

April 29, 2015

TO: Members of the MAG Standard Specifications and Details Committee

FROM: Tom Wilhite, City of Tempe, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Wednesday, May 6, 2015 at 1:30 p.m.  
MAG Office, Suite 200 (Second Floor), Ironwood Room  
302 North 1st Avenue, Phoenix

A meeting of the MAG Specifications and Details Committee has been scheduled for the time and place noted above. Members of the MAG Specifications and Details Committee may attend the meeting either in person, by videoconference or by telephone conference call. If you have any questions regarding the meeting, please contact Committee Chair Tom Wilhite at 480-350-2921 or Gordon Tyus, MAG staff at 602-254-6300.

In 1996, the Regional Council approved a simple majority quorum for all MAG advisory committees. If the MAG Specifications and Details Committee does not meet the quorum requirement, no action can be taken. Attendance at the meeting is strongly encouraged.

Pursuant to Title II of the Americans with Disabilities Act (ADA), MAG does not discriminate on the basis of disability in admissions to or participation in its public meetings. Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting Gordon Tyus at the MAG office. Requests should be made as early as possible to allow time to arrange the accommodation.

It is requested (not required) that written comments on active cases be prepared in advance for distribution at the meeting.

**MAG Standard Specifications and Details Committee**  
**TENTATIVE AGENDA**  
**May 6, 2015**

**COMMITTEE ACTION REQUESTED**

1. Call to Order and Introductions
2. Call to the Audience  
An opportunity is provided to the public to address the MAG Specifications and Details Committee on items that are not on the agenda that are within the jurisdiction of MAG, or non-action agenda items that are on the agenda for discussion or information only. Citizens will be requested not to exceed a three minute time period for their comments. A total of 15 minutes will be provided for the Call to the Audience agenda item, unless the committee requests an exception to this limit. Please note that those wishing to comment on agenda items posted for action will be provided the opportunity at the time the item is heard.

2. Information.

3. Approval of April 8, 2015, Meeting Minutes

3. **Review and approve minutes of the April 8, 2015 meeting.**

**Carry Forward Cases from 2015**

4. Case 14-03: Updates to Guardrail Details  
Revisions to Section 415 and/or inclusion of MCDOT guardrail details.
5. Case 14-06: Revisions to Section 718 Preservative Seal for Asphalt Concrete  
Update specifications for current preservative seal products.
6. Case 14-12: Proposed Revisions to Sections 336, 321.10.3, 601.2.7 and Detail 200-1  
Add pavement removal criteria to prevent full depth pavement cuts from being located within a lane wheel path.
7. Case 14-17: Create New Section 322  
Provide specifications for Asphalt Stamping - materials and methods.

4. Information and discussion.  
Sponsor: Bob Herz, MCDOT
5. Information and discussion.  
Sponsor: Jeff Benedict, Asphalt Working Group
6. Information and discussion.  
Sponsor: Bob Herz, MCDOT
7. Information and discussion.  
Sponsor: Brian Gallimore, Materials WG  
*Updated*

**New Cases for 2015**

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| 8. <u>Case 15-01: Misc. Corrections</u><br>A. Add omitted text to Section 735.1.<br>Text was approved by Case 14-07 and merged into Case 13-15.<br>B. Revise "OA" to Quality Assurance and "OC" to Quality Control in Section 710.<br>C. Update notes in Detail 225. | 8. Information and discussion.<br>Sponsor: Bob Herz, MCDOT                                     |
| 9. <u>Case 15-03: Revise Section 601.4.5 Trench Final Backfill Placement</u><br>Revise Section 601.4.5 trench final backfill placement requirements..  | 9. Information and discussion.<br>Sponsor: Bob Herz, MCDOT<br><i>Updated</i>                   |
| 10. <u>Case 15-05: Proposed Revisions to Section 616</u><br>Update reclaimed water line construction specifications and create NEW Reclaimed Valve Box detail.   | 10. Information and discussion.<br>Sponsor: Warren White, Chandler                             |
| 11. <u>Case 15-06: Section 744 ABS TRUSS PIPE AND FITTINGS.</u><br>Delete this section.  | 11. <b>Information, discussion and possible action.</b><br>Sponsor: Bob Herz, MCDOT            |
| 12. <u>Case 15-07: Revisions to Section 342 Decorative Pavement Concrete Paving Stone or Brick and New Detail.</u><br>Revisions to Concrete Paver Standards for Non-Traveled Surfaces.   | 12. Information and discussion.<br>Sponsor: Warren White, Chandler                             |
| 13. <u>Case 15-08: Revisions to Table 710-4</u><br>Clarify Table 710-4 to eliminate misinterpretation of Criteria 8.   | 13. Information and discussion.<br>Sponsor: Bob Herz, MCDOT                                    |
| 14. <u>Case 15-09: Revisions to Section 321</u><br>Miscellaneous revisions to Section 321:<br>PLACEMENT AND CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT  | 14. Information and discussion.<br>Sponsor: Jeff Benedict, Asphalt Working Group<br><i>NEW</i> |
| 15. Other New or Proposed Cases  | 15. Information and discussion.  |

**General Discussion**

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|---|---|
| 16. <u>Working Group Reports</u>                                  | 16. Information and discussion.<br>Water/Sewer Chair: Jim Badowich<br>04/16/2015 Meeting<br><br>Asphalt Chair: Jeff Benedict<br>Materials Chair: Brian Gallimore<br>Concrete Chair: Jeff Hearne<br>04/23/2015 Meeting |
| 17. <u>General Discussion</u><br>Staff Report<br><br>Other Issues | 17. Information and discussion.   |
| 18. <u>Request for Future Agenda Items</u>                        | 18. Information and discussion.   |
| <u>Adjournment</u>  |   |

MEETING MINUTES FROM THE  
MARICOPA ASSOCIATION OF GOVERNMENTS  
STANDARD SPECIFICATIONS AND DETAILS COMMITTEE

April 8, 2015

Maricopa Association of Governments Office, Ironwood Room  
302 North First Avenue  
Phoenix, Arizona

AGENCY MEMBERS

Jim Badowich, Avondale, Vice Chair	Ryan Nichols, Mesa (proxy)
Craig Sharp, Buckeye	Dan Nissen, Peoria
Warren White, Chandler	Melody Moss, Phoenix (Streets)
Bryce Christo, El Mirage (proxy)	Jami Erickson, Phoenix (Water)
* Wayne Costa, Florence	Rod Ramos, Scottsdale
* Tom Condit, Gilbert	Kristin Tytler, Surprise
Mark Ivanich, Glendale	Tom Wilhite, Tempe, Chair
* Tom Vassallo, Goodyear	* Harvey Estrada, Valley Metro
Bob Herz, MCDOT	Gregory Arrington, Youngtown

ADVISORY MEMBERS

Jeff Benedict, ARPA	Jeff Hearne, ARPA
Arvid Veidmark, AZUCA	Peter Kandarlis, Independent (audio)
* Mike Sanders, AZUCA	* Paul R. Nebeker, Independent
Brian Gallimore, AGC	* Jacob Rodriguez, SRP
Greg Groneberg, AGC	

MAG ADMINISTRATIVE STAFF

Gordon Tyus

\* Members not attending or represented by proxy.

GUESTS/VISITORS

Ruben Aguilar, El Mirage

1. Call to Order

Chair Tom Wilhite called the meeting to order at 1:30 p.m.

Mr. Wilhite introduced the new member from Phoenix, Melody Moss. Also introduced was Ryan Nichols a proxy for Mesa.

2. Call to the Audience

There was no comment from the audience.

3. Approval of Minutes

The members reviewed the March 4, 2015 meeting minutes. Bob Herz moved to accept the minutes as written. Kristin Tytler seconded the motion. A voice vote of all ayes and no nays was recorded.

**Carry Forward 2014 Cases**

4. Case 14-03: Updates to Guardrail Details.

*Make revisions to Section 415 and/or include guardrail details in MAG.* Mr. Herz said he had no change at this time.

5. Case 14-06: Revisions to Section 718 Preservative Seal for Asphalt Concrete.

*Update the specifications preservative seals.* Jeff Benedict said the text was massaged a bit at the last Asphalt working group meeting. He said the specification would be revised to make sure it complied with Maricopa County's Section 340 dust rules, and to make sure the ASTM testing procedures are equivalent to AASHTO tests listed in the initial draft. He encouraged members to attend the next working group meeting to provide input.

6. Case 14-12: Proposed Revisions to Sections 336, 321.10.3, 601.2.7 and Detail 200-1.

*Add pavement removal criteria to prevent full depth pavement cuts from being located within a lane wheel path and to prevent creation of narrow pavement edge strips.* Bob Herz discussed a few areas where he wanted input from the committee. The first was on page 336-3, Item G. The spec currently references Detail 201, but does not specify whether to use the safety edge or not. He said MCDOT uses the safety edge on longitudinal pavement replacement for roadways with posted speed limits of 35 mph or greater. If the speed is less they use the Type B detail. For transverse cuts no safety edge is used unless the cut is greater than 25'. He asked members

if specific requirements should be included in the specification or just to leave it to the jurisdiction as currently shown. The consensus was to leave it to up to the jurisdiction based on the project requirements.

Next Mr. Herz discussed the current spec that reads, “Laying a single course or the base course(s) of the asphalt concrete pavement replacement for trenches shall never be more than 600 feet behind the ABC placement for the pavement replacement.” He noted this is in conflict with Section 601 which has a distance of 1320’. Mr. Herz suggested changing the 600’ to 1320’ to be consistent. Jim Bodowich agreed with the change stating he felt 600’ was too short of a distance for typical construction jobs. Ryan Nichols of Mesa said that although they enforced the 600’ distance on previous jobs, they were not against increasing the distance since they could include an addendum to their specs, or have it as a special provision.

Then Mr. Herz discussed on page 336-4 the reference “Type D trench repair may also be used when the condition of the existing pavement does not justify construction of Type A, Type B or T-Top trench repair.” The Type D trench repair is for non-paved areas. He suggested deleting this sentence. Rod Ramos asked if this section may used to make repairs to other types of surfaces such as unpaved or chip seal roads. Peter Kandarlis said he thought it was added originally as an option for an area with bad pavement conditions. The consensus of the committee was to go ahead and delete the Type D reference. Bob Herz said the two following paragraphs were also revised.

Mr. Herz said the final item he needed to work on this case was updating Detail 200-1. Mr. Kandarlis volunteered to help with the drafting changes if Mr. Herz would send him the redlined version. Mr. Herz said he still needed to review the detail, but once he had it redlined he would send it to Mr. Kandarlis for CAD revisions.

#### 7. Case 14-17: Create New Section 322 - Asphalt Stamping.

*Provide specifications for materials and methods of Asphalt Stamping.* Greg Groneberg said a handout provided at the meeting had the latest updates from the working group that included removing the text “MAG” prior to section references. He said they are looking for comments from the agencies, and are also looking at Scottsdale’s current project request to note any differences.

Bob Herz said the language about contractor qualifications in the general requirements section is typically not used in MAG specs. Mr. Groneberg said currently most of the supplements or project documents do have language on contractor qualifications, but they are looking for feedback, and the case will be discussed at the next working group meeting.

Mr. Herz asked if the type of asphalt should be included. Mr. Badowich wasn’t sure if it needed to be that detailed, but maybe the types of asphalt that this process can be used with should be listed.

Mr. Groneberg explained the current template depths are 3/8" over 99%, but Scottsdale currently specs 95%. He also responded to a question about minimum sizes, stating that they do have standard templates, but they can cut them down for smaller sizes. Medallions were also discussed, and it was thought to have them as separate bid items. Tom Wilhite asked if the bid price should be per square foot. Gregory Arrington said that Youngtown is doing custom stamping at their intersections, and that they are negotiated as a separate complete bid items based on the design. Warren White suggested including standard general patterns. Mr. Wilhite suggested changing the last sentence of 322.5 to simply state, "unless specified by the agency." Jim Badowich thought specialty stamps may need to be measured by the item, and have this clarified in the payment section. Tom Wilhite asked if there was any discussion on the warranty section. Seeing none, Jeff Benedict invited members to attend the next working group meeting to help finalize the case.

## **New Cases for 2015**

### 8. Case 15-01: Miscellaneous Corrections A-C.

*No new corrections were introduced.*

### 9. Case 15-03: Revise Section 601.4.5 Trench Final Backfill.

*Change backfill placement requirement from 2 feet maximum lifts to layers not exceeding eight inches in depth under certain conditions.* Bob Herz explained the latest changes based on feedback from the Water/Sewer and Asphalt working groups. He said changes to the description of the compaction wheel were made. It removed the reference to "sheepsfoot" to avoid confusion with standalone sheepsfoot compaction equipment. He asked for any comments or suggestions. Seeing none, Mr. Herz asked that the case be placed on the agenda for action at the next meeting.

