August 29, 2012

TO: Members of the MAG Standard Specifications and Details Committee

FROM: Troy Tobiasson, City of Goodyear, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Wednesday, September 5, 2012 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 Troy Tobiasson at 623-882-7979 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. Several cases are scheduled for action, so your 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
September 5, 2012

		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 August 1, 2012, Meeting Minutes	3. **Review and approve minutes of the August 1, 2012 meeting.**
4.	2013 Chair and Vice Chair: Candidates for Vice Chair are to submit a letter of interest to the MAG Regional Council chair.	4. Information and discussion.

Cases Carried Forward from 2011

5.	Case 11-02: Add an Asphalt Pavement Safety Edge option to Detail 201. **UPDATE**	5. **Information, discussion and possible action.** Sponsor: Bob Herz, Maricopa County
6.	Case 11-03: Replace cadmium plated bolts referenced in Section 610.13 with zinc plated bolts as described in ASTM-B633. **UPDATE**	6. **Information, discussion and possible action.** Sponsors: Paul Nebeker, Jim Badowich
7.	Case 11-12: Modifications to Regulatory Requirements, MAG Section 107. **UPDATE**	7. **Information, discussion and possible action.** Sponsor: Peter Kandaris
8.	Case 11-16: Modify Section 415: Steel Flexible Metal Guardrail. **UPDATE**	8. **Information, discussion and possible action.** Sponsor: Peter Kandaris

9. Case 11-18: Update Section 350: Removal of Existing Improvements. **UPDATE**	9. **Information, discussion and possible action.** Sponsor: Peter Kandaris
New Cases for 2012	
10. Case 12-01 Miscellaneous Corrections: A. Typographic corrections in Section 108.8 B. Typographic error in Section 108.9 C. Correct references in Detail 160. D. Correct typo in Section 610.3.	10. **Information, discussion and possible action.**
11. Case 12-03: Revisions to Details 260-2: Driveway Entrances. **UPDATE**	11. **Information, discussion and possible action.** Sponsor: Bob Herz, Maricopa County
12. Case 12-04: Revisions to Section 317: Asphalt Milling. **UPDATE**	12. **Information, discussion and possible action.** Sponsor: Jeff Benedict, ARPA
13. Case 12-06: Add ADA Compliant Alley Entrance Detail. **UPDATE**	13. **Information, discussion and possible action.** Sponsor: Warren White, Chandler
14. Case 12-10: Revision to Section 505.7.3 Bridge Deck Joint Assemblies.	14. **Information, discussion and possible action.** Sponsor: Bob Herz, Maricopa County
15. Case 12-11: Use of Reclaimed/Recycled Materials. Revisions to Sections 701, 702, 710 and 728. **UPDATE**	15. **Information, discussion and possible action.** Sponsors: Brian Gallimore, Jeff Hearne, Jeff Benedict - Materials, Concrete and Asphalt WGs
16. Case 12-12: New Section 789: Steel Reinforced Polyethylene Pipe (SRPE)	16. **Information, discussion and possible action.** Sponsor: Rod Ramos, Scottsdale
General Discussion	
17. Working Group Reports	17. Information and discussion. Water/Sewer Chair: Jim Badowich, Avondale Asphalt Chair: Jeff Benedict Materials Chair: Brian Gallimore Concrete Chair: Jeff Hearne Outside ROW: Peter Kandaris

18.	General Discussion	18. Information and discussion.
19.	Request for Future Agenda Items Discussion of possible October meeting if necessary	19. Information and discussion.

Adjournment

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

August 1, 2012

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

AGENCY MEMBERS

Jim Badowich, Avondale
Craig Sharp, Buckeye (proxy)
Warren White, Chandler
Greg Crossman, Gilbert
Mark Ivanich, Glendale
Troy Tobiasson, Goodyear, Chair
Bob Herz, MCDOT
Bob Draper, Mesa
* Javier Setovich, Peoria
Syd Anderson, Phoenix (St. Trans.)
Jami Erickson, Phoenix (Water)
* Rodney Ramos, Scottsdale
Jason Mahkovtz, Surprise
Tom Wilhite, Tempe, Vice Chair
* Jim Fox, Youngtown

ADVISORY MEMBERS

Jeff Benedict, ARPA
* Tony Braun, NUCA
Bill Davis, NUCA (proxy)
Brian Gallimore, AGC
Adrian Green, AGC
Jeff Hearne, ARPA
Peter Kandaris, Independent
Paul R. Nebeker, Independent
Jacob Rodriguez, SRP

MAG ADMINISTRATIVE STAFF

Gordon Tyus

* Members not attending or represented by proxy.

GUESTS/VISITORS

Mike Hook, ACPA
John Kanzlemaz, Contech
Kelly Kokesh, ADS
John Shi, MCDOT

1. Call to Order

   Chairman Troy Tobiasson called the meeting to order at 1:36 p.m.

2. Call to the Audience

   No members of the audience requested to speak.

3. Approval of Minutes

   The members reviewed the July 11, 2012 meeting minutes. Greg Crossman introduced a motion to accept the minutes as written. Bob Herz seconded the motion. A voice vote of all ayes and no nays was recorded.

4. 2013 Chair and Vice Chair

   Chairman Tobiasson noted that the current vice chair, Tom Wilhite will be promoted to chair in 2013, but that the committee will need a new vice chair to fill the vacant position, preferably from the west side of the region. Jim Badowich may be interested and would be checking with his coworkers in Avondale. Any other interested members were encouraged to speak with the chair and/or submit letters of interest.

Review of 2011 Carry Forward Cases

Chair Tobiasson said in order to accommodate a request by Peter Kandaris, who had to leave early for another meeting, the cases sponsored by Mr. Kandaris would be heard first.

5. Case 11-12 – Modifications to Regulatory Requirements, MAG 107

   Update references to state statutes and regulatory requirements. Peter Kandaris said he modified the second paragraph based on comments from Maricopa County. Bob Herz suggested the sentence should be moved up to be part of the first paragraph. Mr. Kandaris also said he made some changes to the second paragraph under 107.2 PERMITS. Bob Herz had additional suggested changes including modifying "will attempt to obtain the required permits" to "may obtain some of the required permits." He also had suggestions about changing the language on maintaining and closing permits, since some permits are transferred, not closed by the contractor. Jami Erickson of Phoenix said they want the contractors to be responsible for closing the permits, since they have had problems with them not being closed properly. Ms. Erickson agreed to review the proposed language changes by MCDOT to make sure Phoenix's issues are addressed. Mr. Kandaris said he would continue to work with the members on a final revision with plans to vote on the case at the next committee meeting.

6. Case 11-16: Modify Section 415: Steel Flexible Metal Guardrail

   Update Section 415 based on the Maricopa County Supplement. Reference MCDOT Details. Peter Kandaris provided an updated case at the meeting that incorporated comments from Maricopa County. He noted, however, that there was an inconsistency in references to the nested guardrail in Section 415.3. Mr. Herz said the information needed was on the guardrail details, rather than in the specification. Mr. Kandaris said the specs should then reference those details. Brian Gallimore asked what temporary overnight barriers would be acceptable. Peter Kandaris said at one time he had references to standard specifications for them, and that text could be added back in. Bob Herz agreed that it should be added and gave an example of a water-filled barrier that could be used. There was also discussion about the AASHTO MASH level 3 standard. Mr. Herz noted that a level 2 standard was acceptable for low speed roads. Mr. Kandaris said he would make the noted revisions and called for a vote at the next meeting.

7. Case 11-18: Update Section 350: Removal of Existing Improvements

   Add language in Section 350.2 for utility removal, and payment requirements. Mr. Kandaris provided an updated case in the packet to address comments from the last meeting. He noted the changes included cleaning up the second item under "350.2.1 Utilities." Bob Herz asked for clarification on where and how abandonments are noted on plans. Brian Gallimore said typically the design plans say when to abandon in place. Jami Erickson said the contractor should make notes and redlines to record the information needed for as-built plans. Bob Herz suggested deleting the second paragraph of 350.2.2. Mr. Kandaris was fine with the change. Mr. Herz also suggested changing the wording "alternate methods" to "locations" when referencing saw-cutting and Section 336. Mr. Kandaris said he would prepare an updated version and would like to vote on the case at the September meeting.

8. Case 11-02 – Safety Edge Detail

   Add an Asphalt Pavement Safety Edge option to Detail 201, update Section 321.8. Bob Herz handed out a revised version of the written specifications (Section 321.8.8 and Section 321.8.9) to go along with the updated detail drawing that was provided in the packet. He said he modified Section 321.8.9 to form the angle with respect to the adjacent roadway surface rather than the horizontal plane. Brian Gallimore asked how the roadway was to be fixed if the safety edge shape is not fully formed. Members suggested several methods of repair, depending on what and how much had to be fixed. Mr. Herz said he felt it should be left open to allow the contractor to fix it in the way deemed most appropriate for the situation. Mr. Gallimore said he also could get more specific language to replace the term "special device" based on actual devices approved by FHWA. Mr. Herz then asked for comments on Detail 201. Tom Wilhite suggested adding the note, "unpaved shoulder recompacted to 95%" on sections 'A' and 'B' as well. Brian Gallimore agreed and Bob Herz was okay with the change, although he thought it was covered in the written specifications. Mr. Herz agreed to make the final revisions and called for a vote at the next meeting.

9. Case 11-03 – Replace Cadmium Plated Bolts.

   Replace cadmium plated bolts referenced in Section 610.13 with zinc plated bolts as described in ASTM-B633. Jim Badowich said the latest version of the case incorporated comments from the county; however, he thought that the reference to AWWA C111 should remain. Bob Herz asked what information it provided since the revised case includes ASTM references. Although the reference to AWWA is very general, the committee saw no harm leaving it in since it was in the original text. Mr. Badowich said he would get with Jami Erickson to check the AWWA reference and make final revisions with a vote planned for September. Troy Tobiasson noted that the case does address the cadmium plating issue and that other issues could be addressed in future cases.

10. Case 11-14: Update Fire Hydrant Details

    Update Detail 360-1, and add Wet Barrel Option (360-2) and Details (360-3). Craig Sharp said the revised details in the packet included the minor corrections noted at the last committee meeting. It was also reviewed during the July water/sewer meeting. Bob Herz suggested a few minor corrections including changing note 7 to read "No valves are to be **located** in curb." Discussion about situations when valves do end up in the curb or gutter followed; however, members thought as a default for new construction, note 7 should be included. Mr. Herz also suggested removing references to MAG since all references by default are to the MAG specifications, and to add the word "acceptance" to the end of Note 10. Finally, he said the note for the second concrete pad should say "alternate location for concrete pad…" No changes were proposed for detail 360-3. Jami Erickson moved to accept Case 11-14 with the changes as discussed. Jim Badowich seconded the motion. A roll call vote was taken. The motion passed. 11 yes, 0 no, 0 abstain, 3 not present.

New 2012 Cases

11. Case 12-01: Miscellaneous Corrections

    No new cases or revisions were suggested. Mr. Tobiasson said he would leave the case open, and asked members to plan to vote on it during the September meeting.

12. Case 12-03: Revisions to Detail 250-2 DRIVEWAY ENTRANCES

    Update Sidewalk Widths to 4' in Detail 250-2 Driveway Entrances. Bob Herz provided an updated detail drawing at the meeting that adjusted note #2 to match Tempe's detail. It also adjusted the driveway entrance width to accommodate widening, and fixed the dimensions. Bob Draper asked why there was a 1' dimension from the beginning of the warp to the expansion joint. Mr. Herz explained that the expansion joint had to be moved a foot to keep the joint perpendicular to the sidewalk, and still keep a minimum 4' width for the entire path. (He noted that the 4' width is the minimum allowed under the proposed ADA standards.) With no further comments, Mr. Herz proposed to vote on the case during the next meeting.

13. Case 12-04: Revisions to Section 317: Asphalt Milling

Revise Asphalt Milling to address dust control measures on milled surfaces open to traffic. Jeff Benedict said there were no comments or changes. Bob Herz reviewed some changes he would like to see made. They included removing references to MAG and changing "shall" to "may, when authorized by the engineer." He also requested that the text be reorganized a bit, moving the payment information under Section 317.3 MEASUREMENT AND PAYMENT. He also suggested adding information clarifying that the contractor shall be responsible for the clean-up of any track-out. Tom Wilhite said he would like to review the final changes in writing before voting. Mr. Benedict agreed to make the changes and provide them to Mr. Tyus for distribution. He agreed to postpone the vote until the September meeting.

14. Case 12-06: New Detail 249: Modified Entrance

Create a new entrance detail meeting ADA requirements for straight sidewalks. Warren White provided an updated Alley Entrance Detail 260 during the meeting and also noted photos showing an installation were provided in the packet. The new Detail 260 showed two types, A-without curb, and B-with curb. Other revisions were made based on comments from the previous meeting. Bob Herz said he believed Note 3 should be referencing Section 340 instead of 390. Mr. White clarified that Note 5 is referring to the optional curb on the left side of the Type B view. Jason Mahkovtz and Greg Crossman suggested showing the concrete pad at the top of the driveway entrance. Members discussed the length of the curb and pad, and decided that it should be shown on the plans since it would depend on the site. It was also determined that the pad was to be Type A concrete as, but that the slope did not need to be specified since it was not part of the pedestrian walkway. Bob Draper noted that this detail could be used for other entrances besides alleyways. It was suggested to show the track-out pad in Section A-A view as well. Finally, there was discussion about transitioning from existing sidewalks, including those larger and smaller. For smaller sidewalks such as those 4' wide, members suggested adding the transition to one the side of the detail, like what was done in a previous curb ramp details. Mr. White said he would incorporate the improvements and have a final detail prepared for a vote at the next meeting.

15. Case 12-07: Revisions to Section 332.6: Protection of Uncured Surface

Add language to include a work plan for uncured slurry protection. Jeff Hearne said there had been no comments or changes since last month. Jami Erickson moved to accept Case 12-07 as presented. Greg Crossman seconded the motion. A roll call vote was taken. The motion passed. 10 yes, 0 no, 1 abstain, 3 not present.

16. Case 12-08: Section 611: Disinfecting Water Mains – Addition of Refreshing Plans

Modify Section 611.17 to include a "Keep Fresh Plan" to assure safe water quality. Jami Erickson said she wished to withdraw the case from consideration, but will continue to work on the issue at the water/sewer working group. Jim Badowich noted that he would like to address the issue in a more comprehensive way that included revising the flushing and testing specifications as well.

17. Case 12-10: Revisions to Section 505.6.3 Bridge Deck Joint Assemblies

Revise Section 505.6.3 and add updated welding requirements in part (7). Bob Herz said he had not received any comments since the last meeting, and proposed to vote on the case at the next committee meeting.

18. Case 12-11: Reclaimed/Recycled Materials

Address the use of reclaimed and/or recycled materials along with proper reference adjustments to their respective corresponding sections. Jeff Hearne provided updated handouts during the meeting that broke the case down into individual components A) for materials, B) for asphalt and C) for CLSM. He then proceeded to summarize the changes in each. Case 12-11A included revisions to Sections 701, 702, and a small change in Section 310. It primarily defines the recycled materials in the aggregate and base materials sections. Mr. Hearne clarified for Mr. Draper that a note was deleted so the specification will include all materials, not just virgin materials. He also said that the AASHTO M319 is more specific to recycled concrete than ASTM specs, and matched the industry standards that allow a max of 50% for concrete but up to 100% for RAP.

Case 12-11B focused on incorporating reclaimed materials into Section 710 ASPHALT PAVEMENT. Jeff Benedict said that by doing so, it would eliminate the need for Sections 709 and 719, which are badly out of date and would be deleted. Keeping with the current terminology, the Reclaimed Asphalt Pavement (RAP) section was added in as 710.2.3. (Following sections were renumbered.) Bob Draper asked why the AASHTO specifications were changed to ASTM in Tables 710-3 and 710-4. Adrian Green explained that the ASTM tests for freezing were simpler and the expanded ones in AASHTO were not needed for our climate. Mr. Benedict noted that some ASTM changes were already approved as part of Case 12-02, and they were just using the latest approved version of 710.

Case 12-11C broke out the changes for CLSM. Brain Gallimore worked to incorporate supplements from the City of Phoenix to incorporate recycled materials for use in CLSM in Section 728.2. Jeff Hearne noted that No. 57 aggregate would still be the default. He also said Note 2 for Table 718-1 clarified that types of ready-mixed structural concrete or grout shall not be used.

Members felt that Parts A and C were pretty straight forward, but that the RAP section would probably require more discussion. Jim Badowich asked if contractors were ready to produce the RAP as described. Adrian Green and Brian Gallimore said they have been producing and using recycled materials for years, and that this specification update corresponds to current industry practice. Some recent projects include U.S. 60 for ADOT, private jobs, paving at Sky Harbor Airport, and work in Pinal County. When asked about the cost savings, Mr. Green said that it depends on the materials used, but that using recycled materials can actually produce a better quality product, since there is additional binder material in the mix.

The sponsors noted that parts B and C were dependent on part A being approved first, but otherwise, they could separate votes. Mr. Benedict said they have an asphalt working group meeting scheduled for August 23rd. He asked for additional feedback and proposed to vote on all three parts at the next meeting. Chairman Tobiasson thanked them for their work on the case, and said he would add it to the schedule for a vote. If additional time is needed to complete the case, it can be determined if an October meeting is necessary, but if possible, he hoped to wrap up the cases next month.

19. Case 12-12: Steel Reinforced Polyethylene Pipe

Add new Section 739 for Steel Reinforced Polyethylene (SRPE) Pipe. Sponsor Rod Ramos was not present however Jim Badowich provided an overview of the discussion of the case during the July water/sewer working group meeting. He suggested keeping the case as a separate material case rather than updating all the existing sections that currently reference HDPE pipe. In the future, Mr. Badowich anticipated that Section 603 for installation of HDPE may be revised to become for general for the installation of all flexible pipe. He said the trench widths in 601 also needed to be updated. Industry representative John Kanzlemaz of Contech was in the audience and said he was working with other pipe suppliers to make necessary changes for future revisions. Greg Crossman asked if adding a reference to Section 603 made sense in the interim to provide some guidance for installation. Bill Davis said they also need to update the trench detail terminology to better match industry conventions. Bob Draper said he reviewed the proposed specification thoroughly, but did have several comments. He noted that the method of specifying classes of pipe stiffness is different than HDPE, and can be confusing because Class 1 is 50 psi, whereas Class 2 is 32 psi – opposite of what you might expect. He said the stiffness is also determined by pipe diameter. Another clarification needed was if all joints have gaskets, and the tests required. Field tests should probably not be included in the material specification. Mr. Tobiasson suggested Mr. Kanzlemaz meet with the case sponsor Rod Ramos to try and make the necessary updates for a possible vote in September. If additional work is required the case may need to be held over for next year.

20. Working Group Reports

Chair Tobiasson asked for reports from the working groups.

a. **Water/Sewer Issues Working Group**
Jim Badowich said the group met July 17th and he summarized some of the discussions not previously discussed on specific cases. (Notes were included in the agenda packet.) He said they were planning to have a presentation on manholes and precast bases by the manufacturers. Troy Tobiasson mentioned that he would like to see a review of liner adhesion methods and testing. Mr. Badowich said they wouldn't be meeting in August, so the next meeting is scheduled for September 18th at 1:30 p.m. at the MAG office.

b. **Asphalt, Materials and Concrete Working Groups**
Jeff Benedict said they did meet in July, and worked on revising the recycled materials case. The next joint meeting of these working groups is planned for August 23rd, beginning at noon at the ARPA office.

21. General Discussion

Mr. Tyus said the ASTM web portal subscription was renewed for another year, and encouraged members to continue to take advantage of the service. He also said if anyone currently not using it would like to sign-up, to please contact him.

22. Adjournment:

Mr. Tobiasson adjourned the meeting at 4:24 p.m.

