

CHAPTER 9 ROADWAY, BASE, STABILIZING AND PAVEMENT ITEMS REVIEW

9.1 PURPOSE

To outline the guidelines and instructions for District Final Estimates Office (DFEO) to use in the final review of the construction categories specified as subgrade, subbase, base, pavement, and friction course.

9.2 PROCEDURE

9.2.1 FINAL REVIEWING - ITEMS GROUPED BY COMMON PROCEDURE

- (A) Square yard or square meter/Plan Quantity Concept Items: The items shown below are paid on an area basis (usually square yards or square meters). The area to be paid for shall be plan quantity subject to the applicable edition of the **Standard Specifications Article 9-3.2** which defines tolerances or deviations for plan errors and plan revisions before adjustments are to be made. Thickness and penalty adjustments are not considered as tolerances. In other words, only plan revisions or plan errors qualify for tolerance.

Stabilized Subbase
Stabilization Type 'B' & 'C'
Cement Treated Subgrade
Reworking Limerock Base
Shaping and Compacting Local Rock Base
Limerock Stabilized Base
Optional Base
Plain Cement Concrete Pavement
Reinforced Cement Concrete Pavement

- (B) Generally speaking, a final review entails verification of properly documented computations for plan revisions or plan errors outside Standard Specification tolerance, and thickness and penalty calculations. Where it is known that plan errors exist, the size of the error must be determined and documented by computations. (a) For **Optional Base** items ~~only~~, the square yard or square meter unit price shall be full compensation for tack coat, prime coat, cover material for prime coat, bituminous material in asphaltic base, and cement in soil/cement. ~~(b) For other base items, a bituminous content pay~~

1 | ~~item adjustment may be paid separately.~~ Note: If the Contractor uses a **Mix**
2 | **In Place** base, such as sand clay, **no thickness adjustment will apply.**
3 | Normally, price adjustments for bituminous material, as provided in **Standard**
4 | **Specifications Subarticle 9-2.1.2**, shall not apply. However, for contracts
5 | that have optional base items with all options being asphalt, the bituminous
6 | adjustment shall apply per Special Provisions of the contract. The maximum
7 | pay shall be 105 percent of surface area. Check thickness calculations to
8 | determine the equivalent square yards or square meters adjustment to be
9 | made (dependent upon specification tolerances).

10 | ~~Adjusted Pay Area = $\frac{\text{Pay Average Thickness} \times \text{Plan Area}}{\text{Plan Thickness}}$~~

12 | (C) Verify computations for areas left in-place at no pay.

13 | ~~(D) Core Averages: For square yard asphalt pay items placed over other asphalt~~
14 | ~~pay items constructed with similar materials **when no line of demarcation**~~
15 | ~~**can be discerned in the cores between the two pay items**, the thickness~~
16 | ~~adjustment will be handled according to the **Standard Specification**~~
17 | ~~**Subarticle 330-16.1**~~

18 | ~~(E)(D)~~ Cubic Yard or Cubic Meter/Certified Truck Capacity Items such as:
19 | Commercial Stabilizing Material (in stabilized subbase)
20 | Limerock, New Material (in reworking limerock base)
21 | Limerock Material (in limerock stabilized base)
22 | Shell Base Material (in shell stabilized base)
23 | Cover Material and Sand Cover Material
24 | Borrow Excavation

25 | (1) Each truck capacity must be certified. If sideboards are added, then
26 | the PE must provide sketches for sideboard dimensions and
27 | calculations verified by DFEO.

28 | (2) Tabulation forms must be submitted with each entry showing time,
29 | date placed, truck number, capacity, or if applicable, weights and void
30 | tickets. Quantity summaries and transfers to computation books must
31 | be verified.

32 | ~~(F)(E)~~ Tonnage/Truck Weights or Automatic Batch Weight Items such as the pay
33 | items below have quantities determined by weighing. These individual truck
34 | weights or automatic printer tickets showing the accumulation of batched
35 | components must be verified for correctness. The spread rate (lbs/sy or

1 kg/m²) in the area of placement for each item must be within 5 percent of the
2 spread rate for that item shown in the plans, or the discrepancy shall be
3 properly explained in the overrun/underrun explanation section of the
4 appropriate computation book page by project personnel. Quantity transfers
5 to computation book must also be verified for each item.