### 10. Case 15-04: Revise Section 602 Trenchless Installation of Steel Casing.

*Update ASTM references for casing material and add minimum casing wall thickness.* Arvid Veidmark said nothing has changed since last month. He asked for comments. Ryan Nichols of Mesa asked if the casing wall thickness table was based on the railroad guidelines. Mr. Veidmark said the railroad guidelines only go up to 40". He said the table was based on the sizes historically used in the region, and that the current Section 602 does not have any minimum case thickness requirements. Jim Badowich said typically engineers specify the thickness of the casing. Mr. Veidmark said he was concerned that without minimum standards, the contractor would have to get the seal of an engineer, and the engineer would need a geotech on the job to determine soil conditions. Jami Erickson asked Mr. Nichols who he thought should determine the case thickness, the design engineer or the contractor. Mr. Nichols replied the design engineer should, but also wondered what would happen if the engineer wanted a thickness smaller than that in the table. Rod Ramos said the engineer can always change the

casing requirements on the plans or through special provisions which would supersede the MAG specs. Jim Badowich added that the table provided a minimum standard, but agencies can always require what they want in the submittal process. Mr. Ramos said they currently have a project using 5/8" thickness for a 48" casing. It was decided no modifications to the case were needed.

Bob Herz moved and Rod Ramos seconded the motion to approve Case 15-04 as presented. A roll call vote was taken. The motion passed: 13 yes, 0 no, 0 abstained, and 4 not present.

11. Case 15-05: Revise Section 616 Reclaimed Water Line Construction and Add New Reclaimed Valve Box Detail.

*Revise Section 616.2 Materials to reference appropriate sections and create new detail.*

Warren White discussed the additional materials provided at the meeting. First he described a page from the administrative code requiring that reclaimed water lines need to be shown in purple or legibly marked. He said many jurisdictions are using square instead of round boxes for reclaimed water. Craig Sharp said MAG specs require that they be different. The second handout included the current frame and cover Detail 270-1 and on the back a new square version of detail 270-2. He said the new detail is very similar to the one used by Scottsdale. Mr. White asked if the title of the detail should be changed to "Reclaimed" "Nonpotable" or "Square" Frame and Cover. Rod Ramos said they use "Nonpotable." Jim Badowich agreed and provided the example of well water that was not reclaimed, nor potable.

Warren White said Note #2 would need to be updated as appropriate and asked about the size of the letters. He said he is currently looking for vendors of these types of boxes. Mr. White said the riser pipe is round, and the box changes from square to round below the 7/8" lip. Members noted that a line should be shown on the drawing where this transition is made.

Mr. White explained the next part of the case is to revise Detail 391 to create a new Reclaimed Water Valve Box Installation detail. An example was provided in the packet. He said Chandler utility crews have had issues with valve extensions, and also typically don't require debris caps. He said this issue would be discussed further at the next Water/Sewer working group meeting.

12. Case 15-06: Delete or Update Section 744 ABS TRUSS PIPE AND FITTINGS.

*Determine if material is still used and if the specification needs revision or should be deleted.*

Bob Herz asked if anyone was still using ABS Truss Pipe. Since no one appears to be using it, he suggested deleting Section 744 from MAG entirely. He proposed that the committee vote on this action at the next meeting.

13. Case 15-07: Revisions to Concrete Paver Standards for Non-Traveled Surfaces.

*Make revisions to Detail 225 and Section 342.* Warren White provided Scottsdale's supplemental Detail 2239 as an example of median concrete pavers not used in traffic areas. He said most agencies have a supplement for the median design. He suggested adding a detail similar to Scottsdale's Type A to MAG Detail 225 (which was included in the packet).

Mr. White asked if the concrete header should remain at 12" as currently shown on the MAG detail, or 6". Mark Ivanich said they typically use them for cross walks, and it is easier to paint an 8" stripe on the 12" header. Tom Wilhite said they use the 12" header without problems.

Another difference in details was that MAG uses 9" thick concrete, whereas Scottsdale uses 8" reinforced concrete. Bob Herz said commercial driveways are also 9". Most members did not see a problem keeping the 9" thickness for traffic areas, but that it may not be needed for the medians or pedestrian areas. Mr. Ramos said Scottsdale does not use pavers for crosswalks. The consensus was to leave 9" non-reinforced concrete as the default. It was noted that the current Detail 225 does have a joint detail. Mr. White asked about the thickness of the sand base. Mr. Ramos said 1" worked perfectly fine.

Tom Wilhite asked what happened when the pavers are cut through during repairs. Arvid Veidmark described a job where this happened. They saved the pavers and replaced them after making repairs to the grade below. Mr. White asked if the 4" ABC below the pavers in the median was sufficient, and if slurry could/should be used. Mr. Ramos said they have not had a problem in the medians using 4" of ABC. Jim Badowich said you need both options (in the roadway and for medians). He also said that Avondale has used the smaller 60 mm pavers in non-traffic areas. He said 60 mm and 80 mm pavers were the common sizes. Mr. Ramos said they typically use only the 80 mm pavers to make it easier.

Bob Herz returned to the thickness of the header stating it made sense to use 12" headers for crosswalks, but 6" headers could be used on flush medians.

Mark Ivanich said Glendale is using the pavers on sidewalks. Bob Herz warned against using this detail for sidewalk construction because the ADA has a maximum allowable change in elevation of 1/4" after which a 2:1 taper is required to avoid a tripping hazard. Mr. Ivanich said they require the HOA to maintain them. Mr. Wilhite said a detail showing the header next to pavers on a private driveway may be useful.

Finally, Warren White asked if asphalt stamping was done on raised medians. Jeff Benedict said it was and asked Rod Ramos if they had a detail. Mr. Benedict said they can look at this at their working group meeting.

14. Case 15-08: Revisions to clarify Table 710-4 to Eliminate Misinterpretation of Criteria 8.

Bob Herz presented a new case to fix the table formatting of 710-4. He said it was being misinterpreted that 3/8" or 1/2" mix are required to be designed for low traffic only and 3/4" mix was for high traffic only. He fixed this problem by pulling out the number of gyrations info and placing it into a separate table 710-4. The existing table 710-4 would be renumbered as 710-5. Rod Ramos asked if there was a better way to specify pavements mixes since MAG has more choices. Mr. Herz said that was beyond the scope of this case, and Jeff Benedict agreed, stating that providing training may be a better option.

Mr. Herz felt this was a pretty simple case and suggested voting on it at the next meeting. Mr. Wilhite thought it would be better to allow the agencies a chance to discuss it next meeting and vote the following month.

## 15. Working Group Reports

Chair Wilhite asked for reports from the working group chairs.

### a. **Water/Sewer Issues Working Group**

Jim Badowich said the group met Thursday, March 19, 2015 at 1:30 p.m. They spent most of the meeting discussing the new Section 608, Horizontal Directional Drilling. He said the initial draft of the spec was assisted by ASU professors, and was a lot more instructional in nature. Mr. Veidmark said they currently are on Revision 17, which includes many of Bob Herz's comments to make it less instructional and written more like other MAG specifications. He said he has run it by APS and other utilities.

Mr. Ivanich asked if this process was changing so quickly that our specs would also need to be constantly updated. Arvid Veidmark said the overall process wasn't changing that much, just that the industry was finding ways to go deeper and further. The draft spec focuses on the mini and mid-range projects that are typically 500' and under for utilities 6" and smaller. Jim Badowich said it focused more on things such as keeping a minimum distance from other utilities, etc.

Mr. Wilhite asked if it covered other methods such as hoggings. Mr. Veidmark said no, only horizontal directional drilling. He was also asked about distance from distribution lines and transmission mains. He said the draft spec did not address these specifically, but that other agencies and utilities will make specific requirements, and that this could be discussed further at the working group. Jim Badowich commented that the original drafts tried to cover all methods, but it has been scaled back to focus on the small and medium size jobs that make up 90%+ of the projects. He said larger projects will have their own specific design. Mr. Badowich commented that he also attended the last AZUCA meeting where they discussed cross-boring and problems such as gas lines boring through sewer laterals. He said SW Gas is now using video to find problems.

Arvid Veidmark said state statutes require utilities to be potholed at each crossing for the duration of the bore. One time they found 17 utilities and ended up doing an open cut

instead of boring. Peter Kandarlis said design engineers have to look at these issues beforehand to determine whether to bore or open cut. Mr. Veidmark said utilities like to pothole at the time of construction. Peter Kandarlis said SRP showed a cross-section on the plan. Mr. Veidmark said now SRP are submitting without profiles. Tom Wilhite said Tempe requires open cuts through intersections due to all the utilities under their streets. Mr. Veidmark said Slade Ottney is working to create cross-bore legislation. Jim Badowich said they will be looking at providing a case to the committee in a month or two.

He said the rest of the meeting was a quick discussion of Mr. Herz's cases, and potential changes to flushing requirements. The next Water/Sewer meeting is planned for April 16, 2015 at 1:30 p.m. at the MAG office.

**b. Asphalt/Materials Working Groups**

Jeff Benedict said the group met on Thursday, March 26, 2015 at noon at the ARPA office. He said the notes in the packet summarized what was discussed.

Mr. Benedict said the next meeting is planned for April 23, 2015 at noon at the ARPA office. They plan to discuss asphalt rubber mix design changes, since ADOT and MAG specs are different. The stamped asphalt case will be reviewed as well as potential stamping in medians. Dave Bechel, who discussed his issues with testing lime-treated ABC last month, will be meeting with Mesa next Thursday. Mr. Bechel said he would provide updates on this issue to the working group. Mr. Benedict encouraged members to attend the meeting where lunch will be served.

**c. Concrete Working Group**

Jeff Hearne said no concrete working group meeting was held last month. He said the group would meet after the other working groups on April 23<sup>rd</sup>.

**d. Outside ROW Working Group**

Peter Kandarlis said he had some repairs to his body, and as his health improves he hopes to restart the group.

**16. General Discussion**

Warren White brought up the issue of locating underground utilities, specifically with tracer wire. He asked other agencies how much it is being used and how effective has it been. He said that his understanding is that Chandler has not had great success in use of tracer wire. He said there was also the problem of bringing the tracer wire to the surface, now that it is outside the valve boxes that has helped. He noted that the wire is not shown on MAG details. Arvid Veidmark said locating ductile iron pipe also only works if you have jumpers between sections. Jim Badowich suggested that another detail may be needed. Craig Sharp said with so much horizontal drilling happening, locating utilities and using tracer wire is critical. He said bluestaking gives a closer depth with tracer wire, and so Buckeye is using the wire and brings the leads up at all hydrants. He thought a case with specs on how to use and connect the wires

would be good. Currently it is one of 11 options available to locate utilities. Arvid Veidmark said you must have a way to positively identify what's in the ground. He added SW Gas uses tracer wire on everything.

Gordon Tyus said he met with representatives from ASTM last month. Also in attendance was a MAG IT specialist. He said they are currently testing MAG's ASTM portal, and that Warren White inadvertently got through using it. Mr. Tyus said he would provide more information on it as it was ready. He said a couple additional items of interest from the meeting included discussion about a tool ASTM was developing that could scan PDF documents (such as the MAG specs) and automatically provide hyperlinks to the specifications on ASTM's Compass website. The Compass website also has added AASHTO specifications, although MAG's subscription currently does not include them.

Bryce Christo introduced El Mirage's new city inspector, Ruben Aguilar. He said Mr. Aguilar would take over as their representative on the committee next month.

17. Future Agenda Items:

None were suggested.

18. Adjournment:

Seeing no further business the meeting was adjourned at 3:31 p.m.