2012 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

(Updated information can be found on the website: http://www.azmag.gov/Committees/Committee.asp?CMSID=1055)

CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE	
	CARRY FORWARD CASES FROM 2011						
11-02	Case 11-02: Add an Asphalt Pavement Safety Edge option to Detail 201.	MCDOT	Bob Herz	01/05/2011 08/06/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
11-03	Case 11-03: Replace cadmium plated bolts referenced in Section 610.13 with zinc plated bolts as described in ASTM-B633.	Peoria Water/Sewer WG	Paul Nebeker/ Jim Badowich	02/02/2011 07/25/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
11-12	Case 11-12: Modifications to Regulatory Requirements, MAG 107.	OROW WG/ SRP	Peter Kandaris	05/04/2011 08/27/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
11-14	Case 11-14: Update Fire Hydrant Detail 360-1, and add Wet Barrel Option (360-2) and Details (360-3).	Water/Sewer WG/ Buckeye	Scott Zipprich	07/13/2011 07/17/2012	Approved 08/01/2012	11 0 0	Yes No Abstain
11-16	Case 11-16: Modify Section 415: Steel Flexible Metal Guardrail.	OROW WG/ SRP	Peter Kandaris	07/13/2011 08/27/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
11-18	Case 11-18: Update Section 350: Removal of Existing Improvements.	OROW WG/ SRP	Peter Kandaris	07/13/2011 08/27/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
11-21	Case 11-21: Add new Section 623: Special Bedding for Mainline Storm Drain Pipe.	Phoenix	Syd Anderson	07/13/2011 01/04/2012	Withdrawn 07/11/2012	0 0 0	Yes No Abstain
11-30	Case 11-30: Update Section 702: Base Material. Moved all ABC material to Section 310. Revise Section 310: Untreated Base Course. Revise for current standards. Update all references to Section 702. (Combined with previous Case 11-35.)	AGC/ Materials WG	Brian Gallimore	07/13/2011 03/07/2012	Approved 03/07/2012	12 0 0	Yes No Abstain

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CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE	
	NEW CASES FOR 2012						
12-01	Case 12-01: Miscellaneous Corrections A. Section 108 typographic errors B. Remove space in Section 108.9 C. Correct references in Detail 160 D. Correct typo in Section 610.3	Goodyear/ Mesa	Troy Tobaisson/ Bob Draper/ Warren White	02/01/2012 05/02/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
12-02	Case 12-02: Modify Section 710 Asphalt Concrete to include low traffic gyration levels.	ARPA/ Asphalt WG	Jeff Benedict	02/01/2012 03/12/2012	Approved 05/02/2012	11 0 1	Yes No Abstain
12-03	Case 12-03: Revisions to Details 260-2: Driveway Entrances	MCDOT	Bob Herz	02/01/2012 08/28/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
12-04	Case 12-04: Revisions to Section 317: Asphalt Milling	ARPA/ Asphalt WG	Jeff Benedict	02/28/2012 08/28/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
12-05	Case 12-05: Revisions to Section 711: Asphalt Paving (Table 711-1)	ARPA/ Asphalt WG	Jeff Benedict	04/04/2012 04/09/2012	Approved 07/11/2012	12 0 0	Yes No Abstain
12-06	Case 12-06: New Detail: Modified ADA Compliant Alley Entrance	Chandler	Warren White	04/04/2012 08/28/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
12-07	Case 12-07: Revisions to Section 332.6: Protection of Uncured Surface	Phoenix	Jami Erikson	04/04/2012 07/02/2012	Approved 08/01/2012	10 0 1	Yes No Abstain
12-08	Case 12-08: Revisions to Section 611: Disinfecting Water Mains – Addition of Refreshing Plans	Phoenix	Jami Erikson	04/04/2012	Withdrawn 08/01/2012	0 0 0	Yes No Abstain
12-09	Case 12-09: ASTM Updates A. Section 770: Structural Steel	OROW WG/ SRP	Peter Kandaris	04/04/2012	Approved 07/11/2012	12 0 0	Yes No Abstain

2012 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

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CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE	
12-10	Case 12-10: Proposed revision to Section 505.6.3 Bridge Deck Joint Assemblies.	MCDOT	Bob Herz	06/06/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
12-11	Case 12-11: Use of Reclaimed/Recycled Materials A. Sections 701, 702 (Base Materials) B. Sections 709, 710 (Asphalt/RAP) C. Section 728 (CLSM)	Materials, Asphalt & Concrete WG	Brian Gallimore	07/02/2012 08/28/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain
12-12	Case 12-12: New Section 789 – Steel Reinforced Polyethylene Pipe (SRPE)	Scottsdale	Rod Ramos	07/11/2012 08/09/2012	Scheduled 09/05/2012	0 0 0	Yes No Abstain

Add the following to Section 321:

321.8.8 Thickened Edge: Prior to commencing paving operations that require construction of a thickened edge, the Contractor shall submit for the Engineer's approval construction procedures to be used for placement and compaction of the thickened edge.

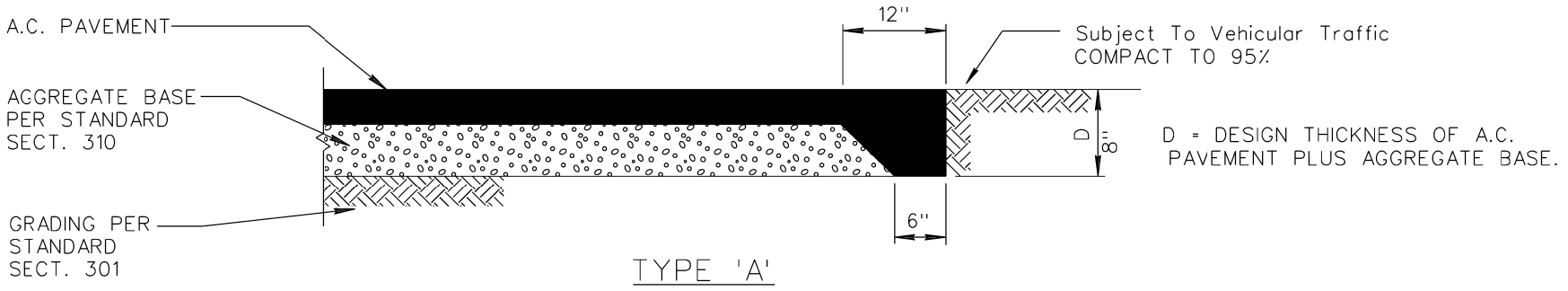
When the depth of the thickened edge extends two inches or more below the bottom of the asphalt pavement base course, the portion below the base course shall be placed and compacted as a separate construction operation. Construction of the base course may immediately follow compaction of the lower portion of the thickened edge.

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

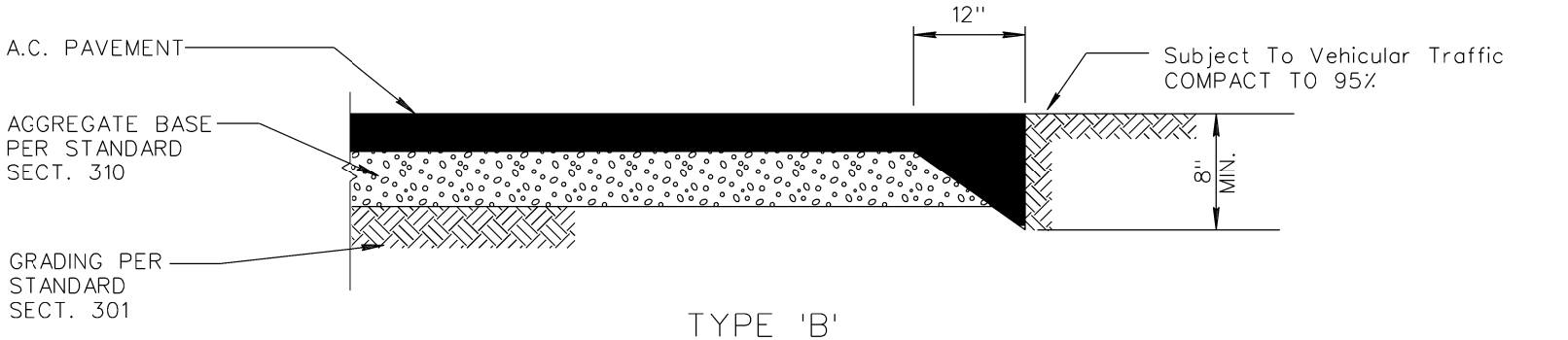
321.8.9 Safety Edge: The finished safety edge slope shall be planar forming a 30° ± 5° angle with the adjacent roadway surface and extend a minimum of five inches (5") below the roadway pavement's finished surface.

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 paving operations until corrections to the laydown operation have been made and resumption of paving is approved by the Engineer or his designated representative.



TYPE 'A'



TYPE 'B'

SAFETY EDGE

CASE 11-02

DETAIL NO.				DATE	DETAIL NO.
201	MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL ENGLISH	ASPHALT PAVEMENT EDGE DETAILS	8-03-2012	201

Section 610.13 COUPLINGS, JOINTS, GASKETS AND FLANGES
Proposed Revision; Case 11-03 – June 6, 2012
Originally Submitted by City of Peoria

[Current]

Section 610.13 COUPLINGS, JOINTS, GASKETS AND FLANGES

- MAG 610

610.13 COUPLINGS, JOINTS, GASKETS AND FLANGES:

C) Bolts and Nuts:

(1) For pipe 12 inches and smaller: Bolts and nuts for use in field connections or for connecting fittings shall be carbon steel equivalent to ASTM A307, Grade B, with cadmium plating in accordance with ASTM B-766, except that the minimum thickness of the plating shall be .00020 inches. Cadmium plated bolts shall have Class 2A threads and the nuts used with them shall have Class 2B threads. All bolt diameters shall normally be 1/8 inch smaller than the bolt hole diameter. High strength, heat treated cast iron tee-head bolts with hexagon nuts, all in accordance with the strength requirements of AWWA C-111, may be used in lieu of the cadmium plated bolts and nuts for jointing mechanical joint cast iron or ductile iron pipe and fittings only.

(2) For pipes 16 inches and larger, all bolts and nuts on flanges for valves and flexible couplings shall be carbon steel equivalent to ASTM A307, Grade B. Bolt diameters shall normally be 1/8 inch smaller than the bolt hole diameters.

[REVISED, DRAFT; 7/17/12]

Section 610.13 COUPLINGS, JOINTS, GASKETS AND FLANGES

- MAG 610

610.13 COUPLINGS, JOINTS, GASKETS AND FLANGES:

(C) Bolts and Nuts:

(1) ~~The minimum requirement for hexagon b~~Bolts, studs, and nuts ~~to be~~ used in underground field flanged connections or for connecting fittings shall be ~~of the exact same material consisting of a~~ carbon steel compliant with~~equivalent to~~ ASTM A307, Grade A unless Grade B is specified. ~~in accordance with the applicable requirements of AWWA C111.~~ Bolts and studs shall have Class 2A thread tolerance~~s~~ with the corresponding nuts having Class 2B tolerance~~threads~~. ~~Hexagon b~~Bolts, studs and nuts shall have a hot-dipped zinc coating in accordance with ASTM F2329. All bolt diameters shall normally be 1/8 inch smaller than the bolt hole diameter. ~~The Engineer may specify a type Grade B material for higher strength if desired and depending on application. If otherwise specified, exceptions to~~ Bolts, studs and nuts shall be zinc coated ~~ing may be~~unless made from 316 stainless steel per ASTM F593 or cadmium plated~~ing~~ per ASTM B766. All bolts shall be hexagonal heads.

Comment [rth1]: Unclear phrase - What item is to be the same material as which item?

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Comment [rth2]: What constitutes equivalency? How equivalency is to be determined needs to be defined.

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Comment [rth3]: Identify which AWWA C111 requirements are applicable.

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(2) The minimum requirement for underground mechanical joint connections using T-head bolts shall meet the ~~applicable~~ requirements of AWWA C111 using a high strength low alloy steel manufactured for atmospheric corrosion resistance per ASTM A242.

Revise Section 505.6.3.3 (5) by deleting the cadmium option as indicated below:

(5) Galvanizing**:** All steel parts of strip seal assemblies shall be galvanized after fabrication, in accordance with the requirements of ASTM A123 and A153, unless ASTM A588 steel is used. Bolts shall be high strength, conforming to the requirements of ASTM A325M, with a protective coating of ~~cadmium or~~ zinc, followed by a chromate and baked organic coating conforming to the requirements of ASTM F1135, Grade 3, 5, 6, 7, or 8 and Color Code A.

SECTION 107

LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

107.1 COMPLIANCE WITH LAWS:

The Contractor shall keep fully informed of, observe and comply with all Federal and State laws, County and City ordinances, regulations, codes and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any way affect the conduct of the work. The Contractor warrants that all items supplied and work performed under the contract have been sold, produced, delivered and furnished in strict compliance with all such laws, ordinances, regulations, codes, orders and decrees to which the items, work and Contractor are subject. Upon request, Contractor shall execute and deliver to the Agency such documents as may be required by the Agency to evidence compliance with such laws, ordinances, regulations, codes, orders and decrees. The Contractor shall protect and indemnify the Contracting Agency and its representatives against any claim or liability arising from or based on the violation of such, whether by the Contractor or the Contractor's employees.

107.2 PERMITS:

Permits, bonding and insurance requirements shall be as required by statutes, codes, ordinances or regulations.

The Public Agency, when acting as the Contracting Agency, may obtain some of the required permits. It is the duty of the Contractor to determine that all necessary permits have been obtained. The Contractor shall, at the Contractor's own expense, obtain all the required permits which have not been furnished. The Contractor shall comply with all permit requirements until the Contract is completed or the permit is closed-out or transferred. The Contractor shall be responsible to closed out all permits except those authorized by special provision to be transferred.

In all cases, the Contractor or the person supervising the authorized work shall notify the appropriate permitting agency so as to insure proper inspection by the agency concerned.

SECTION 107

LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

107.1 COMPLIANCE WITH LAWS ~~TO BE OBSERVED~~:

The Contractor shall keep fully informed of, observe and comply with all Federal and State laws, County and City ordinances, regulations, codes and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any way affect the conduct of the work. ~~He shall at all times observe and comply~~ The Contractor warrants that all items supplied and work performed under the contract have been sold, produced, delivered and furnished in strict compliance with all such laws, ordinances, regulations, codes, orders and decrees~~; and~~ to which the items, work and Contractor are subject. Upon request, Contractor shall execute and deliver to the Agency such documents as may be required by the Agency to evidence compliance with such laws, ordinances, regulations, codes, orders and decrees.
The Contractor shall protect and indemnify the Contracting Agency and its representatives against any claim or liability arising from or based on the violation of such, whether by ~~himself~~ the Contractor or ~~his~~ the Contractor's employees.

~~The attention of the Contractors is directed to the provisions of the following sections, Arizona Revised Statutes.~~

~~(A) Arizona Revised Statutes 23-373. Contracts negotiated between public Contractors and public employers shall contain the following contractual provisions:~~

~~In connection with the performance of work under this contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, religion, color or national origin. The aforesaid provision shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor agrees to post hereafter in conspicuous places, available for employees and applicants for employment, notices to be provided by the contracting officer setting forth the provision of the nondiscrimination clause.~~

~~The Contractor further agrees to insert the foregoing provision in all subcontracts, except subcontracts for standard commercial supplies or raw materials.~~

~~(B) When Federal aid funds are used on a project, the prevailing basic hourly wage rates and fringe benefit payments, as determined by the Secretary of Labor pursuant to the provisions of the Davis Bacon Act, shall be the minimum wages paid to the described classes of laborers and mechanics employed to perform the contract.~~

~~(C) Arizona Revised Statutes 40-360.22 Excavations: determining location of underground facilities; providing information. This statute requires that no person shall begin excavating before the location and marking are complete or the excavator is notified that marking is unnecessary and requires that upon notification, the owner of the facility shall respond as promptly as practical, but in no event later than two working days. The "Blue Stake Center" (263-1100) was formed to provide a more efficient method of compliance with this statute.~~

~~This section is not applicable to an excavation made during an emergency which involves danger to life, health or property if reasonable precautions are taken to protect underground facilities.~~

~~(D) Arizona Revised Statutes 40-360.23. Making excavations in careful, prudent manner: liability for negligence. This statute states that obtaining information as required does not excuse any person making any excavation from doing so in a careful and prudent manner nor shall it excuse such persons from liability for any damage or injury resulting from his negligence.~~

~~(E) Arizona Revised Statutes 40-360.28 Civil penalty; liability. If the owner or operator fails to locate, or incorrectly locates the underground facility, pursuant to this article, the owner or operator becomes liable for resulting damages, costs and expenses to the injured party.~~

~~(F) Arizona Revised Statutes 32-2313. Business license; business name; branch office registration; renewal. No person, partnership, corporation or association shall engage in the business of general pest or weed control without being duly licensed/certified by the Structural Pest Control Board.~~

107.2 PERMITS:

Permits, bonding and insurance requirements shall be as required by ~~the Contracting Agency's~~ statutes, codes, ordinances or regulations.

The Public Agency, when acting as the Contracting Agency, ~~will attempt to~~may obtain some of the required permits.~~,~~ ~~but it~~It is the duty of the Contractor to determine that all necessary permits have been obtained. The Contractor shall, at ~~his~~ the Contractor's own expense, obtain all the required permits which have not been furnished. The Contractor shall comply with all permit requirements until the Contract is completed or the permit is closed-out or transferred. The Contractor shall be responsible to closed out all permits except those authorized by special provision to be transferred.

~~If the permits not included in the proposal pamphlet materially affect any condition, specification, quantity, etc. contained in the proposal pamphlet, the Contracting Agency shall issue an appropriate change order pursuant to Subsection 109.4.~~

In all cases, the Contractor or the person supervising the authorized work shall notify the appropriate permit agency so as to insure proper inspection by the agency concerned.

SECTION 415

FLEXIBLE METAL GUARDRAIL

415.1 DESCRIPTION:

The work under this section shall consist of furnishing all materials, constructing new guardrail, and delineating guardrail sections at the locations shown on the plans.

Guard rail end treatments shall be as specified on the plans or special provisions.

415.2 MATERIALS:

The rail elements, bolts, nuts and other fittings shall conform to the specifications of AASHTO M 180, except as modified in this section. The rail metal shall conform to AASHTO M 180, Type I, Class A and in addition to the requirements of AASHTO M 180, shall withstand a cold bend, without cracking of 180 degrees around a mandrel of a diameter equal to 2 1/2 times the thickness of the plate.

Three certified copies of mill test reports of each heat from which the rail element is formed shall be furnished to the Engineer.

All materials shall be new, except as otherwise noted on the plans or special provisions.

Railing Parts furnished under these specifications shall be interchangeable with similar parts regardless of source. All surfaces of guardrail elements that are exposed to traffic shall present a uniform, pleasing appearance and shall be free of scars, stains or corrosion.

Nails shall be 16 penny common galvanized.

Bolts shall have shoulders shaped to prevent the bolts from turning.

Unless otherwise specified the rail elements, terminal sections, bolts, nuts, and other fittings shall be galvanized in accordance with Section 771. Where galvanizing has been damaged, the coating shall be repaired in accordance with Section 771.

Guardrail reflector tabs shall be either 3003-H14 Aluminum strip 0.063 ± 0.004 inches thick, or steel strip 0.078 ± 0.008 inches thick galvanized in accordance with ASTM A 653 coating designation G 90. The reflector material shall be high-reflectivity sheeting, either silver-white or yellow and shall conform to the requirements of Arizona State Department of Transportation Standard Specifications for Road and Bridge Construction. Adhesive for sheeting attachment to the metal tab shall be of the type and quality recommended by the sheeting manufacturer. Reflector tabs shall conform to the Reflector Tab Detail of Maricopa County Department of Transportation Standard Detail 3002.

Timber for posts and blocks shall be rough sawn (unplanned) or S4S with the nominal dimensions indicated. Any species or group of woods graded in accordance with the requirements for Timber and Posts of the Western Wood Products Association may be used. Timber shall be No. 1 or better, and the stress grade shall be as follows:

6” by 8” Post and Block	1200 psi
8” by 8” Post and Block	900 psi
10” by 10” Post and Block	900 psi

When the plans show guardrail systems using 8” by 8” timber posts and blocks, the Contractor may use 8¼” nominal size posts and blocks with a stress grade of 825 pounds per square inch. Substitution of 8” by 8” posts for 6” by 8” post may be approved on a per project basis by the Engineer.

At the time of installation, the dimensions of timber posts and blocks shall vary no more than plus or minus ½" from the nominal dimensions as specified on the project plans. The size tolerance of rough sawn block in the direction of the bolt holes shall vary no more than plus or minus 3/8".

All timber shall have a preservative treatment as per the requirements of AASHTO M 133.

Structural steel shapes shall conform to the requirements of ASTM A36 and be galvanized in conformance with the appropriate requirements of AASHTO M 111. Dimensions shall meet the dimensional requirements of the American Institute of Steel Construction.

Steel tubes shall conform to the material requirements of ASTM A500 or A501 and be galvanized in conformance with the requirements of AASHTO M 180, Type 1.

415.3 CONSTRUCTION REQUIREMENTS:

415.3.1 General: The construction of the various types of guardrail shall include the assembly and erection of all component parts complete at the locations shown on the project plans or as directed by the Engineer.

Only one type and size of post and block shall be used for any one continuous length of guardrail.

Terminal sections shall be installed in accordance with the manufacturer's recommendations.

Workmanship shall be equivalent to good commercial practice and all edges, bolt holes and surfaces shall be free of torn metal, burrs, sharp edges and protrusions.

The various types of guardrail shall be constructed with wood posts and wood blocks, except as otherwise noted on the plans.

The bolted connection of the rail element to the post shall withstand a 5,000 pound pull at right angles to the line of the railing. All metal work shall be fabricated in the shop. No punching, cutting or welding shall be done in the field, except as provided for by the project plans. All metal cut in the field shall be cleaned and the galvanizing repaired in accordance with Section 771.

Where field cutting or boring of wood posts and blocks is permitted, the affected areas shall be thoroughly swabbed with at least two passes of the same type of wood preservative as initially used.

