

1300.07 ENGINEERING EQUIPMENT, SUPPLIES AND SERVICES

A. General

Engineering equipment and supplies are a significant annual expenditure of the Department of Roads. It is Department policy to maintain equipment in reliable condition, supplies in adequate amounts, and that expenditures be controlled. All employees are expected to support this policy.

B. Responsibility

1. The employee is charged with full responsibility for the care of all equipment issued to him/her. The employee should instruct assistants in the proper care and handling of all equipment, particularly the more delicate equipment such as transits, levels, balances, etc. When accepting responsibility for an instrument, whether new or old, the person should inspect it carefully and make sure that it is in good conditions and complete when received. When returning an instrument, all missing or damaged parts should be reported.
2. The employee is held directly responsible for the loss or damage of equipment in his/her charge caused by negligence or carelessness and may be required to pay for repair or replacement of this equipment. Equipment when not in use should be stored in a place where it is secure from damage or loss. When equipment is left in an unattended automobile, the vehicle should be locked to prevent theft or damage.

C. Engineering, Surveying And Testing Equipment

A supply of this equipment is maintained at Logistics. Equipment will be issued directly to the employee as ordered and approved by the District Engineer or Division Head. Equipment which is no longer needed should be returned to Logistics.

D. Requisition And Transfer

1. The following example cases are given to explain the procedures to be followed. If your question is not answered, contact the Logistics Division.

Case I - Requests for Engineering, Surveying and Testing Equipment listed in the Department's Statewide Inventory System (SWIS) and included in the Supply Catalog in Class 59, are non-stocked items and must be budgeted by districts and purchased by the Logistics Division, Engineering Equipment Section.

Case II - Requests for Engineering, Surveying and Testing Equipment not listed on the Department's SWIS and included in the Supply Catalog in classes other than Class 59 will be ordered on a DR Form 146, Stock Requisition. Equipment not included in the Supply Catalog will be purchased on a DR Form 151, Purchase Order. It will be coded in the District/Division ONE and Activity 5099.

Case III – Material Sampling and Other Miscellaneous Supplies, sacks, cans, molds, lath, stakes, nails, field books, cloth, etc. included in the Supply Catalog will require a DR Form 146, Stock Requisition. Items not included in the Supply Catalog will require a DR Form 151, Purchase Order. These are “direct purchase” items and are to be charged to specific projects. “O” for participating, “I” for nonparticipating, the OE code for your District/Division and the appropriate activity (Constructing, Design, etc.).

Case IV – Office Supplies, Safety Gear and Medical Supplies included in the Supply Catalog will require a DR Form 146, Stock Requisition. Items not included in the Supply Catalog will require a DR Form 151, Purchase Order. These items are not “direct purchase” items and are to be charged to OE code for your District/Division and Activity 5099. Safety equipment is coded to AFE Y500.

Case V- Transfers of Engineering, Surveying and Testing Equipment listed on the Department’s SWIS between Divisions, Districts or returned to Logistics will be documented on DR Form 332, Furniture and Equipment Issue/Transfer. A DR Form 332 must accompany the equipment transferred. Logistics Division will always receive the original. The transferee, transferor and the Districts or Divisions will all receive copies. The transferee is responsible for submitting this form.

Case VI – Transfer of Engineering, Surveying and Testing Equipment not listed on the Department’s SWIS and in classes other than 59 to Logistics will require a DR Form 147 for cataloged equipment and a DR Form 147a for non-cataloged equipment. A copy of the form will accompany the equipment. OE code for your District/Division and Activity 5099 will be used.

2. All forms except the copies required to accompany the equipment will be routed through the District/Division Office and then to the Logistics Division.

E. Precautions And Maintenance Of Survey Equipment

1. Total Stations (Precautions)
 - a. Never place the Total Stations directly on the ground. Avoid damaging the tripod head and centering screw with sand or dust.
 - b. Do not aim the telescope at the sun. Avoid damaging the LED of the EDM.
 - c. Protect the Total Stations with an umbrella against direct sunlight, precipitation, and humidity.
 - d. Never carry the Total Station on the tripod to another site.
 - e. Handle the Total Stations with care. Avoid heavy shocks or vibration.
 - f. Always switch the power off before removing the standard battery.