## 2015 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

(Updated information can be found on the website: <http://www.azmag.gov/Projects/Project.asp?CMSID=1055&CMSID2=7154> )

CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE	
	<b>CARRY FORWARD CASES FROM 2014</b>						
14-03	Case 14-03: Updates to Guardrail Details. Revisions to Section 415 and/or inclusion of MCDOT guardrail details.	MCDOT	Bob Herz	01/08/2014		0 0 0	Yes No Abstain
14-06	Case 14-06: Revisions to Section 718 Preservative Seal for Asphalt Concrete.	Asphalt WG	Jeff Benedict	02/05/2014 03/11/2015		0 0 0	Yes No Abstain
14-12	Case 14-12: Proposed revisions to Sections 336, 321.10.3, 601.2.7 and Detail 200. Add pavement removal criteria to prevent full depth pavement cuts from being located within a lane wheel path and to prevent creation of narrow pavement edge strips.	MCDOT	Bob Herz	06/04/2014 03/04/2015		0 0 0	Yes No Abstain
14-17	Case 14-17: Create New Section 322 Asphalt Stamping. Provide specifications for materials and methods.	Materials WG	Brian Gallimore	07/09/2014 04/21/2015		0 0 0	Yes No Abstain
	<b>NEW CASES FOR 2015</b>						
15-01	<b>Case 15-01: Miscellaneous Corrections:</b> A. Add omitted text to Section 735.1. Text was approved by Case 14-07 and merged into Case 13-15. Both cases were approved in 2014. B. Revise "OA" to Quality Assurance and "OC" to Quality Control in Section 710. C. Update notes in Detail 225.	MCDOT	Bob Herz	02/05/2014 03/04/2015		0 0 0	Yes No Abstain
15-02	Case 15-02: Adjust Fence Requirements to Reference ASTM F1043. Revise Section 772, Table 771-1 and Detail 145.	MCDOT	Bob Herz	01/07/2015	03/04/2015	15 0 1	Yes No Abstain
15-03	Case 15-03: Revise Section 601.4.5 trench final backfill placement requirements.	MCDOT	Bob Herz	02/04/2015 04/28/2015		0 0 0	Yes No Abstain

## 2015 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

(Updated information can be found on the website: <http://www.azmag.gov/Projects/Project.asp?CMSID=1055&CMSID2=7154> )

CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE	
15-04	Case 15-04: Revise Section 602 Trenchless Installation of Steel Casing. Update ASTM references for casing material and add minimum casing wall thickness.	Water/Sewer WG	Arvid Veidmark	02/04/2015 02/24/2015	04/08/2015	13 0 0	Yes No Abstain
15-05	Case 15-05: Proposed Revisions to Section 616 Reclaimed Water Line Construction and NEW Reclaimed Valve Box detail.	Chandler	Warren White	03/04/2015		0 0 0	Yes No Abstain
15-06	Case 15-06: Delete or Update Section 744 ABS TRUSS PIPE AND FITTINGS.	MCDOT	Bob Herz	03/04/2015	05/06/2015	0 0 0	Yes No Abstain
15-07	Case 15-07: Revisions to Concrete Paver Standards for Non-Traveled Surfaces.	Chandler	Warren White	03/04/2015		0 0 0	Yes No Abstain
15-08	Case 15-08: Revisions to clarify Table 710-4 to eliminate misinterpretation of Criteria 8.	MCDOT	Bob Herz	04/08/2015		0 0 0	Yes No Abstain
15-09	Case 15-08: Miscellaneous revisions to Section 321: PLACEMENT AND CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT.	Asphalt WG	Jeff Benedict	04/22/2015		0 0 0	Yes No Abstain

**SECTION 322**  
**ASPHALT STAMPING**

**322.1 DESCRIPTION:**

The work under this item will provide stamped asphalt which shall include surface patterning and/or asphalt surfacing (painting) as described herein in accordance with Owners Standard Details and/or as shown on the plans and called out in the special provisions.

**322.2 GENERAL REQUIREMENTS:**

A Contractor shall meet the following qualifications in order to perform asphalt stamping:

The Contractor shall have completed a minimum of three (3) asphalt stamping projects in the past year (from the date of bid) in the State of Arizona and totaling at least 50,000 S.F. Provide proof of completion of work to three or more government entities within Arizona in last (3 or 5) years totaling 50,000 sq. ft. or more. The Contractor shall furnish evidence of meeting these experience requirements to the Engineer, including all current referral contacts on these projects for verification at the time of bid submittal or bid can be disqualified. Mock ups may be required at the owner's discretion to ensure Contractor familiarity with product and installation procedures. Acceptance of colors and application procedures should be accepted in writing from the agency/owner prior to commencement of work.

The Contractor shall submit for review and approval all manufacturer product and technical data for materials proposed to be installed in the right-of-way. The Contractor shall also submit for review and approval a sample of the stamped asphalt material prior to installation. These submittals shall be submitted to the Engineer.

Prior to acceptance of the project, the Contractor shall repair all damaged or unsuitable areas, as determined by the Engineer, at no expense to the Owner.

**322.3 MATERIALS:**

**322.3.1 Asphalt Concrete:** All roadway construction materials and asphalt thicknesses shall conform to the applicable requirements of Section 321 and the project plans and specifications. Aggregate base course (ABC) shall be clean, well-graded sand and gravel compacted and placed per Section 321.5.1 and the project plans and specifications. The surface area to be stamped should be free from cracking and shall be new enough to have sufficient oil to facilitate the stamping process.

For raised medians and other areas not subject to vehicular traffic, the surface course shall be at least 2-1/2" of 1/2" or 3/8" Marshall Low Traffic asphalt concrete mix in accordance with Section 710, or as approved by the engineer.

**322.3.2 Surface Patterning:** The patterning equipment shall be metal templates that shall correspond to the patterns shown in Owner's standard details or as shown on the plans and called out in special provisions. Refer to the project plans and specifications for the pattern type to be used.

**322.3.3 Surfacing System (Painted Asphalt):** All products used in the surfacing system shall be DecoCoat Polymer System, DP-200, or equivalent by meeting the minimum physical and performance properties in Tables 322-1 and 322-2. The Contractor shall submit a Certificate of Compliance to the

Engineer indicating that the materials to be included in the work meet these specification requirements. The color used for painted asphalt shall be terracotta or as approved by the Engineer.

<b>TABLE 322-1</b>		
<b>ASPHALT STAMPING SURFACING SYSTEM PHYSICAL PROPERTIES</b>		
<b>Characteristic</b>	<b>Test Specification</b>	<b>Base – Colorant</b>
<b>Solids by Volume (%)</b>	ASTM D2697	68%
<b>Solids by Weight (%)</b>	ASTM D2369	78%
<b>Density</b>	ASTM D1475	13.7 lbs./gal

<b>TABLE 322-2</b>		
<b>ASPHALT STAMPING SURFACING SYSTEM PHYSICAL PROPERTIES</b>		
<b>Characteristic</b>	<b>Test Specification</b>	<b>Test Result – Base</b>
Dry-Time (To Recoat)	ASTM D5895	20 Min
Taber Wear Abrasion Dry H-10 Wheel	ASTM D4060 1 day cure	0.16 g/1000 cycles
Taber Wear Abrasion Wet H-10 Wheel	ASTM D4060 7 days cure	2.34 g/1000 cycles
QUV E Accel.	ASTM G154 Delta	0.53
Hydrophobicity Water Absorption	ASTM D-570	7.6% (9 Day Immersion)
Shore Hardness	ASTM D2240	67 Type D
Mandrel Blend	ASTM D522-93A	1/4" @ 21 Degree C Pass
Permeance	ASTM D1653	3.77 g/m <sup>2</sup> /hr (52 mils)
VOC	Per MSDS	25 g/l
Adhesion to Asphalt	ASTM D4541	Substrate Failure
Friction Wet	ASTM E303 British Pendulum Tester	WP * Coated- 62 WP* Uncoated - 59 AC ** Coated - 70 AC ** Uncoated - 61
Cure Time	Measured @ 77 Degrees Fahrenheit	Dry to touch – 20 Min Light Foot/Vehicle Traffic – 2-4 Hrs. Full Cure – 5 to 7 days

#### **322.4 INSTALLATION:**

The Contractor shall furnish all the necessary labor, material, tools, and equipment to complete the proper installation of the asphalt print paving used in decorative pavement, crosswalks, and intersection

medallions or as otherwise noted in the Contract Documents. This includes furnishing a 10-foot straight edge to accomplish the level test specified for the finished decorative pavement. Pattern and color of finished surface shall be as shown in the project plans and details.

**322.4.1 Asphalt Concrete:** The hot-mix asphaltic concrete shall be placed per the project plans and specifications. The Contractor shall contact the Engineer for roadway compaction approval prior to beginning asphalt stamping. Asphalt shall be fully compacted prior to positioning the patterning template.

**322.4.2 Surface Patterning:** When new asphalt is to be stamped, it shall have one overnight period to set prior to stamping for conventional mixes and ARAC mixes shall have 30 days to set prior to the stamping/coating process.

The asphalt to be stamped shall be uniformly heated using infrared technology to a temperature that shall not exceed 280 degrees Fahrenheit. Templates shall be set in place using a plate compactor and fully embedded in the asphalt (minimum static weight shall be 700 lbs.).

The template print depth shall be 3/8" over 95% of the patterned area. Template print depth shall be inspected prior to coating to ensure compliance. All hand tooling shall be complete, full depth, straight in manner, and to the edge of the asphalt pavement, common edge, concrete curb, gutter, or other border. There shall be no over print or shadowing of patterns and no remnants of excess print on surrounding unintended areas. Should overprinting or other imperfections occur, these areas can be repaired by using the same technology to return the asphalt to a smooth condition to that of the unstamped area(s).

**322.4.3 Surfacing System (Painted Asphalt & Clear Coat Sealant):** The air temperature shall be at least 45° Fahrenheit and rising before the application of surface system products begins. There shall also be no precipitation expected within 24 hours of the anticipated surfacing completion in order for the application to be authorized by the agency. The surface should be free from grease, oils, or any other matter that may affect adhesion prior to placing any pavement coating.

The surfacing system products shall be spray-applied. Where required to cover small areas, the surfacing system may be painted on using brooms or brushes. When complete, the entire asphalt surface shall be uniformly covered with the surfacing product with no exposed asphalt present.

The Contractor shall use sufficient masking to ensure that the surface system products are applied only where specified. Masking shall be complete and no overspray, or other imperfections, onto surfaces not designated as coated surfaces shall be allowed.

The Contractor shall apply the surface system products with a minimum of four complete passes on a roadway surface. Three complete passes shall be allowed on medians, walkways, pathways, and bike paths where traffic is primarily pedestrian with minimal or no automobile traffic. Thickness of the surfacing product shall be 20 mils or greater.

After the colorant has had sufficient time to set, a minimum of two coats (or as specified in the bid documents) of a clear coat sealant (DecoCoat Polymer Systems, DP-100, DP-150HD, or equivalent as approved by the agency/engineer) must be applied to provide ease of long-term maintenance and to reduce tire markings on colored asphalt.

After the surfacing system products have been applied, the treated asphalt shall not be exposed to vehicular traffic for eight (8) hours, overnight, whichever is greater. As an alternative, residing engineer can approve a shorter window for vehicular use upon release of written approval provided to the contractor

**322.5 MEASUREMENT:**

Asphalt stamping shall be measured by the square foot, which shall include surface patterning and/or asphalt surfacing (painting), unless specifically outlined in the bid documents.

**322.6 PAYMENT:**

Asphalt stamping shall be measured as provided above and shall be paid for at the contract price per square foot, or as specified in the bid documents, which price shall be full compensation for the item complete as described and specified herein. Specialty marks or stamps shall be paid as lump sum, by the unit, or as approved by the agency.

**322.7 WARRANTY:**

Asphalt stamping shall have a two year warranty when the colorant and sealer have been applied using the application requirements set forth in this section, or the manufacturers requirements, whichever is greater. Warranty shall provide coverage from flaking, premature wearing and like defects. Color changes shall not be part of the warranty.

Should a warranty event occur, the repair shall be corrected at the expense of the contractor. Satisfaction of the warranty repair shall be performed by the specifications outlined in this Section. Areas that require recoating and have been clear coat sealed will require a light scuffing of the surface prior to reapplication.



MARICOPA COUNTY  
Department of Transportation

MEMORANDUM

Date: January 28, 2015 Revised 4/28/2015  
To: MAG Specifications and Details Committee  
From: Robert Herz, MCDOT Representative

Subject: Proposed Revision to Section 601.4.5 Final Backfill and Section 601.4.8 Granular Material and Native Backfill Material. Case 15-03

PURPOSE: Revise trench final backfill placement requirement from 2 feet to layers not exceeding twelve inches in depth except compaction wheels may continue to use the 2' non-compacted layer depth. Add CLSM and granular material to the listing of acceptable materials for final backfill as presently shown on Detail 200-1. Add to Section 601.4.8 identification of the testing procedures required to determine the percent passing the 200 sieve.

REVISIONS:

601.4.5 Final Backfill: Material placed above the initial backfill to the top of the trench or to the bottom of the road base material. Except when using an excavator or backhoe mounted footed compaction wheel the final backfill shall be placed in horizontal layers not more than twelve inches in depth before compaction. When using an excavator or backhoe mounted footed compaction wheel the loose non-compacted lift depth lifts that shall not exceed 2 feet\_ and the non-compacted lift height shall not be more than can be compacted to the required density with the equipment and methods being used.

Final backfill shall be CLSM per Section 604, ABC per Section 702, granular material or sound earthen native backfill material per Section 601.4.8. -with no piece larger than 4 inches and be free from broken concrete, broken pavement, wood or other deleterious material.

Backfill under street pavement shall be constructed per Detail 200-1 with the type of trench and surface replacement as noted on the plans or in the special provisions. Unless otherwise noted, backfill under single curb, curb and gutter, attached sidewalk, driveways, valley gutters, etc. shall be the same as the adjacent street pavement.

Comment [RTH1]: Since Section 601.4.8 defines requirements for native backfill material it does not need to be repeated here and therefore has been proposed for deletion.

**601.4.8 Granular Material and Native Backfill Material:** For purposes of this specification, granular material is material for which the sum of the plasticity index and the percent of the material passing a No. 200 sieve does not exceed 23. The plasticity index shall be tested in accordance with AASHTO T-146 Method A (Wet Preparation), T-89 and T-90. The percent of the material passing a No. 200 sieve shall be tested in accordance with ASTM C136 and ASTM C117.