Where wood posts with rectangular sections are used, the posts shall be set so that the longest dimension is perpendicular to the rail.

All bolts shall extend beyond the nuts a minimum of two threads, except that all bolts adjacent to pedestrian traffic shall be cut off flush to the nut.

Bolts extending more than 2" beyond the nut shall be cut off to less than ½" beyond the nut.

Unless otherwise shown on the plans, bolts shall be torqued as follows:

Diameter of Bolt	Torque, Foot/Pounds
5/8"	45-50
3/4"	70-75
7/8" and larger	120-125

All bolts, other than those specified to be torqued, shall be securely tightened.

When guardrail is being constructed under traffic, the work shall be conducted so as to constitute the least hazard to the public. Guardrail work shall be performed in the direction of traffic flow when feasible.

Any section of guardrail that is removed for modification shall be replaced within five calendar days of the date the guardrail is removed, unless otherwise directed by the Engineer. At the end of each day, incomplete guardrail sections having an exposed end toward oncoming traffic shall have an appropriate temporary protective end treatment acceptable to the Engineer and meeting the requirements of National Cooperative Highway Research Program (NCHRP) 350 or AASHTO Manual for Assessing Safety Hardware (MASH) set securely in place together with approved overnight traffic control devices set in place.

415.3.2 Delineation: The maximum spacing between reflector tabs shall not exceed six posts. The slotted part of the tab shall be installed under the mounting bolt head so that the Reflectorized surface of the tab faces oncoming traffic. The exposed ends of the slotted part of the tab shall be bent up against and then over the top of the bolt head. The color of the reflective portion of the barrier markers shall conform to the color of the adjacent edge line. Silver-faced reflector tabs shall be installed on the right hand side of all roadways, and yellow-faced tabs shall be installed on the left-hand side of one-way, or median divided roadways.

All guardrail delineation shall be installed in accordance with the manufacturer's recommendations and as specified herein.

415.3.3 Roadway Guardrail: Wood posts shall be used for new guard rail installations unless otherwise indicated by plans or special provisions. Wood posts shall either be driven or placed in manually or mechanically dug holes; however, driven posts will not be permitted at locations where damage to the curb, gutter, sidewalk, buried items, shoulders or pavement might occur. The Engineer will be the sole judge as to whether driving of posts will be allowed. Driving of posts shall be accomplished in a manner that will prevent battering, burring, or distortion of the post. Any post which is damaged to the extent it is unfit for use in the finished work, as determined by the Engineer, shall be removed and replaced at no additional cost to the Agency.

The posts shall be firmly placed in the ground. The space around posts shall be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer shall be moistened and thoroughly compacted to the density of the surrounding material.

Where pavement is disturbed in the construction of guardrail, the damaged surfacing shall be repaired as approved by the Engineer.

Where a culvert or other obstacle is at an elevation which would interfere with full depth post placement, guardrail installation shall comply with requirements of Section 415.3.4 Bolted Guardrail Anchors or Section 415.3.5 Nested Guardrail.

Wood blocks shall be toe nailed to the wood post with one 16 penny galvanized nail on each side of the top of the block. Wood blocks shall be set so that the top of the block is no more than ½” above or below the top of the post, unless otherwise shown on the project plans.

Rail elements shall be spliced at 25 foot intervals or less. Rail elements shall be spliced at posts unless otherwise shown on the project plans and shall be spliced by lapping in the direction of traffic in the nearest adjacent lane. Rail elements at joints shall have full bearing. When the radius of curvature is 150 feet or less, the rail elements shall be shop curved.

The Contractor shall dispose of surplus excavated material remaining after the guard railing has been constructed.

415.3.4 Bolted Guardrail Anchors: Where the elevation of the top surface of a concrete box culvert or other similar installation prevents the placement of a post of the specified length, the posts shall be shortened and anchored in accordance with Maricopa County Department of Transportation Standard Detail 3010.

415.3.5 Nested Guardrail: This work shall consist of furnishing and constructing nested guardrail, Type 1, 2, or 3, as shown in Maricopa County Department of Transportation Standard Details 3008-1 through 3008-3.

415.3.6 Guardrail to Structure Transitions: Guardrail transitions shall be constructed in accordance with requirements shown on the plans and special provisions.

415.4 MEASUREMENT:

The limits of measurement for roadway guardrail shall be as detailed in Maricopa County Department of Transportation Standard Detail 3016, except as otherwise noted on the plans or special provisions. Guardrail, of the type shown on the project plans, will be measured by the linear foot along the face of the rail element from center to center of posts, exclusive of guardrail terminals, guardrail end terminal assemblies, nested guardrail (Types 1, 2 and 3) and guardrail transitions.

Delineation is considered a part of installation of guardrail and hence will not be measured as a separate item.

The accepted quantities of guardrail posts secured with bolted guardrail anchors will be measured by the unit each.

Nested guardrail, Types 1, 2, or 3, and guardrail transitions will be measured by the unit each, complete in place and accepted as shown on the plans.

415.5 PAYMENT:

Payment for accepted quantities of each type of guardrail will be made at the contract unit price. Payment shall be full compensation for furnishing materials and installing guardrails, complete in place including excavation, backfill, and disposal of surplus material.

Payment for Bolted Guardrail Anchors will be at the contract unit price, and shall be full compensation for the work, complete in place, including steel brackets, hardware, excavation, backfill, removing and replacing surfacing, cutting and fitting steel beam posts or timber posts, drilling anchor bolt holes in steel posts, timber posts, and box culverts, and disposal of surplus materials.

Payment for guardrail transitions will be at the contract unit price. Payment shall be full compensation for furnishing materials and installing guardrail transitions, complete in place including excavation, backfill, and disposal of surplus material.

SECTION 415

FLEXIBLE METAL GUARDRAIL

415.1 DESCRIPTION:

The work under this section shall consist of furnishing all materials, constructing new guardrail, and delineating guardrail sections at the locations shown on the plans~~, and as per the requirements of this section~~.

Guard rail end treatments shall be as specified on the ~~project~~ plans or ~~as otherwise approved by the Agency~~special provisions.

415.2 MATERIALS:

The rail elements, bolts, nuts and other fittings shall conform to the specifications of AASHTO M~~-~~ 180, except as modified in this section. The rail metal shall ~~be open hearth, electric furnace, or basic oxygen steel and, in addition to~~ conform~~ing~~ to AASHTO M 180, Type I, Class A and in addition to the requirements of AASHTO M~~-~~ 180, shall withstand a cold bend, without cracking of 180 degrees around a mandrel of a diameter equal to 2 1/2 times the thickness of the plate.

Three certified copies of mill test reports of each heat from which the rail element is formed shall be furnished to the Engineer.

All materials shall be new, except as ~~provided for under the project~~otherwise noted on the plans or special provisions.

Railing Parts furnished under these specifications shall be interchangeable with similar parts regardless of source. All surfaces of guardrail elements that are exposed to traffic shall present a uniform, pleasing appearance and shall be free of scars, stains or corrosion.

Nails shall be 16 penny common galvanized. ~~Nails for retainer strap shall be 10 penny common, galvanized.~~

Bolts shall have shoulders ~~of such~~ shaped to ~~as will~~ prevent the bolts from turning.

Unless otherwise specified the rail elements, terminal sections, bolts, nuts, and other fittings shall be galvanized in accordance with Section 771. Where galvanizing has been damaged, the coating shall be repaired in accordance with Section 771.

~~Prismatic guardrail reflector tabs shall have a minimum thickness of 3/16", and be either galvanized steel or ultraviolet-resistant plastic. Prismatic guardrail-mounted barrier markers shall have an ultraviolet-resistant reflective surface, be secured to the body in accordance with the manufacturer's recommendations.~~ Guardrail reflector tabs shall be either 3003-H14 Aluminum strip 0.063 ± 0.004 inches thick, or steel strip 0.078 ± 0.008 inches thick galvanized in accordance with ASTM A 653 coating designation G 90. The reflector material shall be high-reflectivity sheeting, either silver-white or yellow and shall conform to the requirements of Arizona State Department of Transportation Standard Specifications for Road and Bridge Construction. Adhesive for sheeting attachment to the metal tab shall be of the type and quality recommended by the sheeting manufacturer. Reflector tabs shall conform to ~~and have a trapezoidal shaped body as shown in~~ the Reflector Tab Detail of Maricopa County Department of Transportation Standard Detail 3002.

Timber for posts and blocks shall be rough sawn (unplanned) or S4S with the nominal dimensions indicated. Any species or group of woods graded in accordance with the requirements for Timber and Posts of the Western Wood Products Association may be used. Timber shall be No. 1 or better, and the stress grade shall be as follows:

6" by 8" Post and Block	1200 psi

8” by 8” Post and Block	900 psi
10” by 10” Post and Block	900 psi

When the plans show guardrail systems using 8” by 8” timber posts and blocks, the Contractor may use 8¼” nominal size posts and blocks with a stress grade of 825 pounds per square inch. Substitution of 8” by 8” posts for 6” by 8” post may be approved on a per project basis by the Engineer.

At the time of installation, the dimensions of timber posts and blocks shall vary no more than plus or minus ½” from the nominal dimensions as specified on the project plans.

The size tolerance of rough sawn block in the direction of the bolt holes shall vary no more than plus or minus 3/8”. ~~Only one type of post and block shall be used for any one continuous length of guardrail.~~

All timber shall have a preservative treatment as per the requirements of AASHTO M 133.

Structural steel shapes shall conform to the requirements of ASTM A36 and be galvanized in conformance with the appropriate requirements of AASHTO M 111. Dimensions shall meet the dimensional requirements of the American Institute of Steel Construction.

Steel tubes shall conform to the material requirements of ASTM A500 or A501 and be galvanized in conformance with the requirements of AASHTO M 180, Type 1.

415.3 CONSTRUCTION REQUIREMENTS:

415.3.1 General: The construction of the various types of guardrail shall include the assembly and erection of all component parts complete at the locations shown on the project plans or as ~~requested~~ directed by the Engineer.

Only one type and size of post and block shall be used for any one continuous length of guardrail.

Terminal sections shall be installed in accordance with the manufacturer’s recommendations.

Workmanship shall be equivalent to good commercial practice and all edges, bolt holes and surfaces shall be free of torn metal, burrs, sharp edges and protrusions.

The various types of guardrail shall be constructed with wood posts and wood blocks, except ~~where other post materials to be used are~~ as otherwise noted on the plans.

The bolted connection of the rail element to the post shall withstand a 5,000 pound pull at right angles to the line of the railing. All metal work shall be fabricated in the shop. No punching, cutting or welding shall be done in the field, except as provided for by the project plans. All metal cut in the field shall be cleaned and the galvanizing repaired in accordance with Section 771.

Where field cutting or boring of wood posts and blocks is permitted, the affected areas shall be thoroughly swabbed with at least two passes of the same type of wood preservative as initially used.

Where wood posts with rectangular sections are used, the posts shall be set so that the longest dimension is perpendicular to the rail.

All bolts shall extend beyond the nuts a minimum of two threads, except that all bolts adjacent to pedestrian traffic shall be cut off flush to the nut.

Bolts extending more than 2” beyond the nut shall be cut off to less than ½” beyond the nut.

Unless otherwise shown on the plans, bolts shall be torqued as follows:

Diameter of Bolt	Torque, Foot/Pounds
5/8”	45-50
3/4"	70-75
7/8” and larger	120-125

All bolts, other than those specified to be torqued, shall be securely tightened.

When guardrail is being constructed under traffic, the work shall be conducted so as to constitute the least hazard to the public. Guardrail work shall be performed in the direction of traffic flow when feasible.

Any section of guardrail that is removed for modification shall be replaced within five calendar days of the date the guardrail is removed, unless otherwise directed by the Engineer. At the end of each day, incomplete guardrail sections having an exposed end toward oncoming traffic shall have an appropriate temporary protective end treatment acceptable to the Engineer and meeting the requirements of National Cooperative Highway Research Program (NCHRP) 350 or AASHTO Manual for Assessing Safety Hardware (MASH) -set securely in place together with approved overnight traffic control devices set in place.

415.3.2 Delineation: The maximum spacing between reflector tabs shall not exceed six posts. The slotted part of the tab shall be installed under the mounting bolt head so that the Reflectorized surface of the tab faces oncoming traffic. The exposed ends of the slotted part of the tab shall be bent up against and then over the top of the bolt head. The color of the reflective portion of the barrier markers shall conform to the color of the adjacent edge line. Silver-faced reflector tabs shall be installed on the right hand side of all roadways, and yellow-faced tabs shall be installed on the left-hand side of one-way, or median divided roadways.

All guardrail delineation shall be installed in accordance with the manufacturer's recommendations and as specified herein.

415.3.3 Roadway Guardrail: Wood posts shall be used for new guard rail installations unless otherwise indicated by plans or special provisions~~directed by the Engineer~~. Wood posts shall either be driven or placed in manually or mechanically dug holes; however, driven posts will not be permitted at locations where damage to the curb, gutter, sidewalk, buried items, shoulders or pavement might occur. The Engineer will be the sole judge as to whether driving of posts will be allowed. Driving of posts shall be accomplished in a manner that will prevent battering, burring, or distortion of the post. Any post which is damaged to the extent it is unfit for use in the finished work, as determined by the Engineer, shall be removed and replaced at no additional cost to the Agency.

The posts shall be firmly placed in the ground. The space around posts shall be backfilled with selected earth, free of rock, placed in layers approximately 4 inches thick and each layer shall be moistened and thoroughly compacted to the density of the surrounding material.

Where pavement is disturbed in the construction of guardrail, the damaged surfacing shall be repaired as approved by the Engineer.

Where a culvert or other obstacle is at an elevation which would interfere with full depth post placement, guardrail installation shall comply with requirements of Section 415.3.4 Bolted Guardrail Anchors or Section 415.3.5 Nested Guardrail.

Wood blocks shall be toe nailed to the wood post with one 16 penny galvanized nail on each side of the top of the block. Wood blocks shall be set so that the top of the block is no more than ½” above or below the top of the post, unless otherwise shown on the project plans.

Rail elements shall be spliced at 25 foot intervals or less. Rail elements shall be spliced at posts unless otherwise shown on the project plans and shall be spliced by lapping in the direction of traffic in the nearest adjacent lane. Rail elements at joints shall have full bearing. When the radius of curvature is 150 feet or less, the rail elements shall be shop curved.

The Contractor shall dispose of surplus excavated material remaining after the guard railing has been constructed.

415.3.4 Bolted Guardrail Anchors: Where the elevation of the top surface of a concrete box culvert or other similar installation prevents the placement of a post of the specified length, the posts shall be shortened and anchored in accordance with Maricopa County Department of Transportation Standard Detail 3010.

415.3.5 Nested Guardrail: This work shall consist of furnishing and constructing nested guardrail, Type 1, 2, or 3, as shown in Maricopa County Department of Transportation Standard Details 3008-1 through 3008-3~~, including all materials, in accordance with the requirements of the project plans~~.

~~Nested guardrail consists of additional steel W-beam sections attached as an appurtenance to guardrail.~~

415.3.6 Guardrail to Structure Transitions: Guardrail transitions shall be constructed in accordance with ~~the details~~ requirements shown on the ~~project~~ plans and special provisions.~~, at the locations shown on the plans~~

415.4 MEASUREMENT:

The limits of measurement for roadway guardrail shall be as detailed in Maricopa County Department of Transportation Standard Detail 3016~~, and as shown on the project~~ except as otherwise noted on the plans or special provisions. Guardrail, of the type shown on the project plans, will be measured by the linear foot along the face of the rail element from center to center of ~~end~~ posts, exclusive of guardrail terminals, guardrail end terminal assemblies, nested guardrail (Types 1, 2 and 3) and guardrail transitions.

Delineation is considered a part of installation of guardrail and hence will not be measured as a separate item.

The accepted quantities of guardrail posts secured with bolted guardrail anchors will be measured by the unit each.

Nested guardrail, Types 1, 2, or 3, and guardrail transitions will be measured by the unit each, complete in place and accepted as shown on the plans.

415.5 PAYMENT:

Payment for accepted quantities of each type of guardrail will be made at the contract unit price. Payment shall be full compensation for furnishing materials and installing guardrails, complete in place including excavation, backfill, and disposal of surplus material.

Payment for Bolted Guardrail Anchors will be at the contract unit price, and shall be full compensation for the work, complete in place, including steel brackets, hardware, excavation, backfill, removing and replacing surfacing, cutting and fitting steel beam posts or timber posts, drilling anchor bolt holes in steel posts, timber posts, and box culverts, and disposal of surplus materials.

Payment for guardrail transitions will be at the contract unit price. Payment shall be full compensation for furnishing materials and installing guardrail transitions, complete in place including excavation, backfill, and disposal of surplus material.

SECTION 350

REMOVAL OF EXISTING IMPROVEMENTS

350.1 DESCRIPTION:

This work shall consist of removal and disposal of various existing improvements, such as pavements, structures, pipes, conduits, curbs and gutters, and other items necessary for the accomplishment of the improvement.

350.2 CONSTRUCTION METHODS:

350.2.1 Utilities

The removal of existing improvements shall be conducted in such a manner as not to injure active utilities or any portion of the improvement that is to remain in place.

A utility may be abandoned in place below a new major structure that is part of the work only if approved by the Agency and solidly filled with grout using methods approved by the Agency. All abandoned utilities to remain and the approved abandonment method shall be noted on the installation record drawings.

Utilities to be removed by the Contractor shall be disconnected and taken out in accordance with the requirements of the utility owner to the limits shown on the plans. Utility removal shall not be performed until a release has been obtained from the utility stating that their respective service connection and appurtenant equipment have been disconnected, removed or sealed and plugged in a safe manner.

The Engineer shall be notified when utilities are encountered that are not shown on the plans.

350.2.2 Others

Sidewalks shall be removed to a distance required to maintain a maximum slope for the replaced portion of sidewalk, for one inch per foot and all driveways shall be removed to a distance as required by standard details.

Portland cement concrete pavements, curbs and gutters and sidewalks designated on the plans for removal shall be saw-cut at match lines, in accordance with Section 601 and removed.

Portions of asphalt concrete pavements designated on the plans for removal shall be done in accordance with Section 336.

Removal of trees, stumps, roots, rubbish, and other objectionable materials in the right-of-way shall be done in accordance with Section 201.

350.2.3 Backfill and Disposal

Backfill of all excavated areas below structures shall be in accordance with Section 206.4. Backfill and compaction of all other excavated areas shall be compacted to the densities as prescribed in Section 601 (trenches) or Section 211 (holes, pits or other depressions).

All surplus materials shall be immediately hauled from the jobsite and disposed of in accordance with Section 205.6.

350.3 MISCELLANEOUS REMOVAL AND OTHER WORK:

This work shall include, but not be limited to the following, where called for on the plans:

(A) Relocate existing fence and gate.

(B) Remove and reset mail boxes.

(C) Remove signs and bases in right-of-way.

(D) Remove planter boxes, block walls, concrete walls, footings, headwalls, irrigation structures, and storm water inlets.

(E) Install plugs for pipes and remove existing plugs as necessary for new construction.
(F) Remove wooden and concrete bridges.

(G) Remove median island slabs.

(H) Remove pavements and aggregate base where called for outside the roadway prism.

350.4 PAYMENT:

Payment for removals will be made at the unit proposal price for each removal item, which price shall be full compensation for the item complete, as described herein or on the plans.

SECTION 350

REMOVAL OF EXISTING IMPROVEMENTS

350.1 DESCRIPTION:

This work shall consist of removal and disposal of various existing improvements, such as pavements, structures, pipes, conduits, curbs and gutters, and other items necessary for the accomplishment of the improvement.

350.2 CONSTRUCTION METHODS:

350.2.1 Utilities

The removal of existing improvements shall be conducted in such a manner as not to injure active utilities or any portion of the improvement that is to remain in place. ~~See Section 107.~~

A utility may be abandoned in place below a new major structure that is part of the work only if approved by the Agency and solidly filled with grout using methods approved by the Agency. All abandoned utilities to remain and the approved abandonment method shall be noted on the installation record drawings.

Utilities to be removed by the Contractor shall be disconnected and taken out in accordance with the requirements of the utility owner to the limits shown on the plans. Utility removal shall not be performed until a release has been obtained from the utility stating that their respective service connection and appurtenant equipment have been disconnected, removed or sealed and plugged in a safe manner.

The Engineer shall be notified when utilities are encountered that are not shown on the plans.

350.2.2 Others

Sidewalks shall be removed to a distance required to maintain a maximum slope for the replaced portion of sidewalk, for one inch per foot and all driveways shall be removed to a distance as required by standard details.

~~Existing concrete driveway curbs and gutters shall be removed to the right-of-way line, and the new end of curb faced.~~

Portland cement concrete pavements, curbs and gutters and sidewalks designated on the plans for removal shall be saw-cut at match lines, in accordance with Section 601 and removed.

Portions of asphalt ~~Asphalt~~ concrete pavements designated on the plans for removal shall be done ~~cut~~ in accordance with Section 336.

