

**3340000 – SUPERPAVE ASPHALT CONCRETE, ACCEPTANCE OPTIONS
COMMENTS FROM INDUSTRY REVIEW**

David C. O'Hagan, PE
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Comment

I believe my staff has already approved this - I must trust them.

Response:

No action necessary.

Steve James
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Comment

In section 334-5.10.6, second paragraph last two sentences. Do we want to approve the contractors rolling procedure every time they change. We do not do that now. The spec. makes them meet density requirements.

Response:

This section is concerned with areas where density measurements will not be made. Therefore, an approved rolling pattern is required to assure that reasonable compaction is achieved. If the Contractor has an approved rolling pattern and chooses to deviate from that pattern, then the Contractor will need to get the Engineer's approval.

Additionally, the wording for "Acceptance Testing Exceptions" is different between 334-5.1.2 and 334-5.10.6 and should be the same. The second to last sentence of 334-5.10.6 will be removed so that both sections are the same.

Bob Dion
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Comments:

Please add 'as modified herein' after Section 330 in the second paragraph of 334-1. The fourth paragraph mentions that 330-2 does not apply to Option 2.

Response:

The following wording will be added after “Section 330” in the second paragraph; “except as modified herein.”

Howie Moseley
District 2 Bituminous Engineer

Comments:

334-4: In the second paragraph, the wording "for traffic level C through E mixtures" was added in the first line. This wording needs to be deleted.

Response:

Additional wording will be added: “For Option 1 mixture acceptance....” to clarify that Process Control testing does not apply to Option 2 acceptance.

334-5.1.2: The word "testing" needs to be added to the end of the last paragraph of this section.

Response:

The word “testing” will be added.

Table 334-5: Need to keep the 2.3 - 6.0% air void limits for fine graded mixtures. Also need to add a minimum density for traffic level D & E fine graded mixtures of 92%.

Response:

Both of these issues were discussed extensively at the specification committee and District Bituminous Engineers’ meetings. The committee agreed to not change the proposed specification to the values mentioned above. No changes will be made.

334-5.4.4: In the fourth paragraph, it needs to be clearly stated that the contractor will notify the engineer that the lot was terminated and the appropriate corrections made before production is resumed. This is currently only implied by the wording order.

Response:

The following sentence will be added in the fourth paragraph to provide further clarification: “Do not resume production until appropriate corrections have been made.”

334-5.10.1: In the fifth line of this section the word "a" needs to be added b/n as and period to read clearly.

Response:

The word "a" will be added.

General comment to the philosophy of this spec. Option 1 is for the mix that is being used for interstates and other higher traffic levels. Option 2 is for lower traffic levels in areas that are not as critical. Why is the minimum density for fine graded mixtures higher in option 2 than option 1? Wouldn't we want higher density levels to coincide with higher traffic levels???

Response:

The Department wants higher density levels for higher traffic levels and the current specification reflects this. The target density for fine graded mixtures for Option 1 acceptance is 93% Gmm with a lower limit of 91.8% Gmm. For Option 2 acceptance, the target is 92% Gmm or higher.

Jim Warren
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Comment

The Asphalt Industry would like to commend the FDOT for working closely with our ACAF Specifications Committee on many of the changes made to this specification. Our small group that met with FDOT personnel was very pleased with the excellent working environment that was so conducive to a great discussion on these issues. All in all, we all felt this was a win-win result.

Looking at the actual proposed changes that were sent for industry review, we notice one major departure than what the joint working group agreed to - Inclusion of the Optional Acceptance programs inside the 334/337 specification. It is our opinion that this will cause confusion and miss-interpretation in the field. The joint DOT/Industry working group that reviewed many of the proposed specs recommended keeping the R-squared specification as a separate document. Since this R-squared specification is not yet proven in actual use, it will most likely need to be modified. As a free standing developmental specification it would be easy to edit/adjust/modify as needed to improve it over time. If it is incorporated into the regular specifications 234, 334, and 337 it would require changes to these specifications putting yet more editions of these on the street. It may make sense from a specifications viewpoint to include it, but from an application standpoint in the field it does not and will most likely be the source of more confusion, errors, and potential claims.

In addition, changes such as these have additional impacts on CTQP training courses which would have to be redone to accommodate this new specification. Again, if the course is changed to account for the new spec then the new spec is changed (after the pilots), all we have done is waste money twice (on course modifications) and further confusion to the people working in the field (trainees attending the courses).

ACAF strongly disagrees with incorporating this optional specification into the 334/337 specification. We believe it should remain a free standing developmental specification until it is proven in the field and it can be demonstrated that it will not cloud or cause confusion in the field.