Native material used for backfill shall be sound earthen material free from broken concrete, broken pavement, wood or other deleterious material with no piece larger than 4 inches.



**MARICOPA COUNTY**  
*Department of Transportation*

MEMORANDUM

**Date:** March 4, 2015

**To:** MAG Specifications and Details Committee

**From:** Robert Herz, MCDOT Representative

**Subject:** Delete or Update Section 744 ABS TRUSS PIPE AND FITTINGS **Case 15-06**

**PURPOSE:** Remove as an obsolete specification if MAG agencies no longer use or allow this type of pipe. Section 744.3.2 Material references ASTM D1788 which was withdrawn in 1988.



**ASTM D1788-81 (Withdrawn Version)**

Specification for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Plastics (Withdrawn 1988)

Withdrawn Standard:  D1788-81

WITHDRAWN, NO REPLACEMENT

There is no PDF download available at this time, however you may purchase a copy of this document from Global Engineering Documents (Email: [globalcustomerservice@ihs.com](mailto:globalcustomerservice@ihs.com); Phone: 800-854-7179 or 303-397-7956).

**REVISIONS:**

Option 1: Delete Section 744 in its entirety. Section 744 is only referenced in the Index. Since the specification has not been valid since 1988, I assume it has not been used in recent years and is no longer needed.

Option 2: Update the specification to delete references ASTM D1788 and be consistent with ASTM D2680 Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping. The current version of ASTM D2680 includes material requirements for both ABS and PVC used for Truss Pipe and Fittings.

**Date:** April 22, 2015

**To:** MAG Specifications and Details Committee

**From:** Jeff Benedict, Chairman MAG Asphalt Working Group

**Subject:** Revisions to Sections 321

**Case # 15-09**

**PURPOSE:** Incorporate revisions to Section 321, "*PLACEMENT AND CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT*" into the MAG Specifications.

**REVISIONS:**

- 321.8.4 - Removed placement temperature table and replaced with simple minimum placement temperature. Existing table was too complex and difficult to implement, especially since temperature measuring devices being used on underlying base (infrared guns) are only accurate to approximately  $\pm 20$  °F.
- 321.10.2 - Added and/or revised wording for binder content and laboratory air voids to indicate that Contractor is responsible for any coring performed to determine the limits or extent of a deficiency.
- 321.10.4 - Added and/or revised wording for pavement thickness to indicate that Contractor is responsible for any coring performed to determine the limits or extent of a deficiency.
- 321.10.5.2- Added wording to indicate that acceptable in-place air voids must fall within a range; i.e. there is both a lower and upper limit.
- 321.10.5.2- Revised wording for additional coring to correctly reflect intent of verifying a deficient in-place air void test result.
- 321.10.5.2- Also added and/or revised wording to indicate that Contractor is responsible for any additional coring performed to determine the limits or extent of a deficiency.
- 321.10.5.2- Deleted note from Table 321-8 and moved information into table itself to improve clarity.
- 321.10.5.2- Deleted parentheses, space, and colon from heading of column 3 of Table 321-8 to match formatting in rest of Section 321.

**SECTION 321**  
**PLACEMENT AND CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT**

**321.1 DESCRIPTION:**

This section is to provide specifications for furnishing all materials, mixing at a plant, hauling and placing a mixture of aggregate materials, mineral admixture and asphalt binder to form a pavement course for placement upon a previously prepared base or sub base.

**321.2 MATERIALS AND MANUFACTURE:**

The materials shall conform to Section [710](#) for the type specified. Warm Mix Asphalt (WMA) technologies may be used within the mixture provided all requirements of the specifications are met, and the technology is on the ADOT Approved Product list. The specific required mix type shall be called out in the contract documents or as directed by the Engineer.

**321.3 WEATHER AND MOISTURE CONDITIONS:**

Asphalt concrete shall be placed only when the surface is dry, and when the atmospheric temperature in the shade is 40 degrees F. (50 degrees F for Asphalt Concrete lift less than 2 inch thick) or above. No asphalt concrete shall be placed when the weather is foggy or rainy, or when the base or sub base on which the material is to be placed is unstable. Asphalt concrete shall be placed only when the Engineer determines that weather conditions are suitable.

**321.4 APPLICATION OF TACK COAT:**

A tack coat shall be applied to all existing and to each new course of asphalt concrete prior to the placing of a succeeding lift of asphalt concrete. The tack coat may be deleted when a succeeding layer of asphalt concrete is being applied over a freshly laid course that has been subjected to very little traffic when approved by the Engineer.

The application of the tack coat shall comply with Section [329](#). The grade of emulsified asphalt shall be SS-1h or CSS-1h as specified in Section [713](#).

The same material that is specified above for the tack coat shall be applied to the vertical surfaces of existing pavements, curbs, and gutters, against which asphalt concrete is to be placed.

The surface to be covered may require repair or patching as directed by the Engineer. This shall be addressed in the project specifications prior to the bidding of the project.

**321.5 MIX DESIGN:**

The mix design shall be submitted to the Engineer at least five working days prior to the start of asphalt concrete production. Mix designs provided by the agency may be utilized on projects at the Engineer's discretion. The Engineer will review and approve the mix design to assure it contains all of the required information as outlined in Section [710.3.1](#). If WMA technologies are used within the mix design, the type of WMA technology used shall be indicated on the mix design. The target values for gradations, binder contents, and air voids will be established as the accepted Job Mix Formula (JMF) based upon the mix design. Mix designs not containing all of the information will be returned within five working days of receipt of all mix design information, for action and resubmission by the contractor.

Once the mix design has been approved by the agency and the mixing plant selected, the Contractor and/or his supplier shall not change plants nor utilize additional mixing plants without prior approval of the Engineer.

If the contractor elects to change its source of material, the contractor shall furnish the Engineer with a new mix design, which meets the requirements of Section [710](#), as amended by the Project Specifications. The contractor may make self-directed target changes to the approved mix design within the limits shown below. Requests for self-directed target changes shall be made in writing and acknowledged by the Engineer prior to the start of production of a lot and will remain in effect until such time as any additional changes are implemented. The self-directed target changes must meet the contract requirements for mix design criteria and gradation limits.

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**TABLE 321-1**

<b>ALLOWABLE SELF-DIRECTED TARGET CHANGES</b>	
MEASURED CHARACTERISTICS	ALLOWABLE SELF-DIRECTED TARGET CHANGES
Gradation (Sieve Size)	
3/8 inch	± 4% from mix design target value
No 8	± 4% from mix design target value
No 40	± 2% from mix design target value
No 200	+0.5% from mix design target value
Binder Content	± 0.2% from mix design target value
Effective Air Voids	None

The contractor may propose target changes, other than self-directed changes, to the approved mix design for the approval of the Engineer. The Engineer will determine if the proposed target change will result in mix production that meets the contract requirements for mix design criteria and gradation limits. The target changes will not be retroactive for the purpose of acceptance.

**321.6 MIX PRODUCTION:**

All materials shall be proportioned by weight in a hot mix asphalt plant in the proportions required by the mix design to provide a homogeneous and workable mass. Each hot mix asphalt plant shall be inspected in accordance with the provisions contained in the 'Hot Mix Asphalt Production Facilities' by the Arizona Rock Products Association and shall have a current inspection certificate. All measuring devices shall be calibrated at least annually by a technician licensed by the Arizona Bureau of Weights & Measures. Mixing plants shall conform to the requirements of AASHTO M-156, except as modified herein. If WMA technology is being used, any equipment associated with the production of hot mix asphalt shall be calibrated and in proper working order according to the WMA equipment specifications. If there are any deviations in the production or compacting temperatures of the hot mix asphalt with WMA technology, the mix design shall state the differences.

In drum mix plants the mineral admixture shall be added and thoroughly mixed with the mineral aggregate by means of a mechanical mixing device prior to the mineral aggregate and mineral admixture entering the dryer. The moisture content of the combined mineral aggregate shall be a minimum of three percent by weight of the aggregate during the mixing process.

For drum-mix plants, the mineral admixture shall be weighed across a weight belt, or other approved alternative weighing system, with a weight totalizer prior to entry into the mechanical mixing device. The mechanical mixing device shall be a pugmill type mixer that is in good working condition. The rate of the aggregate feed shall not exceed the mixing device's capacity in ton per hour. The mixer shall be constructed to minimize the loss of mineral admixture and shall be located in the aggregate delivery system at a location where the mixed material can be readily inspected. The mixing device shall be capable of effective mixing in the full range of the asphalt concrete production rates.

The hot plant and equipment shall be constructed and operated to prevent loss of mineral admixture through the dust collection system of the plant.

A positive signal system shall be provided and utilized during production whereby the mixing shall automatically be stopped if the mineral admixture is not introduced into the mineral aggregate. The plant will not be permitted to operate unless the signal system is in good working condition.

The introduction of bituminous material shall be controlled by an automated system fully integrated with the controls or the mineral aggregate and mineral admixture. The production of the plant shall be controlled by the rate required to obtain a uniform mixture of all components. Drying and heating shall be accomplished in such a manner as to preclude the mineral admixture from becoming coated with un-spent fuel. The completed asphalt concrete may be held in storage for up to 12 hours in insulated or heated silos, providing the minimum temperature noted herein for placement and compaction is met behind the placement device. If the Engineer determines that there is an excessive amount of heat, heat loss, drain down, segregation

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and/or oxidation of the mixture due to temporary storage, use of surge bins or storage bins will be discontinued.

The temperature of the asphalt concrete, with unmodified binders, upon discharge from the mixer shall not exceed 335 degrees F. The discharge temperature may be increased on the recommendation of the binder supplier, when approved by the Engineer. If the asphalt concrete is discharged from the mixer into a hopper, the hopper shall be constructed so that segregation of the asphalt concrete will be minimized.

### 321.7 TRANSPORTATION:

Petroleum distillates or other substances that will have a detrimental effect on the asphalt concrete shall not be used as a release agent.

The beds of all transportation units shall be clean and smooth to allow the free flow of material into the paving machine's hopper.

Tarpaulins shall be furnished on all trucks and used when weather condition warrant, or if directed by the Engineer.

### 321.8 PLACEMENT:

Placement of asphalt concrete pavement shall not commence until authorized by the Engineer. The Engineer's authorization to allow commencement of asphalt concrete paving will generally require all newly constructed valley gutters, curbing, and curb and gutters which new pavement is to be placed against to be in-place and in an acceptable condition. While it is preferred to have all newly constructed concrete items against which new pavement is to be placed be in an acceptable condition, the Engineer may allow paving to commence based on weather, the amount of defective concrete, or other considerations.

**321.8.1 Placing:** All courses of asphalt concrete shall be placed and finished by means of a self-propelled paving machine equipped with an automatically actuated control system, except under certain conditions or at locations where the Engineer deems the use of a self-propelled paving machine impracticable.

The control system shall control the elevation of the screed at each end by controlling the elevation of one end directly and the other end indirectly either through controlling the transverse slope or alternatively when directed, by controlling the elevation of each end independently.

The control system shall be capable of working with one of the following devices:

- (a) Ski or non-contact device of not less than 30 feet in length, supported throughout its entire length
- (b) Taut stringline or wire set to grade
- (c) Short ski or sonar sensing units from curb control
- (d) Joint matching shoe

Failure of the control system to function properly shall be cause for the suspension of asphalt concrete production. In order to achieve a continuous operation, the speed of the paving machine shall be coordinated with the hot mix plant and transport units.

If the asphalt concrete is dumped from the hauling vehicles directly into the paving machine, care shall be taken to avoid jarring the machine or moving it out of alignment. No vertical load shall be exerted on the paving machine by the truck.

If asphalt concrete is dumped upon the surface being paved and subsequently loaded in the paving machine, the loading equipment shall be self-supporting and shall not exert any vertical load on the paving machine. Substantially all of the asphalt concrete shall be picked up and loaded into the paving machine.

Self-propelled paving machines shall spread the mixture without segregation or tearing, true to line, grade and crown indicated on the Project plans. Pavers shall be equipped with hoppers and augers that will distribute the mixture uniformly in front of an adjustable floating screed. The raising of the hopper wings must be minimized and the paving machine will not be operated when in an empty condition.

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Screeds shall include any strike-off device operated by tamping or vibrating action which is effective, without tearing, shoving or gouging the mixture and which produces a course with a uniform texture and density for the full width being paved. Screeds shall be adjustable as to height and crown and shall be equipped with a controlled heating device for use when required. In the case of the screed, auger extensions and vibrators shall be installed wherever the screed is extended more than one (1) foot beyond the end of the base auger or auger extension. However, when placing material against an extremely uneven curb or edge over a short distance, the Engineer may waive the auger extensions and vibrators.

At any place not accessible to the roller, the mixture shall be thoroughly compacted with tampers to provide a uniform and smooth layer over the entire area compacted in this manner.

