

SECTION 9.00

MEASUREMENT AND PAYMENT

9.01 Measurement of Quantities.

The quantities of the various items of work performed shall be determined for purposes of payment by the Engineer and by the Contract for purposes of the certification(s) of work performed that are generally required by law and specifically by the provisions hereof.

Upon the completion of the work and before final payment is made the Engineer will make final measurements to determine the quantities of the various items of work performed, as the basis for final settlement. All measurements shall be made according to the United States standard units of measurements.

The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the Contracts shall be selected by the Engineer.

Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures having an area of one square meter or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing by the Engineer.

Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.

All items which are measured by the meter, such as pipe, culverts, guardrail, underdrains, etc., will be measured parallel to the base or foundation upon which such structures are placed, unless otherwise shown on the plans.

In computing volumes of excavation the average end area method or other methods acceptable to the Engineer will be used.

When the term "gage" refers to the measurement of wire, it will mean the wire gage specified in the AASHTO Designation M 32.

All materials which are specified for measurement by mass shall be weighed on standard scales furnished by and at the expense of the Contractor. Such scales shall be sealed at the expense of the Contractor as often as is necessary to insure their accuracy. A sworn weigher to be compensated by the Contractor shall weigh all materials required to be weighed as above provided. The weighing of such materials may be witnessed by the Engineer. If materials are shipped by rail or trucks, the car masses or quarry masses may be accepted, but scales shall be used as above, if so directed. Mass slips shall be provided for each shipment of material weighed. Each mass slip shall be signed by the sworn weigher. The mass slips shall be countersigned on delivery by the Engineer and no mass slip not so countersigned shall be included for payment under the Contract.

When requested by the Contractor and approved by the Engineer in writing, material specified to be measured by the cubic meter may be weighed and such masses will be converted to cubic meters for payment purposes. Factors for conversion from mass measurement to volume measurement will be determined by the Engineer and shall be agreed to by the Contractor before such method of measurement of pay quantity is used.

The term "lump sum" when used as a unit of payment will mean complete payment for the work described in the Contract.

When a complete structure or structural unit (in effect, "lump sum" work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories.

When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gage, unit mass, section dimensions, etc., such identification will be considered to be nominal mass or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.

9.02 Scope of Payments.

The Party of the First Part will pay and the Contractor shall receive and accept the compensation as herein provided, in full payment for furnishing all materials, labor, tools and equipment and for performing all work contemplated and embraced under the Contract, also for all loss or damage arising out of the nature of the work, or from

the action of the elements (except as specified in Subsection 7.18), or from any unforeseen difficulties or obstructions which may arise or be encountered during the prosecution of the work (except as set forth in Subsection 4.04) until its final approval by the Party of the First Part, and for all risks of every description connected with the prosecution of the work, also for all expenses incurred by or in consequence of the suspension or discontinuance of the said prosecution of the work as herein specified, and for any infringement of patent, trademark or copyright, and for completing the work in an acceptable manner according to the plans and specifications.

The payment of any current estimate, or any retained percentage shall in no way constitute an acknowledgment of the acceptance of the work or in no way or degree prejudice or affect the obligation of the Contractor, at his/her own cost and expense, to repair, correct, renew or replace any defects and imperfections in the construction of, or in the strength of, or quality of materials used in or about the construction of the work under Contract and its appurtenances, as well as all damages due or attributable to such defects: which defects, imperfections or damages shall have been discovered on or before the final inspection and acceptance of the work. The Engineer shall be the sole judge of such defects, imperfections, or damages and the Contractor shall be liable to the Party of the First Part for failure to correct the same as provided herein (also see Subsection 7.20).

9.03 Payment for Extra Work.

A. Payment for work for which there is a unit price provided for in the Contract.

Where the Contract contains a unit price for work and the Engineer orders Extra Work for work of the same kind as other work contained in the Contract and is performed under similar physical conditions, the Contractor shall accept full and final payment at the Contract unit prices for the accepted quantities of Extra Work done.

No allowance will be made for any increased expenses or any damages whatsoever.

B. Payment for work or materials for which no price is contained in the Contract.

If the Engineer directs, the Contractor shall submit promptly in writing to the Engineer an offer to do the required work on a lump sum or unit price basis, as specified by the Engineer. The stated price, either lump sum or unit price, shall be divided so as to show that it is the sum of: (1) the estimated cost of direct labor, materials, and the use of equipment, plus 10 percent of this total for overhead; (2) plus the actual cost of Workmen's Compensation and Liability Insurance, Health, Welfare and Pension benefits, Social Security deductions, Employment Security Benefits, and such additional fringe benefits which the Contractor is required to pay as a result of Union Labor Agreements and/or is required by authorized governmental agencies; (3) plus 10 percent of the total of (1) and (2); (4) plus the estimated proportionate cost of surety bonds.

