

April 25, 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, May 2, 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
May 2, 2012

COMMITTEE ACTION REQUESTED

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| 1. <u>Call to Order and Introductions</u> | |
| 2. <u>Call to the Audience</u>
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. <u>Approval of April 4, 2012, Meeting Minutes</u> | 3. Review and approve minutes of the April 4, 2012 meeting. |

Cases Carried Forward from 2011

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| 4. <u>Case 11-02:</u>
Add an Asphalt Pavement Safety Edge option to Detail 201. | 4. Information and discussion.
Sponsor: Bob Herz, Maricopa County |
| 5. <u>Case 11-03:</u>
Replace cadmium plated bolts referenced in Section 610.13 with zinc plated bolts as described in ASTM-B633. | 5. Information and discussion.
Sponsor: Paul Nebeker, Javier Setovich |
| 6. <u>Case 11-12:</u>
Modifications to Regulatory Requirements, MAG Section 107. | 6. Information and discussion.
Sponsor: Peter Kandaris |
| 7. <u>Case 11-14:</u>
Update Fire Hydrant Detail 360-1, and add Wet Barrel Option (360-2) and Details (360-3). | 7. Information and discussion.
Sponsor: Scott Zipprich |
| 8. <u>Case 11-16:</u>
Modify Section 415: Steel Flexible Metal Guardrail. | 8. Information and discussion.
Sponsor: Peter Kandaris |

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|---|---|
| 9. <u>Case 11-18:</u>
Update Section 350: Removal of Existing Improvements. | 9. Information and discussion.
Sponsor: Peter Kandararis |
| 10. <u>Case 11-21:</u>
Add new Section 623: Special Bedding for Mainline Storm Drain Pipe. | 10. Information and discussion.
Sponsor: Syd Anderson |

New Cases for 2012

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| 11. <u>Case 12-01 Miscellaneous Corrections:</u>
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. NEW | 11. Information and discussion. |
| 12. <u>Case 12-02:</u>
Modify Section 710 Asphalt Concrete to include low traffic gyration levels. | 12. Information, discussion and possible action.
Sponsor: Jeff Benedict, ARPA |
| 13. <u>Case 12-03:</u>
Revisions to Details 260-2: Driveway Entrances. | 13. Information and discussion.
Sponsor: Bob Herz, Maricopa County |
| 14. <u>Case 12-04:</u>
Revisions to Section 317: Asphalt Milling. | 14. Information and discussion.
Sponsor: Jeff Benedict, ARPA |
| 15. <u>Case 12-05:</u>
Modifications to Section 711: Asphalt Paving | 15. Information and discussion.
Sponsor: Jeff Benedict, ARPA |
| 16. <u>Case 12-06:</u>
Add ADA Compliant Alley Entrance Detail. | 16. Information and discussion.
Sponsor: Warren White, Chandler |
| 17. <u>Case 12-07:</u>
Revisions to Section 332.6 Protection of Uncured Surface | 17. Information and discussion.
Sponsor: Jami Erickson, Phoenix |
| 18. <u>Case 12-08:</u>
Revisions to Section 611: Addition of Refreshing Plans. | 18. Information and discussion.
Sponsor: Jami Erickson, Phoenix |
| 19. <u>Case 12-09:</u>
ASTM Updates - Section 770: Structural Steel | 19. Information and discussion.
Sponsor: Peter Kandararis, SRP |
| 20. <u>Other New and Potential Cases for 2012</u>
Discussion about new cases and that could be brought forward in 2012. | 20. Information and discussion. |

General Discussion

21. Plan for proactive review and revision of MAG specifications and details over a time period such as five years.

21. Information and discussion.

22. Managing and revising agency supplements and incorporating supplements into MAG.

22. Information and discussion.

23 Working Group Reports

23 Information and discussion.

A. Water/Sewer Working Group

Report on 4/17/2012 meeting.

B. Outside Right-of-Way Working Group

Report on 4/17/2012 meeting.

C. Asphalt Working Group

Report on 4/26/2012 meeting.

D. Concrete Working Group

Report on 4/26/2012 meeting.

A. Water/Sewer Chair: Jim Badowich, Avondale,

B. Outside ROW Chair: Peter Kandaris, SRP

C. Asphalt Chair: Jeff Benedict, AGC

D. Concrete Chair: Jeff Hearne, ARPA

24. Request for Future Agenda Items

Topics or issues of interest that the Standard Specifications and Details Committee would like to have considered for discussion at a future meeting will be requested.

Adjournment

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

April 4, 2012

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

AGENCY MEMBERS

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

ADVISORY MEMBERS

Jeff Benedict, ARPA	Doug Laquey, ARPA (proxy)
* James Hacket, NUCA (proxy)	Peter Kandaris, SRP
Kwigs Bowen, NUCA	* Paul R. Nebeker, Independent
Bradley Gallimore, AGC (proxy)	
Brad Parker, AGC (proxy)	

MAG ADMINISTRATIVE STAFF

Gordon Tyus

* Members not attending or represented by proxy.

GUESTS/VISITORS

Art Glover, Flood Control District of Maricopa County

1. Call to Order

Chairman Troy Tobiasson called the meeting to order at 1:33 p.m.

2. Call to the Audience

No public comment was provided.

3. Approval of Minutes

The members reviewed the March 7, 2012 meeting minutes. Greg Crossman introduced a motion to accept the minutes as written. Warren White seconded the motion. A voice vote of all ayes and no nays was recorded.

Review of 2011 Carry Forward Cases

4. Case 11-02 – Safety Edge Detail

Add an Asphalt Pavement Safety Edge option to Detail 201. Bob Herz handed out a revised detail drawing dated 4/4/2012. The revised detail dropped the specialized overlay option. He said that although there was discussion at the last meeting of removing the text about pay limit for subgrade preparation, MCDOT engineers would prefer to keep it in to ensure it is a separate pay item. The detail also added compaction requirements for the replacement shoulder. The overlay uses a saw-cut operation to even the edge. Mr. Herz said that if the width of the cut is greater than 1', the existing pavement would need to be repaired before applying the overlay. Jeff Benedict asked what material was used on the shoulder. Mr. Herz said it would be the existing material. There was discussion about whether the existing material would be able to meet the 95% compaction requirement. Mr. Herz said this is the same requirement for new shoulders, adding the existing material usually is pretty good. Mr. Laquey said it is difficult to get consistent compaction measurements on shoulders. It was suggested that the Type A detail be moved above the Type B in the layout, and that the detail number be corrected to 201.

5. 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. Javier Setovich said he prepared a revised version of the case, which was discussed at the last water/sewer working group meeting. He said he expected revisions to be made at the next working group meeting, and then bringing it back to the full committee.

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

Add references to Arizona native plant requirements and update references to state statutes. Mr. Kandarlis handed out a revised copy that added modifications to Section 107.2 (Item 2) based on a request from the City of Phoenix. Jami Erikson said Phoenix wants language to

make sure permits are not only obtained, but maintained and closed properly. There was discussion about the timing of different kinds of permits.

7. Case 11-14: Update Fire Hydrant Details

Update Detail 360-1, and add Wet Barrel Option (360-2) and Details (360-3). Craig Sharp, substituting for Scott Zipprich said they are making changes to redlined drawings and plan to bring them to the next water/sewer meeting. After review next month he suggested a possible vote at the following committee meeting.

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

Update Section 415 based on the Maricopa County Supplement. Reference New Details. Peter Kandararis handed out a revision that added language about guardrail end treatments being determined by agency requirements. He asked members if they had any feedback regarding a preference on referencing MCDOT or ADOT details. He also said he had done some research into common options for temporary end treatments, since the referenced detail 135-4 no longer exists. Mr. Kandararis said sand and water barrels were common. Warren White said blunt-nosed collapsible types were also common. Mr. Kandararis said he would work on wording for these and come up with a default option using the MUTCD as a reference.

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

Add language in Section 350.2 for utility removal, and payment requirements. Mr. Kandararis said he did not receive any comments and would like to vote on it in June. Rod Ramos asked if the county was removing abandonments. Bob Herz was not sure, but several members said ADOT was. Tom Wilhite asked if the case should be reviewed by the AUCC (a utilities group). There was also discussion about whether to remove the ARS reference to the blue stake law, since they were being removed from section 170. Mr. Kandararis said he was asked previously to add it. Bob Herz recommended leaving it in. There was discussion about the requirements for showing abandonments on as-builts. Jami Erikson said many of the requirements are provided in the blue stake law. She said Phoenix's policies for as-builts depend on where in the city the project is located. For example in downtown, abandonments are not allowed, but they may be in outlying areas. Jim Badowich asked if MAG should develop specifications for as-builts. Tom Wilhite asked if it should include underground or surface or both, and if a working group should investigate it further. Warren White also asked about irrigation and landscaping. Recruiting a member or assistance from the AUCC was discussed.

10. Case 11-21: Add new Section 623: Special Bedding for Mainline Storm Drain Pipe

Incorporate City of Phoenix supplement 623 into the MAG standards. Since Syd Anderson had not arrived at the meeting yet, Jim Badowich said it could be discussed during the Water/Sewer Working Group report later.

New 2012 Cases

11. Case 12-01: Miscellaneous Corrections

Correct References on Detail 160. Gordon Tyus said that the packet included Detail 160 Chain Link Fence. He noted that there was a typo in the notes. It should refer to Section 772, not 722.

12. Case 12-02: Asphalt Concrete Low Traffic Gyration Levels

Modify Section 710 Asphalt Concrete to include low traffic gyration level specifications. Jeff Benedict provided new handout and asked Doug Laquey to describe the changes. Mr. Laquey said the case reduces the gyration levels for low volume traffic areas, and changed the testing requirements from AASHTO to ASTM. The reason for the change was the AASHTO testing added a freeze/thaw test that is not needed in our climate. This previously was removed using an exception, but switching to ASTM would not require the exception since it was not included. The ASTM test also has more leeway in the voids, which allows faster testing. Troy Tobiasson asked if the changes decreased gyrations. Mr. Laquey explained that it did for low volume roads because you can do back calculations to determine requirements. This allows greater binder content in low volume roads which helps reduce wear due to weather.

13. 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 drawing with additional redlines to reduce the amount of concrete paving, and still meet the ADA four foot width requirement. The revised version made it more compact by making the travel lane parallel to the slope edge line of the ramp. This did create some irregular shapes and weird angles as the 5' sidewalk narrowed to 4' around the driveway entrance. Peter Kandarlis was not sure how the joints would work. Bob Herz said he would work with his drafters to draw up a cleaner version for the committee to review at the next meeting.

14. 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 the new version addressed comments at the last meeting. He noted that the additional fog seal was incidental, and not a separate pay item. There was discussion about clarifying the wording so contractors would know this and that it was clear when this process would be used for dust control. Syd Anderson said this process has worked for Phoenix. Mr. Benedict asked if members had suggestions for word-smithing the final version, to please forward them to him. Syd Anderson suggested making final revisions during the next asphalt working group meeting. Mr. Benedict said any modifications would be included in the agenda packet so that it could be voted on during the May meeting.

15. Case 12-05: Modifications to Table 711-1

Revise Paving Asphalt Performance Grading System Requirements. Jeff Benedict introduced a new case with a handout that superseded the one included in the packet. It updates the testing requirements for paving asphalt in Table 711-1 from AASHTO tests to ASTM. Switching to the ASTM test would allow easier reference since members have access to the ASTM libraries online. Mr. Benedict said the ASTM and AASHTO tests currently are identical. Other changes included adding PG64-16 that is used extensively as both a regular binder and asphalt base for asphalt rubber; adding PG76-16 since it is used by ADOT; and deleting PG82 grade since it is not used or recommended for use in this climate. He also recommended deleting the direct tension test because unless you are using polymer-modified binders, if the dynamic shear and creep stiffness tests pass, the direct tension test always passes. Mr. Benedict said everything currently in MAG is not polymer-modified. Bob Herz suggested leaving the reference to the direct tension test, but noting that it is only used for polymer-modified asphalt. Mr. Benedict agreed to add back in and modify footnote 3.

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

Create a new entrance detail meeting ADA requirements for straight sidewalks. Warren White introduced a case to provide an ADA compliant detail for alley entrances based on one of Chandler's supplements. Bob Herz asked if there was a target slope since the grade of the street can have a big effect of the size of the ramps in order to keep the 1/12 max slope. He suggested adding the table from the other ramp details. Rod Ramos further discussed problems on hills and said special designs would be needed, and some limitation placed on when this detail could be used. Tom Wilhite suggested showing where the entrance matches the existing alley grade on the detail. Bob Herz said the walkway could be underwater when there is rain runoff. Rod Ramos suggested deleting the detectable warning strips, saying they are not typically used for driveways or alley entrances unless there is a lot of free-flowing traffic. He noted that they can also be broken by garbage trucks. Tom Wilhite recommended changing the width from 6' to 5' to be consistent with other sidewalk details. Bob Herz recommended changing the title to Alley Entrance and using the same number as the old detail it is replacing. (Note: was Detail 260.)

Mr. White also provided a directional sidewalk ramp detail for review as a possible future dual ramp case. Javier Setovich said Peoria has been installing dual ramps and would work with Mr. White on this issue. Bob Herz suggested transitioning from 6" curb to 4" curb which would allow for smaller ramps. He also noted that the triangular area near the detectable warning needs to be level, and can collect debris. Rod Ramos asked if the detectable warning had to be directional. Peter Kandariz suggested it be worked on by the concrete working group, since that group currently is working on the related Section 340.

