

3301203 HOT BITUMINOUS MIXTURES – GENERAL CONSTRUCTION
REQUIREMENTS
COMMENTS FROM INDUSTRY REVIEW

Jim Warren
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Comment: (Internal Review comment 11-25-09)

1. The following language is in the QC section 330-12.3.1 but should also be in the VT sections 330-12.3.2 "Measure the cross slope of the completed pavement surface by placing the measuring device level at the center location of a lane and perpendicular to the roadway centerline" We discussed this in detail at the task team meeting. We all discussed wanting everyone to use the same length level and test in the same location on the roadway to ensure we would have a good chance of comparing QC to VT.
2. The language in 330-12.3.2 now states: The Engineer reserves the right to verify the pavement cross slope at any time by taking cross slope measurements at any locations. I don't recall having this conversation. We need to stay consistent and this last sentence should be replaced with the one in 12.3.1 above.

Response:

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Comments: (Internal Review comment 11-30-09)

Before responding to the proposed specification change I would like to convey a few points:

1. Intent of cross slope specification – The intent of the cross slope specification as I understand is three fold a) ride quality b) traffic safety and c) surface drainage. The specified cross slopes as per plans or design standards target a cross slope that should yield a smooth ride, drain certain water levels and in super elevated sections allow automobiles to maintain speeds without leaving the pavement surface.

I would think the engineers have built in a certain tolerance in order to meet the intentions of the specification. I would like to know what tolerances were “built in” if any and if there were not tolerances built in then maybe the target / design slopes should be changed in order to help ensure the minimum without having the restrictions on the asphalt pavement so stringent contractors would have difficulties in building and maintaining the desired cross slopes.

2. Many projects do not give enough information for the existing grades in the super elevated section of the plan details to know what would be required to correct cross slope. The Department would need to give detailed information concerning the existing conditions of the

super elevated sections and engineering direction and quantities in order to know how to bid the work and construct the project.

3. Existing conditions – The asphalt pavement seems to be the “fix all” to all problems. Existing grades of structures, catch basins, curb and gutter etc. make it impossible to match curb line and maintain proper cross slopes.

New construction does not have tolerances for the cross slope of the base material or strict tolerances for grade control on curb and gutter. In order for contractors to construct and maintain specified cross slopes with asphalt maybe the Department would be better served to change specifications dealing with the rock base and grade controls of structures and curb and gutter.

330-12.3.1 Quality Control Requirements

1. Sixth paragraph, number 2, fifth sentence: Super elevated Sections Construct the super elevation and the transitions with lane rotation in accordance with the requirements of the Contract Documents.

Comment: There needs to be enough engineering information including quantities from the Department in order for the contractor to do so.

2. Seventh paragraph, second to last sentence: all corrections shall be completed before placement of the final design surface layer, unless otherwise stated in the plans or as determined by the Engineer –

Comment: If friction course is to be dense graded (with a structural value) allow for corrections to be made with the friction course. Any deficiencies with the friction course would then be corrected in accordance with 330-12.5

3. Ninth paragraph, first sentence: should the Contractor wish to have any correction waived, submit a request to the Engineer for approval.

Comment: While the proposed specification change allows for the possible correction waiver under set guidelines many CEIs and Engineers are reluctant or not comfortable to grant waivers. They do not want to make “engineering” decisions. Such requests should be brought before a panel or committee with enough expertise to adequately respond to the request.

4. Paragraph 10: For intersections, tapers, crossovers, transitions at the beginning and the end of the project, bridge approaches and similar areas, adjust the cross slope to match the actual site conditions or as directed by the Engineer.

Comment: There are numerous conditions that would warrant matching the actual site conditions including but not limiting to the aforementioned curb and gutter and catch basin scenarios

5. Table 330-2

Roadway Feature	Individual Deviation	Average Absolute Deviation
Tangent section (including turn lanes)	± 0.4%	± 0.2%
Superelevated curve (unless the design tolerance is shown in the plans)	± 0.4%	± actual site conditions, or as directed by the Engineer. 0.2%
Shoulder	± 0.5%	± 0.5%
Note: In the event that the distance between two edges of deficient areas is less than 100 feet, the correction work shall include the area between deficient sections.		

