

December 21, 2011

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, January 4, 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
January 4, 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 October 5, 2011, Meeting Minutes</u> | 3. Review and approve minutes of the October 5, 2011 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 |
| 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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| <p>9. <u>Case 11-18:</u>
Update Section 350: Removal of Existing Improvements.</p> | <p>9. Information and discussion.
Sponsor: Peter Kandaris</p> |
| <p>10. <u>Case 11-21:</u>
Add new Section 623: Special Bedding for Mainline Storm Drain Pipe.</p> | <p>10. Information and discussion.
Sponsor: Syd Anderson</p> |
| <p>11. <u>Case 11-30:</u>
Update Section 702: Base Material. Revise Section 310: Untreated Base Course.</p> | <p>11. Information and discussion.
Sponsors: Brian Gallimore, AGC
Peter Kandaris, SRP</p> |

New Cases for 2012

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| <p>12. <u>Case 12-01 Miscellaneous Corrections:</u>
Minor Correction Cases</p> | <p>12. Information and discussion.</p> |
| <p>13. <u>Other New Cases</u></p> | <p>13. Information and discussion.</p> |
| <p>14. <u>ASTM Reference Updates</u>
Review ASTM references and update as needed.</p> | <p>14. Information and discussion.</p> |
| <p>15. <u>Potential Cases for 2012</u>
Discussion about cases that could be brought forward in 2012.</p> | <p>15. Information and discussion.</p> |

General Discussion

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| <p>16. <u>Working Group Reports</u></p> <p>A. Outside Right-of-Way Working Group
 B. Asphalt Working Group
 C. Materials Working Group
 D. Water/Sewer Working Group
 Report on 10/18/2011 meeting.
 E. Concrete Working Group</p> | <p>16. Information and discussion.</p> <p>A. Outside ROW Chair: Peter Kandaris, SRP
 B. Asphalt Chair: Jeff Benedict, AGC
 C. Materials Chair: Brian Gallimore, AGC
 D. Water/Sewer Chair: Jim Badowich, Avondale,
 Acting Chair: Scott Zipprich, Buckeye
 E. Concrete Chair: Jeff Hearne, ARPA</p> |
| <p>17. <u>Staff Reports</u>
Report on distribution and online use of the new 2012 edition of the MAG Specifications and Details Document.</p> | <p>17. Information and discussion.</p> |

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| 18. <u>Open General Discussion</u>
Members can report on any items of interest to the committee. | 18. Information and discussion. |
| 19. <u>Request for Future Agenda Items</u>
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. | 19. Information and discussion. |

Adjournment

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

October 5, 2011

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

AGENCY MEMBERS

Jim Badowich, Avondale	Mike Samer, Mesa
Scott Zipprich, Buckeye	* Javier Setovich, Peoria
Warren White, Chandler	Syd Anderson, Phoenix (St. Trans.)
* Dave Emon, El Mirage	Jami Erickson, Phoenix (Water)
Greg Crossman, Gilbert	Marc Palichuk, Queen Creek
Mark Ivanich, Glendale	Rodney Ramos, Scottsdale
Troy Tobiasson, Goodyear, Chair	Jason Mahkovtz, Surprise
Bob Herz, MCDOT	Tom Wilhite, Tempe, Vice Chair

ADVISORY MEMBERS

Jeff Benedict, ARPA	Jeff Hearne, ARPA
* Tony Braun, NUCA	Peter Kandaris, SRP
* Kwigs Bowen, NUCA	Paul R. Nebeker, Independent
Brian Gallimore, AGC	
Adrian Green, AGC	

MAG ADMINISTRATIVE STAFF

Gordon Tyus

* Members not attending or represented by proxy.

GUESTS/VISITORS

Arturo Chavarria, Hanson Pipe and Precast
Don Cornelison, Speedie & Associates
Jim Easterly, NUCA
Art Glover, Flood Control District of Maricopa County
Michael Hook, ACPA
Jerre Mills, Regional Pavement
Matt Rogers, ADS

1. Call to Order

Chairman Troy Tobiasson called the meeting to order at 1:35 p.m.

2. Call to the Audience

No members of the audience requested to speak.

3. Approval of Minutes

The members reviewed the September 7, 2011 meeting minutes. Jason Mahkovtz introduced a motion to accept the minutes as written. Greg Crossman seconded the motion. A voice vote of all ayes and no nays was recorded.

Review of 2011 Cases Scheduled for a Vote

4. Case 11-13 – Replace Current Manhole Frame and Cover Details

Replace Details 423, and 424 with new details of products that are currently being manufactured. Scott Zipprich handed out updates to Details 423-1, 423-2, 424-1 and 424-2. He explained that the revised details are representative of the manhole frame and covers that agencies are currently receiving today. The only exception is the addition of a rubber seal for water-tight frames and covers. Also, revised details for Detail 523 – Pressure Manhole were removed from the case, since there wasn't time to make all the necessary revisions. Some of the revisions made included adding the ring thickness dimensions, and removing extraneous dimensions that were not needed. These details also added a plus or minus 2% weight and a 1/16th of an inch tolerance on all dimensions to allow minor variation for different manufacturers and the casting process. Mr. Zipprich asked members for any additional comments, and if they felt comfortable voting on the case. Mr. Tyus said the current MAG details are dimensioned for the class 30 cast iron, not the class 35 used today, so the new details would be more accurate. Mr. Herz said it could reduce problems with overzealous inspectors that reject products based on the old details. Jim Badowich moved and Scott Zipprich seconded a motion to approve Case 11-13 as presented. A roll call vote was taken. *The case was approved: 13 yes, 0 no, 0 abstaining, 2 not present.*

After the vote, Mr. Zipprich asked the members about their agencies use of bolt-down covers to reduce theft, and if there was a need for a bolt-down cover detail separate from the pressure manhole. Peter Kandarlis said SRP occasionally uses them for this purpose. Paul Nebeker mentioned the difficulty of lining up the bolts. Tom Wilhite asked him if two bolts would be sufficient. He replied that he thought it would, although there would be other bolt holes. Others mentioned welding down the covers as an option. Scott Zipprich concluded that there wasn't a strong need for a separate bolt-down cover detail, and that future revisions to the pressure manhole may be satisfactory.

5. Case 11-19: Modify Section 340: Detectable Warnings

Modify Section 340 to provide performance-based detectable warning specifications. Peter Kandaris said the latest version removed specific material requirements, keeping mainly the Americans with Disabilities Act (ADA) language. The revised specification added a minimum static friction coefficient of 0.8 as per ASTM C1028 for the truncated domes.

Mr. Herz asked how a “design service life of 30 years” was determined. Mr. Kandaris said the working group was worried that types of materials such as rubber mats may not be adequately durable, and this was an attempt reduce future maintenance. Other members agreed that it would be difficult to define a 30 year service life without performance specifications. It was agreed to remove this line since agencies still had final approval of products.

Another issue Mr. Herz raised was the language about the colors. Some members objected to requiring white on dark (asphalt) and brick red on light (concrete). Currently the spec recommends yellow. It was decided to remove this sentence about the colors and have the color approved by the agency. Mr. Herz noted that the use of adhesives was not allowed. Mr. Kandaris said the working group did not want to allow adhesives, but that agencies could make exceptions such as for retrofits.

Bob Herz also asked what was meant by a “proven wet-set anchoring mechanism.” Members discussed how this could be interpreted. There was some confusion as to what an “anchoring mechanism” was, and if other terminology such as “attachment” or “anchoring process” should be substituted. It also wasn’t clear if anchoring meant anchor bolts, or if a roughened surface was adequate. Scott Zipprich asked if paving bricks could be used. Jim Badowich also asked if “cast-in-place” could be confused to allow the warnings themselves to be cast-in-place rather than manufactured prior to installation. Mike Samer suggested the attachment systems also be approved by the agency. Mr. Kandaris worked on language to help clarify that the detectable warning system would be installed in wet-set concrete in a way that provided a secure attachment.

Warren White suggested the last sentence referencing specific details be removed since the details may change, or additional details may be added in the future. The group agreed to delete this sentence. Peter Kandaris made revisions to the case during the discussion and provided feedback of the final language to the full committee.

Greg Crossman moved and Scott Zipprich seconded a motion to approve Case 11-19 with all the changes and revisions discussed. A roll call vote was taken. *The case was approved: 12 yes, 0 no, 0 abstaining, 3 not present.*

6. Case 11-22: Revise Sections 325 and 717: Asphalt Rubber Specifications

Separate material and construction methods and give guidance to rubber specification. Jeff Benedict said he had received no further comments since the last meeting.

Bob Herz noticed that the version of the case in the packet was not the latest version that had incorporated the county's comments, and was concerned if other agencies had reviewed the latest version. Mr. Benedict said it was unfortunate because the current MAG specifications are not being used, and need to be updated. Members asked if the changes were relatively minor and could be summarized. Mr. Benedict explained some of the changes which included: cryogenic processes would not be permitted, the Marshall stability was raised from 600 lbs to 800 lbs, and several smaller changes were made to wording and formatting.

Mr. Kandarlis noted that the final revised version was presented at the September meeting where Maricopa County's changes were included and discussed, so the members did have had the final version available for the past month. He asked if any other agency had changes or comments since then. Since there were none, the committee agreed that they would refer to the revision that was presented during the September 7th meeting. Mr. Tyus said if members were clear that they are referring to the prior version, the committee could proceed with a vote.

Jim Badowich moved and Rod Ramos seconded a motion to approve Case 11-22 as presented during the September 7th meeting with the revisions discussed. A roll call vote was taken. *The case was approved: 13 yes, 0 no, 0 abstaining, 2 not present.*

7. Case 11-23: Revise Section 321: Asphalt Concrete Pavement

Address compaction issues and update Section 321. Jeff Benedict asked if there were any comments. Greg Crossman discussed clarifying tables regarding permitted work and the Engineering Analysis. Don Cornelison explained some of the changes including reducing the number of cores required per or sub-lot (500 tons or 1 day's production), because now they are taking many more cores than needed. This would also reduce testing workload. Troy Tobiasson asked how this would affect penalties. There was discussion about the number of cores needed, and if additional cores would be allowed to determine the extents of the deficient pavement or not. Jim Badowich said that the penalties were not sufficient to offset the increased future maintenance. He also said for residential streets and those with cul-de-sacs, the proposed coring would not be enough. Brian Gallimore suggested adding one core per street (for local/residential) and one core per lane for arterials. The sponsors were directed to update the language regarding coring and testing as discussed. Scott Zipprich added that the cores not be used to evaluate the extent of the deficiency, but be used for the whole sub-lot, with regards to penalties. Revisions discussed would be added to 321.10.1 Acceptance Criteria.

Bob Herz asked for a correction to Section 321.10.2. The reference to AASHTO T209 Section 11, should be Section 15. Another minor correction was to correct the word value to valve in the last paragraph of 321.8.6.

Tom Wilhite said he sent an email with several minor corrections, which was included in the agenda packet. Jeff Benedict said he hadn't noticed the email in time to make the corrections, but that they could be included in the update.