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

Add language to include a work plan for uncured slurry protection. Jami Erikson introduced a new case to add a work plan to Section 332.6 to prevent damage caused to the slurry seal by pedestrians, vehicles and other traffic. The revision would include the additional text, "A

work plan shall be submitted to the Engineer and the Owner providing uncured slurry protection details including the duration of protection, methods of protection and physical boundaries of the protective devices.” It was suggested to strike “and the Owner” since the engineer is the owner representative.

18. 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 introduced this case to help keep water lines fresh after testing, but before final acceptance. New language would require contractors to turn over water in the lines every 10 days and to maintain permits and flushing logs. Javier Setovich said Peoria has extended water lines several times including for some unfinished subdivisions. She also said looped systems that keep the water circulating are less of a problem. When asked what size lines are at issue, Ms. Erikson said 16”-24” size typically.

19. Case 12-09: ASTM Updates

A. *Update ASTM references to steel standards in Section 770.* Peter Kandarlis introduced this case to continue updating ASTM specifications that were not completed in the 2012 edition. He researched the type of structural steel used in the region and recommended modifying Section 770.2 to include ASTM A36 for general purpose structural steel and ASTM A709 or A992 for high strength low-alloy structural steel. The handout included typical steel specifications used by a local supplier.

20. Other New and Potential Cases

Jami Erikson began to introduce two additional cases, but decided to work on them further in the water/sewer working group meetings before formally presenting them to the committee. The first was to add a sentence to Section 610.4 Construction Methods that states, “Pipe installation shall be completed as to not impose undue stress/forces to couplings, connections, supports, valves and instruments. Syd Anderson asked what was meant by “undue stress.” Ms. Erikson said she would take it to the working group for revisions and clearer specifications.

The second potential case Ms. Erikson introduced was to add Section 750.5 Mortar Lining Repair for ductile iron pipe. Bob Herz asked about tapping sleeves. Jami Erikson said this specification was for cut-ins. Other comments included researching and referencing ASTM or AWWA specifications, rather than manufacturer’s instructions. Jami Erikson said she would review and revise the language at the working group before introducing it as a case.

Troy Tobiasson said Detail 251: Return Type Driveways needs to be updated to be consistent with the changes made in Details 250-1 and 250-2. This includes using class A instead of class B concrete, and updating the charts and thickness to comply with class A use. Jim Badowich suggested changing the radius. Currently it shows a 10’ maximum, but Avondale typically uses a 20’ radius for return type driveways, and many other agencies have larger

ones as well. Peter Kandarlis said he could bring this up at his working group meeting, and would compare existing supplements.

21. Working Group Reports

Chair Tobiasson asked for reports from the working groups.

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

Jim Badowich said the group met on March 20th. He summarized the group's discussions on the cadmium bolt case, and the suggestion to modify for MAG precast manhole base details and specifications developed by Buckeye. (See notes provided in agenda packet.) He also described a presentation given by ADS on HDPE pipe installation, and noted that their requirements do not precisely match the MAG tables. Mr. Kandarlis said that since the pipe is designed for a 5% deflection, the presenters said they would supply information on the actual deflection, which would affect design under streets and structures. Mr. Badowich said there may need to be a separate set of specifications for flexible pipe installation and testing. The next meeting is scheduled for Tuesday, April 17th at 1:30 p.m. at the MAG office.

b. **Specifications and Details Outside the Right-of-Way Working Group**

Peter Kandarlis said they met after the water/sewer group meeting where they discussed revisions to the cases previously. He discussed some potential new cases including modification of the bollard detail (240) to provide a lockable option. He said Mesa and the flood control district have examples. Tom Wilhite said the group wanted to investigate updating the liquidated damages table, and perhaps provide a cost index adjustment. Mr. Kandarlis also said he was reviewing sign post supplements, and hoped to provide the most common options with a standardized detail. Finally, there was discussion at the working group about how to handle fire line valve installation. Tempe has a detail, but this may be more appropriate in an Outside ROW manual than the MAG specs. The next meeting will follow the Water/Sewer group on April 17th; however, future meetings will likely be at a different time.

c. **Asphalt Working Group**

Jeff Benedict said the group worked on the cases previously described as described in the meeting notes included in the packet. He asked Syd Anderson on the status of revisions to Section 321. Mr. Anderson said they wanted to clarify what the compaction targets are. The next meeting is scheduled for April 26th at Noon at the ARPA office. Lunch will be provided.

d. **Materials Working Group**

Brian Gallimore was not in attendance, so no update was provided.

e. **Concrete Working Group**

Jeff Hearne was not in attendance; however, notes from the March 21st meeting were provided in the agenda packet. The next meeting will follow the April 26th asphalt working group at 1:30 p.m. at the ARPA office.

22. Open General Discussion

Jim Badowich asked if the low lead requirements case in the 2012 edition met the new standards and the phasing out of existing inventory. Jami Erikson said that it referenced the NSF requirements directly, so it should be fine as currently written.

There was a short discussion about unfinished subdivisions that have had waterlines put in, but were never completed. Jami Erikson said Phoenix is reviewing them, and if they add to their system they will take ownership. It depends on the system, because there has been much theft and damage. If the system is not completed, than future developers will have to reappear/replace it.

23. Adjournment:

Mr. Tobiasson adjourned the meeting at 4:00 p.m.

2012 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

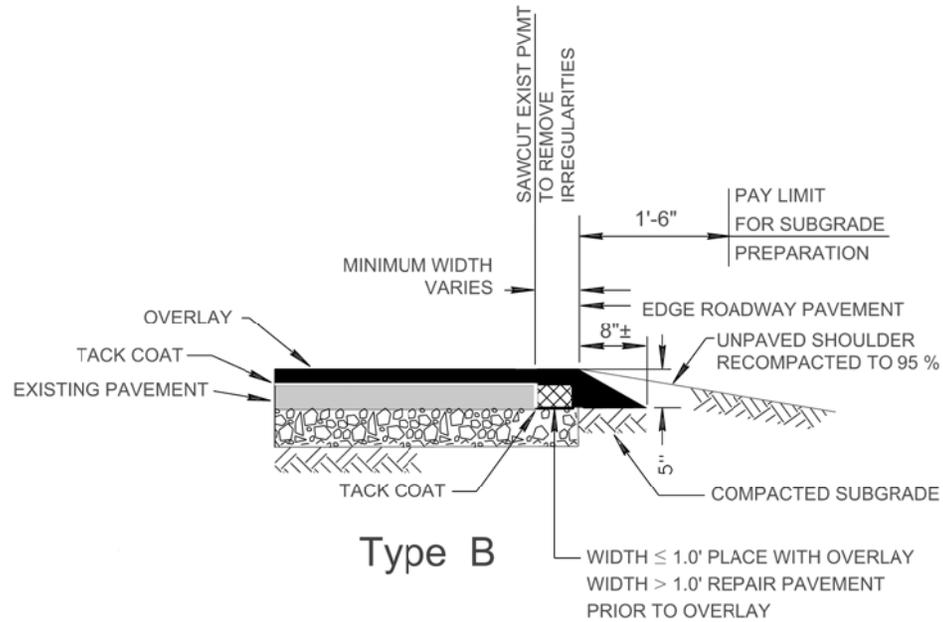
(Updated information can be found on the website: <http://www.azmag.gov/Committees/Committee.asp?CMSID=1055>)

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 04/04/2012		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	Paul Nebeker/ Javier Setovich	02/02/2011 07/13/2011		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 04/04/2012		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 01/04/2012		0 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 04/04/2012		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 02/23/2012		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		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	03/07/2012	12 0 0	Yes No Abstain

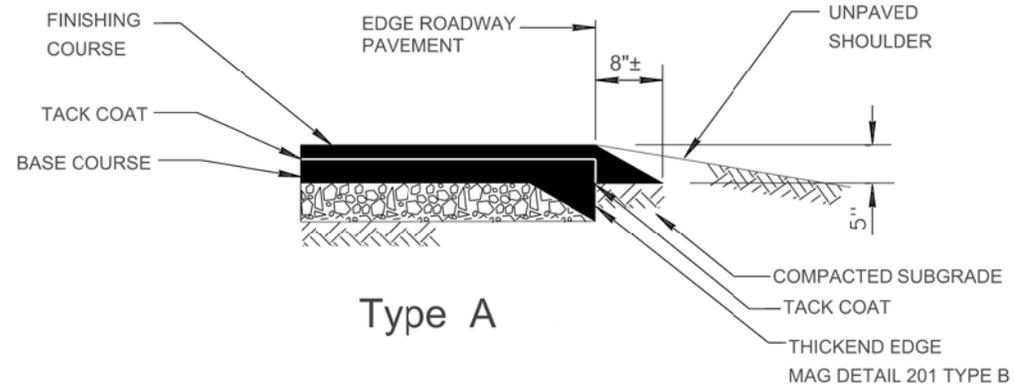
2012 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

(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	
	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		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	05/02/2012	0 0 0	Yes No Abstain
12-03	Case 12-03: Revisions to Details 260-2: Driveway Entrances	MCDOT	Bob Herz	02/01/2012 05/02/2012		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		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		0 0 0	Yes No Abstain
12-06	Case 12-06: New Detail: Modified ADA Compliant Alley Entrance	Chandler	Warren White	04/04/2012		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		0 0 0	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		0 0 0	Yes No Abstain
12-09	Case 12-09: ASTM Updates A. Section 770: Structural Steel	OROW WG/ SRP	Peter Kandararis	04/04/2012		0 0 0	Yes No Abstain



OVERLAY



NEW OR WIDENED PAVEMENT

ASPHALT PAVEMENT
SAFETY EDGE

DATE:
4/4/2012

DETAIL NO.
2001



P.O. Box 52025
Phoenix, AZ 85072-2025
(602) 236-5900

Case 11-12

DATE: March 4, 2012

TO: MAG Specifications and Details Committee Members

FROM: Peter Kandaris, SRP Representative
Outside of Right-of-Way Working Group

RE: **Modifications to Regulatory Requirements, MAG 107**

Purpose: Section 107.1 selects arbitrary state statutes to highlight and has not kept up with changes to state statute changes. Delete specific ARS references and keep the general requirements. This section is typically covered by agency T&C, but should be kept to act as a generic default.

Revisions: (1) Delete all paragraphs after the first in MAG 107.1. Modify the language to include materials. Simplify the indemnification language as there is a separate section for indemnification (Section 103.6.2). Provide language to allow the agency the option to request information verifying contractor compliance.

(2) Modify Subsection 107.2 to require the contractor to insure that permits are maintained and closed.

Note: Subsections 107.3 through 107.14 are not modified by this case.

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.~~

~~shall protect and indemnify~~ Because the Contractor will be acting as an independent contractor, the Contracting Agency and its representatives against any claim or liability arising from or based on the violation of such, whether by himself or his employees assumes no responsibility for the Contractor's acts.

~~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.

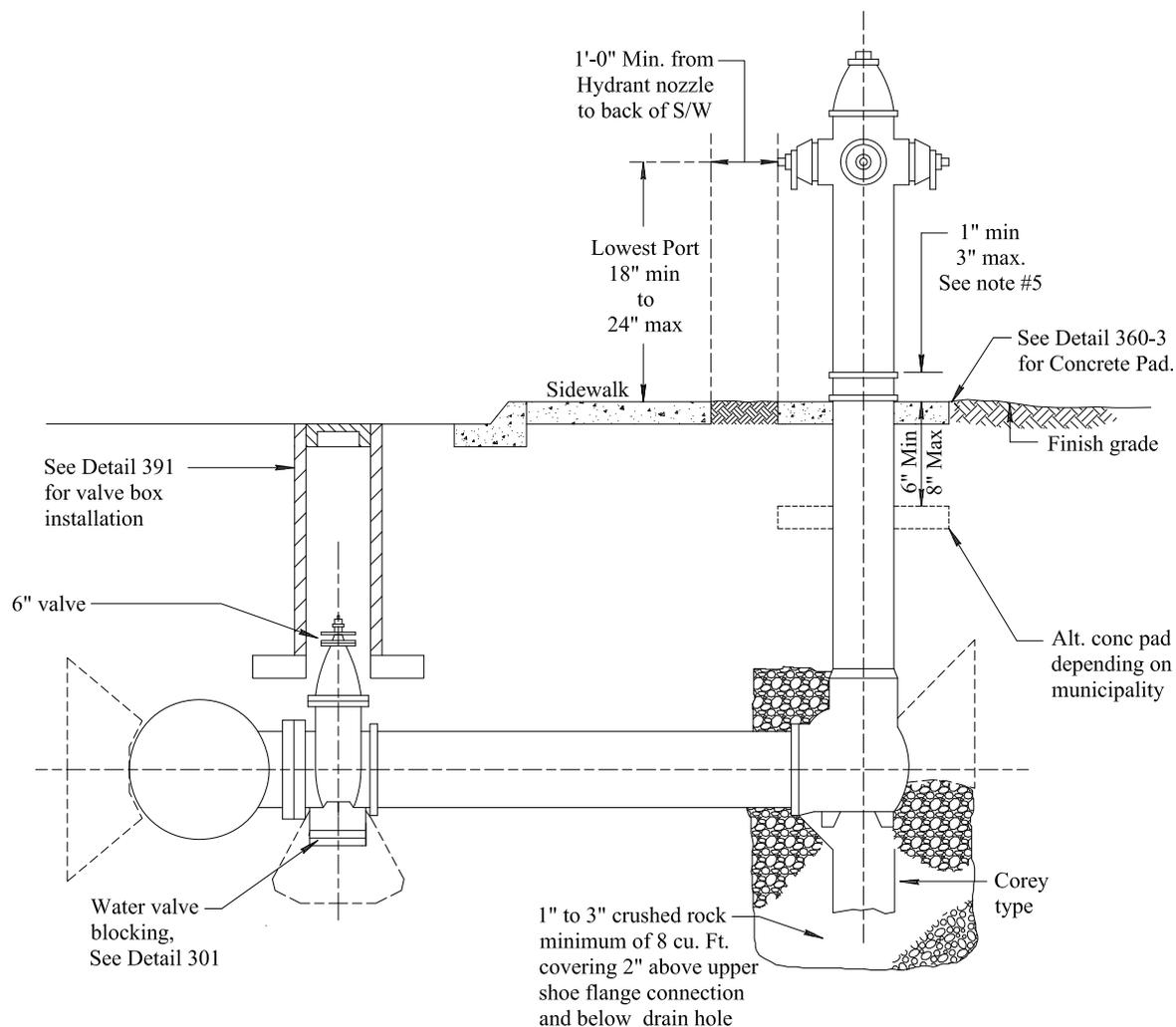
The Public Agency, when acting as the Contracting Agency, will attempt to obtain the required permits, but it is the duty of the Contractor to determine that all necessary permits have been obtained, maintained and closed. The Contractor shall, at his own expense, obtain all the required permits which have not been furnished.