- g. Remove the standard battery from the Total Station before putting it in the case.
- h. When the Total Station is placed in the carrying case, follow the layout plan.
- i. Make sure that the Total Stations and the protective lining of the carrying case are dry before closing the case. The case is hermetically sealed and if moisture is trapped inside, damage to the instrument could occur.
- j. Someone should always be near the instruments when it is set up in the roadway or in any other location where it may be disturbed.

F. Total Stations (Maintenance)

- 1. Wipe off moisture completely if the instrument gets wet during survey work.
- 2. Always clean the instrument before returning it to the case. The lens requires special care. Dust it off with the lens brush first, to remove minute particles. Then after providing a little condensation by breathing on this, wipe it with a soft clean cloth or lens tissue.
- 3. Do not wipe the displays and keyboard or carrying case with an organic solvent.
- 4. Store Total Stations in a dry room where the temperature remains fairly constant.
- 5. If the battery is discharged excessively, its life may be shortened. If it is stored, it should have somewhat of a charge in it.
- 6. Check the tripod for loose fit and loose screws.
- 7. When removing the Total Stations from the carrying case, never pull it out by force. The empty carrying case should be closed to protect it from moisture.
- 8. Check the Total Stations for proper adjustment periodically to maintain the instrument accuracy.

G. Electronic Digital Theodolite/Transit (Precautions)

- 1. When the theodolite/transit is not used for a long time, check it at least once every three months.
- 2. Handle the theodolite/transit with care. Avoid heavy shocks or vibration.
- 3. If any problems are found with the rotatable portion, screws or optical parts (e.g., lens) send it in to the Engineering Equipment Shop.

4. After removing the theodolite/transit from the carrying case, close the case to exclude dust and moisture. Never place the theodolite/transit directly on the ground. (Attached dirt may damage the base plate and centering screw.)
5. Never carry the theodolite/transit on the tripod to another site.
6. Protect the theodolite/transit with an umbrella against strong sunlight and precipitation of any kind.
7. When the operator leaves the theodolite/transit, the vinyl cover should be placed over the instrument.
8. Always switch the power off before removing the internal battery on the theodolite.
9. Make sure the theodolite/transit and the protective lining of the carrying case are dry before closing the case. (The case is hermetically sealed; if moisture is trapped inside, damage to the instrument could occur.)
10. Someone should always be near the instrument when it is set up in the roadway or in any other location where it may be disturbed.

H. Electronic Digital Theodolite/Transit (Maintenance)

1. Wipe off any moisture if the instrument gets wet during operation.
2. Always clean the instrument before returning it to its case. The lens requires special care. Dust it off with the lens brush first, to remove minute particles. Then, after providing a little condensation by breathing on the lens, wipe it with a soft, clean cloth or lens tissue. (Theodolite only) when cleaning the display, keyboard and carrying case, never use any organic solvent (e.g., thinners).
3. Store the instrument in a dry room where the temperature remains fairly constant.
4. Check the tripod for loose fitting and loose screws.

I. Survey Levels (General Precautions)

1. Be sure to carry the instrument to the job site in the plastic case.
2. Handle with care.
3. Do not place the instrument directly on the ground.
4. After taking the instrument and accessories out of the plastic case, be sure to close the case cover to keep out dust and dirt.

5. Use both hands to hold the instrument when carrying it at the job site. Remember that when moving the instrument from one job site to another, it must be removed from the tripod for transporting.
6. If the instrument is left mounted on the tripod for any length of time, cap the objective lens and cover the entire instrument with the vinyl cover.
7. Be careful not to expose the instrument to direct sunlight and precipitation. If it gets wet, wipe it with a dry cloth before putting it back in the plastic case.
8. Store the accessories in the specified places in the case.
9. Use neutral cleanser or water to clean up the plastic case.
10. Someone should always be near the instrument when it is set up in the roadway or in any other location where it may be disturbed.

