

## SECTION 110—PAYMENT

**110.01 GENERAL**—Payment for items of work performed under this contract will be made at the contract price per unit of measure, as specified in [Section 109.01](#) for the item complete in place, or portions thereof. Unless otherwise specified, the contract unit price will cover all costs for materials, labor, and equipment:

- specified, described, or identified in each section of the specifications (including the special provisions and plans);
- identified in each section of the specifications (including the special provisions and plans) as “as required” or “as directed;” or
- allowed under the specifications (including the special provisions and plans) and for which payment is not expressly provided.

In addition to the above, the contract price includes all other costs incurred in performing work on the project (e.g., home office overhead) and all profit. The contract price is accepted as payment in full for all risk, loss, damage, or expense of every kind arising out of the nature of the work or the performance as specified in [Section 107.20](#).

Work specified as “incidental” in the Measurement and Payment section of the specification for a contract item is to be considered as an additional obligation to the other work required for the item(s). This incidental work is not payable directly, but is to be considered included in the contract price for the item(s) of work specified.

Removal and replacement of defective work, as specified in [Section 105.12](#), will not be paid by the Department.

No payment will be made for work in excess of that indicated, shown, or specified, unless otherwise accepted in writing by the Secretary.

Removal of material found in excavation areas and accepted for use, as specified in [Section 106.04](#), will be paid for at the contract unit price for the class of excavation in which it is found. Payment will also be made for the contract bid item in which the excavated material is used.

Work, material, or labor specified for an item will not be measured or paid for again under any other indicated pay items.

### 110.02 DIFFERING SITE CONDITIONS, SUSPENSIONS OF WORK, AND SIGNIFICANT CHANGES IN THE CHARACTER OF WORK—

**(a) General.** If differing site conditions, changes in quantities, or alterations of the construction drawings will significantly increase or decrease the cost of performing the work directly affected, perform such work only when authorized in writing, as specified in [Section 110.03\(a\)](#). Payment for such work will be made as specified in [Section 110.03](#).

**(b) Differing Site Conditions.** During the progress of the work, if subsurface or latent physical conditions, differing materially from those indicated, are encountered at the site, or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work, are encountered at the site, the party discovering such conditions is responsible for promptly notifying the other party, in writing, of the specific differing conditions, before the site is disturbed and before the affected work is performed.

Upon written notification, the Representative will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding loss of anticipated profits, will be made as specified in [Section 110.02\(a\)](#). The Representative will notify the Contractor of the determination whether or not an adjustment of the contract is warranted.

No contract adjustment that results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.

No contract adjustment will be allowed under this section for any effects caused on unchanged work.

**(c) Suspensions of Work Ordered by the Representative.** If the performance of all or any portion of the work is suspended or delayed by the Representative in writing, as specified in [Section 107.16\(c\)](#), for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the Contractor believes that additional compensation and/or contract time is due as a result of such suspension or delay, submit to the Representative, in writing, a request for adjustment within 7 calendar days of receipt of the notice to resume work. Set forth the reasons, and support for such adjustment, in the request.

Upon receipt, the Representative will evaluate the Contractor's request. If the Representative agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the Contractor, its suppliers, or subcontractors, and not caused by weather, the Representative will make an adjustment, excluding profit, as specified in [Section 110.03](#) and [Section 108.06](#), as applicable. The Representative will notify the Contractor of the determination whether or not an adjustment of the contract is warranted.

No contract adjustment will be allowed unless the Contractor has submitted the request for adjustment within the time prescribed.

No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded as specified in [Section 107.16\(c\)](#).

**(d) Required Changes in the Scope of Work.** The Department reserves the right to make, in writing, at any time, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations in the work will neither invalidate the contract or release the surety, and the Contractor agrees to perform the work as changed or altered.

If alterations in the work or changes in quantities do not significantly change the character of the work to be performed under the contract, the work will be paid for at the original contract unit price.

If alterations in the work or changes in quantities significantly change the character of the work under the contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding loss of anticipated profits, will be made as specified in [Section 110.03](#). The basis for the adjustment will be agreed upon before the performance of the work. If a basis cannot be agreed upon, the work will be paid for as extra work as specified in [Section 110.03](#).

The term "significant change in character" applies only to the following circumstances:

- If the work as altered differs materially in kind or nature from that involved or included in the original proposed construction, or
- If an item of work is increased to in excess of 125% or decreased to below 75% of the original contract quantity. Any allowance for an increase in quantity applies only to that portion in excess of 125% of the original contract item quantity or, in case of a decrease below 75%, to the actual quantity of work performed.

When a contract item experiences a significant change in character as a result of a decrease to below 75% of the original contract quantity, the actual quantity of work performed may be paid at an adjusted price, as agreed upon with the Contractor and as approved; however, total compensation will not exceed the contract item's original value. Item value is defined as the original contract quantity multiplied by the contract unit price.

**(e) Adjustment of Lump Sum Items.** The original contract price for a lump sum item, where quantities and unit prices for component items are designated on a component item schedule submitted as specified in [Section 103.01\(a\)](#), will be adjusted only if differing site conditions, as specified in [Section 110.02\(b\)](#), or changes directed by the Representative will significantly increase or decrease the cost of performing the work. If the Representative determines that conditions materially differ and cause an increase or decrease in the cost or time for performance of the work, or if increases or decreases in quantities are required due to a change directed by the Representative, adjusted payment will be made as specified in [Section 110.03](#).

**110.03 ADDITIONAL WORK, EXTRA WORK, AND EXTRA WORK ON A FORCE ACCOUNT BASIS—**

**(a) General.** Work specified in Sections [104.02](#) and [104.03](#) will be paid, if authorized in writing by the District Executive, as additional work, extra work, or extra work on a force account basis. Compensation will be limited to the work authorized in writing and actually performed. Work performed before written authorization will be at the Contractor's risk.

A work order identifying the work to be done and the price to be paid therefore will be processed before or during the performance of the work. To avoid interrupting the project, written authorization to perform work under this section will be in the form of a letter, telegram, mailgram, or other writing from the District Executive, or the Inspector-in-Charge, in writing to the Contractor when confirming an oral authorization of the District Executive, issued within a reasonable length of time.

If the work is to be paid as additional work, the District Executive's writing will refer to the contract price for that work.

If the work is to be paid as extra work and:

- is such that a reasonable price therefore can be negotiated, and
- is such that force account records, if necessary, can be kept by the Department,

the District Executive's writing will authorize commencement of work as extra work. Within 10 calendar days of such authorization, submit a price for the extra work with back-up data to the District Executive for transmittal to the Representative. Pending approval of the price, force account records will be kept as stated below. If the price is accepted, the work will be paid only at the negotiated price, which will not be renegotiated once submitted for acceptance.

If the work is to be paid as extra work and:

- the Contractor and District Executive cannot agree on a tentative price, therefore, and
- the work is such that force account records cannot be kept by the Department,

the District Executive's writing will contain a firm, binding price determined by the District Executive to be fair and equitable for the work to be performed.

If the District Executive and Contractor cannot agree on a tentative price for the extra work and if the work is such that force account records can be kept by the Department, the District Executive's writing will state that such work is to be paid on a force account basis. Force account records will be kept as stated below.

Payment for additional work, extra work, and extra work on a force account basis is accepted as payment in full for all profit and for all equipment, labor, material, field overhead, home office and general administrative expenses, and every other expense incurred as a result of the additional or extra work. No claims for additional compensation of any kind arising out of or relating to such work can be asserted against the Department with the Board of Claims.

**(b) Additional Work.** This includes only the following:

- work of the type already provided by the contract, and
- work for which there is a contract price.

