

January 25, 2012

TO: Members of the MAG Standard Specifications and Details Committee

FROM: Troy Tobiasson, City of Goodyear, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Wednesday, February 1, 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
February 1, 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 January 4, 2012, Meeting Minutes</u> | 3. Review and approve minutes of the January 4, 2012 meeting. |

Cases Carried Forward from 2011

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| 4. <u>Case 11-02:</u>
Add an Asphalt Pavement Safety Edge option to Detail 201. | 4. Information and discussion.
Sponsor: Bob Herz, Maricopa County |
| 5. <u>Case 11-03:</u>
Replace cadmium plated bolts referenced in Section 610.13 with zinc plated bolts as described in ASTM-B633. | 5. Information and discussion.
Sponsor: Paul Nebeker |
| 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 Kandararis</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 Kandararis, SRP</p> |

New Cases for 2012

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| <p>12. <u>Case 12-01 Miscellaneous Corrections:</u>
A. Typographic corrections in Section 108.8</p> | <p>12. Information and discussion.</p> |
| <p>13. <u>Other New Cases</u></p> | <p>13. Information and discussion.</p> |
| <p>14. <u>Potential Cases for 2012</u>
Discussion about cases that could be brought forward in 2012.</p> | <p>14. Information and discussion.</p> |

General Discussion

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| <p>15. <u>Working Group Reports</u></p> <p>A. Water/Sewer Working Group
Report on 10/17/2011 meeting.</p> <p>B. Outside Right-of-Way Working Group
Report on 10/17/2011 meeting.</p> <p>C. Asphalt Working Group
Report on 1/18/2012 meeting.</p> <p>D. Materials Working Group
Progress Update.</p> <p>E. Concrete Working Group
Report on 1/18/2012 meeting.</p> | <p>15. Information and discussion.</p> <p>A. Water/Sewer Chair: Jim Badowich, Avondale,</p> <p>B. Outside ROW Chair: Peter Kandararis, SRP</p> <p>C. Asphalt Chair: Jeff Benedict, AGC</p> <p>D. Materials Chair: Brian Gallamore, AGC</p> <p>E. Concrete Chair: Jeff Hearne, ARPA</p> |
| <p>16. <u>Staff Reports</u>
ASTM portal access reminder.</p> | <p>16. Information and discussion.</p> |

Specs and Details are posted online:
<http://www.azmag.gov/Communications/publications.asp>

17. Open General Discussion
Members can report on any items of interest to the committee.

17. Information and discussion.

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

18. Information and discussion.

Adjournment

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

January 4, 2012

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

AGENCY MEMBERS

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

ADVISORY MEMBERS

Jeff Benedict, ARPA	Jeff Hearne, ARPA
Tony Braun, NUCA	Peter Kandaris, SRP
Bill Davis, NUCA (proxy)	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
Bob Erdman, Cutler Repaving
Michael Hook, ACPA
Tom Villa, Drake Materials

1. Call to Order

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

2. Call to the Audience

Mr. Tom Villa of Drake Materials introduced himself and asked the committee if they had considered using recycled concrete materials in CLSM applications. Mr. Tobiasson said there has been discussion about the use of recycled materials, and that he may want to contribute to the materials or concrete working group that are currently addressing the issue.

3. Approval of Minutes

The members reviewed the October 5, 2011 meeting minutes. Tom Wilhite introduced a motion to accept the minutes as written. Rod Ramos seconded the motion. A voice vote of all ayes and no nays was recorded.

Review of 2011 Carry Forward Cases

4. Case 11-02 – Safety Edge Detail

Add an Asphalt Pavement Safety Edge option to Detail 201. Bob Herz handed out a new detail drawing dated 12/11 that showed safety edge sections for both overlay and new pavement based on FHWA requirements. He noted that construction using these methods was difficult, and the county is still looking for ways to improve the details for better ease of construction; and was open for suggestions on how to do that. Rod Ramos asked if they used a shoe. Mr. Herz replied that they would be getting one as a loner to use on a future project, but have not tested it yet. He said they are currently using these details at the county until better ones are developed. Mr. Herz also noted that Chandler asked if the safety edge should be used in the alley details instead of the thickened edge. He doesn't think it should, because the purpose of the safety edge is to reduce overcorrection problems where speed is an issue. He said MCDOT does not require a safety edge on roads with speeds 40 mph or less. Peter Kandaris said the detail could be used for other applications. He said SRP uses a safety edge on access roads where vehicles frequently move on and off the road. Rod Ramos noted you can call out the detail as needed.

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

Replace cadmium plated bolts referenced in Section 610.13 with zinc plated bolts as described in ASTM-B633. Paul Nebeker said he had not investigated this issue since the last meeting. The sample spec in the agenda was based on a submission from Peoria, so he said he would talk to their representative. He explained that he would not be able to attend the next committee meeting, but perhaps Mr. Setovich would be able to fill them in.

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

Add references to Arizona native plant requirements update references to state statutes. Mr. Kandaris asked for feedback on this case, stating a new standard was needed since ARS 23-373 no longer exists. He said that it needed legal review and asked if any agency would be able to help. He also brought up the question of how many statutes should be included or referenced in the MAG specifications.

7. Case 11-14: Update Fire Hydrant Details

Update Detail 360-1, and add Wet Barrel Option (360-2) and Details (360-3). Scott Zipprich handed out the latest draft details presented during the October Water/Sewer Working Group meeting. In addition to the details, he prepared a draft letter to be forwarded to the agency fire departments so they could review the proposed details and provide feedback needed to revise them and have them accepted by the cities. He said the details added a wet barrel option, and tried to combine the requirements from current agency supplemental details. He gave the example of sheer block options shown on the details that could be specified by the agency depending upon their preference. The goal is to make relatively all-inclusive details that pull everyone's ideas together. Mr. Zipprich welcomed comments and said they would continue to be an item of discussion at the Water/Sewer Working Group meetings, and would like to have them approved this year.

Jim Badowich said some concerns of the fire departments are the clearance and setback requirements, which can vary from 36" to 7'. He also said hydrant threads were an issue, as well as the number of ports – typically 3 on commercial hydrants and 2 for residential area hydrants. Paul Nebeker said Chandler locks their hydrants. Mr. Zipprich said they decided to leave the lock off the main details, but an optional lock detail could be added later.

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

Update Section 415 based on the Maricopa County Supplement. Reference New Details. Peter Kandaris said there were two main goals needed to complete this case. One, is to update the specification, and two, is to decide how to handle the guardrail details which were deleted from the MAG book in the new edition. He said the current specification is essentially based on the county's supplement. For the details he recommended that rather than create our own, we either adopt Maricopa County's or ADOTs. Mr. Herz said the county has revised details not yet published they can provide. He also explained that they use a sole supplier to ensure the rails and end-caps meet current safety requirements. Mr. Kandaris said the county details are simpler, but the ADOT details provide more options. He said he would gather both county and ADOT details for further discussion at the next meeting.

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

Add language in Section 350.2 for utility removal, and payment requirements. Peter Kandaris said currently there is no language to handle utilities – whether they should be kept or

removed. He said ADOT is also currently reviewing this topic, and hopes to get feedback from their meetings as well. He said payment language was changed to get proposal prices for each item removed, rather than an overall removal price that did not address the scope of what was to be removed. He asked agencies to review the case and provide feedback.

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

Incorporate City of Phoenix supplement 623 into the MAG standards. Syd Anderson said the latest version of the case from last year was included in the packet. He said the revised version updates references to the new CLSM standards that were adopted. He said the purpose of the case was to address settlement and testing issues.

Bill Davis of NUCA said industry was opposed to this change, stating that the ASTM D2321 standard for installation does not require a slurry seal. He believes the slurry adds greatly to the cost of installation, and also worries that possible floatation of the pipe could cause misalignment.

Mr. Anderson said that Phoenix has been requiring CLSM slurry for mainline storm drains for 15-20 years, due to a previous failure in the street. Chair Tobiasson asked if other agencies use slurry for bedding. Bob Draper said Mesa uses it to ensure compaction, and for safety issues. Peter Kandarlis said SRP uses it for irrigation pipe, mainly to get the job done faster and get out of the street. Glendale also was said to use slurry.

Jim Badowich said there can also be confusion as to what the term bedding means, since common uses is that bedding is what the pipe rest on, yet it is referred to differently in other specifications. Bob Herz said MAG detail 200-2 shows the bedding zone from the bottom of the pipe to 1' above the pipe.

Greg Crossman asked if this new specification applied only to storm drains. Mr. Anderson said yes, and clarified that it would replace the requirements in Section 603.4.2 for bedding. Mr. Tobiasson asked if a detail could be provided to help clarify these issues. Mr. Anderson said he could include one for the next meeting.

11. 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 during the holiday break; however, he would like them by the next meeting, and proposed to vote on the case in March. Troy Tobiasson said agencies may want to take it to their labs to get feedback. Jeff Benedict said that you may want to accept changes on the draft version, which would make it easier to follow and understand the final proposed specification. Mr. Kandarlis said a “roadmap” version is also available to track the changes made.

New 2012 Cases

12. Proposed Cases

Syd Anderson said Phoenix is developing guidelines for milling and overlay work on high wind advisory days to reduce the amount of dust during construction. He said there are some general precautions in Section 104.1, but no specific requirements for this issue. He said that in their practice using two applications of a 50% tack coat helps reduce dust. The tack coat prevents the dust from coming up off the roadway until paving is completed. Mr. Herz said it could be added to the section on milling or paving. Brian Gallimore said he proposed this method and worked with the City of Phoenix, but that other agencies didn't want to try it. He said it worked well and assured that there was very little tracking. Jim Badowich asked if having the fine dust "tacked down" reduced the adherence of the final roadway surface. Jeff Benedict said it is still swept before the tack coat is applied. Peter Kandaris added that the ridges are more important in getting the interlocking attachment anyway. There is a second tack coat applied before paving. Syd Anderson said he would work on putting a case together for the next meeting.

Chair Tobiasson referred a handout provided by Mr. Tyus which summarized additional proposed cases that had been discussed in the past. It included cases that were withdrawn, cases that were reduced in scope from their initial proposal, and other potential cases discussed during committee and working group meetings. Mr. Tobiasson asked members to review the list and see if there were any cases they wished to resurrect or continue to pursue.

One listed was the case updating ASTM references. A handout was provided by Mr. Tyus. He explained that the top references in green had been corrected last year, or removed when sections were rewritten or deleted. The bottom half of the page listed the remaining ASTM references still in the new edition, which needed to be updated. Mr. Kandaris said he had someone in his office who can work on this case.

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

Jim Badowich said the next meeting is scheduled for Tuesday, January 17th at 1:30 at the MAG office. Mr. Tyus said he would reserve a room. The group will continue to work on issues shown in the notes from the October 18, 2011 meeting. He said they appreciate the input of industry members, such as representatives from Ferguson, that have attended past meetings.

b. **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 January 17th at about 3:15. The group will follow-up on the carry over cases, such as the guardrails.

c. **Asphalt Working Group**

Jeff Benedict said ARPA has their normal technical meeting next week when they will decide when to have the next working group meeting. It likely will be the 18th or 19th of January. He will let Mr. Tyus know the meeting time, so it can be posted.

d. **Materials Working Group**

Brian Gallimore said the group met in December, and began discussing potential new cases. First they would like to complete Case 11-30. The next meeting will be scheduled based on feedback and comments received on this case, so they can respond if necessary.

e. **Concrete Working Group**

Jeff Hearne said the group has been working in smaller groups on potential cases. The next meeting is scheduled for January 18th at 1:30 p.m. at the ARPA office. One topic of discussion will likely be recycled aggregates, but whether to include them in specific sections or as a new specification was up for discussion. Peter Kandaris said recycled aggregates would need performance specifications.

14. Staff Reports

Gordon Tyus provided an update on the 2012 Edition of the MAG Specifications and Details publication. He provided copies to the committee members and said MAG now has hard copies available for sale. The prices of the books have been reduced and are based only on recouping printing costs. Since there are no update packets, the full printed book is priced at \$20.50 before tax and \$22.00 after tax. This price will not include a blue binder. Binders are available for an additional \$10.00 (including tax). Shipping/handling costs are still \$5. Additional discussion about new editions/update is likely needed going forward.

Mr. Tyus also discussed the electronic version of the book. He showed the committee members where it is linked on the MAG website, and that it can be downloaded for free. Once opened, he noted the new cover design, and 1 page summary of changes. He also demonstrated the new hyperlinks in the PDF files, that allow users to jump from the table of contents to any section, as well as jump to referenced sections within the text. Similar hyperlinks were demonstrated in the detail drawings PDF file. Mr. Tyus explained that the file has also been tested using the iPad and iPhone. Members appreciated the new convenient links, and the overall work in preparing the final document for publication.

15. Open General Discussion

Jim Badowich said he attended a recent pavement conference, and noted that the federal government had a grant program to get a shoe for constructing safety edges. Mr. Herz said you need to have a demonstration project to get the loaner awarded for the construction.

Tom Wilhite asked about ADA criteria and changes. Bob Herz said one proposed change to require 4' sidewalk clearance would necessitate updating the driveway details, and can effect right-of-way requirements. The new changes may also require dual sidewalk ramps. He was not sure when the new requirements were finalized, possibly March or April. He noted the comment period ends in February. Sheina Hughes said Chandler was required to use the dual ramps to meet requirements for federally funded projects.

Troy Tobiasson asked if other agencies are investigating the use of speed cushions rather than speed humps for traffic calming. He thought that there could be problems making them work in streets with bike lanes and on-street parking. Jim Badowich said they are trying one. Rod Ramos said Scottsdale installed a couple manufactured ones. Brian Gallimore said Glendale and Mesa have used them, and Greg Crossman said Gilbert has as well. Mr. Tobiasson asked several questions such as the number, road widths, and interference with parked cars, as well as what the fire departments thought about them.