J. Survey Levels (Maintenance)

1. Moisture affects the surveying instrument. Completely wipe off any moisture if the instrument gets wet during surveying work.
2. After use, clean every part of the instrument before putting it back in the case. Breathe on the lens to moisten them and gently clean then with a lens cloth, a clean cloth (preferable, worn out cotton), or soft tissue paper.
3. The tripod shoes may become loose or the legs may become shaky due to faulty wing nuts when used for a long period. Check them periodically.
4. If foreign matter appears to have entered any movable parts or screws or when condensation or fungi appears on the lens, prisms, etc., in the telescope, put on work order and send in to Engineering Equipment Shop.
5. It is recommended to subject the instrument to annual or semi-annual checking and inspection to maintain the high quality necessary for your surveying work.

K. Adjustment Of Instruments

1. All instruments issued to Project Managers should be in proper adjustment when received from the Lincoln Office. They should, however, be checked for accuracy and necessary adjustments made at regular intervals. Adjustments should be made only by the Project Manager or a qualified member of the party who had been authorized by the Project Manager to perform such work. All adjustments should be carefully made strictly in accordance with methods prescribed in surveying handbooks. Any adjustment which requires dismantling must be made in the Lincoln repair shop.
2. All Total Station adjustments should be made in the Lincoln repair shop.

L. Transporting Equipment

1. Surveying equipment should be loaded into cars or trucks in such a manner as to minimize the possibility of damage. Leveling rods, range poles, etc., are easily damaged by rubbing or scratching against other objects. It is suggested that a holder be installed on the car for each of these articles. Level rods should be kept in a canvas case which may be ordered from Logistics.
2. Transits and levels should be carried in their cases when being transported by car or truck over any appreciable distance. It is good practice to provide a special protected holder within the vehicle for these cases. Instruments may be carried out of case over short distances if carefully held in someone's lap.
3. Equipment shall be placed in or on vehicles in the most "safe" position both for the equipment and for the operator and passengers of the vehicle. Employees are encouraged to conceive safe methods of transporting equipment. Any alterations, etc., to the vehicle must be made only with the approval of the District Mechanic.

M. Damaged Equipment

1. All damaged equipment listed in the Department's Statewide Inventory System missing (lost or stolen) is to be reported on DR Form 159.
2. Damaged equipment, especially surveying instruments, should not be used or motions tested to determine the extent of damage until it has been inspected in the Lincoln repair shop. This precaution is necessary for the reason that all damage to the instrument may not be visible. For example, after an instrument has had a fall, the delicate graduated edges of the plates may be seriously damaged by the slightest movement of the plates.
3. All damaged equipment, together with all worn or broken parts, should be promptly shipped to the Logistics Division for repair. Equipment returned to the Logistics Division for repair, adjustment or exchange must be accompanied by DR Form 124, Shop Work Orders. The action desired must be described on this form. The appropriate OE and Activity Coding shall be shown.

N. Shipping

1. If at any time it becomes necessary to ship an instrument, it should be packed securely in its case and arrangements shall be made through the District Construction Engineer for the transfer of the instrument to Lincoln. Total stations and electronic theodolites should be by truck or car and not be shipped.
2. Other equipment shall be carefully packed in the cases provided for that purpose. If cases are not provided, the equipment should be packed in a box or carton of ample strength for protection during shipment. All equipment should be sent to Lincoln in the same manner as transits and levels.

O. Care of Equipment

1. Cloth tapes, pie-tins and other items of similar nature are considered to be expendable equipment for the reason that they depreciate rather rapidly with normal use. The fact that these items are expendable does not relieve the employees of the responsibility for their proper care and conservation.
2. Rods and range poles shall be carried in protective coverings or in holders which prevent marring and scratching. To avoid breakage, they should never be used for any purpose except that for which they are designed.
3. Chains are easily damaged by kinking and by the action of traffic. When practical, a cloth tape should be used instead of a chain, especially if measurements are being made across the line of traffic. When wet or muddy, chains should be cleaned and dried before rolling. They should be cleaned, oiled and inspected occasionally and all kinks removed by hammering on a flat wood surface. Splices are available for use in repairing broken chains.