Perform all such work only when authorized in writing by the District Executive, as stated in [Section 110.03\(a\)](#).

All additional work will be paid at the contract price and in the same manner as if it had been included in the original contract.

**(c) Extra Work.** This includes only the following:

- work arising from changes specified in [Section 110.02](#) that result in a significant increase or decrease in the cost of performing that work, or
- work, having no quantity and/or price included in the contract, which is determined by the District Executive to be necessary or desirable to complete the project.

Perform all such work only when authorized in writing by the District Executive, as stated in [Section 110.03\(a\)](#). All extra work will be paid only as stated in [Section 110.03\(a\)](#).

**(d) Force Account Work.** Perform extra work on a force account basis only when directed in writing by the District Executive, as stated in [Section 110.03\(a\)](#).

The Department will keep records of extra work done on a force account basis. Compare force account records with those kept by the Department, at the end of each day or as directed, to ensure accuracy and obtain concurrence. Report any unresolved disagreements with such records to the Representative. Failure to review the Department's records or to report disagreements with such records will create a presumption that the Department's records are complete and accurate.

Payment for extra work performed on a force account basis will be made, as specified herein, upon completion of the work. Progress payments will be made only when an itemized estimated force account of cost is provided, in writing, within 10 working days after receipt of the Department's written authorization to perform the extra work on a force account basis.

**1. Labor.** Wages of forepersons; equipment operators; and skilled, semiskilled, and common laborers directly assigned to the specific operation will be reimbursed, as direct labor costs, at the actual base pay rate and fringe benefit rate paid, for each hour that such employees are engaged in the performance of authorized work and, if directed, overtime as provided for in existing laws and regulations.

Indirect labor costs will be allowed as a percentage of the total base labor cost. However, if certified payroll records indicate that the Contractor's method of making payment is such that fringe benefits are paid directly to the worker, indirect labor costs will be allowed as a percentage of the total direct labor cost. Compute indirect labor costs as follows:

- Social Security Tax at the percentage legally required;
- Medicare Tax at the percentage legally required;
- Unemployment Taxes at the estimated effective rate;
- Workers' Compensation Insurance at the policy percentage rate as adjusted for experience modifiers;
- Contractor's Public Liability Insurance at the policy percentage rate; and
- Contractor's Property Damage Liability Insurance at the policy percentage rate, including coverage for damage due to blasting and explosions, when additional coverage is required on projects involving blasting.

Compute estimated effective rates for the current calendar year by dividing the Contractor's total, company-wide Unemployment Tax payments for the previous calendar year by the total wages and salaries paid to all employees for the same period. Recompute estimated effective rates each year thereafter, for the duration of the project, based on the previous calendar year's total wages and salaries and total tax payments.

**2. Material.** The cost of material used will be reimbursable, including applicable sales tax and transportation costs charged by the material supplier.

**3. Equipment.** Reasonable rental rates for equipment, including trucks and machinery, mutually considered necessary, will be allowed, computed as follows:

**3.a Owned Equipment.** For any Contractor-owned equipment, an hourly rental rate will be determined using the monthly rate listed in the applicable edition of the Rental Rate Blue Book for Construction Equipment (Blue Book), Volume 1. The Blue Book edition in effect as of the first day that work is performed on a specific force account is the edition that will remain applicable throughout the performance of such work. The applicable edition of the Blue Book will be authorized for use statewide on a specified date.

The hourly rental rate for owned equipment will be computed by dividing the monthly rate listed in the Blue Book by 176. Apply to this rate, the area adjustment percentage for the State and the age adjustment percentage for the model year of the piece of equipment, as shown on the Regional Adjustment Maps and in the Rate Adjustment Tables, respectively, located at the beginning of each section of the Blue Book.

An allowance will be made for operating costs by adding, to the above adjusted hourly rate, the estimated operating cost per hour, as listed in the Blue Book, for each hour that the equipment or machinery is actually in operation on the force account work. If equipment or machinery is required at the work site on a standby basis, but is not operating, compensation will be at 50% of the adjusted hourly rate, exclusive of operating costs.

Equipment used for maintenance and protection of traffic on a 24-hour basis will be reimbursed at a daily rental rate, which will be determined by dividing the monthly rate listed in the Blue Book by 22.

Where Contractor-owned equipment or machinery is not listed in the Blue Book, a rental rate will be determined based on the manufacturer's list price for sale (new) of such equipment. In these cases, the monthly rate will be computed as 6% of the sale price (new), and the total hourly rate determined by dividing the monthly rate by 160, when operating, and by 352, when required at the work site on a standby basis, but not operating, with no adjustment percentages applied. For equipment used for maintenance and protection of traffic on a 24-hour basis, with no listing in the Blue Book, the daily rental rate will be computed as 6% of the manufacturer's list price for sale (new) of the equipment divided by 22, with no adjustment percentages applied.

The rates established above include the cost of fuel; oil; lubrication; supplies; necessary attachments; repairs; overhaul and maintenance of any kind; storage; all costs of moving equipment on to and away from the work site, except as specified below; and all incidentals.

The Department will not approve any costs in excess of those outlined above unless such costs were incurred for the convenience of the Department, as directed, and are supported by an acceptable cost breakdown. If a piece of owned equipment, not already on or near the project site, is needed specifically for the force account work, the cost of moving the equipment on to and away from the work site will be reimbursed, provided the equipment will not be used immediately thereafter in the performance of original contract work.

The term "owned equipment," as used above applies to equipment (including trucks and machinery) which the Contractor is required to provide for the proper execution of the contract work, as specified in [Section 108.05\(c\)](#), whether the equipment is actually owned directly by the Contractor, is leased, or has been obtained in some other manner.

**3.b Rented Equipment.** If a piece of equipment needed for the force account work is not of the type required to be provided by the Contractor for the proper execution of the contract work, or if the piece of equipment needed is "owned" but not currently available, and the equipment can be obtained by rental, discuss the need to rent the equipment with the Representative and obtain approval of the rental rate to be paid before renting the equipment for the force account work.

Additionally, if an item is purchased specifically for the force account work, but does not become a permanent part of the work, the item will be considered rented equipment for cost reimbursement purposes. If the item's useful life is completely expended in the performance of the work, as determined by the Representative, the full cost of the item will be reimbursed, including applicable sales tax and transportation costs. Otherwise, that portion of the item's useful life expended in the performance of the force account work will be determined and reimbursement made at a prorated cost.

The Contractor will be reimbursed the actual invoiced cost for rented equipment, plus the cost of transporting the equipment to and from the work site. An allowance will be made for operating costs by adding, to the rental cost, the estimated operating cost per hour, as listed in the Blue Book, for each hour the rented equipment is actually in operation on the force account work. Furnish a copy of the invoice, receipt, or canceled check as support for the rental expense incurred.

Transportation charges for each piece of rented equipment, to and from the site of the force account work, will be paid provided:

- Equipment is obtained from the nearest available source,

- Return charges do not exceed the delivery charges,
- Haul rates do not exceed the established rates of licensed haulers, and
- Charges are restricted to those units of equipment not readily available and not on or near the project.

**4. Services by Others.** For specialized construction analyses, engineering services, or work not considered subcontract work requiring prequalification, the Contractor will be reimbursed the invoice price plus 2% to cover administration and all other costs. Furnish a copy of the invoice, receipt, or cancelled check as support for the expense incurred. The markup on service by others costs will be limited to 2% only, regardless of whether the service was arranged by the Contractor or a subcontractor performing any or all of the force account work. The overhead and profit allowances specified in [Section 110.03\(d\)7](#) are not applicable to service by others costs.

