

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

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GUIDE FOR APPROVAL OF COMPONENT AND SHIP LOOSE MATERIALS PERTAINING  
TO PRECAST AND PRESTRESSED CONCRETE ITEMS

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- 1.0 PURPOSE
  - 1.1 To set forth the procedures for the approval of component materials used in the fabrication of precast and prestressed concrete items and ship loose materials incidental to precast and prestressed concrete items.
  - 1.2 Ship loose materials are defined as the loose materials that are used in conjunction with various precast or prestressed concrete items. These ship loose materials are normally paid for under the same bid item number as the primary precast or prestressed concrete item.
    - 1.2.1 Examples of ship loose materials include bearing pads and shims that are shipped along with prestressed concrete beams. Materials such as (but not limited to) metal soil reinforcing devices, metal attachment devices, bearing pads, shims, and geotextile fabrics that are used in retaining wall systems are also classified as ship loose materials.
- 2.0 SCOPE
  - 2.1 This procedure will apply to all precast concrete fabricators and prestressed concrete fabricators that supply material for use on West Virginia Division of Highways projects. It shall also apply to suppliers of any other precast concrete items (such as retaining wall system suppliers) which require the use of ship loose materials.
- 3.0 SAMPLING

3.1 Approved Sources

3.1.1 With the exception of coarse and fine aggregate, component materials obtained from a West Virginia Division of Highways approved source and component materials pre-tested at the source in a manner set forth in MP 700.00.01 (or other established procedures) may be used at the precast or prestressed concrete fabricator without further sampling and testing.

3.1.1.1 Any ship loose materials that are obtained from an approved source will not require any further sampling or testing. However, the approved source laboratory number shall be listed on all shipping documents related to that material.

3.1.2 All component materials that are not obtained from a Division approved source or otherwise pre-approved shall be sampled at the precast or prestressed concrete fabricator and subsequently tested. Ship loose materials that are not obtained from a Division approved source may be sampled at a variety of locations (material fabricator, precast concrete fabricator, material distributor, or whichever location is most convenient), but they must be sampled, tested, and approved prior to shipment to the project. All materials must meet the requirements of the appropriate section of the specifications.

3.1.2.1 Certain ship loose materials may, at the discretion of MCS&T Division, be accepted based on certification rather than sampling and testing.

3.1.3 When AASHTO M 6 is the applicable specification for fine aggregate, natural sand shall meet the requirements of Class A with respect to material finer than the No. 200 (75  $\mu$ m) sieve. Natural sand shall meet the remainder of the Class B requirements. All other fine aggregate types shall meet all of the requirements of Class B.

3.1.4 Mixing water for precast concrete items shall be tested in accordance with the requirements of section 715.7 of the standard specifications.

3.2 Frequency of Sampling

3.2.1 Aggregates (both coarse and fine) and other component and ship loose materials not obtained from a Division approved source will be sampled by the Division, at the fabricator (or other location as noted in section 3.1.2), as shown in Table 1.

TABLE 1

<u>Material</u>	<u>Sampling Frequency</u>	<u>Sample Size</u>
Cement	Semi-Annually	10 lb (4 kg)
Pozzolanic Additives	Semi-Annually	4 lb (2 kg)
Fine Aggregate	Semi-Annually	25 lb (10 kg)
Coarse Aggregate	Semi-Annually	110 lb (50 kg)
Mixing Water	Semi-Annually	1 quart (1 liter)
Reinforcing Steel	Each Lot	5 ft (2 m)
Prestressing Steel	Only Sampled At The Source	N/A
Hot-Poured Elastic Type Concrete Joint Sealer	Only Sampled At The Source	N/A
Preformed Expansion Joint Filler	Only Sampled At The Source	N/A
Elastomeric Bearing Pads and Shims	Only Sampled At The Source	N/A
Welded Wire Fabric	Each Lot	1 pc. 3 ft x 3 ft (1 m x 1 m)
Concrete Sealant	Only Sampled At The Source	N/A
Steel Inserts and Miscellaneous Steel Hardware	Each Lot	1 piece
Asphalt Plastic Cement	Each Lot or At The Source	1 quart (1 liter)
Metal Soil Reinforcing Strips	Each Lot (Either At The Source or At The Point of Use Prior to Installation)	N/A (NDT Testing of Random Pieces)
Geotextile Fabric	N/A (Accepted on NTPEP Certification)	N/A
Steel Diaphragms	N/A (Inspected At Fabricator)	N/A

3.2.2 The fabricator may not use any component material in the fabrication process until the material has been shown to meet specifications. Until otherwise notified by the Division, the fabricator may continue to use materials that are sampled on a semi-annual basis (and that were approved during the prior sampling period) while these materials are being tested during the current sampling period.

3.2.2.1 An approved laboratory number shall be issued to each ship loose material that meets specifications. Approved laboratory numbers must be issued to all ship loose materials that are to be paid for under the same bid item number as a precast or prestressed concrete item before an approved laboratory number can be issued to that precast or prestressed concrete item.

3.2.3 At the time of component material sampling, the fabricator shall provide the Division with a current copy of each concrete mix design (and a list of all items that are produced from each mix design) that may be used in production of precast or prestressed concrete items for the Division during the next six months.

3.3 Non-Specification Material

3.3.1 If a material is removed from the Division's approved list, use of that material shall be immediately discontinued, and the material shall be sampled and tested in the same manner as any other material that is not on the approved list (i.e. it shall be sampled and tested at the frequency shown in Table 1) until it regains status on the Division's approved list.