Jami Erickson said she and Tom Wilhite gave a presentation on the changes in the new edition of the specs to ACI. She said the PowerPoint is available from Mr. Tyus if other members would like to use it.

16. Adjournment:

Mr. Tobiasson adjourned the meeting at 3:00 p.m.

2012 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

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

CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE	
	CARRY FORWARD CASES FROM 2011						
11-02	Case 11-02: Add an Asphalt Pavement Safety Edge option to Detail 201.	MCDOT	Bob Herz	01/05/2011 01/04/2012		0 0 0	Yes No Abstain
11-03	Case 11-03: Replace cadmium plated bolts referenced in Section 610.13 with zinc plated bolts as described in ASTM-B633.	Peoria	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 01/04/2012		0 0 0	Yes No Abstain
11-16	Case 11-16: Modify Section 415: Steel Flexible Metal Guardrail.	OROW WG/ SRP	Peter Kandaris	07/13/2011 01/17/2012		0 0 0	Yes No Abstain
11-18	Case 11-18: Update Section 350: Removal of Existing Improvements.	OROW WG/ SRP	Peter Kandaris	07/13/2011		0 0 0	Yes No Abstain
11-21	Case 11-21: Add new Section 623: Special Bedding for Mainline Storm Drain Pipe.	Phoenix	Syd Anderson	07/13/2011 01/04/2012		0 0 0	Yes No Abstain
11-30	Case 11-30: Update Section 702: Base Material. Moved all ABC material to Section 310. Revise Section 310: Untreated Base Course. Revise for current standards. Update all references to Section 702. (Combined with previous Case 11-35.)	AGC/ Materials WG	Brian Gallimore	07/13/2011 01/18/2012		0 0 0	Yes No Abstain

2012 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

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

CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE
	NEW CASES FOR 2012					
12-01	Case 12-01: Miscellaneous Corrections A. Section 108 typographic errors	Goodyear	Troy Tobaisson	02/01/2012		0 Yes 0 No 0 Abstain
12-02	Case 12-02: Modify Section 710 Asphalt Concrete to include low traffic gyration levels.	ARPA/ Asphalt WG	Jeff Benedict	02/01/2012		0 Yes 0 No 0 Abstain
12-03	Case 12-03:					0 Yes 0 No 0 Abstain
12-04	Case 12-04:					0 Yes 0 No 0 Abstain
12-05	Case 12-05:					0 Yes 0 No 0 Abstain

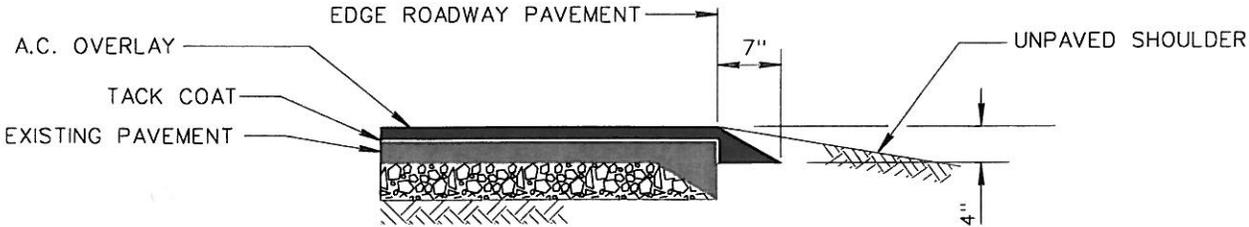
Add the following to Section 321:

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.

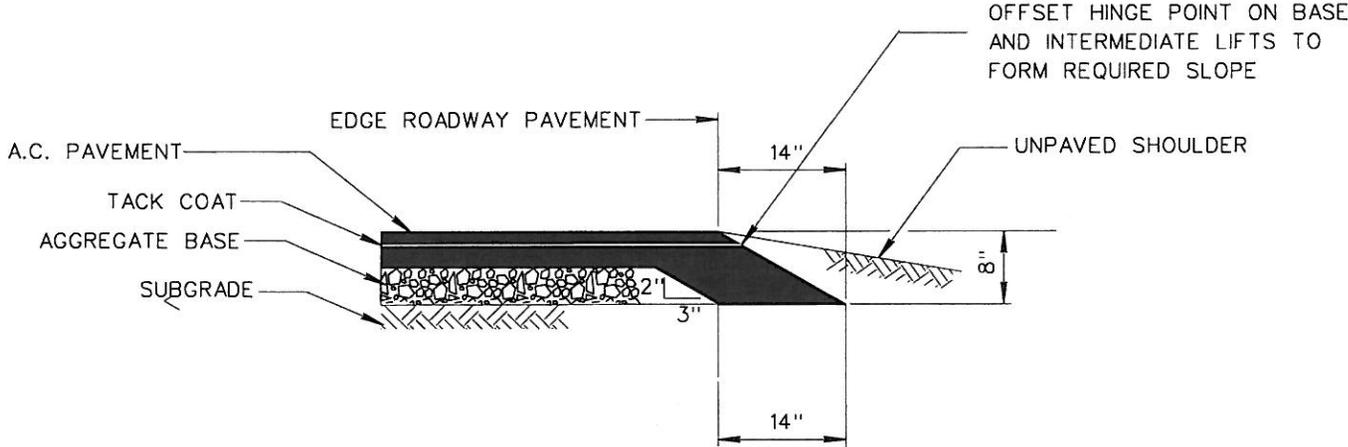
The finished safety edge slope shall be planar and form a $30^{\circ} \pm 5^{\circ}$ angle with the horizontal plane. Due to the required final edge slope of the safety edge, compaction as required by sections 321.8.4 and 321.10 may not be attainable. When the approved procedures for placement and compaction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



Overlay



New and Widened Pavements

STANDARD DETAIL

ASPHALT PAVEMENT
SAFETY EDGE

DATE:
12/11

DETAIL NO.

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.



In addition to Zinc plated bolts, Phoenix would like specs for stainless steel.



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.

Memo

To: MAG Standard Specification and Details Committee Members
From: MAG Water and Sewer Sub-Committee
Date: 11/15/20112 (*To Be Distributed in January 2012*)
Re: MAG Detail 360 (Fire Hydrant Detail) Update

Revised MAG Fire Hydrant Detail:

The MAG Water and Sewer Sub-Committee has revised the MAG Standard Detail 360 - Fire Hydrant Details and is requesting that all local Fire Departments and Engineering Departments review and make comments on the revised detail for the upcoming MAG Standard Specifications and Details Committee in 2012.

Task:

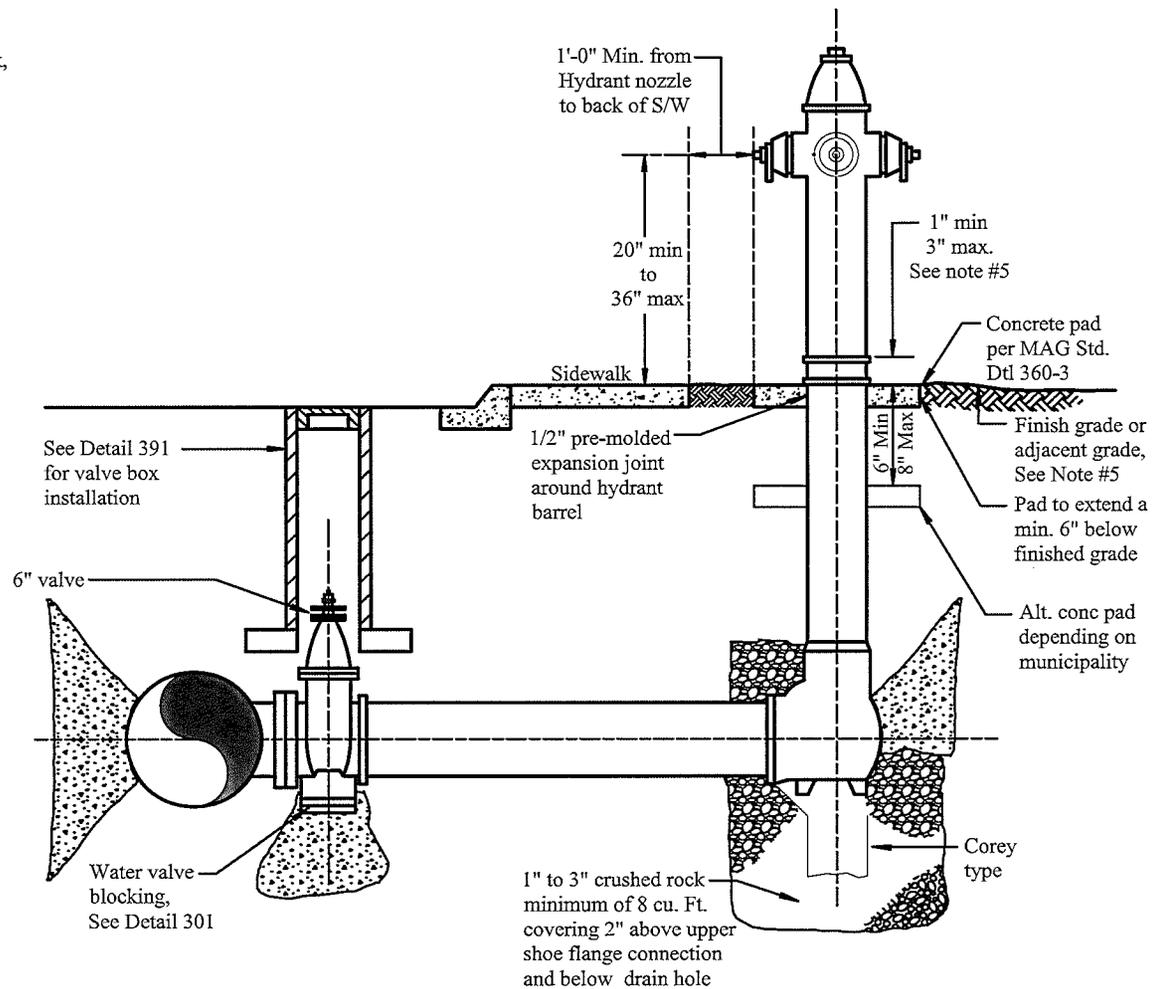
Please distribute or forward the enclosed revised details to the local Fire Department Representative and Engineering Department Representative to review and comment. Comments shall be returned to the MAG Water and Sewer Sub-Committee at the February 21, 2012 meeting (**est date**) for review and discussion.

- DTL 360-1 Dry Barrel Fire Hydrant Installation
- DTL 360-2 Wet Barrel Fire Hydrant Installation
- DTL 360-3 Fire Hydrant Installation

Please contact _____ at _____ with any questions.

General Notes:

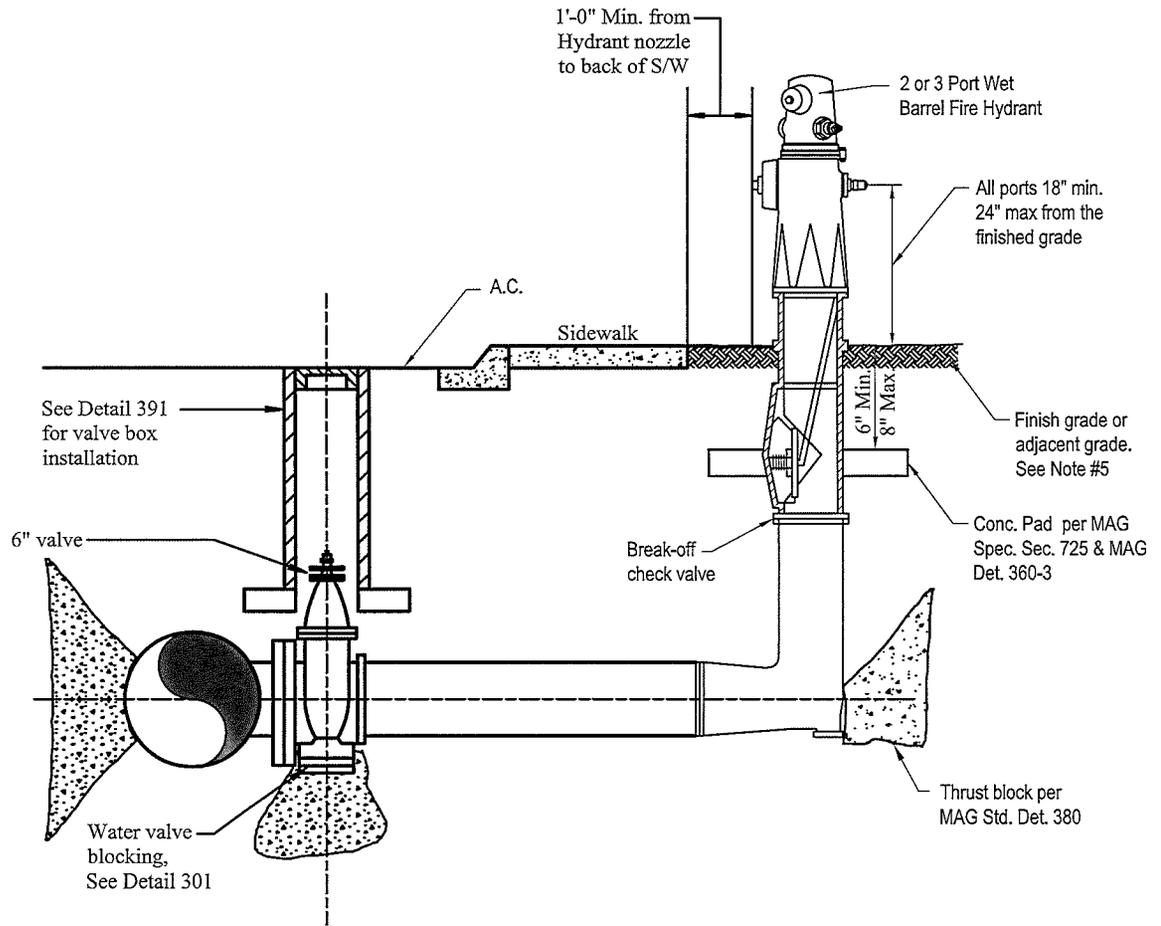
1. Joints between the valve and the main shall be flanged type. Joints between the valve and hydrant shall be restraint or mechanical type.
2. Restraints shall be per MAG Std. Det. 380 (thrust block) or Mechanical Restraint depending on Municipality
3. A flange joint by mechanical joint valve may be 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).



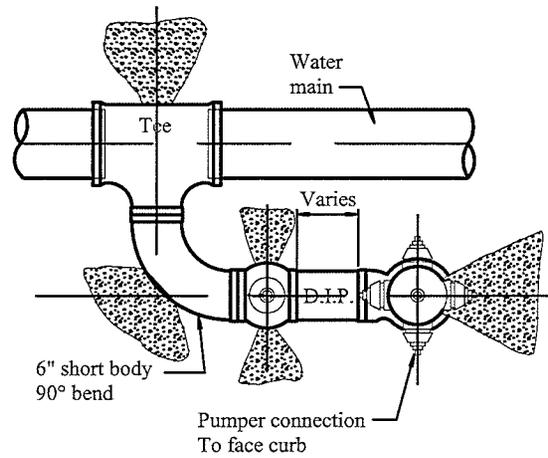
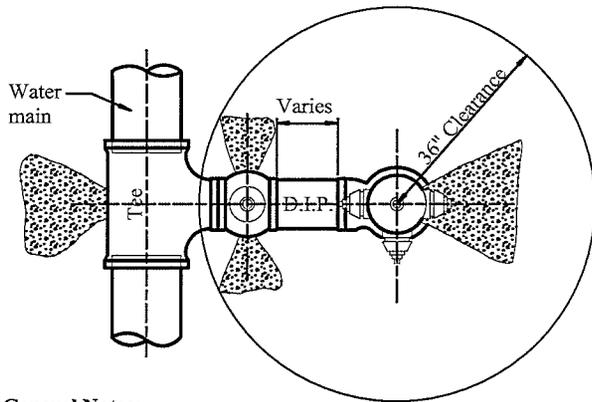
DETAIL NO. 360-1	 MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL ENGLISH	DRY BARREL FIRE HYDRANT INSTALLATION	REVISED 04-27-2011	DETAIL NO. 360-1
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General Notes:

1. Joints between the valve and the main shall be flanged type. Joints between the valve and hydrant shall be 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

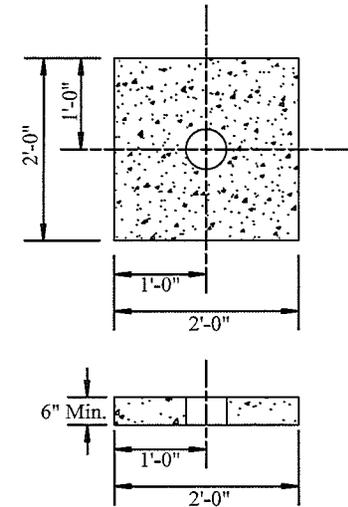


DETAIL NO. 360-2	 MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL ENGLISH	WET BARREL FIRE HYDRANT INSTALLATION	REVISED 04-27-2011	DETAIL NO. 360-2
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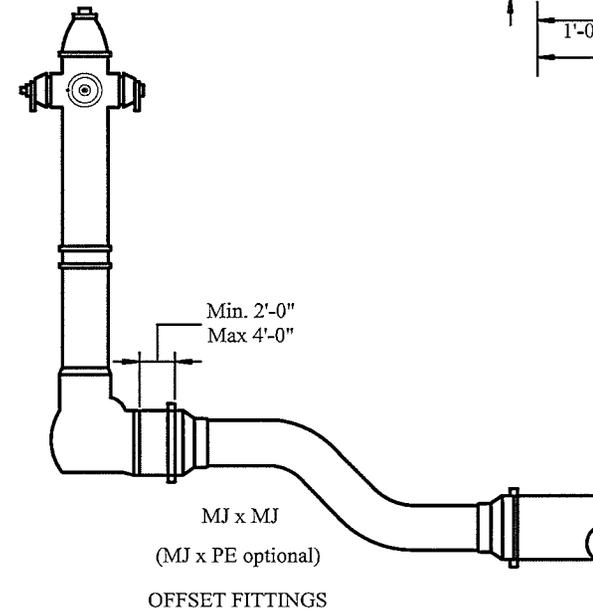
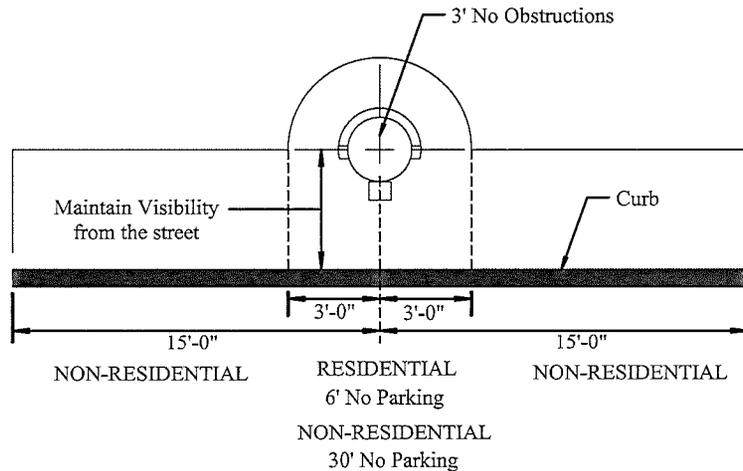
Pad Detail

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.
8. Offset fitting can be used on wet or dry barrel hydrants



DETAIL NO.

360-3



STANDARD DETAIL
ENGLISH

FIRE HYDRANT INSTALLATION

REVISED

04-27-2011

DETAIL NO.

360-3



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 Kandaris, 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 ~~S~~ 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.

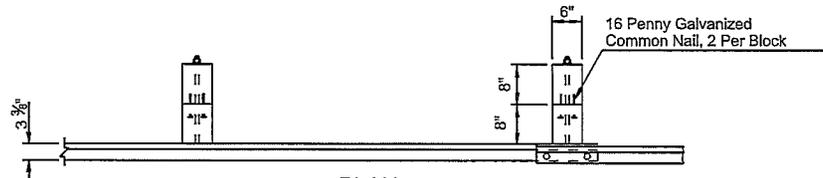
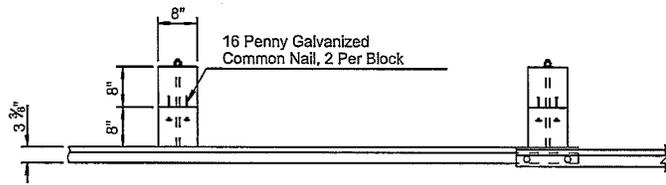
Payment for Bolted Guardrail Anchors will be at the contract unit price, and shall be full compensation for the work, complete in place, including steel brackets, hardware, excavation, backfill, removing and replacing surfacing, cutting and fitting steel beam posts or timber posts, drilling anchor bolt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

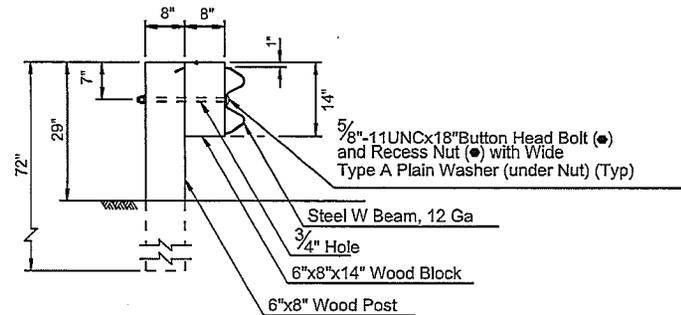
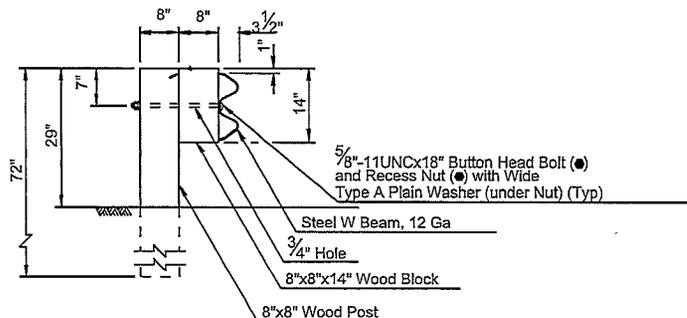
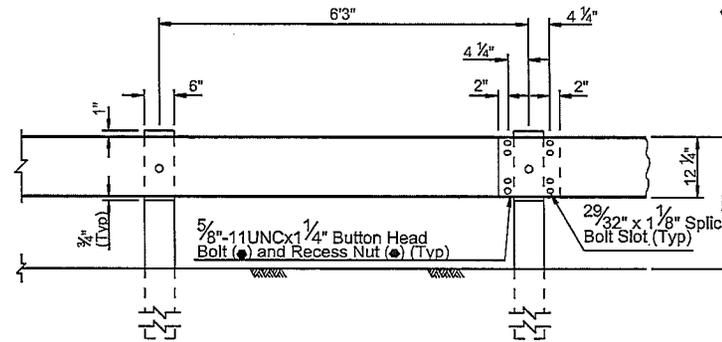
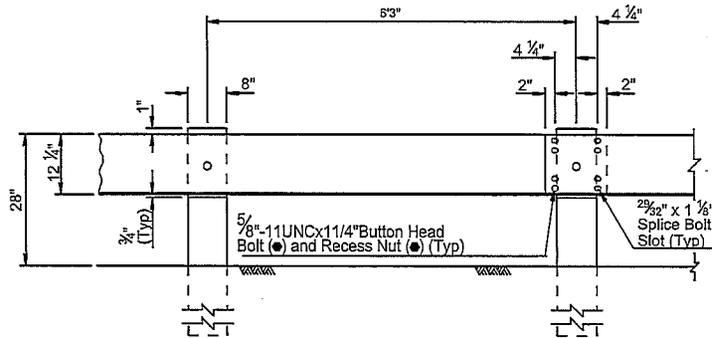
415.3 PAINTING:

~~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.~~



GENERAL NOTES

• - Indicates ARTBA designation

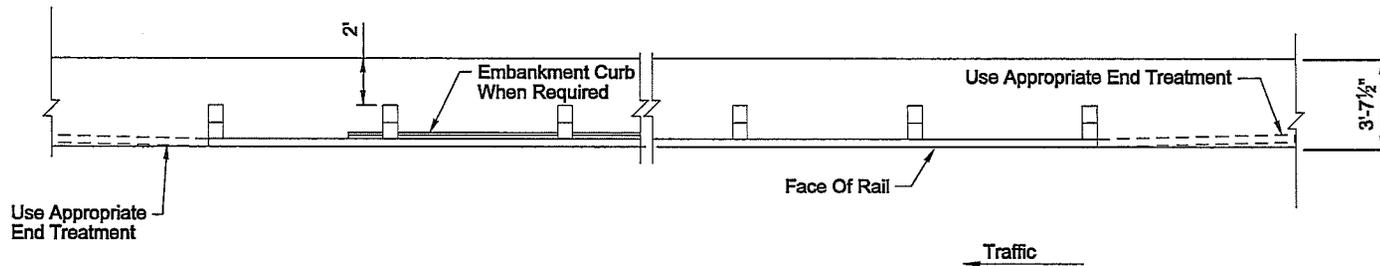


MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
STANDARD DETAIL

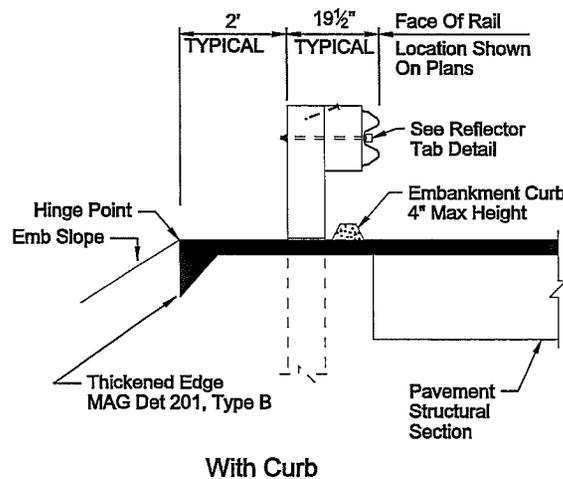
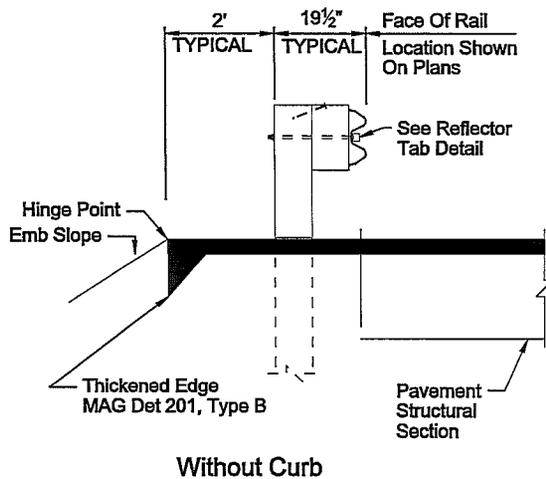
W BEAM GUARD RAIL G4(1W) AND G4 (2W)
BLOCKED OUT TIMBER POST