Rod Ramos moved and Tom Wilhite seconded a motion to approve Case 11-24 with the revisions discussed, and other corrections noted. A roll call vote was taken. *The case was approved: 13 yes, 0 no, 0 abstaining, 2 not present.*

8. Case 11-24: Add new Section 337: Crack Sealing

Add a new section with clear limits of its use and scope of crack sealing. There were questions about the specific material used for Crack Sealing. The most common brand name used is Pollyflex 3, which is designed for the desert environment. Mr. Kandarlis said you should use a different type in Northern Arizona. The agency is allowed to modify the type of sealant. Phoenix said they primarily use the Pollyflex 3 without problems. The final version includes the revisions previously discussed including removing references to blowing and incorporating Maricopa County's comments. Mr. Herz asked if the spec included filling material. Jeff Benedict suggested removing references to crack filling in the title and elsewhere and include only crack sealing for clarity. Jim Badowich moved and Greg Crossman seconded a motion to approve Case 11-24 with the revisions discussed. A roll call vote was taken. *The case was approved: 12 yes, 0 no, 1 abstaining, 2 not present.*

9. Case 11-29: Revise Section 701. Rock, Gravel and Sand (renamed Aggregates)

Revise Section 701. Change title from Rock, Gravel and Sand to Aggregates. Move materials to appropriate sections, and clarify types of aggregates. Update all references to Section 701. Brian Gallimore said he received no comments. Jeff Hearne said he received some comments from Art Glover at the County Flood Control District. Mr. Hearne said he explained and clarified the specifications, but that no changes were required or made to the case. Peter Kandarlis noted that the cover memo summarizes the changes. The case includes changes to all the other sections affected by the revisions to Section 701. Rod Ramos moved and Bob Herz seconded a motion to approve Case 11-29 as presented. A roll call vote was taken. *The case was approved: 13 yes, 0 no, 0 abstaining, 2 not present.*

10. Case 11-30: Update Section 702: Base Material and Section 310 Untreated Base Course

Update Section 702: Base Material. Revise for current standards. Brian Gallimore said he received no new comments. Scott Zipprich noticed that the ABC fractured faces requirement was reduced from 50%-30%, to be like ADOT, but the grading requirements of ADOT base were not the same as MAG. Don Cornelison said the 50% fracture face requirement was for crushed rock, there was none for gravel. He said he thought the grading band in MAG was superior to ADOT, that the new ABC was the best of both, and that the R-value for MAG was comparable to ADOT.

Bob Herz said the county did not have time to review this case, and would prefer to postpone a vote until next year. Syd Anderson said the City of Phoenix also wants time to review it. Troy Tobiasson said due to the agencies' need to have more time to review the case it would be carried forward to 2012.

11. Case 11-31: Revise Sections 220 and 703: Riprap

Revise Sections 220 and 703: Riprap. Indicate proper aggregate size and testing methods. Peter Kandarlis said the case was fairly simple. The last changes were made a couple months ago. The updates included having the proper testing requirements in Section 703 and updating grout specifications in Section 220. Syd Anderson moved and Jim Badowich seconded a motion to approve Case 11-31 as presented. A roll call vote was taken. *The case was approved: 13 yes, 0 no, 0 abstaining, 2 not present.*

12. Case 11-32: Modify Section 309: Lime Slurry Stabilization

Modify Section 309: Lime Slurry Stabilization to include the use of hydrated lime, add mix criteria, testing procedures and payment. Brian Gallimore said he received comments from Maricopa County on Section 309.2.2 to put the prohibition on quicklime back in. The text to be added back in would read, “The direct use of quicklime to the soil material is strictly prohibited.” The reference to quicklime would need to be deleted from Section 309.3.2 (a) and 309.4.4.1 as well. Peter Kandarlis also noted that in Section 309.2.3 (A) the chemical formulas should be using the letter “O” not the number “0”. Greg Crossman moved and Syd Anderson seconded a motion to approve Case 11-32 with the revisions discussed. A roll call vote was taken. *The case was approved: 13 yes, 0 no, 0 abstaining, 2 not present.*

13. Case 11-33: Revise Section 311: Soil Cement Base Course

Revise Section 311: Soil Cement Base Course. Clarify and update the construction methods of cement treated subgrade. Bob Herz discussed references regarding optimum moisture in Section 311.4.4. He said the ASTM specification referenced wasn’t sufficient because testing with a nuclear gage could give a false reading. Peter Kandarlis said it could reference AASHTO test T-394 instead of T-217 or have some other test to get accurate moisture content measure. Greg Crossman said in Section 311.4.8 the purpose of the Engineering Analysis (EA) needs to be clear, and their needs to be recommendations on what to do. Brian Gallimore said the EA would help determine what needs to be done. Mr. Crossman said the engineer shall determine what corrective actions if any are required based on the EA. Bob Herz said to clarify the ASTM reference in Section 311.4.6, delete “standards as specified above.” And replace it with the specific reference to ASTM D6938. Greg Crossman moved and Syd Anderson seconded a motion to approve Case 11-33 with the revisions discussed. A roll call vote was taken. *The case was approved: 11 yes, 0 no, 0 abstaining, 4 not present.*

14. Case 11-34: Revise Section 312: Cement Treated Base

Revise Section 312: Cement Treated Base to add provisions for measuring moisture content and update density testing procedures. Bob Herz said to replace reference to ASTM D2932 with D6938. The same concerns about moisture content discussed in Section 311 also apply to this case. Mr. Herz said references to the Arizona test method should be specified consistently in Section 312.3 and 705.4. Greg Crossman moved and Syd Anderson seconded a motion to approve Case 11-33 with the revisions discussed. A roll call vote was taken. *The case was approved: 11 yes, 0 no, 0 abstaining, 4 not present.*

Carry Forward Cases

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

Incorporate City of Phoenix supplement 623 into the MAG standards. Syd Anderson said a revised version of the case was included in the packet. He said he thinks there is some misunderstanding on the purpose of the specification with some suppliers. Mr. Anderson said this supplement is used by the City of Phoenix to deal with settlement issues on pipe 36" and larger. This is used on all pipe, not just corrugated metal or HDPE. He said Phoenix intends to keep the supplement this year and discussion on the issue can continue in 2012.

16. Working Group Reports

Chair Tobiasson again thanked the working groups and participants for all the work during the past year, stating that all the revisions done this year would not have been possible without their efforts.

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

Peter Kandaris said the next meeting will follow the Water/Sewer Working Group meeting on October 18th.

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

Jim Badowich said the last meeting spent time finalizing the manhole frame and cover details, and also discussed changes to the fire hydrant details including the use of offset connections. Notes of the meeting were provided in the packet. The next meeting is scheduled for Tuesday, October 18th at 1:30 at the MAG office.

17. Staff Reports

Due to the length of the meeting, none was provided.

18. Additional Meetings in November and December

Chair Tobiasson reintroduced the idea of adding committee meetings in November and December to continue work on carry forward cases. He said in addition to carry forward cases, the committee could begin looking at future cases such as ASTM updates and cases that were previously withdrawn. Warren White mentioned cases based on the final ADA guidelines such as dual ramp details could also be reviewed. Members asked about meeting requirement and voting issues. Mr. Tyus explain that members could still vote on cases, but that those revisions would not be included in the standards until the following year. He said that the committee would still need a quorum of members present; otherwise the meeting would have to be canceled. Mr. Zipprich mentioned that MAG staff needed time to work on this year's updates. Continuing work on the cases in Working Groups was discussed as another option to continue finalizing carry forward cases. Members agreed due to current workloads, and the upcoming holidays, it would be better to make revisions at the working

group meetings, with the goal of having carry forward cases ready for a final vote in March of 2012, rather than waiting until the end of the year to vote on active cases.

19. Open General Discussion

In response to Mr. Herz's request, Mr. Tyus said he would post final copies of approved cases on the MAG website for members to review.

20. Adjournment:

Mr. Tobiasson adjourned the meeting at 4:35 p.m.

**2012 Schedule for the
Specifications and Details Committee Meetings**

MAG, 302 N. 1st Avenue, Suite 200
Ironwood Conference Room
1:30 p.m.

January 4, 2012

February 1, 2012

March 7, 2012

April 4, 2012

May 2, 2012

June 6, 2012

July 11, 2012

August 1, 2012

September 5, 2012

October 3, 2012 (if necessary)

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 04/06/2011		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	Jesse Gonzales/ Paul Nebeker	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		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		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		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		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 09/26/2011		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 08/23/2011		0 0 0	Yes No Abstain



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: Jan 5, 2011

To: MAG Specifications and Details Committee

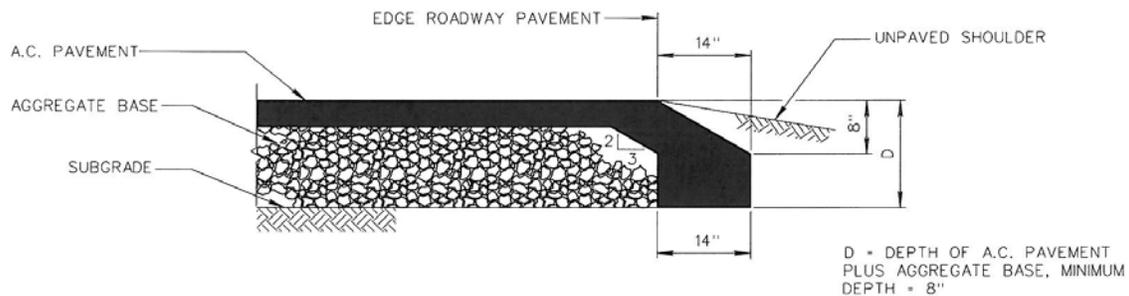
From: Robert Herz, MCDOT Representative

Subject: Proposed addition to Standard Detail 201 – Pavement
Section at Termination

Case 11-02

PURPOSE: Add an Asphalt Pavement Safety Edge option to Detail 201

REVISION: Add Asphalt Pavement Safety Edge Detail.



Add the following to Section 321:

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

The finished safety edge slope shall be planar and form a $30^{\circ} \pm 5^{\circ}$ angle with the horizontal plane. Due to the required final edge slope of the safety edge, compaction as required by sections 321.8.4 and 321.10 may not be attainable. When the approved procedures for placement and compaction of the safety edge are followed, the safety edge compaction shall be considered acceptable.

When the depth of the safety edge extends two inches or more below the bottom of the asphalt pavement base course, the portion below the base course shall be placed and compacted as a separate construction operation. The remaining portions of the safety edge shall be constructed as part of each successive asphalt lift (base, intermediate, and finishing courses). Construction of the base course may immediately follow compaction of the lower portion of the safety edge.

When the depth of the safety edge extends less than two inches below the bottom of the asphalt pavement base course, the portion below the base course may be placed and compacted with the base course in a single operation. The remaining portions of the safety edge shall be constructed as part of each successive asphalt lift (intermediate and finishing courses).

Section 610

610-13 COUPLINGS, JOINTS, GASKETS AND FLANGES

(C) Bolts and Nuts

(1) For pipe 12 inches and smaller: Bolts and nuts for use in field connections or for connecting fittings shall be carbon steel equivalent to ASTM A307, Grade B, with zinc plating in accordance to ASTM B633 TY II, SC 2. Zinc plated bolts shall have class 2A threads and the nuts used with them shall have Class 2B threads. All bolt diameters shall normally be 1/8 inch smaller than the bolt hole diameter. High strength, heat treated cast iron tee-head bolts with hexagon nuts, all in accordance with the strength requirements of AWWA C-111, may be used in lieu of the zinc plated bolts and nuts for jointing mechanical joint cast iron or ductile iron pipe and fittings only.



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

Case 11-12

DATE: May 4, 2011

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: MAG standards are absent of requirements for Native Arizona Plants. Rules are provided in ARS Title 3, Chapter 7.

Revisions: Reference ARS Title 3, Chapter 7 in MAG 107.1

Additional: MAG 107.1 (A) references ARS 23-373. The current state statutes no longer include this statute. A new reference is needed (possibly ARS 23-425 and/or a statute within ARS 34). Agencies should consult their legal departments to determine the most appropriate revised reference.

SECTION 107**LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC****107.1 LAWS TO BE OBSERVED:**

The Contractor shall keep fully informed of 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 with all such laws, ordinances, regulations, codes, orders and decrees; and shall protect and indemnify the Contracting Agency and its representatives against any claim or liability arising from or based on the violation of such, whether by himself or his employees.

