



ENGINEERING POLICY BALLOT

Effective:

Level 2

Level two revisions require the approval of the **Assistant Chief Engineer** and the **Federal Highway Administration** only. The **Senior Management Team** is encouraged to review the content and provide comment to the appropriate director. For all other parties, these revisions are posted for information only.

ENGINEERING POLICY BALLOT

Effective: **October 1, 2023**

Issue 1: Subletting of Contract- Limitation Changes

Approval: **Level 2 – Assistant Chief Engineer**

Sponsor: Randy C. Hitt – CM

Summary: Changes the contractor self-perform percentage from no less than 40% to 30% to align with the federal requirement.

Publication: Missouri Standard Specification: Sec 108.1
Engineering Policy Guide: 108.1.1

Issue 2: Poor Quality HMA (401 and 403 mix) When Place in Temperatures Below 40 F.

Approval: **Level 2 – Assistant Chief Engineer**

Sponsor: Dennis Brucks – CM

Summary: Due to past quality issues with 403 and 401 mixes that were placed in temperatures below 40 F, the following specification changes (#1 and #2) are proposed to add minimum temperature restrictions (40 F).

Also included is a minor revision (#3) to the current 402 language for minimum temperature restrictions (50 F). The revision to 402 is simply in the wording and does not change any requirements. This standardizes the language among the three sections.

Publication: Missouri Standard Specifications: Sec 401.7.1, 402.10.1, 403.10.1

Issue 3: Sec 1005 Aggregate for Concrete is being updated to clarify required tests

Approval: **Level 2 – Assistant Chief Engineer**

Sponsor: Sarah Kleinschmit – CM

Summary: Sec 1005 is being updated to clarify which tests are required for concrete aggregate and which tests may be waived based on the results of other tests. This will ensure the quality of concrete aggregate is acceptable at the quarry source and for specific projects.

Publication: Missouri Standard Specifications: Sec 1005

Issue 4: Sec 304 & EPG 1007 Aggregate Base Course

Approval: Level 2 – Assistant Chief Engineer

Sponsor: Sarah Kleinschmit, Brett Trautman & Lydia Brownell – CM

Summary: EPG 1007 processes for the Districts and CM Lab are being updated to establish how comparable and non-comparable tests and material will be handled. Sec 304 is being updated to increase acceptable tolerances of aggregate base rock.

Publication: Missouri Standard Specifications: Sec 304
Engineering Policy Guide: 1007

Missouri Standard Specification: 108.1

108.1 Subletting of Contract. 108.1.1 The contractor shall not sublet, sell, transfer, assign or otherwise dispose of the contract or contracts or any portion thereof, or of any right, title, or interest therein, without written consent of the engineer. Requests for permission to sublet, assign or otherwise dispose of any portion of the contract shall be in writing and accompanied by evidence that the organization that will perform the work is particularly experienced and equipped for such work. In case such consent is given, the contractor will be permitted to sublet a portion thereof, but the contractor's organization shall perform work amounting to no less than ~~4~~30 percent of the ~~total~~original contract ~~cost~~price. Certification or classification of a contractor by type of work performed or consent to a subcontract shall not constitute the Commission's endorsement of the qualifications of the subcontractor or that the particular subcontractor's work will constitute compliance with any other provisions of the contract.

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Engineering Policy Guide: 108.1.1**108.1.1 Review and Approval of a Subcontract Request**

When a contractor desires to sublet a portion of the work, the request will be submitted to the resident engineer on [Request to Subcontract Work \(Form C-220\)](#). The resident engineer, or a designee assigned by the District Construction Engineer, shall perform the following review on all subcontract requests:

1. Check all information on the header for accuracy and determine if the request a) involves a 2nd tier relationship, b) is for a DBE subcontractor, or c) includes any line item with a unit price or quantity that differs from the contract. If any of those three situations apply, then the request must include the subcontract agreement between the prime and the sub. For 2nd tier requests, the agreement between the 1st and 2nd tier subcontractor should also be submitted.
2. For DBE requests, verify that the unit price and quantity matches what is on the DBE Identification Submittal Form. For more information on DBE requests, refer to the article on DBE Subcontracting. If additional DBE subcontractors, suppliers, manufacturers or brokers are proposed by the prime contractor after the project commences, the engineer should work with the contractor to complete the [“DBE Termination, Substitution or Additional Request” form](#) so that the total utilization of DBEs can be accounted for on the project towards MoDOT’s overall statewide DBE goal attainment. In addition, any added DBEs need to be evaluated for CUF.
3. The Line No. and Description should be as shown in the contract. If the Quantity and/or Subcontracted Unit Price differ from the values in the contract, ensure they match what is in the subcontract agreement between the prime and sub. This is necessary since the total percent sublet is determined by subcontracted prices and quantity of the 1st tier subcontracts.
4. Verify that all 1st tier requests include all work they plan to perform, as well as all work they plan to sublet to a 2nd tier sub. The 2nd tier request will only list items the 2nd tier plans to perform. See [EPG 108.1.2 Second Tier Subcontracting](#) and [EPG 108.1.3 Disadvantaged Business Enterprise Subcontracting](#) for more information.
5. Verify that the requested subcontractor is on the approved Subcontractor List on the [Bid Opening Info page](#) under the Documents section and is qualified as a DBE (if the DBE box is checked) on the [MRCC directory page](#). Refer unapproved subcontractors to the [Perform Subcontracting Work webpage](#). If the requested subcontractor is performing a Professional Service, refer to [EPG 108.1.4 Professional Service](#).
6. For Federal Aid projects, verify that the subcontract request is accompanied with a completed Subcontractor Certification Regarding Affirmative Action form, and a document listing the name, address, and telephone number of the subcontractor’s EEO Officer on the subcontractor’s letterhead.
7. Confirm the request has been signed by an authorized representative of the prime contractor.
8. [FHWA 1273](#) (required federal contract provisions) is included in all federal aid contracts, and it is the prime contractor’s responsibility to ensure that all subcontract agreements also include a copy of FHWA 1273. The reviewer should perform a random check on the submitted subcontract agreements to help ensure the prime is meeting this requirement.
9. If all information is correct and all requirements are met, promptly enter the subcontract information into AASHTOWARE Project (AWP). Verify that the subcontract limit has not been exceeded (A pop-up notice will occur in AWP). Apply the MoDOT approval signature to the form. Save the approved subcontract request electronically according to current policy, with an electronic copy sent to the contractor as an attachment to an email.
10. If any of the information on the form is incorrect, or if approval cannot be granted for any reason, the contractor should be notified immediately with an explanation so they can correct the form or take other actions to proceed without delay. Once the subcontract request is approved and work begins, work performed by the subcontractor will be recorded in AWP

daily on the Daily Work Reports (DWR) work items tab, with the subcontractor designated on the contractor line.

Subletting Limitation

The self-perform requirement for prime contractors is ~~set at~~ a minimum of ~~40~~30% by specification which is also the federal requirement. ~~The minimum requirement is tracked by the C-220 request to subcontract forms. No self-perform re-evaluation will be required for contract change order adjustments. The prime contractor is allowed to purchase materials for subcontractor's work. The material purchased by the prime for the subcontractor should be clearly indicated on the C-220 subcontract form.~~ The federal requirement for prime contractor self-perform work is 30%. The reason MoDOT has a higher requirement is to discourage project brokering. Project brokering is when a large contractor low bids numerous projects and then subcontracts the work to local contractors at a lower price. This practice reduces competition which is detrimental to MoDOT and our small contractors.

However, there are circumstances whereby the nature of the work the 40% self-perform requirement is not practical. For example, if a project is comprised of 50% bridges and 50% roadway work, the bridge contractors may bid as the prime and subcontract the roadway work. Alternately, the roadway contractor may bid as a prime and subcontract the bridge work. The project may have a 15% DBE goal and some specialty work items are typically not performed by a prime contractor. So, from this example the most that one of these bidders can self-perform is 35%. The only way to achieve 40% self-perform is to have the prime put the subcontractor's workers on their payroll or for the prime to purchase all the materials for the subcontractors. Neither of these options are beneficial to MoDOT or the contractor. So, the core teams should look at the nature of the work and if warranted can lower the requirement to 30% by JSP. A non-standard JSP is available to lower the requirement to 30%.