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.

General Notes:

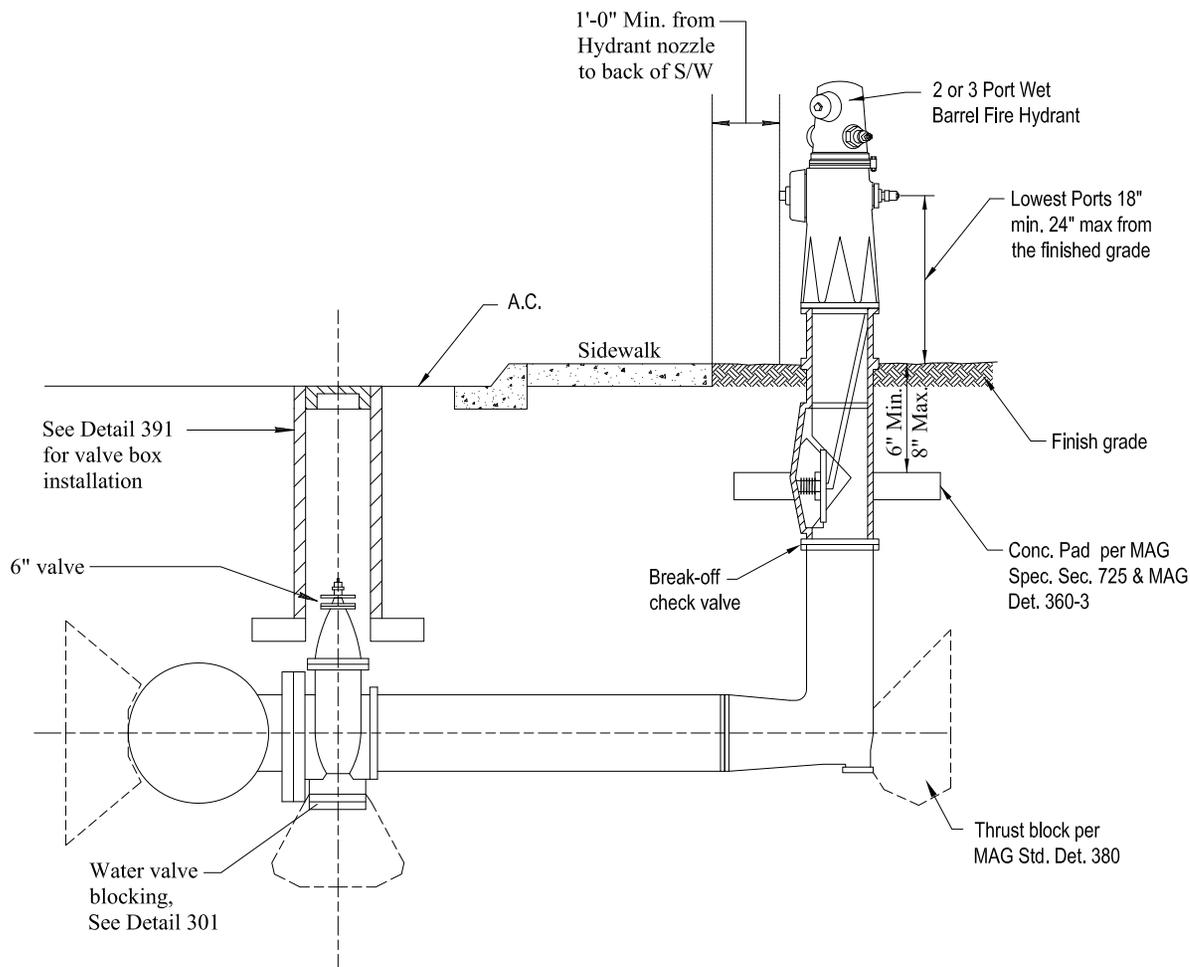
1. Joints between the valve and the main shall be flanged type.
Joints between the valve and hydrant shall be restraint or mechanical type.
2. Restraints shall be mechanical restraint or thrust block per MAG Std Dtl 380.
3. A flange joint by mechanical joint valve shall be used as the transition between 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 in curb.
8. National standard threads required on all connections unless otherwise directed.
9. 1/2" bituminous expansion shall be placed around the barrel of the Fire Hydrant.
10. See Detail 360-3 for Concrete Pad.
11. Fire Hydrant shall be freshly painted prior to final.
12. See MAG Std. Spec. 756 for hydrant Material.



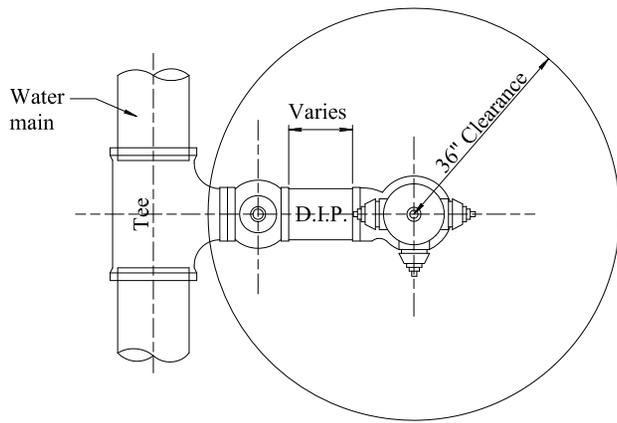
DETAIL NO. 360-1	 STANDARD DETAIL ENGLISH	DRY BARREL FIRE HYDRANT INSTALLATION	REVISED 04-27-2011	DETAIL NO. 360-1
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General Notes:

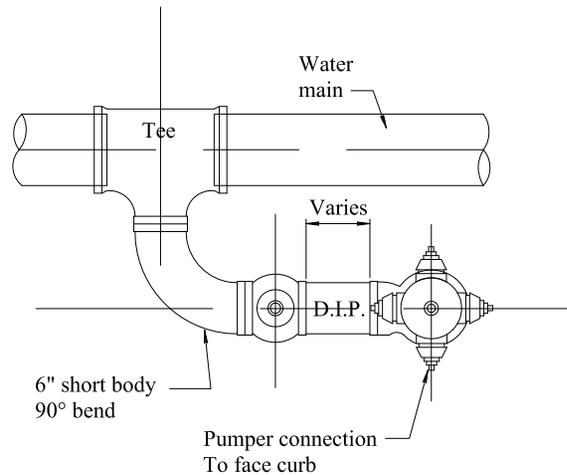
1. Joints between the valve and the main shall be flanged type. Joints between the valve and hydrant shall be mechanical restraint mechanical type.
2. Restraints shall be mechanical restraint or thrust block per MAG Std. Det. 380.
3. A flange joint by mechanical joint valve shall be used as the transition 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 in curb.
8. National standard threads required on all connections unless otherwise directed.
9. 1/2" bituminous expansion shall be placed around the barrel of the Fire Hydrant.
10. See Detail 360-3 for Concrete Pad.
11. Fire Hydrant shall be freshly painted prior to final.
12. The hydrant shall have 2- 2½" port and 1- 4½" port (industrial or commercial).
13. The hydrant shall have 1- 2½" port and 1- 4½" port (residential).



DETAIL NO. 360-2	 STANDARD DETAIL ENGLISH	WET BARREL FIRE HYDRANT INSTALLATION	REVISED 04-27-2011	DETAIL NO. 360-2
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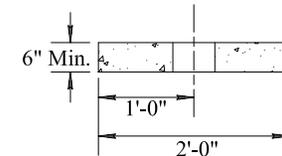
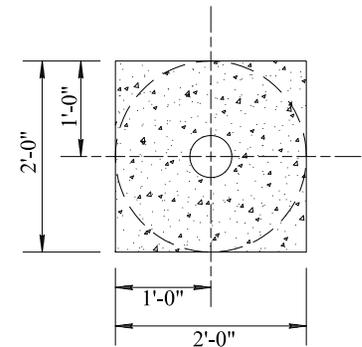


**TYP MAIN CONNECTION
(PREFERRED)**

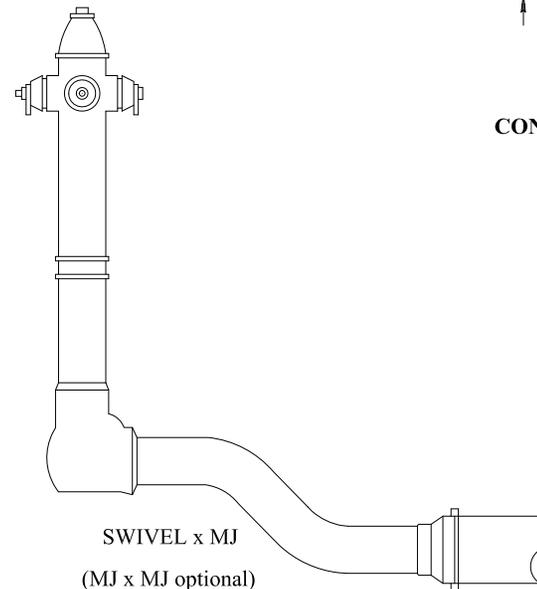


ALT MAIN CONNECTION

Square or round is acceptable
If Round: 24" diameter min. required



CONCRETE PAD DETAIL



General Notes:

1. Concrete for pad shall be Class "A".
2. Score line shall bisect this 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. Offset fittings shall not be installed under pavement.
6. Minimum clearance per NFPA-24.



P.O. Box 52025
Phoenix, AZ 85072-2025
(602) 236-5900

Case 11-16

DATE: February 23, 2012

TO: MAG Specifications and Details Committee Members

FROM: Peter Kandarlis, SRP Representative
Outside of Right-of-Way Working Group

RE: **Section 415: Steel Flexible Metal Guardrail**

Purpose: The existing MAG guardrail standard (Section 415) is outdated and generally not followed by MAG agencies.

Revisions: Adopt MCDOT supplemental Section 415 in whole as a replacement section.

Work still needed: The MCDOT standard references an end buffer detail deleted from last year's MAG. It is recommended that the need for temporary end buffers reference the MUTCD for approach protection (sand or water filled drums).

Note: The revisions include standard modern guardrail materials and construction, but exclude oncoming traffic terminal end options as these seem to be where the most variety exists between agencies.

SECTION 415

FLEXIBLE METAL GUARDRAIL

415.1 DESCRIPTION:

~~This~~ The work under this section shall consist of furnishing all materials, constructing metal beam ~~new~~ guard-railing, and delineating guardrail sections at the locations and in accordance with the details shown on the plans, and as specified in the special provisions 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.

415.2 MATERIALS ~~AND CONSTRUCTION~~:

~~Materials and construction for the railings shall conform to the following requirements:~~

The rail elements, ~~terminal sections~~, bolts, nuts and other fittings shall conform to the specifications of AASHTO M-180, except as modified in this specification. ~~The edges and center of the rail element shall contact each post or block. Rail element joints shall be lapped not less than 12 1/2 inches and bolted.~~ The rail metal shall be open hearth, electric furnace, or basic oxygen steel and, in addition to conforming 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.

~~The ends of each length of railing shall be fitted with terminal sections.~~

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

All material shall be new.

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 shape 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, and have a trapezoidal-shaped body as shown in the Reflector Tab Detail of Maricopa County Department of Transportation Standard Detail 3002.

~~Posts, including blocks, shall be construction grade, Douglas Fir, free of heart center.~~

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:

<u>6" by 8" Post and Block</u>	<u>1200 psi</u>
<u>8" by 8" Post and Block</u>	<u>900 psi</u>

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 8 1/4" 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 1/2" 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.

~~The posts and blocks~~All timber shall be pressure treated have a preservative treatment after fabrication with oil borne pentachlorophenol, or coppernaphthenate, as provided in the requirements of Section 779.