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

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

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

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

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

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

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

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

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

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

(G) Arizona Revised Statutes Title 3, Chapter 7, Native Arizona Plants. Those native plant species which are protected by the State of Arizona must be preserved at all times. When it is necessary to remove any of these protected plant species from the site, use suitable methods in the excavation, handling and transportation to ensure they are not damaged.



Fiftieth Legislature - First Regular Session

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Title 23 - Labor

Search Title 23

- Show links as HTML Documents
- Show links as Word Documents

Chapter 1
Article 1
[23-101](#)

INDUSTRIAL COMMISSION

In General

Industrial commission; members; qualifications; appointment; terms; compensation; removal

- [23-102](#)
- [23-103](#)
- [23-104](#)
- [23-105](#)
- [23-106](#)
- [23-107](#)
- [23-108](#)
- [23-108.01](#)
- [23-108.02](#)
- [23-108.03](#)
- [23-109](#)
- [23-110](#)

Payment of salaries of commissioners

Organization; quorum

Seal; copies of orders or records as evidence

Sites of offices and sessions; business hours; sessions and records; voting

Capacity to sue and be sued; service of summons on commission

General powers

Director; employees; compensation and expenses

Duties of director

Administrative law judges

Performance of certain powers and duties

Gifts and grants

Industrial commission ombudsman

Chapter 2
Article 1

EMPLOYMENT PRACTICES AND WORKING CONDITIONS

In General

- [23-201](#)
- [23-202](#)
- [23-203](#)

Obtaining labor by false pretenses; civil liability; classification

Exaction of fee or gratuity as condition of employment prohibited; classification

Compulsion or coercion of employee or another to buy from a particular person; classification

Article 2

Employment of Unauthorized Aliens

- [23-211](#)
- [23-212](#)

Definitions

Knowingly employing unauthorized aliens; prohibition; false and frivolous complaints; violation; classification; license suspension and revocation; affirmative defense

- [23-212.01](#)

Intentionally employing unauthorized aliens; prohibition; false and frivolous complaints; violation; classification; license suspension and revocation; affirmative defense

- [23-213](#)
- [23-214](#)

Employer actions; federal or state law compliance

Verification of employment eligibility; e-verify program; economic development

- [23-215](#)
- [23-216](#)

incentives; list of registered employers

Voluntary employer enhanced compliance program; program termination

Independent contractors; applicability

Article 3

Youth Employment

- [23-230](#)
- [23-231](#)
- [23-232](#)
- [23-233](#)
- [23-234](#)
- [23-235](#)
- [23-236](#)
- [23-237](#)
- [23-238](#)
- [23-239](#)
- [23-240](#)
- [23-241](#)
- [23-242](#)

Definitions

Prohibited employments of persons under the age of eighteen

Prohibited employments of persons under the age of sixteen

Permissible hours of labor for persons under the age of sixteen; exceptions; definition

Minimum age of newspaper carriers

Exemptions

Cease and desist order; time for compliance; civil penalty

Hearings on cease and desist orders

Injunctive relief

Violation; classification

- [23-240](#)
- [23-241](#)
- [23-242](#)
- [23-281](#)
- [23-282](#)

Rules and regulations

Application for variation; contents; notice; denial; hearing

Applicability of other laws

- [23-284](#)

Hours of Labor

Operation of certain railroad employers on prescribed time

Underground mine employees and hoisting engineers; eight hour day; exceptions; violation; classification

- [23-286.01](#)

Laundry workers; exceptions; posting notice of hours of labor; arrangement of laundry rooms; violation; classification

Agricultural operations

23-287	Requiring railroad employee to work longer than sixteen consecutive hours; classification
Article 6	Minimum Wages for Minors
23-311	Definitions
23-312	Powers and duties of commission
23-313	Investigation of wage rates
23-314	Wage board; membership; organization; quorum; compensation
23-315	Classification of employments by wage board
23-316	Establishment of minimum fair wage; procedure; criteria
23-317	Learner and apprentice wage rates
23-318	Power of wage board to administer oaths, issue subpoenas and take depositions
23-319	Notice of hearing on wage matters
23-320	Duty of commission to provide information to wage board
23-321	Report of wage board; action by commission
23-322	Directory orders
23-323	Posting of wage orders
23-324	Reconsideration of minimum wages in effect over a year
23-325	Judicial review of commission decisions; scope of review; appeal procedure; action of reviewing court
23-326	Special licenses to work for less than minimum wage
23-327	Action by employee for recovery of wages; amount of recovery
23-328	Contract or agreement for employment of minor at oppressive wage void
23-329	Violations; classification
Article 6.1	Equal Wages
23-340	Definitions
23-341	Equal wage rates; variations; penalties; enforcement
Article 7	Payment of Wages
23-350	Definitions
23-351	Designation of paydays for employees; payment; exceptions; violation; classification
23-352	Withholding of wages
23-353	Payment of wages of discharged employee; violation; classification
23-354	Preference of wages in insolvency proceedings or upon death of employer
23-355	Action by employee to recover wages; amount of recovery
23-356	Wage claims
23-357	Investigation of wage claims
23-358	Review of department determination
23-359	Effect of department determination
23-360	Penalty
23-361	Rules and regulations
23-361.01	Employer requirements; cash payments; unlawful practices; civil penalty
23-362; Version 2	Definitions
23-362	Minimum wage; prohibition
Article 8	Minimum Wage
23-363	Minimum wage
23-364	Enforcement
23-365	Reliance on administrative rule or regulation
Article 9	Wages and Hours of Public Employees
23-391	Overtime pay; work week
23-392	Overtime compensation for certain law enforcement or probation officer activities; option; definitions
Article 10	Division of Occupational Safety and Health
23-401	Definitions
23-402	Applicability
23-403	Employer's duty
23-404	Employee's duty
23-405	Duties and powers of the industrial commission relative to occupational safety and health
23-406	Division of occupational safety and health; director; appointment; qualifications; compensation
23-407	Duties and powers of the division
23-408	Inspection of places and practices of employment; employee initiation of investigation; violation; classification; injunction
23-409	Advisory committees
23-410	Development of standards and rules
23-411	Temporary and experimental variances
23-412	Permanent variances
23-413	Protest of validity of order
23-414	Emergency temporary standards
23-415	Citations
23-416	De minimis violations
23-417	Enforcement procedure
23-418	Penalties; violation; classification
23-418.01	Additional penalty for wilful or repeated violation causing employee permanent disability or death covered by workers' compensation; payment to employee; enforcement
23-419	Imminent dangers
23-420	Hearing rights and procedures
23-421	Decisions of the administrative law judge
23-422	Review board
23-423	Review board rights and procedures

23-425	Employee discharge or discrimination
23-426	Confidentiality of trade secrets
23-427	Employer recordkeeping
23-428	State legal representation
23-429	Employer and employee representation
23-430	Political subdivision jurisdiction
23-431	Standards of competency
23-432	Testimony of witnesses; compensation; order of superior court to appear
23-433	Consulting program
Article 11	Safety Conditions for Boilers and Lined Hot Water Storage Heaters
23-471	Definitions
23-472	Administration
23-473	Owner's and operator's duty
23-474	Duties of commission
23-475	Duties of division
23-476	Safety standards and regulations
23-477	Notice requesting investigation
23-478	Enforcement
23-479	Hearing rights and procedures
23-480	Decisions of administrative law judge; contents; disposition and effect
23-481	Decision upon review
23-482	Time for compliance with order; extension of time; effect of orders
23-483	Petition for special action to review lawfulness of decision, order or decision upon review; procedure
23-484	Nonimpairment of other agencies
23-485	Special inspectors; civil liability
23-487	Political subdivision jurisdiction
23-488	Division inspection service
Article 12	Safety Conditions for Elevators and Similar Conveyances
23-491	Definitions
23-491.01	Administration
23-491.02	Owner's and operator's duty
23-491.03	Existing conveyances
23-491.04	Commission powers and duties
23-491.05	Division powers
23-491.06	Development of standards and regulations
23-491.07	Certificate of inspection
23-491.08	Notice requesting investigation; confidentiality; determination of grounds
23-491.09	Enforcement
23-491.10	Hearing rights and procedures
23-491.11	Decisions of administrative law judge; contents; disposition and effect
23-491.12	Decision upon review
23-491.13	Effective date of orders; time for compliance; effect of orders
23-491.14	Petition for special action to review lawfulness of decision, order or decision upon review; procedure
23-491.15	Nonimpairment of other agencies
23-491.16	Private elevator inspector; qualifications; civil penalty; prohibited conduct; exemption from rule making
Article 14	Drug Testing of Employees
23-493	Definitions
23-493.01	Collection of samples
23-493.02	Scheduling of tests
23-493.03	Testing procedures
23-493.04	Testing policy requirements
23-493.05	Disciplinary procedures
23-493.06	Employer protection from litigation
23-493.07	Causes of action based on test results
23-493.08	Limits to causes of action
23-493.09	Confidentiality of results; access to records
23-493.10	Construction; collective bargaining
23-493.11	Effect of mandatory testing obligations
Article 15	Noncompete Clauses
23-494	Noncompete clause prohibition; broadcast employees; definitions
Chapter 3	EMPLOYMENT SERVICES
Article 1	Vocational Rehabilitation
23-501	Definitions
23-502	Rehabilitation services
23-503	Duties and powers
23-503.01	Coordination of vocational rehabilitation services
23-504	Merchandising businesses for the blind
23-506	Eligibility for assistance
23-507	Hearings
23-508	Administrative funds
Article 2	Private Employment Agents
23-521	Employment agent defined
23-522	Supervision of employment agents by industrial commission
23-522.01	Employment advisory council; members; terms; meetings
23-522.02	Council powers and duties
23-523	Powers and duties of commission



Fiftieth Legislature - First Regular Session

[change session](#) | [printer friendly version](#)

[Email a Member](#) | [Email Webmaster](#)

[Senate](#) [House](#) [Legislative Council](#) [JLBC](#) [More Agencies](#) [Bills](#) [Committees](#) [Calendars/News](#)

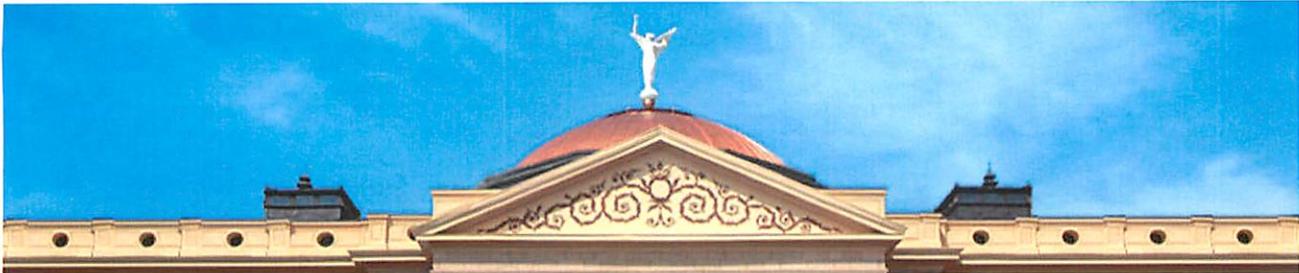
[ARS TITLE PAGE](#) [NEXT DOCUMENT](#) [PREVIOUS DOCUMENT](#)

23-425. Employee discharge or discrimination

A. No person shall discharge or in any manner discriminate against any employee because such employee has filed any complaint or instituted or caused to be instituted any proceeding under or related to this article or has testified or is about to testify in any such proceeding or because of the exercise by such employee on behalf of himself or others of any right afforded by this article.

