

June 29, 2016

TO: Members of the MAG Standard Specifications and Details Committee

FROM: Jim Badowich, City of Avondale, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Wednesday, July 6, 2016 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 Jim Badowich at 623-333-4222 or Gordon Tyus, MAG staff at 602-254-6300.

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

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

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

MAG Standard Specifications and Details Committee
TENTATIVE AGENDA
July 6, 2016

COMMITTEE ACTION REQUESTED

1. Call to Order and Introductions
Introductions

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

3. Approval of June 1, 2016, Meeting Minutes

2. Information.

3. **Review and approve minutes of the June 1, 2016 meeting.**

Carry Forward Cases from 2015

4. Case 15-13: Revisions to Section 725
Add text to Section 725.6 to identify what to include in a concrete mix design submittal.

4. **Information, discussion & possible action.**
Sponsor: Jeff Hearne, Concrete WG

New Cases for 2016

5. Case 16-01: Misc. Corrections
A. Revise Table 310-1 by deleting "or gradation deficiency" from the Deficiency column for Type IV.
B. Correct arrow placement on Detail 507: Encased Concrete Pipe
C. Add bullets back into Table 608-2 to make sure item 3. Surface Survey is included in medium and large projects.

5. Information and discussion
Sponsors: Bob Herz, MCDOT
Arvid Veidmark, AZUCA

- | | |
|---|--|
| <p>6. <u>Case 16-02: Certificates of Compliance and Analysis</u>
Add requirements for certificate of compliance and certificate of analysis. Add Section 106.2.1 Certificate of Compliance, add Section 106.2.2 Certificate of Analysis, and modify Section 717.2.1.2 Crumb Rubber.</p> | <p>6. Information and discussion
Sponsor: Bob Herz, MCDOT</p> |
| <p>7. <u>Case 16-05: DUAL CURB RAMPS.</u>
New Details 236-1, 236-2, 237-1, 237-2 and revise Section 340.3.9 Tolerances.</p> | <p>7. Information and discussion
Sponsor: Warren White, Chandler
<i>Updated</i></p> |
| <p>8. <u>Case 16-08 Valve Stem Extension Detail.</u>
Separate Valve box Installation and Grade Adjustment. Revise Detail 391-2 to remove Valve Stem extension drawing. Create new Detail 393 for the Valve Stem Extension.</p> | <p>8. Information, discussion & possible action.
Sponsor: Craig Sharp, Buckeye
<i>Updated</i></p> |
| <p>9. <u>Case 16-09: Revisions to Section 710.</u>
Remove low volume Gyratory and Marshall mixes.</p> | <p>9. Information, discussion & possible action.
Sponsor: Greg Groneberg, Asphalt WG
<i>Updated</i></p> |
| <p>10. <u>Case 16-10: Proposed new Section 719. POLYMER MODIFIED TERMINAL BLENDED RUBBERIZED ASPHALTIC CONCRETE.</u></p> | <p>10. Information and discussion
Sponsor: Greg Groneberg, Asphalt WG
<i>Updated</i></p> |
| <p>11. <u>Case 16-11: Update to Section 309 Lime Stabilization or Modification of Subgrade.</u>
Eliminate reference to AASHTO T-26 which has been discontinued.</p> | <p>11. Information and discussion
Sponsor: Bob Herz, MCDOT</p> |
| <p>12. <u>Case 16-12: Revision to Alteration of Work Section 104.2.1.</u>
Replace existing requirements of Section 104.2.1 with Maricopa County requirements.</p> | <p>12. Information and discussion
Sponsor: Bob Herz, MCDOT
<i>Withdrawn</i></p> |
| <p>13. <u>Case 16-13: New Detail 115.</u>
Temporary Site Access With Trackout Pad.</p> | <p>13. Information and discussion
Sponsor: Bob Herz, MCDOT</p> |
| <p>14. <u>Case 16-14: Revisions to Water Meter Box and Cover Details.</u>
Details 310, 315, and 320.</p> | <p>14. Information and discussion
Sponsor: Warren White, Chandler
<i>Updated</i></p> |

- | | |
|--|---|
| 15. <u>Case 16-15: Proposed new Detail 319.</u>
Traffic rated water meter box and cover. | 15. Information and discussion
Sponsor: Warren White, Chandler
<i>Updated</i> |
| 16. <u>Case 16-16: Revision to Section 717.</u>
Change TSR method from AASHTO T-283 to ASTM D 4867 to be consistent with Section 710. | 16. Information and discussion
Sponsor: Greg Groneberg, Asphalt WG
<i>New</i> |
| 17. <u>New and Potential Cases.</u>
New sponsored cases, other potential cases. | 17. Information and discussion |

