

SECTION 740**ENGINEER'S FIELD OFFICE AND MATERIALS LABORATORY
(EACH WITH PERTINENT EQUIPMENT)****DESCRIPTION****740.20 General.**

Satisfactory office space, trailers, materials laboratory, or the utilization of a suitable existing building or buildings as directed shall be provided when required, in an approved location on the project or in the immediate vicinity thereof, for the exclusive use of the Engineer and Inspectors of the Department; such facilities to be separate from any building or buildings used by the Contractor.

740.21 Requirements.

The trailers or buildings shall be fully equipped and made ready for use prior to the beginning of other work on the project and may remain for a period of approximately 45 days after all work on the project has been completed and accepted by the Department.

All offices and laboratories shall be maintained in good condition and appearance by the Contractor for the designated period, after which all portable buildings or trailers, fencing, surfacing and utilities shall be removed from the location, the areas cleaned, loamed and seeded if required, and left in a neat and acceptable condition.

If existing buildings are utilized, the above mentioned requirements shall apply, unless otherwise indicated in the Special Provisions.

740.22 Building Types and Construction.

Unless particularly specified the building or facilities may consist of any of the following, subject to approval of the Engineer.

- a. Moved onto or constructed on the site.
- b. A trailer or trailers, each type as stipulated in the Proposal.
- c. An existing building, owned or rented by the Contractor, containing floor space equivalent to the type specified.

Buildings or trailers moved onto or constructed on the project shall conform with the following:

A. General.

The work to be done under this section shall consist of furnishing all labor, equipment and materials to construct, furnish and maintain buildings or trailers for the Engineer's use, in accordance with the Department Standards and these Specifications.

The sanitary facilities are not for general use by the Contractor's employees. Sanitary provisions for these employees shall be provided otherwise by the Contractor in accordance with Subsection 7.02F.

The work on buildings and trailers shall be completed before any other construction work is done at the site. Maintenance shall continue until the work at the site under the Contract is completed and the buildings or trailers shall be kept clean, orderly, and in working condition at all times.

The Contractor shall protect the buildings or trailers against theft throughout the 24 hours of the day and night, and be responsible for any loss of property of the Department and the personal property of the employees of the Department housed therein, due to either fire, theft or other causes.

B. Plumbing.

Each office shall be equipped with complete sanitary and washroom facilities. All connections shall conform with state and local requirements for venting and other sanitary provisions.

A 20 millimeter copper tubing Type L shall be installed for the water service. The water closets shall be provided with sufficient pressure to completely expel the contents in one operation.

Insulation shall be provided on all services where necessary. If directed, the Contractor shall furnish and install an approved electric tape, as directed, together with necessary switches and thermostat for each water pipe to prevent

freezing.

If a sanitary sewer is not available, a septic system adequate for the office meeting the requirements of the Department of Environmental Protection regulations set forth in "The State Environmental Code, Minimum Requirements for the Subsurface Disposal of Sanitary Sewage - Title 5" shall be installed.

The Department will not approve the location of a Field Office until the Contractor has obtained approval for his/her proposed method of sanitary sewage disposal from a) The Department of Environmental Protection if the location is on state property or b) The Department of Environmental Protection and the applicable local Board of Health if the location is on private or municipal property.

The Contractor will be required to furnish personnel, equipment and materials for soil test pits and percolation tests and to furnish plans, prepared by a Registered Professional Engineer skilled in the matter of subsurface sewage disposal, signed and stamped with the Engineer's stamp, for any proposed subsurface sewage disposal system. The plan or plans will meet the requirements of Title 5 of the State Environmental Code or its successor or amendments thereto.

The Contractor will be required to determine, through the appropriate regional office of the Department of Environmental Protection, whether or not a proposed site is within a watershed area for public water supply.

Every effort will be made *not* to locate temporary Sanitary Facilities on any public water supply watershed. Should there be no alternative, the provisions of any regulations of D.E.P. Division of Water Supply and the above shall apply.

In the event that it can be shown that there is no place reasonably proximate to the job with suitable soil and site conditions that will permit subsurface sewage disposal, the Department of Environmental Protection will consider approval of a tight tank system. The Contractor will have his/her engineer submit his/her tight tank proposal and plans to the appropriate Regional Environmental Engineer of the Department of Environmental Protection in compliance with their "Sanitary Sewage Tight Tank Policy" for approval.