DATE:
11/01/2011

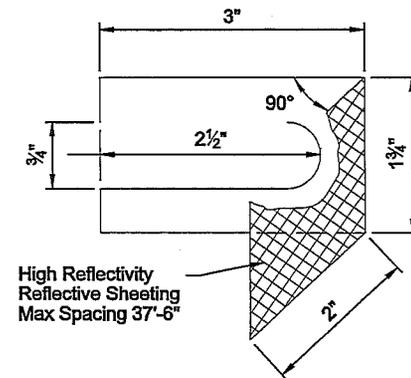
DETAIL NO.
3001



PLAN



SECTION



REFLECTOR TAB DETAIL

GENERAL NOTES

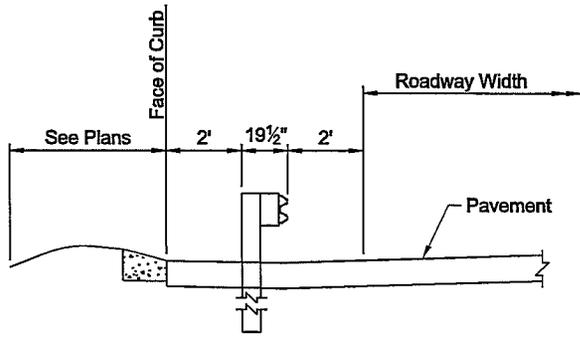
1. All Embankment Curb Shall Be Protected By Guard Rail.
2. Guard Rail Shall Extend Beyond The Limits Of Embankment Curb.
3. See Std. 3016 For Measurement Limits.
4. Asphalt Pavement Behind Face Of Rail Shall Be ≥ 2 Inches in Thickness

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
STANDARD DETAIL

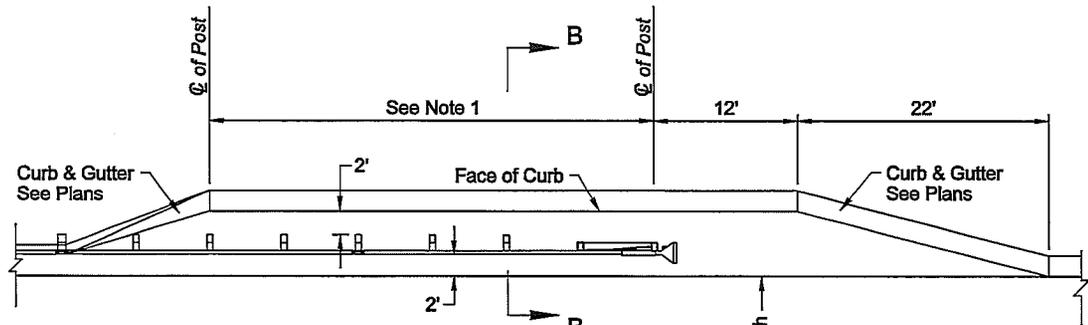
GUARDRAIL INSTALLATION

DATE:
1/1/2011

DETAIL NO.
3002

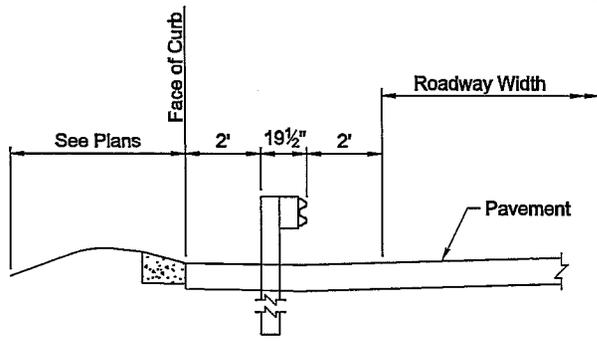


SECTION B-B

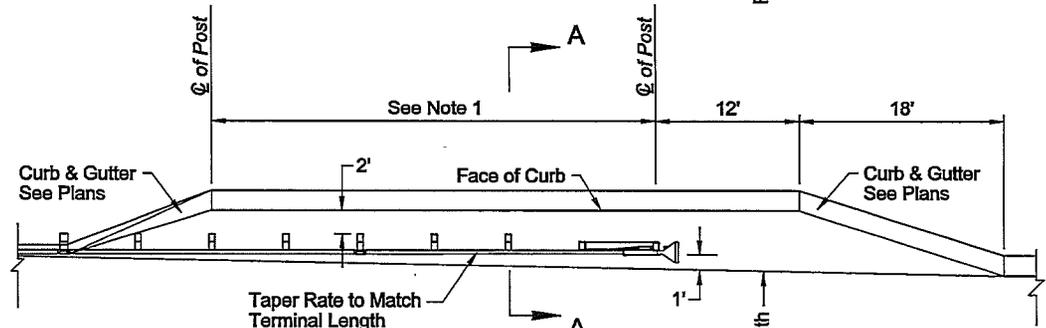


PLAN

TYPE B GUARD RAIL INSTALLATION



SECTION A-A



PLAN

TYPE A GUARD RAIL INSTALLATION

NOTES:

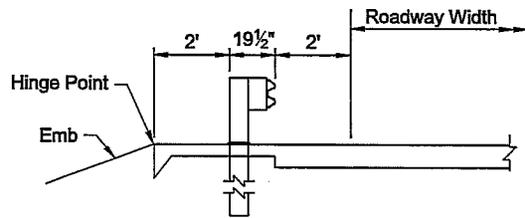
1. Distance = 37.5' for 50.0' Terminal Length
 Distance = 25.0' for 37.5' Terminal Length
 Distance = 12.5' for 25.0' Terminal Length

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
 STANDARD DETAIL

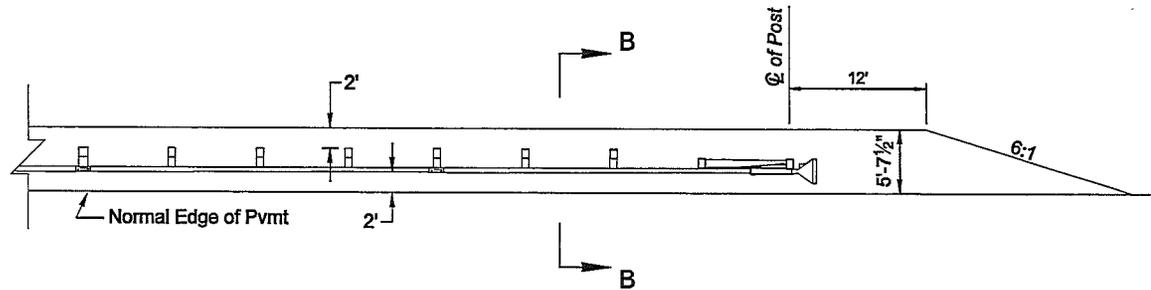
END TERMINAL LAYOUT
 WITH CURB & GUTTER

DATE:
 02/10

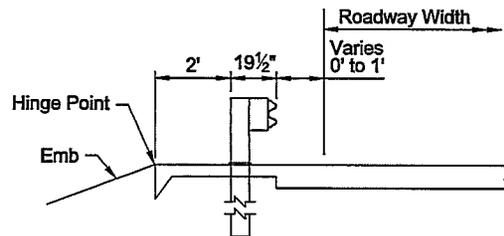
DETAIL NO.
 3005



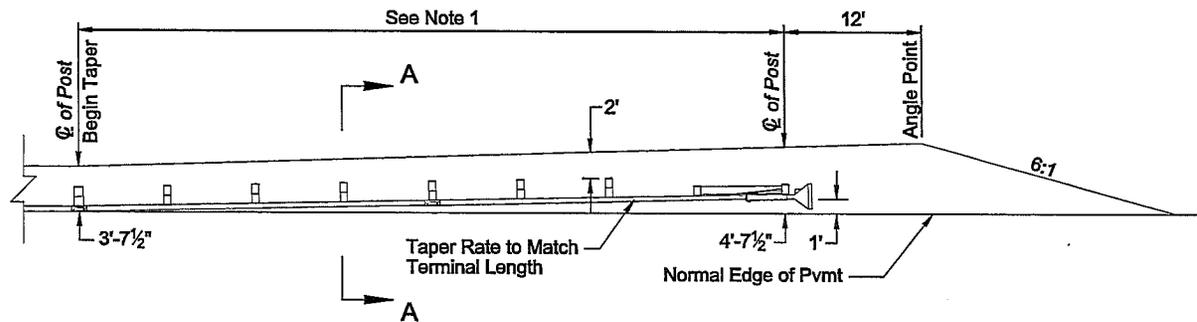
SECTION B-B



TYPE B GUARDRAIL INSTALLATION



SECTION A-A



TYPE A GUARDRAIL INSTALLATION

NOTES:

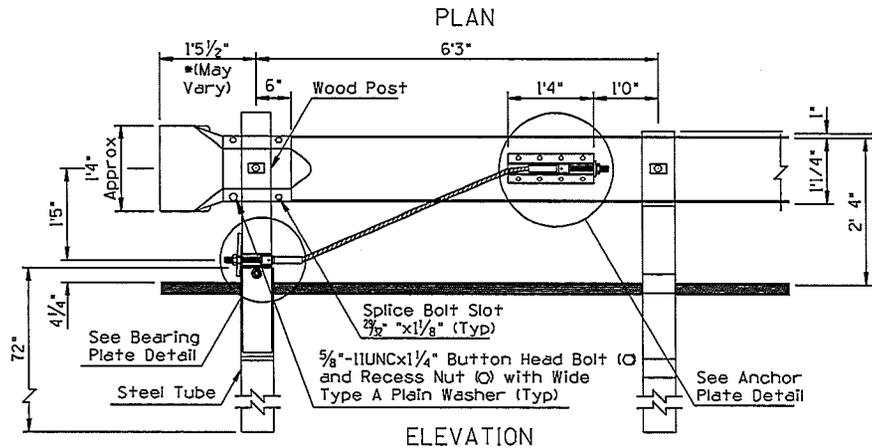
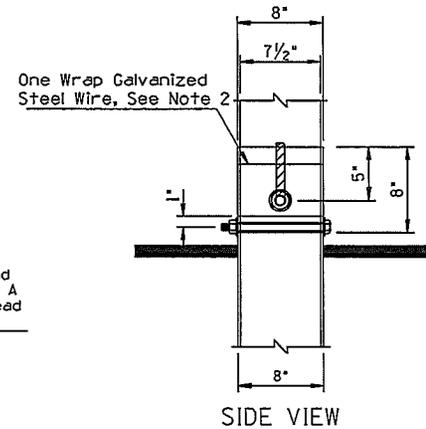
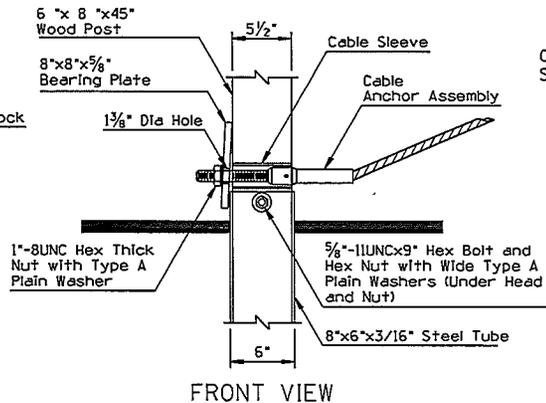
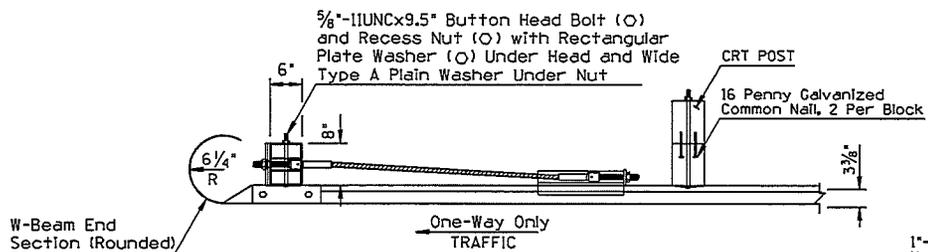
1. Distance = 50' for 50' Terminal Length
 Distance = 37.5' for 37.5' Terminal Length
 Distance = 25' for 25' Terminal Length

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
 STANDARD DETAIL

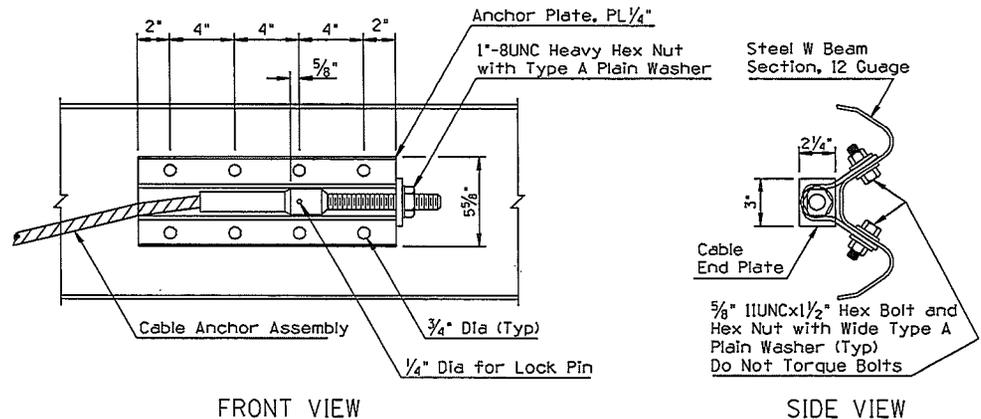
**END TERMINAL LAYOUT
 WITHOUT CURB AND GUTTER**