Unless an agreed lump sum and/or unit price is obtained from above and is so stated in the Extra Work Order the Contractor shall accept as full payment for work or materials for which no price agreement is contained in the Contract an amount equal to the following: (1) the actual cost for direct labor, material (less value of salvage, if any) and use of equipment, plus 10 percent of this total for overhead; (2) plus actual cost of Workmen's Compensation and Liability Insurance, Health, Welfare and Pension benefits, Social Security deductions, and Employment Security Benefits; (3) plus 10 percent of the total of (1) and (2); (4) plus the estimated proportionate cost of surety bonds. For work performed by a Subcontractor, the Contractor shall accept as full payment therefor an amount equal to the cost to the Contractor of such work as determined by the Engineer, plus 10 percent of such cost.

No allowance shall be made for general superintendence and the use of small tools and manual equipment.

The Contractor shall, when requested by the Engineer, furnish itemized statements of the cost of the work ordered and give the Engineer access to all accounts, bills and vouchers relating thereto, and unless the Contractor shall furnish such itemized statements, access to all accounts, bills and vouchers, the Contractor shall not be entitled to payment for any items of extra work for which such information is sought by the Engineer.

C. Equipment Rates.

In the event there arises the need for determination of costs of use of equipment as part of "actual costs" or "cost of performance" or "damages" under Subsections 4.04, 7.16, 8.05, 9.02 and/or 9.03, or under Chapter 30 of the Massachusetts General Laws, such costs for use of equipment shall be established in accordance with the following:

(1) "Construction equipment" as used herein means equipment in sound workable condition, either owned or controlled by the Contractor or the Subcontractor at any tier, or obtained from a commercial rental source, and furnished for use under the contract.

(2) Allowable hourly ownership and operating costs for contractor-owned or subcontractor-owned equipment shall be determined as follows:

(a) Actual cost data from the Contractor's accounting and operating records shall be used whenever such data can be determined for hourly ownership and operating costs for each piece of equipment, or groups of similar serial or series equipment. Actual costs shall be limited to booked costs of the annual accounting period or periods during which the equipment was utilized on the Contract, and will not include estimated costs not recorded and identifiable in the Contractor's formal accounting records. The Contractor shall afford Department auditors full access to all accounting, equipment usage, and other records necessary for development or confirmation of actual hourly cost rates for each piece of equipment, or groups of similar serial or series equipment. The Contractor's refusal to give such full access shall invalidate any request or claim for payment of the equipment costs. When costs cannot be determined from the Contractor's records, hourly equipment cost rates may be determined under (b) and (c) below.

(b) When the Department ascertains that it is not practicable to determine actual equipment cost rates from the Contractor's records, hourly equipment cost rates for equipment owned by the Contractor may be determined by the use of rate schedules (with adjustments) contained in the *Rental Rate Blue Book* (Volumes 1 and 2) published by Dataquest Incorporated; said publication is incorporated herein by reference.

The contractor shall provide to the Department, in a format prescribed by the Department, sufficient descriptive ownership and operating records and documentation for each piece of equipment subject to the extra work so that the equipment rates may be determined and adjusted from the aforementioned Dataquest *Rental Rate Blue Book* as follows:

(1) Hourly equipment rates shall be developed by dividing monthly rates contained in the *Rental Rate Blue Book* by 176 hours per month (the weekly, hourly and daily rates listed in the *Rental Rate Blue Book* will not be used);

(2) Equipment rates shall in all cases be adjusted by application of the Rate Adjustment Tables (for machine age adjustment) plus adjustments to eliminate Equipment Overhead plus Regional Adjustments plus adjustments to the CFC to reflect for the equipments age; and

(3) Equipment operating rates shall be further reduced by 20% to eliminate duplicate and excessive costs, except that the rates shall instead be reduced by 75% to determine standby equipment rates.

The number of equipment hours to be paid for under the extra work or force account work shall be the number of hours that the equipment is actually used on a specific extra work or force account activity.

The current revisions to Dataquest's *Rental Rate Blue Book* will be used in establishing equipment rates. The "current revision" applicable to specific extra work or force account work will be the revision in effect (the copyright date being the deciding factor) as of the Contractor's Notice to Proceed.

In all cases, the Department reserves the right to utilize equipment rates based upon the contractor's actual equipment ownership costs, other equipment rate books and guides (i.e., *Construction Equipment Ownership and Operating Expense Schedule, Region One* published by the Army Corps of Engineer's) or hybrid rates determined to be reasonable by the Department.