C. Wiring and Lighting.

1.2 meter non-glare fluorescent luminaries shall be installed in each office so as to provide a minimum level of illumination at desk height of 1075 lux. Two fixtures shall be placed over the drawing table as directed. The master switch shall be near the door and control the desk light. Separate pull chains shall be provided for the lights over the table. Four double convenience outlets shall be installed where directed.

Electric wiring in each building or trailer shall be complete with meter connections, fuse box and switch.

D. Heating and Air Conditioning.

All buildings or trailers shall be heated and air conditioned with equipment capable of maintaining a temperature of 20 °C, the total cost to be borne by the Contractor.

E. Area Enclosures, Surfacing and Maintenance.

The area occupied by the buildings or trailers shall be enclosed with 1.8 meter chain link fence, including a 3.5 meter clear opening double-swing gate, all with 3 strands of barbed wire on extension arms and conforming to the relevant provisions of Section 644. The area to be enclosed will depend on the manner in which the buildings are arranged and shall be satisfactory to the Engineer.

A portion of the area within the enclosure designated by the Engineer for use as walks and parking shall be graded and paved with 60 millimeter Class I Bituminous Concrete Pavement Type I-1 over a 150 millimeter gravel foundation.

The Contractor shall maintain the enclosed area by cleaning as required, including the removal of snow from the paved portions.

Toilet tissue, paper towels and soap shall be furnished by the Contractor as required. The office shall be cleaned and floors washed and waxed weekly. The space between the ground and trailer floor shall be completely closed in and insulated.

All of this work shall be included for payment under the contract price for furnishing the specified number and types of buildings.

F. Insurance and Replacement.

At the time the buildings are made available to the Department, the Contractor shall furnish evidence to the Engineer that Insurance in form, coverage and substance satisfactory to the Department in the amount of \$5,000 (non-deductible) has been obtained which will protect the Commonwealth's property and/or employee's personal work related or professional equipment against loss of property in any of the buildings or trailers from fire, theft, storm or flood.

The insurance shall be kept in effect during the entire period of occupancy, with evidence of all necessary renewals being promptly forwarded to the Engineer.

In case of fire, theft or breakdown, all equipment involved shall be repaired or replaced by the Contractor within 48 hours.

In the event buildings or trailers, being used as field offices or materials laboratory, are destroyed or rendered untenable for any reason, they shall be replaced within two weeks, or as directed.

Title to the buildings and equipment shall remain in the name of the Contractor.

MATERIALS (EQUIPMENT)

740.40 General.

Buildings or trailers shall have equipment as hereinafter specified, which shall be new or in a condition satisfactory to the Engineer. The repair or replacement of faulty equipment shall be prompt and at the expense of the Contractor. A suitable non-freezing type fire extinguisher shall be furnished for each field office and materials laboratory.

740.41 Engineers Field Office (Type A).

In addition to the general requirements, the Type A office shall provide a minimum of 40 square meters of floor space with two outside doors, six windows and be furnished as follows:

1. A slant top drafting table, 900 millimeters x 1.8 meters minimum size, two plan racks and a closet equipped with a lock.
2. Two office type desks, minimum top dimensions 750 millimeters x 1.5 meters, with two or more drawers on each side.
3. Four desk chairs on casters with adjustable height tilt seat.
4. Four stools (Drafting table type).
5. One fire resistant drawer-type safe, legal size, with combination lock. Combination to be reset at the direction of the Engineer and revealed only to him/her.
6. A utility table 750 millimeters high, minimum top size 50 millimeters x 1.5 meters.
7. Two legal size fire resistant metal filing cabinets, 4 drawer, with locks.
8. An electric sanitary hot and cold water cooler, supplied with cups and drinking water.
9. An electric adding machine, tape type, with tape.
10. A fully automatic electric calculator, with printout and sufficient supply of tapes.
11. Safety helmets and safety vests for all Department Construction personnel assigned to the project. The safety equipment will not carry any marking such as the name of the Contractor and shall remain the property of the Contractor after completion of the project.
12. A trailerized office shall be provided with a one half bath that shall consist of all full size water closet and a porcelain steel lavatory recessed in a plastic top. The drain and vent lines shall be A.B.S. plastic and supply lines shall be Type L copper. A 22 liter (minimum) electric water heater shall be provided.
13. First Aid Kits shall be provided in the amount and with contents as specified in the current requirements of the Massachusetts Department of Labor and Industries regulations.
14. One new or like new Survey Transit, complete with tripod and storage container, for the exclusive use of the Resident Engineer for the duration of the contract. The transit shall be suitable for Construction Surveys, to establish line and grade, equipped with horizontal circle direct-reading to one (1) minute and vernier calibrations graduated to at least twenty (20) seconds, a vertical angle gradation with vernier to thirty (30) seconds, crosshairs for stadia measurements, optical plumbing capability. A compatible level rod with a minimum length of 3.5 meters shall also be supplied for setting elevations for structures, grades and stakes.
15. One 30 meter (minimum) steel tape, one 30 meter (minimum) cloth tape and one plumb bob.
16. One (1) electrostatic or plain paper copier capable of producing 216 millimeter x 279 millimeter or 216 millimeters x 356 millimeter copies. Included shall be the cost of paper and chemicals. The total cost for the paper and chemicals shall not exceed \$500 for the life of the project. Only one copier will be required if there is more than one Field Office in the Contract.
17. The Contractor shall assume the cost of all telephone installations, maintenance and removal, including the cost of the telephones. The Contractor shall assume the cost of all telephones and the answering machine, including installations, maintenance, and removal. Two telephones and one telephone answering machine shall be provided at the Resident Engineer's office. If there are additional Field Offices and/or a Materials Laboratory Building an additional telephone shall be intercommmed to each. The Contractor will pay all monthly telephone charges and be reimbursed by the

Department for monthly use charges only. Payment under this item shall be full compensation for telephone installation, instruments, maintenance and removal. The Contractor will pay all monthly telephone charges and be reimbursed by the Department for monthly use charges only.

18. The following materials testing and sampling equipment shall be supplied if the Contract specifies 100 cubic meters of cement concrete or more and does not require a Materials Laboratory.

- (a) One Air Meter, 0.01 cubic meter Press-Ur-Meter Type (Ref. AASHTO T 152 and ASTM C 231).
- (b) Two (2) Concrete Curing Boxes meeting the requirements of AASHTO T 23, Section 9 (Curamold or equal).
- (c) A Quick Check Air Indicator Kit meeting the requirements of AASHTO T 199.
- (d) Concrete Cylinder Molds with Plastic Covers, 150 millimeters in diameter by 300 millimeters high, single use mold meeting the requirements of AASHTO M 205 shall be supplied (4 cylinders per 40 cubic meters or fraction thereof). The cylinders shall be approved for use by the Research and Materials Section.
- (e) One complete Slump Test Outfit (Ref. AASHTO T 23 and T 119), as follows:
 - A slump cone of seamless spun metal, with handles and foot clamps.
 - A tamping rod, 300 millimeters long, 16 millimeters in diameter, with hemispherical end.
 - A sturdy pan, made of 2.0 millimeter thick metal, with reinforced rims (600 millimeters x 600 millimeters x 75 millimeters).
 - A brass-wire briquette brush.
 - A wooden handled steel trowel, 90 millimeters x 180 millimeters.
- (f) One wheelbarrow, minimum 0.06 cubic meter volume.
- (g) One long-handled shovel.
- (h) If 100 cubic meters of lightweight concrete are specified in the Contract, the following shall be supplied:
 - 1-Roller Meter type air meter (Ref. AASHTO T 196).
 - 1-Unit weight bucket (Ref. AASHTO T 121).
 - One platform beam scale, capacity 100 kilograms, sensitivity 5 grams, with two beams at front of platform, reading to 10 kilograms by single kilogram and to 500 grams by 5 grams, with additional hanger weights to fulfill capacity of 100 kilograms; all parts to be of steel with enclosed weighing mechanism, platform to be 300 millimeters by 360 millimeters. A digital platform scale, with a minimum capacity of 100 kilograms, with similar sensitivity can be substituted. Scale must be calibrated immediately prior to start of Contract.
- (i) Plastic lined sampling bags, capable of holding 30 kilograms of soil or aggregates. Sample bags are to be approved by the Research and Materials Section.