B. Any employee who believes that he has been discharged or otherwise discriminated against by any person in violation of this section may within thirty days after such violation occurs, file a complaint with the commission alleging such discrimination. Upon receipt of such complaint, the commission shall cause such investigation to be made as it deems appropriate. If upon such investigation, the commission determines that the provisions of this section have been violated, it shall bring an action in any appropriate superior court against such person. In any such action the superior court shall have jurisdiction for cause shown to restrain violations of subsection A and order all appropriate relief including rehiring or reinstatement of the employee to his former position with back pay.

C. Within ninety days of the receipt of a complaint filed under this section the commission shall notify the complainant of its determination under subsection B.



Fiftieth Legislature - First Regular Session

[change session](#) | [printer friendly version](#)

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Title 34 - Public Buildings and Improvements

Search Title 34

- Show links as HTML Documents
- Show links as Word Documents

**Chapter 1
Article 1**

- [34-101](#)
- [34-102](#)
- [34-103](#)

**34-104
Chapter 2
Article 1**

- [34-201; Version 2](#)
- [34-201; Version 3](#)
- [34-201; Version 4](#)

[34-201](#)

- [34-202](#)
- [34-203](#)

Article 2

[34-221](#)

- [34-222](#)
- [34-223](#)
- [34-224](#)
- [34-225](#)
- [34-226](#)
- [34-227](#)

Article 3

[34-241](#)

[34-242](#)

[34-243](#)

[34-243.01](#)

- [34-244](#)
- [34-245](#)
- [34-246](#)

Article 4

- [34-251](#)
- [34-252](#)

- [34-253](#)
- [34-254](#)
- [34-255](#)
- [34-256](#)
- [34-257](#)
- [34-258](#)

**Chapter 3
Article 1**

- [34-301](#)
- [34-302](#)

**EMPLOYMENT OF SPECIAL SERVICES
General Provisions**

Definitions

Multiple contracts; professional services

Employment of technical registrants for work on public buildings and structures; direct selection; final list selection; public competition

Contract with architect; proprietary specifications; penalty; compensation

EMPLOYMENT OF CONTRACTORS

Bids and Estimates

Notice of intention to receive bids and enter contract; procedure; doing work without advertising for bids; county compliance

Notice of intention to receive bids and enter contract; procedure; doing work without advertising for bids; county compliance

Notice of intention to receive bids and enter contract; procedure; doing work without advertising for bids; county compliance

Notice of intention to receive bids and enter contract; procedure; doing work without advertising for bids; county compliance

Bids by contractors; estimates when work not done by contract

Failure to comply; civil penalty

Contract

Contract with successful bidder; payments to contractor; security; recovery of damages by contractor for delay; progress payments

Surety bond required; suit on bond; limitations

Payment bond provisions

Effect of article on prior contracts

Governmental mall; private and public development; construction contracts; limitations

Indemnity agreements in construction and architect-engineer contracts void; definitions

Construction contracts; void provisions

Eligibility and Preference of Contractors and Subcontractors

Eligibility of contractors on public works; preferred contractors; eligibility of subcontractor; definitions

Preference for locally manufactured materials in awarding contracts for furnishing materials

Preference for materials supplied by resident dealers in awarding contracts for furnishing materials

Effect of transaction privilege and use taxes in awarding contracts for furnishing any kind of equipment or materials or construction

Provisions inapplicable to federal aid contracts when federal law conflicts

Provisions inapplicable to irrigation districts

Violations; classification

Contracts in Restraint of Trade or Commerce

Definitions

Contract, combination or conspiracy to restrain trade or commerce; violation; classification

Noncollusion affidavits

Civil damages; limitation

Convicted persons; contracting employment; prohibition

Persons convicted; service prohibition

Suspension from bidding

Enforcement jurisdiction

EMPLOYEES ON PUBLIC WORKS

Eligibility for Employment

Employment of aliens on public works prohibited

Residence requirements for employees

Article 2
34-321
Chapter 4
Article 1
34-401
Article 3
34-451
34-452
34-453
34-454
34-455
34-456
Article 4
34-461
34-462
Article 5
34-471

34-472
Chapter 5
Article 1
34-501
34-502
Chapter 6

Article 1
34-601
34-602
34-603

34-604

34-605

34-606
34-607
34-608
34-609

34-610

34-611

34-612; Version 2
34-612
34-613

Wages and Hours

Public policy; prevailing wage contract prohibited; definition

STRUCTURE OF BUILDINGS

State Buildings

New and renovated state buildings; automated external defibrillators

Energy Conservation and Solar Design Standards

Energy conservation standards for public buildings

Solar design standards for state buildings; energy life cycle costing

Energy performance goals for state buildings

Establishment and use of life cycle cost methods and procedures; definition

Performance contracting; definitions

Use of energy savings; definitions

Building Codes

Applicability of local codes; exception; definition

Community college buildings; exemption from building codes

Lighting Standards for State

Lighting standards for state and community college buildings; life cycle costing; evaluation standards; shielding

Exemptions

COMPUTER ACCESS

Access by Minors

Definitions

Computer access; harmful to minors

ARCHITECT SERVICES, ASSAYER SERVICES, CONSTRUCTION SERVICES, ENGINEER SERVICES, GEOLOGIST SERVICES, LANDSCAPE ARCHITECT SERVICES AND LAND SURVEYING SERVICES

General Provisions

Definitions

Project delivery methods for design and construction services

Procurement of professional services and construction-manager-at-risk, design-build and job-order-contracting construction services; definition

Procurement of multiple contracts for certain job-order-contracting construction services and certain professional services; definition

Requirements applicable to construction services and professional services and to contracts for construction services and professional services; definition

Emergency procurements

Multiterm contracts for job-order-contracting construction services

Bid security for design-build and job-order-contracting construction services

Contracts for construction-manager-at-risk, design-build and job-order-contracting construction services; payments to contractor; security; recovery of damages by contractor for delay; progress payments

Construction-manager-at-risk, design-build and job-order-contracting construction services surety bond required; suit on bond; limitations

Payment bonds for construction-manager-at-risk, design-build and job-order-contracting construction services

Accounting standards; statutory applicability

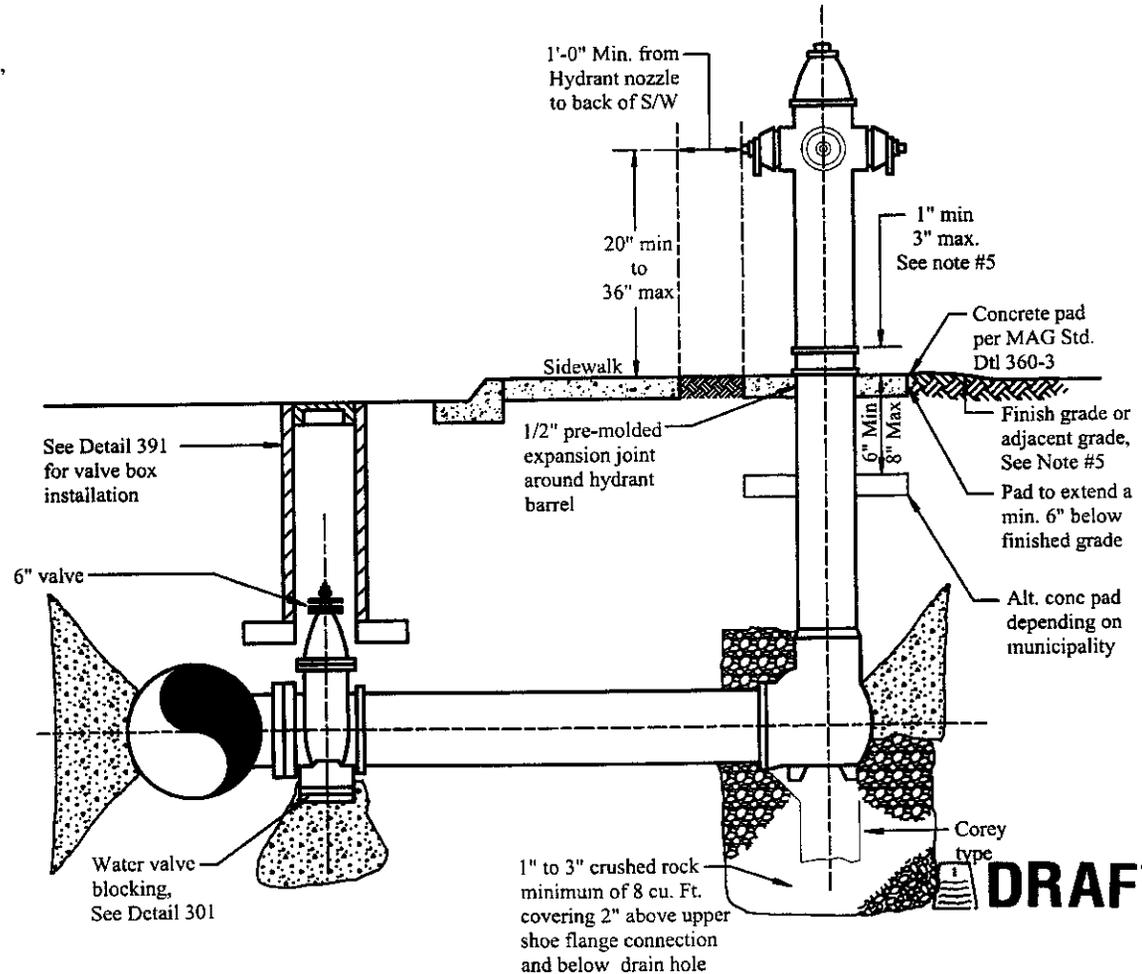
Accounting standards; statutory applicability

Failure to comply; civil penalty

DRAFT

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 per MAG Std. Det. 380 (thrust block) or Mechanical Restraint depending on Municipality
3. A flange joint by mechanical joint valve may be used as the transition between the joint types.
4. Piping between water valve and hydrant shall be ductile iron.
5. Finish grade shall be ground level, sidewalk, adjacent sidewalk, pavement, adjacent curb or other nearby obstruction denying wrench access to the bottom flange bolts.
6. See Detail 362 for location of hydrant.
7. Main steamer nut shall face the street.
8. No valves are to be in thrust block concrete.
9. Minimum 3-foot diameter clearance around hydrant.
10. National standard threads required on all connections unless otherwise directed.
11. 1/2" bituminous expansion shall be placed around the barrel of the F/H.
12. See Detail 360-3 for Concrete Pad.
13. See MAG Std. Spec. 756 (Material).



