

## SECTION 109 - MEASUREMENT AND PAYMENT

109.01 **Measurement of Quantities.** The Engineer will measure work acceptably \*|  
completed under the contract according to United States standard measure. \*|

A station when used as a definition or term of measurement will be one hundred (100) linear feet.

The Engineer will recognize the method of measurement and computations \*|  
used for payment as conforming to engineering practices. \*|

The Engineer will make longitudinal measurements for area computations \*|  
horizontally. The Engineer will not make deductions for individual fixtures \*|  
having an area of nine (9) square feet or less. Transverse measurements for \*|  
area computations will be the neat dimensions shown in the contract or |  
ordered in writing by the Engineer. |

The Engineer will measure structures to neat lines shown in the contract \*|  
or as altered to fit field conditions according to measurement stated in the \*|  
contract. \*|

The Engineer will measure items that are measured by the linear foot \*|  
parallel to the base or foundation. \*|

The Engineer will use the average end area method in computing volumes \*|  
of excavation. The Engineer may use other methods if acceptable. \*|

The term "gage":

(1) is the U.S. Standard Gage when measuring plates; \*|

(2) will be according to AASHTO M 36, M 167, M 196, M 197, or M 219 \*|  
when measuring corrugated metal pipe, metal plate pipe culverts and \*|  
arches, and metal cribbing; and \*|

(3) will be according to AASHTO M 32 when measuring wire. \*|

The term "ton" will mean the short ton of two thousand (2,000) pounds \*|  
avoirdupois weight. The Contractor shall weigh materials measured or \*|  
proportioned by weight on scales. The Department of Agriculture (DOA) or from \*|  
agencies or firms certified by the DOA to do such services shall certify the \*|  
scales. The Contractor shall weigh the trucks used to haul paid material by \*|  
weight empty on a daily basis. Each truck shall bear a plainly legible \*|  
identification mark. The Contractor shall notify the Engineer twenty-four \*|  
(24) hours before hauling paid material based on weight. |

The Engineer shall accept vehicles hauling materials measured by volume \*|  
in the vehicle. The Engineer will measure the trucks at the point of \*|  
delivery. These vehicles may be of size or type where the Engineer may \*|

readily determine the actual contents accurately. The Contractor shall load vehicles to at least their water level capacity. The Contractor shall level the loads when the vehicles arrive at the point of delivery.

The Contractor may weigh the material specified to be measured by the cubic yard if acceptable by the Engineer. The Engineer may convert these weights to cubic yards for payment purposes. The Engineer will decide the factors for conversion from weight to volume measurement. The Contractor shall agree to the factors before using such method of measurement.

The Contractor shall furnish the Engineer with a certificate from the DOA or from an agency or firm certified by the DOA to do such services when measuring and paying bituminous materials by the gallon and a distributor dispenses the bituminous materials. The certificate shall certify calibration of the measuring device and truck capacity.

The Engineer will measure volumes at sixty (60) degrees Fahrenheit or correct to the volume at sixty (60) degrees Fahrenheit. The Engineer will use the following conversion tables as published in the Asphalt Handbook, Manual Series 4:

	April 1965 Edition	1989 Edition
MC-800	Table XVI-1	Table 2.9
MC-30, 70	Table XVI-2	Table 2.11
All emulsions	Table XVI-3	Table 2.12

When losing or wasting bituminous material from the car or distributor, the Contractor shall use the net certified scale weights for measurement subject to correction.

When shipping bituminous materials by truck or transport net certified weights or volume subject to correction, the Contractor may use such material for computing quantities.

The term "barrel" will mean three hundred and seventy-six (376) pounds of cement when measuring cement by the barrel. The term "bag" will mean ninety-four (94) pounds of cement when measuring cement by the bag.

The Contractor shall measure timber by the thousand feet board measure (MFBM) incorporated in the structure. The Contractor shall base measurement on nominal widths and thicknesses and the length of each piece.

The term "lump sum" (L.S.) when used as an item of payment will mean complete payment for the item of work described in the contract.

When specifying L.S. work as the unit of measurement, the unit will include necessary fittings and accessories

The Engineer will measure rental of equipment by time in hours of actual working time and necessary traveling time of the equipment within the limits of the project. If the Engineer orders a special equipment for force account work, the Engineer will pay travel time and transportation to the project. If the Engineer orders the equipment on standby, the Engineer will pay half (1/2) time rates for the equipment.

When identifying standard manufactured items by gage, unit weight, or section dimensions, such identification will be nominal weights or dimensions. Standard manufactured items shall be such items as fence, wire, plates, rolled shapes, and pipe conduit. The Department will accept the manufacturer's tolerance established by the industries involved or the tolerance according to the contract whichever is more stringent.

**109.02 Scope of Payment.** The Contractor shall receive and accept the compensation provided in the contract as full payment for:

- (1) Furnishing materials, labor, equipment, tools and incidentals necessary for the completed work;
- (2) Doing work contemplated and embraced in the contract;
- (3) Loss or damage arising out of the nature of the work, from the action of the elements, and from unforeseen difficulties or obstructions that may have arisen or met in the prosecution of the work;
- (4) Risks of descriptions connected with the prosecution of the work;
- (5) Expenses incurred by the Contractor for the suspension or discontinuance of the work;
- (6) Costs arising from claims of infringement of a patent, trademark or copyright; and
- (7) The completion of the work according to the contract.

The contract unit price or lump sum price includes material, labor, equipment, tools and incidentals necessary to complete the work for contract items of work.

If the "Basis of Payment" subsection stipulates that the unit price will be full compensation for items of work or material, the Engineer will not measure or pay work or material under other pay items.

**109.03 Compensation for Altered Quantities.** The actual accepted quantities of work may vary from the estimated quantities in the proposal. The Contractor shall accept payment in full at the original contract unit prices for the accepted quantities of work done. The Department will not make

allowance except as provided in Subsection 104.02 - Alteration of Plans or Type of Work. \*|  
\*|

**109.04 Extra and Force Account (F.A.) Work.** The Department will pay for work done according to Subsections 104.02 - Alteration of Plans or Type of Work and 104.03 - Extra Work at the unit prices or L.S. prices. Also, the Department may require the Contractor to do such work on a F.A. basis as follows: \*|  
\*|

**(A) Labor.** The Contractor will receive the wage rate including fringe benefits for actual work engaged by the worker. Fringe benefits are the required amounts by collective bargaining agreement or other employment contract generally applicable to the classes of labor employed. The Contractor shall submit the fringe benefits for each class in writing to the Engineer for acceptance before the F.A. work begins. The Contractor may include foremen when authorized by the Engineer. \*|  
\*|

The Department will pay the Contractor an amount equal to twenty (20) percent of the actual labor cost. \*|  
\*|

The Engineer will not allow for overtime compensation without the written acceptance of the Engineer before performance of that work. \*|  
\*|

**(B) Insurance and Tax.** The Contractor will receive the actual costs paid for property damage, liability, worker's compensation insurance premiums, State unemployment contributions, Federal unemployment taxes and social security taxes. Add six (6) percent of the insurance and tax. \*|  
\*|

**(C) Material.** The Contractor shall receive the actual cost of that material including transportation charges accepted by the Engineer, delivered, and incorporated into the work. The Engineer will add twenty (20) percent of the material cost. \*|  
\*|

**(D) Equipment.**

(1) Machinery and equipment shall be in good working condition and suitable for the purpose for which the Contractor plans to use the machinery and equipment. \*|  
\*|

(2) Individual pieces of equipment or tools having a replacement value of twenty-five (\$25.00) dollars or less are small tools. The Department will not make payments for small tools. \*|  
\*|