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 by the Engineer. All materials shall be new except as provided for under the project plans.

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 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. ~~The All~~ metal work shall be fabricated in the shop, ~~and no~~ No punching, cutting or welding ~~will be permitted~~ 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 1/2" beyond the nut.

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

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

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 Rail elements shall be lapped so that the exposed ends toward oncoming will not face approaching traffic. shall have a buffer end section (MAG Standard Detail 135-4, Detail No. 5 Buffer End Section) bolted securely in place together with approved overnight traffic control devices 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 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 1/2" 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. The rail element shall have full bearing at joints. When the radius of curvature is 150 feet or less, the rail elements shall be shaped in the shop curved.

Posts shall be placed at equal intervals, as shown on the plans, except that the end posts may be spaced closer to adjacent posts if directed by the Engineer.

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

Railing parts furnished under these specifications shall be interchangeable with similar parts regardless of source.

415.3.4 Bolted Guardrail Anchors: Where the elevation of the top surface of a 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 Details 3010-1 and 3010-2 at the locations shown on the plans.

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 shown on the project plans, 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 plans. 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, and guardrail transitions and anchor assemblies.

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

The accepted quantities of bolted guardrail anchors, will be measured by the unit each, 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.

Nested guardrail, Type 1, 2, or 3, installed as an appurtenance to new guardrail, shall be measured by the linear foot of additional steel W-beam, installed using guardrail hardware, complete in place and accepted, as shown on the plans.

Guardrail transitions will be measured by the unit each, complete and accepted as shown on the project 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.

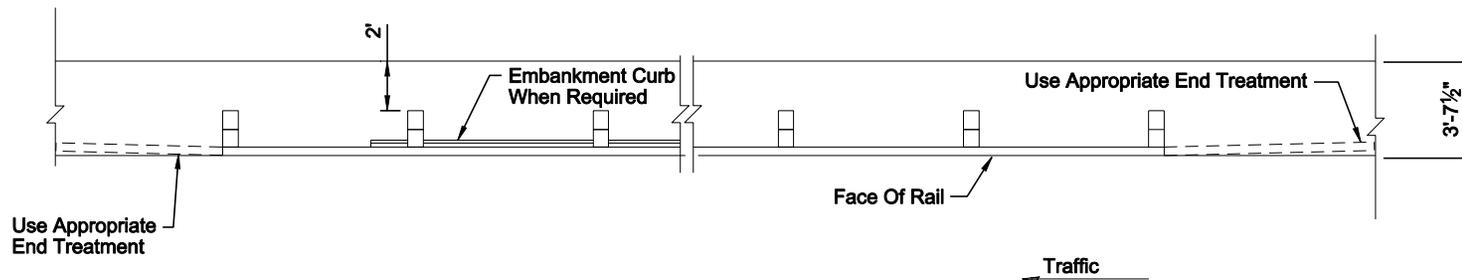
Payment for Bolted Guardrail Anchors will be at the contract unit price, and shall be full compensation for the work, complete in place, including steel brackets, hardware, excavation, backfill, removing and replacing surfacing, cutting and fitting steel beam posts or timber posts, drilling anchor bolt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

Payment for Additional Steel W-beam will be at the contract unit price.

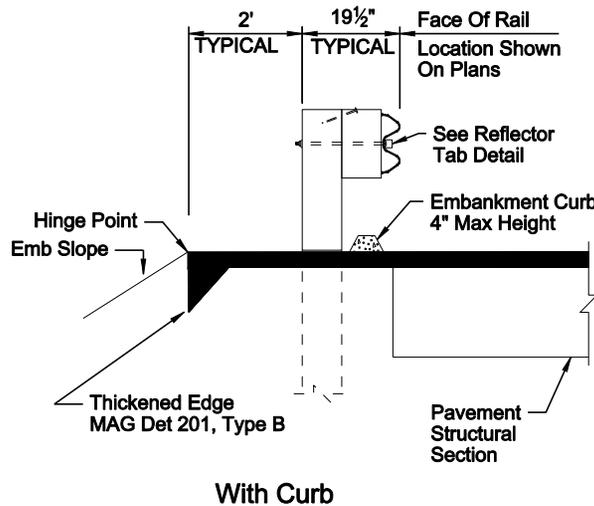
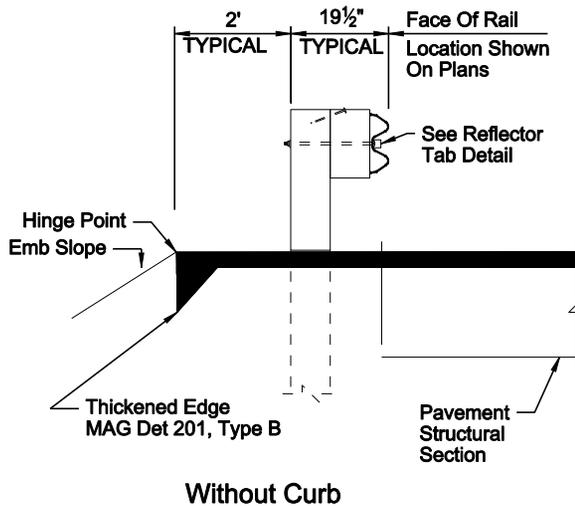
Payment for guardrail transitions will be at the contract unit price.

415.3 PAINTING:

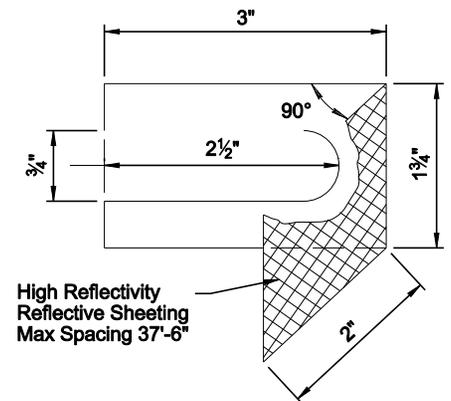
~~All metal surfaces of the guard rails shall have a zinc chromate prime coat and two coats of white enamel. The exposed portions of the wood posts shall have a wood primer and two coats of finish paint. Materials and application shall be as specified in Sections 790 and 530. Colors shall be as directed by the Engineer.~~



PLAN



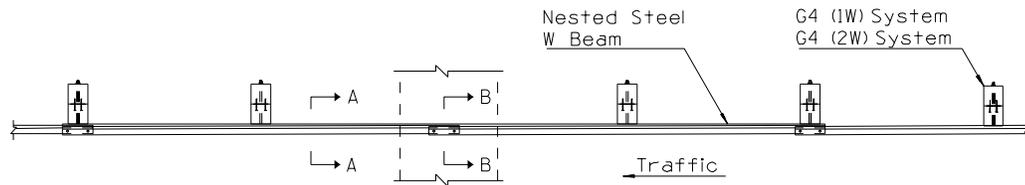
SECTION



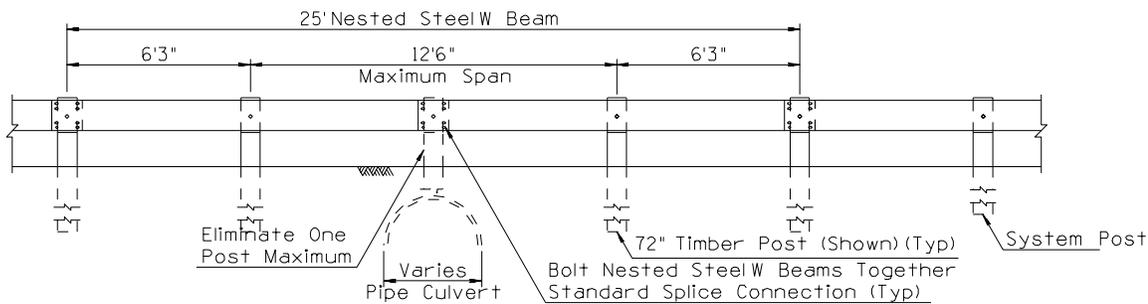
REFLECTOR TAB DETAIL

GENERAL NOTES

1. All Embankment Curb Shall Be Protected By Guard Rail.
2. Guard Rail Shall Extend Beyond The Limits Of Embankment Curb.
3. See Std. 3016 For Measurement Limits.
4. Asphalt Pavement Behind Face Of Rail Shall Be ≥ 2 Inches in Thickness



PLAN

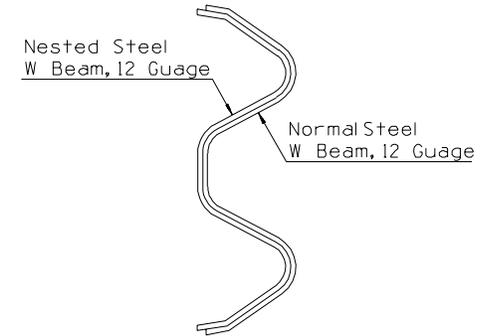


NESTED STEEL W BEAM - TYPE 1 - SHORT SPAN
(Splice Connection Inside Span) Length = 25'

ELEVATION

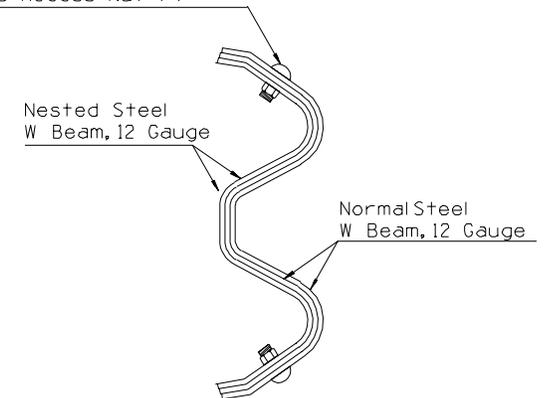
GENERAL NOTES

- - Indicates ARTBA designation.



SECTION A-A

Bolt Nested Steel W Beam Together
5/8"-11UNC x 1/4" Button Head Bolt (●)
and Recess Nut (●)



SECTION B-B

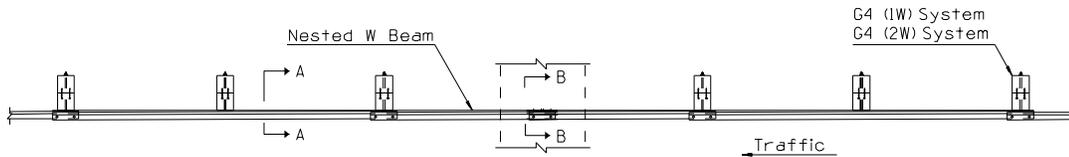
Base Drawing Courtesy of ADOT 2/25/00

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
STANDARD DETAIL

NESTED GUARDRAIL
TYPE 1

DATE:
5/02/01

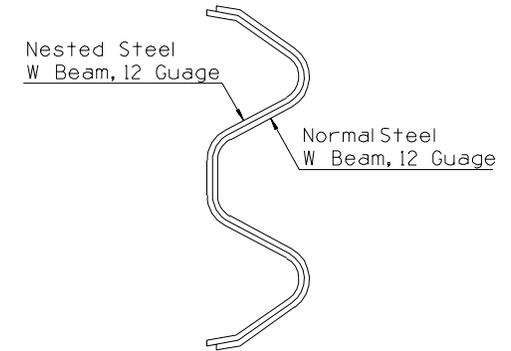
DETAIL NO.
3008-1



PLAN

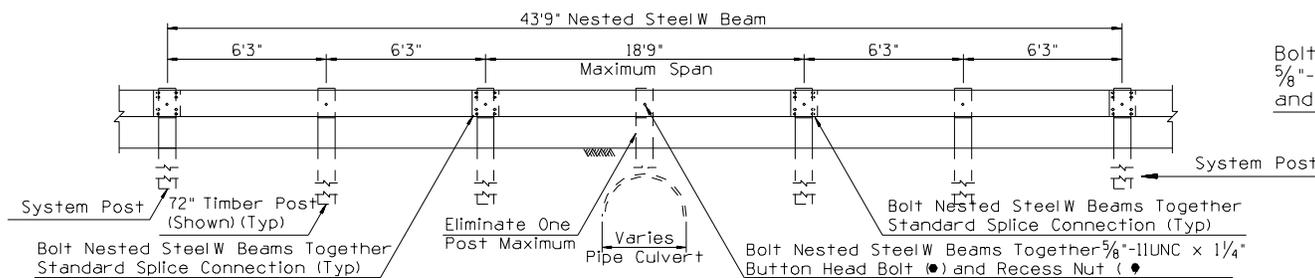
GENERAL NOTES

1. ● - Indicates ARTBA designation.