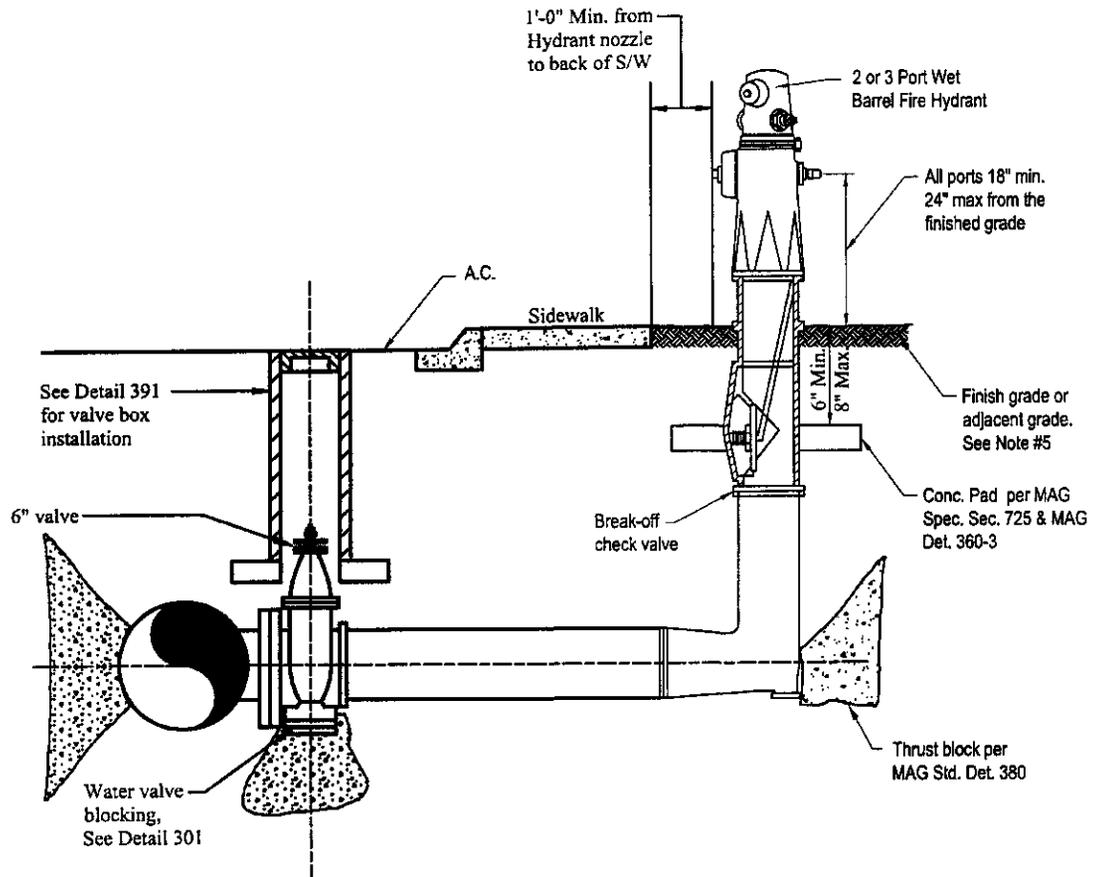
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DETAIL NO. 360-1		STANDARD DETAIL ENGLISH	DRY BARREL FIRE HYDRANT INSTALLATION	REVISED 04-27-2011	DETAIL NO. 360-1
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DRAFT

General Notes:

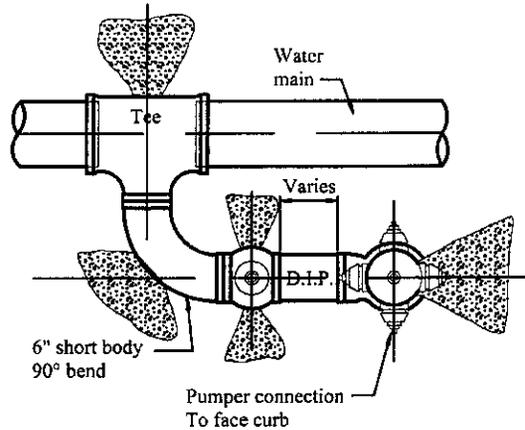
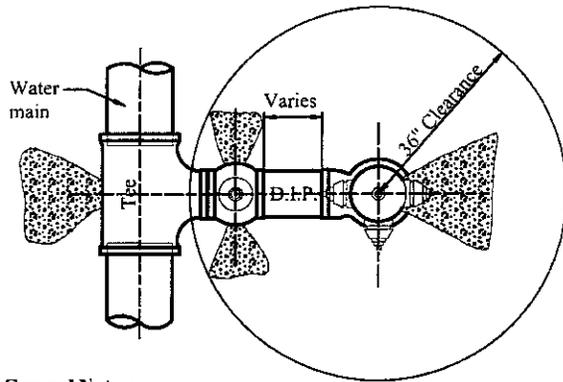
1. Joints between the valve and the main shall be flanged type. Joints between the valve and hydrant shall be restraint or mechanical type.
2. Restraints shall be per MAG Std. Det. 380 (thrust block) or Mechanical Restraint depending on Municipality
3. A flange joint by mechanical joint valve may be used as the transition between the joint types.
4. Piping between water valve and hydrant shall be ductile iron.
5. Finish grade shall be ground level, sidewalk, adjacent sidewalk, pavement, adjacent curb or other nearby obstruction denying wrench access to the bottom flange bolts.
6. See Detail 362 for location of hydrant.
7. Main steamer nut shall face the street.
8. No valves are to be in concrete.
9. Minimum 3-foot diameter clearance around hydrant.
10. National standard threads required on all connections unless otherwise directed.
11. 1/2" bituminous expansion shall be placed around the barrel of the F/H.
12. See Detail 360-3 for Concrete Pad.
13. The hydrant shall have 2- 2½" port and 1- 4½" port (industrial or commercial).
14. The hydrant shall have 1- 2½" port and 1- 4½" port (residential).
15. Consistent Manufacturers is required



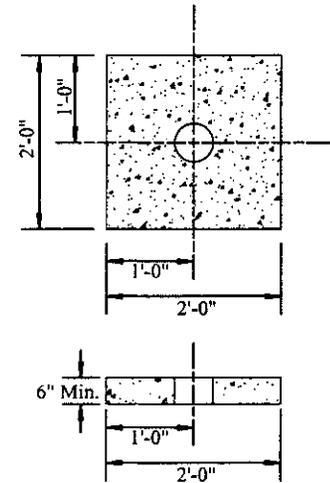
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DETAIL NO. 360-2	 MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL ENGLISH	WET BARREL FIRE HYDRANT INSTALLATION	REVISED 04-27-2011	DETAIL NO. 360-2
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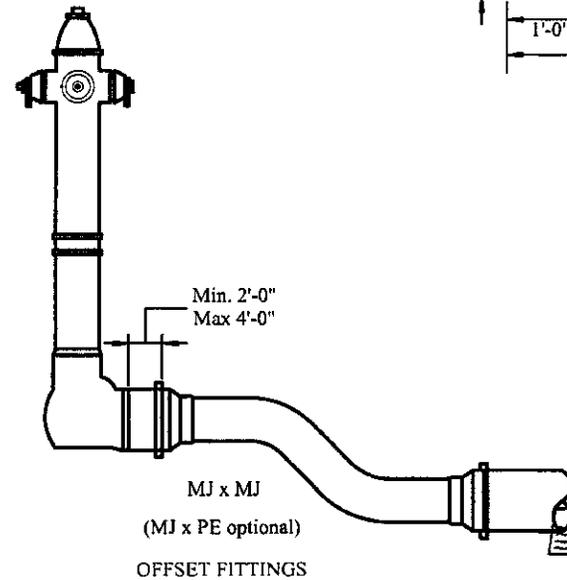
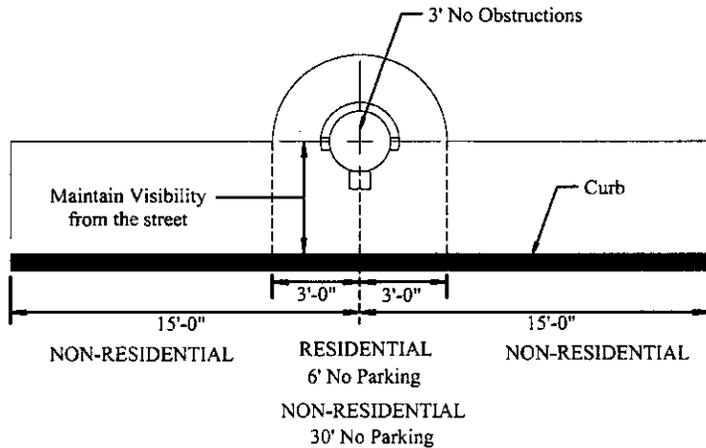


Pad Detail
 Square or round is acceptable
 If Round: 24" diameter min. required



General Notes:

1. Concrete for pad shall be Class "B".
2. Round pads shall have a diameter not less than 24".
3. Score line shall bisect this pad at mid point of all sides.
4. Concrete color shall match adjacent concrete.
5. The finished concrete surface shall have a rough broom finish (surface only).
6. Multiple offset fittings shall not be allowed.
7. Offset fittings shall generally not be installed under pavement.



DRAFT

DETAIL NO. 360-3	STANDARD DETAIL ENGLISH	FIRE HYDRANT INSTALLATION	REVISED 04-27-2011	DETAIL NO. 360-3
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P.O. Box 52025
Phoenix, AZ 85072-2025
(602) 236-5900

Case 11-16

DATE: July 11, 2011

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: Existing MAG guardrail standards (Section 415 and Details 135-1 thru 4) are outdated and generally not followed by MAG agencies. Some details may not be safe to use.

Revisions: a) Adopt MCDOT supplemental Section 415 in whole as a replacement section, with minor revisions to referenced details. Replace reference to details with selected ADOT guardrail details and limited use of MCDOT details where ADOT details are not sufficient.

b) Delete Details 135-1 through 4.

The revisions include standard modern guardrail materials and construction, but exclude oncoming traffic terminal end options as these seem to be where ADOT and MCDOT have the greatest difference and the most variety exists between agencies. Attached is a proposed revised Section 415 that includes the MCDOT supplemental section, but with references ADOT details (except for measurement).

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.

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 ADOT Roadway Standard Drawing C-10.01.

~~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>
<u>10" by 10" Post and Block</u>	<u>900 psi</u>

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

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

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

The posts and blocksAll timber shall be pressure treated, have a preservative treatment after fabrication with oil borne pentachlorophenol, or coppernaphthenate, as provided inper 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.

General guardrail construction shall be done in accordance with ADOT Roadway Standard Drawings C-10.01, C-10.02 and C-10.03. Departure end terminals shall be done in accordance with ADOT Roadway Standard Drawing C-10.8

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 a~~ 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 ½" 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 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 ADOT Roadway Standard Drawing C-10.07 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 *ADOT Roadway Standard Drawing C-10.06* 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. *Thrie beam to concrete half barrier guardrail transitions shall be in accordance with ADOT Roadway Standard Drawing C-10.30.*

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.



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Case 11-18

DATE: July 11, 2011

TO: MAG Specifications and Details Committee Members

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

RE: **Section 350: Removal of Existing Improvements**

Purpose: Section 350 needs updating to include detailed information on handling utilities when renovations occur within the right-of-way and backfill of voids left from removals where structures are to be installed (manholes, vaults, etc.). Additionally, payment for removals should delineate specific removal items to insure that the scope is understood during the bid process.

Revisions:

- a) Add new language in Section 350.2 for utility removal. Utility abandonment is not permitted unless specified in the
- b) Delete Details 135-1 through 4.
- c) Identify payment for removals for each item.

SECTION 350

REMOVAL OF EXISTING IMPROVEMENTS

350.1 DESCRIPTION:

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

350.2 CONSTRUCTION METHODS:

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

Utilities shall not be abandoned in place below future structures. In all other cases, in-place abandonment shall only be allowed if a plan for abandonment is provided in the plans.

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

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

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

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

Asphalt concrete pavements designated on the plans for removal shall be cut in accordance with Section 336.

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

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

All surplus materials shall be immediately hauled from the jobsite and disposed of in accordance with Section 205.

350.3 MISCELLANEOUS REMOVAL AND OTHER WORK:

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

- (A) Relocate existing fence and gate.

- (B) Remove and reset mail boxes.
- (C) Remove signs and bases in right-of-way.
- (D) Remove planter boxes, block walls, concrete walls, footings, headwalls, irrigation structures, and storm water inlets.
- (E) Install plugs for pipes and remove existing plugs as necessary for new construction.
- (F) Remove wooden and concrete bridges.
- (G) Remove median island slabs.
- (H) Remove pavements and aggregate base where called for outside the roadway prism.