6 | ~~Asphalt Base Course, Type I, II, III~~
7 Turnout Construction (Asphalt)
8 | ~~Type S Asphaltic Concrete~~
9 ~~Type II Asphaltic Concrete~~
10 ~~Type III Asphaltic Concrete~~
11 | ~~Sand Asphalt Hot Mix~~
12 Miscellaneous Asphalt Pavement
13 Superpave
14 Friction Course

15 **9.2.2 FINAL REVIEWING - INDIVIDUAL ITEM PROCEDURES:** In addition to the above
16 general instructions, the following specific points are to be checked when
17 applicable.

18 (A) Commercial Stabilizing Material used in Stabilized Subbase:

- 19 (1) Truck capacities shall be certified.
- 20 (2) Check the tabulation forms, truck numbers, and calculated total
21 volumes.
- 22 (3) Summaries and transfers to the Computation Book shall be verified.
- 23 (4) No separate payment will be made for commercial material that the
24 Contractor elects to utilize in Type 'B' or Type 'C' Stabilization (per
25 ***Standard Specifications Subarticle 160-10.3***).

26 (B) Type 'B' and Type 'C' Stabilization: The quantity of these types shall be the
27 area in square yards or square meters paid for on the basis of plan quantity.
28 If the item of Borrow Excavation is included in the contract, any stabilizing
29 materials obtained from designated borrow areas shall be included in the pay
30 quantity for Borrow Excavation (per ***Standard Specification Subarticle 160-***
31 ***10.4***).

- 32 | (1) ~~Verify~~ Review that the Designer has provided the required supporting
33 documentation for plan quantity and any additions or deletions are

- 1 supported with backup documentation.
- 2 (C) Stabilized Subbase: The area to be paid for shall be the area in square
3 yards or square meters paid for on the basis of plan quantity.
- 4 (1) Verify-Review that the Designer has provided the required
5 supporting documentation for plan quantity and any additions or
6 deletions are supported with backup documentation.
- 7 (D) Cement Treated Subgrade or Roadbed:
- 8 (1) Determine that any deficient areas allowed to be left in place with no
9 pay are deducted from the final pay area and that the theoretical
10 amount of cement is deducted.
- 11 (2) Check tabulation forms for materials utilized. Only the amount
12 authorized to be used by the PE shall be paid for under this item.
- 13 (3) No separate payment will be made for bituminous material applied as
14 a curing membrane.
- 15 (4) No additional compensation will be allowed for labor or materials
16 involved in reconstructing defective and deficient thickness areas.
- 17 (E) Cracking and Resealing Concrete Pavement: The quantity to be paid for
18 shall be the area in square yards or square meters on the basis of plan
19 quantity.
- 20 (1) Verify-Review that the Designer has provided the required supporting
21 documentation for plan quantity and any additions or deletions are
22 supported with backup documentation.
- 23

1 (F) Base Courses:

2 (1) Reworking Limerock Base Courses: The quantity to be paid for shall
3 be: (a) The area in square yards or square meters on the basis of
4 plan quantity, and; (b) The certified truck quantity of new limerock.
5 For new limerock material only, check the total cubic yards or cubic
6 meters using the final measurement books and the Tabulation forms.

7 | (a) Verify-Review that the Designer has provided the required
8 supporting documentation for plan quantity and any additions
9 or deletions are supported with backup documentation.

10 (2) Shaping and Compacting Local Rock Base: The quantity to be paid
11 for shall be the area in square yards or square meters on the basis of
12 plan quantity. The priming required by this pay item is usually paid for
13 separately as outlined in **Standard Specifications Article 220-7 and**
14 **300.**

15 | (a) Verify-Review that the Designer has provided the required
16 supporting documentation for plan quantity and any additions
17 or deletions are supported with backup documentation.

18 (3) Limerock Stabilized Base: The quantity to be paid for shall be the
19 area in square yards or square meters on the basis of plan quantity.
20 and the quantity of limerock material certified loose in truck bodies at
21 the point of placement. Where extra limerock is placed at culverts,
22 etc., as detailed in the plans, the volume of such material shall be
23 included in the quantity of limerock material to be paid for, but the
24 area of base to be paid for shall not be adjusted.

25 (4) Asphalt Treated Permeable Base and Cement Treated Permeable
26 Base: The quantity to be paid for shall be the plan quantity in cubic
27 yards or cubic meters, completed and accepted.

28 | (a) Verify-Review that the Designer has provided the required
29 supporting documentation for plan quantity and any additions
30 or deletions are supported with backup documentation.