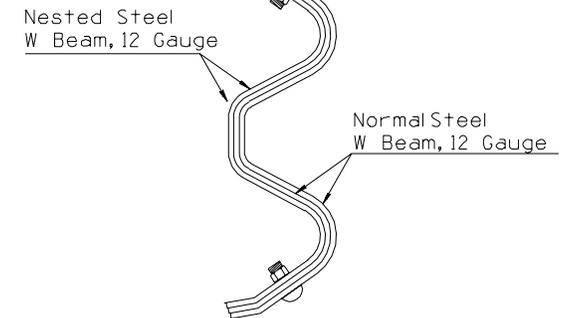
SECTION A-A

Bolt Nested Steel W Beam Together
5/8"-11UNC x 1/4" Button Head Bolt (●)
and Recess Nut (●)



NESTED STEEL W BEAM - TYPE 2 - LONG SPAN
(Splice Connection Outside Span) Length = 43'9"

ELEVATION



SECTION B-B

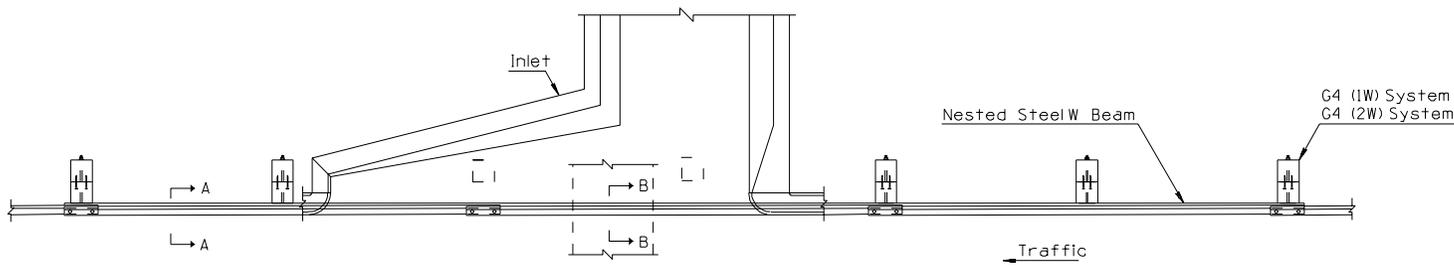
Base Drawing Courtesy of ADOT 2/25/00

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
STANDARD DETAIL

NESTED GUARDRAIL
TYPE 2

DATE:
6/27/01

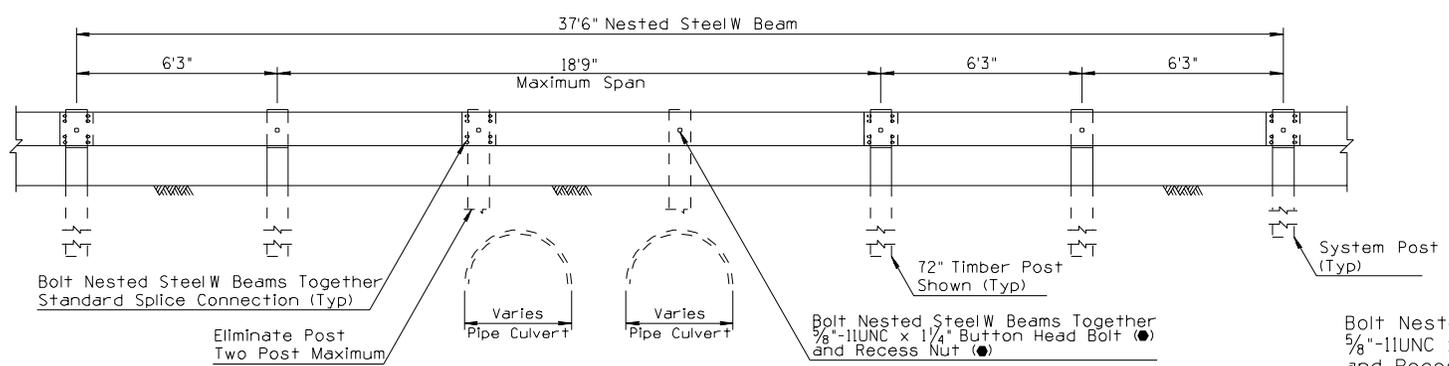
DETAIL NO.
3008-2



GENERAL NOTES

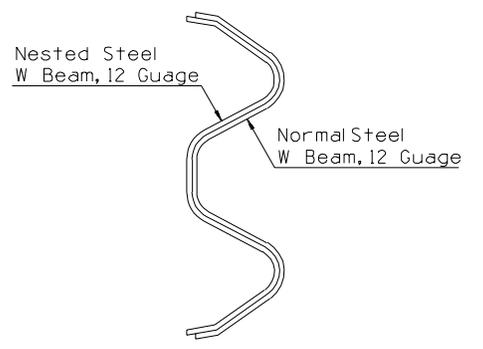
1. Use Type 3 Nested Steel W Beam to span downdrain or spillway inlets as shown in the plan view.
2. Use Type 3 to span multiple obstructions as shown in the elevation view.
3. See Std 3008-1 for additional information and dimensions

PLAN



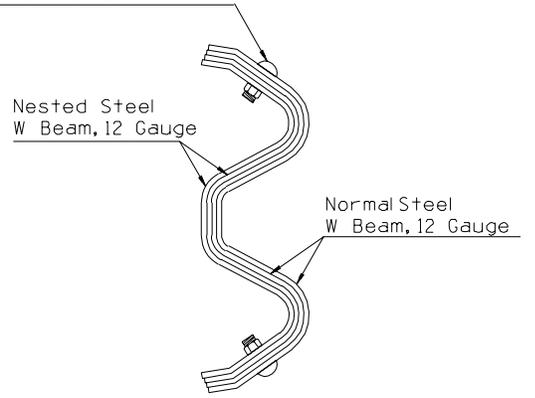
NESTED STEEL W BEAM - TYPE 3 - LONG SPAN
Length = 37'6"

ELEVATION



SECTION A-A

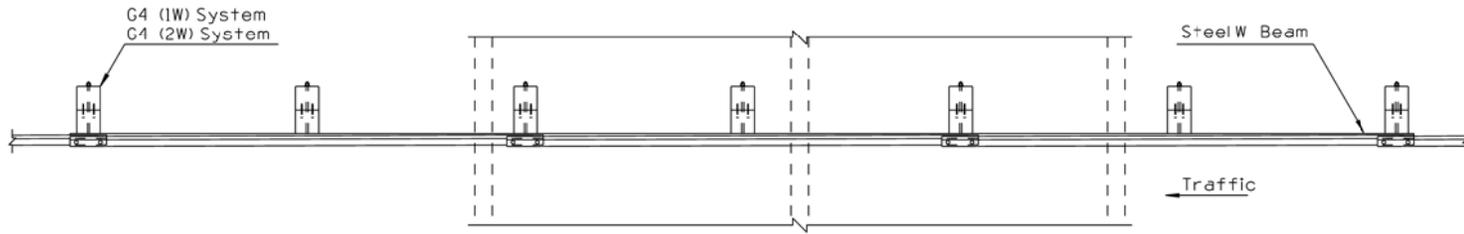
Bolt Nested Steel W Beam Together
5/8"-11UNC x 1/4" Button Head Bolt (●)
and Recess Nut (●)



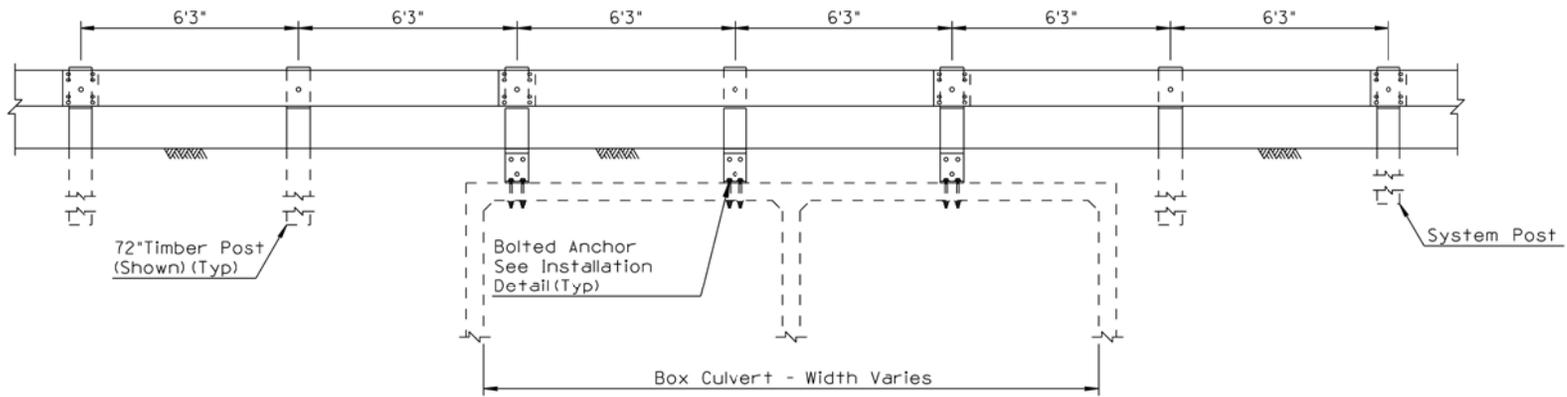
SECTION B-B

Base Drawing Courtesy of ADOT 2/25/00

<p>MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION STANDARD DETAIL</p>	<p>NESTED GUARDRAIL TYPE 3</p>	<p>DATE: 5/01/01</p>	<p>DETAIL NO. 3008-3</p>
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PLAN



ELEVATION

BOLTED ANCHOR
BOX CULVERT INSTALLATION

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
STANDARD DETAIL

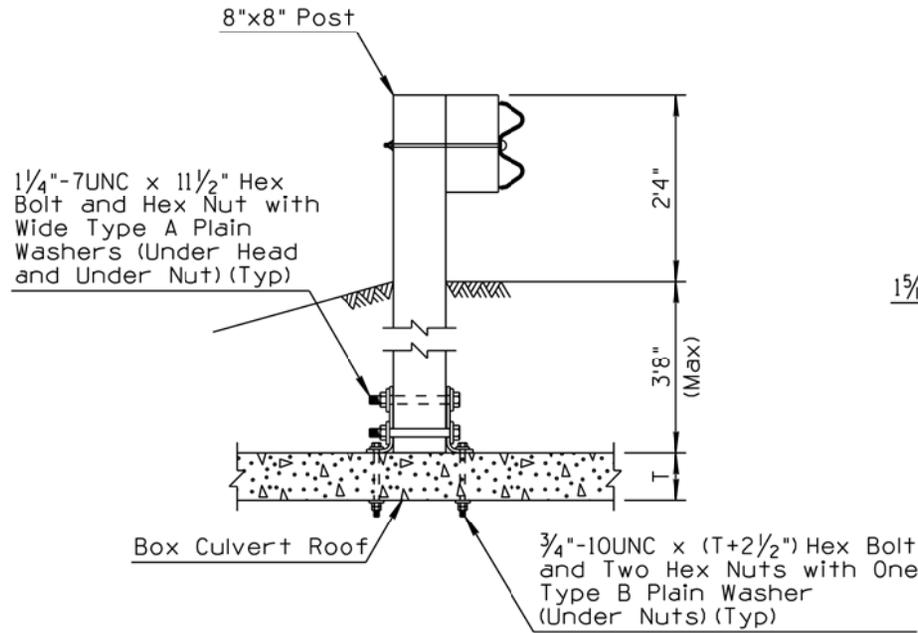
**BOLTED GUARDRAIL
ANCHORS**

DATE:
11/19/09

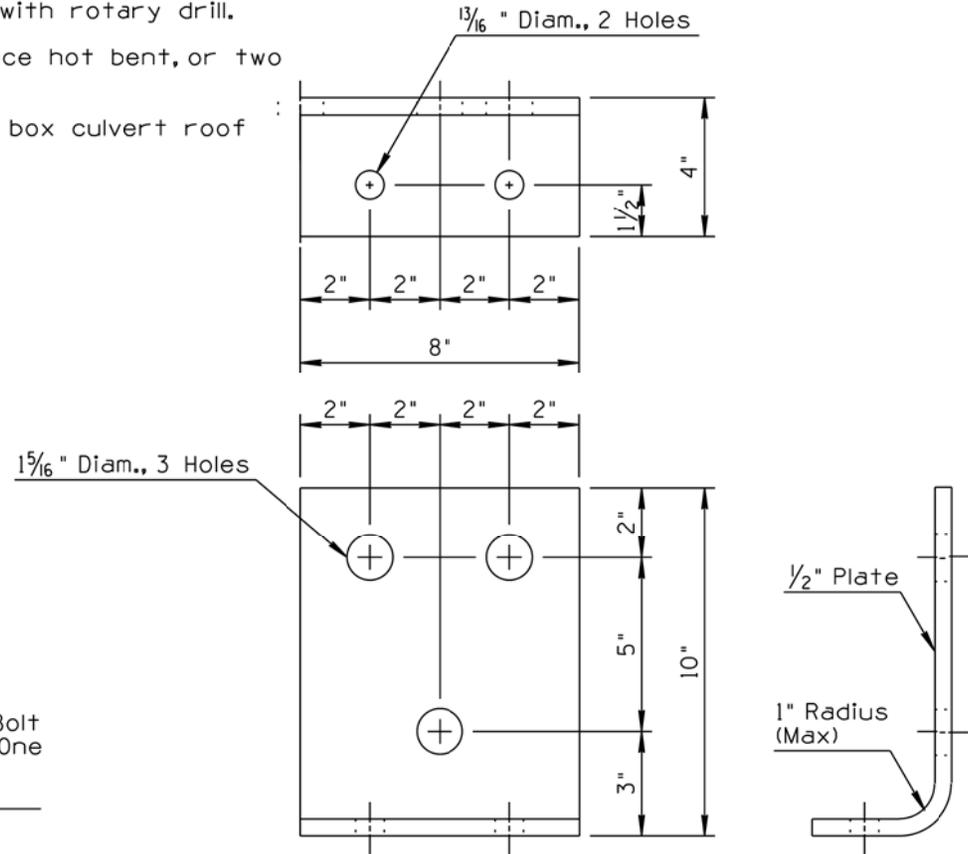
DETAIL NO.
3010-1

GENERAL NOTES

1. Drill through top of box culvert with rotary drill.
2. Bracket may be made of one piece hot bent, or two pieces welded together.
3. Short timber posts anchored to box culvert roof shall be 8" x 8" only.