**321.8.2 Joints:** Transverse joints, before a surface course is placed in contact with a cold transverse construction joint, the cold existing asphalt concrete shall be trimmed to a vertical face for its full depth exposing a fresh face. The fresh face shall be tack coated prior to placement of the new asphalt concrete. After placement and finishing the new asphalt concrete, both sides of the joint shall be dense and the joint shall be smooth and tight. The surface in the area of the joint shall not deviate more than 1/4 inch from a 12-foot straightedge, when tested with the straightedge placed across the joint, parallel to the centerline.

Longitudinal joints of each asphalt course shall be staggered a minimum of 6 inches with relation to the longitudinal joint of the immediate underlying course's cold longitudinal construction joint.

Longitudinal joints with existing or cold (more than 32 hours old) asphalt concrete shall require the existing pavement to be trimmed to a vertical face for its full depth exposing a fresh face. The fresh face shall be tacked prior to placement of the adjacent course. Longitudinal joints with an existing asphalt pavement that is less than 32 hours old that has had its edge protected from damage may have adjacent new asphalt concrete placed after applying the required tack coat. After placement and finishing of longitudinal joints, both sides of the joint shall be dense and the joint shall be smooth and tight. The surface in the area of the joint shall not deviate more than 1/4 inch from a 12-foot straightedge, when tested with the straightedge placed across the joint, in any direction.

**321.8.3 Asphalt Leveling Course:** A leveling course shall be used when specified, or as directed in writing by the Engineer, to bring existing pavement to a uniform grade prior to placing an overlay or other course. If a leveling course is being applied on an Asphalt surface, a tack coat shall be applied. The compaction requirements contained in Section [321.10](#) do not apply to leveling courses.

**321.8.4 Compaction; Asphalt Base Course and Surface Course:** It is the contractor's responsibility to perform Quality Control monitoring and/or testing during compaction operations to achieve the required compaction. The temperature of the asphalt concrete immediately behind the laydown machine shall ~~meet the minimum requirements of Table 321-2~~ be at least 250 °F. unless WMA technology is being used. If WMA technology is being used then the minimum requirements will be stated within the mix design recommended by the WMA manufacturer. A probe type electronic thermometer with a current calibration sticker attached will be used to measure the temperature of the asphalt concrete mixture. When measuring the temperature of the mat, the probe shall be inserted at mid-depth and as horizontal as possible to the mat. ~~The minimum temperatures in Table 321-2 do not guarantee that the asphalt mix will be compacted to the required density.~~ The contractor is responsible to achieve the required compaction.

<b>TABLE 321-2</b>						
<b>MINIMUM ASPHALT CONCRETE PLACEMENT TEMPERATURE</b>						
Base <sup>(1)</sup> Temp (°F)	Mat Thickness (inches)					
	1/2	3/4	1	1-1/2	2	3 and greater
40—50	—	—	310	300	285	275
50—60	—	310	300	295	280	270
60—70	310	300	290	285	275	265
70—80	300	290	285	280	270	265
80—90	290	280	270	270	265	260
+90	280	275	265	265	260	255

—(1) ~~Base on which mix is to be placed~~

Asphalt compaction equipment shall be of sufficient size and weight to accomplish the required compaction. All compaction equipment shall be operated and maintained in accordance with the manufacturer's recommendations and the project requirements. During the rolling operation, the speed of the roller shall not exceed 3 miles per hour, unless otherwise

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approved by the Engineer.

Pneumatic tired compactors shall be equipped with skirt-type devices mounted around the tires so that the temperature of the tires will be maintained during the compaction process.

The Engineer will determine the acceptability of the pavement compaction in accordance with Section [321.10](#).

**321.8.5 Smoothness:** The completed surfacing shall be thoroughly compacted, smooth and true to grade and cross-section and free from ruts, humps, depressions or irregularities. An acceptable surface shall not vary more than one-fourth (¼) inch from the lower edge of a 12-foot straightedge when the straightedge is placed parallel to the centerline of the roadway.

**321.8.6 Asphalt Concrete Overlay:** Asphalt concrete overlay consists of the placing and compacting plant mix asphalt concrete over existing pavement. The mix design and thickness of the overlay shall be as shown on the plans or as specified in the special provisions.

Except when the existing asphalt surface is to be preheated and remixed, pavement surfaces shall be prepared as follows:

- (a) Areas designated for pavement repair by the contract documents (which may include severely raveled areas, severely cracked areas, over-asphalted areas, and other defects) shall be cut out and replaced. Pavement repairs shall be completed and approved before placing asphalt concrete overlay.
- (b) Before placing asphalt concrete overlay, milling shall be done as shown on the plans or specified in the special provisions and shall be in accordance with Section [317](#).
- (c) After pavement repairs and milling have been completed the entire surface shall be cleaned with a power broom.
- (d) After surfaces have been prepared to the satisfaction of the Engineer, they shall receive a tack coat per Section [321.4](#). Traffic will not be permitted to travel over surfaces which have received a tack coat, except when tack coat is applied to milled surfaces in compliance with Section [317.2](#) for dust control purposes. When the overlay is to extend onto a concrete gutter, the gutter shall be thoroughly cleaned of loose dust and cement particles and shall be tack coated.

Asphalt concrete overlay shall be placed as specified in Section [321.8.1](#) and compacted as specified in Section [321.8.4](#). The surface smoothness shall meet the tolerances specified in Section [321.8.5](#).

Frames and covers of manholes, survey monuments, valve boxes, clean-outs and other existing structures shall be adjusted in accordance with Section [345](#) to set flush with the finished surface of the new pavement. During adjustment if pavement or base materials are removed or disturbed, they shall be replaced with approved materials installed in a manner acceptable to the Engineer.

On roads without curb and gutter, the existing unpaved shoulder elevation shall be adjusted by the Contractor to match the elevation at the edge of the new overlay and slope away from the new pavement surface at a rate that the existing quantity of shoulder material will allow. Shoulder material shall be compacted to a minimum of 95% of maximum density, determined in accordance with Section [301.3](#). Shoulder adjustment to match the new pavement surface elevation shall not be measured. The cost of shoulder adjustment shall be included in the price paid for the asphalt concrete overlay or other related pay items. When the Engineer determines an insufficient amount of material is available for shoulder adjustment, the Engineer may require the Contractor to provide additional material. Acceptable material for shoulders includes the existing shoulder material, millings, untreated base materials, or a granular material approved by the Engineer. Engineer requested imported material for shoulder adjustment is not included in the price paid for the asphalt concrete overlay.

**321.8.7 Pavement Fabric Interlayer:** Pavement fabric interlayer shall be used only when specified on the plans or in the specifications.

Pavement fabric interlayer shall be in accordance with Table [796-1](#) and be the class designated on the plans or in the specifications.

Asphalt binder coat used to bond the fabric to the pavement shall be paving asphalt PG 70-10 asphalt cement conforming to the requirements of Section [711](#). The application and distributing equipment for the asphalt binder shall conform to the requirements of Section [330](#). The asphalt binder coat shall be uniformly spray applied to the prepared pavement surface at the rate of 20 gallons per square yard for Class B fabric or at the rate of 0.25 gallons per square yard for Class A fabric. Some

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underlying surfaces may require a higher or lower application rate. A test strip may be necessary to determine the proper application rate. The width of liquid asphalt cement application shall be the fabric width, plus six inches.

Neither the asphalt binder coat or fabric interlayer shall be placed when weather conditions, in the opinion of the Engineer, are not suitable. The asphalt binder and fabric interlayer shall only be placed when the pavement is dry, the ambient air temperature is 50 degrees F and rising, and pavement temperature is 40 degrees F and rising.

Equipment for placing the fabric shall be mechanized and capable of handling full rolls of fabric. The equipment shall be able to lay the fabric smoothly to maximize pavement contact and remove air bubbles. Stiff bristle brooms shall be used to smooth the fabric. The equipment used to place the fabric shall be in good working order and is subject to approval by the Engineer.

Pavement fabric interlayer shall not be placed if the in-place binder is hotter than 325 degrees F or has cooled to 180 degrees F or below (as determined by non-contact thermometer).

Pavement fabric interlayer shall be placed onto the asphaltic binder with the heat bonded side up with a minimum amount of wrinkling or folding. Remaining wrinkles or folds 1-inch and larger shall be removed or slit and shingle-lapped in the direction of paving. Burning or torching of wrinkles is not allowed. Fabric shall overlap three to six inches to insure full closure of the joint. Transverse joints shall be shingle-lapped in the direction of paving to prevent edge pickup by the paver. A second application of hand-placed asphalt binder may be required at laps and repairs as determined by the Engineer to ensure proper binding of the narrow double fabric layer.

All areas where fabric has been placed shall be paved with asphaltic concrete during the same workshift. Placement of the asphaltic concrete shall closely follow fabric lay down. The temperature of the asphaltic concrete immediately behind the laydown machine shall not exceed 325 degrees F, unless modified by the WMA technology being used. If WMA technology is being used then the minimum requirements will be stated within the mix design recommended by the WMA manufacturer. In the event that the asphalt binder coat bleeds through the fabric causing construction problems before the overlay is placed, the affected areas shall be sanded with a sand blotter in compliance with Section 333. Excess sand shall be removed before beginning the paving operation. In the event of rainfall prior to the placement of the asphaltic concrete, the fabric shall be allowed to dry before the asphalt concrete is placed.

Turning of the paving machine or of other vehicles on the fabric shall be gradual and kept to a minimum to avoid damage to the fabric. Should equipment tires stick to the fabric during pavement operations, small quantities of paving asphalt concrete shall be broadcast on the fabric to prevent pick-up. Decrease of binder rate in order to minimize pick-up on tires is not allowed.

**321.8.8 Thickened Edge:** When the depth of the thickened edge extends four inches or more below the bottom of the asphalt pavement, the portion of the thickened edge extending below the asphalt pavement shall be placed and compacted prior to placement of the asphalt pavement. Placement of tack coat on the surface of the compacted thickened edge asphalt may be omitted when additional asphalt pavement is placed on the same day and the Engineer agrees that the surface of the thickened edge asphalt has remained clean.

When the depth of the thickened edge extends less than four inches below the bottom of the asphalt pavement, the portion below the asphalt pavement may be placed and compacted with the asphalt pavement in a single operation.

**321.8.9 Safety Edge:** The finished safety edge slope shall be planar forming a  $30^\circ \pm 5^\circ$  angle with the adjacent roadway surface and extend a minimum of five inches (5") below the roadway pavement's finished surface.

The safety edge shall be constructed with the top or final paving lift of a new pavement or overlay using a device that is mounted to or is a part of the screed portion of the laydown machine. The safety edge device shall be capable of constraining the asphalt concrete material to increase density of the extruded profile by reducing the volume. A conventional single strike-off plate is not acceptable. Compaction obtained from the extruded safety edge shall be acceptable when the extruded shape conforms to the specified shape.

During laydown operations if the extruded safety edge does not conform to the specified shape, the Contractor shall take immediate actions to correct the deficiency and to repair all non-compliant sections of safety edge. The Contractor shall stop operations until corrections to the laydown operation have been made and resumption of paving is approved by the

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**321.8.10 Protection for Asphalt Base Course:** Arterial roadway traffic shall not be allowed on a new asphalt base course that is less than five inches (5") in thickness without the written consent of the Engineer.

### 321.9 QUALITY CONTROL:

It is the contractor's responsibility to perform Quality Control monitoring and/or testing during asphalt concrete production to achieve the required compaction and to perform Quality Control monitoring and/or testing during asphalt concrete production to achieve the required mix properties. The Engineer may obtain samples of any portion of any material at any point of the operations for his own use. Also, the Engineer may order the use of any drying, proportioning and mixing equipment or the handling of any material discontinued which, in his/her opinion, fails to produce a satisfactory mixture.

The asphalt concrete produced shall conform to the requirements of the production tolerances established in section [321.10](#). When the asphalt concrete does not conform to the production tolerances, it shall be reported to the Engineer, and corrective quality control measures shall be implemented, or production shall cease immediately at no additional cost to the contracting Agency.

Requests for Referee Testing as described in 321.11 will only be considered based on quality control test results performed by a laboratory accredited by the AASHTO Accreditation Program (AAP) for the tests being performed or a laboratory listed in the current ADOT Directory of Approved Materials Testing Laboratories for the set of tests in question. The laboratory shall use properly certified technicians in accordance with ASTM D3666, Section 7 (Personnel Qualifications).

### 321.10 ACCEPTANCE:

**321.10.1 Acceptance Criteria:** Asphalt concrete will be divided into lots for the purpose of acceptance. A lot shall be one day's production. Each lot shall be divided into sublots of 500 ton or fraction thereof. Tests used to determine acceptance will be performed by a laboratory accredited by the AASHTO Accreditation Program (AAP) for the tests being performed. The contracting agency shall provide an appropriately accredited laboratory or laboratories to perform the acceptance testing. Laboratories shall use properly certified technicians in accordance with ASTM D3666, Section 7 (Personnel Qualifications). The acceptance laboratory will take representative samples of the asphalt concrete from each subplot to allow for testing of gradation, binder content, air voids, pavement thickness and compaction of base and surface courses. Acceptance of each subplot will be based on the test data from the sample(s) from that subplot. All acceptance samples shall be taken using random locations or times designated by the Engineer in accordance with ASTM D3665.