Removal of trees, stumps, roots, rubbish, and other objectionable materials in the right-of-way shall be done in accordance with Section 201.

350.2.3 Backfill and Disposal

Backfill of all excavated areas below structures shall be in accordance with Section 206.4. Backfill and compaction of all other excavated areas shall be compacted to the densities as prescribed in Section 601 (trenches) or Section 211 (holes, pits or other depressions).

All surplus materials shall be immediately hauled from the jobsite and disposed of in accordance with Section 205.6.

350.3 MISCELLANEOUS REMOVAL AND OTHER WORK:

This work shall include, but not be limited to the following, where called for on the plans:

(A) Relocate existing fence and gate.

(B) Remove and reset mail boxes.

(C) Remove signs and bases in right-of-way.

(D) Remove planter boxes, block walls, concrete walls, footings, headwalls, irrigation structures, and storm water inlets.

(E) Install plugs for pipes and remove existing plugs as necessary for new construction.
(F) Remove wooden and concrete bridges.

(G) Remove median island slabs.

(H) Remove pavements and aggregate base where called for outside the roadway prism.

350.4 PAYMENT:

Payment for removals will be made at the unit ~~bid~~ proposal price~~s bid in the applicable proposal pay~~ for each removal item~~s~~, which price shall be full compensation for the item complete, as described herein or on the plans.

SECTION 108

All equipment which is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the project shall be such that it will not damage property adjacent to the work area.

When the methods and equipment to be used by the Contractor in accomplishing the construction are not prescribed, the Contractor is free to use any methods or equipment that he demonstrates to the satisfaction of the Engineer will accomplish the work in conformity with the requirements of the specifications.

When the specifications state the construction shall be performed by the use of certain methods and equipment, such methods and equipment shall be used unless others are authorized by the Engineer. If the Contractor desires to use a method or type of equipment other than those specified, he may request authority from the Engineer to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed to be used and an explanation of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Contractor will be fully responsible for producing construction work in conformity with the specifications. If, after trial use of the substituted methods or equipment, the Engineer determines that the work produced does not meet the specifications, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining construction with the specified methods and equipment. The Contractor shall remove the deficient work and replace it with work of specified quality, or take such other corrective action as the Engineer may direct. No change will be made in basis of payment for the construction items involved nor in contract time as result of authorizing a change in methods or equipment under these provisions.

108.7 DETERMINATION AND EXTENSION OF CONTRACT TIME:

The number of calendar days allowed for the completion of the work included in the contract will be as stated in the proposal and will be known as the contract time.

When the contract time is on a calendar day basis it shall consist of the number of calendar days specified, including all weekends and legal holidays. All calendar days elapsing between the effective dates of any written notice from the Engineer to suspend work and to resume work following suspensions, not the fault of the Contractor, shall be excluded.

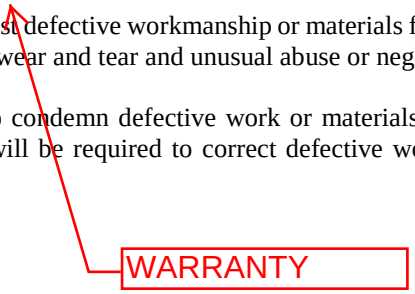
When the contract completion time is a fixed calendar date it shall be the date on which all work on the project shall be completed and meet final inspection.

If the Contractor finds it impossible for reasons beyond his control to complete the work within contract time as specified or as extended, he shall immediately submit a written request to the Engineer for an extension of time setting forth therein the reasons which he believes will justify the granting of his request. The Contractor's plea that insufficient time was specified is not a valid reason for extension of time. If the Engineer* finds that the work was delayed because of conditions beyond the control and through no fault of the Contractor, he may extend the time for completion in such amount as the conditions justify. The extended time for completion shall then be in full force and effect the same as though it were the original time for completion.

108.8 GUARANTEE AND WARRANTEE PROVISIONS:

The Contractor shall guarantee the work against defective workmanship or materials for a period of one year from the date of its final acceptance under the contract, ordinary wear and tear and unusual abuse or neglect excepted.

Any omission on the part of the Engineer to condemn defective work or materials at the time of construction shall not be deemed an acceptance, and the Contractor will be required to correct defective work or materials at any time before final acceptance and within one year thereafter.



*For Improvement District Project: The words “Superintendent of Streets” will be substituted for the word “Engineer.” Any extension of contract time will be determined by the Superintendent of Streets with the consent of the governing body

Add space

Should any defects develop within one year from the date of final acceptance due to faults in workmanship or materials the Contractor shall, within 14 calendar days of receipt of written notice from the Contracting Agencybegin making the necessary repairs to the satisfaction of the Engineer. Such work shall include the repair or replacement of other work or materials damaged or affected by making the above repairs or corrective work, all at no additional cost to the Contracting Agency.

If defects develop which are determined by the Engineer to be an emergency, the Engineer shall notify the Contractor, via the most expeditious means, regarding the nature and condition of the defects. In turn, the Contractor shall immediately dispatch necessary forces to correct the defect or the emergency condition. If the Contractor, in his initial action, resolves the emergency condition but not the defect, a letter as discussed above will follow and normal procedures for corrections will be employed. If immediate or appropriate action, satisfactory to the Engineer, is not taken by the Contractor, or if the Contractor cannot be contacted, the Engineer will deploy necessary forces to correct and/or secure the deficiency. Costs of the Engineer's action shall be paid by the Contractor and/or his bonding agency. Should it later be determined that the defects requiring such emergency action are not the responsibility of the Contractor, the Contractor will be paid for all costs incurred as a result of these demands in accordance with Subsection 109.5. Such action by the Engineer will not relieve the Contractor of the guarantees required by this Section or elsewhere in the Contract Documents.

In case of work, materials, or equipment for which written warranties are required by the special provisions, the Contractor shall provide or secure from the appropriate Subcontractor or supplier such warranties addressed to and in favor of the Contracting Agency and deliver same to the Engineer prior to final acceptance of the work. Delivery of such warranties shall not relieve the Contractor from any obligation assumed under any other provisions of the contract.

The warrantees and guarantees provided in this subsection of the contract documents shall be in addition to and not in limitation of any other warrantees, guarantees or remedies required by law.

warranties

108.9 FAILURE TO COMPLETE ON TIME:

For each and every calendar day that work shall remain in completed after the time specified for the completion of the work in the proposal, or as adjusted by the Engineer, the sum per calendar day shown in Table 108-1, unless otherwise specified in the proposal form, may be deducted from monies due to or to become due to the Contractor, not as a forfeit or penalty but as liquidated damages. This sum is fixed and agreed upon between the parties because the actual loss to the Contracting Agency and to the public caused by delay in completion will be impractical and extremely difficult to ascertain and determine.

Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time fixed for its completion may have been extended, will in no way operate as a waiver on the part of the Contracting Agency of any of its rights under the contract.

TABLE 108-1
LIQUIDATED DAMAGES

Original Contract Amount		**Daily Charges**
From More Than	To and Including	Calendar Day or Fixed Date
$ 0	$ 25,000	$ 210
25,000	50,000	250
50,000	100,000	280
100,000	500,000	430
500,000	1,000,000	570
1,000,000	2,000,000	710
2,000,000	5,000,000	1,070
5,000,000	10,000,000	1,420
10,000,000	—	1,780

*For Improvement District Project: The words “Superintendent of Streets” will be substituted for the word “Engineer.” Any extension of contract time will be determined by the Superintendent of Streets with the consent of the governing body

war·ran·tee

[wawr-uh n-tee, wor-]
noun
a person to whom a warranty is made.

war·ran·ty

[n. wawr-uh n-tee, wor-; v. wawr-uh n-tee, wor-] noun, plural -ties, verb, -tied, -ty·ing.
noun
1. an act or an instance of warranting; assurance; authorization; warrant.
2. Law .
a. a stipulation, explicit or implied, in assurance of some particular in connection with a contract, as of sale: an express warranty of the quality of goods.
b. Also called covenant of warranty. a covenant in a deed to land by which the party conveying assures the grantee that he or she will enjoy the premises free from interference by any person claiming under a superior title. Compare quitclaim deed, warranty deed.
c. (in the law of insurance) a statement or promise, made by the party insured, and included as an essential part of the contract, falsity or nonfulfillment of which renders the policy void.
d. a judicial document, as a warrant or writ.
3. a written guarantee given to the purchaser of a new appliance, automobile, or other item by the manufacturer or dealer, usually specifying that the manufacturer will make any repairs or replace defective parts free of charge for a stated period of time.

verb (used with object)
4. to provide a manufacturer's or dealer's warranty for: The automaker warranties its new cars against exterior rust.

be paid by the Contractor and/or his bonding agency. Should it later be determined that the defects requiring such emergency action are not the responsibility of the Contractor, the Contractor will be paid for all costs incurred as a result of these demands in accordance with Subsection 109.5. Such action by the Engineer will not relieve the Contractor of the guarantees required by this section or elsewhere in the Contract Documents.

In case of work, materials, or equipment for which written warranties are required by the special provisions, the Contractor shall provide or secure from the appropriate Subcontractor or supplier such warranties addressed to and in favor of the Contracting Agency and deliver same to the Engineer prior to final acceptance of the work. Delivery of such warranties shall not relieve the Contractor from any obligation assumed under any other provisions of the contract.

The warrantees and guarantees provided in this subsection of the contract documents shall be in addition to and not in limitation of any other warrantees, guarantees or remedies required by law.

108.9 FAILURE TO COMPLETE ON TIME: 2011

For each and every calendar day that work shall remain incompleted after the time specified for the completion of the work in the proposal, or as adjusted by the Engineer, the sum per calendar day shown in table 108-1, unless otherwise specified in the proposal form, may be deducted from monies due to or to become due to the Contractor, not as a forfeit or penalty but as liquidated damages. This sum is fixed and agreed upon between the parties because the actual loss to the Contracting Agency and to the public caused by delay in completion will be impractical and extremely difficult to ascertain and determine.

Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time fixed for its completion may have been extended, will in no way operate as a waiver on the part of the Contracting Agency of any of its rights under the contract.

TABLE 108-1

LIQUIDATED DAMAGES

Original Contract Amount		Daily Charges
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2,000,000	5,000,000	1,070
5,000,000	10,000,000	1,420
10,000,000	—	1,780

108.10 FORFEITURE AND DEFAULT OF CONTRACT:

It is further agreed to by the Contractor that if he:

(A) Fails to begin the work under the contract within a reasonable time, or

Should any defects develop within one year from the date of final acceptance due to faults in workmanship or materials the Contractor shall, within 14 calendar days of receipt of written notice from the Contracting Agencybegin making the necessary repairs to the satisfaction of the Engineer. Such work shall include the repair or replacement of other work or materials damaged or affected by making the above repairs or corrective work, all at no additional cost to the Contracting Agency.

If defects develop which are determined by the Engineer to be an emergency, the Engineer shall notify the Contractor, via the most expeditious means, regarding the nature and condition of the defects. In turn, the Contractor shall immediately dispatch necessary forces to correct the defect or the emergency condition. If the Contractor, in his initial action, resolves the emergency condition but not the defect, a letter as discussed above will follow and normal procedures for corrections will be employed. If immediate or appropriate action, satisfactory to the Engineer, is not taken by the Contractor, or if the Contractor cannot be contacted, the Engineer will deploy necessary forces to correct and/or secure the deficiency. Costs of the Engineer's action shall be paid by the Contractor and/or his bonding agency. Should it later be determined that the defects requiring such emergency action are not the responsibility of the Contractor, the Contractor will be paid for all costs incurred as a result of these demands in accordance with Subsection 109.5. Such action by the Engineer will not relieve the Contractor of the guarantees required by this Section or elsewhere in the Contract Documents.

In case of work, materials, or equipment for which written warranties are required by the special provisions, the Contractor shall provide or secure from the appropriate Subcontractor or supplier such warranties addressed to and in favor of the Contracting Agency and deliver same to the Engineer prior to final acceptance of the work. Delivery of such warranties shall not relieve the Contractor from any obligation assumed under any other provisions of the contract.

The warrantees and guarantees provided in this subsection of the contract documents shall be in addition to and not in limitation of any other warrantees, guarantees or remedies required by law.

108.9 FAILURE TO COMPLETE ON TIME: 2012

For each and every calendar day that work shall remain in completed after the time specified for the completion of the work in the proposal, or as adjusted by the Engineer, the sum per calendar day shown in Table 108-1, unless otherwise specified in the proposal form, may be deducted from monies due to or to become due to the Contractor, not as a forfeit or penalty but as liquidated damages. This sum is fixed and agreed upon between the parties because the actual loss to the Contracting Agency and to the public caused by delay in completion will be impractical and extremely difficult to ascertain and determine.

Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time fixed for its completion may have been extended, will in no way operate as a waiver on the part of the Contracting Agency of any of its rights under the contract.

TABLE 108-1
LIQUIDATED DAMAGES

Original Contract Amount		**Daily Charges**
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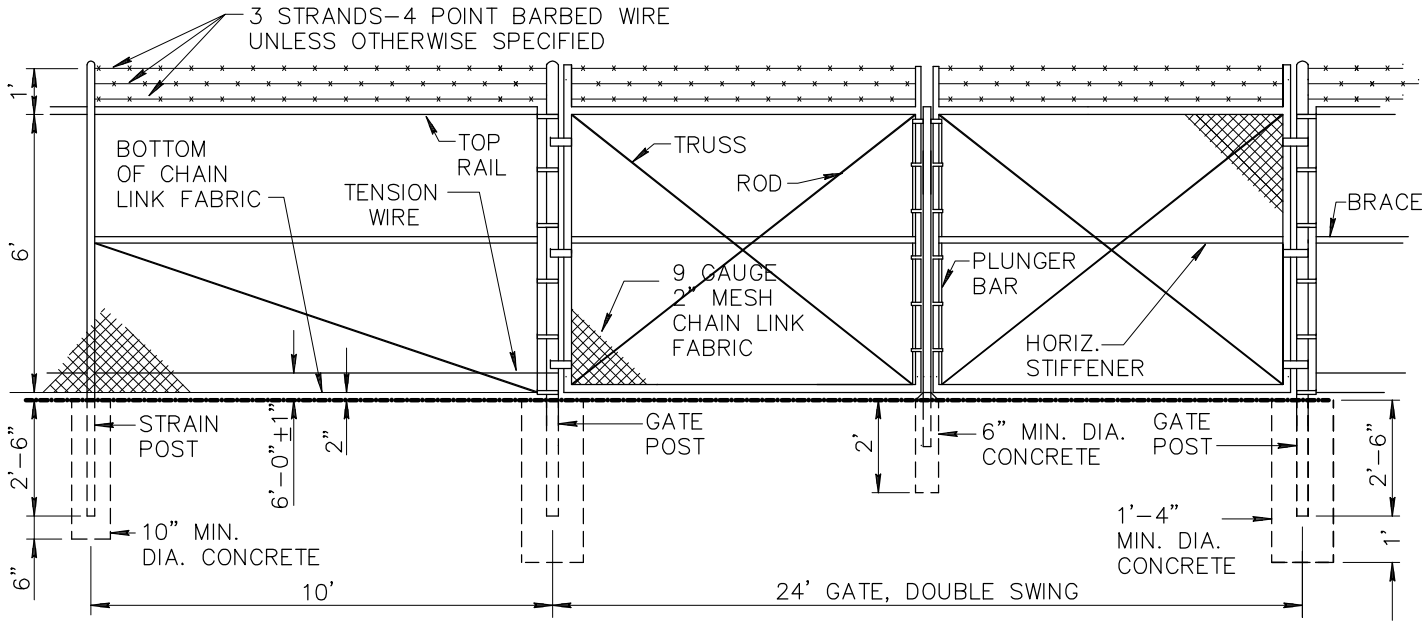
5,000,000	10,000,000	1,420
10,000,000	—	1,780

*For Improvement District Project: The words "Superintendent of Streets" will be substituted for the word "Engineer." Any extension of contract time will be determined by the Superintendent of Streets with the consent of the governing body



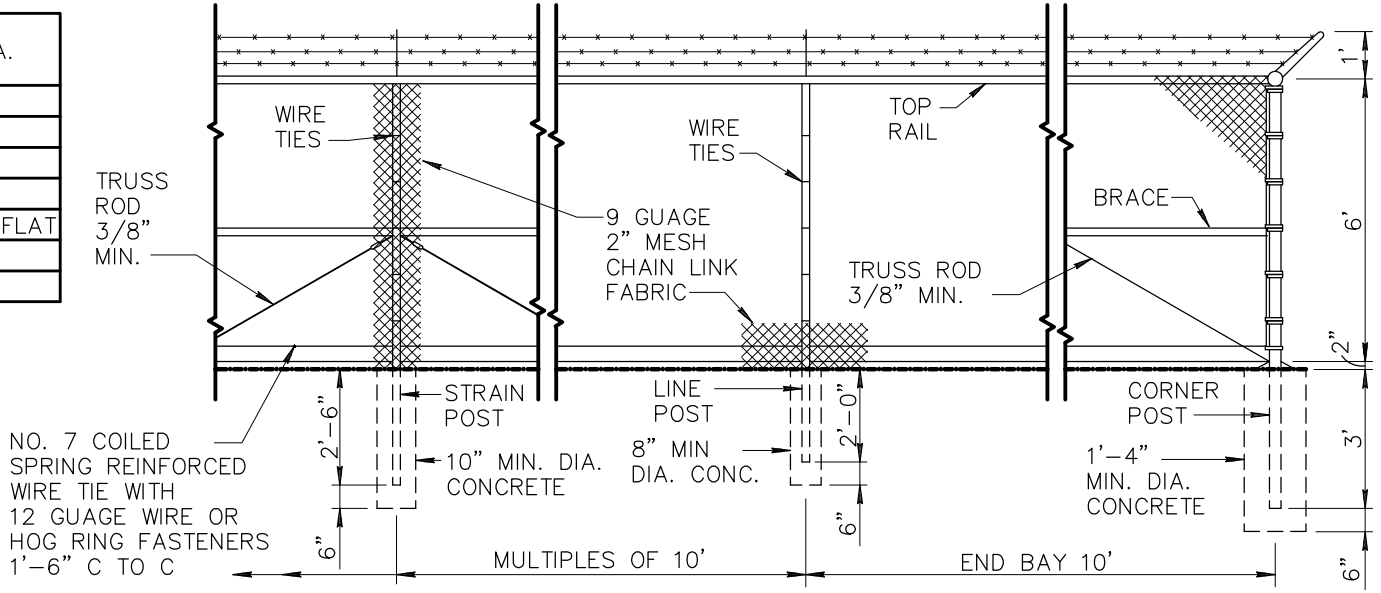
NOTES

1. ALL CONCRETE SHALL BE CLASS 'C' PER SECT. 725.
2. FITTINGS NOT SPECIFICALLY DETAILED SHALL BE HEAVY DUTY DESIGN.
3. STRAIN POSTS SHALL BE SPACED AT 500' MAXIMUM SPACING.
4. BOTH CORNER AND STRAIN POSTS SHALL HAVE STRAIN PANELS.
5. ALL POSTS SHALL BE CAPPED.
6. MEMBER SIZES SHALL BE THE FOLLOWING:

MEMBER	AISC SIZE	OUTSIDE DIA.
CORNER POST	2–1/2"	2.875"
LINE POST	1–1/2"	1.900"
STRAIN POST	1–1/2"	1.900"
BRACE	1–1/4"	1.666"
STRETCH BAR	3/16"x3/4" FLAT	3/16"x3/4" FLAT
GATE POST	3–1/2"	4.000"
TOP RAIL	1–1/4"	1.666"

7. CONSTRUCTION AND MATERIALS SHALL CONFORM TO SECT. 420 AND 722, RESPECTIVELY. SEE TABLE 722 FOR WEIGHTS OF MEMBERS.

Should refer to Section 772 and Table 772-1.



DETAIL NO.			REVISED	DETAIL NO.
160	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH	6' CHAIN LINK FENCE AND GATE	01–01–2003	160

Case 12-01 D

SECTION 610

WATER LINE CONSTRUCTION

610.1 DESCRIPTION:

The construction of all water lines shall conform to applicable standard specifications and details, except as otherwise required on the plans or as modified in the special provisions.

610.2 GENERAL:

All pipes shall be delivered, handled and installed in accordance with the manufacturer's recommendations and/or applicable provisions of AWWA standards for installation of the various types of water mains specified, insofar as such recommendations and provisions are not in variance with the standard specifications and details.

Where water lines are to be constructed in new subdivisions or in conjunction with street repaving projects, the streets shall be pre-graded to within 6 inches of the new street subgrade prior to trenching or cut stakes shall be set for trenching.

610.3 MATERIALS:

All pipes for water lines shall be of the classes shown on the plans or as specified below.

(A) The 4 inches through 16 inches diameter pipe may be asbestos-cement or ductile iron, except where a particular material is specified. All pipes shall be minimum 150 P.S.I. design unless otherwise specified.