**5. Permits, Bonds, and Insurance.** When specifically required for the force account work, as directed, the securing of permits, bonds, or specialized insurance coverage, of a type not already required by the contract, will be considered service by others, as specified in [Section 110.03\(d\)4](#), and reimbursement of the permit fee, bond price, or insurance premium paid will be allowed plus the specified markup.

**6. Subcontracting.** If any or all of the force account work is to be performed by an approved subcontractor, the work must be considered subcontract work requiring prequalification and the Contractor's need to subcontract the work must be approved. Payment for work performed by a subcontractor, will be determined based on a complete statement of applicable material, labor, and equipment costs, computed as specified herein, plus applicable markups for overhead and profit.

**7. Overhead and Profit.** Except for work considered to be service by others, as specified in [Section 110.03\(d\)4](#), to cover all administration, general and project superintendence, other overhead, bonds, insurance, anticipated profit, and use of small tools and equipment for which no rental is allowed, 25% will be added to the total material cost, 40% will be added to the total labor cost, and 5% will be added to the total equipment cost. If applicable, in addition to the above markups, 8% will be added to the total cost of any force account work performed as approved subcontract work as specified in [Section 110.03\(d\)6](#).

**8. Statements.** Final payment will not be made for work performed on a force account basis until the Contractor has furnished the Representative with an itemized statement of the cost of the work, in the form of a properly completed force account record, detailed as follows:

- Name, classification, work dates, daily hours, total hours, base pay rate, fringe benefit rate, total pay rate and extension for each foreperson; equipment operator; and skilled, semi-skilled, and common laborer;
- Description (year, make, model, capacity, etc.), use dates, daily hours, total hours, rental rates (operating and standby) and extension for each piece of rented equipment and/or description, rental cost, transportation costs (if separate), and extension for each piece of rented equipment;
- Description, quantity, unit price and extension for all materials, applicable sales tax, and transportation costs charged by the material supplier;
- Name, description, unit price and extension for all services by others; and
- Rates (legally required, estimated effective, or policy percentage) paid for property damage and public liability insurance, workers' compensation insurance, unemployment taxes, medicare tax, and social security tax.

Statements of labor costs are to be supported by certified payroll records.

Statements of material costs (including sales tax and transportation costs) and service by others costs are to be supported and accompanied by invoices.

If materials used in the force account work are not specifically purchased for the work but are taken from the Contractor's stock or provided by entities that are divisions, affiliates, subsidiaries or in any other way related to the Contractor or its parent company, furnish an affidavit certifying that the materials were obtained as described above, that the quantity claimed was actually used, and that the price and transportation costs claimed were actually incurred.

**(e) Disputes.** Notwithstanding the provisions specified in [Section 105.01](#), in the event of a disagreement with the District Executive as to whether work is:

- original contract work or additional work,
- original contract work or extra work, or
- additional work or extra work,

notify the Inspector-in-Charge immediately of such disagreement and confirm the disagreement in writing to the District Executive within 10 calendar days. Upon notification to the Inspector-in-Charge of such disagreement, records will be kept daily of all labor, equipment, and materials used from that day forward in the disputed work. Keep and maintain such daily records in the field. Claim no extra costs of any kind for work performed before notifying the Inspector-in-Charge of disagreements with the District Executive's decision. On each Monday, compare records of the previous week's work with those kept by the Department and review for accuracy. Report to the District Executive within 10 calendar days of each review all disagreements with such records or to report disagreements with such records. Refusal or repeated failure to meet to review the Department's records or to report disagreements with such records will create an irrebuttable presumption in favor of the Department that its records are accurate.

Disputes concerning all such work will be resolved by the District Executive and payment will be made on the basis determined by him.

In the event of a disagreement with the decision of the District Executive, comply with provisions specified in [Section 105.01](#) concerning due notice in writing of an intent to file a claim and send a copy of the written notice to the District Executive within the time frame allowed by that section. If written notice is not submitted to the District Executive within 10 calendar days of receipt of the District Executive's decision, daily records of labor, equipment and materials will no longer be kept by the Department and no claim for additional compensation of any kind arising from or relating to the disputed work or the decision of the District Executive can be filed with the Board of Claims.

If due notice in writing is submitted to the District Executive and Deputy Secretary for Highway Administration within the 10 calendar-day period, continue to keep and review daily records, as provided above, until completion of the disputed work.

With the exception of those specific daily records or portions thereof on which written disagreements were filed with District Executive as provided above, any claim for damages filed with the Board of Claims arising out of or relating to the disputed work or the decision of the Secretary can be measured at the hearing solely by the aforementioned daily records kept by the Department.

**110.04 PRICE ADJUSTMENT OF BITUMINOUS MATERIALS**—These requirements provide for a price adjustment, in the form of a payment to the Contractor or a rebate to the Department, for fluctuations in the cost of asphalt cement used in the bituminous materials placed as part of the construction work specified in the following Sections:

[305](#) [360](#) [424](#) [460](#) [471](#) [653](#)  
[309](#) [409](#) [430](#) [461](#) [480](#) [654](#)  
[320](#) [420](#) [431](#) [467](#) [481](#) [656](#)  
[341](#) [421](#) [439](#) [469](#) [482](#) [657](#)  
[342](#) [422](#) [440](#) [470](#) [651](#)

Applicable contract items include any modified standard or nonstandard item where the work to be performed involves placement of one or more of the bituminous materials specified in these Sections.

**(a) General.** These price adjustment provisions apply only to projects where more than 90 tonnes (100 tons) of asphalt cement, including asphalt cement residue contained in emulsions or cut backs, will be used in the bituminous materials specified or indicated for placement.

The Department posts monthly index prices for asphalt cement (PG 64-22) using price data obtained, on the last Wednesday of the preceding month, from a survey of producers who do business in Pennsylvania. Data provided by producers serving the eastern portion of the state is averaged to compute the index price for Zone 1 (Districts 3-0, 4-0, 5-0, 6-0, and 8-0). Data provided by producers serving the western portion of the state is averaged to compute the index price for Zone 3 (Districts 1-0, 10-0, 11-0, and 12-0). The index price for Zone 2 (Districts 2-0 and 9-0) is computed as the average of the index prices for Zone 1 and Zone 3.

The price index in the proposal, IB, will be the index price posted by the Department, determined as specified above, for the month in which the project is advertised.

The price index at the time of placement, IP, will be the index price posted by the Department, determined as specified above, for the month during which the applicable material is placed.

**(b) Price Adjustment Criteria and Conditions.** The following criteria and conditions will be considered in determining a price adjustment for bituminous materials:

**1. No Price Adjustment.** When the ratio IP/IB falls within the range of 0.90 to 1.10, no price adjustment will be made for any bituminous material placed during the relevant month.