DATE:
 02/10

DETAIL NO.
 3006



BEARING PLATE DETAIL



ANCHOR PLATE DETAIL

GENERAL NOTES

1. The cable assembly shall be tightened to remove slack.
 2. To ensure that the bearing plate remains in position, one wrap of 14 gauge galvanized steelwire shall be wrapped around the terminal post near the top of the plate.
 3. See W-Beam End Section (Rounded), ARTBA Std. RE-6-79, for dimension variables.
- * See Std. 3016 for measurement limits.
 o Indicates ARTBA designation

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
 STANDARD DETAIL

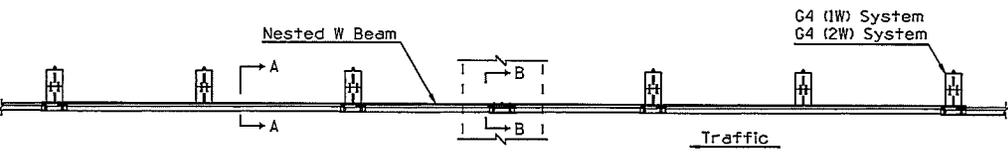
DEPARTURE END TERMINAL

DATE:
 11/01/11

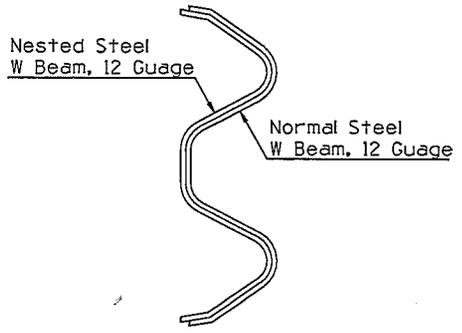
DETAIL NO.
 3007

GENERAL NOTES

1. ● - Indicates ARTBA designation.

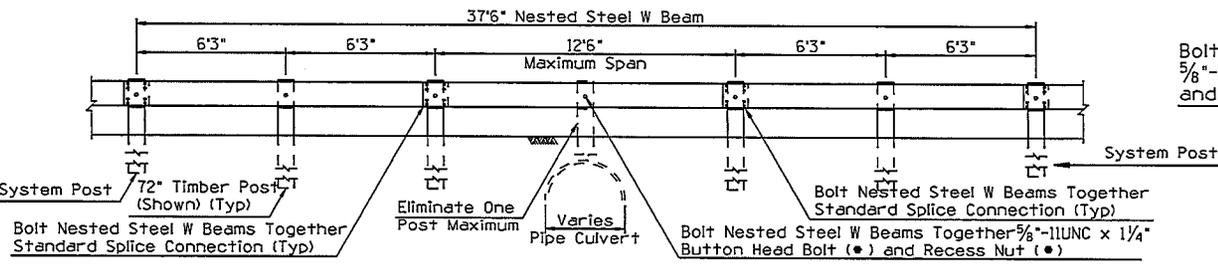


PLAN



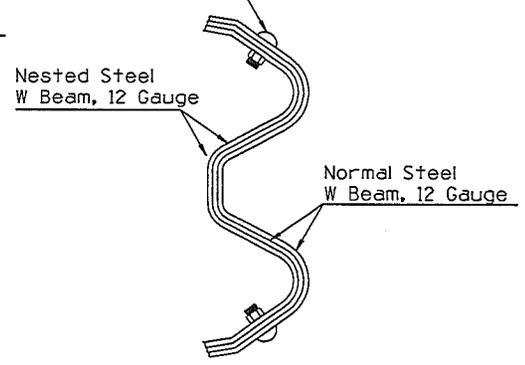
SECTION A-A

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



NESTED STEEL W BEAM - TYPE 2 - LONG SPAN
(Splice Connection Outside Span) Length = 37'6"

ELEVATION



SECTION B-B

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
STANDARD DETAIL

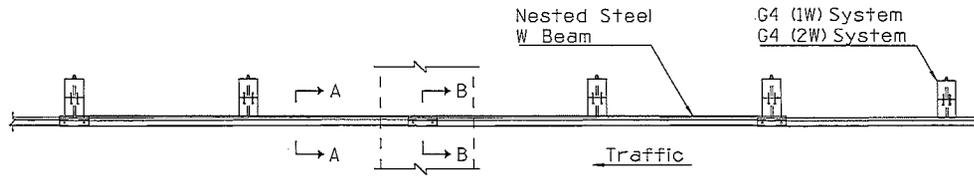
NESTED GUARDRAIL
TYPE 2

DATE:
11/14/11

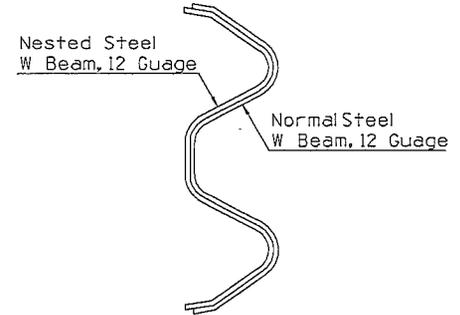
DETAIL NO.
3008-2

GENERAL NOTES

- - Indicates ARTBA designation.

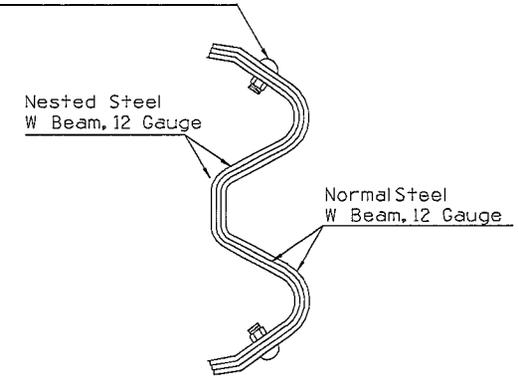


PLAN

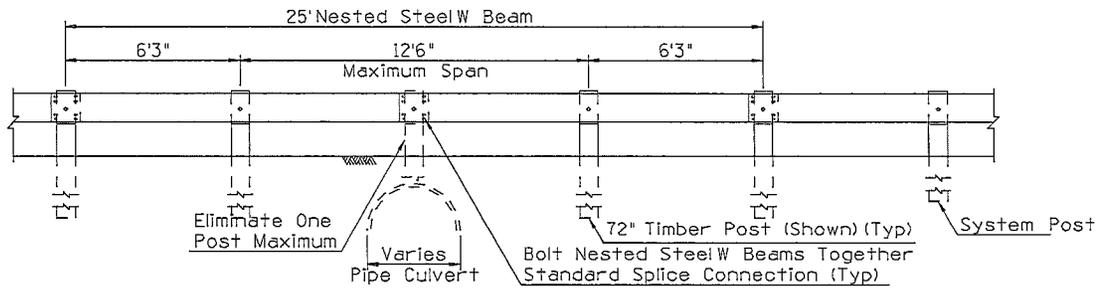


SECTION A-A

Bolt Nested Steel W Beam Together
 $\frac{3}{8}$ "-11UNC x $\frac{1}{4}$ " Button Head Bolt (•)
 and Recess Nut (●)



SECTION B-B



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

ELEVATION

Base Drawing Courtesy of ADOT 2/25/00

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
 STANDARD DETAIL

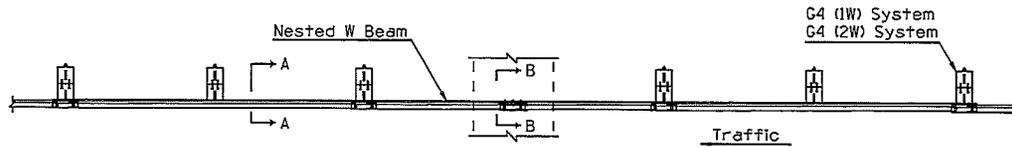
NESTED GUARDRAIL
 TYPE 1

DATE:
 5/02/01

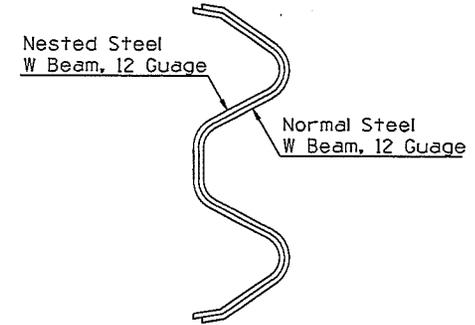
DETAIL NO.
 3008-1

GENERAL NOTES

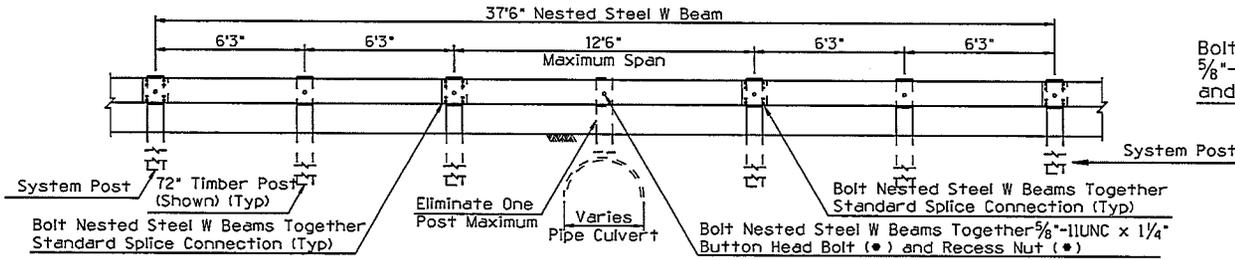
1. ● - Indicates ARTBA designation.



PLAN

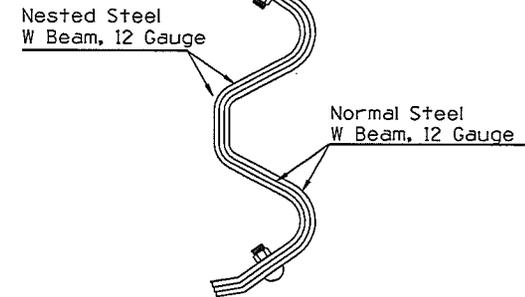


SECTION A-A



NESTED STEEL W BEAM - TYPE 2 - LONG SPAN
(Splice Connection Outside Span) Length = 37'6"

ELEVATION



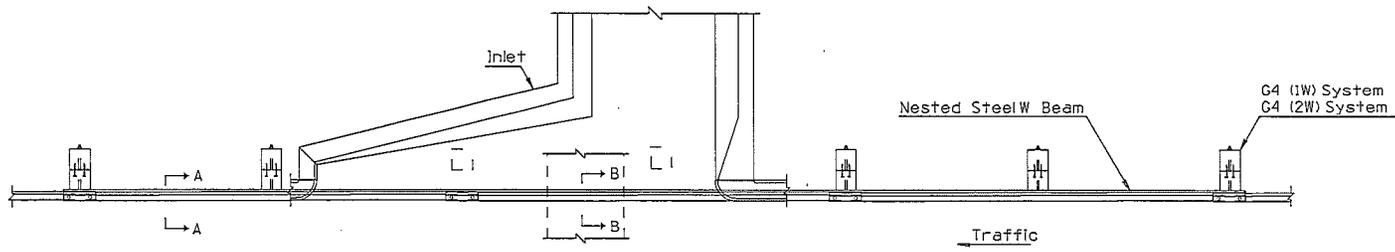
SECTION B-B

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
STANDARD DETAIL

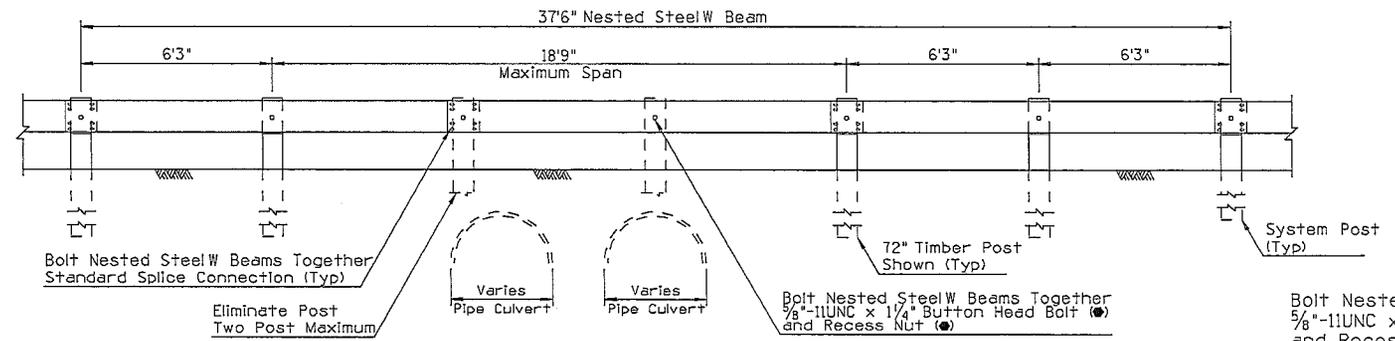
NESTED GUARDRAIL
TYPE 2

DATE:
11/14/11

DETAIL NO.
3008-2



PLAN

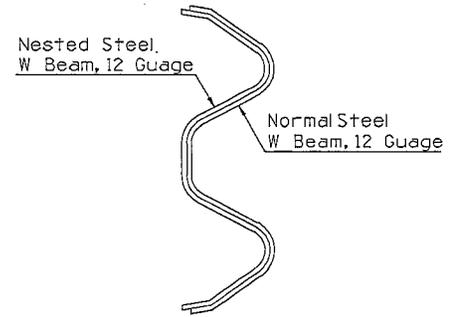


NESTED STEEL W BEAM - TYPE 3 - LONG SPAN
Length = 37'6"