31

- 1 (G) Optional Base Courses: This item consists of base construction of one of the
2 optional base materials (15 base groups) shown in the plans typical cross section.
3 The surface area to be paid for shall be plan quantity.
- 4 | (1) Verify-Review that the Designer has provided the required supporting
5 documentation for plan quantity and any additions or deletions are
6 supported with backup documentation.
- 7 (2) Thickness **in excess of** (1/2) inch or 13mm greater than specified
8 **shall not be considered** in payment.
- 9 (3) Thickness adjustments within prescribed Standard Specifications are
10 payable and are not considered as plan errors or revisions. The pay
11 area **shall not exceed 105 percent of surface area**.
- 12 (4) The square yard or square meter unit price and payment shall be
13 full compensation for tack coat, prime coat, cover material for prime
14 coat, and bituminous material in plant mix.
- 15 (5) Price adjustment for bituminous material as provided in **Standard**
16 **Specifications Subarticle 9-2.1.1** shall not apply, unless the plans
17 specify a black base option only. (See Chapter 6).
- 18 (6) Price adjustment for bituminous material (Lump Sum Projects) as
19 provided in the **Special Provisions Subarticle 9-2.1.1** shall apply.
- 20 (a) Limerock Base: The pay quantity shall be the area in square yards or square
21 meters on the basis of plan quantity. In addition, the final pay requirements
22 are verified as follows:
- 23 | (1) Verify-Review that the Designer has provided the required supporting
24 documentation for plan quantity and any additions or deletions are
25 supported with backup documentation.
- 26 (2) Check limits of deficient thickness areas left in place without pay.
- 27 (3) Average thickness shall be calculated for the entire contract as a unit.
28 Check that the thickness does not exceed the normal specified
29 thickness plus one-half (1/2) inch or 13 millimeters. Maximum pay is
30 105 percent of surface area, if bid under Optional Base item. (**Note:**
31 See Special Provisions for any changes).

- 1 (4) Deficient thickness area(s) not included for pay shall appear on the
2 final estimate as follows:
- 3 Square yards or square meters have been deducted due to deficient
4 thickness.
- 5 (5) Core measurements in areas of deficient thickness (no pay) shall not
6 be used to determine average thickness of base material.
- 7 (6) Areas and thickness for connection to back of sidewalks shall not be
8 included in average thickness calculations of square yard or square
9 meter pay area.
- 10 (7) Authorized variable thickness base shall be calculated separately.
11 The area shall not be included when adjusting for depths over or
12 under normal thickness.
- 13 (8) The mathematics of the adjustment shall be checked. The formula
14 used is as follows:

$$\text{Adjusted Pay Area} = \frac{\text{Pay Average Thickness} \times \text{Plan Area}}{\text{Plan Thickness}}$$

- 15
16
- 17 (9) Formulas for converting variable depth base to normal thickness area
18 Where T = Plan Thickness:

$$\text{English} = \text{S.Y.} = \text{C.Y.} \times \frac{36}{9 \times T(\text{inches})} = \text{or} \text{S.Y.} = \frac{\text{C.F.} \times 12}{9 \times T(\text{inches})}$$

$$\text{Metric} = \frac{[\text{C.Y.} \times 3 \times 0.3048]}{[(T \times 25.40) \div 1000]} = 30.1 \times \text{C.Y.} = \text{M}^2$$

- 21 CY=CubicYards
22 3 = 3 feet per CY
23 0.3048 = Metric Equivalent of 1 foot
24 T = Thickness in inches
25 25.4 = Millimeters in 1 inch
26 1000 = Conversion of millimeters to Meters

- 27 (b) Sand Clay Base: The quantity to be paid for shall be the area in square
28 yards or square meters on the basis of plan quantity. Note that this pay item