**2. Price Rebate.** When the ratio IP/IB is calculated to be less than 0.90, the Department will receive an automatic price rebate determined according to the following formula:

$$P.R. = (0.90 - IP/IB) (Q) (IB)$$

where:

- P.R. = Price Rebate
- IP = Price Index for the last Wednesday of the month preceding the month in which the material is placed (One-Month Price Adjustment Period)
- IB = Price Index in the Proposal
- Q = Quantity tonnes (tons) of Bitumen in Mixture placed

**3. Price Increase.** When the ratio IP/IB is calculated to be greater than 1.10, the Contractor will receive a price increase determined according to the following formula:

$$P.I. = (IP/IB - 1.10) (Q) (IB)$$

where:

- P.I. = Price Increase
- IP = Price Index for the last Wednesday of the month preceding the month in which the material is placed (One-Month Price Adjustment Period)
- IB = Price Index in the Proposal
- Q = Quantity tonnes (tons) of Bitumen in Mixture Placed

**4. Equivalent Tonnage (Tonnage).**

**4.a Square Meter (Square Yard) Basis.** For bituminous mixtures placed on a square meter (square yard) basis, the equivalent tonnage (tonnage) is computed as follows:

Metric Only: Bituminous Mixture Tonnage Placed = (0.000 001) (A) (D) (d)

where:

- A = Surface Area (square meters)  
 D = Design Depth (millimeters)  
 d = Design Density\* (kilograms per cubic meter)

$$\left( \begin{array}{l} \text{Bitumen} \\ \text{Tonnage in} \\ \text{Bituminous Mixture} \end{array} \right) = \left( \begin{array}{l} \text{Bituminous Mixture} \\ \text{Tonnage Placed} \end{array} \right) \left( \begin{array}{l} \text{Percent} \\ \text{Bitumen}^{**} \end{array} \right)$$

English Only: Bituminous Mixture Tonnage Placed = (0.000375) (A) (D) (d)

where:

- A = Surface Area (square yards)  
 D = Design Depth (inches)  
 d = Design Density\* (pounds per cubic feet)

$$\left( \begin{array}{l} \text{Bitumen} \\ \text{Tonnage in} \\ \text{Bituminous Mixture} \end{array} \right) = \left( \begin{array}{l} \text{Bituminous Mixture} \\ \text{Tonnage Placed} \end{array} \right) \left( \begin{array}{l} \text{Percent} \\ \text{Bitumen}^{**} \end{array} \right)$$

\* The Design Density will be obtained from the approved JMF (Form TR-448A, Job Mix Formula Report) for the bituminous mixture placed. The Design Density will be the “Lab Density” listed on the applicable JMF. The Design Density (i.e. Lab Density) obtained from Form TR-448A will be converted to the proper units by multiplying by the density of water, 997.1 kg/m<sup>3</sup> (62.4 pounds per cubic feet).

\*\* The Percent Bitumen will be obtained from the approved JMF (Form TR-448A, Job Mix Formula Report) for the bituminous mixture placed. The Percent Bitumen will be the “Virgin AC%” listed on the applicable JMF.

**4.b Liters per Square Meter (Gallons per Square Yard) Basis.** For bituminous material placed on a liters per square meter (gallons per square yard) basis according to specification, and residue content according to Bulletin 25, the equivalent tonnage (tonnage) is computed as follows:

Metric Only: Bitumen Tonnage = (0.001) (A) (a) (g)

where:

- A = Surface Area (square meters)  
 a = Actual Residue Application Rate (liters per square meter)  
 g = Specific Gravity of Bituminous Material

English Only: Bitumen Tonnage = (0.004164) (A) (a) (g)

where:

- A = Surface Area (square yards)  
 a = Actual Residue Application Rate (gallons per square yard)  
 g = Specific Gravity of Bituminous Material

**4.c Liter (Gallon) Basis.** For bituminous material placed on a liter (gallon) basis, the equivalent tonnage (tonnage) is computed as follows:

Metric Only: Bitumen Tonnage = (0.001) (g) (p) (No. of liters)

where:

g = Specific Gravity of Bituminous Material  
p = % Asphalt in Emulsion

English Only: Bitumen Tonnage = (0.004164) (g) (p) (No. of gallons)

where:

g = Specific Gravity of Bituminous Material  
p = % Asphalt in Emulsion

**5. Expiration of Contract Time.** If bituminous materials or mixtures are placed after expiration of contract time and liquidated damages are chargeable, the value for IP used to compute the price adjustment will be either the price index at the time of actual placement or the price index at the time contract time expired, whichever is less.

**6. Approval.** Should the price index at time of placement, IP, indicate an increase of 50% or more over the price index in the proposal, IB, do not furnish bituminous material for the project without prior written approval.

**7. Payment/Rebate.** The price adjustment will be paid, or rebated, upon approval of a work order to be prepared after completion of all work. Cumulative price adjustments amounting to less than \$500 will be disregarded. Upon written request by the Contractor, partial payments may be made, before total completion, when the unpaid accrued price increase exceeds \$10,000 or once every 12 months.

**8. Inspection of Records.** The Department, through the Office of Inspector General, reserves the right to inspect the records of the prime contractor and its subcontractors and material suppliers to ascertain actual pricing and cost information for the asphalt cement used in the bituminous materials incorporated in the work.

**9. Extra Work.** If applicable items of work, as specified herein, are added to the contract as extra work, as specified in [Section 110.03](#), no price adjustment will be made for fluctuations in the cost of asphalt cement used in any bituminous materials placed in the performance of the extra work, unless otherwise approved. The current price for asphalt cement is to be used when preparing required backup data for extra work to be performed at a negotiated price. For extra work performed on a force account basis, reimbursement for material costs along with the specified overhead and profit markup will be considered to include full compensation for the current cost of asphalt cement.

**110.05 CURRENT ESTIMATE PAYMENTS**—Current estimate payments will be processed based upon assessments made by the Department as work is satisfactorily completed. Processing of estimate payments will begin on the first estimate date established following the Notice to Proceed Date or indicated in the special provisions. No estimate payments will be processed before the Notice to Proceed Date. Current estimate payments exceeding \$1,000 will be processed by the Department at semimonthly intervals, or more frequently, as work progresses. Current estimate payments amounting to less than \$1,000 may be processed monthly. Final payments amounting to between -\$10 and +\$10 will be disregarded. Partial payments do not bind the Department to the acceptance of any material furnished or work performed.

Within 7 calendar days of the receipt of current estimate and final payments from the Department, pay all subcontractors their earned share of the payments, including all retainage, provided the terms and conditions of the applicable subcontract or purchase agreement have been reasonably met.

**110.06 MATERIAL STORED OR ON HAND—**

**(a) Stored Material.** The Representative may authorize payment for certain material, before its incorporation into the work. Upon the Contractor's written request and the Representative's written approval, the Contractor may be paid 100% of the cost of the material, less the pro-rata share of the retainage, if any; provided the quantity of stored material does not exceed the total estimated quantity required to complete the project, the cost is at least \$1,000 but does not exceed 90% of the contract price of the applicable contract item and/or component item, and the accumulative costs do not exceed 25% of the current contract amount. The cost of the material is that amount to be paid by the Contractor as evidenced by invoices. Fabricated structural steel that is to receive a protective coating may be approved for prepayment at 75% of the contract price of the applicable contract item and/or component item, before application of the coating, provided the structure has been fully fabricated and preassembly of field connections has been made.

Payment for stored material will not be authorized until the material has been delivered to the project site or an approved location in the vicinity of the project, is inspected by the Representative to ensure the material is in a satisfactory condition and of sufficient quantity, is stored in an approved manner, and conforms to the requirements specified in this section and [Section 106.03](#). Identify stored material by project designation and set apart from other materials. Material to be stored less than 45 days is not eligible for prepayment. If the Representative determines that, because of required fabrication at an off-site location, it is not feasible or practicable to store material in the vicinity of the project, the material may be stored at an approved location, which is not in the vicinity of the project.

Only end product manufactured material or fully fabricated products that are awaiting installation and/or incorporation into the finished work are eligible for prepayment. Components, elements, or ingredients of a finished product are not eligible for prepayment. Aggregates, cements, and other bulk material are not eligible for prepayment. Living or perishable plant materials are not eligible for prepayment before planting.

Assume full control and responsibility for the protection of the stored material from the elements and against loss or damage by any cause. In the event any stored material becomes lost, stolen, impaired, or damaged while stored, the monetary value of the lost, stolen, impaired, or damaged material as may have been paid for in a current estimate will be deducted from the next estimate. Retain the title to the prepaid material until issuance of the acceptance certificate.