(c) In those cases where a 10 percent additive for overhead and profit is to be superimposed on the equipment costs as provided in Subsections 4.04, and 9.03B, equipment cost rates determined under (a) and (b) above shall exclude any overhead costs such as equipment insurance, licenses, or taxes. The 10 percent additive shall compensate the Contractor for all overhead costs, including equipment overhead, general superintendence, small tools, manual equipment, field overhead, and central office overhead. Where the 10 percent overhead additive is not applicable, overhead items clearly related to equipment, (equipment insurance, licenses, taxes), shall be includable in the equipment rates; provided, however, that such costs shall be identified and eliminated from any other direct or indirect costs or damages payable by the Department under the Contract. No element of profit shall be allowable in equipment cost rates for Contractor-owned equipment; it being understood that a 10 percent profit additive will be superimposed upon equipment costs when called for by the Contract.

(3) Reasonable hourly costs of renting equipment are allowable subject to Contractor production of auditable records supporting actual costs incurred, provided further that:

(a) Costs such as fuel, lubricants, and minor or running repairs incident to operating such rented equipment that are not included in the rental rate are allowable.

(b) Costs incident to major repair and overhaul of rental equipment are not allowed.

(c) Charges for equipment leased or rented from any division, subsidiary organization under common control, or business under common ownership, ordinarily will be reimbursable to the extent that they do not exceed the actual costs of ownership and operating costs determined as in (2), above. Rental cost of equipment leased or rented from any division, subsidiary, affiliate of the Contractor under common control, or business under common ownership, that has an established practice of renting out the same or similar equipment to unaffiliated parties, shall be allowed at

rates higher than actual ownership and operating costs, provided that the Contractor furnishes the Department adequate documentation, including the rental and usage records for the same or similar equipment items, demonstrating a reasonable likelihood that the equipment would have been rented out if not used on this Contract, and that the rental rates charged are consistent with rates charged to unaffiliated parties and going market rates. Rental costs under a sale and leaseback arrangement will be allowable only up to the amount the Contractor would be allowed if the Contractor retained title.

(4) Equipment cost rates determined in (2) and (3) shall be exclusive of labor cost of equipment operators. Such costs shall be reimbursable subject to Contractor production of auditable payroll and other records sufficient for determination of hours, pay rates, and reimbursable fringe costs as defined in Subsection 4.04 and above.

(5) Except in cases of unit price or lump sum extra work orders approved by the Department before the work is done, actual reimbursable hours of equipment usage and operator time must be adequately documented by the Department force account records or Contractor field and office records maintained during performance of the work in a manner acceptable to the Department. Failure of the Contractor to so maintain time records which adequately segregate added equipment hours caused by extra work required by the Department, or caused by other Department actions cited in the Contractor's claim for damages, from other equipment time worked on the Contract, when maintenance of such records would have been feasible, shall constitute a cardinal omission of the Contractor, invalidating any claim for equipment cost reimbursement.

The above provisions constitute an advanced agreement made in general conformance with intent of Federal Acquisition Regulation 31.105, paragraph (d)(1), said intent being to maximize clarity of understanding and minimize possible disputes with respect to determination of reimbursable actual equipment costs under this Contract.

9.04 Partial Payments.

The Engineer shall biweekly make an estimate of the total amount of the work done from one estimate to the next. The Department's Computer Section will process the estimated value from the Engineer's report. The Party of the First Part shall retain a portion of such estimated value, but not to exceed \$500,000 on any one Contract as part security for the fulfillment of the Contract by the Contractor, and shall also retain from said estimates an amount sufficient to cover claims which it may have against the Contractor and claims filed pursuant to Chapter 149, Section 29 and Chapter 30, Section 39A and F of the General Laws. The Party of the First Part shall pay biweekly to the Contractor while carrying on the work the balance not retained as hereinbefore provided. No such estimates or payment shall be required to be made when, in the Engineer's judgment, the work is not proceeding in accordance with the provisions of the Contract, or when in his/her judgment the total value of the work done since the last estimate amounts to less than \$1,000.00.

There will be a retainage of ten (10) percent of the value of all planting items. For all other items of work there will be no retainage for the first fifty (50) percent of the bid price as determined by the Engineer. For the second fifty (50) percent of the bid price there will be a retainage of five (5) percent of the value of all items of work excluding planting items.

Whenever the work is substantially complete, the Party of the First Part may, if it considers the amount retained to be in excess of the amount adequate for the protection of the Commonwealth and is required by statute, at its discretion, release to the Contractor all or a portion of such excess amount, and may cause the Contractor to be paid, temporarily or permanently, from time to time such portion of the reserve as it deems prudent.