19. The following shall be supplied if the Contract specifies painting of bridges:

- (a) Cans and jars for sampling paint. Cans shall be 1 liter metal friction top paint sample cans with covers. Jars shall be 1 liter plastic or glass, designed to hold acid with acid resistant covers.
- (b) 2-Each Wet Film Thickness gauges (0.025 - 0.330 millimeter range).
- (c) One Dry Film Thickness Gauge (Tooke Mark III or equal) equipped with spare set of cutting tips.
- (d) One Dry Film Thickness (Gauge Nordsen or Inspector Model III) range 0 - 0.635 millimeter.
- (e) One Sling Psychrometer.

20. A computer system meeting the requirements set forth by Data Processing and including installation, maintenance, removal shall be provided at the Resident Engineer's Office.

740.42 Engineer's Field Office (Type B).

Engineer's Field Office (Type B) shall be equipped as described in Subsection 740.41 except that the minimum floor space shall be 32 square meters.

740.43 Engineer's Field Office (Type C).

Engineer's Field Office (Type C) shall have a minimum floor space of 25 square meters and be equipped as described in Subsection 740.41 except that only one plan rack, two desk chairs, no paper copier and no computer are required.

740.44 Engineer's Field Office (Type D).

Engineer's Field Office (Type D) shall have a minimum floor space of 15 square meters and be equipped as described in Subsection 740.41 except that only one door, four windows, one plan rack, no closet, one telephone, one desk chair, two stools, no utility table, no paper copier and no computer are required.

740.45 Materials Laboratory Building.

In addition to the general requirements, Materials Laboratory Building shall provide a minimum of 20 square meters of floor space and be equipped as follows:

1. An office-type desk, minimum top dimensions of 750 millimeters x 1.5 meters with two or more drawers on each side.
2. One desk chair on casters with adjustable height tilt seats.
3. One metal filing cabinet, legal size, four drawer, with locks.
4. A stainless steel sink, at least 500 millimeters x 600 millimeters outside dimensions and 250 millimeters deep, installed in a suitable counter top and supplied with hot and cold running water. Waste shall be disposed through a "Zurn" trap 180 millimeters x 280 millimeters high (or equal) to a septic tank or sewer.
5. One 1.22 meters square galvanized metal plate 2.0 millimeters thick.
6. One cylindrical compaction mold 0.000943 cubic meter, 101.6 millimeters x 116.43 millimeters \pm high, complete with 50.8 millimeter collar extension and base plate; all parts to be plated for corrosion resistance. (Reference: AASHTO T 99; ASTM D 698.)
7. One cylindrical compaction mold 0.002124 cubic meter, 152.4 millimeters x 116.43 millimeters \pm high, complete with 50.8 millimeter collar extension and base plate; all parts to be plated for corrosion resistance. (Reference: AASHTO T 180; ASTM D 1557.)
8. One 2.5 kilogram rammer, 50.8 millimeter diameter, with circular face and guide sleeve for 305 millimeter drop. (Reference: AASHTO T 99; ASTM D 698.)
9. One 4.54 kilogram rammer, 50.8 millimeter diameter, with circular face and guide sleeve for 457 millimeter drop. (Reference: AASHTO T 180; ASTM D 1557.)
10. Two hardened steel straight-edges 300 millimeters x 32 millimeters x 3 millimeters.
11. The Contractor shall provide and maintain for the exclusive use of the Department a Nuclear Density Meter conforming to the following specifications:
Shall meet the requirements of ASTM D 2922, D 2950, D 3017.
Shall have test range of:
Density - 1280 kilograms/cubic meter to 2720 kilograms/cubic meter
Moisture - 0 to 30%
The meter shall have the capability of both direct transmission and/or back scatter capable of measuring the density of soil to a minimum depth of 200 millimeters. When the Contractor delivers to the job site the Nuclear Density Meter, as specified, he/she shall notify immediately in writing the Research and Materials Engineer, Massachusetts Highway Department, 400 "D" Street, South Boston, Massachusetts 02210-1953, so that this gauge can be programmed for periodic wipe tests. Such notification shall include Model Number, Serial Number and Date of Manufacture. Payment for furnishing and maintaining the nuclear density meter and for the stipulated training and licensing of Department Personnel, furnishing the monthly film badge detection service, and all costs related thereto, will be included in the unit price bid.
12. Plastic lined sampling bags capable of holding 30 kilograms of soil or aggregates. Sample bags are to be approved by the Research and Materials Section.
13. One sand cone apparatus, including three 3.79 liter clear plastic jugs with screw caps and 300 millimeter x 300 millimeter base plate with hole opening 150 millimeters in diameter. (Ref. AASHTO T 191.)
14. One galvanized trash can (with cover) 0.70 millimeter thick metal, 150 millimeter diameter, 50 millimeters high, for storage of calibrated sand, filled with ten 22.7 kilogram bags Ottawa Standard sand.
15. Four sampling spoons of heavy gauge plated steel, approximately 300 millimeters long.
16. Four 3.79 liter moisture cans, lacquered inside, with friction type lid and bail.
17. Twelve 0.0005 cubic meter aluminum moisture cans 95 millimeters in diameter, 64 millimeters high with covers.
18. One solution balance, 20 kilogram, capacity to weigh directly to 1 gram, with two weighing beams and taring