Payment for acceptable stored material will be made on current estimates against the applicable contract item, the quantity being determined by dividing the accepted material cost by the contract unit price and rounding to the lower whole number. This quantity will be proportionately reduced as the material is incorporated into the work. The cost of surplus stored material, though previously paid on a current estimate but not ultimately incorporated in the final measured work, will not be included in the final payment. Surplus stored material is the property of the Contractor. Remove and dispose of this surplus material from the project in a satisfactory manner.

Pay the material provider the amount owing shown on the invoices within 7 calendar days of receipt of payment from the Department. Provide evidence of payment upon request. Failure to make invoice payments as specified will cause the appropriate monies to be deducted from future estimates and will cause the disapproval of further prepayment requests.

**(b) Erected Steel.** Partial payment for structural steel required for bridge construction will include not over 97% of the total estimated mass (weight) of structural steel in a span erected and completely and permanently bolted, riveted, or welded. The total estimated mass (weight) of structural steel will be included in partial payments after painting has been satisfactorily completed.

**110.07 VALUE ENGINEERING—**Upon approval of a value engineering proposal, as specified in [Section 104.04](#), a two-part, lump sum Value Engineering payment will be made in an amount equal to one-half of the actual net cost savings associated with the proposal. Actual net cost savings is defined as the cost difference between the original contract work and the actual cost of the new work.

Compensation will be made only for proposals pertaining to contracts in effect with the submitting Contractor at the time of submission.

An initial contract work order or contract adjustment will be processed to provide payment for one-half of the lump sum value engineering payment, based on the estimated net cost savings as identified in the approved value engineering proposal. Upon completion of all items of work included as part of the value engineering proposal, a final, lump sum payment will be made by processing a follow-up contract work order or contract adjustment. The final, lump sum payment amount will be determined by computing the actual net cost savings associated with the value engineering proposal, based on actual item quantities, taking one-half of the actual net cost savings, and deducting the amount paid under the initial contract work order or contract adjustment.

#### **110.08 FINAL INSPECTION, ACCEPTANCE, AND FINAL PAYMENT—**

**(a) Final Inspection.** When the project is substantially complete, make arrangements for a mutual final inspection. Substantial completion is the date when at least 90% of the contract work has been completed and the project can be used, occupied, or operated for its intended use.

At the time of final inspection, the Representative, along with the Contractor, will establish the following:

- The date of final inspection;
- The list of all physical work items, by stations and in detail, requiring completion and/or correction; and
- A list of all certificates or documents requiring submission, completion, and/or correction.

As established during the final inspection, perform work as necessary for required correction or completion of all physical work items, and complete, correct, and submit all outstanding certificates and documents.

The Contractor will be relieved of responsibility for further physical work, maintenance, and third-party liability only for work items which are satisfactorily completed at the time of, or subsequent to, the final inspection. The Contractor's responsibility for further physical work, maintenance, and third-party liability remains for work items, which are not satisfactorily completed at the time of, or subsequent to, the final inspection. When all physical work has been satisfactorily completed according to the requirements of the contract, the Representative will establish the Date of Physical Work Completion.

Upon receipt and verification, the Representative will establish the date that all required certificates and/or documents are satisfactorily furnished.

When all physical work has been satisfactorily completed and all contractually required certificates and documents have been properly furnished, the date of project acceptance will be established.

If any substantial project section has been completed in advance of the whole, a final inspection will be made of that section and the Contractor will be relieved of responsibility for further physical work, maintenance, and third-party liability on the section of the project as specified in [Section 108.04\(b\)](#). The final inspection will be conducted as specified for the entire project; except, the date of project acceptance will not be established nor will an acceptance certificate be issued.

**(b) Acceptance Certificate.** Upon completion of the requirements specified in [Section 110.08\(a\)](#), an acceptance certificate will be issued, establishing the date on which the project has been satisfactorily completed and certifying that the project is accepted as of that date.

**(c) Final Settlement Certificate Computations.** The Representative will compute the entire amount of each contract work item performed and its contract value. The Representative will notify the Contractor of the amount for each item, including additions to and deductions from the contract quantity for each item of work, all other legal and equitable additions and deductions to be made, amounts previously paid, and the net amount of the final settlement certificate computations. The Representative will request written acceptance of, or exception to, these final settlement certificate computations within 10 days of the notification. Failure to follow the following procedures will waive the right to file a claim.

1. Within 10 days from the date the final settlement certificate computations or revised computations are submitted, notify the Representative, in writing, of acceptance or exceptions.

**1.a** If accepted, or upon failure to accept or take exception within the specified time, the Chief Engineer, Highway Administration will certify to the Secretary, in the final settlement certificate, the entire amount of each work item performed, its contract value, all legal and equitable additions and deductions, and the amounts previously paid. The Secretary will certify to the State Treasurer the amount due in final payment and contract settlement. Under these circumstances, all claims are considered waived by the Contractor.

The Department will forward a copy of the final settlement certificate, setting forth the final settlement date. Copies will also be forwarded to the surety and other appropriate interested agencies. The date the Secretary notifies the Contractor of the final settlement certificate computations, or revised computations, will be the date of contract completion.

**1.b** If not acceptable, notify the District Executive, in writing, of all exceptions. The District Executive will give notification of the acceptance or rejection of the exceptions. The Contractor or surety has the right to appeal, within 10 days of the rejection, to the Director, BOCM. Notification will then be sent, in writing, from the Director, BOCM stating that the claim has been approved or rejected. Where the claim does not involve any disputes specified in [Section 105.01](#), the “date that the claim accrued,” for purposes of filing claims before the Board of Claims, will be the date notification in writing is sent from the District Executive, of the rejection of the claim. In the event of an appeal within 10 days, as provided, the date will be the first notification following the claim rejection by the Director, BOCM.

**2.** During final settlement certificate computations, if the Department determines that the net total amount to be received is actually a negative amount, then prompt reimbursement to the Department for the total amount overpaid is required. In the event of failure to reimburse the Department, the Secretary will take legal measures to secure the amount due. The Department may, in addition, remove the Contractor from its list of approved pre-qualified contractors, according to regulations.

**(d) Final Settlement of Contract.** Final contract settlement will occur when the Secretary certifies to the State Treasurer the amount due in final payment and contract settlement, after making all legal and equitable additions and deductions, including amounts previously paid, according to the contract terms, the terms of written or approved work orders, and the terms of an award, if any, of the Board of Claims. The Department will forward a copy of the final settlement certificate, setting forth the final settlement date. Copies will also be forwarded to the surety and other appropriate interested agencies.

**(e) Final Settlement Certificate on Related Contracts.** Where work has been done for a political subdivision of the State or other agency, by means of approved related contract or contracts under the specifications and Department supervision, the Secretary will forward a copy of the acceptance certificate to the proper authorities. The final settlement certificate in such cases will be certified to the proper authorities for payment, after approval by the Secretary or authorized representative, instead of to the State Treasurer, as provided for work done for the State.

**110.09 RELEASE OF FINAL PAYMENTS**—The Secretary will authorize interest payments on the final payment due, at the rate of 6% per annum, beginning 30 calendar days after the date of physical work completion and running until the date when payment is made. If payment for an item or items is withheld due to a lack of required information from the Contractor, interest charges for the item or items will not begin to accrue until 30 days after the date the Representative receives the information required for payment. For projects financed with bonds, interest will be payable at the rate of interest of the bond issue or at the rate of 10% per annum, whichever is less.