350.4 PAYMENT:

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

SECTION 623

SPECIAL BEDDING FOR MAINLINE STORM DRAIN PIPE

Adding in entirety

The Contractor **shall** utilize a commercial-source ~~cement-enriched slurry aggregate base course~~ ^{1/2-sack cement CLSM in accordance with MAG Section 728 as} bedding from the outside bottom of the pipe to the springline of the pipe for all mainline storm drain pipe, except cast-in-place pipe. ~~The slurry aggregate base course shall be per MAG Specification Section 728. The slurry shall have a minimum 8-inch slump, and a minimum of 25 psi compressive strength and a maximum of 100 psi based on a 28 day test. Cement slurry aggregate base course~~ CLSM bedding is not required for catch basin connector pipes.

~~Only commercial source cement-enriched slurry ABC will be allowed. Batch mixing of slurry on site by the Contractor will not be allowed.~~ The Contractor shall submit the commercial source mix design for ~~cement-enriched slurry ABC~~ ^{CLSM} at the pre-construction meeting, along with all other required commercial mix designs.

The Contractor, **at his option**, may excavate a trench having a cross-section with a rounded bottom rather than a flat bottom. If this option is chosen, the trench cross-section must maintain a minimum of 6-inches between the outside wall of the pipe and the trench wall. The minimum trench width at the springline for each side of the pipe, as specified in Section 601, may be reduced to 6-inches for all pipe sizes if this option is used.

The Contractor, **at his option**, may use ~~cement-enriched slurry aggregate base course~~ ^{1/2-sack cement CLSM} for the bedding material ~~specified in the City of Phoenix Supplement to MAG Section 601.3.2~~ **from the springline to one (1) foot over the outside top of pipe.**

If the Contractor elects to use corrugated steel (CSP) or high density polyethylene (HDPE) storm drain pipe, the Contractor shall use cement-enriched slurry aggregate base course material for the entire pipe bedding, to one (1) foot over the outside top of pipe—no option. ^{1/2-sack cement CLSM}

There will be no separate measurement or payment for ~~special cement-enriched slurry aggregate base course~~ ^{CLSM} bedding. The cost shall be considered incidental to the cost of the pipe.



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Case 11-30

DATE: August 17, 2011
TO: MAG Specifications and Details Committee Members
FROM: Peter Kandaris, SRP Representative
RE: **Revisions to Section 702 – Base Materials**

Purpose: Update standard identified by Outside ROW WG

Revisions: The purpose of the changes is to simplify base material requirements with physical properties shown in a single table. Delete information that is redundant to Section 701 (re-defining general aggregate requirements) and remove language that is vague and cannot be enforced through objective tests.

Major changes are summarized below:

- (a) Delete references to specific aggregate materials such as decomposed granite, slag, etc., as these should be covered by Section 701 requirements.
- (b) Add functional descriptions for ABC and Select Material.
- (c) Consolidate all material requirements into Table 702-1. This includes PI, fractured face and LA abrasion testing.
- (d) Fractured face for ABC was changed from 50% to 30% to match ADOT requirements.
- (e) Change from 1-1/4" sieve to 1" sieve in Table 702-1 as plants do not have the capability to separate at 1-1/4". Modify the gradation requirement for the 1" sieve to meet the same gradation as before.
- (f) Include a referee test for aggregates that exceed a PI of 5. A white paper was prepared by the Materials Working Group to give the rational for using an R-value of 70 if the PI is too high (to be provided to the committee at the next meeting).

SECTION 702 – REVISED 8/7/11

BASE MATERIALS

702.1 GENERAL:

Base materials shall be as defined in Section 701, consisting of appropriately sized coarse and fine aggregates, other inert materials, and/or aggregates that have been treated for plasticity index mitigation, as approved by the Engineer.

When base material without further qualification is specified, the Contractor shall supply Aggregate Base Course as defined in Table 702-1. When a particular classification of base material is specified, the Contractor may substitute any higher classification of base material for the specified classification.

The Contractor shall ~~notify~~provide the Engineer, in writing, material information and the source location at least 10 days prior to use of the material unless the material is currently acceptable for use, as determined by the Engineer.

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

702.1.2 Select Material shall be primarily used, but not limited to applicable structure and pipe backfill installations, shoulders, turnouts, driveways, and tapers or where otherwise specified by project special provisions.

702.2 PHYSICAL PROPERTIES:

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

Table 702- 12			
Sieve Analysis			
Test Methods AASHTO T-27, T-11			
Sieve Size	Accumulative Percentage Passing Sieve, by Weight		
	Select Material		Aggregate Base Course
	Type A	Type B	
3 in.	100	--	--
1-1/2 in.	--	100	100
1 in.	--	--	90 – 100
No. 4	30 - 75	30 - 70	38 - 65
No. 8	20 - 60	20 - 60	25 – 60
No. 30	10 - 40	10 - 40	10 – 40
No. 200	0 - 12	0 - 12	3 – 12
Plasticity Index			
Test Methods AASHTO T-89 Method A, T-90, T146 Method A			
Maximum allowable value	5	5	5
Fractured Face, One Face			
Test Method ARIZ 212, One Face <u>Percent by Weight of the Material Retained on a #4 Sieve</u>			
Minimum required value	30	30	30
Resistance to Degradation <u>and Abrasion by the Los Angeles Abrasion Machine</u>			
Test Method AASHTO T-96, <u>Percent Loss by Weight</u>			
Maximum allowable value at 100 revolutions	10	10	10
Maximum allowable value at 500 revolutions	40	40	40

702.2.2: Base material that does not meet Table 702-1 properties may be approved at the Engineer’s discretion if the R-Value is at least 70 when determined by test method AASHTO T-190.

SECTION 702
BASE MATERIALS

702.1 GENERAL:

Materials for use as aggregate base shall be classified in the order of preference as follows:

- ~~(A) Crushed Aggregate.~~
- ~~(B) Processed Natural Material.~~
- ~~(C) Processed Steel Slag.~~
- ~~(D) Decomposed Granite.~~

Delete. Materials to be used for aggregates are classified in Section 701. Include specific aggregate base limitations and allow for PI stabilized base material.

Base materials shall be as defined in Section 701, consisting of appropriately sized coarse and fine aggregates, other inert materials, and/or aggregates that have been treated for plasticity index mitigation, as approved by the Engineer.

Aggregate Base Course as defined in Table 702-1

When base material without further qualification is specified, the Contractor shall supply ~~crushed aggregate~~. When a particular classification of base material is specified, the Contractor may substitute any higher classification of base material for the specified classification.

"crushed aggregate" is not a defined material. Use ABC as it is a defined product.

~~Except where materials are being obtained from a previously approved source, the Contractor shall give the Engineer 10 days advance notice, in writing, of the source of the base material he intends to use in order to allow sufficient time to perform the necessary tests, unless the material is currently accepted for use, as determined by the Engineer.~~

The Contractor shall provide material information and the source location, in writing, at least

Simplify language. No justification is needed for requiring advanced notification.

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

702.1.2 Select Material shall be primarily used, but not limited to, applicable structure and pipe backfill installations, shoulder, turnouts, driveways, and tapers, or where otherwise specified by the project special provisions.

702.2 CRUSHED AGGREGATE: PHYSICAL PROPERTIES:

~~Crushed aggregate shall consist of crushed rock or crushed gravel or a combination thereof as defined in Section 701.~~ Delete, redundant.

~~702.2.1 Soundness: The percentage of wear of crushed aggregate to be used as base will be determined as in Section 701, except that Grading B of ASTM C-131 shall be used. The percentage of wear of the material shall not exceed 40 after 500 revolutions.~~

Simplify. Put test methods in Table 702-1.

~~702.2.2. Grading: The aggregate shall be well graded when tested in accordance with ASTM C-136 and C-117. The percentage composition by weight shall be within Table 702-1.~~

Table 702-1 CRUSHED AGGREGATE GRADATION			
Sieve Sizes (Square Openings)	Percentage by Weight Passing Sieve		Aggregate Base
	Select Material		
	Type A	Type B	
3"	100		
1 1/2"		100	
1 1/4"			100
No. 4	30-75	30-70	38-65
No. 8	20-60	20-60	25-60
No. 30	10-40	10-40	10-40
No. 200	0-12	0-12	3-12

Place all material grade, PI, fractured face, and abrasion with test requirements in a single table.

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

Table 702-1 Sieve Analysis Test Methods AASHTO T-27, T-11			
Sieve Size	Accumulative Percentage Passing Sieve, by Weight		Aggregate Base Course
	Select Material		
	Type A	Type B	
3 in.	100	--	--
1-1/2 in.	--	100	100
1 in.	--	--	90 - 100
No. 4	30 - 75	30 - 70	38 - 65
No. 8	20 - 60	20 - 60	25 - 60
No. 30	10 - 40	10 - 40	10 - 40
No. 200	0 - 12	0 - 12	3 - 12
Plasticity Index Test Methods AASHTO T-89 Method A, T-90, T146 Method A			
Maximum allowable value	5	5	5
Fractured Face, One Face Test Method ARIZ 212, Percent by Weight of Material Retained on #4 Sieve			
Minimum required value	50 30	50 30	50 30
Resistance to Degradation and Abrasion by the Los Angeles Abrasion Machine Test Method AASHTO T-96, Percent Loss by Weight			
Maximum allowable value at 100 revolutions	10	10	10
Maximum allowable value at 500 revolutions	40	40	40

From 701.2

~~702.2.3 Plasticity Index: Unless otherwise noted, the Plasticity Index as tested in accordance with AASHTO T-146 Method A (Wet Preparation), T-89 and T-90 shall not be more than 5.~~

702.2.2: Base material that does not meet Table 702-1 properties may be approved at the Engineer's discretion if the R-Value is at least 70 when determined by test method AASHTO T-190.

Use the R-value as a referee test if PI is out. See the Working Group white paper analysis. The fractured face count is indirectly referenced in 701.2.1 as 50. Use ARIZ 212 & change to 30 to match ADOT requirements. Sieve changed from 1-1/4" to 1" since plants do not have the ability to grade at 1-1/4 inches. Gradation adjusted for smaller sieve.

SECTION 702

~~702.3 PROCESSED NATURAL MATERIAL.~~

~~702.3.1 General: Processed natural material shall consist of hard, durable fragments of stone or gravel and a filler of sand or other finely divided mineral matter. It shall be free from an excess of soft or disintegrated pieces, alkali, adobe, vegetable matter, loam, or other deleterious substances.~~

Delete. Covered in Section 701.

~~702.3.2 Physical Requirements: When sampled and tested in accordance with standard test methods, the aggregate shall meet the following requirements:~~

~~(A) Percentage of Wear: When tested in accordance with ASTM C 131, the percentage of wear shall not exceed 40 percent after 500 revolutions.~~

Move into Table 702-1

~~(B) Plasticity Index: When tested in accordance with AASHTO T 146 Method A (Wet Preparation), T 89 and T 90, the plasticity index shall not be more than 5.~~

~~(C) Liquid Limit: When tested in accordance with AASHTO T 89, the liquid limit shall not be more than 25 percent.~~

Deleted. Not realistic with PI limit of 5.

~~702.3.3 Crushed Material: Crushed material is not required, but may be incorporated in the finished product.~~

Meaningless – includes no enforceable standard.

~~702.3.4 Grading: The aggregate shall conform to the sieve analysis in this specification except that the least dimension of the maximum particle size shall not exceed 2/3 of the compacted thickness of the specified lift being placed.~~

This is a placement, not a material requirement. Table 702-1 does not provide for changing max particle size for various lift thickness.

