

[Title 10—DEPARTMENT OF]
[NATURAL RESOURCES]
[Division 30—Land Survey]
[Chapter 4—First and Second Order Horizontal and Vertical Control]

Title 2—DEPARTMENT OF AGRICULTURE
Division 90—Weights and Measures
Chapter 62— First and Second Order Horizontal and Vertical Control

PROPOSED AMENDMENT

[10 CSR 30-4.060] **2 CSR 90-62.060 Traverse Survey Guidelines**

PURPOSE: This rule prescribes the minimum procedures for first or second order traverse surveys.

(1) First Order Traverse Procedure.

(A) The location of first order traverse lines and monumented stations shall be determined by a thorough field reconnaissance. The traverse point spacing shall not be less than six hundred meters (600m).

(B) All first order traverse lines shall start from, and close upon, first order stations **or higher order stations** of the Missouri Geographic Reference System (MO GRS) or National *[Geographic]* **Spatial** Reference System *[(GRS)]* **(NSRS)** in accordance with these procedures.

(C) Properly maintained theodolites with a least count of one second (1") or a *[din rating]* **DIN 18723 specification** of one and one-half seconds (1.5") or *[better]* **smaller** shall be used to observe directions and azimuths. At least four (4) positions or repetitions of the angles shall be observed. The theodolite and targets should be centered to within two millimeters (2 mm) over the survey station or traverse point.

(D) Electronic distance measuring (**EDM**) instruments shall be used to measure all distances. *[Electronic Distance Meter (EDM)]* **EDM** instruments shall be tested on an *[DNR]* **MDA** base line at the start **of** and on the completion of any first *[or second]* order traverse. Copies of the **EDM base line** *[calibrations]* **comparisons** shall be *[provided to the department]* **included** in the survey report **submitted to the Department**. Barometric pressure to **the nearest** five millimeters (5 mm) **of mercury** and temperature to **the nearest** one degree Celsius (1°C) shall be recorded for each measurement.

(E) Each traverse shall be tied to a minimum of two (2) bench marks. **Trigonometric** or spirit leveling will be observed along all traverse lines. All HI's, HO's and zenith angles shall be recorded and submitted.

(F) The traverse shall be controlled by an astronomic azimuth at each end of the traverse line and at not more than every six (6) segments along the line. Astronomic azimuths shall have a standard deviation of one and one-half seconds (1.5") or *[better]* less.

(G) All field data shall be submitted to **Missouri** Department of *[Natural Resources (DNR)]* **Agriculture (MDA)** in a format acceptable to the *[d]*Department. This shall include directions, distances, azimuth and elevations.

(2) Second Order Traverse Procedure.

(A) The location of second order traverse lines and monumented stations shall be determined by a thorough field reconnaissance. The traverse point spacing shall not be less than three hundred meters (300m).

(B) All second order traverse lines shall start from and close upon, second order or higher **order** stations of the MO GRS or [NGRS] **NSRS** in accordance with these procedures [or shall be run in closed circuits].

(C) Properly maintained theodolites with a least count of one second (1") or [din] **DIN 18723 specification** of one and one-half seconds (1.5") or [better] **smaller** shall be used to observe directions and azimuths. At least four (4) positions or repetitions of the angles shall be observed. The theodolite and targets should be centered to within two millimeters (2 mm) over the survey station or traverse point.

(D) Electronic distance measuring (**EDM**) instruments shall be used to measure all distances. EDM instruments shall be tested on an [DNR] **MDA** base line at the start of and on the completion of any [first] **second** order traverse. Copies of the EDM **base line [calibrations] comparisons** shall be [provided to the department] **included** in the survey report **submitted to the Department**. Barometric pressure to **the nearest** five millimeters (5 mm) of **mercury** and temperature to **the nearest** one degree Celsius (1°C) shall be recorded for each measurement.

(E) Each traverse shall be tied to a minimum of (two) 2 bench marks. **Trigonometric** or spirit leveling will be observed along all traverse lines. All [HI's, HO's] **Instrument Heights (HI), Reflector Heights (HO)**, and zenith angles shall be recorded and submitted.

(F) The traverse shall be controlled by an astronomic azimuth at each end of the traverse line and at not more than every eight (8) segments along the line. Astronomic azimuth shall have a standard deviation of two seconds (2") or [better] **less**.

(G) All field data shall be submitted to the DNR in a format acceptable to the [d]Department. This shall include directions, distances, azimuth and elevations.

AUTHORITY: sections 60.451.3. and 60.461, RSMo 1986. Original rule filed May 3, 1994, effective Dec. 30, 1994.*

**Original authority: 60.451.3, RSMo 1984 and 60.461, RSMo 1984.*

[10 CSR 30-4.070 Waiver of 1 Km Limitation]

[PURPOSE: This rule defines conditions for which the 1 km limitation may be waived.]

[Coordinate values of land boundary corners presented for recording must be based upon measurements from a first or second order control station of the Missouri Geographic Reference System or the National Geographic Reference System. The one kilometer (1 km) limitation in distance from the control station may be waived if the accuracy of the coordinate values are within the accuracy values required in 10 CSR 30-2.040.]

[AUTHORITY: sections 60.451.3. and 60.461, RSMo 1986. Original rule filed May 3, 1994, effective Dec. 30, 1994.]*

*[*Original authority: 60.451.3, RSMo 1984 and 60.461, RSMo 1984.]*

PUBLIC COST: This proposed amendment will not cost state agencies or political subdivisions more than five hundred dollars (\$500) in the aggregate.

PRIVATE COST: This proposed amendment will not cost private entities more than five hundred dollars (\$500) in the aggregate

NOTICE TO SUBMIT COMMENTS: Anyone may file a statement in support of or in opposition to this proposed amendment with Missouri Department of Agriculture, Weights, Measures and Consumer Protection Division, Mr. Ronald G. Hayes, Division Director, PO Box 630, Jefferson City, MO 65102. Hand carried copies may be delivered to the Missouri Department of Agriculture, Weights, Measures and Consumer Protection Division, Mr. Ronald G. Hayes, Division Director, 1616 Missouri Blvd., Jefferson City, MO 65109. To be considered, comments must be received within thirty (30) days after publication of this notice in the Missouri Register. No public hearing is scheduled.