Foreign corporations and their sureties will not be discharged from liability on the bond, nor the bond surrendered, until the corporation files the following with the Department:

- a certificate, from the Department of Revenue, proving the payment in full of all bonus taxes, penalties, and interest; and
- a certificate, from the Bureau of Employment and Unemployment Compensation of the Department of Labor and Industry, as required by the Act of June 10, 1947, P.L. 493 (8 P.S. 23).

**110.10 EVALUATION, DISPOSITION, AND ADJUSTED PAYMENT OF LOW STRENGTH CEMENT CONCRETE**—The following outlines procedures for the evaluation, disposition, and adjusted payment of low strength cement concrete. Use the Concrete Specification Flowchart, [Section 110.10\(e\)](#), as a visual guide to these procedures.

(a) **General.** Low strength, cast-in-place cement concrete will be evaluated using the compressive strength of concrete cylinder or concrete core test specimens. The requirements of this specification do not apply to concrete construction performed as specified in [Section 506](#).

(b) **Definitions.**

- **F'(28-day).** 28-day minimum mix design concrete compressive strength (MPa (pounds per square inch)), as specified in [Section 704, Table A](#).
- **C<sub>28</sub>.** Correction factor for 28-day minimum mix design concrete compressive strength (MPa (pounds per square inch)), as specified in [Section 110.10, Table B](#).
- **F'(c).** 28-day structural design concrete compressive strength (MPa (pounds per square inch)), as specified in [Section 704, Table A](#).
- **C<sub>c</sub>.** Correction factor for 28-day structural design concrete compressive strength (MPa (pounds per square inch)), as specified in [Section 110.10, Table B](#).
- **F'(cyl).** 28-day concrete compressive strength (MPa (pounds per square inch)) of acceptance cylinders representing a specific concrete lot. Determined as the average of the compressive strength testing of two cylinders molded from the same sample.
- **F'(cs).** Minimum allowable concrete compressive strength (MPa (pounds per square inch)), as specified in [Section 110.10, Table A](#).
- **C<sub>cs</sub>.** Correction factor for minimum allowable concrete compressive strength (MPa (pounds per square inch)), as specified in [Section 110.10, Table B](#).
- **CUP.** Contract unit price of in-place concrete as shown in the Bid Items or, for lump sum structure items, the Component Item Schedule. This value represents the cost of the in-place concrete only and does not include the cost of reinforcing steel. The cost of stay-in-place formwork and other incidental items is to be included in the contract unit price.
- **LOT.** Lot size (m<sup>3</sup> (cubic yards)).
- Standard Deviation of the lot measurements, as specified in [Section 106.03\(a\)](#).

**TABLE A**  
**Minimum Concrete Compressive Strength Requirements**

Class of Concrete	Use	Minimum F'(cs) (MPa)	Minimum F'(cs) (psi)
AAA	Bridge Deck	24	3,500
AA	Paving	21	3,000
H.E.S.	Paving	21	3,000
AA	Structures and Misc.	21	3,000
A		17	2,500
C		14	2,000
H.E.S.		21	3,000

**(c) Evaluation, Disposition, and Payment of Low Strength Cement Concrete Using Acceptance Cylinders.** If  $F'(cyl)$ , representing a specific concrete lot, fails to meet the  $F'(28\text{-day})$  for the specified class of concrete, the concrete will be considered deficient. Disposition of the low strength concrete will be determined as follows:

**1.  $F'(cyl) \geq F'(c)$ .** If  $F'(cyl)$  is greater than or equal to  $F'(c)$ , and the 28-day QC test result is greater than or equal to  $F'(c)$ , the concrete lot may be accepted at an adjusted payment. The adjusted payment will be calculated as follows:

$$\text{Adjusted Payment} = \{(A/B \times 0.20) + 0.80\} \times \text{CUP} \times \text{LOT}$$

where:

$$\begin{aligned} A &= F'(cyl) - F'(c) \\ B &= F'(28\text{-day}) - F'(c) \end{aligned}$$

As an alternative, within 2 working days of notification of deficient  $F'(cyl)$ , request permission of the Representative, in writing, to extract concrete cores from the deficient lot of concrete. If this alternative is permitted, the procedures specified in [Section 110.10\(d\)](#) for extracting and evaluating the core specimens will be followed. When coring is approved, final disposition of the low strength concrete will be determined based solely on the compressive strength of core specimens. The acceptance cylinder strength will no longer be used.

**2.  $F'(cyl) < F'(c)$ .** If  $F'(cyl)$  is less than  $F'(c)$ , extract core specimens from the deficient lot of concrete. Notification to core will be given by the Representative within 2 working days after receiving acceptance cylinder test results.

Use the procedures specified in [Section 110.10\(d\)](#) for extracting and evaluating the core specimens.

**(d) Evaluation, Disposition, and Payment of Low Strength Cement Concrete Using Concrete Core Specimens.** Core locations will be randomly selected within the deficient lot of concrete according to [PTM No. 1](#). Obtain cores, under the direction and supervision of the Representative, within 1 week of notification, at no additional cost to the Department.

Obtain three cores if the size of the deficient lot of concrete is less than  $20 \text{ m}^3$  (25 cubic yards). If the deficient lot size is greater than or equal to  $20 \text{ m}^3$  (25 cubic yards), obtain five cores.

Obtain cores according to AASHTO T 24, except as follows:

Obtain 100 mm (4-inch) diameter cores, which are free of reinforcing steel. A pachometer will be used to locate the reinforcing steel. If 100 mm (4-inch) diameter cores free of reinforcing steel cannot be obtained, smaller diameter cores will be allowed provided the core diameter is at least three times the nominal maximum size of the coarse aggregate used in the concrete mix, but not less than 75 mm (3 inches). Obtain approval from the BOCM, MTD, for any deviation from these requirements.

Deliver cores immediately to the Representative. Cores will be delivered to the MTD within 3 working days. Cores will be prepared for testing according to AASHTO T 24 and compressive strength testing will be conducted according to [PTM No. 604](#).

The compressive strength test results of the core specimens will be evaluated to determine material acceptance and adjusted payment. Disposition of the low strength concrete will be determined as follows:

1. **Acceptance.** Material acceptance for the lot of low strength cement concrete will be determined as follows:

**TABLE B**  
**Metric Correction Factor for Quality Index ( $Q_L$ )**  
[Section 106.03\(a\)3.a.6](#)

Class of Concrete	Correction Factors ( $C_x$ )		
	$C_{28}$	$C_C$	$C_{CS}$
AAA	-0.03/s	0.42/s	-0.13/s
AA;H.E.S.	0.14/s	-0.13/s	0.32/s
A	0.25/s	0.32/s	-0.24/s
C	0.21/s	0.21/s	0.21/s

For metric calculation only, add correction factors to quality index ( $Q_L$ ) (which is calculated as specified in [Section 106.03\(a\)3.a.6](#)) to determine the corrected Quality Index  $Q'_L$ :

$$Q_L + C_x = Q'_L$$

Estimate the percentage of material that will fall within the lower tolerance limit (L) by entering  $Q'_L$  in Table A of [Section 106.03\(a\)](#) using the column corresponding to total number of measurements (n).

**1.a PWL F'(cs).** The percent within tolerance relative to F'(cs), PWL F'(cs), will be calculated as specified in [Section 106.03\(a\)3](#) (except the corrected Quality Index  $Q'_L$ , as specified in Table B, will be used in place of  $Q_L$ ), using F'(cs) value for specified class of concrete, as specified in Section 110.10, [Table A](#), as the lower limit and the core strengths as lot measurements.