ELEVATION

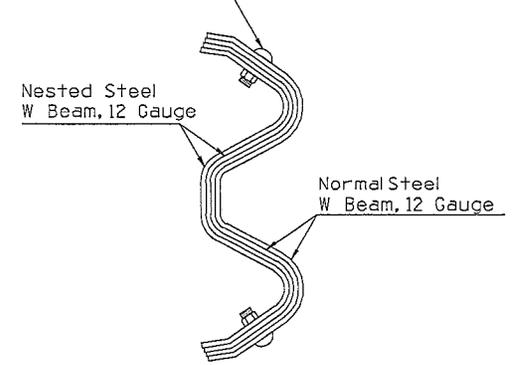
GENERAL NOTES

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



SECTION A-A

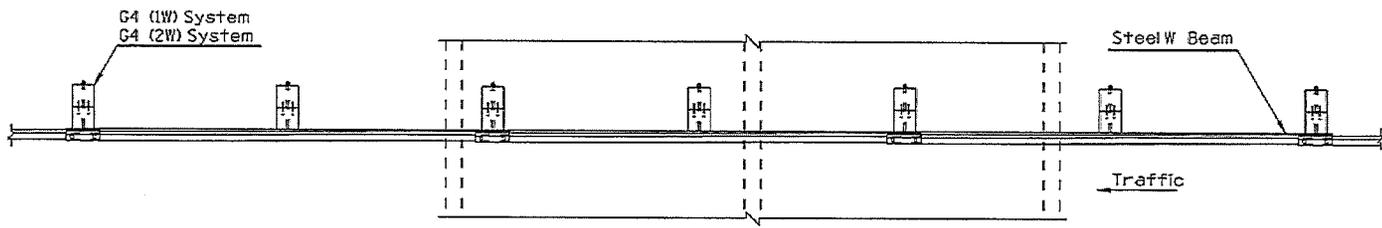
Bolt Nested Steel W Beam Together
5/8"-11UNC x 1/4" Button Head Bolt (●)
and Recess Nut (●)



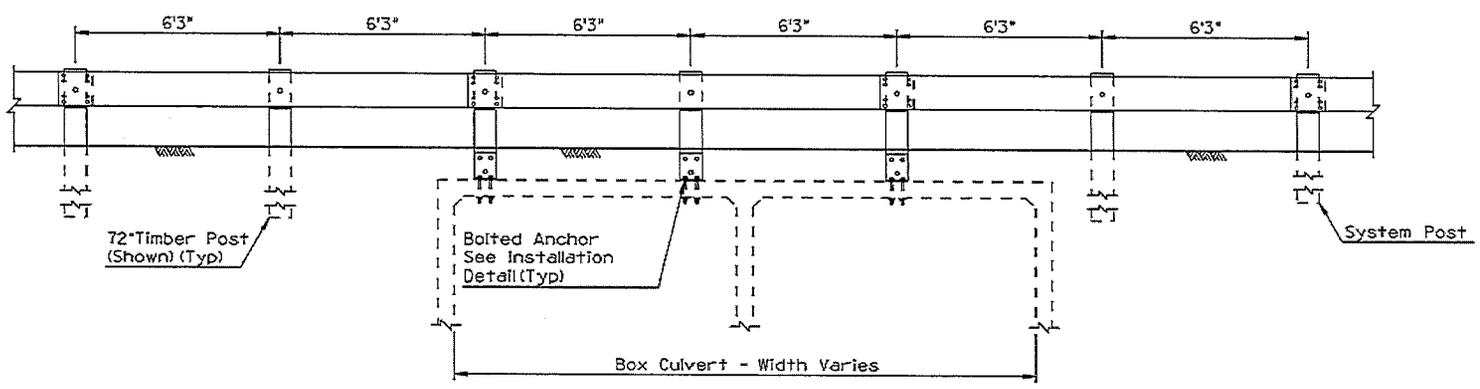
SECTION B-B

Base Drawing Courtesy of ADOT 2/25/00

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



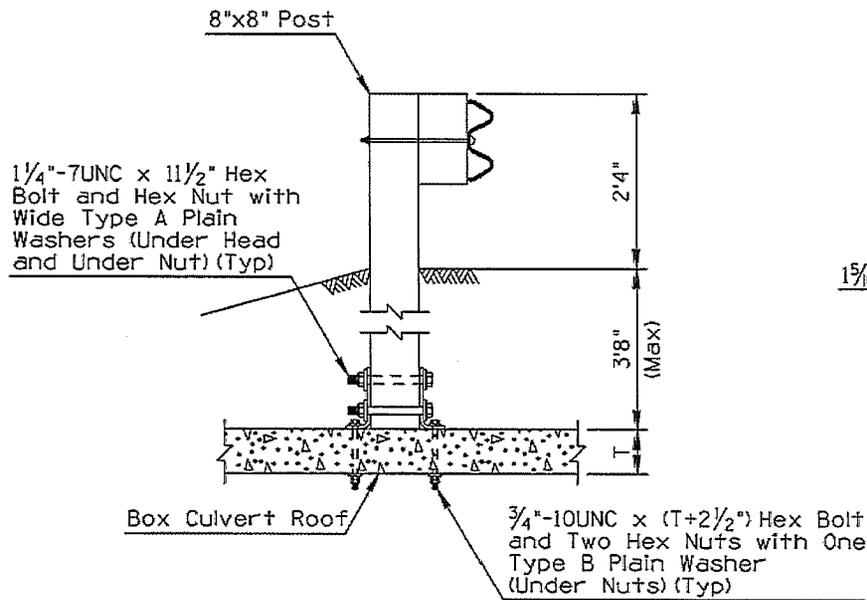
ELEVATION

BOLTED ANCHOR
BOX CULVERT INSTALLATION

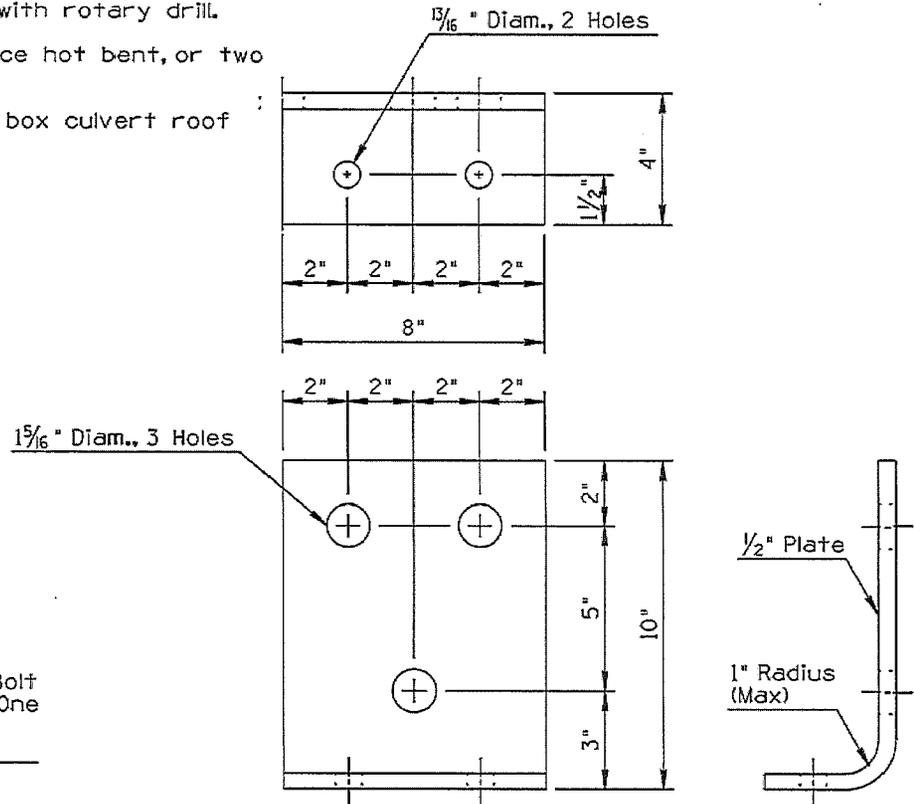
<p>MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION STANDARD DETAIL</p>	<p>BOLTED GUARDRAIL ANCHORS</p>	<p>DATE: 11/19/09</p>	<p>DETAIL NO. 3010-1</p>
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GENERAL NOTES

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



INSTALLATION DETAIL



BRACKET DETAIL

BOLTED ANCHOR TIMBER POST INSTALLATION DETAIL

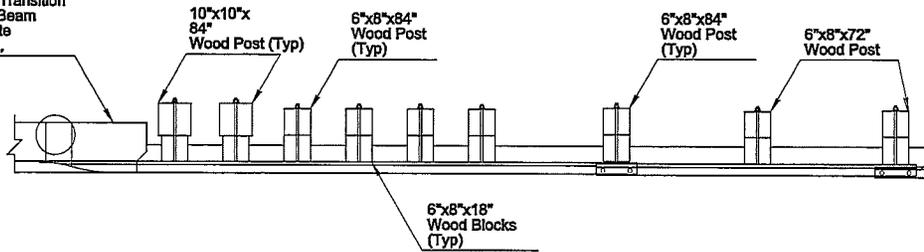
MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
STANDARD DETAIL

BOLTED GUARDRAIL
ANCHORS

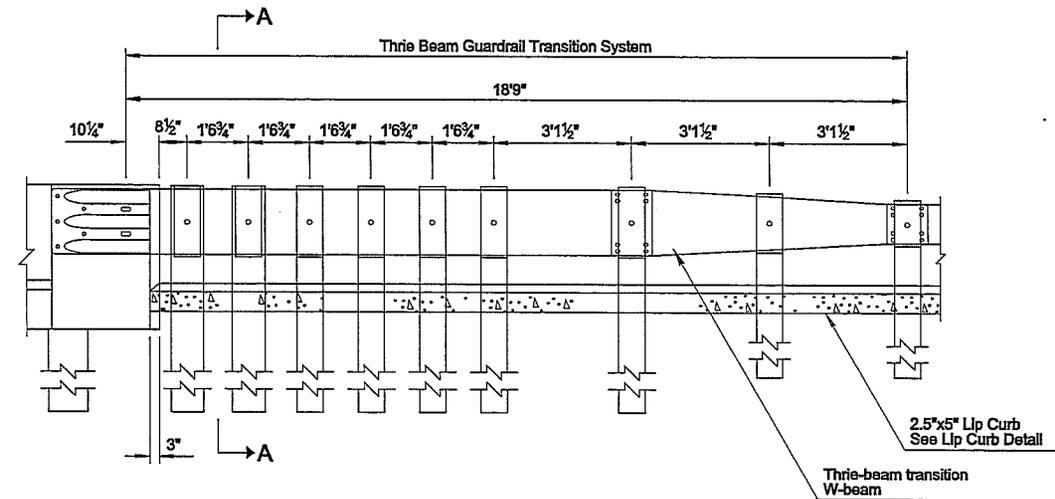
DATE:
11/19/09

DETAIL NO.
3010-2

Concrete Barrier Transition
Type 'F' to Thrie Beam
or Bridge Concrete
Barrier Transition,



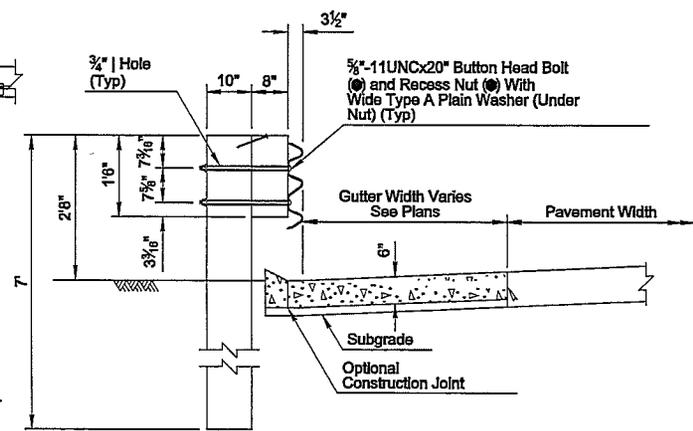
PLAN



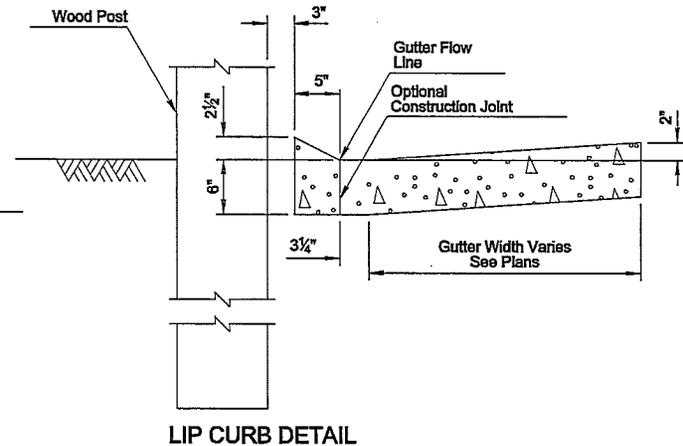
ELEVATION

GENERAL NOTES

• - Indicate ARTBA designation.