P. Salvage Of Equipment

1. Marred, broken or worn rods and range poles, badly kinked or broken chains, cut or torn cloth tapes, etc., shall be returned to the Engineering Equipment Repair Section for painting, repair or salvage. Many other items of equipment, usually considered expendable, may often be reconditioned for further use. District Construction Engineers should make periodic checks with Project Managers having such equipment. All broken or salvage equipment should be assembled at the District Headquarters Office and sent to the Engineering Equipment Repair Section using state transportation. The following items of equipment are considered to have salvage value:

Cylinder molds	Paving station numbers
Level rods	Stoves (gasoline and electric)
Range poles	Tapes, 100 ft, 200 ft, 300 ft [30 m, 60m, 90 m] steel
Sieves	Tapes, 50 ft (15 m) filler
	Tapes, 50 ft (15 m) steel, case

2. Also, any other broken or damaged equipment which the Project Manager believes has salvage value.

Q. Supplies

1. The Department policy is to have central procurement of supplies. The Supply Catalog lists the items usually stocked. The Supply Catalog can be accessed via computer terminal. Items not listed in the Supply Catalog may be ordered on DR Form 151, "Purchase Order". Be sure and list adequate description of the item desired.

2. The Project Manager shall prepare a stock requisition DR Form 146 for such office and field supplies as may be required for a reasonable length of time. Additional stock requisitions may be submitted as field supplies are depleted. The carrying of large quantities of supplies in the field office should be avoided.

R. Stakes

Construction stakes are stored at the Department's supply base in Lincoln. The following types of stakes are available and are listed in the Supply Catalog.

Class	Stock No.	Type	Dimensions	Package d	General Use
58	85700	"A" Oak	1" x 2" x 18"	50	Reference Stake; Blue Top
58	85705	"A" Oak	1" x 2" x 12"	50	Reference Stake; Blue Top
58	85712	"B" Oak	2" x 2" x 9"	50	Pavement Hub; Location Hub
58	85740	"C" Pine	1" x 2" x 16"	50	Reference Stake; Blue Top
58	85730	"D" Pine	½" x 2" x 16"	100	Lath; reference, guard and ROW stakes
58	85720	"E" Oak	2" x 2" x 20"	25	Reference Hub
58	09700	Lath	½" x 2" x 36"	50	Reference Stake; Lath

S. Local Purchase Of Services

Local services shall be processed for payment by the Project Manager by coding attachments and by indicating his/her approval signing and dating the bill. Coding attachments are DR Form 160 for all services except telephone bills and DR Form 57 for telephone bills. Chapter 4 of the accounting and DOR-1 80-9 should be reviewed.

T. Equipment Inventory

Equipment listed in the Department's Statewide Inventory System will be inventoried when requested by Logistics. The internal control and inventory of equipment not listed will be established by the District/Division.

U. Non-NDOR Equipment Calibration Policy

1. Highway Construction Work

This policy is applicable to all non-NDOR equipment used for the inspection of highway construction work under the jurisdiction of the Nebraska Department of Roads.

- a. NDOR will not provide calibration services for consultants, contractors, or other testing firms performing inspection work; however, the calibration must be performed by a commercial laboratory or business.

- b. All equipment shall be calibrated at least annually and at any other time when the results of tests are questionable or unreliable. (With the development of Nebraska's Quality Assurance Program for Construction, a set calibration schedule will be implemented for the various types of inspection equipment. This calibration schedule may be other than annual.)
- c. A "Certificate of Calibration" shall be available for inspection by NDOR personnel at any time. The "Certificate of Calibration" shall provide, at a minimum, the following information:
 - Serial number or identification number of the equipment.
 - Date of calibration.
 - Results of the calibration.
 - Name of the laboratory or company performing the calibration.
- d. NDOR inspection personnel have the right to verify the calibration of any inspection equipment owned by a consultant, contractor, or other testing firm by performing an independent calibration check. The decision to perform an independent calibration check rests solely with NDOR personnel and will not be performed on a request basis.