- 1 will not require a thickness adjustment in accordance with **Standard**
2 **Specifications Article 285-8.**
- 3 | (1) Verify-Review that the Designer has provided the required supporting
4 documentation for plan quantity and any additions or deletions are
5 supported with backup documentation.
- 6 (2) When the location of a materials pit is changed by the DOT, and such
7 change entails an increase in haul distance, such increase in haul
8 distance will be considered as extra work.
- 9 (c) Shell Base: Payment is based on plan quantity. Calculations for average
10 thickness and the method of making adjustment of the pay area due to
11 excess or deficient thickness shall be the same as those outlined for limerock
12 base. Shell Base material is not to be paid for separately.
- 13 | (1) Verify-Review that the Designer has provided the required supporting
14 documentation for plan quantity and any additions or deletions are
15 supported with backup documentation.
- 16 (d) Shell Stabilized Base: The pay quantities shall be plan quantity for the
17 square yards or square meters item and the volume in cubic yards or cubic
18 meters of shell material applied by truck measure.
- 19 | (1) Verify-Review that the Designer has provided the required supporting
20 documentation for plan quantity and any additions or deletions are
21 supported with backup documentation.
- 22 (2) Check all tabulation forms to verify volumes.
- 23 (3) The volume of extra shell material placed at culverts, etc., shall be
24 included in the pay quantity of shell base material.
- 25 (e) Soil Cement Base: The quantity to be paid for shall be based on plan
26 quantity for the square yards or square meters item.
- 27 | (1) Verify-Review that the Designer has provided the required supporting
28 documentation for plan quantity and any additions or deletions are
29 supported with backup documentation.
- 30 (2) Check to see that deductions for deficient areas have been properly
31 made.

1 (3) The contractor will provide written documentation to enable the
2 engineer to perform calculations confirming the design quantity of
3 cement was incorporated into the project.

4 ~~(f) Asphalt Base Courses: These plant mixed base courses shall be designated~~
5 ~~as Asphalt Base Course Type 1, Type 2, and Type 3.~~

6 ~~The quantity to be paid for shall be: (a) the area in square yards or square~~
7 ~~meters on the basis of plan quantity or (b) the quantity in tons or metric tons~~
8 ~~determined as provided in the **Standard Specifications Article 320-2.**~~

9 ~~(1) Verify that the Designer has provided the required supporting~~
10 ~~documentation for plan quantity and any additions or deletions are~~
11 ~~supported with backup documentation.~~

12 ~~(2) Check to ensure that acceptance of the mixture for density, gradation,~~
13 ~~and asphaltic content was in accordance with the applicable~~
14 ~~requirements of **Standard Specification Article 280-6.**~~

15 ~~(3) Check the adjusted area of specified thickness for accuracy and~~
16 ~~compliance with the Standard Specifications~~

17 ~~(4) Check to see that the deficient areas left in place without pay, are~~
18 ~~deducted from the final quantity and are not taken into account in the~~
19 ~~average thickness calculations.~~

20 ~~(5) Criteria for thickness calculations: The maximum allowable thickness~~
21 ~~calculated for the entire job shall be the normal thickness plus;~~

22 ~~½ inch or 13mm~~

23 ~~(Note: The pay area shall not exceed 105 percent of the surface~~
24 ~~area.)~~

25 ~~(g) Criteria for payment thickness: The maximum average thickness upon which~~
26 ~~payment will be made normal thickness plus;~~

27 ~~(1) ½ inch or 13mm.~~

28 ~~(2) The maximum allowable deficiency from the specified thickness shall~~
29 ~~be:~~

- 1 (a) ~~Less than 2½ inches [60mm] ¼ inch [6mm].~~
- 2 (b) ~~2½ inches [60mm] or more ½ inch [13mm].~~
- 3 (3) ~~Verify that the design specified thickness of areas, corrected by~~
4 ~~overlaying additional material, is used in the calculation for contract~~
5 ~~average thickness.~~
- 6 (4) ~~To determine how these deficiencies are to be treated refer to~~
7 ~~**Standard Specification Subarticle 330-15-1.**~~
- 8 (h) Superpave Base: The quantity to be paid will be the area in square yards or
9 square meters on the basis of plan quantity.
- 10 (1) ~~Verify~~ Review that the Designer has provided the required supporting
11 documentation for plan quantity and any additions or deletions are
12 supported with backup documentation.
- 13 (2) Check to see that each Composite Pay Factor unit price adjustment
14 has a Lot Submittal Package representing this adjustment ~~that~~
15 ~~acceptance of the mixture for density, gradation, and asphaltic~~
16 ~~content was in accordance with the applicable requirements of~~
17 ~~**Standard Specification Article 234-6.**~~
- 18 (3) Check to see that the maximum allowable pay for thickness
19 adjustment does not exceed 105 percent of the surface area.
- 20 (H) Miscellaneous Asphalt (Pay Item No. 339-1) is not a pay item which may be used
21 for convenience in resolving leveling and other asphalt roadway problems (per
22 **Standard Specifications Article 339-1** Should the DFEE encounter an improper
23 use of this pay item on the roadway, a Supplemental Agreement shall be required to
24 pay for the improperly used quantity.
- 25 (1) Check to ensure that the pay quantity was based on the spread rate
26 limited to a maximum of 105 percent.
- 27 (I) Superpave Asphaltic Concrete: The quantity in tons or metric tons as provided in
28 **the Standard Specifications Section 334.** (Refer to Final Estimates Preparation
29 and Documentation Manual Chapter 9)
- 30 (1) Check to ensure each Composite Pay Factor unit price adjustment