It may have not been obvious when the project was being developed that the self-perform requirement should have been lowered. In this situation the 40% requirement may be reduced to 30% by change order. The Resident Engineer should carefully review the nature of the work and circumstances of what work cannot be readily self-performed. The Construction and Materials Liaison should be consulted and concur on the self-perform requirement being lowered. The change order language to be used is as follows:

"This change order hereby deletes the limitation in Sec 108.1.1 that requires the contractor to self-perform no less than 40 percent of the total contract cost. In lieu of this requirement, the contractor shall self-perform no less than 30 percent of the total original contract price, as stated in the contract under FHWA 1273.

This change is being made at the contractor's request in order to give the subcontractors the flexibility to include the cost of materials in the work they perform. This change also benefits the Commission as it simplifies internal processes for materials inspection and testing yet retains the FHWA limit on subcontracting."

Proposed Specification Changes to add minimum temperature limits for placing HMA (401 and 403)

Due to past quality issues with 403 and 401 mixes that were placed in temperatures below 40 F, the following specification changes (#1 and #2) are proposed to add minimum temperature restrictions (40 F).

Also included is a minor revision (#3) to the current 402 language for minimum temperature restrictions (50 F). The revision to 402 is simply in the wording and does not change any requirements. This standardizes the language among the three sections.

Change #1:

Delete Sec 403.10.1 and substitute with the following:

403.10.1 Weather Limitations. No mixture shall be placed on any wet or frozen surface. No mixture shall be placed when either the air temperature or the temperature of the surface on which the mixture is to be placed is below 40 F. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

Change #2:

Delete Sec 401.7.1 and substitute with the following:

401.7.1 Weather Limitations. No mixture shall be placed on any wet or frozen surface. No mixture shall be placed when either the air temperature or the temperature of the surface on which the mixture is to be placed is below 40 F. ~~Bituminous mixtures shall not be placed on any wet surface or frozen pavement.~~ Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

Change #3:

402.10.1 Weather Limitations. ~~Bituminous mixtures~~ No mixture shall ~~not~~ be placed on any wet or frozen surface. ~~Bituminous mixture~~ No mixture shall ~~not~~ be placed when either the air temperature or the temperature of the surface on which the mixture is to be placed is below 50 F, except as otherwise allowed in Sec 402.10.1.1. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20.

SECTION 1005

AGGREGATE FOR CONCRETE

1005.1 Scope. This specification covers aggregate to be used for concrete construction.

1005.2 Coarse Aggregate.

1005.2.1 All coarse aggregate for concrete shall consist of sound, durable rock, free from objectionable coatings and frozen and cemented lumps. The percentage of deleterious substances shall not exceed the following values, and the sum of percentages of all deleterious substances, exclusive of the material passing No. 200 sieve (Gradations D and E), and thin or elongated materials~~Items 5 and 6~~, shall not exceed 6.0 percent. For crushed stone, the percentage of wear shall not exceed 50 when tested in accordance with AASHTO T 96.

Deleterious Material	Percent by Weight
Deleterious Rock	6.0
Shale	1.0
Chert in Limestone	4.0
Other Foreign Material	0.5
Material Passing No. 200 Sieve Gradations D & E	2.5 ^a
Thin or Elongated	5.0

^a Value may be raised to 3.0 percent, providing the material passing the #200 sieve in the fine aggregate is less than or equal to 1.0 percent.

1005.2.1.1 The above requirements will apply to each size or fraction of aggregate produced.

1005.2.1.2 Crushed stone shall be obtained from rock of uniform quality. Rock tested for initial approval, source samples, and production samples shall meet the requirements below for Los Angeles abrasion, absorption, and soundness~~be in accordance with the criteria below. The absorption and soundness test results may be waived provided a durability factor of 75 percent or higher is achieved. Source approval and production samples shall also meet the following criteria:~~

Property	Value
Los Angeles Abrasion, AASHTO T 96, percent loss, max	50
Absorption, AASHTO T 85, percent, max.:	
(a) Portland Cement Concrete Pavement	<u>2.0</u> —
(b) Portland Cement Concrete Masonry	3.5
Soundness, MoDOT Test Method TM 14, percent loss, max.:	
(a) Portland Cement Concrete Pavement	<u>16.0</u> —
(b) Portland Cement Concrete Masonry	18.0
Durability Factor, AASHTO T 161 Procedure B, percent, min:	
(a) Portland Cement Concrete Pavement	75 ^a
(b) Portland Cement Concrete Masonry	<u>75</u> ^b --

^a Approval will be based on maximum aggregate size produced that meets durability requirements.