(B) Pipe 16 inches and larger may be either ductile iron, or concrete pressure pipe-steel cylinder type.

Ductile iron water pipe and fittings - Section 750. Asbestos-cement water pipe and fittings - Section 752. Concrete pressure pipe-steel cylinder type - Section 758.

~~Service Material~~ containing Brass or Bronze must comply with the current NSF 61-8 Standards at the time the Project begins.

All Brass or Bronze service material must meet the current AWWA C-800 Standards.

Any ~~project~~ product used in water line construction containing brass or bronze that comes in contact with potable water shall meet the current NSF Standards and Federal Law.

~~610.4~~ CONSTRUCTION METHODS:

All water mains in major streets shall have a minimum cover of 48 inches over the top of the pipe. Water mains in other locations shall have a minimum cover over the top of the pipe as follows:

(A) 36 inches for mains smaller than 12 inches.

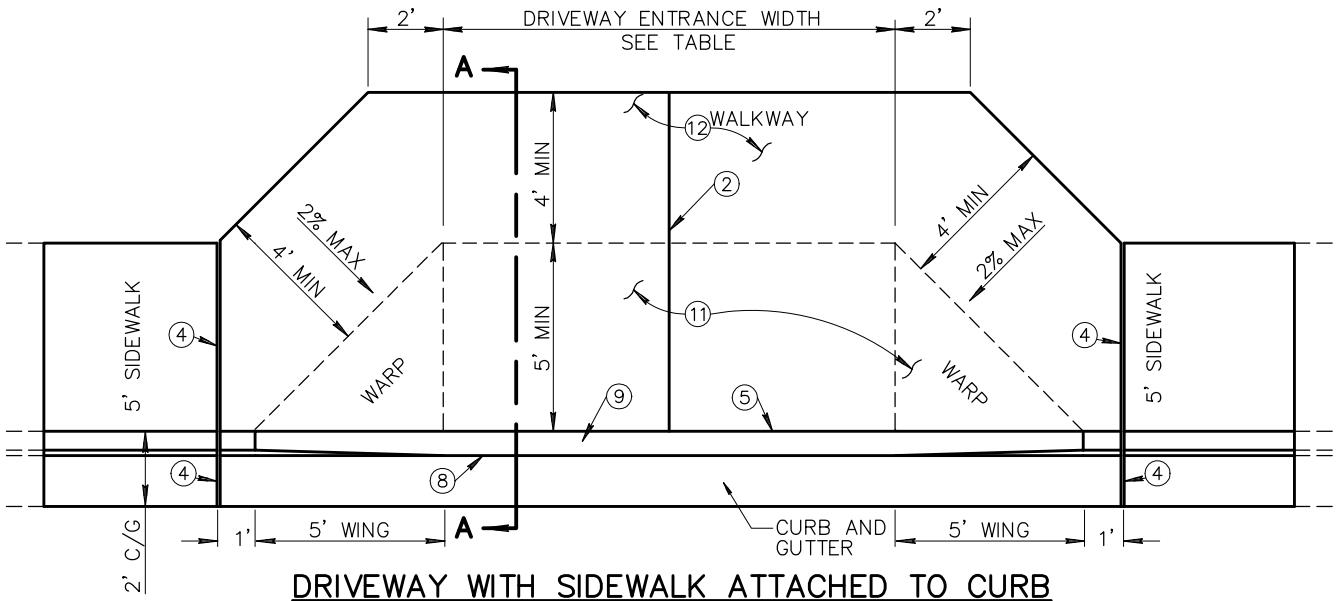
(B) 48 inches for mains 12 inches and larger.

Cover for water mains will be measured from existing or proposed finished grade of pavement or from natural ground, whichever is deeper.

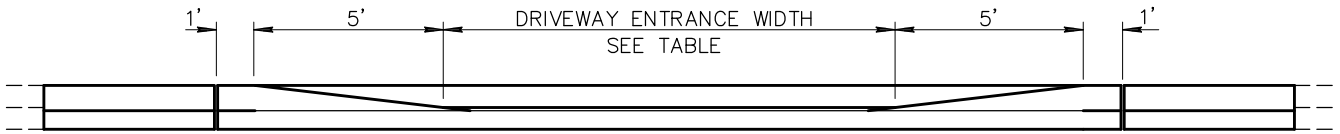
No water main shall be deflected, either vertically or horizontally, in excess of that recommended by the manufacturer of the pipe or coupling, without the appropriate use of bends or offsets.

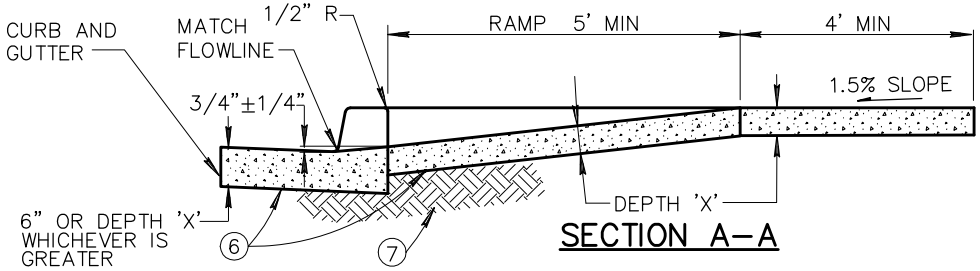
If adjustment of the position of a length of pipe is required after it has been laid, it shall be removed and rejoined as for a new pipe.

Every precaution shall be taken to prevent foreign material from entering the pipe. When on the project site, the ends of the pipe section shall be plugged, wrapped or tarped at all times when pipe laying is not in progress, which includes storage and staging at the site. The pipe shall be stored on a pallet, blocking or other means to prevent foreign materials from entering the



DRIVEWAY WITH SIDEWALK ATTACHED TO CURB





SECTION A–A

NOTES:

1. DEPRESSED CURB SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE TYPE OF CURB USED AT THAT LOCATION.
2. CONTRACTION JOINT(S) FOR DRIVEWAY ENTRANCE: WIDTH LESS THAN 22' NONE REQUIRED; WIDTH GREATER THAN 22' AND LESS THAN 30' LOCATE SINGLE JOINT ON D/W CENTERLINE; WIDTH OF 30' OR GREATER LOCATE TWO JOINTS TO EQUALLY DIVIDE THE DRIVEWAY ENTRANCE WIDTH.
3. DETAIL GEOMETRICS ARE BASED ON A CURB HEIGHT OF SIX INCHES (6"), AN ATTACHED SIDEWALK WIDTH OF FIVE FEET (5'), AND A DRIVEWAY RAMP LENGTH NOT EXCEEDING SIX FEET (6'). GEOMETRIC MODIFICATIONS MAY BE REQUIRED WHEN CONDITIONS ARE MODIFIED.
4. 1/2–INCH EXPANSION JOINTS SHALL COMPLY WITH SECTION 340.
5. BACK OF CURB – CONSTRUCTION JOINT.
6. CONCRETE CLASS AS NOTED IN TABLE. CONCRETE PER SECTION 725.
7. SUBGRADE PREPARATION, SECT. 301.
8. FLOW LINE OF GUTTER.
9. DEPRESSED CURB.
10. SECT. A–A AND ELEVATION: D/W SHOWN WITH VERTICAL CURB AND GUTTER, ROLL TYPE CURB AND GUTTER TREATED SIMILARLY.
11. ROUGH BROOM FINISH FULL WIDTH OF RAMP AND WINGS.
12. TROWEL AND USE LIGHT HAIR BROOM FINISH FOR WALKWAY AREA.
13. 'DRIVEWAY ENTRANCE WIDTH' IS THE DRIVEWAY WIDTH PLUS ADDITIONAL WIDENING REQUIRED BY THE LOCAL JURISDICTION.

COMMERCIAL AND INDUSTRIAL					RESIDENTIAL				
DRIVEWAY ENTRANCE WIDTH	MIN.	MAX.	CLASS	DEPTH 'X'	DRIVEWAY ENTRANCE WIDTH	MIN.	MAX.	CLASS	DEPTH 'X'
COMMERCIAL	✳ 16'	40'	A	9"	MAJOR STREET	16'	30'	B	5"
INDUSTRIAL	✳ 16'	40'	A	9"	COLLECTOR STREET	∗ 12'	30'	B	5"
✳24' MIN. FOR TWO WAY TRAFFIC					LOCAL STREET	12'	30'	B	5"
					∗16' DESIRABLE				

DETAIL NO.			REVISED	DETAIL NO.
250–2	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH	DRIVEWAY ENTRANCES WITH SIDEWALK ATTACHED TO CURB	08–28–2012	250–2

CASE 12–03

SECTION 317
ASPHALT MILLING

317.1 DESCRIPTION:

The work under this section shall consist of milling existing asphalt concrete pavement where shown on the Plans or requested by the Engineer.

317.2 CONSTRUCTION REQUIREMENTS:

Contractor is responsible for locating all milling hazards on and below the surface within the areas to be milled including areas requiring special milling. Special milling is not a separate pay item and shall be paid for as Asphalt Milling.

The milling cut depth shall be the depth indicated on the Plans plus or minus 1/8 inch. The milling machine shall have electronic grade controls. Contractor shall remove the milled material and sweep the roadway clean with a power pick-up broom to the satisfaction of the Engineer.

Asphalt pavement adjacent to manholes, valve boxes, small radius curbs and other fixed objects that produce confined area shall be removed with milling equipment specifically designed to operate in constricted areas. The equipment shall be capable of removing asphalt concrete of the specified thickness without damage to, or displacement of, the adjacent object(s).

The Contractor shall be responsible for continually checking the milling operation to determine that the proper depth of milling has been achieved, that the proper profile and cross slope are achieved, and that the surface texture is (a) free from longitudinal ridges, and (b) has a uniform pattern.

The Contractor shall immediately notify the Engineer when:

- The existing pavement thickness is found to be less than anticipated and breaking of the underlying material occurs.
- Delamination of underlying material occurs.

The work shall result in a clean milled surface to the specified depth for the area indicated by the construction documents including the areas immediately around and next to any individual hazard within the area to be milled. The edge of milled area shall form a straight clean cut line.

For milled surfaces on major streets (arterial and collector streets) that will be subject to traffic prior to overlay, a tack coat per Section 329 may when authorized by the Engineer be applied to the milled surface as a dust control measure. The tack coat shall be applied after sweeping and prior to allowing traffic on the milled surface. The tack coat application rate shall be half of the prescribed tack rate or contract amount or an alternate rate as prescribed by the Engineer. The Contractor shall be responsible for clean-up of any tack coat tracking that occurs.

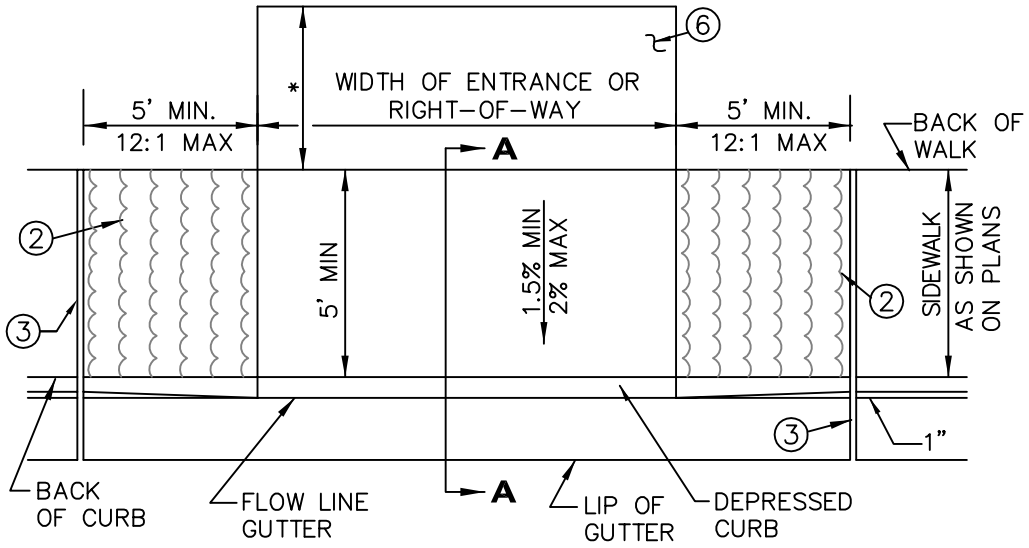
317.3 MEASUREMENT AND PAYMENT:

Measurement for Asphalt Milling will be by the square yard and shall only include area milled to the required depth and cross-section.

Payment for Asphalt Milling at the contract unit price shall be full compensation for the work, complete-in-place, including all asphalt milling, milling around structures, removal and disposal of milled materials, and sweeping.

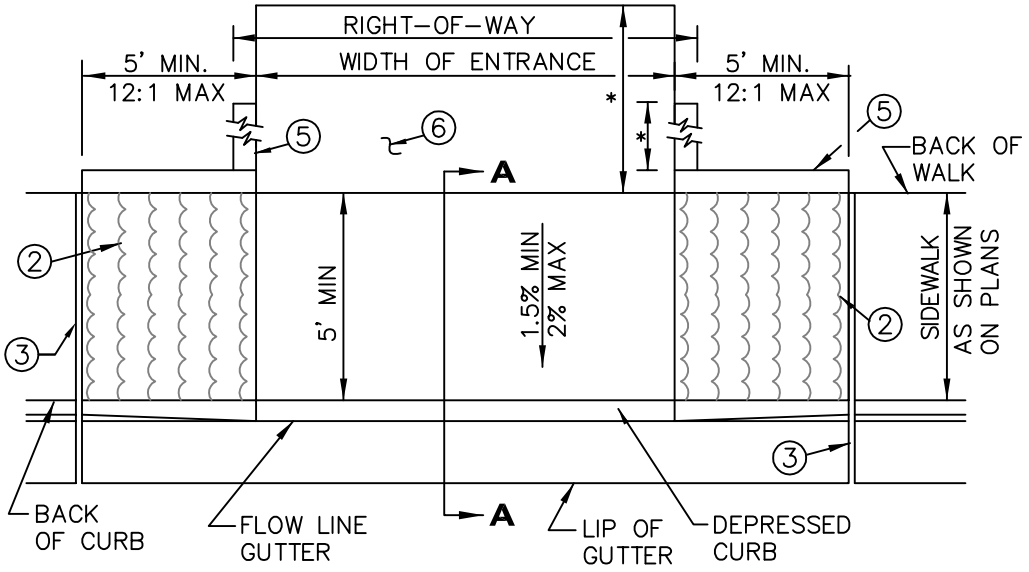
Engineer approved tack coat applied for dust control will be paid at the contract rate for tack coat. No additional payment for the application of dust control tack coat shall be made.

- ***End of Section*** -



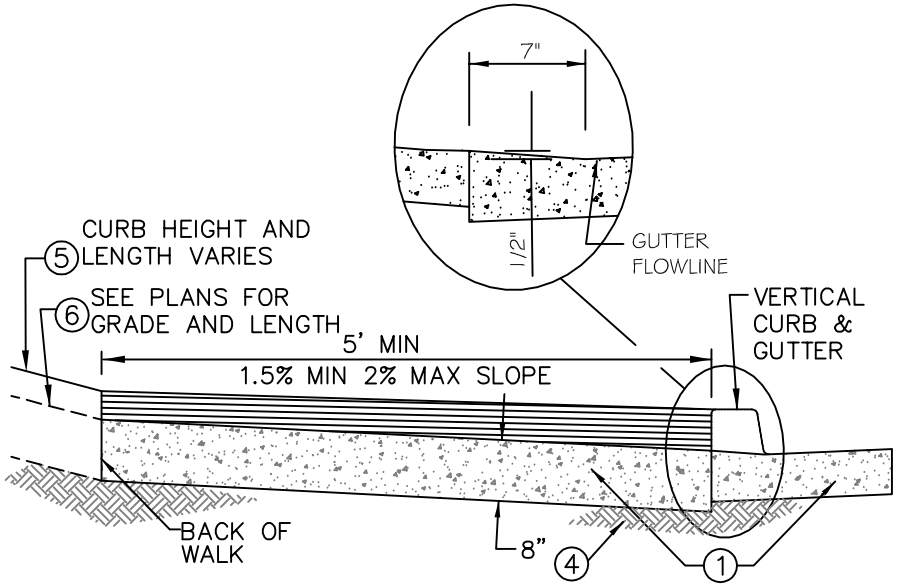
TYPE A - WITHOUT RETAINING CURB

*SEE PLANS FOR ALLEY SURFACING REQUIREMENTS

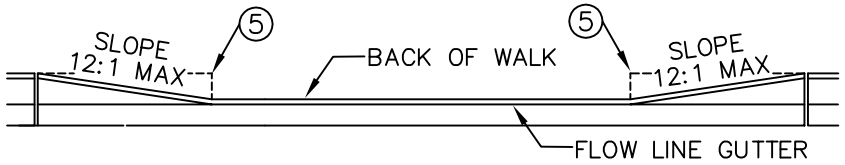


TYPE B - WITH RETAINING CURB

* SEE PLANS FOR RETAINING CURB LENGTHS,
TOP OF CURB ELEVATIONS, AND ALLEY SURFACING REQUIREMENTS



SECTION A-A



ELEVATION

NOTES:

1. CLASS "A" CONCRETE PER SECTION 725.
2. LIMITS OF HEAVY ROUGH BROOM FINISH.
3. EXPANSION JOINTS PER SECTION 340.
4. SUBGRADE PREPARATION PER SECTION 301.
5. SINGLE CURB PER DETAIL 222, TYPE "B".
6. ALLEY SURFACING PER PLANS.

DETAIL NO.				REVISED	DETAIL NO.
260	MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH	ALLEY ENTRANCE (WITH VERTICAL CURB AND GUTTER)		09/05/2012 DRAFT	260

MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: May 15, 2012

To: MAG Specifications and Details Committee

From: Robert Herz, MCDOT Representative

Subject: Proposed revision to Section **505.6.3 Bridge Deck Joint Assemblies**. **Case 12-10**

PURPOSE: Eliminate the MCDOT supplement to this section by incorporating the requirement into the MAG specification.

REVISION: Add to 505.6.3.3 Construction Requirements a subsection: (7) Welding. The proposed changes are show below using track changes.

505.6.3 Bridge Deck Joint Assemblies:

505.6.3.1 Description: This work shall consist of furnishing and installing expansion devices including the seals, anchorage system, and hardware in accordance with the project plans and these specifications.

505.6.3.2 Materials: Elastomer Seals shall be of the Compression Seal or Strip Seal type, and shall conform to the requirements of the Arizona Department of Transportation Standard Specifications for Road and Bridge Construction Section 1011-5.

Steel shapes and plates shall conform to the requirements of ASTM A36, or ASTM A588.

505.6.3.3 Construction Requirements:

(1) General: Deck joint assemblies shall consist of elastomer and steel assemblies which are anchored to the concrete at the deck joint. The seal armor shall be cast in the concrete. The completed assembly shall be properly installed in the planned position, shall satisfactorily resist the intrusion of foreign material and water, and shall provide bump-free passage of traffic. For each size of seal on a project, one piece of the seal material supplied shall be at least 18 inches longer than required by the project Plans. The additional length will be removed by the Engineer and used for materials testing. Certificates of Compliance conforming to the requirements of Section 106.2 shall also be submitted by the Contractor.

(2) Shop Drawings**:** Prior to fabrication, the Contractor shall submit shop drawings to the Engineer for approval, in accordance with the requirements of Section 105.2. The shop drawings shall show complete details of the method of installation to be followed, including a temperature correction chart for adjusting the dimensions of the joint according to the ambient temperature, and any additions or rearrangements of the reinforcing steel from that shown on the project plans.

2901 West Durango Street Phoenix, Arizona 85009 Phone: 602-506-4760 Fax: 602-506-5969

~~Deck joint assemblies for pretensioned and post-tensioned prestressed concrete superstructures shall be installed at the narrowest joint opening possible to allow for long-term superstructure shortening.~~

(3) Elastomer Seals: Seals shall conform to the requirements specified.

(4) Armor: All steel ~~forecast~~for cast-in-place deck joint assemblies shall conform to the requirements specified.

(5) Galvanizing**:** All steel parts of strip seal assemblies shall be galvanized after fabrication, in accordance with the requirements of ASTM A123 and A153, unless ASTM A588 steel is used. Bolts shall be high strength, conforming to the requirements of ASTM A325M, with a protective coating of cadmium or zinc, followed by a chromate and baked organic coating conforming to the requirements of ASTM F1135, Grade 3, 5, 6, 7, or 8 and Color Code A.

Steel parts of compression seal assemblies do not require galvanizing, plating, or painting.

(6) Joint Preparation and Installation: At all joint locations, the Contractor shall cast the bridge decks and abutment backwalls with a formed blockout, sized to accommodate the pre-assembled joint assembly. The joint assembly will be anchored in the concrete to be placed with the secondary pour in the blockout. Prior to the secondary pour, the surface of the existing concrete in the blockout shall be coated with an approved adhesive specifically formulated for bonding new concrete to old concrete.