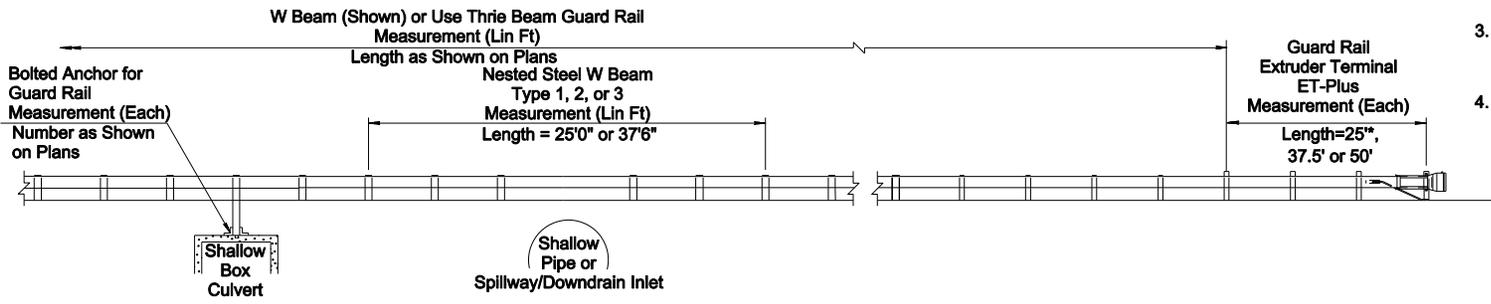


INSTALLATION DETAIL



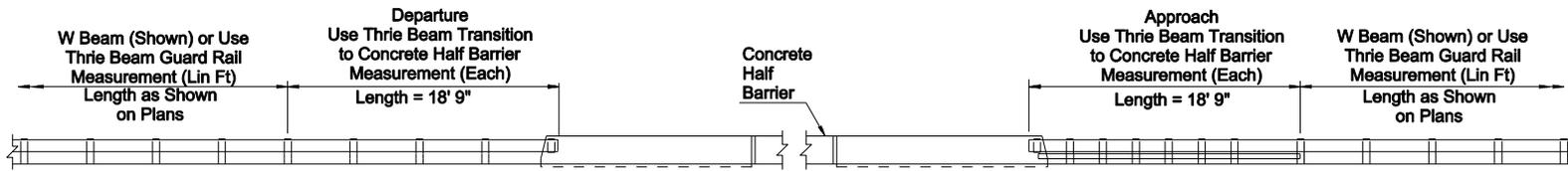
BRACKET DETAIL

BOLTED ANCHOR TIMBER POST INSTALLATION DETAIL

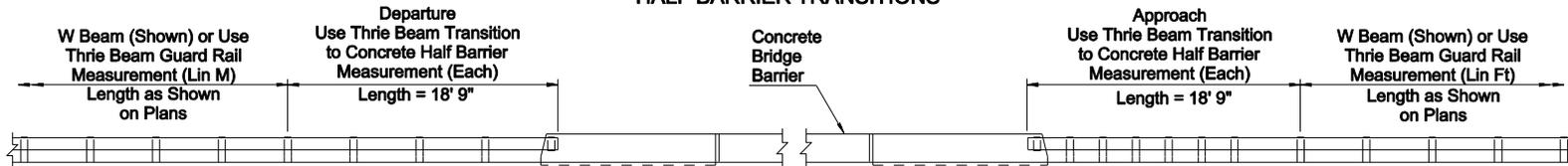


GENERAL NOTES

1. Length shall be as shown unless otherwise indicated on project plans.
2. Post type for transitions shall match post type of adjoining guardrail.
3. Guardrail Extruder Terminals may be shortened to 37' 5" as approved by the Engineer.
4. * 25' Length can be used for design speed @ or below 45 mph and as per manufacturer's recommendations for TL2 and as approved by the engineer.



HALF BARRIER TRANSITIONS



BRIDGE BARRIER TRANSITIONS

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

DATE: March 8, 2012

TO: MAG Specifications and Details Committee Members

FROM: Jeff Benedict, Valero; AGC/ARPA Advisory Member
Asphalt Working Group

RE: **MAG 710: Asphalt Concrete Revisions**

Purpose: MAG 710 needs to be updated to include a provision for utilization of gyratory asphalt mixes in low traffic (residential) situations. 2008 and previous versions of MAG 710 had this provision included but it was not incorporated in the 2009 version or thereafter. Low traffic gyratory mix designs will be prepared using specimens compacted to 160 gyrations, N_{max} for high volume traffic situations, and mathematically back-calculated to determine the relative density for a reduced number of Gyrations. This procedure is currently used by the City of Glendale for their low volume traffic asphalt concrete.

Additionally, the test procedure for Tensile Strength Ratio (TSR) testing should be changed from AASHTO T 283 to ASTM D 4867. The AASHTO procedure was modified in 2007 and included significant changes. In the previous version there was an optional freeze/thaw cycle that is now mandated in the current version. This requires MAG 710 to include language that the freeze/thaw cycle be skipped. The ASTM procedure does not include the freeze/thaw cycle so the additional language would not be necessary and the procedure could be performed as written. The AASHTO version also now includes 2 different curing/aging steps that add 2 days to the duration of the test. ASTM D 4867 is a much simpler, cleaner and quicker version of the same test. Instead of four days, the testing could be completed in two. ASTM also includes language for sample preparation when dry admix (lime or cement) is added to moist aggregates (wet treating), as is the case on most of the hot plants in the valley. Wet treating is also the local industry standard for performing lab mixed TSR's for hot plants with pugmills. There is nothing in AASHTO that mandates or even allows for wet treating the aggregates. The ASTM specimen air void range is 6.0% to 8.0% with initial saturation between 55% and 80%, instead of air voids between 6.5% and 7.5% and initial saturation of 70% and 80% for AASHTO T 283. That can make a huge difference in reducing the trial and error time trying to achieve the tighter requirements of AASHTO T 283. This will relieve some of the burden from the laboratory performing the test while still allowing for a well-documented method for determining the potential for moisture sensitivity of an asphalt mixture.

- Revisions:
- a) Language was added to Section 710.3.1(5) stating that either gyratory or Marshall mix design method may be used for both high and low traffic conditions.
 - b) The reference to AASHTO T 283 was changed to ASTM D 4867 in Section 710.3.1(6).
 - c) The test procedure for Tensile Strength Ratio and Dry Tensile Strength in Tables 710-3 and 710-4 was changed from AASHTO T 283 to ASTM D 4867. A small formatting change was made to the bottom of Table 710-4 to evenly distribute the column spacing.
 - d) Language was added in Section 710.3.2.2 to describe how the specimens are to be compacted and then volumetrics for other gyration levels calculated.
 - e) The test procedure for moisture sensitivity testing in Section 710.3.2.3 was changed from AASHTO T 283 to ASTM D 4867. The comment regarding the freeze/thaw cycle was removed since ASTM D 4867 does not include a freeze/thaw cycle.

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, 1/2 inch, 3/4 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 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
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. Should 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 ₄ 791	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 Gyrotory mixes by weight of the total aggregate for a mix.

710.2.3 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 mix design report, whether Gyratory or Marshall, shall state the traffic condition (low or high traffic) and size designation. ~~In all cases Gyratory based mix designs shall be designated as high traffic mixes. Marshall based mix design shall be designated either low or high traffic mixes.~~
- (6) 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~~ASTM D 4867), 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) The laboratory mixing and compaction temperature ranges for the supplier and grade of asphalt binder used within the mix design.
- (8) 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) 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 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 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
	3/8" Mix	1/2" Mix	3/4" Mix	Base Mix	Method
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	AASHTO T-283 ASTM D 4867
6. Dry Tensile Strength: psi, Min.	100	100	100	100	AASHTO T-283 ASTM D 4867
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
	Percent Passing with Admix				
Sieve Size	3/8 inch Mix	1/2 inch 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	
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.

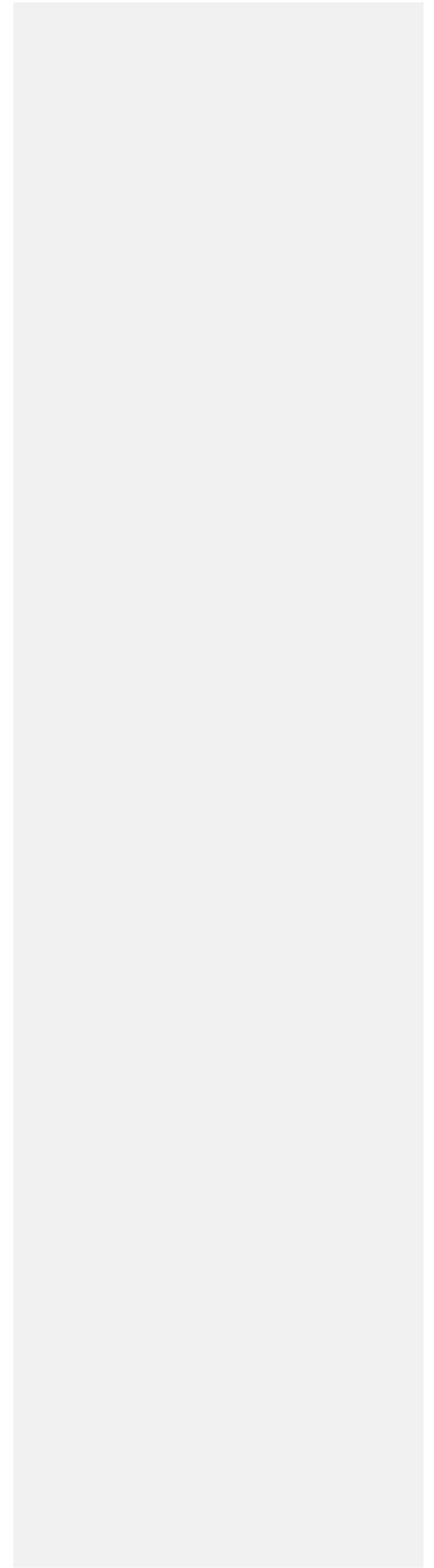
** The ratio of the mix design composite gradation target for the No. 200 sieve, including admixture, to the effective asphalt content shall be within the indicated range.

710.3.2.2 Gyrotory Mix Design: Gyrotory 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 gyrotory 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 gyrotory samples shall be prepared at a minimum of four (4) binder contents to select the recommended binder content. [The gyrotory specimens shall be compacted to 160 gyrations. Volumetric data for the design number of gyrations.](#)

SECTION 710

N_{des} , and the initial number of gyrations, N_{inj} , 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 completed mix design shall meet all the mineral aggregate and mix design criteria specified herein.



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For purposes of design, the number of gyrations shall be 8 for N_{ini} , 100 for N_{des} , and 160 for N_{max} . The corrected density of the specimens shall be less than 89.0 percent of maximum theoretical density at 8 gyrations N_{ini} . The corrected density of the specimens shall be less than 98.0 percent of maximum theoretical density at 160 gyrations N_{max} . The Gyratory mix shall comply with the criteria in Table 710-4.

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	1/2" 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	AASHTO T-283 ASTM D 4867
6. Dry Tensile Strength: psi, Min.	75	75	75	AASHTO T-283 ASTM D 4867
7. Mineral Aggregate Grading Limits				AASHTO T-27
Percent Passing with Admix				
Sieve Size	3/8 inch Mix	1/2 inch Mix	3/4 inch Mix	
1 inch			100	
3/4 inch		100	90-100	
1/2 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 [AASHTO-ASTM Test Method T283D 4867](#) 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.

Comment [DL1]: If the ASTM procedure is adopted, there is no freeze/thaw cycle to omit.

- End of Section -

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, 1/2 inch, 3/4 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 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
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. Should 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 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 mix design report, whether Gyratory or Marshall, shall state the traffic condition (low or high traffic) and size designation.
- (6) 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 (ASTM D 4867), 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) The laboratory mixing and compaction temperature ranges for the supplier and grade of asphalt binder used within the mix design.
- (8) 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) 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 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 the compactive effort of 75 blows per side of specimen. The mix shall comply with the criteria in Table [710-3](#).

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TABLE 710-3					
MARSHALL MIX DESIGN CRITERIA					
Criteria	Requirements				Designated Test
	3/8" Mix	1/2" Mix	3/4" Mix	Base Mix	Method
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 D 4867
6. Dry Tensile Strength: psi, Min.	100	100	100	100	ASTM D 4867
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	
Percent Passing with Admix					
Sieve Size	3/8 inch Mix	1/2 inch 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	
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

SECTION 710

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	1/2" 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 D 4867
6. Dry Tensile Strength: psi, Min.	75	75	75	ASTM D 4867
7. Mineral Aggregate Grading Limits				AASHTO T-27
	Percent Passing with Admix			
Sieve Size	3/8 inch Mix	1/2 inch Mix	3/4 inch Mix	
1 inch			100	
3/4 inch		100	90-100	
1/2 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.