^b The maximum top size of the aggregate tested shall be 1 inch or greater.

1005.2.1.3 Gravel shall be washed and shall be in accordance with the criteria below for initial approval. Source approval and production samples shall also meet the following criteria:

Property	Value
Los Angeles Abrasion, AASHTO T 96, percent loss, max.	45
Absorption, AASHTO T 85, percent, max.	4.5
Soundness, MoDOT Test Method TM 14, percent loss, max.	18.0

1005.2.1.4 The engineer reserves the right to use additional test methods, such as ASTM C 586, AASHTO T 161 or other appropriate tests, to measure the soundness and durability of aggregate for use in concrete when deemed necessary.

1005.2.2 Coarse aggregate for concrete pavement or base course shall be crushed stone or porphyry.

1005.2.3 Grade F Aggregate. Coarse aggregate for Portland cement concrete pavement, base and approach slabs for bridges that is not produced from the Burlington, Keokuk, Cedar Valley (formerly Callaway) or Warsaw limestone formations, which is obtained from sources in the following areas shall have a maximum top size of $\frac{3}{4}$ inch:

(a) State of Kansas, Iowa and Nebraska.

(b) Counties of Missouri – Adair, Andrew, Atchison, Bates, Benton, Buchanan, Caldwell, Carroll, Cass, Cedar, Chariton, Clay, Clinton, Daviess, DeKalb, Gentry, Grundy, Harrison, Henry, Holt, Jackson, Johnson, Lafayette, Linn, Livingston, Mercer, Macon, Nodaway, Pettis, Platte, Putnam, Randolph, Ray, St. Clair, Saline, Schuyler, Sullivan, Vernon and Worth.

1005.2.4 Grade F shall be obtained from rock of uniform quality. Rock tested for initial approval, source samples, and production samples, shall meet the requirements below for Los Angeles abrasion, absorption, soundness, and bulk specific gravity shall be in accordance with the criteria below. The absorption, soundness, and bulk specific gravity test results may be waived provided a durability factor of 75 percent or higher is achieved.

<u>Property</u>	<u>Value</u>
<u>Los Angeles Abrasion, AASHTO T 96, percent loss, max.</u>	<u>50</u>
<u>Absorption, AASHTO T 85, percent, max.</u>	<u>1.5</u>
<u>Soundness, MoDOT TM 14, percent loss, max.</u>	<u>10.0</u>
<u>Bulk Specific Gravity, AASHTO T 85, min.</u>	<u>2.58</u>
<u>Durability Factor, AASHTO T 161 Procedure B, percent, min:</u>	<u>75^a</u>

^a Approval will be based on maximum aggregate size produced that meets durability requirements.

1005.2.4-5 Coarse aggregate for concrete for structures, except as specified in Sec 1005.2.5, may be gravel or crushed stone. Coarse aggregate for Class B, B-1, B-2, MB-2 or Seal

concrete shall be in accordance with either Gradation D or E. Coarse aggregate for Class A-1 concrete shall be in accordance with Gradation E.

Gradation D	Percent by Weight
Passing 1-inch sieve	100
Passing 3/4-inch sieve	85-100
Passing 3/8-inch sieve	15-55
Passing No. 4 sieve	0-10

Gradation E	Percent by Weight
Passing 3/4-inch sieve	100
Passing 1/2-inch sieve	70-100
Passing 3/8-inch sieve	30-70
Passing No. 4 sieve	0-20
Passing No. 8 sieve	0-6

1005.2.5-6 Coarse aggregate for ornamental concrete shall be crushed stone in accordance with [Sec 1005.2.4](#), Gradation E. However, the use of coarse aggregate containing more than 2 percent chert will not be permitted.