**321.10.2 Gradation, Binder Content and Air Voids:** The acceptance laboratory will take a sample of the asphalt concrete in accordance with the requirements of Section 2 or 4 of Arizona Test Methods 104 or AASHTO T-168 from each subplot. The minimum weight of the sample shall be 45 pounds. Asphalt binder content and gradation shall be determined in accordance with AASHTO T-308 using the ignition furnace for each subplot. The acceptance laboratory is responsible for obtaining the necessary materials and performing an ignition furnace calibration as outlined in AASHTO T-308 for each asphalt concrete mixture utilized on the project. The correction factor used for each test shall be clearly indicated on the report. The bulk density for Marshall Mix designs shall be tested in accordance with AASHTO T-245. The bulk density for Gyratory mix designs shall be determined in accordance with AASHTO T-312. The maximum theoretical density shall be determined in accordance with the requirements of AASHTO T-209 including fan drying per AASHTO T209 Section 15. Effective voids of the laboratory compacted specimens will be determined at a minimum of once per lot in accordance with the requirements of AASHTO T-269. Should the testing for effective air voids not meet the "Full Payment" or "No Corrective Action" requirements of Table [321-5](#), additional testing for laboratory air voids on the remaining sublots will be performed as necessary to determine the extent of the deficiency. Acceptance testing results will be furnished to the contractor and the supplier within five working days of receipt of samples by the acceptance laboratory.

During production, the allowable deviations from the mix design gradation targets are listed in the tables below. The allowable production tolerances may fall outside of the mix design gradation bands.

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<b>TABLE 321-3A</b>				
<b>GRADATION ACCEPTANCE LIMITS FOR MARSHALL MIXES</b>				
Sieve Size	3/8 inch Mix	1/2 inch Mix	3/4 inch Mix	Base Mix
1 inch	---	---	---	±7%
3/4 inch	---	---	±7%	±6%
1/2 inch	---	±7%	---	---
3/8 inch	±7%	±6%	±6%	±6%
No. 8	±6%	±6%	±6%	±6%
No. 40	±4%	±4%	±4%	±4%
No. 200	±2%	±2%	±2%	±2%

<b>TABLE 321-3B</b>			
<b>GRADATION ACCEPTANCE LIMITS FOR GYRATORY MIXES</b>			
Sieve Size	3/8 inch Mix	1/2 inch Mix	3/4 inch Mix
3/4 inch	---	---	±7%
1/2 inch	---	±7%	±6%
3/8 inch	±7%	±6%	---
No. 8	±6%	±6%	±6%
No. 40	±4%	±4%	±4%
No. 200	±2%	±2%	±2%

If the results from a single acceptance sample fall outside of the acceptance limits in Table [321-3A](#) or [321-3B](#) as applicable, a second sample shall be taken and if the second acceptance sample is also outside of the acceptance limits the Contractor shall cease production of asphalt concrete. Production shall not begin again until calibration test results verify that adjustments made to materials or proportions yield a gradation that falls within acceptance limits in Table [321-3A](#) or [321-3B](#) as applicable.

If the asphalt binder content is within ± 0.40% of the mix design target value, the asphalt concrete will be paid for at the contract unit price. If the asphalt binder content deviates by more than ± 0.40% from the mix design target value, the deficient area will be evaluated within the subplot by coring at maximum intervals of 100 feet from the deficient sample. The asphalt content of the original deficient sample will be averaged with the asphalt binder content of the cores taken for re-evaluation to determine compliance with the acceptance requirements. If the resulting average of the asphalt binder content deviates by more than ± 0.40% from the mix design target value, then Table [321-4](#) shall apply to the subplot. Additional cores may be ~~required-obtained at the Contractor's discretion~~ to define the limits of the deficient area, ~~and-but~~ shall not be used for re-evaluating acceptance.

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<b>TABLE 321-4</b>		
<b>ASPHALT BINDER CONTENT ACCEPTANCE AND PENALTIES</b>		
Deviation from that permitted	When the contracting agency is the owner: Payment Reduction (\$ per ton of asphalt concrete)	When the contracting agency is not the owner (i.e. permits): Corrective Action
Over 0.2% <u>above</u> that permitted	Removal* or EA	Removal* or EA
Over 0.1% to 0.2% <u>above</u> that permitted	\$6.00	EA
Over 0.0% to 0.1% <u>above</u> that permitted	\$2.00	EA
Within permitted range	Full Payment	No Corrective Action
Over 0.0% to 0.1% <u>below</u> that permitted	\$2.00	EA
Over 0.1% to 0.2% <u>below</u> that permitted	\$6.00	EA
Over 0.2% <u>below</u> that permitted	Removal* or EA	Removal* or EA

NOTES: \*The Contractor shall remove and replace the entire subplot that is deficient.  
EA = Engineering Analysis per Section 321.10.6

If the laboratory air voids fall within a range of 2.8% to 6.2%, the asphalt concrete will be paid for at the contract unit price. If the laboratory air voids are outside of this range, the deficient area will be evaluated within the subplot by coring at maximum intervals of 100 feet from the deficient sample. The laboratory air voids of the original deficient sample will be averaged with the laboratory air voids obtained from each of the cores taken for re-evaluation to determine compliance with the acceptance requirements. If the resulting average of the laboratory air voids is outside the indicated range, then Table [321-5](#) shall apply to the subplot. Additional cores may be ~~required~~ [obtained at the Contractor's discretion](#) to define the limits of the deficient area, ~~and but~~ shall not be used for re-evaluating acceptance.

<b>TABLE 321-5</b>		
<b>LABORATORY VOIDS ACCEPTANCE AND PENALTIES</b>		
Laboratory Air Voids (Measured at N <sub>des</sub> or 75 blows as applicable)	When the contracting agency is the owner: Payment Reduction (\$ per ton of asphalt concrete)	When the contracting agency is not the owner (i.e. permits): Corrective Action
Less than 1.5%	Removal* or EA	Removal* or EA
1.5-2.0%	\$5.00	EA
2.1-2.7%	\$2.00	EA
2.8-6.2%	Full Payment	No Corrective Action
6.3-6.9%	\$2.00	EA
7.0-8.0%	\$5.00	EA
Greater than 8.0%	Removal* or EA	Removal* or EA

NOTES: \*The Contractor shall remove and replace the entire subplot that is deficient  
EA = Engineering Analysis per Section [321.10.6](#)  
Removal for In-place Air Voids Greater than 11.0% is not eligible for Section [321.10.6](#).  
If an agency or Engineer is purchasing asphalt concrete directly from a commercial material supplier, the agency or Engineer

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will use Section [321.10](#), and specifically Tables [321-3A](#) or [321-3B](#) as applicable, [321-4](#) and [321-5](#) from Section [321.10](#), when determining the acceptance of the asphalt concrete with the material supplier.

**321.10.3 Surface Testing:** If directed by the Engineer surface drainage test shall be performed. The completed surfacing shall be thoroughly compacted, smooth and true to grade and cross-section and free from ruts, humps, depressions or irregularities. An acceptable surface shall not vary more than 1/4 inch from the lower edge of a 12-foot straightedge when the straightedge is placed parallel to the centerline of the roadway. The straightedge shall be furnished by the contractor and shall be acceptable to the Engineer.

All streets shall be water tested for drainage in the presence of the Engineer or designated representative before final acceptance. Any areas not draining properly shall be corrected to the Engineer's satisfaction at the Contractor's expense. Water for this testing shall be provided and paid for by the Contractor.

When deviations in excess of the above tolerance are found, humps or depressions shall be corrected to meet the specified tolerance, or shall be cut out along neat straight lines and replaced with fresh hot mixture and thoroughly compacted to conform with and bond to the surrounding area. Materials and work necessary to correct such deviations shall be at no additional cost to the Contracting Agency.

**321.10.4 Asphalt Pavement Thickness:** Asphalt Pavement thickness will be determined from cores secured from each lift of each sublot. Such cores will be taken and measured by the Asphalt Concrete Coring Method. This method can be found in Section [321.14](#). Each core location will be patched by the party responsible for the testing.

Acceptance or assessment of penalties for asphalt pavement thickness will be based on the combined total thickness of all asphalt concrete layers omitting all layers of asphalt-rubber asphalt concrete. If the final total pavement thickness exclusive of all ARAC layers is deficient from the target thickness by 0.25 inches or less, it will be paid for at the contract unit price.

If the pavement thickness deficiency is greater than 0.25 inches and the contracting agency is not the owner (i.e. permits) the following steps will apply:

- (1) If the thickness deficiency of the pavement exceeds 0.25 inch, the limits of the deficient area will be evaluated by coring at maximum intervals of 100 feet from the deficient core. The thicknesses of the original deficient core will be averaged with the thicknesses of the cores taken from 100 feet on each side of it to determine compliance with the acceptance requirements. If the resulting average thickness deficiency is greater than 0.25 inch, additional cores may be ~~required~~ [obtained at the Contractor's discretion](#) to define the limits of the deficient area, ~~and but~~ shall not be used for re-evaluating acceptance.
- (2) If the pavement thickness from step one above deviates from the target thickness by more than 0.25 inch but not more than 0.50 inch, corrective action will be required. This corrective action will consist of application of a Type II slurry seal coat in accordance to Section [715](#). The Contractor may present an engineering analysis outlining other proposed remedial measures for the consideration of the Engineer. The Engineer will review the engineering analysis and decide within 30 working days whether to accept the proposed remedial measures.
- (3) If the pavement thickness from step one above deviates from the target thickness by more than 0.50 inch, corrective action will be required. The deficient area shall be overlaid with no less than a 1 inch thick lift, for the full width of the pavement to meet or exceed the designed thickness, with appropriate end and edge milling, with a mixture approved by the Engineer. The Contractor may present an engineering analysis outlining other proposed remedial measures for the Engineer's consideration. The Engineer will review the engineering analysis and decide within 10 working days whether to accept the proposed remedial measures. If the Engineer chooses to reject the engineering analysis, the indicated overlay will be constructed by the Contractor at no additional cost to the Owner.

If the contracting Agency is the owner and the pavement thickness deficiency is greater than 0.25 inches but less than 0.50 inches Table [321-6](#) will apply. If the pavement thickness deficiency is greater than 0.5 inches the deficient area shall be overlaid with no less than a 1-inch thick lift for the full width of the pavement to meet or exceed the designed thickness using an asphalt mixture approved by the Engineer. The Contractor shall provide appropriate end and edge milling. The overlay and milling shall be accomplished by the Contractor at no additional cost to the Contracting Agency.

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<b>TABLE 321-6</b>	
<b>ASPHALT PAVEMENT THICKNESS PAYMENT REDUCTION</b>	
<b>For Thickness Deficiency of More Than 0.25 inches and less than 0.50 inches</b>	
<b>Total Specified Asphalt Pavement Thickness exclusive of ARAC (if any)</b>	<b>Reduction in Payment Applied to asphalt concrete Except ARAC layers (if any)</b>
Less than 1.5 inches	50%
1.50 inches to 1.99 inches	33%
2.00 inches to 2.49 inches	25%
2.50 inches to 2.99 inches	20%
3.00 inches and over	17%

**321.10.5 Density:**

**321.10.5.1 Pavement 1-1/2 Inches or Less in Nominal Thickness:**

Compaction shall consist of a “Rolling Method Procedure” using an established sequence of coverage with specified types of compactors. A pass shall be defined as one movement of a compactor in either direction. Coverage shall be the number of passes as are necessary to cover the entire width being paved.

The rolling sequence, the type of compactor to be used, and the number of coverages required shall be as shown in Table [321-7](#).

<b>TABLE 321-7</b>				
<b>ROLLING SEQUENCE FOR LIFT THICKNESS 1½” OR LESS</b>				
<b>Rolling Sequence</b>	<b>Type of Compactor</b>		<b>No. of Coverages</b>	
	<b>Option No. 1</b>	<b>Option No. 2</b>	<b>Option No. 1</b>	<b>Option No. 2</b>
Initial	Static Steel	Vibrating Steel	1	1
Intermediate	Pneumatic Tired	Vibrating Steel	4	2- 4*
Finish	Static Steel	Static Steel	1-3	1-3
* Based on the roller pattern which exhibits the best performance.				

The Contractor shall select the option for compaction and, when pneumatic-tired compactors are used will designate the tire pressure. Steel wheel compactors shall not be used in the vibratory mode for courses of one inch or less in thickness nor when the temperature of the asphaltic concrete falls below 180 degree F. Initial and intermediate compaction shall be accomplished before the temperature of the asphaltic concrete falls below 200 degree F.