- If PWL F'(cs) is greater than or equal to 99%, calculate payment as specified in [Section 110.10\(d\)2](#).
- If PWL F'(cs) is less than 99%, concrete will be considered deficient. Remove and replace deficient lot of concrete, at no additional cost to the Department, unless otherwise directed, in writing, by the Chief Engineer. Remove and replace reinforcement steel damaged as a result of the concrete removal process, and not conforming to requirements specified in Sections [709](#) and [1002](#), at no additional cost to the Department.

Under certain specific circumstances, the Chief Engineer may approve allowing deficient concrete to remain in place. This approval may be granted only if all of the following conditions are met:

- The Contractor must request, in writing, that the lot of deficient concrete remain in place.
- An engineering analysis of the deficient concrete is performed at no expense to the Department.
- Adjusted Payment for the lot of deficient concrete left in place will be exactly 5% of the contract unit price (CUP) of the contract item.
- The Contractor provides a signed document waiving the right to pursue a claim as a result of the reduced payment for the lot of concrete.

For deficient incidental concrete meeting the above conditions, this approval may be granted by the District Executive provided all of the conditions detailed above are met.

2. **Payment.** Adjusted payment for lot of low strength cement concrete will be calculated as follows:

**2.a PWL F'(c).** The percent within tolerance relative to F'(c), PWL F'(c), will be calculated as specified in [Section 106.03\(a\)3](#) (except the corrected quality index  $Q'_L$ , as specified in Table B, will be used in place of  $Q_L$ ), using the F'(c) value for the specified class of concrete, as specified in [Section 704, Table A](#), as the lower limit and the core strengths as the lot measurements.

**2.b PWL F'(28-day).** The percent within tolerance relative to F'(28-day), PWL F'(28-day), will be calculated as specified in [Section 106.03\(a\)3](#) (except the corrected quality index  $Q'_L$ , as specified in Table B, will be used in place of  $Q_L$ ), using the 28-day minimum mix design compressive strength requirement for the specified class of concrete, as specified in [Section 704, Table A](#), as the lower limit and the core strengths as the lot measurements.

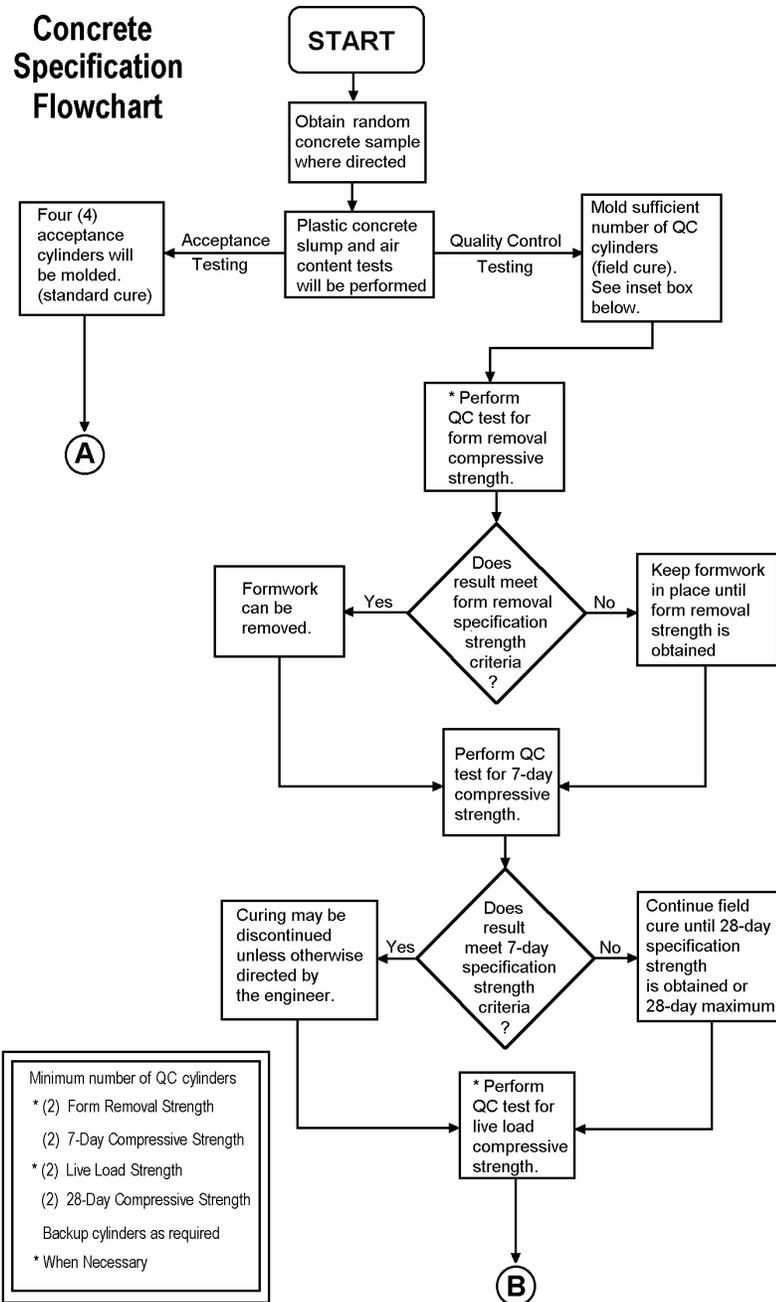
**2.c Payment Equation.** Adjusted payment for the lot will be calculated as follows:

$$\text{Adjusted Payment} = (A + 0.85B + 0.50C) \times \text{CUP} \times \text{LOT}$$

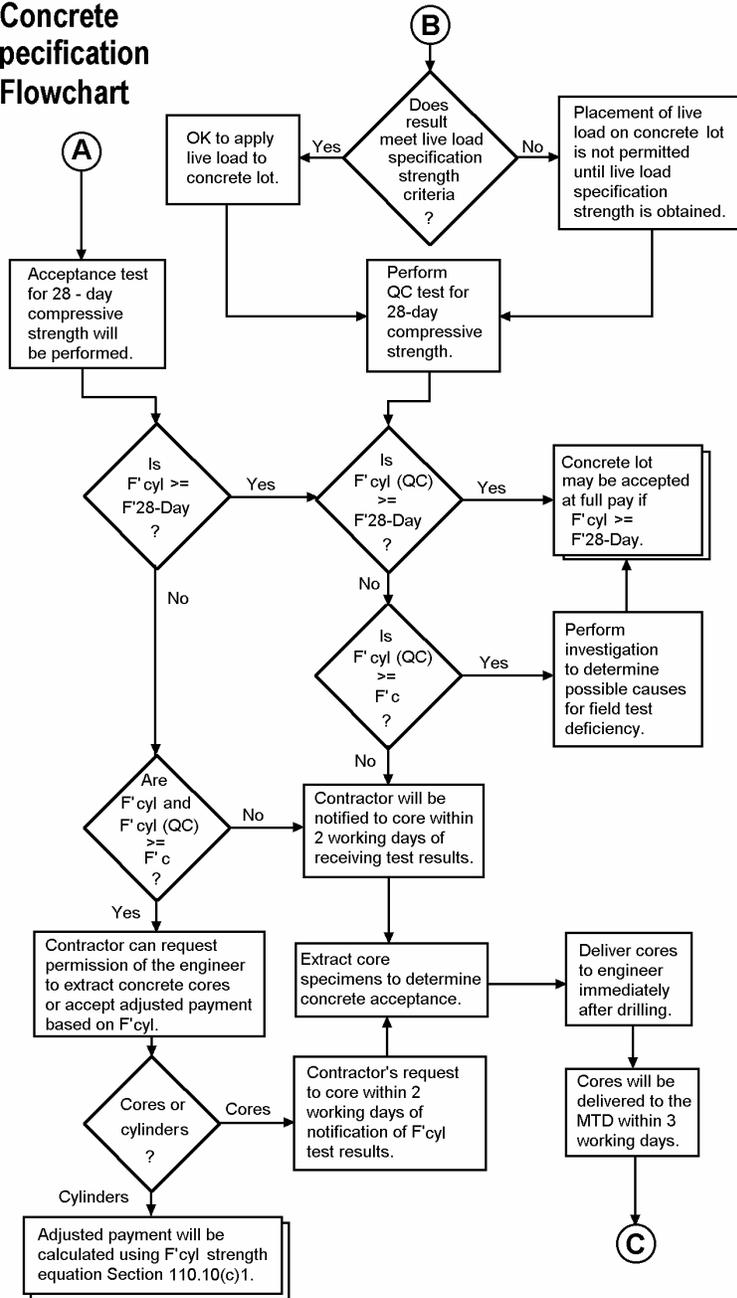
where:

- A = PWL F'(28-day)
- B = PWL F'(c) - PWL F'(28-day)
- C = PWL F'(cs) - PWL F'(c)

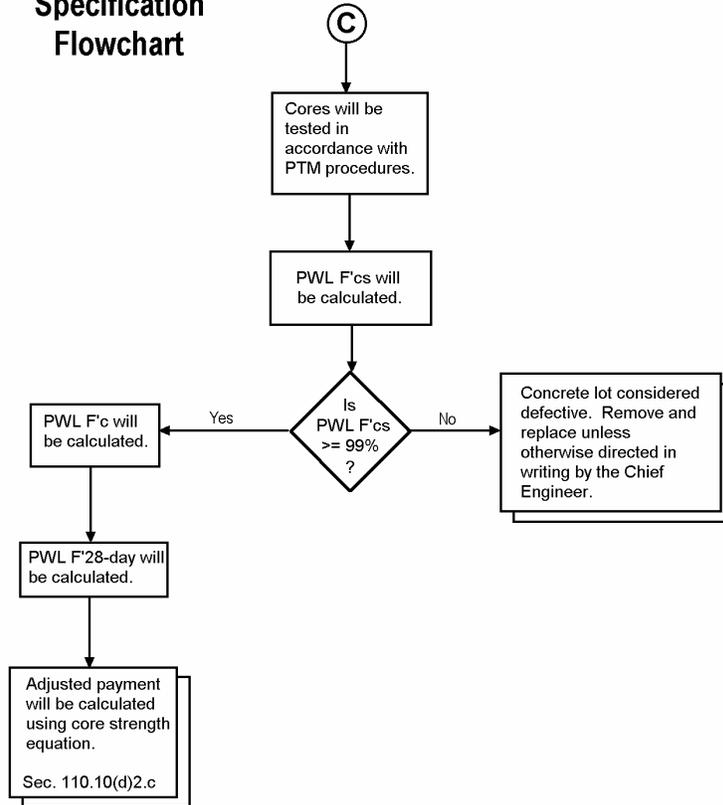
(e) Concrete Specification Flowchart.



### Concrete Specification Flowchart



### Concrete Specification Flowchart



## 110.11 EVALUATION, DISPOSITION, AND ADJUSTED PAYMENT OF PRESTRESSED CONCRETE BEAMS—

(a) **General.** Low strength concrete prestress beams will be evaluated using the compressive strength of concrete cylinder or concrete core test specimens.

(b) **Definitions.**

- **F'(28-day).** 28-day minimum concrete compressive strength (MPa (pounds per square inch)), as specified on the approved shop drawings.
- **F'(cyl).** 28-day concrete compressive strength (MPa (pounds per square inch)), of acceptance cylinders representing a beam. Determined as the average of the compressive strength of two or more cylinders.
- **F'(r).** Minimum concrete compressive strength (MPa (pounds per square inch)), for transfer of prestress as indicated.
- **F'(core).** Concrete compressive strength (MPa (pounds per square inch)) of acceptance cores extracted from a beam. Determined as the average of the compressive strength of three cores.
- **FBP.** Fabricated beam price.

(c) **Evaluation, Disposition, and Payment of Low Strength Prestressed Concrete Beams Using Acceptance Cylinders.** If  $F'(cyl)$ , representing a specific beam, fails to meet the  $F'(28\text{-day})$  for the specified design, the beam will be considered deficient. If  $F'(cyl) < F'(r)$ , the beam will be rejected. If  $F'(cyl) \geq F'(r)$ , perform structural calculation based on  $F'(cyl)$  for the prestressed beam. Calculations must include all the original design considerations and be performed by a Professional Engineer registered in the State. Submit calculations to the Structural Materials Section, MTD for review by the appropriate Engineering District. These calculations must be submitted within 2 weeks of notification that  $F'(cyl)$  was deficient. If the structural calculations show that the beam is not acceptable to the Department, the beam will be rejected. If the calculations show that the beam is structurally acceptable, the adjusted payment will be determined as follows:

$$\text{Adjusted Payment} = [(A/B \times 0.50) + 0.50] \times \text{FBP}$$

where:

$$\begin{aligned} A &= F'(cyl) - F'(r) \\ B &= F'(28\text{-day}) - F'(r) \end{aligned}$$

As an alternative, within 2 working days of notification of deficient  $F'(cyl)$ , request permission of the Structural Materials Engineer, in writing, to extract concrete cores from the deficient beam. If this alternate is permitted, the procedures specified in [Section 110.11\(d\)](#) for extracting and evaluating the core specimens will be followed. When coring is approved, final disposition of the low strength beam will be determined based solely on the compressive strength of core specimens. The acceptance cylinder strength will no longer be used.

(d) **Evaluation, Disposition, and Payment of Low Strength Prestressed Concrete Beams Using Cores.** When coring is approved by the Structural Materials Engineer, obtain cores, under the direction and supervision of the Representative or his or her designate, within 1 week of notification, at no additional cost to the Department.

Obtain three cores, one from each third of the deficient strength beam, according to AASHTO T 24. Obtain cores from the portion of the beam that does not contain prestressing strands. Use a pachometer if necessary to avoid damage to the stirrups or strands. Patch holes left after coring using an approved patching material from a manufacturer listed in [Bulletin No. 15](#) or the approved concrete mix design.

Deliver the cores to the Representative immediately upon drilling. Cores will be delivered to the MTD within 3 working days of obtaining them. No cores will be tested at an age of greater than 50 days. Cores will be prepared for testing according to AASHTO T 24 and compressive strength testing will be conducted according to [PTM No. 604](#).

The  $[F'(\text{core})]$  and standard deviation(s) of three cores will be determined and the results sent to the supplier of the prestress beam. If  $F'(\text{core}) \geq F'(28\text{-day})$ , the beam will be accepted at full payment; no structural analysis is required. If  $F'(\text{core})$  falls below  $F'(r)$ , the beam will be rejected. If  $s \geq 7.0$  MPa (1,000 pounds per square inch) and  $[F'(\text{core}) - s] < F'(r)$ , the beam will also be rejected. If  $s < 7.0$  MPa (1,000 pounds per square inch) or  $[F'(\text{core}) - s] \geq F'(r)$ , perform structural calculations based on  $F'(\text{core})$  and submit these to the Structural Materials Section as specified in [Section 110.11\(c\)](#). If the calculations show that the beam is not structurally acceptable, the beam will be rejected. If the calculations show that the beam is structurally acceptable, the beam will be accepted at an adjusted payment. The adjusted payment will be calculated using the equation specified in [Section 110.11\(c\)](#), except that  $F'(\text{core})$  will be used in place of  $F'(\text{cyl})$ .