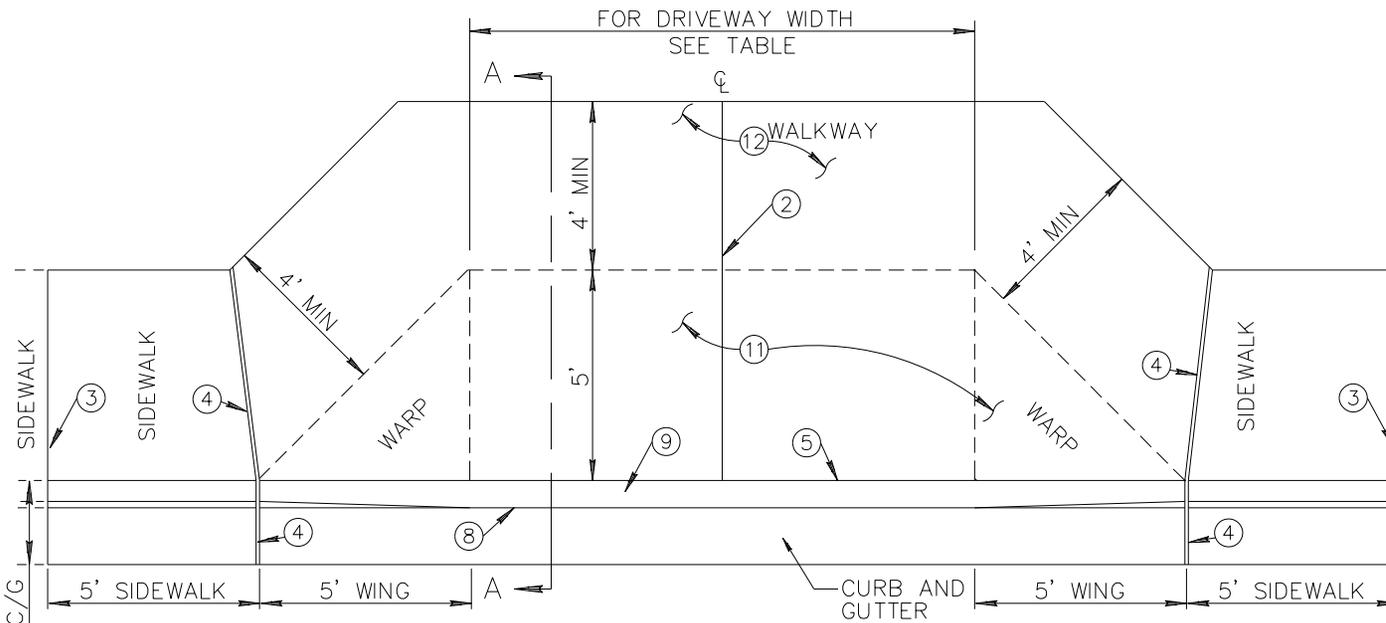
** The ratio of the mix design composite gradation target for the No. 200 sieve, including admixture, to the effective asphalt content shall be within the indicated range.

710.3.2.3 Moisture Sensitivity Testing: Moisture sensitivity testing will be performed in accordance with ASTM D 4867 for both Marshall and Gyratory mix designs. The minimum required Tensile Strength Ratio is indicated in the tables above.

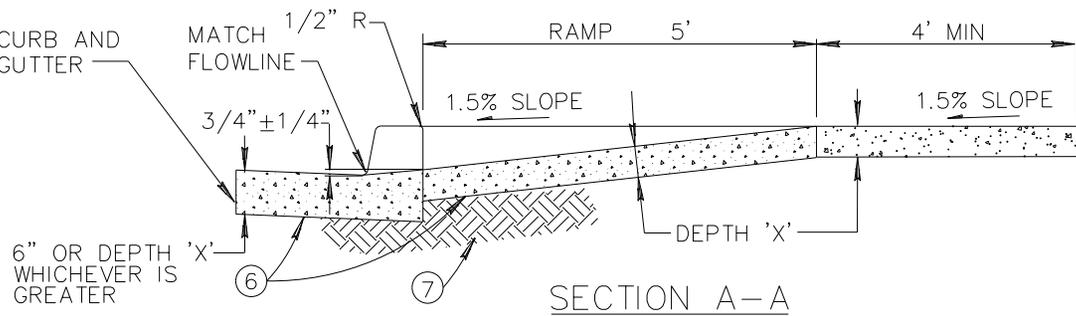
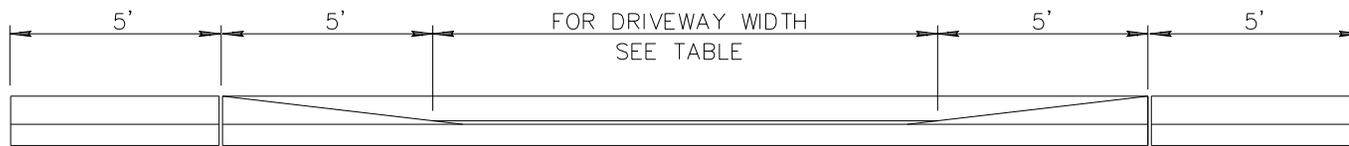
- End of Section -

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 ON D/W CENTERLINE.
3. CONTRACTION JOINT.
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.



DRIVEWAY WITH SIDEWALK ATTACHED TO CURB



SECTION A-A

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

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 MAG 329 shall 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 as prescribed by the Engineer, typically being half of the total required tack coating application rate. The other half of the required tack coating will typically be applied immediately prior to overlay. No additional payment for the dust control tack coating application shall be made and the operation shall be considered incidental to the tack coat pay item as long as the overall required tons of applied tack coat for the project does not increase because of the prescribed dust control application rate.

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.

- End of Section -

Case 12-05

Modifications to MAG 711-1 table

We still showed a typo in the math nomenclature on the original binder section. I have added PG64-16 that is used extensively as a both regular binder and asphalt base for asphalt rubber. I deleted the PG82 grade. This has never been used and is not recommended for use.

The PG76-16 is included because ADOT uses it in desert climates. This product is not expected to be used regularly. It is expensive and is usually a special order product. I have changed all of the AASHTO tests to ASTM this also eliminates the temporary test methods that were indicated before.

I have also taken the direct tension test out. The test is still used for modified asphalts but the standard Bending Beam Rheometer is used to determine low temperature qualities in neat paving asphalt. The direct tension can be specified for modified asphalt tests.

PAVING ASPHALT

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711.1 GENERAL:

The asphalt shall be produced from crude asphalt petroleum or a mixture of refined liquid asphalt and refined solid asphalt. It shall be free from ad-mixture with any residues obtained by the artificial distillation of coal, coal tar, or paraffin oil and shall be homogeneous and free from water.

Asphalt shall not be heated during the process of its manufacture, storage, or during construction so as to cause injury as evidence by the formation of carbonized particles.

711.2 TESTING REQUIREMENTS:

Paving asphalt shall be classified by the Performance Grading System and shall conform to the requirements set forth in Table 711-1 and ~~AASHTO M-320~~ ASTM D6376 with the PAV temperature changes noted herein this table.

TABLE 711-1				
PERFORMANCE GRADING SYSTEM				
	PG 58-22	1064-16 PG 70-10	1070-10 PG 76-10	1076-16 PG 82-16
Original Asphalt				
Viscosity, ASTM D4402 (Note 1) Max. 3 Pa-s, Test Temp, °C	135	135	135	135
Dynamic Shear TP5 <u>ASTM D7175</u> (Note 2) G*/Sin δ, Min., 1.0 kPa Test Temp. @ 10 rad/s, °C	58	7064	7670	8276
Rolling Thin Film Oven Residue (AASHTO T-240 <u>ASTM D2872</u>)				
Mass Loss, Maximum % Dynamic Shear TP5 <u>ASTM D7175</u> G*/Sin δ, Min., 2.20 kPa Test Temp. @ 10 rad/s, °C	1.0 58	1.0 7064	1.0 7670	1.0 8276
Pressure Aging Vessel Residue (AASHTO R-28 <u>ASTM D6521</u>)				
PAV Aging Temperature, °C	100	100	110	110
Dynamic Shear TP5 <u>ASTM D7175</u> G*/Sin δ, Max., 5000 kPa Test Temp. @ 10 rad/s, °C	22	28	3734	3434
Creep Stiffness, TP1 <u>ASTM D6648</u> (Note 3) S, Maximum, 300.0 Mpa m-value, Minimum, 0.300 Test Temp. @60s, °C	-12	-6	0	-6
Direct Tension, TP3 <u>ASTM D6723</u> (Note 3) Failure Strain, Minimum 1.0% Test Temp. @ 1.0 mm/min. °C	-12	-6	0	-6

Comment [JB2]: Work horse grade for all of Maricopa County agencies

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Comment [JB1]: This is used in desert climates as the base asphalt for rubber projects

Comment [JB3]: A very stiff and expensive binder that is used occasionally. A typical ADOT grade.

Comment [JB4]: This should be same as the RTFO: G*/Sin δ, Min

Revised 2012

Comment [JB5]: This test is only used for modified asphalts. The table is restored.

On all Grades Flash Point Temperature ~~T48~~ASTM D92: Minimum 230 °C and Mass Loss, Maximum 1.00 percent.

NOTES:

- (1) This requirement may be waved at the discretion of the specifying agency if the supplier warrants that the asphalt binder can be adequately pumped and mixed at temperatures that meet all applicable safety standards.

(2) For quality control of unmodified asphalt cement production, measurement of the viscosity of the original asphalt cement may be substituted for dynamic shear measurements of $G^*/\sin(d)$ at test temperatures when the asphalt is a Newtonian fluid. Any suitable standard means of viscosity measurement may be used, including capillary or rotational viscometry (~~T210 or T202~~ASTM D4402).

(3) If the Creep Stiffness is below 300 MPa, the direct tension test is not required. If the Creep Stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used in lieu of the Creep Stiffness requirement. Direct tension test is recommended for polymer modified asphalt binders. The m-value requirement must be satisfied in all cases.

Comment [JB6]: This language is inserted for clarity.

PAVING ASPHALT

711.1 GENERAL:

The asphalt shall be produced from crude asphalt petroleum or a mixture of refined liquid asphalt and refined solid asphalt. It shall be free from admixture with any residues obtained by the artificial distillation of coal, coal tar, or paraffin oil and shall be homogeneous and free from water.

Asphalt shall not be heated during the process of its manufacture, storage, or during construction so as to cause injury as evidenced by the formation of carbonized particles.

711.2 TESTING REQUIREMENTS:

Paving asphalt shall be classified by the Performance Grading System and shall conform to the requirements set forth in Table 711-1 and ASTM D6376 with the PAV temperature changes noted herein this table.

TABLE 711-1				
PERFORMANCE GRADING SYSTEM				
	PG 58-22	PG 64-16	PG-70-10	PG 76-16
Original Asphalt				
Viscosity, ASTM D4402 (Note 1) Max. 3 Pa-s, Test Temp, °C	135	135	135	135
Dynamic Shear ASTM D7175 (Note 2) G*/Sin δ, Min., 1.0 kPa Test Temp. @ 10 rad/s, °C	58	64	70	76
Rolling Thin Film Oven Residue (ASTM D2872)				
Mass Loss, Maximum % Dynamic Shear ASTM D7175 G*/Sin δ, Min., 2.20 kPa Test Temp. @ 10 rad/s, °C	1.0	1.0	1.0	1.0
PAV Aging Temperature, °C	100	100	110	110
Dynamic Shear ASTM D7175 G**Sin δ, Max., 5000 kPa Test Temp. @ 10 rad/s, °C	22	28	34	34
Creep Stiffness, ASTM D6648 (Note 3) S, Maximum, 300.0 Mpa m-value, Minimum, 0.300 Test Temp. @ 60s, °C	-12	-6	0	-6
Direct Tension, ASTM D6723 (Note 3) Failure Strain, Minimum 1.0% Test Temp. @ 1.0 mm/min. °C	-12	-6	0	-6

On all Grades Flash Point Temperature ASTM D92: Minimum 230 °C and Mass Loss, Maximum 1.00 percent.

Revised 2012

NOTES:

- (1) This requirement may be waived at the discretion of the specifying agency if the supplier warrants that the asphalt binder can be adequately pumped and mixed at temperatures that meet all applicable safety standards.

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(3) If the Creep Stiffness is below 300 MPa, the direct tension test is not required. If the Creep Stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used in lieu of the Creep Stiffness requirement. Direct tension test is recommended for polymer modified asphalt binders. The m-value requirement must be satisfied in all cases.