Compaction will be deemed to be acceptable on the condition that the asphaltic concrete is compacted using the type of compactors specified, ballasted and operated as specified, and with the number of coverages of the compactors as specified.

**321.10.5.2 Pavement Greater than 1-1/2 Inches in Nominal Thickness:**

Achieving the required compaction is the responsibility of the contractor. The number and types of rollers is the contractor’s responsibility and shall be sufficient to meet these requirements.

In-place air voids shall be determined in accordance with AASHTO T-269 utilizing cores taken from the finished pavement. The maximum theoretical density used in the determination of in-place air voids will be the average value from the acceptance samples determined for the Lot as outlined in [321.10.1](#).

The Engineer will designate one random test location for each subplot and the acceptance laboratory will obtain one core from that location. Regardless of subplot quantities or boundaries, a minimum of one core will be obtained per residential street and a minimum of one core per travel lane for collector and arterial streets. The outside one foot of each pass of the pavement course

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or any unconfined edge will be excluded from testing. The Engineer may exclude areas from the compaction lot that are not accessible by normal compaction equipment.

The Contractor will provide the traffic control to facilitate any coring operations necessary for compaction acceptance.

Cores will be taken per the Asphalt Concrete Coring Method. This method can be found in Section [321.14](#). Acceptance testing results will be furnished to the contractor within five working days of receipt of samples by the acceptance laboratory.

If the pavement density has in-place voids of [between 4.0% and 8.0%](#) ~~or less~~, the asphalt concrete will be paid for at the contract unit price. If the [acceptance core for a subplot indicates that the](#) pavement density has in-place voids [of less than 4.0% or greater than 8.0%](#), ~~the deficient area will be evaluated within the subplot by coring at maximum intervals of 100 feet from the deficient core(s). If both cores in a subplot are deficient, the deficient area will be evaluated by coring two additional locations at maximum intervals of 100 feet from the deficient core. The in-place voids of the original deficient core will be averaged with the in-place voids of the cores taken from 100 feet on each side of it to determine compliance with the acceptance requirements. If the resulting average of the in-place voids is outside the indicated range, then Table 321-8 shall apply to the subplot. 3 to 4 additional cores may be necessary to re-evaluate acceptance. The in-place voids of all the original core(s), whether deficient or acceptable, will be averaged with the in-place voids of the cores taken for re-evaluation to determine compliance with the acceptance requirements. If the average of the in-place voids is greater than 8.0% then Table 321-8 shall apply to the subplot.~~ Additional cores may be [required-obtained at the Contractor's discretion](#) to define the limits of the deficient area, ~~and but~~ shall not be used for re-evaluating acceptance.

<b>TABLE 321-8</b>		
<b>PAVEMENT DENSITY PENALTIES</b>		
Limits of In-place Air Voids for design lift thicknesses 1.5 inches and greater	When the contracting agency is the owner:  Payment Reduction (\$ per ton of asphalt concrete)	When the contracting agency is not the owner; <del>(i.e. permits)</del>  Corrective Action
Below 3.0%	Removal* or EA	Removal* or EA
3.0% to below 4.0%	\$10.00	EA and Type II Surry Seal
4.0% to 8.0%	Full Payment	No Corrective Action
Greater than 8.0% to less than 9.0%	\$6.00	EA
9.0% to 10.0%	\$10.00	EA and Type II Surry Seal
Greater than 10.0%	Removal* or EA	Removal* or EA
<a href="#">Greater than 11.0%</a>	<a href="#">Removal*</a>	<a href="#">Removal*</a>

NOTES: \*The Contractor shall remove and replace the entire subplot that is deficient.  
EA = Engineering Analysis per Section [321.10.6](#)  
[Removal for In place Air Voids greater than 11.0% is not eligible for Section 321.10.6.](#)

**321.10.6 Engineering Analysis (EA):** Within 10 working days after receiving notice that a lot or subplot of asphalt concrete is deficient and is found to fall within the “Removal or EA” band per Table(s) [321-4](#), [321-5](#), and/or [321-8](#) the contractor may submit a written proposal (Engineering Analysis) to accept the material in place at the applicable penalties along with possible remediation(s) listed in the “Removal or EA” category. Engineering Analysis can also

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be proposed for non-removal categories of “Corrective actions” when the contracting agency is not the owner (i.e. permits).

The Engineering Analysis shall contain an analysis of the anticipated performance of the asphalt concrete if left in place. The Engineering Analysis shall also detail the effect of any proposed corrective action to the material(s) in place as it relates to the in-place material’s performance. The Engineering Analysis shall be performed by a professional engineer experienced in asphalt concrete testing and mix designs.

If a lot or subplot is accepted for referee testing and the referee test results still show a deficiency, the contractor shall have ten working days to submit an engineering analysis beginning upon notification of referee test results.

When an Engineering Analysis recommends that a specific lot or subplot should not be removed, the Engineering Analysis will recommend that the following penalties (Table 321-9) be paid when the contracting agency is the owner, for the specific criteria being reviewed by the EA.

<b>TABLE 321-9</b>		
<b>ENGINEERING ANALYSIS PENALTIES for REMOVAL* LOTS/SUBLOTS LEFT IN-PLACE</b>		
<b>Acceptance Criteria</b>	<b>Acceptance Limits</b>	<b>Penalty When Contracting Agency is the Owner (\$/Ton)</b>
Asphalt Binder Content	Over 0.2% points from that Permitted	\$9.00
Laboratory Air Voids (Measured at N <sub>des</sub> or 75 blows as applicable)	Less than 1.5% or Greater Than 8.0%	\$7.50
Limits of In-place Air Voids	Less than 3% or Greater than 10.0%	\$15.00

Within 15 working days, the Engineer will determine whether or not to accept the contractor’s proposed Engineering Analysis.

**321.11 REFEREE:**

If the Contractor has reason to question the validity of any of the acceptance test results, the Contractor may request that the Engineer consider referee test for final acceptance. Any request for referee testing must describe the contractor’s reasons for questioning the validity of the original acceptance test results and must clearly describe which set of acceptance tests are in question. The engineer may either accept or reject the request for referee testing. When referee testing is accepted the Contractor (at the Contractors own expense) will engage an independent laboratory accredited by the AAP or a laboratory listed in the current ADOT Directory of Approved Materials Testing Laboratories as appropriate the acceptance tests that are being questioned. The independent referee laboratory shall use properly certified technicians in accordance with ASTM D3666, Section 7 (Personnel Qualifications). For the set of test results in question the referee laboratory shall perform a new set of acceptance tests (as required by Section 321.10 representing the area for the set of tests in question). The referee tests will replace the original acceptance tests that were in question.

These tests may include asphalt binder content, aggregate gradation, Marshall or Gyratory unit weight, maximum theoretical unit weight, laboratory air voids and in-place air voids (compaction). Samples for referee testing shall come from representative samples obtained from the completed pavement, as directed by the Engineer.

The number of samples taken will be the same as specified in Section 321.10. The independent laboratory shall compile the test results and transmit them to both the Engineer and the contractor. The independent laboratory shall include a report sealed and signed by an Engineer registered in the State of Arizona, who is experienced in asphalt concrete testing and mix design development. The signed report shall give an opinion that the material evaluated does or does not comply with project specifications, shall clearly describe any deficiencies, and the results will be binding between all parties.

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### 321.12 MEASUREMENT:

Asphalt concrete pavement will be measured by the ton, or by the square yard, for the mixture actually used as allowed above, which shall include the required quantities of mineral aggregates, asphalt binder, and mineral admixture. Measurement shall include any tonnage used to construct intersections, roadways, streets, or other miscellaneous surfaces indicated on the plans or as directed by the Engineer.

### 321.13 PAYMENT:

The asphalt concrete measured as provided above will be paid for at the contract price per ton or square yard, as adjusted per Section [321.10](#), which price shall be full compensation for the item complete, as herein described and specified.

Payment for tack coat will be by the ton diluted, based on the rate of application, as directed by the Engineer. No payment will be made for any overrun in quantity of asphalt concrete in excess of 10 percent based on actual field measurement of area covered, design thickness, and the mix design unit weight. The calculations and payment for overrun will be by individual pay item. To compensate or adjust for a thickness deficiency in an underlying asphalt concrete course, the Engineer may authorize a quantity increase in excess of 10 percent for a subsequent asphalt concrete course. In such cases, the quantity in excess of 10 percent will be paid for at the lowest unit price.

Agency required repairs of existing pavement prior to roadway overlay operations will be paid for as a separate pay item.

Except as otherwise specified, no separate payment will be made for work necessary to construct miscellaneous items or surfaces of asphalt concrete.

### 321.14 ASPHALT CORE METHOD: Core Drilling of Hot Mix Asphalt (HMA) for Specimens of 4" or 6" diameter

**321.14.1 Scope:** This method is to establish a consistent method of the use of a diamond bit core to recover specimens of 4 or 6 inch diameter for laboratory analysis and testing. The method will require the use of: water, ice (bagged or other suitable type), dry ice, and a water-soap solution to be utilized when coring asphalt rubber concrete. Individuals doing the specimen recovery should be observing all safety regulations from the equipment manufacturer as well as the required job site safety requirements for actions, and required personal protective equipment.

**321.14.2 Core Drilling Device:** The core drilling device will be powered by an electrical motor, or by an acceptable gasoline engine. Either device used shall be capable of applying enough effective rotational velocity to secure a drilled specimen. The specimen shall be cored perpendicularly to the surface of pavement, and that the sides of the core are cut in a manner to minimize sample distortion or damage. The machinery utilized for the procedure shall be on a mounted base, have a geared column and carriage that will permit the application of variable pressure to the core head and carriage throughout the entire drilling operation. The carriage and column apparatus shall be securely attached to the base of the apparatus; and the base will be secured with a mechanical fastener or held in place by the body weight of the operator. The core drilling apparatus shall be equipped with a water spindle to allow water to be introduced inside of the drill stem while operating. The cutting edge of the core drill bit shall be of hardened steel or other suitable material with embedded diamond chips in the cutting surface. The core barrel shall be of sufficient diameter to secure a specimen that is a minimum of four or six inches or whichever is prescribed for necessary testing. The core barrel shall not be missing more than one of the teeth used for cutting; if so it shall be discarded and another barrel shall be used. The core barrel shall also be a minimum of two inches longer than the anticipated depth of pavement in accordance with project paving plans.

**321.14.3 Accessory Equipment:** A sufficient supply of ice and dry ice shall be provided to sufficiently cool the pavement prior to securing the samples from the designated areas in the pavement. The ice should also be used to adjust the temperature of the water used to cool the core bit. A water supply (usually a plastic 35 – 55 gal drum) with sufficient hose to introduce the water into and through the spindle of the coring device by gravity feed. The

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drum should be white or light in color to minimize excessive thermal heating of the water (*for coring of asphalt rubber cores see Note 1*). At no time shall the water utilized in the coring operation exceed 65° F during the coring operation. Ice shall be utilized to ensure the temperature control of the water being introduced during the cutting operation. An ice chest or other suitably insulated container that can maintain a temperature of less than 70° F shall be used to secure the specimens during transport. The container will be equipped with flat shelving that will support the drilled cores throughout the entire specimen dimension during transport back to the testing facility.

Miscellaneous hand tools to remove the drilled specimen from the drill hole or the core barrel taking great care in not disturbing the specimen more than necessary (refer to fig. 1 in ASTM D5361).

**321.14.4 Process:** The pavement surface at the time of coring shall not exceed a temperature of 90° F; the pavement shall be conditioned with ice or dry ice to ensure that this requirement is met. Immediately after it has been ensured that the pavement has dropped to the required temperature, core drilling shall begin. The operator will then apply an even and continuous pressure (Note 2) to penetrate through the full depth of the pavement. The operator will concurrently ensure that enough water is moving over the core surface as to adequately remove any and all cuttings that could damage the drilled core. After the pavement thickness has been penetrated the core shall be carefully removed from either the drill hole or the core barrel and be immediately transferred to an ice chest or other suitable container. Each individual core shall be placed on a shelf in the cooler with the exposed side of the specimen facing down, or the “top side” down. If the specimen is a two lift core, the only acceptable means of separating lifts is with a power or other acceptable wet saw type of equipment (conforming to ASTM D5361); however, at no time shall cores be split using a mallet and screwdriver or metal straight edge when being tested for bulk density. Perpendicularity of the specimen shall be checked in the field after the specimen has been extracted from the surface. The core operator shall hold the core up to eye level and place the core top side down in a “speed square” or small carpenters square. The specimen placed in the square shall not depart from perpendicular to the axis more than 0.5° (approximately equivalent to 1/16 of an inch in 6 inches). If the specimen is outside of this distance from square it shall be discarded in the field and another sample cored that falls within tolerance. The cores upon arriving at the laboratory for testing shall be carefully cleaned and measured for thickness in accordance with ASTM D3549. A speed square shall be utilized to measure perpendicularity as compared to a 90° degree angle and shall not depart from perpendicular to the axis more than 0.5° (approximately equivalent to 1/16 of an inch in 6 inches). All remaining testing shall be done within the parameters of the current project and / or agency required specification.