1005.3 Fine Aggregate.

1005.3.1 Fine aggregate for concrete shall be a fine granular material naturally produced by the disintegration of rock of a siliceous nature, or shall be manufactured from an approved limestone or dolomite source as defined in [Sec 1005.2](#). By specific approval from the engineer, chat sand produced from flint chat in the Joplin area or fines manufactured from igneous rock or chert gravel may be used. Fine aggregate shall be free from cemented or conglomerated lumps and shall not have any coating of injurious material. The percentage of deleterious substances shall not exceed the following values:

Deleterious Material	Percent by Weight
Clay Lumps and Shale	0.25
Coal and Lignite	0.50
Total Lightweight Particles, Including Coal and Lignite	0.50
Material Passing No. 200 Sieve	
(a) Natural Sand	2.0
(b) Manufactured Sand	4.0
Other Deleterious Substances	0.10

1005.3.2 The total lightweight particle requirement will not apply to angular chert sand or manufactured sand.

1005.3.3 Fine aggregate shall produce a mortar having a seven-day compressive strength of at least 90 percent of a control mortar developed at the same proportions, using standard Ottawa sand. Tests shall be performed in accordance with AASHTO T 106. Cement used in the tests shall be Type I, in accordance with [Sec 1019](#). AASHTO T 106 may be waived provided the fine aggregate produces a glass color standard lighter than Organic Platte No. 3, in accordance with AASHTO T 21.

1005.3.4 Fine aggregate for ornamental concrete shall be free from coal and lignite material when tested in accordance with AASHTO T 113.

1005.3.5 All fine aggregate for PCCM shall meet the following gradation requirements:

SECTION 304**AGGREGATE BASE COURSE**

304.4.2 Quality Assurance. The contractor's QC test results and the engineer's QA test results shall meet the specifications and the following. For Type 1 and 5 base the contractor's compaction standard tests shall compare within 3.0 pounds of the maximum density of the MoDOT determined compaction standard. For Type 7 base the contractor's average DCP penetration index shall compare within 0.1 inches per blow of the MoDOT determined average penetration index. For retained samples, the contractor's test results and the engineer's test results shall compare within the following limits:

(a) The total deleterious material shall be within 2.0 percentage points.

(b) The plasticity index shall be within 2.

(c) The gradation test results shall compare within the following limits:

Sieve	Tolerance (%)
1 1/2-inch	± 5.0
1-inch	± 5.0
3/4-inch	± 5.0
1/2-inch	± 5.0
No. 4	± 4.0
No. 8	± 4.0
No. 10	± 3.0
No. 30	± 3.0
No. 40	± 2.0
No. 100	± 2.0
No. 200	± 1.0

Category:1007 Aggregate for Base

1007.2 Acceptance

Acceptance is based on routine tests in the field to ensure compliance with [Sec 1007. Quality Control \(QC\) and Quality Assurance \(QA\) samples](#). Samples are to be taken at destination or at the source of aggregate production by MoDOT inspectors [and contractor personnel](#) at intervals [in accordance with Sec 304.4 of one per 2,000 tons](#).

1007.4 Laboratory Testing for Sec 1007

1007.4.1 Types of Samples Tested

1007.4.1.1 Initial Approval Sample

Tests consist of specific gravity, absorption and Los Angeles abrasion. The minimum time required for completion of tests is four working days from the date received. Test results and calculations shall be recorded through AWP.

1007.4.1.2 Compaction Standard

[District initial tests shall consist of sieve analysis, deleterious and plasticity index. Initial tests shall comply with Sec 1007 prior to sending to the Central Office Laboratory. Samples that do not comply with Sec 1007 should be sent with a letter of approval from the Engineer of Record.](#)

[Central Office Laboratory](#) Tests consist of sieve analysis, [plasticity index, deleterious content](#), maximum density, [and optimum moisture, and plasticity index](#). The minimum time required for completion of the [test](#) is 5 days from the date received. Test results and calculations shall be recorded through AWP.