Response:

The Department is of the opinion that including the Option 2 acceptance procedure actually is less confusing and makes more sense. Everything is in one document and flows better. The reader does not have to cross reference two documents for an Option 2 project. Since there is typically a specification change every year for the standard 334 specification, it will not be a problem if the Option 2 portion needs to be changed. It can all be done at the same time. Furthermore, the long term vision would be to have one specification instead of two for Superpave mix, so merging the two acceptance options now is a good idea.

Kevin Price
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Comments

I am concerned with this revision and how the Option 1 and option 2 have been added. I can see how some folks will be confused with bouncing back and forth through the spec. I know in the specification meetings we had discussed creating a “Developmental” spec for this new addition. Considering the volume of projects that will be affected by this change (very small) and the amount of revisions a change like this will go through it may be best served as a stand alone spec that can be added as needed to certain projects. We have three different classifications for this R squared, first is by traffic level, then by options and then by sections of the spec. If FDOT insists that this portion be included in the 334, perhaps it should be a completely separate section that outlines what sections apply and what does not. Maybe after the CPF acceptance portion.

Response:

The Department is of the opinion that including the Option 2 acceptance procedure actually is less confusing and makes more sense. Everything is in one document and flows better. The reader does not have to cross reference two documents for an Option 2 project. Since there is typically a specification change every year for the standard 334 specification, it will not be a problem if the Option 2 portion needs to be changed. It can all be done at the same time. Furthermore, the long term vision would be to have one

specification instead of two for Superpave mix, so merging the two acceptance options now is a good idea.

Process control does not need to be delineated between option 1 and 2, since it does not apply for option 2 – Regardless of mix type or placement this is how you handle PC testing.

Response:

The philosophy of the Remove Restrictions portion of the specification is for the Department not to mandate any process or quality control requirements. The Department understands that most, if not all, contractors will continue to perform process control testing as a good construction practice. The Department does not want to mandate this for lower traffic level asphalt projects.

Another concern is that with the IV section and the comparison of Gmm to Gmm for verification but we are still using air voids as the pass/fail check (334-5.7.1). It may be better served that if QC and IV compare, regardless of air voids, that the sample is considered acceptable. The Acceptance lab (QC), since that is the controlling facility, should be the standard considering the sample is hot when run. The problems most are running into is the reheated samples are comparing Gmm to Gmm and Gmb to Gmb but the air voids can be as much as a percent different which causes a shut down and EAR's when they are not needed.

Response:

Ideally, there would be a within-lab and between-lab precision value for air voids, but a rigorous study has not been conducted for that property. The air void range given in the Master Production Range has been established at a very wide range, so that if a value occurs outside of this range and has been verified with a second IV test, there is likely a problem with the asphalt mixture. Additionally, the QC will have a split of the IV sample, and it will be treated exactly in the same manner as the IV samples.

334-5.1.2 Should outline somehow that asphalt base is not to be considered in the quantification of the 2000 tons. It states combined mix for the project first.

I hope my comments assist in your efforts, if you have any questions please feel free to contact me.

Response:

The exact wording as given in the specification was agreed upon at the specification committee meeting. The wording states that the 2000 tons applies to only Type SP and Type FC mixtures. No change is needed.

Howard Moseley
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Late Comments:

334 (rev 11-09-06) spec comments offered by District 2 Bit. Eng -- H. Moseley

334-3.2.6 Why not require a minimum amount of liquid antistriper of 0.5% for all mixes, especially mixtures containing granite. TL C-E that fail T 283 would get a higher dosage or be redesigned. If liquid antistriper has an adverse affect on the performance of the PG 76-22 binder, require hydrated lime for granite mixtures. I think it is risky to allow granite mix designs to be issued with PG 76-22 and that don't contain some form of antistriper agent.

Response:

There will be no changes at this point, as this will require committee discussion. This issue will be discussed at future Flexible Pavement Committee and District Bituminous Engineers' meetings.

334-4 Need to require process control samples for traffic levels A & B if the contractor chooses option 1.

Response:

Wording will be added to require process control testing for Option 1 Traffic Level A and B mixtures.

334-5.1.1 Last paragraph requires a temperature and time tolerance. What if the sample does not meet both requirements? Can the results be used? How do we accept, or can we accept the results? Need to consider placing these requirements in the test method and not the specification.

Response:

This issue has been debated for years with no acceptable solution to everyone. The Department does not have its own test method that covers compaction and aging. The Department uses an AASHTO procedure that we prefer not to modify. The requirement for the mixture temperature to be within +/- 20 F of the roadway compaction temperature was agreed upon at the specification committee and DBE meeting as a compromise that should alleviate a majority of the problems related to reheating. If this temperature range cannot be achieved, then it is likely that a different oven or an additional oven is needed.