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\*Note 1 – It should be noted that when the material to be cored is a rubberized asphalt mixture a wetting agent such as liquid dish soap shall be added to the water barrel to hinder the material from sticking or allowing the binder to spread during coring.

\*Note 2 – This refers to pressure exerted on the core barrel and machine during the coring process. Too much pressure can cause damage to the core barrel and the motor; and too little pressure can cause a glazing of the diamonds, reducing cutting efficiency and premature wear of the barrel.

**- End of Section**

# Water/Sewer Working Group Meeting

Meeting Notes  
April 16, 2015

## Opening:

A meeting of the Specifications and Details Water/Sewer Working Group was called to order by Jim Badowich on April 16, 2015, at 1:35 p.m. in the MAG Cottonwood Room.

## 1. Introductions/Attendance

Jim Badowich (Avondale), Anthony Bussio (Geneva Polymer), Julie Christoph (Mesa), Will Fielder (SW Gas), Daniel Kiel (Peoria), Matt Ligouri (SW Gas), Robert McGee (SW Gas), Connie Peretz (AZUCA), Craig Sharp (Buckeye), Gordon Tyus (MAG), Arvid Veidmark (SSC Boring), Warren White (Chandler).

## 2. Presentation from Armorock – Polymer Manhole System

Jim Badowich asked Anthony Bussio to give a short presentation on polymer based manholes. Mr. Bussio provided several handouts including a presentation, sample specifications and details, and product data sheets. He then provided an overview of the product. Polymer concrete uses resin rather than cement as the binder holding the sand and aggregate together to make the entire manhole corrosion resistant. He explained how sulfide gas oxidizes to sulfuric acid which can deteriorate the cement and corrode typical manholes. The handouts showed typical failures of concrete manholes and coating and lining failures as well. The polymer manholes have greater strength and so the wall thickness can be 2" rather than 4"-5" but are still structurally sound at 4000 psi and are not flexible. He provided charts that illustrated how the extended life of the polymer product made it more economical over a 50 year period. He said their product was warranted for a full 50 years compared to a typical 5 year warranty. Mr. Bussio said the product has been approved in Clark County, the Twin Cities, and tests are underway in several Arizona agencies including Pima County, Queen Creek and tests in Pheonix.

Mr. White asked about insecticides. Mr. Bussio said the material was resistant to chemicals, and they should work fine. Craig Sharp asked when the material would be ASTM ready. Mr. Bussio said they are working with the ASTM committee and have a contributing member, but thought it may be 5-10 years. In the meantime, the product meets the ASTM standards for Polymer-based pipe, and standard manhole specifications for loading requirements. He said there are other manufactures in the U.S. of this type of manhole, and they have worked with other agencies including Pima County. Julie Christoph asked about handling the material. Mr. Bussio explained that since the material is pre-coated there were approved methods for installation (such as lifting vertical) to avoid damage. He said that if a crack or chip is made, they have a polymer grout (a chemical repair method) that hardened in about an hour and reached maximum strength in 24 hours. He noted installation time can also be quicker since a separate coating or lining operation is not needed. He said if a replacement is needed they have a 24 hour turnaround time with a plant in the Las Vegas area.

Jim Badowich thanked Mr. Bussio for the presentation and said it was just a matter of time before these products become used widely. Other products such as meter boxes are already being used due to the corrosion resistance. He said Avondale is planning to test these manholes. He said having ASTM approval, and making the pieces interchangeable would be beneficial.

### **3. Case 15-01 Misc. Bloopers**

Gordon Tyus said Bob Herz brought to his attention an error in the existing specifications. Section 603 was to be deleted from the spec since flexible pipe is now included in Section 601, however, it was inadvertently left in the initial printing of the books. Mr. Tyus said the document posted online has been corrected, but the books already sold and printed still have those pages in them. He advised members to cross out those two pages (603-1 and 603-2), and that he would send out an email notice about the correction.

### **4. Case 15-03 Trench Compaction Requirements**

Jim Badowich said that although Bob Herz was not in attendance his case is up for a vote at the next meeting. He noted a change removing the reference to “sheepsfoot” for the compaction wheel. Mr. Tyus said this change was suggested during the asphalt/concrete working group meetings since a “sheepsfoot” can also refer to a self-propelled or radio controlled compaction equipment. He suggested contacting Mr. Herz for clarification.

### **5. Case 15-04 Revisions to Section 602 Trenchless Installation of Steel Casing**

This case was passed at the last committee meeting.

### **6. Case 15-05 Reclaimed Water Valve Boxes**

Warren White provided handouts for his current case. One showed a detail of a square reclaimed water valve box produced by Old Castle. It included a 3D illustration to show the transition from round to square. He said Bob Herz noted the finish symbols should match the existing Detail 270. Ms. Christoph said Mesa uses round boxes for reclaimed water valves, but are labeled as such and painted purple. Daniel Kiel said Peoria typically uses C900 pipe, which you can get in the purple color. There was also discussion about which types are commonly used and how to avoid loads damaging the valves. Arvid Veidmark asked if we could get away from using key extensions Craig Sharp said he would prefer not to use extensions, but that Buckeye does use them. (Currently they are required over 5’ depths.)

Mr. White also passed out potential changes to the Valve Box Installation Details 391-1 and 391-2 and a proposed new Detail 391-3. The revised Detail 391-1 would show the standard collars for paved and unpaved areas. The different types (A-D) of installations were shown on 391-2. The type D installation added.

### **7. Horizontal Drilling Directional Drilling (New Section 608)**

Attendees from Southwest Gas asked to provide comments on the proposed section before they had to leave. Sponsor Arvid Veidmark provided a new version #17 of Section 608. Will Fielder of Southwest Gas asked if the new section would apply to them. Mr. Badowich said that it would apply to any horizontal directional drilling. He explained that there currently is no spec governing this process, and agencies were concerned about such things as the clearance from other utilities in their right-of-way. Mr. Fielder expressed concerns that the proposed spec may be overlap with other requirements that they must currently meet from the ACC. He also thought the requirement to be trained by the manufacturer would not be feasible for their many contractors. Arvid Veidmark summarized the development of the current draft specification, and his work with ASU, AZUCA and the MAG working group. He said that they wanted input from the utilities such as SW Gas so that there aren’t conflicts. Mr. Fielder said things such as getting a PE stamp for fluids seemed unreasonable. Mr. Veidmark said agencies are concerned about all

the horizontal drilling, and there have been issues such as cross-boring through sewer laterals. Mr. Fielder acknowledged the problem, and said they were now doing in-house reviews and taking video of the project. Jim Badowich explained that the size of the project in the spec was dependent on the size and length of each bore, not the total length of the project, and that most were around 500' on average, that did not require all the additional reporting. Mr. Fielder said they typically use a 4" sleeve and then pull their 2" pipe through to avoid damage to their line. Mr. Badowich said MAG is trying to create a general spec that would cover all HDD including telecommunications, and ITS conduits used by the cities. There was also some discussion about welding joints. Arvid Veidmark said he would meet with representatives from SW Gas personally to review their suggestions on the proposed specification.

Mr. Badowich asked Connie Peretz of AZUCA how their membership has responded to the proposed spec. She said that although there was some initial pushback from contractors on additional regulation, overall their membership is on board, and believe it will even the playing field for contractors. She said that telecommunications providers, however, did not respond favorably. Mr. Veidmark said he thinks this is because utilities believe the requirements will increase their costs. Jim Badowich said he likes the idea of having contractors verify that adjacent utility lines were not breached. Ms. Peretz explained some of the problems locating utilities. She said after 2007 sewer laterals must be electronically locatable, but not before, so many are not correctly identified on existing maps. Members discussed the importance of getting feedback and taking into consideration the concerns of utilities.

#### **8. Locating Utilities – Using Tracer Wire, etc.**

Craig Sharp moved the group's discussion towards methods to better locate utilities including preferred methods. He handed out a matrix of agencies and their requirements, which included tracer wire, locating balls, tape and detectable mule tape. He also handed out supplements from the cities of Avondale, Buckeye, Flagstaff, Goodyear, Phoenix, Scottsdale and Surprise. He also provided information on the Arizona Statutes and Blue Stake Law. He discussed some of the options, including running tracer wire next to fire hydrants.

Julie Christoph said over the past couple years Mesa has been mapping potholing data on their GIS system. Members agreed that keeping a record of where utilities have previously been located was a good idea.

Due to the lateness of the meeting, discussion on this item was cut short. Mr. Sharp asked members to review the material he provided and consider a possible case to standardize electronic location methods.

#### **9. Adjournment**

The meeting was adjourned at 3:45 p.m.

**Report to MAG Technical Committee  
Meeting April 23, 2015  
Asphalt and Materials Working Group meetings  
By Chairmen, Jeff Benedict, Brian Galimore**

The meeting was held on noon on April 23, 2015 at the ARPA offices.

Present at the meeting: Greg Groneberg (S.W. Asphalt), Robert Herz (MCDOT), Scott Thompson, Bob Kostelny (Cardno ATC), Don Cornelison (Speedie), Brian Gallimore (WSP), David Beckel, Kevin Moss (Southwest Rock products), Sam Huddleston (Western Refining), Mo Rahman (Alon), Jeff Hearne (SRMG), Alf Wold (Alpha Geotech), Joshua Kelter (Lafarge), Todd Ingram (Lhoist).

Cases for submittal:

**Case 14-06 revision to section 718** Sam Huddleston's version that was handed out to the entire MAG was reviewed with many AASHTO tests replaced with ASTM versions. Sam explained how he is reviewing each ASTM test method and comparing them to the AASHTO test methods. He indicated that this will take two weeks to accomplish. He explained that the V.O.C. limits indicated on certain products were rarely needed with emulsion products. He recommended that they not be included in the table to save money on routine testing.

**Case 14-12** MCDOT version 4-9-2015 submitted this case for "Pavement removal" to prevent joints along pavement wheel paths. The case was discussed. The working group supports the case as it is now written. The case includes changes to details Section 200 (Scottsdale). and includes the line inserted in 321.10.3, Section 601.2.7 and to Section 336. It should have the full committee's support.

**Case 14-17 Stamped (decorative) asphalt** the new section was reviewed. It now includes revised wording that included the new technology of sealers. It was reviewed with one of the major manufacturer who had recommended some changes to the case. The working group had comments on the "experience" requirement in the spec. This case can go the full MAG in May.

**Case 15-03 modifications to Section 601** the case would limit horizontal lifts of ABC to 8" rather than the 2 feet limit in the specification now. It was acknowledged that it would tend to ensure better compaction for the owner. Discussion on the definition of "pad foot rollers", and equipment are now understood.

**Case 15-08 710 table revision** the case was reviewed to improve the understanding of high volume and low volume mix designs. There will not be any changes but a formatting change to make it easier to understand. This is almost a "typo" case that could be voted on soon.

**Section 321 revisions** a possible case. The working group has decided that it will work on modifications to the section. Placement temperatures are too complicated and therefore are not enforced evenly. The roadmap and case will be submitted next month.

Discussion was centered on thin overlays and the issue of poor compaction due to bad undersurface stability. This is an industry issue that is not easily identified or fixed.

Section 717 Asphalt rubber and a discrepancy between admixture volume needs to be addressed.

David Beckel's discussion to have a case on "lime Treated ABC" was had. It was decided that he will work on a possible case at the working group. He has a list of experts that have agreed to help him create and work on a possible case. He is going to produce a "roadmap" on the case for distribution.

Next meeting is May 28rd 2015 at the ARPA offices.

This meeting was adjourned at 1:35 PM.

# MAG Concrete Working Group

## Meeting Notes

Thursday, April 23, 2015, 1:00 pm at the ARPA Offices

### Present:

See attached attendance sheet.

### Discussion:

- 1) Revision to Section 725 – Bob Hertz (email from John Shi @ MCDOTX)  
Jeff Hearne presented a draft of the additional wording to add as the mix design submittal requirements in Section 725.6. It was also proposed and discussed to change the modification limit for coarse aggregates from 5% to 10% in regards to mix design re-submittal requirements. The current 5% level was modeled after an old ADOT requirement and is realistically too small to actually affect concrete performance in the field.
  
- 2) New Pervious Concrete Sections – Jeff Hearne  
A draft of a new Section 6XX on field placement/maintenance and 7XX materials/mix design was presented as a starting point for additions and revisions – loosely modeled after the current California Greenbook Sections. Contractor qualifications, curing, infiltration rate testing, and potential future evaluation/maintenance were discussed as probably additions to the Draft. A Caltrans Pervious Pavement Design Guidance document along with other Caltrans suggested Standard Specification changes were given to the Group for review and future discussion. These can be found on the MAG website.

### Date for Next Meeting:

The next meeting is scheduled for **May 28, 2015 @ 1:00 pm** in the ARPA offices.  
(Following the Asphalt and Materials Working Group meetings)

Any and all participants are welcome and encouraged to be involved.



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