**(3) Rental Rate**

(a) The Department will pay the rental rates at the per-hour rates according to Subsection 109.04(D)(4) - Determination of Hourly Rate. These rental rates are in the "Rental Rate Blue Book for Construction Equipment Volume I" (Rental Blue Book). The Engineer will use the edition for the period doing work. The rental rate includes the estimated operating cost per hour \*|  
\*|

and the regional correction factor. The Engineer shall review \*|  
and accept the equipment for use. \*|

(b) If the Rental Blue Book does not have the particular type \*|  
of equipment, the Engineer and the Contractor shall agree on \*|  
the rates in writing before its use. This includes rental \*|  
rates for Contractor-owned trucks. \*|

(c) For trucks not owned by the Contractor, the Hawaii State \*|  
Public Utilities Commission shall establish the rental rate. \*|  
The Department will pay for these as a material item according \*|  
to Subsection 109.04(C) - Material. \*|

(d) The Department may allow rental rates that are higher \*|  
than the "Rental Blue Book". The Contractor will submit a \*|  
request for such higher rates in writing for acceptance before \*|  
using such equipment. \*|

(e) Rental rates include the cost of fuel, oil, lubricants, \*|  
supplies, small tools, attachments, repairs, maintenance, tire \*|  
wear, depreciation, and storage. \*|

**(4) Determination of Hourly Rental Rate.**

(a) The continuous and consecutive number of working days \*|  
shall be the normal eight (8) hour shift work day, Monday \*|  
through Friday, excluding holidays. The Engineer will not \*|  
consider less than eight (8) hours of work as continuous. \*|  
The Engineer will include equipment removed from rental for \*|  
fuel and lubrication as continuous. \*|

(b) The Department will pay for equipment with more than \*|  
thirty-two (32) continuous and consecutive hours on a per hour \*|  
weekly rental rate. \*|

(c) The Department will pay for equipment with more than one \*|  
hundred and twenty (120) continuous and consecutive hours on a \*|  
per hour on a monthly rental rate. \*|

(d) The Department will pay for overtime over the normal \*|  
eight (8) hour shift work day at the corresponding hourly \*|  
rental rate. \*|

(5) The Department will pay for only hours worked. The Department \*|  
will not pay for equipment due to breakdowns. \*|

(6) Less than thirty (30) minutes of operation is half (1/2) hour \*|  
of operation. \*|

(7) The Contractor shall not exceed the cost of transporting the equipment the rates established by PUC. If such rates are non-existent, the Engineer will resolve the rates based on the rates charged by established haulers within the State.

**(8) Payment.**

**(a) Equipment on the Project Site.**

1. The rental time shall be the time the equipment is in operation on the F.A. work. Also, the rental time includes the time required to move the equipment to the location of the F.A. work and to return the equipment to the original location or to another location requiring no more time than to return the equipment to its original location. If the Contractor uses the equipment at the site of the F.A. work on other than such F.A. work, the Engineer will not pay for moving time.

2. When moving the equipment other than its own power, the Engineer will allow loading and transporting costs instead of moving time. If the Contractor uses the equipment at the site of the F.A. work on other than such F.A. work, the Engineer will not pay for moving time.

**(b) Equipment Not on the Project Site.**

1. The Engineer shall confirm the location from which the equipment is to move or transport.

2. If the Contractor transports the equipment to the site for the exclusive use of the F.A. work, the Department will pay the cost of mobilizing and transporting the equipment from its original location to the site of the F.A. work. This includes loading and unloading. Also, the Engineer will pay the cost of demobilizing and transporting the equipment back to its original location or to another location, whichever cost is less.

3. For self-propelled equipment, the Department will pay the cost of moving the equipment by its own power from its original location to the site of the F.A. work. Also, the Department will pay the cost of moving the equipment back to its original location or to another location, whichever cost is less.

4. If the Contractor desires the return of the equipment to another location, the Department will pay the cost of transportation according to the above provisions, provided such payment does not exceed the cost of moving the equipment to the project site.

