

SECTION 5.14

FIELD MEASURING TAPE CALIBRATION

1.0 Purpose

To describe the procedure for maintaining a standardized measuring tape and calibrating field survey tapes.

2.0 Responsibilities

- The Laboratory Manager is responsible for assuring that this procedure is implemented, and for maintaining custody of the standard reference tape.
- Survey team personnel are responsible for following this procedure.

3.0 Procedure

3.1 Equipment

- ✓ INVAR standard measuring tape.
- ✓ Field survey tape.
- ✓ Tape calibration form.
- ✓ Survey stake, chaining pin, or other appropriate anchor point.

3.2 General

- 3.2.1 Tapes used for field survey measurements are to be calibrated upon receipt from the manufacturer and if damage or discrepancies are identified or suspected.
- 3.2.2 Tapes are calibrated by comparing them with the INVAR Standard Tape. This tape remains in the custody of the Program's Laboratory Manager and is used only for calibration purposes.
- 3.2.3 Each field measuring tape is assigned a unique identification number.
- 3.2.4 Tapes should be in agreement with the INVAR Standard to within 1.0% (e.g., 1.0 m per 100 m), at each calibration point. If not, the tape is to be removed from service until the differences can be resolved.

3.2.5 Originals of calibration records are maintained for each field measuring tape. A copy may be taken to the field, if necessary.

3.2.6 Tapes should be visually inspected for damage prior to initial use and before and after each use.

3.3 Calibration

3.3.1 Obtain the INVAR Standard Tape from the Laboratory Manager.

3.3.2 Determine the section of the field measuring tape to be calibrated. Although the entire tape will usually be calibrated, the procedure may also be used to calibrate sections of tape.

3.3.3 Attach the two tapes to a common anchor point, such that the starting point on the field measuring tape is aligned with the zero point on the INVAR Standard Tape.

3.3.4 Using moderate pressure (that which would be used during typical field measurements) stretch the field measuring tape and hold it adjacent to the INVAR Standard Tape.

3.3.5 Using the Tape Calibration Form (Figure B-7 or equivalent), record the distance intervals for the field measuring tape and INVAR Standard Tape at the starting or zero point and at 1%, 5%, 10%, 25%, 50%, 75%, and 100% of the full tape length being calibrated. For example, if a 30 m length is being calibrated, measurements should be noted at 0, 0.3 m, 1.5 m, 3 m, 15 m, 22.5 m, and 30 m.

3.3.6 Compare the field survey tape and the INVAR Standard Tape to assure that all points satisfy the $\pm 1.0\%$ criteria.

3.3.7 If the tape satisfies the criterion, file the form and return the tape to the equipment and supply inventory. If not, mark the tape as unacceptable and initiate actions to determine the reason for discrepancies.

3.3.8 Clean the INVAR Standard Tape (if appropriate) and return it to the Laboratory Manager.