beam; tare capacity to be 2 kilogram; weighing beams to read 1000 grams by 100 gram divisions and 100 grams by 1 gram divisions; additional matching weights (one 1 kilogram, two 2 kilogram, one 5 kilogram, and one 10 kilogram) to be provided to fulfill capacity of 20 kilogram platform to be 280 millimeters in diameter. An electronic, direct reading, top loading, 20 kilogram minimum capacity, balance with a precision of 0.1 gram may be substituted for the solution balance. All scales must be calibrated immediately prior to start of Contract.

19. One single-span, triple-beam scale, minimum capacity 1610 grams, weighing directly to 0.1 gram; weighing beams to read 500 grams by 100 grams, 100 grams by 10 grams and 10 grams by 0.1 gram; pan to be 140 millimeters in diameter; together with a scoop, hanging tare counter weight and plastic balance cover. An electronic top loading balance with a capacity of 2000 grams minimum, and reading to 0.1 gram. All scales must be calibrated immediately prior to start of Contract.

20. One platform beam scale, capacity 100 kilograms, sensitivity 5 grams, with two beams at front of platform, reading to 10 kilograms by single kilograms and to 500 kilograms by 5 kilograms, with additional hanger weights to fulfill capacity of 100 kilograms; all parts to be of steel with enclosed weighing mechanism, platform to be 300 millimeters x 350 millimeters. A digital platform scale, with a minimum capacity of 100 kilograms, with similar sensitivity can be substituted. All scales must be calibrated immediately prior to start of Contract.

21. Two 2-burner commercial or laboratory grade electric hot plates with enclosed elements; one burner single heat, 650 watt; one burner, three-heat, 1000 watts; at least 450 millimeters x 225 millimeters high for use on 115 volts; UL approved, or two 2 burner gas hot plates of equal or greater heat capacity.

22. One gravity convection thermostatically controlled drying oven of rugged construction, with 10 millimeter thick Transite (or equal) walls, minimum inside dimensions to be 400 millimeters wide, 280 millimeters deep and 400 millimeters high, equipped with two expanded metal shelves, automatic thermostat and other standard controls capable of maintaining temperatures of 110 ± 5 °C, a glass thermometer reading from 0 °C divisions; maximum 1600 watts, connected for use on 115V 60 hertz current, unless the Contractor elects to provide 230 volt service.

23. One Gilson Screen shaker set, including standard Gilson shaker plus a set of screens 375 millimeters x 578 millimeters x 64 millimeters as follows: 75 millimeters, 50 millimeters, 37.5 millimeters, 25 millimeters, 19 millimeters, 12.5 millimeters, 9.5 millimeters, and 4.75 millimeters and shall include a dust pan. All sieves shall meet AASHTO M 92.

24. One motor-driven portable sieve shaker for operation on 110 volt 60 hertz, single phase current, complete with belt driven mechanism to produce combination rocking and tapping action, capacity for six full height sieves plus pan and cover; all parts mounted on a sturdy base.

25. A set of brass frame United States Standard testing sieves, all to be full height, 203 millimeters in diameter and matched for nesting; one each of the following, 50 millimeters, 19 millimeters, 12.5 millimeters, 9.5 millimeters, 4.75 millimeters, 2.36 millimeters, 2.00 millimeters, 1.18 millimeters, 850 micrometers, 600 micrometers, 425 micrometers, 300 micrometers, 180 micrometers, and 150 micrometers, two 75 micrometer mesh, two pans and one cover. The sieves shall meet AASHTO M 92.