1007.4.2 [Test Procedures](#)

[1007.4.2.5 Compaction Standard](#)

[Aggregate shall be tested in accordance with AASHTO T 99, Method "C".](#)

1007.4.2.56 Deleterious Content

The percentage of deleterious substances in coarse aggregate is to be determined according to [TM-71, Deleterious Content of Aggregate](#). [Where field determinations show a total deleterious content of 5.0 percent or less for Type 1 and 5 base aggregates, the deleterious content may be inspected visually. Otherwise, the sample is to be tested for deleterious content.](#)

[1007.4.2.65 Compaction Standard](#)

[Aggregate shall be tested in accordance with AASHTO T 99, Method "C".](#)

[1007.4.3 Central Office Laboratory Approval Procedures](#)

[Samples from a quarry or other source without a project number or contract ID shall be Informational.](#)

[If Central Office Laboratory gradation, deleterious and PI results compare with the Quality Assurance tolerances in Sec. 304.4.2 District initial results, within the limits shown in Table 1, Central Laboratory will move forward with completing on of the compaction standard. If results do not compare with the Quality Assurance tolerances in Sec. 304.4.2 table, send the sampler a notification that Central Office Laboratory will send the sampler a notification that a compaction standard will not be completed not be performing a compaction standard and a new sample should be submitted for testing. Central Laboratory will authorize the non-comparing sample as informational and should be marked as complete within the sample record and note in AWP remarks, that a compaction standard was not](#)

completed because test results were not within tolerance. Central Laboratory should retain the sample ~~should be retained~~ for three months unless ~~for the Districts unless requested~~ the material to be retained longer.

Samples from a quarry or other source **with a** ~~P~~project number or contract ID shall indicate Acceptance or Rejection. Samples that do not comply with Sec 1007 should be sent with a letter from the Engineer indicating the project number or contract ID, and their intent to use the non-compliant material.~~If the District is submitting a failed sample for use on a project, the sampler needs to notify the lab of the submittal as per the Engineer of Record's approval.~~ If Central Office Laboratory gradation, deleterious and PI results compare with District test~~initial~~ results, within the Quality Assurance tolerances in Sec. 304.4.2~~limits shown in Table 1~~, Central Laboratory will complete~~move forward with completion of~~ the compaction standard and mark the sample record as accepted. If results do not comply with the tolerances in Sec. 304.4.2 ~~table~~, Central Laboratory will send the sampler a notification that Central ~~O~~Laboratory will not be performing a compaction standard and a new sample should be submitted for testing. Central Laboratory ~~We~~ will only complete~~run~~ a compaction standard on non-comparing material if the Engineer ~~of Record~~ provides a remark in AWP indicating their intent to use the material and its intended use on the project~~for the project provides a note stating they intend to use the material without comparing results.~~ Central Laboratory should retain the sample for three months unless the Districts request the material be retained longer.~~The sample should be retained for three months for the Districts unless requested to be retained longer.~~

Table 1—Tolerance limits

<u>Sieve</u>	<u>Tolerance (%)</u>
<u>1 1/2-inch</u>	<u>± 5.0</u>
<u>1-inch</u>	<u>± 5.0</u>
<u>3/4-inch</u>	<u>± 5.0</u>
<u>1/2-inch</u>	<u>± 5.0</u>
<u>No. 4</u>	<u>± 4.0</u>
<u>No. 8</u>	<u>± 4.0</u>
<u>No. 10</u>	<u>± 3.0</u>
<u>No. 30</u>	<u>± 3.0</u>
<u>No. 40</u>	<u>± 2.0</u>
<u>No. 100</u>	<u>± 2.0</u>
<u>No. 200</u>	<u>± 1.0</u>

1007.4.43 Sample Record

The sample record shall be ~~authorized~~~~completed~~ in AASHTOWARE Project (AWP) in accordance with ~~AWP MA Sample Record, General~~, and shall indicate acceptance, ~~informational~~~~qualified~~ acceptance, or rejection. Appropriate remarks, as described in ~~EPG 106.20 Reporting~~, are to be included in the remarks to clarify conditions of acceptance or rejection. Test results shall be reported on the appropriate templates under the Tests tab.