~~702.4 DECOMPOSED GRANITE.~~

~~Decomposed granite shall be any granitoid igneous rock which has been weathered in place and which has as principal constituents granular fragments of quartz and feldspar. It may also contain fragments of granitic rock not yet broken down into the component minerals. This material shall remain stable when saturated with water. Particles larger than 2 inches, which will not be broken in the process of rolling and tamping during construction, shall not be used.~~

Meaningless – “stable when saturated with water” and “broken down during the process of rolling and tamping” are subjective. Use LA abrasion testing as a measureable testing method in lieu of subjective requirements.

~~Decomposed granite shall conform to the following requirements:~~

~~(A) When tested in accordance with this specification, not more than 20 percent shall pass the No. 200 mesh sieve.~~

Contradicts Table 702-1 requirements. Delete

~~(B) The P.I. of material passing the No. 200 sieve prior to testing shall not be less than 3 nor greater than 10. The Plasticity Index shall be tested in accordance with AASHTO T 146 Method A (Wet Preparation), T 89 and T 90.~~

~~702.4.1 Preparation of Test Specimens: A quantity of sufficient size to have a dry weight of 15 pounds shall be selected and dried to constant weight at a temperature between 215°F. and 230°F. Fifteen pounds of this material shall then be subjected to 500 revolutions in a Los Angeles abrasion machine, as described in Section 701, except that nothing shall be placed in the drum other than the material to be tested.~~

Covered by the test requirements in Table 702-1.

~~The material that has been subjected to the breakdown shall be tested in accordance with ASTM C 117 to determine the percentage of material finer than a No. 200 mesh sieve by washing.~~

End of Section

SECTION 702
BASE MATERIALS

702.1 GENERAL:

~~Materials for use as aggregate base shall be classified in the order of preference as follows: Base materials shall consist of appropriately sized aggregate as defined in section 701, or other approved inert materials of similar characteristics, including recycled material, and materials that have been treated for plasticity index mitigation. Base materials shall be clean and free from vegetable matter and other deleterious substances. The Contractor shall notify the Engineer, in writing, at least 10 days prior to use of the material unless the material is currently acceptable for use as determined by the Engineer.~~

~~(A) Crushed Aggregate.~~

~~(B) Processed Natural Material.~~

~~(C) Processed Steel Slag.~~

~~(D) Decomposed Granite.~~

~~When base material without further qualification is specified, the Contractor shall supply crushed aggregate. When a particular classification of base material is specified, the Contractor may substitute any higher classification of base material for the specified classification.~~

~~702.1.1 Aggregate base course material shall be used primarily in roadway applications except or where otherwise specified by project special provisions. Aggregate base shall conform to the requirements listed below.~~

~~702.1.2 Select material shall be primarily used, but not limited to applicable structure and pipe backfill installations, shoulders, turnouts, driveways, and tapers or where otherwise specified by project special provisions. Select material shall meet the requirements listed below.~~

~~Except where base materials are being obtained from a previously approved source, the Contractor shall give the Engineer 10 days advance notice, in writing, of the source of the base material he intends to use in order to allow sufficient time to perform the necessary tests.~~

702.2 CRUSHED AGGREGATE PHYSICAL PROPERTIES:

~~Crushed aggregate shall consist of crushed rock or crushed gravel or a combination thereof as defined in Section 701.~~

~~**702.2.1 Soundness/Abrasion:** The percentage of wear of crushed aggregate to be used as base will be determined as in Section 701, except that using Grading B of ASTM C 131, grading B shall be used. The percentage of wear of the material shall not exceed 40 after 500 revolutions.~~

~~**702.2.2 Angularity:** The amount of coarse aggregate particles retained in the No. 4 sieve shall be a minimum of 50% as determined in accordance with test method Ariz 212.~~

Comment [DR6]: Included in table?

Comment [DR7]: Included in table?

~~702.2.2.13- Grading: -The aggregate base material shall be well-graded when tested in accordance with ASTM C-436 and C-117. The percentage composition by weight shall be within Table 702-1, meet the physical properties listed in Table 702-2.~~

Table 702-12			
Sieve Analysis			
Test Methods AASHTO T-27, T-11			
Sieve Size	Accumulative Percentage Passing Sieve, by Weight		
	Select Material		Aggregate Base Course
	Type A	Type B	
3 in.	100	--	--
1-1/2 in.	--	100	100
1 in.	--	--	90 - 100
No. 4	30 - 75	30 - 70	38 - 65
No. 8	20 - 60	20 - 60	25 - 60
No. 30	10 - 40	10 - 40	10 - 40
No. 200	0 - 12	0 - 12	3 - 12
Plasticity Index			
Test Methods AASHTO T-89 Method A, T-90, T146 Method A			
Maximum allowable value	5	5	5
Fractured Face			
Test Method ARIZ 212, One Face			
Minimum required value	30	30	3050
Resistance to Degradation			
Test Method AASHTO T-96			
Maximum allowable value at 100 revolutions	10	10	10
Maximum allowable value at 500 revolutions	40	40	40

Table 702-1

CRUSHED AGGREGATE GRADATION

Sieve Sizes (Square Openings)	Percentage by Weight Passing Sieve		Aggregate Base
	Select Material		
	Type A	Type B	
3"	100		
1 1/2"		100	
1 1/4"			100
No. 4	30-75	30-70	38-65
No. 8	20-60	20-60	25-60
No. 30	10-40	10-40	10-40
No. 200	0-12	0-12	3-12

702.2.2: Base material that does not meet Table 702-2 properties may be approved, at the Engineer's discretion, if the R-Value is a minimum of 70 when determined by test method AASHTO T-190.

702.2.3 Plasticity Index: Unless otherwise noted, the Plasticity Index as tested in accordance with AASHTO T 146 Method A (Wet Preparation), T 89 and T 90 shall not be more than 5.

Comment [DR8]: Table to be re-written by Mike Whitman

702.3 PROCESSED NATURAL MATERIAL:

702.3.1 General: Processed natural material shall consist of hard, durable fragments of stone or gravel and a filler of sand or other finely divided mineral matter. It shall be free from an excess of soft or disintegrated pieces, alkali, adobe, vegetable matter, loam, or other deleterious substances.

702.3.2 Physical Requirements: When sampled and tested in accordance with standard test methods, the aggregate shall meet the following requirements:

(A) Percentage of Wear: When tested in accordance with ASTM C 131, the percentage of wear shall not exceed 40 percent after 500 revolutions.

(B) Plasticity Index: When tested in accordance with AASHTO T 146 Method A (Wet Preparation), T 89 and T 90, the plasticity index shall not be more than 5.

(C) Liquid Limit: When tested in accordance with AASHTO T 89, the liquid limit shall not be more than 25 percent.

702.3.3 Crushed Material: Crushed material is not required, but may be incorporated in the finished product.

702.3.4 Grading: The aggregate shall conform to the sieve analysis in this specification except that the least dimension of the maximum particle size shall not exceed 2/3 of the compacted thickness of the specified lift being placed.

702.4 DECOMPOSED GRANITE:

Decomposed granite shall be any granitoid igneous rock which has been weathered in place and which has as principal constituents granular fragments of quartz and feldspar. It may also contain fragments of granitic rock not yet broken down into the component minerals. This material shall remain stable when saturated with water. Particles larger than 3 inches, which will not be broken in the process of rolling and tamping during construction, shall not be used.

SECTION ~~701~~703

Decomposed granite shall conform to the following requirements:

(A) When tested in accordance with this specification, not more than 20 percent shall pass the No. 200 mesh sieve.

(B) The P.I. of material passing the No. 200 sieve prior to testing shall not be less than 3 nor greater than 10. The Plasticity Index shall be tested in accordance with AASHTO T 146 Method A (Wet Preparation), T 89 and T 90.

~~702.4.1 Preparation of Test Specimens:~~ A quantity of sufficient size to have a dry weight of 15 pounds shall be selected and dried to constant weight at a temperature between 215°F. and 230°F. Fifteen pounds of this material shall then be subjected to 500 revolutions in a Los Angeles abrasion machine, as described in Section 701, except that nothing shall be placed in the drum other than the material to be tested.

The material that has been subjected to the breakdown shall be tested in accordance with ASTM C 117 to determine the percentage of material finer than a No. 200 mesh sieve by washing.

End of Section

SECTION 310

PLACEMENT AND CONSTRUCTION OF AGGREGATE BASE COURSE

310.1 DESCRIPTION:

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

310.2 PLACEMENT AND CONSTRUCTION:

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

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

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

310.3 COMPACTION

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

The laboratory maximum dry density and optimum moisture content for the aggregate base course material shall be determined in accordance with AASHTO T-99. Field 'one-point' maximum dry density and optimum moisture procedures shall only be allowed upon approval of the Engineer.

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

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

For roadway construction, one field density test shall be performed per lift per 660 feet per lane. For other aggregate base course applications, a minimum of 1 field density test shall be performed for each 800 square yards. ~~More or less frequent testing may be performed at the approval of the Engineer.~~

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

SECTION 310

The following percent compaction is required:

- | | |
|---|------|
| (A) Below asphalt concrete pavement | 100% |
| (B) Below Portland cement concrete pavement, curb & gutter, attached sidewalk, roadway
Shoulders, and other areas of the right-of-way subject to vehicular traffic | 95% |
| (C) All other areas not subject to vehicular traffic | 85% |

Areas which fail initial testing for density and/or moisture content shall be reworked until passing tests for density and/or moisture content are achieved. Lower moisture content percentages at the time of field density testing may be allowed if significant time has passed since the time of compaction and the required density has been achieved.

310.4 THICKNESS AND/OR PLASTICITY INDEX DEFICIENCY:

When in the opinion of the Engineer there is reason to believe that a deficiency in thickness, or an excess of plasticity exists, measurements or samples will be taken in the same pattern as that defined in Section 321. If the base has been covered or it is otherwise impractical to correct the deficiency, the corrective measures in Table 310-1 shall be taken by the Contractor at no additional cost to the Contracting Agency.

TABLE 310-1

THICKNESS AND PLASTICITY DEFICIENCY

Type	Deficiency	Corrective Measure
I	Less than ½ inch of the required thickness	No corrective measure required.
II	½ inch or more but less than 1 inch of the required thickness	(1) The contractor may choose to add additional material and rework the grade to meet the specification requirements. (2) The contractor may choose to increase the thickness of asphalt concrete by the amount of the aggregate base course thickness deficiency at no additional cost to the Owner. Required grade shall be met.
III	Thickness deficiency by greater than 1 inch	(1) The contractor will remove the aggregate base course and regrade the subgrade to allow the required aggregate base course layer thickness to be constructed. (2) If grades allow, the contractor may propose that the thickness of asphalt concrete be increased by the amount of the aggregate base course deficiency at no additional cost to the Owner.
IV	A plasticity index of 6 to 7 inclusive	(1) An Engineering Analysis (EA) may be prepared by the contractor to evaluate the expected performance of the aggregate base course layer. The EA may provide mitigation options for the Engineer to consider. If the Engineer accepts the plasticity index as a result of the EA, the material will be accepted at full payment. If the Engineer rejects the EA, the contractor will perform either option 2 or 3

SECTION 310

below.

(2) The contractor may choose to reprocess or treat the existing material to bring it within specification limits or remove deficient material from affected area and replace with material complying with the specifications.

(3) If grades allow, the contractor may increase the thickness of asphalt concrete by ½-inch at no additional cost to the Owner.

V A plasticity index of over 7

(1) The contractor may choose to reprocess or treat the existing material to bring it within specification limits or remove deficient material from affected area and replace with material complying with the specifications.

310.4 PAYMENT:

Payment for aggregate base course will be made on the basis of the contract unit price per ton unless an alternate basis of payment is provided in the proposal.

SECTION 310

UNTREATED PLACEMENT AND CONSTRUCTION OF AGGREGATE BASE COURSE

310.1 DESCRIPTION:

~~Untreated base, i.e., select or a~~ Aggregate base course, shall comply with Subsection 702.2 unless the use of a different type of material is specifically authorized in the special provisions.