Deck joint assemblies for pretensioned and post-tensioned prestressed concrete superstructures shall be installed at the narrowest joint opening possible to allow for long-term superstructure shortening.

(7) Welding: All welding and inspection of welding for structural steel shall be performed in accordance with the requirements of the latest revision of the AASHTO/AWS D1.5M/D1.5 Bridge Welding Code. The use of electro-slag welding process on structural steel will not be permitted.

Installed armor assemblies shall be covered or otherwise protected at all times prior to installing the elastomer portion of the joint assembly. The elastomer shall be installed at such time and in such manner that it will not be damaged by construction operations.

~~The seal element shall be installed subject to these specifications and approval of the Engineer.~~ Immediately prior to the installation of the seal element, the steel contact surfaces of the joint armor shall be clean, dry, and free of oil, rust, paint, or foreign material. Any perforation or tearing of the seal element due to installation procedures or construction activities will be cause for rejection of the installed seal element.

During the installation of all proprietary deck joint assemblies, the manufacturer's representative shall be present. As a minimum, the representative shall be present during the placement of the joint assembly in the deck blockout, prior to the secondary concrete pour, and shall also be present during the installation of the seal element.

DATE: August 23, 2012

TO: MAG Specification and Details Committee Members

FROM: Brian Gallimore, Materials Working Group/AGC
Jeff Benedict, Asphalt Working Group/ARPA
Jeff Hearne, Concrete Working Group/ARPA

RE: Reclaimed Materials – Aggregates and Base

PURPOSE: Addresses the use of reclaimed and or recycled materials along with proper reference adjustments to their respective corresponding sections

REVISIONS:

Section 701

1) Added section 701.4 and correctly adjusted sequential numbering, 701.4 "RECLAIMED CONCRETE MATERIAL (RCM); a definition and general statement to describe the product – with reference to AASHTO M 319. The exclusion of RCM in the use of Portland Cement Concrete without approval of the Engineer was also included.

2) Added section 701.5 and correctly adjusted sequential numbering, 701.5 "RECLAIMED ASPHALT PAVEMENT (RAP); a definition and general statement to describe the product. The exclusion RAP in the use of Portland Cement Concrete without approval of the Engineer was also included.

3) Re-numbered section 701.4 to 701.6

Section 702

1) Added additional material descriptions to include reclaimed materials to Section 702.1 "GENERAL".

2) Revised primary applications for Select material in 701.2

Section 725

1) Added exclusion of RCM and RAP in the use of Portland Cement Concrete without approval of the Engineer to Section 725.3.

Section 310

1) In Section 310.3 "COMPACTION" - add the note to AASHTO T-99 regarding the proper use of method "C" or "D" as required based upon the gradation of the material.

SECTION 701 – REVISED 8-23-12

AGGREGATE

701.1 GENERAL:

Coarse and fine aggregates are defined in accordance with ASTM D-2487. Material property requirements for specific uses are provided in applicable MAG sections.

701.2 COARSE AGGREGATE:

Rock and gravel shall be clean, hard, sound, durable, uniform in quality, and free of any detrimental quantity of soft, friable, thin elongated, or laminated pieces, disintegrated material, organic matter, oil, alkali, or other deleterious substance. Aggregate sources shall include, but not be limited to alluvial deposits, terrace aggregates, quarry stone, or other suitable sources including recycled products that meet all material test requirements as approved by the Engineer. Aggregate classification shall be made by size as noted herein.

Apparent specific gravity shall be at least 2.50, when tested in accordance with ASTM C-127.

701.2.1 Boulders: Particles of rock that will not pass a 12-inch square opening.

701.2.2 Cobbles: Particles of rock that will pass a 12-inch square opening, but are retained on a 3-inch square opening.

701.2.3 Coarse Gravel: Particles of rock that will pass a 3-inch U.S. standard sieve, but are retained on a 3/4-inch U.S. standard sieve.

7.01.2.4 Fine Gravel: Particles of rock that will pass a 3/4-inch U.S. standard sieve, but are retained on a No. 4 U.S. standard sieve

701.3 FINE AGGREGATE (SAND):

Fine aggregate (sand) shall be fine granular material produced by the crushing of rock or gravel or naturally produced by disintegration of rock and shall be sufficiently free of organic material, mica, loam, clay, and other deleterious substances to be thoroughly suitable for the purpose for which it is intended. Fine aggregates particles shall pass a No. 4 U.S. standard sieve, but are retained on a No. 200 U.S. standard sieve.

701.4 RECLAIMED CONCRETE MATERIAL (RCM)

Reclaimed concrete material (RCM) is defined as an aggregate material that is derived from the crushing, processing and classification of Portland cement concrete construction materials recovered, salvaged, or recycled from roadways, sidewalks, buildings, bridges, and other sources.

In accordance with Section 7 of AASHTO M319, RCM shall not contain more than five percent by mass of brick or concrete block and shall be substantially free of wood, metal, plaster, and gypsum board, RCM shall be free of all materials that fall under the category of solid waste or hazardous materials as defined by the state or local jurisdiction. With the approval of the Engineer, these respective quantities may be adjusted if the performance of the RCM is not adversely impacted. RCM may be used alone or uniformly blended with other approved aggregate materials to obtain the applicable performance criteria. RCM shall not be used in Portland Cement Concrete without the prior approval of the Engineer.

701.5 RECLAIMED ASPHALT PAVEMENT (RAP):

Reclaimed asphalt pavement (RAP) is defined as all recoverd, salvaged or recycled asphalt road waste, large particles or milled material that has been size-reduced, crushed and or screened appropriately, making it reusable. This material shall be of a consistent and relatively clean manner as to not adversely affect the final material usage. RAP may be used alone or uniformly

blended with other approved aggregate materials to obtain the applicable performance criteria. RAP shall not be used in Portland Cement Concrete without the prior approval of the Engineer.

701.~~4~~ 6 SAMPLING:

Sampling of aggregates shall be performed in accordance with ASTM D-75.

SECTION 702 – REVISED 8-29-12

BASE MATERIALS

702.1 GENERAL:

Base materials shall be as defined in Section 701, consisting of appropriately sized coarse and fine aggregates, Reclaimed Concrete Material (RCM) or Reclaimed Asphalt Pavement (RAP), other inert materials, and/or aggregates that have been treated for plasticity index mitigation, as approved by the Engineer. These materials, whether virgin or reclaimed or a uniform blend of both, shall conform to the end result quality requirements of this section.

When base material without further qualification is specified, the Contractor shall supply materials that meet the gradation and other quality requirements for Aggregate Base Course as defined in Table 702-1. When a particular classification of base material is specified, the Contractor may substitute materials meeting the gradation and other quality requirements for Aggregate Base Course for Select material, when approved by the Engineer.

The Contractor shall provide the Engineer~~,~~ laboratory testing documentation on the source of the base material showing compliance to Table 702-1 ~~in writing, material information and the source location~~ at least 10 business days prior to placement except where the base materials are being obtained from a currently approved source from a list maintained by the appropriate Agency or ~~use of the material unless the material is currently accepted for use,~~ as determined by the Engineer. Included in the documentation shall be the percentage of RCM or RAP, if applicable.

RCM meeting the requirements of Section 701.4 can be utilized in base material at a maximum quantity of 50% and shall be used in roadway applications or where otherwise specified by Project plans or special provisions.

RAP meeting the requirements of Section 701.5 can be utilized in base material up to 100% and shall be used in roadway applications or where otherwise specified by Project plans or special provisions.

702.1.1 Aggregate Base Course shall be used ~~primarily~~ in roadway applications or where otherwise specified by project plans or special provisions.

702.1.2 Select Material shall be primarily used, ~~but not limited to applicable structure and pipe backfill installations, shoulders, turnouts, driveways, and tapers~~ as a sub base in roadways or deep lifts for backfill and embankment applications or where otherwise specified by project special provisions.

702.2 PHYSICAL PROPERTIES:

702.2.1 Base material shall meet the physical properties listed in Table 702-1.

Table 702-1			
Sieve Analysis Test Methods AASHTO T-27, T-11			
Sieve Size	Accumulative Percentage Passing Sieve, by Weight		
	Select Material		Aggregate Base Course
	Type A	Type B	
3 in.	100	- -	- -
1-1/2 in.	- -	100	100
1 in.	- -	- -	90 – 100
No. 4	30 - 75	30 - 70	38 - 65
No. 8	20 - 60	20 - 60	25 – 60
No. 30	10 - 40	10 - 40	10 – 40
No. 200	0 - 12	0 - 12	3 – 12
Plasticity Index Test Methods AASHTO T-89 Method A, T-90, T146 Method A			
Maximum allowable value	5	5	5
Fractured Face, One Face Test Method ARIZ 212, Percent by Weight of the Material Retained on a #4 Sieve			
Minimum required value	50	50	50
Resistance to Degradation and Abrasion by the Los Angeles Abrasion Machine Test Method AASHTO T-96, Percent Loss by Weight			
Maximum allowable value at 100 revolutions	10	10	10

Maximum allowable value at 500 revolutions	40	40	40

702.2.2: When tested for acceptance, Base material that does not meet Table 702-1 properties for gradation or PI may be approved at the Engineer's discretion if the R-Value is at least 70, when determined by test method AASHTO T-190 (see Table 310-1).

End of Section

SECTION 725 – REVISED 8-23-12

PORTLAND CEMENT CONCRETE

725.3 AGGREGATES:

Coarse and fine aggregate shall conform to the applicable requirements of ASTM C33. Coarse aggregate grading requirements shall conform to the appropriate rock size designation in the Grading Requirements for Coarse Aggregate, Table 2. Fine aggregate grading requirements shall conform to the Fine Aggregate Grading section.

The average value of 3 successive sand equivalent samples shall not be less than 70 when tested in accordance with ASTM D2419. No individual sample shall have a sand equivalent less than 65.
The loss by abrasion in the Los Angeles Abrasion Machine, determined as prescribed in ASTM C131, shall not exceed 10 percent, by weight, after 100 revolutions nor 40 percent after 500 revolutions.

Prior to the delivery of the aggregates and whenever required during concrete production, the Contractor shall make stockpiles available to the Engineer for testing. All required samples shall be furnished at the expense of the Contractor, and the cost of sampling and testing shall be at the expense of the Contracting Agency.

Reclaimed Concrete Materials (RCM) and Reclaimed Asphalt Pavement (RAP) as defined in Section 701 shall not be used in Portland Cement Concrete without the prior approval of the Engineer.

SECTION 310 – REVISED 7-30-12

PLACEMENT AND CONSTRUCTION OF AGGREGATE BASE COURSE

310.1 DESCRIPTION:

Aggregate base course shall comply with Subsection 702 unless the use of a different type of material is specifically authorized in the special provisions.

310.2 PLACEMENT AND CONSTRUCTION:

The compacted lift thickness shall not exceed 6 inches, unless approved by the Engineer. Based on the type of material, type of equipment and compaction methods used, the Contractor may propose a greater lift thickness.

After distributing, the aggregate base course material shall first be watered and then graded to a uniform layer that will net, after compacting, the required thickness. The grading operation shall be continued to such extent as may be necessary to minimize segregation. The quantity of water applied shall be that amount which will assure proper compaction resulting in the density required by Section 310.3.

After placement, the aggregate base course surface shall be true, even and uniform conforming to the grade and cross-section specified. In no case shall the aggregate base course vary by more than ½ inch above or below required grade.

310.3 COMPACTION

The contractor is responsible for providing appropriate equipment and techniques to achieve the compaction results required by this specification. The aggregate base course shall be compacted in lift thicknesses as allowed by Section 310.2.

The laboratory maximum dry density and optimum moisture content for the aggregate base course material shall be determined in accordance with AASHTO T-99. (Note: when testing base materials - use method "C" or "D" as required based upon the gradation of the material.) Field 'one-point' maximum dry density and optimum moisture procedures shall only be allowed upon approval of the Engineer.

The in-place density shall be determined in the field by nuclear density testing in accordance with AASHTO T-310 or sandcone density testing in accordance with AASHTO T-191. In the event nuclear density testing is selected, a minimum of one sandcone correlation shall be performed for each 10 nuclear density tests.

A rock correction, to compensate for rock content larger than the #4 or ¾ inch sieves (as required by the laboratory maximum dry density and optimum moisture procedure selected), shall be performed in accordance with AASHTO T-224. Care should be taken to account for the specific gravity of the oversize particles particularly if recycled materials are utilized for aggregate base course. The specific gravity shall be determined in accordance with AASHTO T-85, as applicable.

For roadway construction, one field density test shall be performed per lift per 660 feet per lane. For other aggregate base course applications, a minimum of 1 field density test shall be performed for each 800 square yards.

Unless otherwise noted in the project plans or project specifications, the moisture content of the aggregate base course at the time of compaction shall be the optimum moisture content +/- 3%.

DATE: August 2, 2012

TO: MAG Specification and Details Committee Members

FROM: Brian Gallimore, Materials Working Group/AGC
Jeff Benedict, Asphalt Working Group/ARPA
Jeff Hearne, Concrete Working Group/ARPA

RE: Reclaimed Materials - Asphalt

PURPOSE: Addresses the incorporation of Reclaimed Asphalt Pavement (RAP) into Asphalt Concrete along with proper reference adjustments to their respective corresponding sections

REVISIONS:

Section 709 and 719

Remove these in their entirety

Section 710

1) **NOTE: As the starting point for this revision, we have used the most current Section 710 that was approved by the Standards Committee on May 2, 2012 – not the language that is in the published 2012 Specifications book**.

2) Added a new Section 710.2.3 "Reclaimed Asphalt Pavement (RAP)". This section references Section 701.5 regarding material constituents and provides the appropriate methods for the incorporation of RAP into an asphalt mix design. **References used here are: NAPA IS123, COP SHIA Specification for P-403, and the NCAT Third Edition HMA Materials Mixture Design and Construction**

3) Renumber existing 710.2.3 "Mineral Admixture" to 710.2.4

4) Renumber existing 710.3.1 to include new language for inclusion of RAP and RAP binder in the mix design.

5) Corrected two spelling errors in the third paragraph of 710.3.2.2 "Gyratory Mix Design", by adding an "r" to the make the word "Traffic" . And deleted the 's in the title of table 710-1 "thickness" Changed the word "Utilized" to "when used" or "used".

ASPHALT CONCRETE

710.1 GENERAL:

Asphalt concrete shall be a mixture of asphalt cement and mineral aggregates. Mineral admixture shall be included in the mixture when required by the mix design or by the Engineer. Asphalt concrete shall be produced in accordance with Section 321.

The designation for asphalt concrete mixes shall be based on the nominal maximum aggregate size of the mix. The applicable mix designations are 3/8 inch, ½1/2 inch, ¾3/4 inch and Base (1") mix.

Each mix shall be designed using Marshall or Gyratory compaction methods. Either Gyratory or Marshall Mixes may be used for low or high traffic conditions, as determined by the agency. Low traffic conditions are conditions where the asphalt mix will be subject to low volume and low weight vehicle usage. Examples of this condition are residential streets, most parking lots and residential minor collector streets. High traffic conditions are conditions where the asphalt mix will be subject to high volume and/or heavy weight vehicle usage as found on major collector, arterial and commercial streets. Street classifications (i.e. minor collector and major collector) shall be determined by the specifying agency.

The following table (Table 710-1) displays the recommended lift thickness for various asphalt concrete mix designations found within Section 710. Please note that these recommended lift thicknesses are minimums based on each mix designation's "Nominal Aggregate Size" and the relative coarseness of its gradation. The compacted thickness of layers placed shall not exceed 150% of the Minimum Lift Thickness of Table 710-1 except as otherwise provided in the plans and specifications, or if approved in writing by the Engineer.

TABLE 710-1

RECOMMENDED MINIMUM LIFT THICKNESS'S for FOR ASPHALT CONCRETE MIXES

Asphalt Concrete Mix Designation (inches)	Minimum Lift Thickness Marshall Mixes	Minimum Lift Thickness Gyratory Mixes
3/8"	1.0 inches	1.5 inches
½"1/2	1.5 inches	2.0 inches
3/4"	2.5 inches	3.0 inches
Base	3.0 inches	n/a

710.2 MATERIAL:

710.2.1 Asphalt Binder: The asphalt binder specified in this section has been developed for use in desert climate conditions. When usedShould it be utilized in other climates, consideration should be given to adjustments in the asphalt binder selection. The asphalt binder shall be Performance Grade Asphalt conforming to the requirements of Section 711 for PG 70-10, unless otherwise approved by the Engineer or specified differently in the plans or special provisions.

710.2.2 Aggregate: Coarse and Fine aggregates shall conform to the applicable requirements of this section. Coarse mineral aggregate shall consist of crushed gravel, crushed rock, or other approved inert material with similar characteristics, or a combination thereof, conforming to the requirements of these specifications.

Coarse aggregate for hot mix asphalt is material retained on or above the No. 4 sieve and Fine aggregate is material passing the No. 4 sieve. Aggregates shall be relatively free of deleterious materials, clay balls, and adhering films or other material that prevent coating with the asphalt binder. Coarse and Fine aggregates shall conform to the following requirements when tested in accordance with the applicable test methods.

TABLE 710-2 COARSE/FINE AGGREGATE REQUIREMENTS			
Characteristics	Test Method	Low Traffic	High Traffic
Fractured Faces, % (Coarse Aggregate Only)	Arizona 212	75, 1 or more	85, 1 or more 80, 2 or more
Uncompacted Voids, % Min.	AASHTO T-304, Method A	42	45
Flat & Elongated Pieces, % 5:1 Ratio	ASTM D 4791	10.0 Max.	10.0 Max.
Sand Equivalent, %	AASHTO T-176	50 Min.	50 Min.
Plasticity Index	AASHTO T-90	Non-plastic	Non-plastic
L.A. Abrasion, %Loss	AASHTO T-96	9 max. @ 100 Rev. 40 max. @ 500 Rev.	9 max. @ 100 Rev. 40 max. @ 500 Rev.
Combined Bulk Specific Gravity	AI MS-2/SP-2	2.35 – 2.85	2.35 – 2.85
Combined Water Absorption	AI MS-2/SP-2	0 – 2.5%	0 – 2.5%

Tests on aggregates used in asphalt concrete outlined above, shall be performed on materials furnished for mix design purposes and composited to the mix design gradation.

Blend sand (naturally occurring or crushed fines) shall be clean, hard and sound material which will readily accept asphalt binder coating. The blend sand grading shall be such that, when it is mixed with the other mineral aggregates, the combined product shall meet the requirements of Table 710-2.

The natural sand shall not exceed 20 percent for the Marshall mixes and 15 percent for the Gyratory mixes by weight of the total aggregate for a mix.

710.2.3 Reclaimed Asphalt Pavement (RAP): Reclaimed Asphalt Pavement (RAP), as defined in Section 701.5, may be used in asphalt concrete provided all requirements of Section 710 are met. References to use of RAP in Section 710 apply only if RAP is ~~utilized~~used -as part of the mixture.

When RAP is ~~utiliz~~used in asphalt concrete, it shall be of a consistent gradation, asphalt content, and properties. When RAP is fed into the plant, the maximum RAP particle size shall not exceed ~~2~~1 1/2 in. The percentage of asphalt in the RAP shall be established in the mix design. The percentage of RAP binder shall be established in the mix design.

When RAP is ~~utiliz~~used in base and intermediate courses, the amount of RAP aggregate and RAP binder should not exceed 30% contribution; Surface courses should be limited to 20% RAP aggregate and RAP binder contribution.

In addition to the requirements of Section 710.3.1, the job mix formula shall indicate the percent of ~~reclaimed~~ asphalt ~~pavement~~RAP and the percent and ~~viscosity~~performance grade of virgin (added) asphalt ~~cement~~binder.

When less than or equal to 15% RAP binder is used by weight of total binder in the mix, the added virgin binder shall meet the requirements for PG 70-10 as shown in Section 711. When greater than 15% RAP is used by weight of the total binder in the mix, the added virgin binder will be dropped one grade for low and high temperature properties to a PG 64-16, unless testing indicates that the blend of the recovered RAP binder and virgin binder meets the requirements for PG 70-10 as shown in Section 711. The virgin asphalt ~~cement~~binder shall not be more than one standard asphalt material grade~~s~~ different than the specified mix design binder grade.

710.2.~~3~~4 Mineral Admixture: Mineral admixture when used as an anti-stripping agent in asphalt concrete shall conform to the requirements of AASHTO M-17. Mineral admixture used in asphalt concrete shall be dry hydrated lime, conforming to the requirements of ASTM C1097 or Portland cement conforming to ASTM C150 Type II or ASTM C595 Type IP. The amount of hydrated lime or Portland cement used shall be determined by the mix design. The minimum Mineral admixture content within a mix will be 1.00 percent, by weight of total aggregate.