SECTION A-A

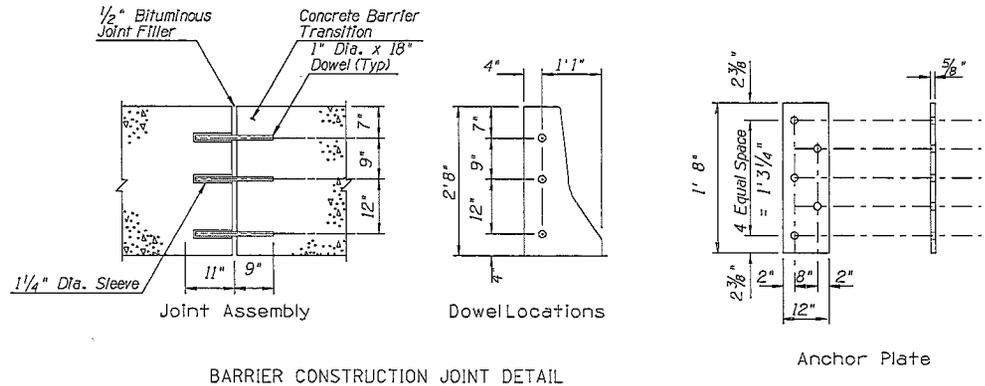
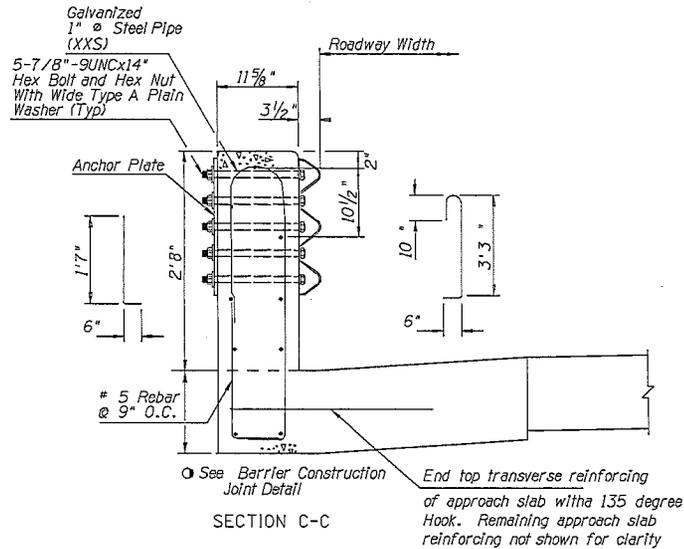
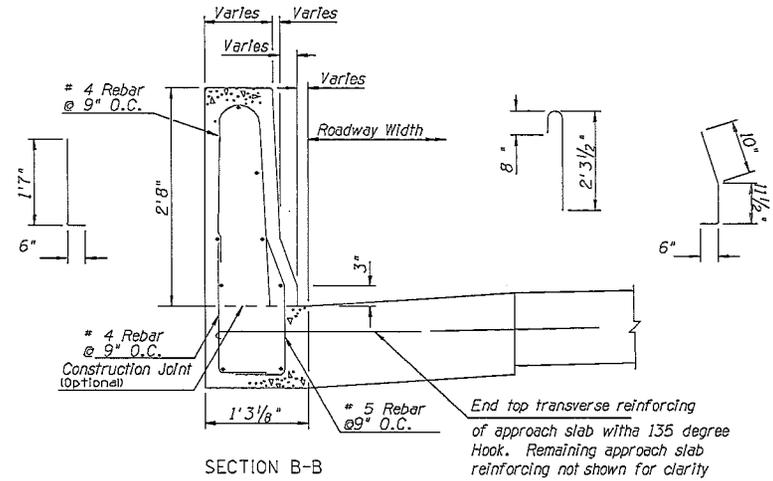
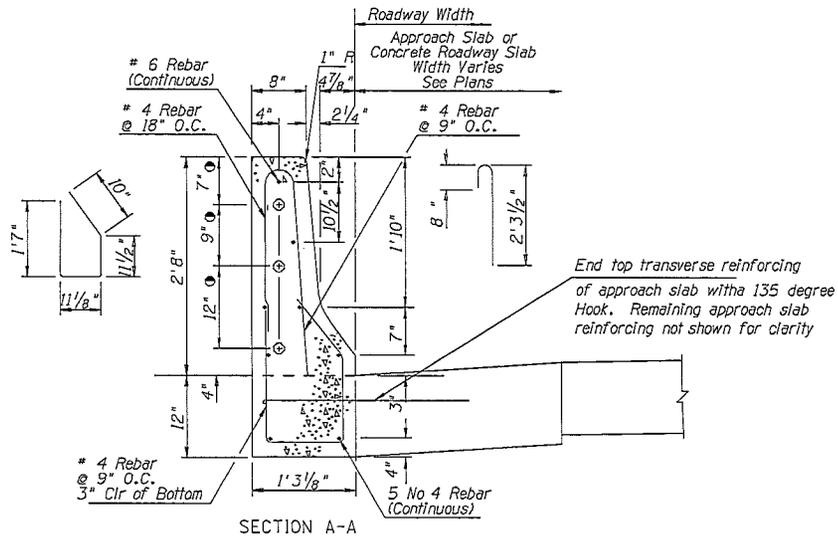


MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
STANDARD DETAIL

THRIE BEAM GUARDRAIL TRANSITION

DATE:
06/01

DETAIL NO.
3012-1



Base Drawing Courtesy of ADOT 2/25/00

MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION
STANDARD DETAIL

BARRIER DETAIL

DATE:
8/06/01

DETAIL NO.
3012-3



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

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~~ pay for 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.~~ ^{CLSM} The Contractor shall submit the commercial source mix design for ~~cement-enriched slurry ABC~~ 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.

^{1/2-sack cement CLSM}

The Contractor, **at his option**, may use ~~cement-enriched slurry aggregate base course~~ 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.



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

Case 11-30

DATE: January 18, 2012
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.** Fractured Face was left at existing 50% - moved from 701.2.1
- (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 1/18/12

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

702.2.2: 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 – REVISED 1/18/12

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- 1 <u>2</u>			
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, <u>One Face</u>			
Test Method ARIZ 212, <u>One Face Percent by Weight of the Material Retained on a #4 Sieve</u>			
Minimum required value	<u>30</u> 50	<u>30</u> 50	<u>30</u> 50
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.

702.2 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.~~

~~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.~~

Sieve Sizes (Square Openings)	Select Material		Aggregate Base
	Percentage by Weight Passing Sieve		
	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

Simplify. Put test methods in Table 702-1.

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

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.

702.2.1 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	— 50	— 50
Resistance to Degradation and Abrasion by the Los Angeles Abrasion Machine			
Test Method AASHTO T-96, Percent Loss by Weight			
Maximum allowable value at 100 revolutions	10	10	10
Maximum allowable value at 500 revolutions	40	40	40

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. Leave at current 50% The fractured face count is indirectly referenced in 701.2.1 as 50. Use ARIZ 212 & 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 702-1- Sieve Analysis Test Methods AASHTO T-27, T-11			
Sieve Size	Accumulative Percentage Passing Sieve, by Weight		
	Select Material		Aggregate Base Course
	Type A	Type B	
3 in.	100	--	--
1-1/2 in.	--	100	100
1 in.	--	--	90 - 100
No. 4	30 - 75	30 - 70	38 - 65
No. 8	20 - 60	20 - 60	25 - 60
No. 30	10 - 40	10 - 40	10 - 40
No. 200	0 - 12	0 - 12	3 - 12
Plasticity Index Test Methods AASHTO T-89 Method A, T-90, T146 Method A			
Maximum allowable value	5	5	5
Fractured Face One Face Test Method ARIZ 212, Face Percent by Weight of the Material Retained on a #4 Sieve			
Minimum required value	50	50	50 —
Resistance to Degradation and Abrasion by the Los Angeles Abrasion Machine Test Method AASHTO T-96 Percent Loss by Weight			
Maximum allowable value at 100 revolutions	10	10	10
Maximum allowable value at 500 revolutions	40	40	40

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%.

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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.

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A rock correction, to compensate for rock content larger than the #4 or 3/4 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.~~

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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~~8590%

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 1/2 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 1/2-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.

MAG 702 – Case 11-30 (2012 Revision) (Comments from Goodyear)

Pros:

- Combining various specs into one place, as in Table 702.1, makes it much easier to find relevant information.
- Using an R-Value as a referee method for materials with PIs slightly above 5 makes sense, and should give more accurate results for a specific project.
- Changing the 1 ¼" screen to more universal 1" screen

Cons:

- I'd strongly suggest keeping the fractured face count at the current minimum of 50, and not lowering it to match ADOT's minimum of 30. In the field I've experienced clean, sandy ABC that was quite unstable due to a combination of high natural (rounded) sand content, and few fractured faces in the aggregate. These rounded aggregates behave more as peas and marbles and won't interlock, so that even the paving machine ruts the base as it's placing the HMA. Sometimes I've observed checking in the mat as the roller passed over, presumably from the unstable base vibrating and losing density since there was limited interlocking.

In contrast, crusher fines and angular aggregates interlock, providing much stability with proper moisture and compaction. This is especially critical when the base is supporting flexible pavements. The attached white paper refers to this when it states that "the material derives its high stability, stiffness, and strength from particle interlock and inter-particle friction". Combined with high compaction, these interlocking aggregates create a base with limited permeability, keeping out water which could create subgrade failures in the long term.

- Though redundant, I would like to see the descriptive portion 702.3.1("hard, durable fragments.....deleterious substances") left in place, or 701.2 specifically referred to. The basic quality of the material, based on visual observations by inspectors and materials technicians, can't be emphasized enough, and this would address contamination after material has left the plant's hopper.

Otherwise, great overhaul! It's long overdue...

SECTION 108

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

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

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

108.7 DETERMINATION AND EXTENSION OF CONTRACT TIME:

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

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

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

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

108.8 GUARANTEE AND WARRANTEE PROVISIONS:

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

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

WARRANTY

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

Add space

SECTION 108

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

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

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

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

108.9 FAILURE TO COMPLETE ON TIME: warranties

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

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

TABLE 108-1		
LIQUIDATED DAMAGES		
Original Contract Amount		Daily Charges
From More Than	To and Including	Calendar Day or Fixed Date
\$ 0	\$ 25,000	\$ 210
25,000	50,000	250
50,000	100,000	280
100,000	500,000	430
500,000	1,000,000	570
1,000,000	2,000,000	710
2,000,000	5,000,000	1,070
5,000,000	10,000,000	1,420
10,000,000	—	1,780

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

war·ran·tee

[wawr-uh n-tee, wor-]

noun

a person to whom a warranty is made.

war·ran·ty

[n. wawr-uh n-tee, wor-; v. wawr-uh n-tee, wor-] noun, plural -ties, verb, -tied, -ty-ing.

noun

1. an act or an instance of warranting; assurance; authorization; warrant.

2. Law .

a. a stipulation, explicit or implied, in assurance of some particular in connection with a contract, as of sale: an express warranty of the quality of goods.

b. Also called covenant of warranty. a covenant in a deed to land by [which](#) the party conveying assures the grantee that he or she [will](#) enjoy the premises free from interference by any person claiming under a superior title. Compare [quitclaim deed](#), [warranty deed](#).

c. (in the law of insurance) a statement or promise, made by the party insured, and included as an essential part of the contract, falsity or nonfulfillment of which renders the policy void.

d. a judicial document, as a warrant or writ.

3. a written guarantee given to the purchaser of a new appliance, automobile, or other item by the manufacturer or dealer, usually specifying that the manufacturer will make any repairs or replace defective parts free of charge for a stated period of time.

verb (used with object)

4. to provide a manufacturer's or dealer's warranty for: The automaker warranties its new cars against exterior rust.

ASPHALT CONCRETE

710.1 GENERAL:

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

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

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

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

TABLE 710-1		
RECOMMENDED MINIMUM LIFT THICKNESS'S for ASPHALT CONCRETE MIXES		
Asphalt Concrete Mix Designation (inches)	Minimum Lift Thickness Marshall Mixes	Minimum Lift Thickness Gyratory Mixes
3/8"	1.0 inches	1.5 inches
1/2"	1.5 inches	2.0 inches
3/4"	2.5 inches	3.0 inches
Base	3.0 inches	n/a

710.2 MATERIAL:

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

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

Coarse aggregate for hot mix asphalt is material retained on or above the No. 4 sieve and Fine aggregate is material passing the No. 4 sieve. Aggregates shall be relatively free of deleterious materials, clay balls, and adhering films or other material that

prevent coating with the asphalt binder. Coarse and Fine aggregates shall conform to the following requirements when tested in accordance with the applicable test methods.

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

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

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

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

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

710.3 MIX DESIGN REQUIREMENTS:

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

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

- (1) The name and address of the testing organization and the person responsible for the mix design report.
- (2) The mix plant identification and/or location, as well as the supplier or producer name.
- (3) A description of all products that are incorporated in the asphalt concrete along with the sources of all products, including admixtures and asphalt binder, and their method of introduction.
- (4) The supplier and grade of asphalt binder, the source and type of mineral aggregate, and the percentage of asphalt binder and mineral admixture used.
- (5) The mix design report, whether Gyratory or Marshall, shall state the traffic condition (low or high traffic) and size designation. ~~In all cases Gyratory based mix designs shall be designated as high traffic mixes. Marshall based mix design shall be designated either low or high traffic mixes.~~
- (6) The results of all testing, determinations, etc., such as: specific gravity and gradation of each component, water absorption, sand equivalent, loss on abrasion, fractured coarse aggregate particles, Tensile Strength Ratio (AASHTO T-283), Marshall stability and flow, asphalt absorption, percent air voids, voids in mineral aggregate, and bulk density. Historical abrasion values may be supplied on existing sources. The submittal should include a plot of the gradation on the Federal Highway Administration's 0.45 Power Gradation Chart, plots of the compaction curves and the results of moisture sensitivity testing.
- (7) The laboratory mixing and compaction temperature ranges for the supplier and grade of asphalt binder used within the mix design.
- (8) A specific recommendation for design asphalt binder content and any limiting conditions that may be associated with the use of the design, such as minimum percentages of crushed or washed fine aggregate.
- (9) The supplier's product code, the laboratory Engineer's seal (signed and dated), and the date the design was performed.