Upon presentation by the Contractor of certified copies of paid invoices, the Party of the First Part may include in the estimate, advance payments for acceptable reinforcing steel, structural steel, stone, piles, culvert pipe or other non-perishable materials purchased expressly for the work and delivered on the work or in approved storage places at the site, but which materials are not considered as erected or complete in place under the items of the Contract, and for which partial payment as specified above would not be made until such materials and items were erected or complete in place.

If it is impossible due to lack of area on the site or other valid reason, the Contractor may request in writing permission from the Engineer to store materials off the site and still have the materials paid as material on hand and the Engineer may approve payment. This request will state the reason for the request, location of proposed storage site, methods that will be employed to insure that material is properly protected and the material will be used on the particular project, and any other information as may be deemed necessary in order to evaluate the request. No advance payment for material stored off the site will be made until written approval of the Engineer has been obtained. The amount to be

included in the estimate will be determined by the Engineer up to a maximum of 100% of the value of the materials as shown by the certified copies of paid invoices. Payment will not be approved when the invoice value of such materials as determined by the Engineer, amounts to less than \$1000.

Deductions at rates and in amounts which are equal to the payments will be made from estimates as the materials are incorporated in the work.

Payment for the materials, as aforesaid, shall not in itself constitute acceptance and any materials which do not conform to the specifications for same shall be rejected in accordance with the stipulation of Subsection 6.04.

Payment for structural steel and aluminum, specifically purchased and received by fabricators for incorporation into a Department project may be requested by the Contractor and included in the current estimates in an amount not to exceed fifty (50) percent of the contract price. Certified paid invoices and material certifications must be submitted by the Contractor to the Department with the request for payment. The invoices must clearly identify the Department project for which the material is intended along with the material type and quantity. When payment is made, the raw material becomes the property of the Commonwealth of Massachusetts. A document transferring ownership of the raw material to the Commonwealth shall be submitted to the Department immediately after payment is made. Such payment shall in no way release the Contractor from his/her responsibility for condition, protection and, in case of loss, replacement of such materials or from any liability resulting in any manner from the presence of such materials wherever they may be stored. Any material not conforming to the specifications shall be rejected in accordance with the stipulation of Subsection 6.04.

In instances where the raw material is not in the process of fabrication, the material shall be segregated from other material, designated as "Property of the Commonwealth of Massachusetts", and clearly marked to identify the project into which the material will be incorporated.

All material shall be inspected at the fabricator's plant by a representative of the Department prior to the submittal of invoices to ensure that all material has been received and is properly stored and segregated.

For any item for which the payment is made on a lump sum basis, (except lump sum Bridge Structures) and for which payment may be allowed if the Contractor requests partial payment on such an item, the Contractor shall submit for approval by the Engineer, a schedule of the quantities and unit prices for the major components of the item. Each component part shall be considered as including all its concomitance so that the total cost listed for the components is the contract cost for the item. The approval of the schedule by the Engineer shall not be considered as a guarantee to the Contractor that the quantities shown on the schedule are the approximate quantities actually included in the lump sum item.

The schedule is only for the purpose of estimating partial payments, and it shall not affect the contract terms in any way.

The Contractor will be required to certify, in writing, that the work for which the Contractor is being paid on the estimate in question has in fact been done.

9.05 Final Acceptance and Final Payment.

When in the opinion of the Chief Engineer the Contract has been satisfactorily completed and final acceptance has been voted by the Board of Commissioners, the Department Secretary shall inform the Contractor in writing of the date of such acceptance, upon which date the Contractor's responsibility shall cease except as provided in his bond and as provided in Subsection 7.20.

The Engineer shall, as soon as practicable after the physical completion of the Contract, make final estimate of the amount of work done thereunder and the value of such work. Within 65 days from and after the date the work has been accepted by the Board, the Party of the First Part shall forward to the Contractor a copy of the final estimate or semifinal estimate as stipulated in Chapter 30, Section 39G of the General Laws, as amended, together with an agreement form for his acceptance. After such acceptance has been filed with the Supervisor of Fiscal Management of the Department payments of the entire sum will be made, so found to be due thereunder after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the Contract. All prior partial estimates and payments shall be subject to correction in the final estimate and payment. If within six months from the date the final estimate is forwarded to the Contractor, the Contractor has not filed a valid (as determined by the Engineer) written reason(s) for not accepting the final estimate, the final estimate will be considered acceptable to the Contractor and payment of the final estimate made.

The acceptance by the Contractor of the final payment shall operate as and shall be a release to the Party of the

First Part and every member, agent and employee thereof, from all claims by the Contractor for anything done or furnished for, or relating to the work or for any act or neglect of the Party of the First Part or of any person relating to or affecting the work, except the claim against the Party of the First Part for the remainder if any there be, of the amounts kept or retained as provided in Subsection 7.15.