5. If the Contractor uses the equipment on the project site in ways other than on F.A. work, the Department will pay the cost of transporting the equipment to the jobsite. The Contractor shall bear the cost of returning the equipment. \*|  
\*|  
\*|  
\*|  
\*|

6. The Engineer will begin the rental period at the time the equipment is unloaded at the site of work or at the time specified, whichever is later. The Engineer will include each day that the machinery or equipment is at the site of the F.A. work. The Engineer will terminate when the Engineer orders the Contractor to discontinue the use of the machinery or equipment. \*|  
\*|  
\*|  
\*|  
\*|  
\*|  
\*|

(9) If the equipment stand-bys due to delayed or halted work, the Engineer will continue the rental set forth in the following schedule until the Engineer orders the equipment removed from the work site or continues the F.A. work: \*|  
\*|  
\*|  
\*|

Hours Equipment is on Stand-Bye	Hours to be Paid
0.00	4.00
0.50	4.25
1.00	4.50
1.50	4.75
2.00	5.00
2.50	5.25
3.00	5.50
3.50	5.75
4.00	6.00
4.50	6.25
5.00	6.50
6.00	7.00
6.50	7.25
7.00	7.50
7.50	7.75
8.00	8.00
Over 8.00	hours in operation *
* The Engineer shall confirm the need for hours of operation over eight (8) hours in one (1) day before doing that work. *  *	

The delayed or halted work shall be because of design, traffic, or other related causes not under the control of the Contractor. The delayed or halted work excludes Saturdays, Sundays, and legal holidays, unless the Contractor uses the equipment to work on such days. \*|  
\*|  
\*|  
\*|

The Engineer will not apply the above schedule to equipment \*|  
that the Contractor uses on the same day for both F.A. work and \*|  
other work of the Contractor. \*|

(E) **Subcontracting.** The Contractor shall receive an additional amount \*|  
equal to five (5) percent of the total cost of that work computed as set \*|  
forth above when approved subcontractors work on a F.A. basis. \*|

(F) **Bond.** The Engineer will add a bond allowance of one (1) percent to \*|  
the total sum determined in (A) through (E). \*|

(G) **State Excise Tax.** The Engineer will add a State Excise Tax to the \*|  
total sum determined in (A) through (F). \*|

The Contractor shall consider the compensation as determined in (A), \*|  
(B), (C), (D), (E), (F) and (G) above to be payment in full for work done \*|  
on a F.A. basis, including superintendence, overhead, use of non-rental \*|  
tools and equipment, profit, taxes, and subcontracting. \*|

(H) **Records.** The authorized representative of the Contractor and the \*|  
authorized representative of the Engineer shall verify and sign the F.A. \*|  
worksheet each day for work done on a F.A. basis. These records shall be \*|  
the basis for payment of the F.A. work. \*|

(I) **Statements.** The Engineer will not make payment for work done on a \*|  
F.A. basis until the Contractor submits duplicate, itemized statements of \*|  
the cost of that F.A. work, as authorized by the Engineer, and: \*|

(1) **Title.** Contract number, its name or with the Subcontractor's \*|  
name, date, project title, contract change order number, project \*|  
number, item number and item description. \*|

(2) **Labor.** Name of worker, classification, quantity of workers, \*|  
daily hours, unit, rate of pay, extension of each worker, the \*|  
fringe benefits amount payable if there is fringe benefits, and the \*|  
extension for its operating expense, overhead and profit. \*|

(3) **Insurance Rate - Average Tax.** Cost for property damage, \*|  
liability, workmen's compensation insurance premiums, average tax \*|  
rate of State unemployment contributions, Federal unemployment taxes \*|  
and social security taxes. \*|

(4) **Materials.** Description of the material, quantity of material, \*|  
prices, extensions, cost of transporting materials, wholesale tax, \*|  
and the extension for its operating expense, overhead, and profit. \*|  
Include the cost of transporting materials only if the prices of the \*|  
materials do not reflect that cost. \*|

(5) **Equipment.** Equipment classification, quantity of equipment, \*|  
daily hours, unit, rental rate, extension for each unit of machinery \*|  
and equipment. \*|



(6) The Contractor shall type or write the description of work done for the day. The Contractor shall have an authorized representative sign the two (2) copies. The authorized representative will initial the copies if the signatures are from a copy machine.