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

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

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

TABLE 710-3					
MARSHALL MIX DESIGN CRITERIA					
Criteria	Requirements				Designated Test
	3/8" Mix	1/2" Mix	3/4" Mix	Base Mix	Method
1. Voids in Mineral Aggregate: %, min	15.0	14.0	13.0	12.0	AI MS-2
2. Effective Voids: %, Range	4.0 ± 0.2	4.0 ± 0.2	4.0 ± 0.2	4.0 ± 0.2	AI MS-2
3. Absorbed Asphalt: %, Range *	0 - 1.0	0 - 1.0	0 - 1.0	0 - 1.0	AI MS-2
4. Dust to Eff. Asphalt Ratio, Range **	0.6 - 1.4	0.6 - 1.4	0.6 - 1.4	0.6 - 1.4	AI MS-2
5. Tensile Strength Ratio: %, Min.	65	65	65	65	AASHTO T-283
6. Dry Tensile Strength: psi, Min.	100	100	100	100	AASHTO T-283
7. Stability: pounds, Minimum	2,000	2,500	2,500	3000	AASHTO T-245
8. Flow: 0.01-inch, Range	8 - 16	8 - 16	8 - 16	8 - 16	AASHTO T-245
9. Mineral Aggregate Grading Limits				AASHTO T-27	
Percent Passing with Admix					
Sieve Size	3/8 inch Mix	1/2 inch Mix	3/4 inch Mix	Base Mix	
1-1/4 inch				100	
1 inch			100	90-100	
3/4 inch		100	90 - 100	85-95	
1/2 inch	100	85 - 100	---	---	
3/8 inch	90-100	62 - 85	62 - 77	57-72	
No. 8	45-60	40 - 50	35 - 47	33-43	
No. 40	10-22	10 - 20	10 - 20	9-18	
No. 200	2.0 - 10.0	2.0 - 10.0	2.0 - 8.0	1.0 - 7.0	

* Unless otherwise approved by the Engineer.

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

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

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The mix design shall be formulated in a manner described for volumetric mix designs in the current edition of the Asphalt Institute Manual SP-2, except the number of trial blend gradations necessary will be determined by the mix design laboratory. Duplicate gyratory samples shall be prepared at a minimum of four (4) binder contents to select the recommended binder content. The gyratory specimens shall be compacted to 160 gyrations. Volumetric data for the design number of gyrations, N_{des} , and the initial number of gyrations, N_{mix} , are then back calculated based on the bulk specific gravity, G_{mb} , of the N_{max} specimens and the height data generated during the compaction process of those same specimens. For Low Traffic designs, volumetric data for 115 gyrations, N_{max} , for Low Traffic designs, is also back calculated from the specimens compacted to 160 gyrations. The completed mix design shall meet all the mineral aggregate and mix design criteria specified herein.



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

~~The Gyratory mix shall comply with the criteria in Table 710-4.~~

TABLE 710-4				
GYRATORY MIX DESIGN CRITERIA				
Criteria	Requirements			Designated Test
	3/8" Mix	1/2" Mix	3/4" Mix	Method
1. Voids in Mineral Aggregate: %, Min.	15.0	14.0	13.0	AI SP-2
2. Effective Voids: %, Range	4.0 ± 0.2	4.0 ± 0.2	4.0 ± 0.2	AI SP-2
3. Absorbed Asphalt: %, Range *	0 - 1.0	0 - 1.0	0 - 1.0	AI SP-2
4. Dust to Eff. Asphalt Ratio, Range **	0.6 - 1.4	0.6 - 1.4	0.6 - 1.4	AI SP-2
5. Tensile Strength Ratio: %, Min.	75	75	75	AASHTO T-283
6. Dry Tensile Strength: psi, Min.	75	75	75	AASHTO T-283
7. Mineral Aggregate Grading Limits				AASHTO T-27
	Percent Passing with Admix			
Sieve Size	3/8 inch Mix	1/2 inch Mix	3/4 inch Mix	
1 inch			100	
3/4 inch		100	90-100	
1/2 inch	100	90-100	43-89	
3/8 inch	90-100	53-89	-	
No. 8	32-47	29-40	24-36	
No. 40	2-24	3-20	3-18	
No. 200	2.0-8.0	2.0-7.5	2.0-6.5	
8. Number of Gyrations	Low Traffic		High Traffic	
N_{ini}	7		8	
N_{des}	75		100	
N_{max}	115		160	

* Unless otherwise approved by the Engineer.

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

710.3.2.3 Moisture Sensitivity Testing: Moisture sensitivity testing will be performed in accordance with AASHTO Test Method T-283 for both Marshall and Gyratory mix designs, without the freeze/thaw cycle(s). The minimum required Tensile Strength Ratio is indicated in the tables above.

- End of Section -

Water/Sewer Working Group Meeting

Meeting Notes
January 17, 2012

Opening:

A meeting of the Specifications and Details Water/Sewer Working Group was called to order by chair Jim Badowich on January 17, 2012, at 1:35 p.m. in the MAG Agave Room. Mr. Badowich mentioned the new specs book online, and introduced the purpose of the working groups.

1. Participants

Jim Badowich (Avondale), Tony Braun (NUCA), Jami Erickson (Phoenix), Arturo Chavarria (Hanson Pipe), Mike Hook (ALPA), Mark Ivanich (Glendale), Peter Kandarlis (SRP), Paul Nebeker (Pipe Right Now), Matt Savage (Ferguson), Gordon Tyus (MAG), Scott Zipprich (Buckeye)

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

The case passed last year, but the group still needs to update the Pressure Manhole Frame and Cover Details, and introduce them as a new case (details 523-1 (24") and 523-2 (30")).

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

Jim Badowich said Case 11-14 is continued from last year, so the group needs to update and finish the case this year. Scott Zipprich handed out the latest versions of the details for dry and wet barrel hydrants and a sheet of details. Mr. Badowich said they need to be reviewed by agency fire departments. There was discussion on different clearance zones. Mr. Tyus said the group may want to revise Detail 362 as well. Paul Nebeker said some agencies have clearance zones for cactuses to keep hoses from being punctured. He also suggested following the national fire code for such things as the height requirement. There was discussion about the round and square pads, and the break-off valve for wet barrel hydrants. Jami Erickson suggested showing joint restraints and making thrust blocks optional. Most cities to require thrust blocks under valves. Mark Ivanich suggested referencing Detail 122 for location of hydrant markers. Mr. Nebeker discussed making the 90 degree retrofit detail as optional. That led to discussion on the difficulty of bluestaking. Finally, it was suggested to review Section 610.9 as well as revising the details. Tony Braun said he could get more detailed wet and dry barrel drawings from manufacturers.

4. Pre-Cast Manhole Bases

Scott Zipprich said he has visited manufacturers and described the manufacturing process. He explained the difference between wet and dry casting. He said the people at Old Castle/Utility Vault would be willing to manufacture the bases with gaskets built in, and can line the base so it is protected before shipping. He said a floatation ring can be included to reduce issues related to ground water. He was asked about lift connectors, and said they were included on the inside. Mr. Zipprich said he can get detail drawings that show the location of rebar. Advantages of precast bases are they can be done for about half the price, due mainly to time savings. Discussion on preparing to place precast bases included proper compaction prior to placement. Peter Kandarlis said they use ½ sack slurry to even it out, although then you are waiting for cure

time again. Paul Nebeker said if a base settles, it sometimes can be adjusted by jacking it back into place.

5. Manhole Detail Updates

Jim Badowich commented that the manhole detail (420-1) also needs to be updated and could be revised to include the pre-cast base option.

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

Jim Badowich asked members to comment on this case that was referred to the working group from the main committee. Many agencies including Phoenix and Mesa, require slurry around storm drain now. It was discussed that plastic pipe manufacturers were against the case, however, they were not in attendance to provide comment. Mr. Badowich said they would be invited to the next meeting. Other rigid pipe manufacturers were in attendance, and they supported the case. Mr. Zipprich said there needed to be guidelines for both rigid and flexible pipe, and perhaps separate trench details for each. Clarifying bedding requirements is also needed. Peter Kandaris said SRP uses slurry because it saves time and is safer.

7. Plated Bolts (Case 11-03)

Paul Nebeker said he would not be at the next committee meeting to discuss this case. Jim Badowich said the case needs to be wrapped up this year, and asked manufacturers for their comments. In general, most of the time zinc plated bolts are used instead of cadmium because they are less expensive and don't have environmental issues. He suggested specifying zinc plated grade A. Grade B bolts are more expensive. Jami Erickson said Phoenix uses stainless steel and would like that as an option. Gordon Tyus said cadmium bolts are also called out in Detail 302-2. Creating a list of options with the correct ASTM references for different types of plated bolts was discussed.

7. Next Meeting Date

Members agreed to tentatively schedule the next meeting on Tuesday, February 21st at 1:30 at the MAG office.

Specifications & Details Outside Right-of-Way Working Group

January 17, 2012 Meeting (2:45 pm to 4:00 pm)

at

Maricopa Association of Governments

302 North 1st Avenue

Phoenix, AZ

Meeting Agenda

INTRODUCTION

- Welcome participants – Introductions

DISCUSSION ITEMS

- Status on MAG Carry-over Cases from the WG
 - Case 11-12 – Modify Section 107
 - Case 11-16 – Section 415 Guardrails
 - Case 11-18 – Section 350, Removal of Existing Improvements
- Discuss other potential cases
 - Modifications of Geogrid Materials – Section 796-4
 - Revise Section 360 – Telecommunications Installation
 - Revise Section 401 – Traffic Control
 - Revise Detail 131 – Street Sign Base
 - Revise Detail 160 – Chain Link Fence and Gate
 - Irrigation and Landscaping Sections – Revisions needed
- Next meeting date (February 21)

MAG Asphalt Working Group

1-18-2012 Notes

We met at the ARPA conference room at noon and discussed the following:

1. Regarding the penalties described in section 321(mix placement), the working group will provide a table showing actual work performed and applying MAG, ADOT, PAG and MCDOT penalties to compare dollar amounts levied.
2. A group was selected to add some language to section 710 (Mix design) adding some language for a gyratory low volume road mix design. Glendale will be consulted on the exact language to be used.
3. A warm mix specification will be explored to see how to implement it into the MAG standards.
4. RAP specification section 709 needs a complete overhaul. The working group desires to utilize FHWA specifications with some tweaks. This will be a new case but it may be delivered from the materials working group. We will help them with this issue.

General discussion and the concrete working group took over at 1:15

Respectfully submitted,
Jeff Benedict

MAG Concrete Working Group

Meeting Notes

Wednesday, January 18, 2012, 1:30 pm at the ARPA Offices

Present:

See attached attendance sheet.

Discussion:

The following were emailed or handed out to members for review and comments:

- 702 Base Materials – Case 11-30
- 324 PCCP
- 340 Concrete Curb, Gutter, Sidewalk, etc.
- 342 Decorative Concrete Paving Stone – Detail 225
- 505 Concrete Structures
- 506 Precast/Prestressed Concrete
- 510 Concrete Block Masonry
- 511 Brick Masonry
- 525 Shotcrete
- 775 Brick and Concrete Masonry Units
- 776 Masonry Mortar and Grout
- 728 CLSM

Various Specifications on Recycled materials used in base applications

- 1) The meeting was opened with a discussion on the current Case 11-30 Section 702 on Base Materials. Several Agencies have expressed a concern over the proposed change to reduce the current 50% fractured face value to 30% to match the current ADOT requirements. The Group decided to leave the 30% requirement in the proposed revision and would present this to the Standards Committee at the next meeting. We also discussed the possible inclusion of recycled materials being added to 702 and other Sections. The Group agreed it would be best to let the current hold-over Case 11-30 be approved to go into the Standards as soon as possible to complete the work started last year. We will bring a new Case to the Standards Committee regarding recycled materials.
- 2) The Group went over the list of other Sections for review and possible revision to obtain commitments from Group participants as follows:

- 324 PCCP
Robert Barkley
- 340 Concrete Curb, Gutter, Sidewalk, etc.
Peter Kandarlis

- 342 Decorative Concrete Paving Stone – Detail 225
Jeff Hearne, Scott Ziprich
- 505 Concrete Structures
Jeff Hearne, other Ready Mix Producers TBD
- 506 Precast/Prestressed Concrete
Robert Barkley, other Precast Manufacturers TBD
- 510 Concrete Block Masonry
Robert Barkley, Jeff Hearne, other Masonry Manufacturers
- 511 Brick Masonry
Robert Barkley, Jeff Hearne, other Masonry Manufacturers
- 525 Shotcrete
Peter Kandarlis
- 775 Brick and Concrete Masonry Units
Robert Barkley, Jeff Hearne, other Masonry Manufacturers
- 776 Masonry Mortar and Grout
Robert Barkley, Jeff Hearne, other Masonry Manufacturers
- 728 CLSM
Tom Villa – regarding recycled materials as aggregate

Date for Next Meeting:

The next meeting is scheduled for **Thursday, February 23rd at 1:30 PM** in the ARPA Offices. Any and all participants are welcome and encouraged to join the Group.

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