310.2 ~~PLACING~~ PLACEMENT AND CONSTRUCTION:

~~The compacted lift thickness shall not exceed 6 inches, unless approved by the Engineer. Based on Aggregate Untreated base course shall be placed in lifts the height of which shall not exceed that which can be effectively compacted depending on the type of material, type of equipment and compaction methods used, the Contractor may propose a greater lift thickness. 6 inches or less in compacted thickness may be placed not to exceed 12" in a single layer. Lifts in excess of and those more than 6 inches in thickness shall be built up in successive layers of approximately equal compacted thickness not to exceed a maximum thickness of 6 inches. The requirements which follow are applicable to all types of material.~~

After distributing, the aggregate base course material shall first be watered and then ~~immediately graded~~ bladed to a uniform layer that will net, after ~~compacting~~ rolling, the required thickness. ~~If the materials deposited are not uniformly blended together, the grading~~ blading operation shall be continued to such extent as may be necessary to ~~minimize~~ eliminate segregation. The quantity of water applied shall be that amount which will assure proper compaction resulting in ~~the a relative density of not less than 100 percent as determined under Section 301~~ as required by Section 310.3.

~~Care shall be exercised in connection with watering operations to avoid wetting the subgrade or any lower base course to detrimental extent.~~

~~Upon completion~~ After placement, the aggregate base course surface shall be true, even and uniform conforming to the grade and cross-section specified.

~~In no case shall the Untreated~~ Aggregate base course ~~may vary by~~ not more than 1/2 inch above or below required grade, ~~and cross section.~~

310.3 COMPACTION

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

~~The AASHTO procedures described in the section will be utilized unless the Engineer allows the corresponding ARIZ or ASTM procedure to be substituted. The laboratory maximum dry density and optimum moisture content for the aggregate base course material shall be determined in accordance with one of the following procedures: ARIZ 245, AASHTO T 99, or ASTM D698~~ AASHTO T-99. Field 'one-point' maximum dry density and optimum moisture procedures shall only be allowed upon approval of the Engineer.

~~The in-place density shall be determined in the field by nuclear density testing in accordance with AASHTO T-310 sandcone density testing and/or nuclear density testing. Sandcone density testing shall be performed in accordance with one of the following procedures: ARIZ 238, AASHTO T191, or ASTM D1556 and/or sandcone density testing in accordance with AASHTO T-191~~ nuclear density testing shall be performed in accordance with ARIZ 235, AASHTO T310, or ASTM D6938. In the event nuclear density testing is selected, a minimum of one sandcone correlation shall be performed for each 10 nuclear density tests.

SECTION 310

A rock correction, to compensate for rock content larger than the #4 or ¾ inch sieves (as required by the laboratory maximum dry density and optimum moisture procedure selected), shall be performed in accordance with ~~one of the following procedures: ARIZ 227, AASHTO T224, or ASTM D4718~~AASHTO T-224. Care should be taken to account for the specific gravity of the oversize particles ~~especially~~particularly if recycled materials are utilized for aggregate base course. The specific gravity shall be determined ~~in accordance with the one of the following procedures: ARIZ 210, AASHTO T85, or ASTM C127~~AASHTO T-85, as applicable.~~(How can you run C 127 on RAP or Asphalt Millings~~

~~One field density test shall be performed on each lift of aggregate base course.~~ For roadway construction, one field density test shall be performed ~~for per lift per each~~ 6650 feet per lane width ~~(Is this consistent)~~. For other aggregate base course applications, a minimum of 1 field density test shall be performed for each 800 square yards. ~~More or less frequent testing may be performed at the approval of the Engineer.~~

Unless otherwise noted in the project plans or project specifications, the moisture content of the aggregate base course at the time of compaction shall be ~~the~~ optimum moisture content ~~to~~ +/- 23% ~~of optimum moisture content.~~

SECTION 310

The following percent compaction is required:

- (A) Below asphalt concrete pavement 100%
- (B) Below Portland cement concrete pavement, curb & gutter, attached sidewalk, roadway Shoulders, and other areas of the right-of-way subject to vehicular traffic 95%
- (C) ~~Below detached sidewalk or other flatwork~~ All other areas not subject to vehicular traffic
~~85~~^{85.90}%

Areas which fail initial ~~field density~~ testing for density and/or moisture content shall be reworked until passing tests for density and/or moisture content are achieved. ~~Lower moisture content percentages at the time of field density testing may-~~ be allowed if significant time has passed since the time of compaction and the required density has been achieved.

310.43 THICKNESS AND/OR PLASTICITY INDEX DEFICIENCY:

When in the opinion of the Engineer there is reason to believe that a deficiency in thickness, or an excess of plasticity exists, measurements or samples will be taken in the same pattern as that defined in Section 321. If the base has been covered or it is otherwise impractical to correct the deficiency, the corrective measures in Table 310-1 shall be taken by the Contractor at no additional cost to the Contracting Agency.

TABLE 310-1

THICKNESS AND PLASTICITY DEFICIENCY

Type	Deficiency	Corrective Measure
<u>I</u>	<u>Less than ½ inch of the required thickness</u>	<u>No corrective measure required.</u>
<u>II</u>	<u>½ inch or more but less than 1 inch of the required thickness</u>	<u>Place asphalt chip seal using pre-coated chips in accordance with Section 330 for the full roadway width over the area involved but for not less than 660 feet or one City block in length. (1) The contractor may choose to add additional material and rework the grade to meet the specification requirements.</u> <u>An Engineering Analysis (EA) shall be prepared by the contractor to evaluate the expected performance of the reduced aggregate base course layer. The EA may provide mitigation options for the Engineer to consider. If the Engineer accepts the in-place thickness as a result of the EA, a penalty of \$1/ton shall be applied to the subject aggregate base course the Contractor shall reimburse the Agency for reduced aggregate base course quantities.</u> <u>(2) The contractor may choose to increase the thickness of asphalt concrete by the amount of the aggregate base course thickness deficiency at no additional cost to the Owner. Required grade shall be met.</u>
<u>III</u>	<u>1 inch or more in thickness deficiency by greater than 1 inch</u>	<u>Place an additional asphalt concrete overlay, a 9.5 mm mix, of ½ the thickness of the deficiency in thickness for the full roadway width over the area involved, not less than 660 feet or one City block in length. (1) The contractor will remove the Aggregate base course removed and regrade the subgrade regraded to</u>

SECTION 310

- allow the required aggregate base course layer thickness to be constructed.
- (2) If grades allow, the ~~Engineer~~ contractor may propose that allow the thickness of asphalt concrete to be increased by the amount of the aggregate base course deficiency at no additional cost to the Owner.
- IVH A plasticity index of 6 to 7 inclusive* Place an asphalt concrete overlay ½ inch in thickness over the same total area as required for Type I and II. (1) An Engineering Analysis (EA) shall may be prepared by the contractor to evaluate the expected performance of the aggregate base course layer. The EA may provide mitigation options for the Engineer to consider. If the Engineer accepts the plasticity index as a result of the EA, the material will be accepted at full payment. If the Engineer rejects the EA, the contractor will perform either option 2 or 3 below.
- (2) The contractor may choose to reprocess or treat the existing material to bring it within specification limits or remove deficient material from affected area and replace with material complying with the specifications.
- (3) If grades allow, the contractor may increase the thickness of asphalt concrete by ½-inch at no additional cost to the Owner. If the Engineer accepts the in-place thickness as a result of the EA, a penalty of \$1/ton shall be applied to the subject aggregate base course.
- IV A plasticity index of over 7* (1) The contractor may choose to reprocess or treat the existing material to bring it within specification limits or Rremove deficient material from affected area and replace with material complying with the specifications.

* The plasticity index shall be in accordance with AASHTO T 146 Method A (wet preparation), T 89 and T 90.

310.4 PAYMENT:

Payment for aggregate untreated base course will be made on the basis of the contract unit price per ton unless an alternate basis of payment is provided in the proposal.

Water/Sewer Working Group Meeting

Meeting Notes
October 18, 2011

Opening:

A meeting of the Specifications and Details Water/Sewer Working Group was called to order by acting chair Scott Zipprich on October 18, 2011 at 1:40 p.m. in the MAG Cholla Room.

1. Participants

Mark Ivanich (Glendale), Bill Romo (Ferguson), Matt Savage (Ferguson), Gordon Tyus (MAG), Scott Zipprich (Buckeye)

2. Manhole Frames and Covers (Case 11-13)

Scott Zipprich said based on feedback during the last MAG committee meeting, he thought there was no need to create a separate detail just for bolt-down covers. He said intended to update the Pressure Manhole Frame and Cover Details, and introduce them as a new case in January. He handed out draft details 523-1 (24") and 523-2 (30") Pressure Manhole Frame and Covers. Gordon Tyus said he finished updating the manhole frame and cover details that were approved at the last meeting.

3. Wet Barrel Fire Hydrant Spec and Detail Update

This is currently Case 11-14 at the committee. Scott Zipprich handed out revised details 360-1 (Dry Barrel) 360-2 (Wet Barrel) and 360-3 (Hydrant Details) to the work group. He said that Jim Badowich is reviewing them. Mark Ivanich asked about the concrete pad. Bill Romo said manufacturers specify its use. (It helps shear the hydrant when hit.) For wet-barrel hydrants the pad must be at the check valve. Mr. Tyus said plan view on 360-3 may be more appropriate on existing 362. Mr. Zipprich agreed that 362 also should be reviewed; an example was the maximum 6' clearance zone. Mr. Ivanich said that maximum came from the Glendale Fire Department, who cut and repair hoses down to six feet in length. Mr. Tyus suggested preparing a package specifically for agency fire departments to get their feedback on the details. There was also discussion about the use of the adjustable Gradelock, thrust blocks and restraint systems.

4. Pre-Cast Manhole Bases

Scott Zipprich handed out sample details for precast manhole bases. He said they had researched different companies, and was planning to visit Old Castle. The draft details were developed by Buckeye to allow pre-cast bases as an option. He said a problem with how they are currently locally manufactured is they bore holes to make room for the connections, which exposes steel, and could lead to rapid deterioration. Mr. Zipprich wants a flexible connected and gasket. Mark Ivanich said that Glendale requires submittals to use pre-cast bases, and suggested rather than adding generic details, the written specifications could be updated.

5. Manhole Detail Updates

Gordon Tyus noted that Jim Badowich was planning to make updates to the manhole details, and it would make sense to update the specifications at the same time. Scott Zipprich said the manholes needed to remove brick (other than for repairs) and the steps. There was also

discussion on adding steel to the base of manholes 12'-16' deep, and requiring designs for deeper installations. Mark Ivanich said they chip-out the concrete when tapping into a manhole, and wanted to make sure that any bases not have steel within the area needed to add lines. Mr. Tyus asked if the brick manhole details could be completely removed, and have any necessary requirements on them updated on the precast manhole details. Mark Ivanich said that Glendale doesn't allow 24" manhole frame and covers. They require 30" frames and 5' manholes, and suggested MAG may want to move in this direction. Those present agreed that 24" manhole frame and covers really were too small for people to get in and out, especially with a ladder and equipment, although the 24" manhole frame and cover details may need to remain in the book for maintenance of existing manholes.

6. Other Specifications

Mr. Zipprich reviewed and summarized the progress in other areas based on the previous meeting's notes. There was a short discussion on the difficulties with fiberglass pipe in installations in Phoenix, Glendale and Buckeye. Members also discussed creating new adjustment details designed for the street construction contractor.

7. Next Meeting Date

Members agreed to tentatively schedule the next meeting on Tuesday, November 15th at 1:30 at the MAG office.

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January 2012

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