26. Three fine 25 millimeter sieve or sash brushes.

27. Two wooden-handled knives, 250 millimeters overall in length with 150 millimeter thin steel blades.

28. A set of sturdy pans for drying soils as follows: Two 600 millimeters x 600 millimeters x 75 millimeters (minimum size), of 2.0 millimeter thick metal with reinforced rims. Eight (for use in oven) approximately 250 millimeters x 355 millimeters x 57 millimeters of 2.7 millimeter thick metal.

29. Two air meters, 0.01 cubic foot, Press-Ur-Meter type (Reference: AASHTO T 152 and ASTM C 231).

30. Two complete slump test outfits (Reference: AASHTO T 23 and T 119), 2 each as follows:

A slump cone of seamless spun metal, with handles and foot clamps.

A tamping rod, 600 millimeters long, 16 millimeters in diameter with hemispherical end.

A sturdy pan (2.0 millimeters thick metal with reinforced rims, 600 millimeters x 600 millimeters x 75 millimeters).

A brass-wire briquette brush.

A wooden handled steel trowel 90 millimeters x 180 millimeters.

31. If the job has more than 4.2 cubic meters of lightweight concrete a Roller-Meter type air meter meeting AASHTO T 196 and a unit weight bucket meeting AASHTO T 121 shall be furnished.

- 32. An electric sanitary water cooler, supplied with cups and drinking water.
 - 33. 2 concrete curing boxes, meeting the requirements of AASHTO T 23 Section 9; shall be Curamold or equal.
 - 34. 6 heavy duty 9.46 liter plastic pails.
 - 35. 1 quick-check air indicator kit meeting the requirements of AASHTO T 199.
 - 36. Concrete cylinder molds with plastic covers, 150 millimeters in diameter by 300 millimeters high, single use, meeting the requirements of AASHTO M 205 shall be supplied (4 cylinders per 40 cubic meters or fraction thereof). Cylinders shall be approved for use by the Research and Materials Section. Three molds shall be submitted for approval prior to start of the project.
 - 37. One copy of the Standard Specifications for Transportation Materials and Methods of Sampling and Testing – Part I and Part II Methods of Sampling and Testing – latest edition, and one copy of the latest interim AASHTO Specifications. Both are published by the American Association of State Highway and Transportation Officials, 444 North Capital Street, N.W., Suite 225, Washington, D.C. 20001.
 - 38. One shovel and one 0.06 cubic meter wheelbarrow for transporting samples.
- Catalogs for the above equipment may be seen at the Department’s Research and Materials Laboratory in South Boston.

COMPENSATION

740.81 Basis of Payment.

Payment for work under these items will be at the respective contract unit bid price for Engineer’s Field Office and Equipment (Type A), Engineer’s Field Office and Equipment (Type B), Engineer’s Field Office and Equipment (Type C) and Engineer’s Field Office and Equipment (Type D) and Materials Laboratory Building and Equipment.

Payment as described above shall be compensation for all services (heat, gas, light, water, sanitary, etc.), except monthly telephone charges; for all labor, material, fencing, surfacing, equipment service (including general inside cleaning at least once each week) and incidentals necessary to provide, equip, maintain, insure, remove and dispose of the buildings and clean the site as specified and directed. The contract unit bid price will prevail for buildings built or furnished as described, for equivalent trailer space, or office space rented in existing buildings, when such substitution has been approved.

740.82 Payment Items.

740.	Engineer’s Field Office and Equipment (Type A)	Month
741.	Engineer’s Field Office and Equipment (Type B)	Month
742.	Engineer’s Field Office and Equipment (Type C)	Month
743.	Engineer’s Field Office and Equipment (Type D)	Month
744.	Materials Laboratory and Equipment	Month
999.740	Telephone Charges	Dollars

SECTION 746

TRANSPORTATION VEHICLE

DESCRIPTION

746.20 General.

This item consists of furnishing and maintaining current model vehicles equipped with strobe lights for the use of Department personnel assigned to the project.

MATERIALS

746.40 General.

The vehicle may be any medium size air conditioned six cylinder four door sedan, van, or other type vehicle capable of transporting four persons in comfort and protected against the elements.