334-5.1.2 First paragraph, we should require the contractor to perform PC tests not make it optional.

Response:

The current wording in the specification allows the Engineer to require process control testing and not be the Contractor's option for quantities less than 2000 tons.

334-5.1.2 Second paragraph, need to require density testing on all 10 foot shoulders on the interstate, regardless of the length.

Response:

This exception only applies to shoulders (and other areas) less than 1000 feet in length. No change will be made.

334-5.7.1 Why is this time limit +/- 10 minutes and the other time limit +/- 5 minutes (334-5.1.1). Need to be consistent.

Response:

The tolerance of +/- 10 minutes will be changed to +/- 5 minutes.

334-5.7.1 a) Contractor needs to test samples immediately and not box. There are enough boxes already. b) Also this part of the spec needs to indicate that if the contractor is not going to test a split of the IV sample, the DOT only needs to get one sample. c) The spec should also require the contractor to report the test data within one working day.

Response:

a) Depending on when the IV sample is obtained, the Contractor may not have the ability to test immediately. There is no need to require immediate testing. The IV sample is not tested immediately.

b) It is highly unlikely that a Contractor will not obtain a split sample. It is good practice to obtain enough material for two IV tests in case something goes wrong with the first test. If the Contractor does not obtain or test a split sample, then the second IV sample can be discarded if not needed.

c) The specification does require the contractor to provide the test results to the Engineer within one working day.

District 2 [Materials] does not agree with this philosophy of getting two IV samples. IV failure rates and EARs are decreasing with the wider MPR. Do we really need to be getting an IV check sample? The vast majority of IV samples taken in District 2 compare favorably with the contractor splits.

Response:

Other Districts do not have the same situation as District 2 and do support the philosophy of two IV samples. The idea is supported by Industry and the change in practice is an attempt to solve an issue that has plagued the Department for years.

334-5.10.1 Eighth line, add the word “acceptance” between no and testing so it reads no acceptance testing will be required.

Response:

The word “acceptance” will be added.

Table 334-7 Add a note that reduces the minimum density in column A to 91% if static compaction only is required.

Response:

Column A will be modified to show 91%, if static compaction is required.

334-5.10.5 Need to define delineation testing better. Delineation testing means that something is going to be removed and replaced and the contractor is defining the limits of the removal. Contractor needs to have an EAR performed by a licensed PE if they want everything to remain in place.

Response:

Delineation testing does not necessarily imply that material will be removed and replaced. It can be left in place with no pay, if approved by the Engineer. The SMO believes that delineation testing utilizing a testing plan and a qualified lab approved by the Department is sufficient, considering this is only for traffic level A and B mixtures and air voids is not an acceptance criterion.

334-5.10.6 Need to exclude 10 foot interstate shoulders from the exception list. Traffic is sometimes diverted on them and they need density testing.

Response:

This exception only applies to shoulders (and other areas) less than 1000 feet in length. No change will be made.

Greg Schiess
FHWA

Comments

334-2.2 - ~~with the following exceptions: for Traffic Level D, use a PG 76 22~~

~~asphalt binder in the final structural layer; for Traffic Level E, use a PG 76-22 asphalt binder in the top two structural layers.~~ - Where is this required if this is deleted?

Response:

The use of PG 76-22 binders will be shown on the plans.

334-2.3, 2 - How can we address high viscosity with 76-22?

Response:

The Department is not aware of a test method to adequately characterize polymer modified binder in a manner as suitable as recovered viscosity for unmodified mixtures. Therefore, the Department limits the amount of RAP to 15%. Volumetric and gradation test results will have to be used to determine if a percent change to the RAP has occurred.

334-2.3, 7 – a) Any checks during construction? b) and if under option 2 will FDOT run this? c) Viscosity testing frequency and make is qc reg to send to SMO ...how is that system working?

Response:

a) The Engineer (DBE) may check the RAP stockpile at anytime to verify the stockpile meets Department requirements.

b) The Contractor will still determine the RAP stockpile properties during mix design, whether Option 1 or 2 is specified. During production, if Option 2 is specified, the Department will sample and test, if determined necessary by the Engineer.

c) The possibility of having the Contractor be responsible for recovered viscosity testing will be discussed at future Flexible Pavement Committee and District Bituminous Engineer meetings.

334-3.2.3 - Should this read all mixes? Or does sand equivalent apply to A and B?

Response:

The current wording is correct. The four consensus properties listed in the spec in subarticle 334-3.2.3 do not apply to traffic level A and B mixtures.

334-3.2.5 - Do not agree to the VMA reduction.