710.3 MIX DESIGN REQUIREMENTS:

710.3.1 General: The mix design for asphalt concrete shall be prepared by a laboratory that is accredited through the AASHTO Accreditation Program (AAP) in Hot Mix Asphalt Aggregates and Hot Mix Asphalt. The laboratory shall be under the direct supervision of a Civil Engineer, registered by the State of Arizona, and who is listed by ADOT as a "Qualified Asphaltic Concrete Mix Design Engineer" within ADOT's latest list of approved laboratories. The latest list of approved laboratories is available on ADOT's web page www.azdot.gov. The date of the design shall not be older than one year from the date of submittal, unless supportive documentation is provided and approved by the Engineer.

The mix design report shall include the following elements as a minimum.

(1) The name and address of the testing organization and the person responsible for the mix design report.

(2) The mix plant identification and/or location, as well as the supplier or producer name.

(3) A description of all products that are incorporated in the asphalt concrete along with the sources of all products, including admixtures and asphalt binder, and their method of introduction.

(4) The supplier and grade of asphalt binder, the source and type of mineral aggregate, and the percentage of asphalt binder and mineral admixture used.

(5) The percentage of RAP and RAP binder being contributed to the total mix shall be included in the mix design report.

(~~5~~6) The mix design report, whether Gyratory or Marshall, shall state the traffic condition (low or high traffic) and size designation.

(~~6~~7) The results of all testing, determinations, etc., such as: specific gravity and gradation of each component, water absorption, sand equivalent, loss on abrasion, fractured coarse aggregate particles, Tensile Strength Ratio (AASHTO T-283), Marshall stability and flow, asphalt absorption, percent air voids, voids in mineral aggregate, and bulk density. Historical abrasion values may be supplied on existing sources. The submittal should include a plot of the gradation on the Federal Highway Administration's 0.45 Power Gradation Chart, plots of the compaction curves and the results of moisture sensitivity testing.

(~~7~~8) The laboratory mixing and compaction temperature ranges for the supplier and grade of asphalt binder used within the mix design.

(~~8~~9) A specific recommendation for design asphalt binder content and any limiting conditions that may be associated with the use of the design, such as minimum percentages of crushed or washed fine aggregate.

(~~9~~10) The supplier's product code, the laboratory Engineer's seal (signed and dated), and the date the design was performed.

The mix design shall be submitted to the Agency or Engineer by the Contractor/Supplier for which it was developed as part of his project submittals. Once the mix design has been approved by the agency or Engineer, the Contractor and/or his supplier shall not change plants nor ~~utilize~~use additional mixing plants without prior approval of the Engineer. Any changes in the plant operation, the producer's pit, the asphalt binder, including modifiers in the asphalt binder, or any other item that will cause an adjustment in the mix, shall be justification for a new mix design to be submitted.

710.3.2 Mix Design Criteria: The mix design shall be performed by one of two methods, Marshall Mix Design or Gyratory Mix Design. The method shall be specified on the plans, special provisions, or by the Engineer. A minimum of 4 points will be used to establish the mix design results. The oven aging period for both Marshall and Gyratory mix design samples shall be 2 hours.

710.3.2.1 Marshall Mix Design: The Marshall Mix Design shall be performed in accordance with the requirements of the latest edition of the Asphalt Institute's Manual, MS-2 "Mix Design Methods for Asphalt Concrete." The mix shall ~~utilize~~use the compactive effort of 75 blows per side of specimen. The mix shall comply with the criteria in Table 710-3.

TABLE 710-3

MARSHALL MIX DESIGN CRITERIA

Criteria	Requirements				Designated Test Method
	3/8" Mix	~~½"~~1/2 Mix	3/4" Mix	Base Mix	
~~1.~~ Voids in Mineral Aggregate: %, min	15.0	14.0	13.0	12.0	AI MS-2
~~2.~~ Effective Voids: %, Range	4.0 ± 0.2	4.0 ± 0.2	4.0 ± 0.2	4.0 ± 0.2	AI MS-2
~~3.~~ Absorbed Asphalt: %, Range *	0 - 1.0	0 - 1.0	0 - 1.0	0 - 1.0	AI MS-2
~~4.~~ Dust to Eff. Asphalt Ratio, Range **	0.6 – 1.4	0.6 – 1.4	0.6 – 1.4	0.6 – 1.4	AI MS-2
~~5.~~ Tensile Strength Ratio: %, Min.	65	65	65	65	ASTM D4867
~~6.~~ Dry Tensile Strength: psi, Min.	100	100	100	100	ASTM D4867
~~7.~~ Stability: pounds, Minimum	2,000	2,500	2,500	3000	AASHTO T-245
~~8.~~ Flow: 0.01-inch, Range	8 - 16	8 - 16	8 – 16	8 – 16	AASHTO T-245
~~9.~~ Mineral Aggregate Grading Limits				AASHTO T-27	

Sieve Size	Percent Passing with Admix			
	3/8 inch Mix	~~½~~ 1/2inch Mix	3/4 inch Mix	Base Mix
1-1/4 inch				100
1 inch			100	90-100
3/4 inch		100	90 – 100	85-95
~~½~~1/2 inch	100	85 – 100	---	---
3/8 inch	90-100	62 – 85	62 – 77	57-72
No. 8	45-60	40 – 50	35 – 47	33-43
No. 40	10-22	10 – 20	10 – 20	9-18
No. 200	2.0 – 10.0	2.0 – 10.0	2.0 – 8.0	1.0 – 7.0

* Unless otherwise approved by the Engineer.

** The ratio of the mix design composite gradation target for the No. 200 sieve, including admixture, to the effective asphalt content shall be within the indicated range.

710.3.2.2 Gyratory Mix Design: Gyratory Mix Designs shall be performed in accordance with the requirements of latest edition of the Asphalt Institute's SP-2 manual. Mix design laboratory compacted specimens shall be prepared using a gyratory compactor in accordance with AASHTO T-312.

The mix design shall be formulated in a manner described for volumetric mix designs in the current edition of the Asphalt Institute Manual SP-2, except the number of trial blend gradations necessary will be determined by the mix design laboratory. Duplicate gyratory samples shall be prepared at a minimum of four (4) binder contents to select the recommended binder content. The gyratory specimens shall be compacted to 160 gyrations. Volumetric data for the design number of gyrations, N_{des}, and the initial number of gyrations, N_{ini}, are then back calculated based on the bulk specific gravity, G_{mb}, of the N_{max} specimens and the height data generated during the compaction process of those same specimens.

For Low Traffic designs, volumetric data for 115 gyrations, N_{max} for Low Traffic designs, is also back calculated from the specimens compacted to 160 gyrations.

The corrected density of the specimens shall be less than 89.0 percent of maximum theoretical density at N_{ini}. The corrected density of the specimens shall be less than 98.0 percent of maximum theoretical density at N_{max}. The Gyratory mix shall comply with the criteria in Table 710-4.

TABLE 710-4

GYRATORY MIX DESIGN CRITERIA

Criteria	Requirements			Designated Test
	3/8" Mix	½1/2" Mix	3/4" Mix	Method
1. Voids in Mineral Aggregate: %, Min.	15.0	14.0	13.0	AI SP-2
2. Effective Voids: %, Range	4.0 ± 0.2	4.0 ± 0.2	4.0 ± 0.2	AI SP-2
3. Absorbed Asphalt: %, Range *	0 - 1.0	0 - 1.0	0 - 1.0	AI SP-2
4. Dust to Eff. Asphalt Ratio, Range **	0.6 – 1.4	0.6 – 1.4	0.6 – 1.4	AI SP-2
5. Tensile Strength Ratio: %, Min.	75	75	75	ASTM D4867
6. Dry Tensile Strength: psi, Min.	75	75	75	ASTM D4867
7. Mineral Aggregate Grading Limits				AASHTO T-27

	Percent Passing with Admix		
Sieve Size	3/8 inch Mix	½1/2 inch Mix	3/4 inch Mix
1 inch			100
3/4 inch		100	90-100
½1/2 inch	100	90-100	43-89
3/8 inch	90-100	53-89	-
No. 8	32-47	29-40	24-36
No. 40	2-24	3-20	3-18
No. 200	2.0-8.0	2.0-7.5	2.0-6.5

8. Number of Gyrations	Low Traffic	High Traffic
N_{ini}	7	8
N_{des}	75	100
N_{max}	115	160

* Unless otherwise approved by the Engineer.

** The ratio of the mix design composite gradation target for the No. 200 sieve, including admixture, to the effective asphalt content shall be within the indicated range.

710.3.2.3 Moisture Sensitivity Testing: Moisture sensitivity testing will be performed in accordance with ASTM D4867 for both Marshall and Gyratory mix designs, without the freeze/thaw cycle(s). The minimum required Tensile Strength Ratio is indicated in the tables above.

DATE: July 30, 2012

TO: MAG Specification and Details Committee Members

FROM: Brian Gallimore, Materials Working Group/AGC
Jeff Benedict, Asphalt Working Group/ARPA
Jeff Hearne, Concrete Working Group/ARPA

RE: Reclaimed Materials – CLSM

PURPOSE: Addresses the use of alternate or reclaimed materials along with proper reference adjustments to their respective corresponding sections

REVISIONS:

Section 728

1) Added the option of alternate materials , ABC (per City of Phoenix Supplements) or Reclaimed Concrete Materials (RCM) to Section 728.2 "Materials" – with Engineer approval
2) Added additional clarification to Note 2 or Table 728-1 regarding the prohibition of "structural" concrete or "grout" in lieu of CSLM (per City of Phoenix Supplements)

SECTION 728 – REVISED 7-30-12

CONTROLLED LOW STRENGTH MATERIAL

728.1 GENERAL:

Controlled Low Strength Material (CLSM) is a mixture of cementitious materials, aggregates, admixtures\additives, and water that, as the cementitious materials hydrate, forms a soil replacement. CLSM is a self-compacting, flowable, cementitious material primarily used as a backfill, structural fill, or a replacement for compacted fill or unsuitable native material. Placement and usage of each type of CLSM is described in Section 604,

728.2 MATERIALS:

Cementitious materials shall conform to Section 725.2.
Coarse aggregate shall conform to ASTM C-33 grading size No. 57. The size and gradation of fine aggregates (sand) shall conform to ASTM C-33. Alternate materials meeting the applicable requirements of Section 701 or 702 such as combinations of other aggregates, Aggregate Base Course (ABC) or Reclaimed Concrete Material (RCM) may be used to replace the required coarse and fine aggregate as long as the approved mix design meets the requirements of Table 728-1 and is approved by the Engineer.
Water shall conform to Section 725.4.

728.3 PROPORTIONING OF MIXTURES AND PRODUCTION TOLERANCES:

Proportioning of the mixture shall comply with Section 725.6 and Table 728-1. The CLSM shall have consistency, workability, plasticity, and flow characteristics such that the material when placed is self-compacting. A minimum of 40% coarse aggregate shall be used. A mix design shall be submitted for the Engineer's approval prior to the excavation for which the material is intended for use. Sampling shall be in accordance with ASTM D-5971. The flow consistency shall be tested in accordance with ASTM D-6103. Unit weight (when applicable) shall be obtained by ASTM D-6023. Compressive strength shall be tested in accordance with ASTM D-4832.

TABLE 728-1

CONTROLLED LOW STRENGTH MATERIAL REQUIREMENTS

Portland Cement Content, Sack/cu yd	Flow, inches
1/2 Sack	9±2
1 Sack	9±2
1 1/2 Sack	9±2

Note for Table 728-1:

1) CLSM mixes meeting the table requirements will not generally be placeable by means of a concrete pump or may not provide the needed workability for certain conditions. When pumpable mixes or increased workability are required, the addition of fly ash or a natural pozzolan in excess of the required Portland Cement Content may be used.

2) Ready-mixed structural concrete or grout shall not be used in lieu of CLSM without prior approval from the Engineer and shall be subject to rejection.

728.4 MIXING:

CLSM mixing shall comply with Section 725.7. Mixing shall continue until the cementitious material and water are thoroughly dispersed throughout the material. Mixes shall be homogenous, readily placeable and uniformly workable.

STEEL REINFORCED POLYETHYLENE PIPE & FITTINGS FOR STORM DRAIN, SANITARY SEWER & IRRIGATION

739.1 GENERAL:

This specification covers the requirements of Steel Reinforced Polyethylene Pipe (SRPE) pipe manufactured per ASTM F2562 for storm drains, irrigation and sanitary sewer systems. When noted on the plans or in the special provisions, storm drains, irrigation and sanitary sewers may be constructed using SRPE pipe. The SRPE pipe will be of the sizes 24 inch diameter through 120 inch diameter.

Gasketed watertight pipe joints shall meet a laboratory test pressure of 15.0 psi or 34.5 feet of water when tested in accordance with ASTM D3212.

Optional electrofusion watertight pipe joints shall meet a laboratory test pressure of 30.0 psi or 69 feet of water when tested in accordance with ASTM D3212.

The size and stiffness class of the SRPE pipe per ASTM F2562 to be furnished shall be specified by the Engineer and shown on the plans or in the project specifications.

When specified, SRPE pipe shall be tested in accordance with 615.11 and ASTM C828

739.2 MATERIALS:

739.2.1 Base Steel Materials: Continuous high strength galvanized ribs shall be cold rolled steel meeting the requirements of either ASTM A1008 or ASTM A1011 with minimum yield strength of 80,000 psi. Steel ribs shall be completely encased within the HDPE profile.

739.2.2 HDPE Material Composition: SRPE pipe HDPE material and fittings shall, in accordance with ASTM 2562, be made from HDPE plastic compound meeting the minimum requirements of cell classification 335464C or higher cell classification, in accordance with ASTM D3350.

739.2.3 Gaskets: Rubber gaskets shall be manufactured from a natural rubber, synthetic elastomer or a blend of both and shall comply in all respects with the physical requirements in ASTM F477.

739.2.4 Water Stops: Water stops shall be manufactured from a natural or synthetic rubber and shall conform to the requirements of ASTM C923. The water stop shall have expansion rings, a tension band, or a take-up device used for mechanically compressing the water stop against the pipe.

739.2.5 Thermal Welding Material: The material used for thermally welding the pipe material shall be compatible with the base material.

739.2.6 Lubricant: The lubricant used for assembly shall comply with manufacturer's recommendations and have no detrimental effect on the gasket or pipe.

739.2.7 Other Materials: Materials other than those specified above shall comply with ASTM F2562.

739.3 JOINING SYSTEMS:

738.3.1 Gasket Type: Steel reinforced bell and spigot joints for the piping system and fittings shall consist of an integrally formed bell and spigot gasketed joint. The joint shall be designed so that when assembled, the elastomeric gasket is compressed radially on the pipe or fitting bell to form a water tight seal. The joint shall be designed so to prevent displacement of the gasket from the joint during assembly and when in service. The elastomeric gasket shall meet the provision of ASTM F477.

All pipes shall have a home mark on the spigot end to indicate proper penetration when the joint is made.

The bell and spigot configurations for the fittings shall be compatible to those used for the pipe.

Joints shall provide a seal against exfiltration and infiltration. All surfaces of the joint upon which the gasket may bear, shall be smooth and free of any imperfections, which would adversely affect seal ability. The assembly of the gasketed joints shall be in accordance with the pipe manufacturer's recommendations.

739.3.2 Thermal Weld Type: Electro fusion (EF) joints, when specified, shall utilize plain ended pipe welded together by internal pressure testable couplers. The internal couplers shall have a minimum wall thickness equal to or greater than the pipe wall thickness as defined in pipe specification, ASTM F2562. The assembly of the welded joints shall be in accordance with the manufacturer's recommendations.

739.4 FITTINGS:

Fittings for SRPE pipe may include tees, elbows, manhole adapter rings, plugs, caps, adapters and increasers. Fittings shall be joined by gasket type or thermal weld type joints in accordance with Subsection 739.3.

A clamp gasket or approved method shall be provided at manhole entry or connection to reduce infiltration and exfiltration. Where precast manholes are used, entrance holes must be large enough to allow for proper grouting around the manhole gasket. A non-shrink grout shall be used for grouting.

739.5 CERTIFICATION:

The manufacturer shall furnish an affidavit (certification) that all materials delivered shall comply with the requirements of ASTM F2562.

739.6 DIMENSIONS AND TOLERANCES:

SRPE pipe dimensions shall comply with dimensions given in Table 2 of ASTM F2562. The "inside diameter" of profile wall SRPE pipe shall not deviate from its published inside diameter by more than as specified in Section 6.2.3 of ASTM F2562.

739.7 MARKINGS:

Markings on pipe shall be per ASTM F2562. These markings shall be clearly shown on the pipe at intervals of approximately 12 feet and include but not limited to the following: the manufacturer's name or trademark, nominal size, the specification designation, plant designation code, date of manufacture or an appropriate code. All fittings shall be marked with the designation number of the specification and with the manufacturer's identification symbol.

739.8 CARE OF PIPE AND MATERIALS:

All pipe and materials shall be manufactured, handled, loaded, shipped and unloaded in such a manner as to be undamaged and in sound condition, in the completed work. Particular effort shall be exercised to protect the ends of the pipe. Repairs on damaged pipe shall be made to the satisfaction of the Engineer otherwise they shall not be used in the work and shall be replaced with an equal pipe or special in an acceptance condition. At all times, rubber gaskets shall be covered in a factory applied protective wrap or stored in a cool, dark place until ready for use.

- End of Section -

MAG Asphalt, Materials, and Concrete Working Groups Meeting

Jeff Benedict (Valero) chaired the meeting. It was convened at noon on Thursday August 23rd at the ARPA meeting room.

Present were: Brad Parker (Mesa Materials), Don Cornelison (Speedie), Jeff Hearne (Salt River Materials Group), Adrian Green (Vulcan), Don Green (Cemex), Phil Feliz (WTI), Scott Thompson (PT.), Mohamed Rahman (ATC), Brian Gallimore (WSP), Alex Carter (Cemex), Darren Olson (SW Slurry), Charlie Buchanan (Ergon).
Agency members present: Gordon Tyus (MAG), John Shi (MCDOT), Bob Herz (MCDOT), Rob Gallows (Goodyear), Bob Draper(Mesa), Jonathan Flatt (Glendale), Ryan Lowe (Glendale), Peter Kandaris (Consultant).

Topics discussed were as follows:

MAG 317 (milling) section was reviewed. This version has been before the whole MAG group and will be pushed to call for a vote in the September meeting.

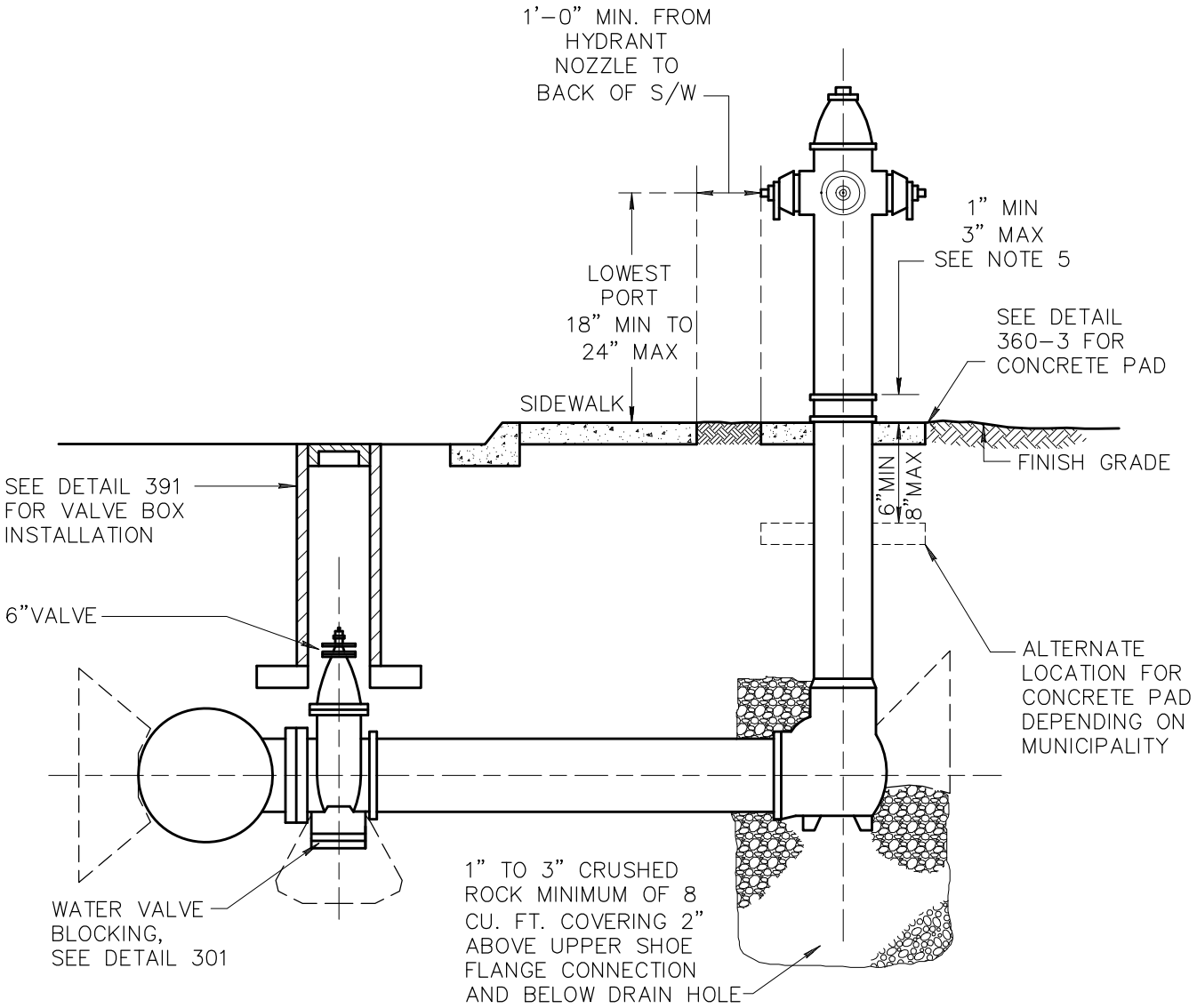
Case 12-11A (Aggregate definitions)
Good year had a suggestion to insert the word "uniformly" blended in both the RCM as well as the RAP definitions for section 701. MCDOT asked that RCM be excluded from virgin redi-mix. It was decided that this language would best go into section 725.3 "Without prior approval of the engineer". It will also be noted that RCM will not be used in hot mix asphalt, and will be noted in 710 as well. Goodyear asked if language could be crafted to ensure that base material be uniformly blended regardless of the source. Section 702.1 will be addressed.