Comment:

- a. Increase the average absolute deviation from 0.2% to 0.3%
- b. Increase the Individual Deviation from 0.4% to 0.5%
- c. The Individual Deviation for Shoulders should be greater than the average absolute deviation.
- d. Increase the Individual Deviation from 0.5 to 0.7 on shoulders

Response:

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Comments: (Internal Review comment 12-8-09) (Industry Review O’Hagan – 12-11-09)

1. Section 330-12-3.1: Rewrite the paragraph beginning with “Should the Contractor wish to have any corrections waive...” to eliminate the numbering. There are three different conditions addressed under number 1 and only one condition addressed under number 2. This inappropriately implies that number 2 (appearance) carries as much weight alone as all three of the items under number 1 (ride, safety, and drainage). If anything, Safety should be number 1 among all these items. Safety, ride and drainage should be retained, but consider eliminating number 2 (appearance) altogether.
2. Table 330-2: Under “Superelevated curve”, please delete the phrase “(unless the design tolerance is shown in the plans)”. This phrase is not necessary since, even without this phrase, a different tolerance could be included in the plans that would override the spec. Furthermore, this specification should address “construction” tolerances only without mention of “design” tolerances, which will only lead to questions of interpretation and confusion. It will be very unusual for a designer to include a construction or design tolerance for superelevation in the plans.

3. Except for the above comments, the proposed changes will be a significant improvement.

Response:

Donnie Autry
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Comments: (12-11-09)
Both (3270300 and 3301203) of these proposed specification changes are difficult to understand. How may roadway technicians know the meaning of *average absolute deviation* much less how to calculate it? This makes a difficult task more difficult.

Response:

Christopher NeSmith
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Comments: (12-14-09)
In 330-12.3.2, the comparison really needs to say: "If the comparisons are beyond the acceptable comparison tolerance according to 330-12.3.1..." This will help clarify if someone is only reading the verification section of this Specification.

Response:

Howie Moseley
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Comments: (12-18-09)
Table 330-2: Can the average absolute deviation in Table 330-2 be a negative number? Aren't all absolute numbers positive? You may want to provide guidance somewhere on how to calculate the average absolute deviation.

Response:

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Comments: (12-30-09)

- 1) 330-12.3.1 states that QC shall measure the cross slope of the “completed” pavement surface. If we wait until it is completed in the summer it could be up to an hour or more behind the paver due to the high temperatures. Then later in the spec it says that if you find a cross slope reading that is out you should make “immediate” corrections well as noted above this could be an hour or more after the fact if this the intent.
- 2) We should include some verbiage stating that if the contractor wishes to delineate areas by means of a survey this should be done at no expense to the department.
- 3) In specification 330-12.3.2 why are we only checking or verifying fully super elevated sections? Shouldn't we be checking transition slope and length also?
- 4) Rather than saying that the electronic level should be approved by the engineer, why not specify what the acceptance criteria for the electronic level should be? Otherwise, what should the engineer accept or reject? Should it be based on the Tolerance of the level being less than the Individual Deviation Tolerance?
- 5) The new specification indicates the use of the “average absolute deviation” numerous times. The absolute average deviation needs to be clarified. Maybe in the table show how the absolute average deviation is calculated with an example.

Response:

Rudy Powell
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Comments: (1-5-10)

1. 330-12.3: It is not clear if the contractor provides and calibrates the QC level only or both the QC and verification levels.
2. 330-12.3.1: The comparison tolerance between the QC and verification levels is the same as the absolute average deviation. Is that correct? It seem the comparison tolerance would need to be tighter. For instance, if the plans show a 2% cross slope, the QC level may read 1.8% which is within tolerance but the verification level may read 1.6% which is out of tolerance but the levels compare to each other.
3. 330-12.3.1: If the levels don't compare, is the QC or verification level not used? Which one is assumed to be correct?
4. 330-12.3.2: Is the number of measurements per lane?
5. 330-13.3.2: If the verification measurements don't meet the acceptance tolerances then a comparison check is made at the QC check locations. What is being compared? Also, if the comparison at the QC locations is ok then what happens at the verifications locations that were not ok?
6. Table 330-2: The note needs to be moved into the text.

Response:
