances, computer allowable error, and closure error.
- **Level Adjustment Report** - This report contains the adjustment details, including residual values, adjusted elevations and standard errors.

- **ASCII Elevation Data File**

**00305.52 Pavements** - Set stakes or other control devices to control the location and elevation of asphalt and PCC pavement as shown. Provide surveying or survey-related activity necessary to control grade, thickness, and smoothness as required.

**00305.53 Signs, Signals, Illumination and Fabricated Items** - Determine the exact location and their relative location to roadway and bridge features as appropriate such as edge of pavement, curbs, islands, sidewalks, sidewalk ramps, lane lines, bridge columns, bridge decks, and other existing features for the following items:

- Posts and poles including foundations.
- Cabinets.
- Junction boxes.
- Detectors.
- Other similar sign, signal, and illumination appurtenances.

Provide the following documentation to the Engineer before submitting working drawings:

- Field verified length of poles, posts, mast arms, and tenon locations.
- Field verified orientation of triangular bases for poles.
- Field verified measurements of all existing features including orientation and relationship to all other new appurtenances and new fabricated items.
- Plan, elevation, and side views.
- Identification of all obstacles.

Field adjustment to the planned location may be required in order to avoid obstacles and to ensure its placement in a functional location. Do not submit working drawings until the Engineer returns the field verified documents. The Engineer will return field verified documents within 21 calendar days after receipt of the documents.

Set a stake referencing the center of the item. Set a guard stake with the following information written on it:

- Description of item (by plan number if applicable).
- Centerline station.
- Centerline offset distance.
- Cut or fill from reference point (and what point the cut or fill is to).
- Intended elevation.

If the orientation of the item is significant and is not clear, establish a reference line for the skew of the item.

Have bridge layout and roadway layout features staked, including referencing, no more than seven calendar days before submitting field verification documents.

**Temporary**

**00305.60 Temporary Protection and Direction of Traffic** - Provide all work zone signing conforming to "ODOT Signing and Flagging Standards for Short Term Work Zones 1998" and "Short Term Traffic Control Handbook for ODOT Survey Crews 1998".

Signs for use by the survey crew may be constructed of plywood, sheet aluminum or fabric. Signs, flaggers and flagger equipment shall conform to the requirements of Section 00225.

#### **Maintenance and Monumentation**

##### **00305.70 Preservation of Survey Markers:**

**(a) Project Control Points Established by the Engineer** - Maintain, relocate or replace existing survey monuments, control points, and stakes, as determined by the Engineer. Perform the work to produce the same level of accuracy as the original monument(s) in a timely manner, and at no additional cost to the Agency.

**(b) Monuments of Record** - Preserve survey monuments according to 00170.82(c), and ORS 209.140 and ORS 209.150. If such monuments are to be disturbed or destroyed, comply with requirements of these ORS at no additional cost to the Agency.

**00305.71 Project Monumentation** - The Contractor will not be responsible for performing right-of-way monumentation.

#### **Measurement**

**00305.80 Measurement** - No measurement of quantities will be made for construction survey work.

#### **Payment**

**00305.90 Payment** - The accepted quantities of performing construction survey work will be paid for at the Contract lump sum amount for the item "Construction Survey Work".

Payment will be payment in full for furnishing all material, equipment, labor, and incidentals necessary to complete the work as specified.

No separate or additional payment will be made for all temporary protection and direction of traffic measures including flaggers and signing necessary for the performance of the construction survey work.

No separate or additional payment will be made for preparing surveying documents including but not limited to office time, preparing and checking survey notes, and all other related preparation work.

The amount to be allowed for "Construction Survey Work" in the progress payments will not be in excess of the reasonable value of the surveying work performed under this specification as said reasonable value is estimated by the Engineer.

McMinnville City Streets: Pavement Resurfacing and ADA Ramps  
Various City Streets  
Yamhill County  
Paving & Sidewalk Ramps Project  
(Bids to be opened and read June 18, 2009)

Addenda No. 1

Costs incurred as a result of survey errors will be borne by the Contractor. Such costs include price adjustments for failure to meet requirements of the construction specifications, repair or removal and replacement of deficient product, and over-run of material.