Case 12-11B (RAP for use in hot mix)
The asphalt subcommittee discussed adding the definition of "RAP binder" to the definition portion of 710.3 as well as defining RAP %s.
It was discussed the use of rubber or high binder RAP being used and identified in the mix design. Industry experts assured the group that the binder percentage contributed from RAP still is limited to the total allowed. Goodyear also asked that the top sieve size for RAP be limited to 1.5". Industry agreed.

Case 12-11C (Recycled products in CLSM)
The case was reviewed and no changes to the case were noted.

"Warm Mix" This topic was discussed and it was agreed to push this case this for a later date, possibly next year. MCDOT may have first hand input for this latter in the year.

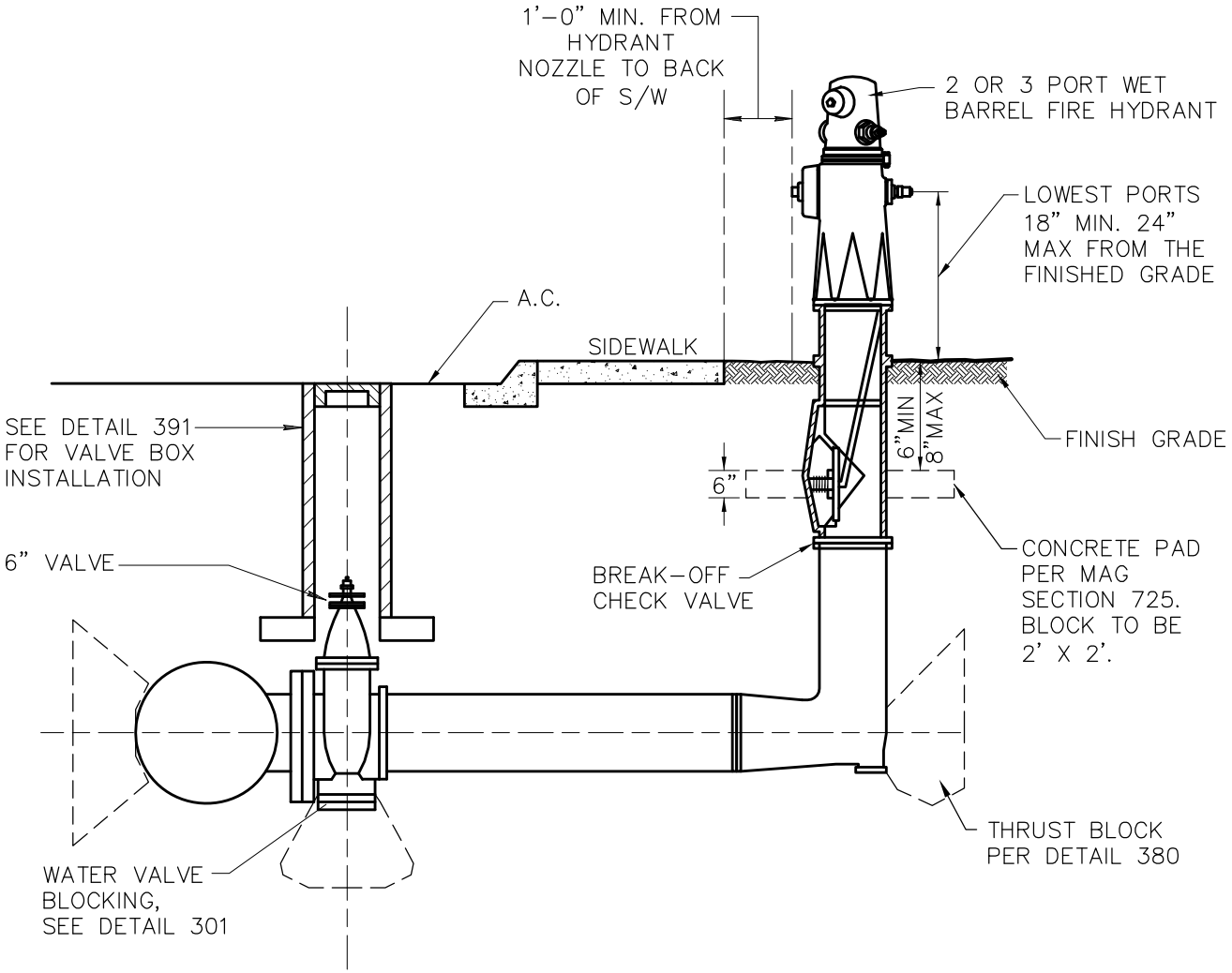
Section 321 "penalty table" will be reviewed at a future meeting as requested by MAG member agencies.
It was decided that the next sub-committee meeting will be determined after the regular MAG meeting is convened. The meeting was adjourned at 2:15 p.m.



NOTES:

1. JOINTS BETWEEN THE VALVE AND THE MAIN SHALL BE FLANGED TYPE. JOINTS BETWEEN THE VALVE AND HYDRANT SHALL BE RESTRAINT OR MECHANICAL TYPE.
2. RESTRAINTS SHALL BE MECHANICAL RESTRAINT OR THRUST BLOCK PER DETAIL 380.
3. A FLANGE JOINT BY MECHANICAL JOINT VALVE SHALL BE USED AS THE TRANSITION BETWEEN THE JOINT TYPES.
4. PIPING BETWEEN WATER VALVE AND HYDRANT SHALL BE DUCTILE IRON.
5. SEE DETAIL 362 FOR LOCATION OF HYDRANT.
6. PUMPER CONNECTION SHALL FACE THE STREET.
7. NO VALVES ARE TO BE LOCATED IN CURB.
8. NATIONAL STANDARD THREADS REQUIRED ON ALL CONNECTIONS UNLESS OTHERWISE DIRECTED.
9. SEE DETAIL 360–3 FOR CONCRETE PAD.
10. FIRE HYDRANT SHALL BE FRESHLY PAINTED PRIOR TO FINAL ACCEPTANCE.
11. SEE SECTION 756 FOR HYDRANT MATERIAL.

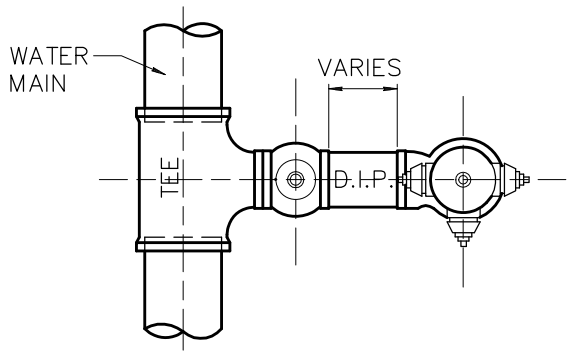
DETAIL NO.				REVISED	DETAIL NO.
360-1	MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL ENGLISH	DRY BARREL FIRE HYDRANT INSTALLATION	01–01–2013	360-1



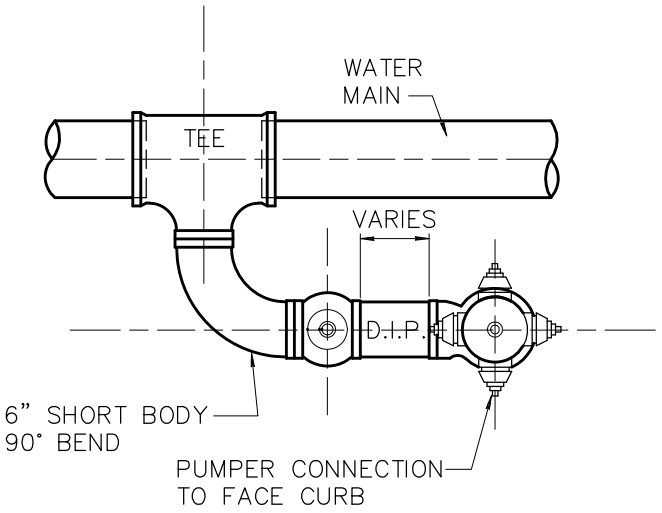
NOTES:

1. JOINTS BETWEEN THE VALVE AND THE MAIN SHALL BE FLANGED TYPE. JOINTS BETWEEN THE VALVE AND HYDRANT SHALL BE MECHANICAL RESTRAINT MECHANICAL TYPE.
2. RESTRAINTS SHALL BE MECHANICAL RESTRAINT OR THRUST BLOCK PER DETAIL 380.
3. A FLANGE JOINT BY MECHANICAL JOINT VALVE SHALL BE USED AS THE TRANSITION BETWEEN THE JOINT TYPES.
4. PIPING BETWEEN WATER VALVE AND HYDRANT SHALL BE DUCTILE IRON.
5. SEE DETAIL 362 FOR LOCATION OF HYDRANT.
6. PUMPER CONNECTION SHALL FACE THE STREET.
7. NO VALVES ARE TO BE LOCATED IN CURB.
8. NATIONAL STANDARD THREADS REQUIRED ON ALL CONNECTIONS UNLESS OTHERWISE DIRECTED.
9. SEE DETAIL 360–3 FOR CONCRETE PAD.
10. FIRE HYDRANT SHALL BE FRESHLY PAINTED PRIOR TO FINAL ACCEPTANCE.
11. THE HYDRANT SHALL HAVE 2– 2½" PORT AND 1– 4½" PORT (INDUSTRIAL OR COMMERCIAL).
12. THE HYDRANT SHALL HAVE 1– 2½" PORT AND 1– 4½" PORT (RESIDENTIAL).

DETAIL NO.		STANDARD DETAIL		REVISED	DETAIL NO.
360-2	MARICOPA ASSOCIATION of GOVERNMENTS	ENGLISH	WET BARREL FIRE HYDRANT INSTALLATION	01–01–2013	360-2

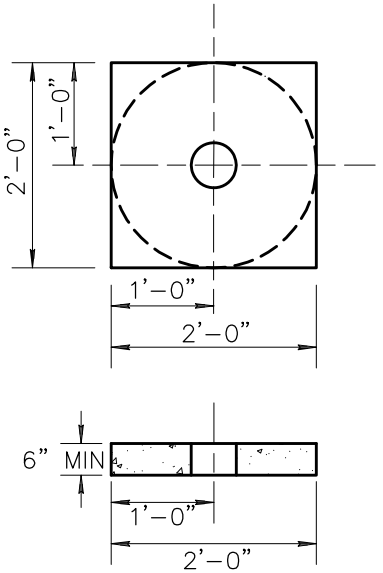


TYP MAIN CONNECTION
(PREFERRED)

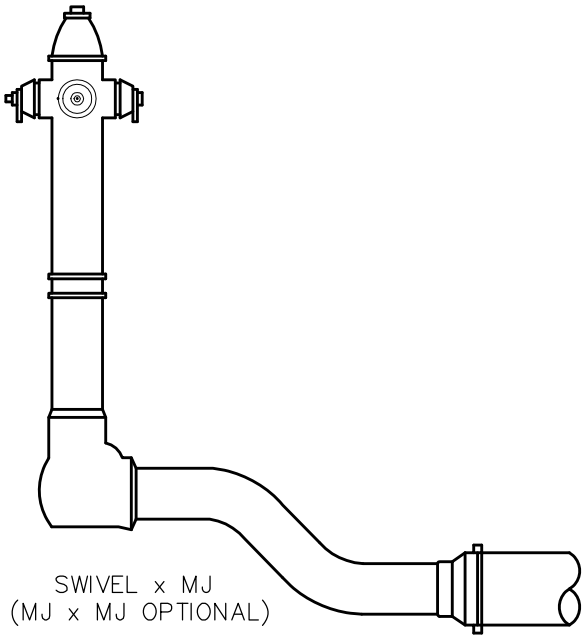


ALT MAIN
CONNECTION

SQUARE OR ROUND IS ACCEPTABLE
IF ROUND: 24" DIAMETER MIN. REQUIRED



CONCRETE PAD
LOCATION DETAIL



OFFSET FITTINGS

NOTES:

1. CONCRETE FOR PAD SHALL BE CLASS "A".
2. SCORE LINE SHALL BISECT CONCRETE PAD AT MID POINT OF ALL SIDES.
3. CONCRETE COLOR SHALL MATCH ADJACENT CONCRETE. THE FINISHED CONCRETE SURFACE SHALL HAVE A ROUGH BROOM FINISH (SURFACE ONLY).
4. MULTIPLE OFFSET FITTINGS SHALL NOT BE ALLOWED.
5. MINIMUM 36" CLEARANCE PER NFPA-24 AROUND FIRE HYDRANT.
6. 1/2" BITUMINOUS EXPANSION SHALL BE PLACED AROUND THE BARREL OF THE FIRE HYDRANT AT THE CONCRETE PAD.

DETAIL NO.				REVISED	DETAIL NO.
360-3	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH	FIRE HYDRANT INSTALLATION DETAILS		01-01-2013	360-3

MAG Specification & Detail Committee – ATTENDANCE for 2012

Quorum - 8 Agency Representatives		January 4, 2012	February 1, 2012	March 7, 2012	April 4, 2012	May 2, 2012	June 6, 2012	July 11, 2012	August 1, 2012	Sept. 5, 2012	October 3, 2012	Total
Member	**Representative**											
Agency Members:												
Avondale	Jim Badowich	√	√	√	√	√	√	√	√			
Buckeye	Scott Zipprich	√	√	√	S	√	√	S	S			
Chandler	Warren White	S	√	√	√	√		√	√			
El Mirage	Lance Calvert-resigned 7/12											
Gilbert	Greg Crossman	√	√	√	√	√		√	√			
Glendale	Mark Ivanich	√	√	√		√	√	√	√			
Goodyear	Troy Tobiasson	√	√	√	√	√	√	√	√			
Maricopa Co.	Bob Herz (Transportation)	√	√	√	√	√	S	√	√			
Mesa	Bob Draper	√	√	√		√		√	√			
Peoria	Javier Setovich		√		√	S						
Phoenix	Syd Anderson (Street Trans)	√		√	P	√		√	√			
	Jami Erickson (Water)	√	√	√	√		√	√	√			
Queen Creek	Mark Palichuk-resigned 7/12											
Scottsdale	Rodney Ramos	√		√	√	√		√				
Surprise	Jason Mahkovtz		√	√	√	√	√	√	√			
Tempe	Thomas Wilhite	√	√	√	√	√	√	√	√			
Youngtown	Jim Fox		√									
Advisory Members:												
AZ Rock Products Association	Jeff Benedict	√	√	√	√	√	√	√	√			
	Jeff Hearne	√	√	√	S	√	√	√	√			
Associated General Contractors	Brian Gallimore	√	√	√	S	√	S	√	√			
	Adrian Green		√	S	S		√	√	√			
S.R.P.	Peter Kandaris/Jacob Rodriguez	√	√	√	√	√	√		√			
Independent	Paul Nebeker	√		√		√	√	√	√			
	Peter Kandaris						√	√	√			
National Utility Contractors Assoc	Kwigs Bowen or Bill Davis (Alternate)	S			S	S		S	S			
	Tony Braun	√	√					√				
MAG Admin.	Gordon Tyus	√	√	√	√	√	√	√	√			

Attendance: √: Attended meeting; (Blank): Not attended meeting; S: Designated substitute attended
P: Attended a portion of the meeting; A: Attended via audio conferencing.

MAG Specification & Detail Committee
VOTING SUMMARY for 2012

Case No.	Title – Section/Detail	Vote Date	Avondale	Buckeye	Chandler	~~El Mirage~~	Gilbert	Glendale	Goodyear	Maricopa County	Mesa	Peoria	Phoenix	~~Queen Creek~~	Scottsdale	Surprise	Tempe	Youngtown	Voting Summary Y-N-A-NP
11-02	Add an Asphalt Pavement Safety Edge option to Detail 201.	Scheduled 09/05/12																	**0-0-0-0**
11-03	Replace cadmium plated bolts referenced in Section 610.13 with zinc plated bolts as described in ASTM-B633.	Scheduled 09/05/12																	**0-0-0-0**
11-12	Modifications to Regulatory Requirements, MAG 107.	Scheduled 09/05/12																	**0-0-0-0**
11-14	Update Fire Hydrant Detail 360, and Add Wet Barrel Option and Details.	Approved 08/01/12	Y	Y	Y	—	Y	Y	Y	Y	Y	—	Y	—	—	Y	Y	—	**11-0-0-3**
11-16	Modify Section 415: Steel Flexible Metal Guardrail.	Scheduled 09/05/12																	**0-0-0-0**
11-18	Update Section 350: Removal of Existing Improvements.	Scheduled 09/05/12																	**0-0-0-0**
11-21	Add new Section 623: Special Bedding for Mainline Storm Drain Pipe.	Withdrawn 07/11/12																	**0-0-0-0**
11-30	Update Section 702: Base Material. Moved all ABC material to Section 310. Revise Section 310: Untreated Base Course. Revise for current standards.	Approved 03/07/12	Y	Y	Y	—	Y	Y	Y	Y	Y	—	Y	—	Y	Y	Y	—	**12-0-0-4**
12-01	Misc. Corrections: A. Section 108 typographic errors B. Remove extra space in Section 108.9 C. Correct references in Detail 160 D. Correct typo 'product' in Section 610.3	Scheduled 09/05/12																	**0-0-0-0**

Voting Abbreviations: **Y**: Yes **N**: No **A**: Abstain **—** : Not Present (NP)

∗: Indicates changes made to proposal prior to vote.

MAG Specification & Detail Committee
VOTING SUMMARY for 2012

Case No.	Title – Section/Detail	Vote Date	Avondale	Buckeye	Chandler	~~El Mirage~~	Gilbert	Glendale	Goodyear	Maricopa County	Mesa	Peoria	Phoenix	~~Queen Creek~~	Scottsdale	Surprise	Tempe	Youngtown	Voting Summary Y-N-A-NP
12-02	Modify Section 710 Asphalt Concrete to include low traffic gyration levels.	Approved 05/02/12	Y	—	Y	—	Y	Y	Y	Y	Y	A	Y	—	Y	Y	Y	—	**11-0-1-4**
12-03	Revisions to Details 260-2: Driveway Entrances	Scheduled 09/05/12																	**0-0-0-0**
12-04	Revisions to Section 317: Asphalt Milling	Scheduled 08/01/12																	**0-0-0-0**
12-05	Revisions to Section 711: Asphalt Paving (Table 711-1)	Approved 07/11/12	Y	Y	Y	—	Y	Y	Y	Y	Y	—	Y	—	Y	Y	Y	—	**12-0-0-4**
12-06	New Detail: Modified ADA Compliant Alley Entrance	Scheduled 09/05/12																	**0-0-0-0**
12-07	Revisions to Section 332.6: Protection of Uncured Surface	Scheduled 08/01/12	Y	Y	Y	—	Y	Y	Y	A	Y	—	Y	—	—	Y	Y	—	**10-0-1-3**
12-08	Section 611: Disinfecting Water Mains – Addition of Refreshing Plans	Withdrawn 08/01/12																	**0-0-0-0**
12-09	Case 12-09: ASTM Updates A. Section 770: Structural Steel	Approved 07/11/12	Y	Y	Y	—	Y	Y	Y	Y	Y	—	Y	—	Y	Y	Y	—	**12-0-0-4**
12-10	Case 12-10: Proposed revision to Section 505.6.3 Bridge Deck Joint Assemblies.	Scheduled 09/05/12																	**0-0-0-0**
12-11	Case 12-11: Reclaimed and Recycled Materials – Sections 701, 702, 709, 710 and 728	Scheduled 09/05/12																	**0-0-0-0**
12-12	Case 12-12: New Section 739 - Steel Reinforced Polyethylene Pipe	Scheduled 09/05/12																	**0-0-0-0**

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