1 ~~has a Lot Submittal Package representing this adjustment that~~
2 ~~acceptance of the mixture for density, gradation, and asphaltic~~
3 ~~content was in accordance with the applicable requirements of~~
4 ~~**Standard Specification Article 334-5.**~~

5 (J) Asphaltic Concrete Friction Course: The quantity to be paid for will be the weight in
6 tons or metric tons, as determined in accordance with **Standard Specification**
7 **Article 320-2.**

8 ~~(1) Check to ensure that each Composite Pay Factor unit price adjustment~~
9 ~~has a Lot Submittal Package representing this adjustment acceptance~~
10 ~~of the mixture for density, gradation and asphaltic content was in~~
11 ~~accordance with the applicable requirements of **Standard**~~
12 ~~**Specification Article 337-6.**~~

13
14 ~~(2) Verify that the Engineer set the spread rate in writing at the~~
15 ~~Preconstruction or Prepaving Conference.~~

16 (3) Check to ensure that the thickness was based on the plan spread rate
17 ~~set by the Engineer~~ limited to 105 percent of the project average.

18 ~~(4) Check to ensure that the smoothness calculations was in accordance~~
19 ~~with **Standard Specification Subarticle 330-13.5**~~

20
21 (K) Certification of Quantities: All asphalt produced and accepted will have a
22 Certification of Quantities provided each month.

23
24 (1) Check to ensure that for every month asphalt was produced and
25 accepted, a Certification of Quantities has been submitted.

26
27 (2) Check to ensure that all discrepancies have been resolved.

28 **9.2.3 PORTLAND CEMENT CONCRETE PAVING AND REINFORCED CEMENT**
29 **CONCRETE PAVEMENT ITEMS:** In addition to the general instructions listed in
30 (9.2.1) the following specific points are to be checked when applicable.

31 (A) Plain Cement Concrete Pavement (PCCP) and Reinforced Cement Concrete
32 Pavement (RCCP): The pay quantities under this item shall be the area in
33 square yards or square meters, of PCCP and RCCP based on plan quantity
34 completed and accepted. The final area shall be subject to adjustment for
35 over-thickness or under-thickness in accordance with the Standard
36 Specifications.

- 1 | (1) ~~Verify~~Review that the Designer has provided the required supporting
2 | documentation for plan quantity and any additions or deletions are
3 | supported with backup documentation.
- 4 | (2) Check core-out report for representative interval and PE's explanation
5 | of deficient areas removed and replaced or left in place without pay.
- 6 | (3) Criteria for thickness calculations: Cores measured and greater than
7 | specified thickness shall be considered in the average thickness
8 | calculations plus;
- 9 | (a) ~~1/2~~1/2"-inch or 13mm
- 10 | (4) Criteria for payment thickness: The maximum average over-thickness
11 | upon which payment will be made shall be normal thickness plus;
- 12 | (a) 1/4" or 6mm
- 13 | (5) When the plans call for cement concrete pavement which is to be
14 | covered with asphaltic concrete surface course, the total thickness of
15 | the entire combination shall be measured and paid for as plain
16 | cement concrete pavement, ~~except the bituminous material shall be~~
17 | ~~measured and paid for separately.~~
- 18 | (6) Toe bars and dowel bars shall not be included in final pay quantities
19 | as reinforcing steel.
- 20 | (B) Bridge Approach Expansion Joints: This item is paid for per linear foot or
21 | linear meter, on the basis of plan quantity.
- 22 | (1) ~~Verify~~Review that the Designer has provided the required supporting
23 | documentation for plan quantity and any additions or deletions are
24 | supported with backup documentation.

25 | 9.3 LIST OF ~~FIGURES~~ATTACHMENTS FOLLOWING THIS CHAPTER

26 | There are no ~~Figures~~Attachments following this Chapter.