3.3.2 If tests conducted on a component material sample indicate that one or more properties of a material do not meet specification requirements, the Division shall immediately notify the fabricator. Upon receipt of this notification (whether written or verbal), the fabricator shall discontinue the use of the component material in question until further notice by the Division.

3.3.3 If an amount of material finer than the No. 200 (75  $\mu\text{m}$ ) sieve, greater than what is allowed by specifications, is present in either the coarse or fine aggregate, then the total amount of material finer than the No. 200 (75  $\mu\text{m}$ ) sieve for the entire mix shall be evaluated. The fabricator shall have previously provided a copy of all mix designs as outlined in section 3.2.3, and the total amount of material finer than the No. 200 (75  $\mu\text{m}$ ) sieve for the entire mix will be evaluated as outlined in section 3.3.3.1.

3.3.3.1 As long as the total percentage of material finer than the No. 200 (75  $\mu\text{m}$ ) sieve present in the entire mix does not exceed the total percent of material finer than the No. 200 (75  $\mu\text{m}$ ) that would exist if both aggregate fractions in the mix contained their specified maximum percentage passing the No. 200 (75  $\mu\text{m}$ ) sieve, then that combination of aggregates will be considered as meeting specifications.

3.3.4 If it is determined that a ship loose material does not meet specification requirements, use of that ship loose material shall not be permitted.

3.4 Re-Testing of Non-Specification Component Material

3.4.1 When tests of the first sample indicate that one or more properties of a material do not meet specification requirements, the Division shall re-sample the material as soon as possible after the fabricator has taken corrective action, and one of the following two scenarios will occur (3.4.1.1 or 3.4.1.2).

- 3.4.1.1 If the second sample meets specifications, the Division will immediately notify the fabricator. Upon this notification (whether written or verbal), the fabricator may resume the use of this component material.
- 3.4.1.2 If the second sample does not meet specifications, the Division will immediately notify the fabricator, but the Division will not re-sample the material in question (from the particular source that did not meet specifications) until the next sampling period specified in Table 1 (and only after corrective action has been taken by the fabricator). Until a sample is obtained that meets specifications, this non-specification component material may not be used.
- 3.4.2 Once a component material in question has been shown to not meet specifications by more than one sample and test, the Division will only re-sample that component material once during the next sampling period (as set forth in Table 1), and one of the following two scenarios will occur (3.4.2.1 or 3.4.2.2).
- 3.4.2.1 The material is sampled again during the next sampling period, and it meets specifications. The use of this component material may be resumed.
- 3.4.2.2 The material in question is sampled again during the next sampling period, and again it does not meet specifications. The Division will not re-sample the material in question again until the next sampling period specified in Table 1 (see section 3.4.2). Until a sample is obtained that meets specifications, this non-specification component material may not be used.
- 3.4.3 For an aggregate in which an excessive amount of material finer than the No. 200 (75  $\mu\text{m}$ ) sieve is the only reason for not meeting specifications, there are two possible scenarios. When the first scenario, given in section 3.3.3.1, occurs, that particular combination of fine and coarse aggregate will be considered as meeting specifications. The second scenario is if the total percentage of material finer than the No. 200 (75  $\mu\text{m}$ ) sieve present in the entire mix exceeds the total percent of material finer than the No. 200 (75  $\mu\text{m}$ ) sieve that would exist if both aggregate fractions in the mix contained their specified maximum percentage passing the No. 200 (75  $\mu\text{m}$ ) sieve. In this case, that particular combination of fine and coarse aggregate will be considered as not meeting specifications. At this point, the Division shall immediately notify the fabricator. Upon receipt of this notification (whether written or verbal), the fabricator shall discontinue the use of this combination of material until further notice by the Division. Situations in which the second scenario occurs will be handled as outlined in section 3.4.4.

- 3.4.4 During any re-sampling of a failing combination of aggregates, both the fine and coarse aggregate shall be re-sampled (so that a current evaluation of the total amount of material finer than the No. 200 (75  $\mu$ m) sieve present in the entire mix may be performed). The Division will re-sample both the fine and coarse aggregate as soon as possible, and one of the following two scenarios will occur (3.4.4.1 or 3.4.4.2).
- 3.4.4.1 If the second sample meets specifications, the Division will immediately notify the fabricator. Upon this notification (whether written or verbal), the fabricator may resume the use of this combination of fine and coarse aggregate.
- 3.4.4.2 If the second sample does not meet specifications (as outlined in section 3.3.3.1), the Division will immediately notify the fabricator, but the Division will not re-sample that combination of fine and coarse aggregate until the next sampling period specified in Table 1 (see section 3.4.2). Until a sample is obtained that meets specifications, this non-specification combination of fine and coarse aggregate may not be used.
- 4.0 ALTERNATE MATERIALS
- 4.1 The prestressed or precast concrete fabricator may use a different source of material if the current material has been shown to not meet specifications.
- 4.1.1 This new material shall be sampled as set forth in section 3.0 or 3.2 (whichever is applicable).
- 4.1.2 In the case of component materials, a new concrete mix design (in the case of prestressed items) containing this material shall be approved by the Division prior to the use of this new material. In the case of precast items, a new mix design containing this material shall be provided to the Division at the time of sampling.
- 4.2 If either a new source of coarse or fine aggregate is used because of an inability of the former combination of material to meet specifications due to an excessive amount of material finer than the No. 200 (75  $\mu$ m) sieve, both the coarse aggregate and fine aggregate portions of this new combination shall be re-sampled and evaluated as set forth in section 3.4.3.



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