

## Colorado Procedure 12B-23

*Standard Practice for*

### **Contractor's Portland Cement Concrete Paving Process Control Notebook**

#### **1. SCOPE**

- 1.1 This Standard describes the best practice to be used when developing appropriate worksheets and forms in a Process Control (PC) notebook.
- 1.2 The requirements such as, but not limited to: the sample size, specimen size, number of specimens, interpretation of results, reporting significant digits, and precision statements are in the specific test method.
- 1.3 This practice is to be used when quantities exceed 1000 square yards of Item 412.

#### **2. GENERAL PC NOTEBOOK REQUIREMENTS**

- 2.1 The following information shall be included on each page of a worksheet or form:

- 1. Project number, Contract ID, and Project location
- 2. Item number and grading or class
- 3. Supplier's name and address
- 4. Name of the laboratory performing the test
- 5. Date, location, and time the sample was taken or the beginning of the test
- 6. Type of test performed
- 7. Sampling method
- 8. Name of the person taking the sample and performing the test
- 9. Sample ID number
- 10. Quantity of material placed to date at the time of taking the sample
- 11. Specification limits
- 12. Remarks area

#### **3. PAVEMENT TEXTURE WORKSHEET**

- 3.1 When determining the texture depth, the following shall be included on the worksheet:
  - 1. 10 consecutive texture depth readings
  - 2. Average depth

**4. SIEVE ANALYSIS WORKSHEET**

4.1 When performing a sieve analysis and determining the aggregate gradation, the following shall be included on the worksheet:

1. Weight of the tare
2. Wet weight of material before washing
3. The dry weight of material before washing
4. Weight of moisture lost due to drying
5. Percent moisture
6. Dry weight after washing
7. Weight retained on the applicable sieve size
8. Percent passing the applicable sieve size
9. Total weight sieved
10. The percent difference between number 6 & 9
11. Test Date

**5. WATER CEMENTITIOUS MATERIAL RATIO WORKSHEET**

5.1 When determining the water cementitious material ratio the following shall be included on the worksheet:

1. CDOT Form #1373 mix design number
2. Weight of Cement
3. Weight of Fly ash
4. Weight of total cementitious material
5. The moisture content of each aggregate
6. Absorption of each aggregate
7. Free moisture of each aggregate
8. Weight of batch water
9. Weight of total water
10. Water cementitious material ratio

**6. JOINT SEALANT PULL TEST WORKSHEET**

6.1 When determining the joints pull test, the following shall be included on the worksheet:

1. Method Used
2. Pass / Fail

**7. COMPRESSIVE STRENGTH WORKSHEET**

7.1 When determining the compressive strength of a molded cylinder the following shall be included on the worksheet:

1. CDOT Form #1373 mix design number
2. Time of initial cure
3. Minimum & maximum temperature of curing facility
4. Age of specimen
5. 2 diameter measurements & average diameter or established diameter
6. Cross-sectional area
7. Cylinder cap type
8. Maximum load
9. Fracture type (if necessary)
10. Compressive strength of each cylinder
11. Average compressive strength
12. The slump of the fresh concrete
13. Air temperature at the time of sampling
14. The temperature of the fresh concrete
15. Air content of the fresh concrete
16. Unit weight of the fresh concrete including the following:
  - a. Pot tare weight
  - b. Pot volume
  - c. Weight of pot & concrete
17. The yield of the fresh concrete

7.2 When determining the compressive strength of a core the following shall be included on the worksheet:

1. CDOT Form #1373 mix design number
2. Age of specimen
3. 2 diameter measurements & average diameter or established diameter
4. Cross-sectional area
5. Core length
6. L/D ratio & correction factor
7. Core cap type
8. Maximum load
9. Fracture type
10. Compressive strength of each core
11. Average compressive strength

**8. FLEXURAL STRENGTH WORKSHEET**

8.1 When determining the flexural strength the following shall be included on the worksheet:

1. CDOT Form #1373 mix design number
2. Time of initial cure
3. Minimum & maximum temperature of curing facility
4. Age of specimen
5. 3 width measurements & average width
6. 3 height measurements & average height
7. Span length
8. Maximum load
9. Distance between fracture & nearest support
10. Modulus of rupture of each beam
11. Average modulus of rupture
12. The slump of the fresh concrete
13. Air temperature at the time of sampling
14. The temperature of the fresh concrete
15. Air content of the fresh concrete
16. Unit weight of the fresh concrete including the following:
  - a. Pot tare weight
  - b. Pot volume
  - c. Weight of pot & concrete
17. The yield of the fresh concrete

8.2 Correlation between Flexural Strength and Splitting Tensile Strength is developed during the project for each mix design.

**9. PAVEMENT THICKNESS WORKSHEET**

9.1 When determining the pavement thickness, the following shall be included on the worksheet:

1. Thickness
2. The difference in thickness from plan thickness

**10. SAND EQUIVALENT WORKSHEET**

10.1 When determining the equivalency the following shall be included on the worksheet:

1. Type of shaker
2. Age of stock solution
3. Clay reading of each specimen
4. Sand reading of each specimen
5. The sand equivalent of each specimen
6. Average sand equivalent
7. Date Tested

**11. Pavement Smoothness**

11.1 When determining the pavement smoothness, the following shall be included:

1. Distance calibration site
2. Start and stop locations
3. Time of each test
4. MRI of each section

**12. Pavement Texture**

12.1 When determining the pavement texture, the following shall be included on the worksheet:

1. Location of test
2. Diameter of each measurement
3. Average diameter at the test location
4. Macro-texture thickness

**13. SUBMITTAL OF PC NOTEBOOK**

Once the Contractor has completed production of all Portland Cement Concrete on the Project the Contractor shall submit the final PC notebook to the Department in an electronic format. The document shall be in sequential order by date and the file shall be in PDF format. The electronic PC notebook shall be delivered to the Department within 10 working days after the end of production.

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