Response:

The Department would like to encourage the use of more RAP in low volume (Traffic Level A and B) roadway asphalt mixtures to help reduce costs and alleviate material

supply issues. The use of more RAP will likely lower the VMA of the mixture. Therefore, the VMA requirement needs to be reduced. Since this only applies to Traffic Level A and B mixtures, the Department does not believe that this change will have a significant impact on durability.

334-4 - I still think we need the DBE to retain the ability to require the DBE's approval is the QM Manager demonstrates poor judgment

Response:

This change was discussed at the specification committee and District Bituminous Engineers' meetings and was agreed upon at both forums. If continued problems persist with the Contractor's samples, the Department could suspend the QC Plan.

334-5.4.4 – Need to add controls for fine mixes. Re-word the 2nd and 3rd paragraphs to match the 1st paragraph.

Response:

The Department does not see the benefit in stopping production and terminating the Lot after a failing density test from one subplot for fine graded mixtures. The current system has worked well and the Department does not believe that a change is needed

Additional change to specification: Wording as shown below in italics will be added to clarify the meaning of the 3rd paragraph.

“In the event that two consecutive individual Quality Control test results (for the same material characteristic) for gradation (P₂₀₀ only), asphalt binder content, or the average subplot density (*for two consecutive sublots*) for fine graded mixes do not meet the requirements of Table 334-5, or two individual....”

Table 334-5 – Why remove “Air Voids (percent) Fine Graded?”

Response:

The air voids criteria for fine and coarse mixtures have been combined into a single “air voids” criterion. The minimum air voids criterion for fine mixtures was reduced to 2.0% to match that of coarse mixtures. The Department does not believe that material quality will be affected.

334-5.7, paragraph 4 - Would it help to also say if both the IV and contractor's split do not meet 334-5 production cease....regardless of meeting the precision values?

Response:

If both sets of results fail the Master Production Range but do not meet between-lab precision values, then it would be prudent for the IV to verify their first results with the

split sample. If the IV sample is verified, then the Contractor has to cease production regardless of the Contractor's results.

334-5.10 – a) Need to address the whether or not an acceptance technician will be at the plant at all times? b) What about a 5 year warranty?

Response:

a) The technician will likely be at the plant only when necessary to obtain a sample. However, the Department has the option, if it so desires, to have the technician at the plant for longer durations.

b) Currently, a three year warranty will be required. The Department believes this will be sufficient. This portion of the specification section is for low volume roadways (TL A and B) and should not require a longer warranty than the higher traffic level projects (TL C – E), which have a three year warranty.

334-5.10.2 - We need to require a comparison of at least three samples taken from the roadway to plant samples to determine the differences if any. Also if roadway samples are going to be used we need to define who and how the sample is taken.

Response:

The following wording will be deleted from 334-5.10.2:

“At the Engineer's discretion, samples may be obtained at the asphalt plant or roadway.”
Wording will remain to sample the mix per FM 1-T 168.

The intent is to take samples at the plant for now. Two Districts have research studies underway to examine plant versus roadway sampling. The results of those studies will be examined to determine whether roadway sampling will be an effective method for obtaining acceptance samples in the future.

334-5.10.4 - Add air voids or go with a 5 year warranty. I would think you would want the air voids in cases where the other characteristic fail.

Response:

The Department and Industry believe that air voids is not a necessary test parameter for low volume roadways, especially since a three year warranty will be included. Prior to Superpave and during the initial implementation of Superpave, the Department did not conduct air void testing for acceptance and did not experience a negative impact on performance for low volume roadways.

Table 334-7 -*Density, percent Gmm (2), Column A*, This needs to be a higher value, if out target was 93 for option 1 this should be at least 92.5 or higher

Response:

92.00 % Gmm density is a minimum value prior to having to remove and replace the material or leave it in place with no pay. The average density value, which would be comparable to the 93.00 % target mentioned, will likely be greater than 92.00 % since Contractors will not want to take the risk of failing the 92.00 % limit.

334-5.10.5 – first sentence should read - *Should the test result(s) for the sample exceed the limit(s) given in Table 334-7, Column A, or fall below the density requirement then the material for that day is considered defective.*

Response:

Wording will be added to make the density portion easier to interpret.

334-5.10.6 – a) Is there a total on lump sum jobs? b) The Engineer may run independent verification tests, and follow section ??? c) based on the results?

Response:

a) The quantity is available.

b and c) Not sure as to the exact questions posed here, but the premise of the specification is that visual acceptance is the default position, but the Engineer has the option to test the material for acceptance. The wording in the specification will be modified to: “If determined necessary, the Engineer may run acceptance tests as defined above to determine the acceptability of the material.”

334-5.10.7 - By the contractor or FDOT ...also address spread rate.

Response:

The FDOT will be responsible for all roadway acceptance criteria including smoothness and spreadrate.