The Contractor shall accompany and support the statements by invoices for transportation charges and materials used. If materials used on the F.A. work are not specifically purchased for such work but the Contractor took the material from its stock, the Engineer may request verification of material payment instead of invoices. The Contractor shall submit an affidavit certifying that:

- (1) the Contractor took such materials from its stock,
- (2) the Contractor used the quantity claimed used, and
- (3) the price and transportation claimed represent the actual cost.

**109.05 Eliminated Items.** If the Contractor orders acceptable material for the eliminated item before the notification date of that elimination by the Engineer, the Department will pay for the material at the actual cost to the Contractor. In such case, the material paid for shall become the property of the State. The State will pay for the actual cost of further handling.

If the Contractor returns or cancels that material to the supplier or other source at the Engineer's request, the Department will pay for the actual cost of charges made by the supplier or other source for returning the material.

If the Department is paying the work on a F.A. basis according to Subsection 109.04 - Extra and F.A. Work, the Engineer will compute the actual costs or charges to be paid as if paying the work on a F.A. basis according to Subsection 109.04 - Extra and F.A. Work.

**109.06 Deduction from Payment.** If the Department has claims against the Contractor, the Department may retain such claims out of the amount due to the Contractor without liability for damages or interests.

**109.07 Assignment of Payments.** The Department will pay monies payable under the contract to the Contractor according to this section. The Department will not recognize assignments or order executed by the Contractor directing payment of that funds to other person or persons by the State unless accepted by the State. The Department will attach the consent of its surety before such assignment or order can be accepted.

**109.08 Payment for Material.** Unless the Contractor submits a paid invoice for the materials, the Department will not make payment for materials under this Subsection.

The Department may pay the Contractor: \*

(1) the cost of accepted materials to be incorporated in the work, \*  
and \*

(2) when the Contractor delivers such materials to the project and \*  
stored in acceptable storage places near the project. \*

Also, the Department may pay the Contractor: \*

(1) for cost of accepted materials furnished and acceptably stored \*  
in a fabricator's yard provided such storage yard is within the \*  
State of Hawaii and \*

(2) if the Contractor furnishes evidence that the materials are \*  
for use on the project. The Contractor shall not use that material \*  
elsewhere. \*

The Department will not exceed the bid price of that item for payments \*  
authorized in this Subsection. The Contractor shall not consider payment of \*  
the material as final acceptance. The Contractor shall be responsible for \*  
that materials. \*

Payment for material does not relieve the Contractor of its obligations \*  
to furnish material acceptable to the Engineer and to incorporate properly \*  
the material into the project according to the contract. \*

The Department will not make material payment on living or perishable \*  
plant material. \*

**109.09 Progress Payments.** The Engineer will prepare a monthly estimate of \*  
the progress of the project based on the items of work done and materials \*  
incorporated in the work at the unit prices or lump sum prices set forth in \*  
the contract. Progress estimates and payments will be approximate only and \*  
shall be subject to correction before or in the final estimate and payment. \*  
Monthly shall mean the period between the sixteenth day of the month to the \*  
fifteenth day of the succeeding month. The Engineer and the Contractor may \*  
agree on a different monthly period. \*

The Department will not make progress payment if the total value of the \*  
work done since the last estimate is less than one thousand dollars \*  
(\$1,000.00). If the progress payment includes work from Sections 617 - \*  
Planting Soil, 618 - Grassed Surfaces, 619 - Planting and Transplanting and \*  
641 - Hydro-Mulch Seeding, the Department will not make progress payment if \*  
the total value of the work done since the last estimate is less than five \*  
hundred dollars (\$500.00). \*

If the Engineer finds that the Contractor is progressing satisfactorily \*  
in completing the project work: \*

If the Contractor is progressing satisfactorily in completing the project work and less than fifty (50) percent of the whole contract cost is complete, the Engineer shall retain five (5) percent of the value of the work done minus materials on hand until the Engineer makes final payment. If the Contractor is progressing satisfactorily in completing the project work and more than fifty (50) percent of the whole contract cost is complete, the Engineer may make the remaining progress payments in full.