Chandler • Arizona
Where Values Make The Difference

MEMORANDUM

Case # 12-06

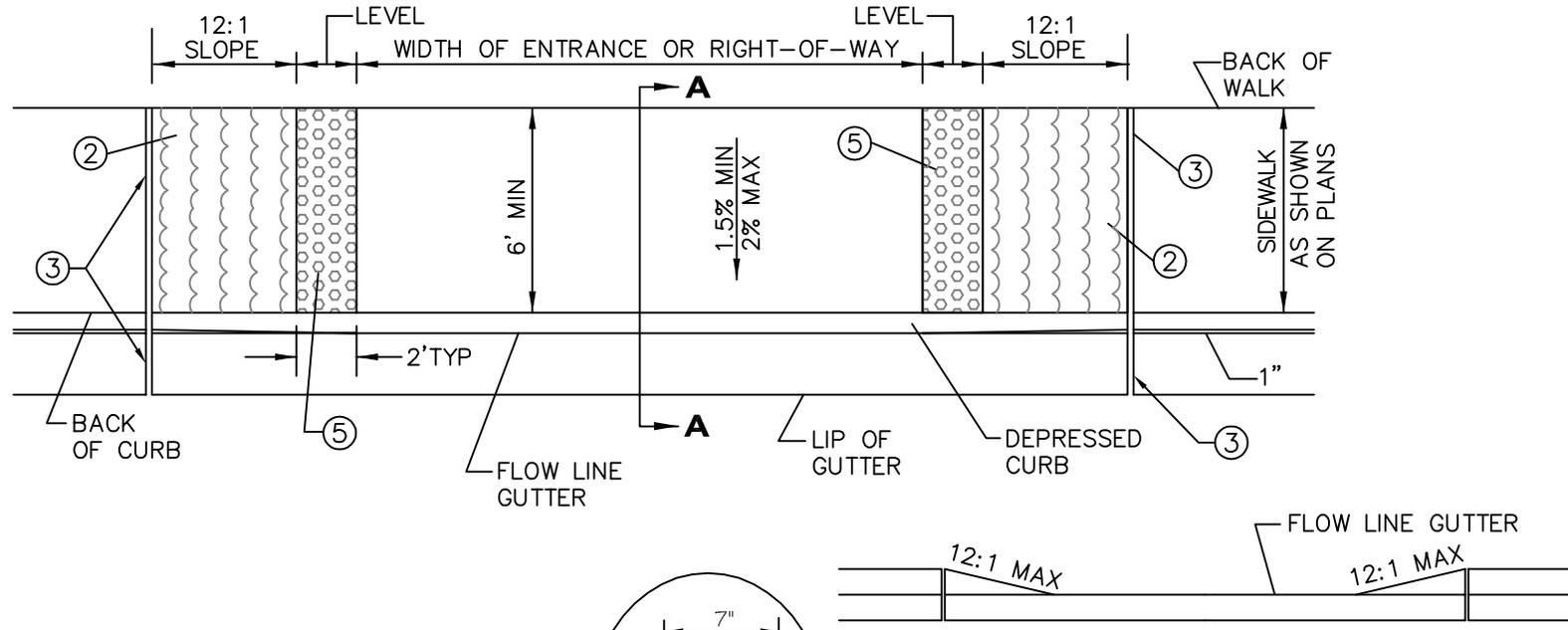
DATE: April 4, 2012

TO: MAG Specifications and Details Committee Members

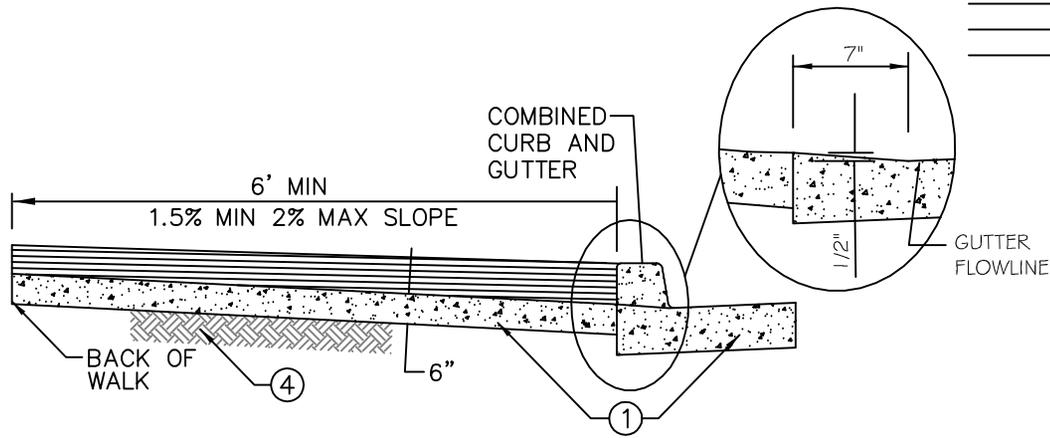
FROM: Warren White, City of Chandler Representative

SUBJECT: Proposed MAG Detail 249: Modified Entrance

Proposed new ADA Compliant MAG Detail 249 for alley entrances, etc.



ELEVATION



SECTION A-A

NOTES:

- ① CLASS "B" CONCRETE PER MAG SECTION 725.
- ② LIMITS OF HEAVY ROUGH BROOM FINISH.
- ③ EXPANSION JOINTS PER MAG SECTION 729.
- ④ SUBGRADE PREPARATION PER MAG SECTION 301.
- ⑤ DETECTABLE WARNING PER APPROVED PRODUCTS LIST.



City of Phoenix
Water Services Department

Date: April 4, 2012

Case: 12-07

To: MAG Specification & Details Committee

From : Jami Erickson

RE: Section 332: Placement and Construction of Asphalt Emulsion Slurry Seal Coat

Purpose: Add to Section 332.6 to include a work plan to prevent damage caused to the slurry seal by pedestrians, vehicles, and other types of traffic. It is important to know traffic control methods by the Contractor to mitigate the potential damage to the surface coat during the curing time period.

Revisions:

332.6 PROTECTION OF UNCURED SURFACE:

Adequate methods such as barricades, flagmen, pilot cars, etc., shall be used to protect the uncured slurry surface from all types of traffic. A work plan shall be submitted to the Engineer providing uncured slurry protection details including the duration of protection, methods of protection and physical boundaries of the protective devices.



City of Phoenix
Water Services Department

Date: April 4, 2012

Case: 12-08

To: MAG Specification & Details Committee

From : Jami Erickson

RE: Section 611 Disinfecting Water Mains

Purpose: Modify Section 611.17 to include a refreshing plan to assure safe water quality and to document the expectation by the Owner on maintaining the pipeline fresh until after final acceptance has been granted.

Revisions:

611.17 REFRESHING PLAN:

The Contractor shall submit a refreshing plan including procedures, responsibilities and locations for keeping lines fresh after testing, chlorination but prior to final acceptance of main. Water in the pipe shall be completely flushed and turned over at least every 10 calendar days. The Contractor shall obtain and maintain any permits and flushing logs required for this activity.

611.18 PAYMENT:

No separate pay item shall be contained in the proposal for disinfecting water mains. This operation shall be included in the price bid for the water mains, installed complete in place, as specified in the proposal.

Deleted: 611.17



P.O. Box 52025
Phoenix, AZ 85072-2025
(602) 236-5900

Case 12-09

DATE: April 3, 2012

TO: MAG Specifications and Details Committee Members

FROM: Peter Kandaris, SRP Representative
Outside of Right-of-Way Working Group

RE: **Section 770: ASTM Updates for Structural Steel**

Purpose: Section 770.2 references various ASTM steel standards that have been removed or replaced. Update and simplify this subsection to be more consistent with general steel standards. This is a default specification and does not need to cover all types of steel for all types of uses.

Revisions:

- a) High-Strength, Low-Allow Structural Steel: Federal guideline standards recommend three types of high-strength, low-allow structural steels; (1) ASTM A572 is the most common and available in Grades 42, 50, 55, 60 and 65 ksi; (2) ASTM A992 for W shapes (rolled wide flange shapes); and (3) ASTM A709 structural shapes, plates, and bars and quenched and tempered alloy steel for structural plates intended for use in bridges. Delete reference to A242, A606, A607 (withdrawn) and A653 (this material is typically used with galvanized chain link fence construction, not structural steel).
- b) Standard Structural Steel: Change the title to be more generic since the copper content is useful for non-marine corrosion protection, but not the primary reason for use of the standard. ASTM A36 is a general purpose structural grade steel with a minimum yield strength of 36 ksi. Delete reference to A570 (withdrawn), A611 (withdrawn) and A653 (see above).

SECTION 770

STRUCTURAL AND RIVET STEEL, RIVETS, BOLTS, PINS, AND ANCHOR BOLTS

770.2 STRUCTURAL STEEL:

Stock Materials: The Contractor shall select the material he wishes to use from stock. The Contractor shall furnish 3 certified mill reports for each of the heat numbers. Two samples shall be taken by a representative of the Engineer from each heat number, one for the tension test and one for the coldbend test. If the heat numbers cannot be identified, the representative of the Engineer shall select random test specimens from the unidentifiable heats. The number of such test specimens shall be at the discretion of the Engineer. The cost of all tests on stock material shall be borne by the Contractor.

High Strength Low-Alloy Structural Steel: The material shall conform to the requirements of ASTM ~~A242, A572, A709 or A992/A572M, A606, A607 or A653 Grades C, D, or E~~ as specified in the special provisions.

~~Copper Bearing General Purpose~~ Structural Steel: ~~Copper bearing s~~Structural steel shall conform to the requirements of ASTM A36 with a minimum of 0.2 percent copper., ~~A570, A611, or A653 as specified in the special provisions.~~

Water/Sewer Working Group Meeting

Meeting Notes

April 17, 2012

Opening:

A meeting of the Specifications and Details Water/Sewer Working Group was called to order by chair Jim Badowich on April 17, 2012, at 1:37 p.m. in the MAG Cholla Room.

1. Participants

Jim Badowich (Avondale), Arturo Chavarria (Hanson Pipe), Bill Davis (ADS), Peter Kandaris (SRP), Kelly Kokesh (ADS), Paul Nebeker (Pipe Right), Matt Savage (Ferguson), Craig Sharp (Buckeye), Gordon Tyus (MAG).

2. Cadmium Plated Bolts (Case 11-03)

Jim Badowich handed out a revised version that showed the original MAG spec, the draft case from Peoria, and his suggested revisions. One revision was to separate the hex bolts for flanges from the t-bolts for mechanical joints, and to have other options and finishes shown separately. He also researched references to ASTM standards. There was discussion about minimum bolt sizes, materials, thread types and uses of different grades. Matt Savage was asked to research several questions on bolt types and grades and report back to the group.

3. Wet Barrel Fire Hydrant Spec and Detail Update (Case 11-14)

Buckeye representative Craig Sharp presented the group with the current draft drawings for dry and wet barrel hydrants as well as installation details. Led by Mr. Badowich, the group did a thorough review of the details 360-1, 360-2 and 360-3. Points of discussion included updating the offset fitting detail, concrete pad detail, and removing blocking from plan view details. Several other changes were proposed, and notes were clarified or deleted. Mr. Nebeker suggested using the NFPC standards when applicable. Craig Sharp said he would take these redlines back to his drafter and update the details for the next MAG committee meeting.

4. Manhole Details and Pre-Cast Manhole Bases

Jim Badowich said he would like to use the specifications and details developed by Buckeye as a basis for the pre-cast manhole base option. Craig Sharp said he could supply them to the group for review.

5. Special Bedding for Mainline Storm Drain Pipe (Case 11-21)

Kelly Kokesh of ADS provided a handout that had information requested during the March meeting. The first table she discussed was the trench widths for HDPE pipe based on ASTM D2321. Mr. Kandaris suggested that this table could be added to Section 603, since it is different than the current trench widths. She also presented a table showing the 5% deflection and the actual deflection in inches based on the pipe diameter. This was followed by a discussion of a report summary about testing types of flexible pipe installations and their deflection. Mr. Davis said they recommend mandrel testing to determine the actual deflection. Arturo Chavarria of Hanson Pipe handed out a summary of a report about the laser profiling method, and said he would provide links to Mr. Tyus.

6. New Potential Areas for Discussion

Mr. Sharp asked if the group wanted to review the new cases submitted by the City of Phoenix at the last meeting. Mr. Tyus said some of the cases were held until clearer language was specified. Since Phoenix representatives were not present, discussion on them was postponed.

7. Outside Right-of-Way Cases

Peter Kandarlis handed out a revision to 107.2 requested by Phoenix and said it would be included for the next committee meeting. He also researched standards for temporary guardrail end protection, and suggested referencing a national standard that provided several options. Due to the lateness of the meeting, and the fact he wanted Tom Wilhite to review the remaining potential cases he had prepared for bollard locks and penalties, Mr. Kandarlis suggested reviewing them at a later date. He said he would like move the next Outside ROW working group meeting date to May 22nd at 1:30 p.m. so members would have more time to focus on the Outside ROW issues and cases.

7. Next Meeting Date

Members agreed to tentatively schedule the next meeting of the Water/Sewer working group on Tuesday, May 15, 2012 at 1:30 p.m. at the MAG office.



**Arizona Rock Products Association
916 W. Adams Phoenix, Arizona 85007
Phone (602) 271-0346 Fax (602) 255-0363**

Agenda

MAG Concrete Working Group Meeting

Thursday, April 26, 2012 @ 1:30 pm

- I. Call to Order and Introductions**
- II. Notes from the Last Meeting and Sign-in Sheet**
- III. Presentation by Chuck Taylor on segmental paving with specific emphasis on permeable interlocking concrete pavers (PICP). Chuck is a Commercial Hardscapes Advisor for Belgard® Hardscapes by Oldcastle (Superlite), and one of the nation's foremost experts on PICP's and regular pavers**
- IV. MAG Section 340 Draft Revision – Peter Kandaris, SRP**
- V. Peoria/Chandler Potential New - Javier Setovich, Peoria**
- VI. New/Old Business**
- VII. Next meeting: May _____ @ 1:30 pm**
- VIII. Adjournment**