If the Contractor is progressing unsatisfactory in completing the project work, the Department may withhold five (5) percent of subsequent progress payments upon written notice to the Contractor.

If the Contractor refuses or fails to comply with the equal employment opportunity, affirmative action, non-discrimination, labor compliance, training, and disadvantaged business enterprise requirements, the Department at its sole discretion and upon written notice to the Contractor may withhold the entire or portion of the monthly progress payments.

The Engineer may adjust the amount of retainage under the contract to fifteen (15) percent of the landscaping items or two and one-half (2-1/2) percent of the total contract amount, whichever is less after satisfactory completion of work except landscaping items. The Engineer will not apply this provision to contracts where the scope of work is solely landscaping items.

**109.10 Acceptance and Final Payment.** The Engineer will prepare the final estimate when the Department accepts the project according to Subsection 105.17 - Acceptance. The Department will pay the entire sum due after deducting previous payments and amounts to be retained or deducted according to the contract after the Contractor accepts such final estimate.

Prior progress estimates and payments shall be subject to correction in the final estimate and payment.

The documents required before making final payment are:

**(A) For State projects.**

(1) Consent of the surety to payment of the final estimate and certificate of release from the surety.

(2) Evidence by affidavit that the Contractor fully paid or received the debts resulting from the contract.

(3) Tax clearance from the State Director of Taxation that the Contractor paid delinquent taxes levied or allowed under State statutes according to Section 103-53, H.R.S.

(4) Properly executed non-gratuity affidavit.

(5) Certificate of release from each subcontractor.

(B) For County Projects. |

(1) Tax clearance. |

(a) Clearance Certificate (Income Assessment and Audit Division). |

(b) Division of Taxation. |

(2) Certificate of plumbing inspection, electrical inspection and building occupancy as required. |

(3) Make guarantees required by the contract in writing. \*|

(4) Evidence that the Contractor paid or secured claims for persons, firms or corporations who have done work or supplied materials, tools, equipment, machinery or other services. \*|

(5) Certificate of release from each subcontractor. |

(6) Certificate of release from surety or bonding company. |

(7) Non-Gratuity Affidavit. |

(8) Furnish as-built plans according to the contract. \*|

(9) Other documents as required by the contract. \*|

Sums necessary to meet the claims of the State may be retained from the sums due the Contractor until said claims have been fully and completely discharged or satisfied. \*|

The filing of false affidavits will disqualify the Contractor from bidding on future work of the Department. \*|

**109.11 Records, Accounts and Documents.** The Department will retain and preserve records, accounts, computer sites and data and documents of the Contractor and its subcontractors for not less than three (3) years from the date of final payment. If there are litigations, claims or audits before the expiration of the three (3) year period, the Department will retain the documents until they have been resolved. The documents shall be available for inspection and auditing by the Department and other government agencies at the offices of the Contractor and its subcontractors upon twenty-four (24) hours notice to the Contractor. The Contractor shall help every way possible during such inspection and auditing of the documents at no cost to the Department. The Department will not pay claims unless substantiated by documents acceptable to the State. \*|

**109.12 Funds From Which The Engineer Will Make Payment.** The Engineer will pay for Federal-Aid contracts partly out of State and/or County funds and Federal Aid funds that include the extras that the Engineer allows according to Section 103-39 and Chapter 264, H.R.S. and as expressed in the contract. \*|