General Discussion

- | | |
|--|--|
| 18. <u>Working Group Reports</u> | 18. Information and discussion. <ul style="list-style-type: none">• Curb Ramp WG Chair: Warren White
06/08/2016 Meeting• Water/Sewer WG Chair: Jim Badowich
06/21/2016 Meeting• Asphalt, Materials and Concrete WGs
06/16/2016 Meeting
Chairs: Greg Groneberg, Brian Gallimore
and Jeff Hearne• Outside ROW Chair: Peter Kandaris |
| 19. <u>General Discussion</u>
Microsurfacing/Microseal Discussion | 19. Information and discussion. |
| 20. <u>Request for Future Agenda Items</u> | 20. Information and discussion. |
- Adjournment

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

June 1, 2016

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

AGENCY MEMBERS

Jim Badowich, Avondale, Chair	Steve Ketchum, Mesa (proxy)
Craig Sharp, Buckeye	Dan Nissen, Peoria
Warren White, Chandler, Vice Chair	Robert Duvall, Phoenix (Streets)
Nick Russo, El Mirage (audio)	Jami Erickson, Phoenix (Water)
* Jess Knudson, Florence	Rod Ramos, Scottsdale
Tom Kaczmarowski, Glendale	David Mobley, Surprise
Tom Condit, Gilbert	Tom Wilhite, Tempe
* Tom Vassalo, Goodyear	* Jonathan Sorrell, Valley Metro
Bob Herz, MCDOT	Gregory Arrington, Youngtown

ADVISORY MEMBERS

Greg Groneberg, ARPA	Brian Gallimore, AGC
Jeff Hearne, ARPA	Peter Kandaris, Independent
* Arvid Veidmark, AZUCA	Paul R. Nebeker, Independent
Tom Brennan, AZUCA	Jeff Rodgers, SRP (proxy)

MAG ADMINISTRATIVE STAFF

Gordon Tyus

* Members not attending or represented by proxy.

GUESTS/VISITORS

Troy McGahey, New Horizon Sales
Mark Moeller, ADS
Peter Rupel, Phoenix
Brian Sitarz, Oldcastle

1. Call to Order

Chair Jim Badowich called the meeting to order at 1:35 p.m.

Mr. Badowich introduced the proxies (Steve Ketchum from Mesa and Jeff Rodgers filling in for Christina Buckle of SRP) and also had those on audio call introduce themselves (Nick Russo of El Mirage).

2. Call to the Audience

Chair Badowich announced the call to the audience. No members of the audience wished to speak.

3. Approval of Minutes

The members reviewed the May 4, 2016 meeting minutes. Mr. Badowich asked if there were any changes. Peter Kandaris noted that he attended in person, rather than via audio as noted in the minutes.

Bob Herz moved to accept the minutes with Mr. Kandaris' correction. Tom Wilhite seconded the motion. A voice vote of all ayes and no nays was recorded.

Carry Forward 2015 Cases

4. Case 15-13: Add text to Section 725.6 to Identify what to Include in a Concrete Mix Design Submittal.

Jeff Hearne said he has not had any comments since the last meeting. Mr. Badowich asked if there were any comments at the last working group meeting. Mr. Hearne said there were none, and proposed voting on the case and the next committee meeting.

New Cases for 2016

5. Case 16-01: Miscellaneous Corrections.

Chair Badowich asked if there were any new submissions. None were presented.

6. Case 16-02: Add Section 106.2.1 Certificate of Compliance, add Section 106.2.2 Certificate of Analysis, modify Section 717.2.1.2 Crumb Rubber, and modify several other sections as noted.

Bob Herz provided a revised version of the case, but since it was not in the agenda packet copies needed to be made. The discussion jumped ahead to Case 16-05. After that case was discussed and copies were provided to the committee, Mr. Herz summarized some of the changes. These included the sentence shown in red on the first page that added, "issuance of

the solicitation for a construction price proposal (aka: at the time of advertising for bids).” He also said “upon request” was added to many of the other sections shown on page three. He thanked Phoenix for providing other references to the certificates of compliance and certificates of analysis and said he was continuing to review them. Mr. Herz asked members to take the case back to their agencies for review and provide him comments.

7. Case 16-05: Dual Curb Ramps. New Details 236-1, 236-2, 237-1, 237-2 and revise Section 340.3.9 Tolerances.

Warren White provided a handout of the updated case at the meeting. He said the details had been reviewed at the last working group meeting as well as by FHWA and ADOT. The revision incorporated many of their comments, including removing the limits of the landing area. He noted the tables now show typical minimums that need to be maintained.

One of the first areas Mr. White wanted to discuss was the maximum slopes vs. the preferred slopes, and whether to show both on the detail as currently shown on the draft details. Mr. Herz recommended removing the maximum slopes from the details since they are in the specifications, and you want contractors to use the preferred slopes to allow for construction tolerances. Mr. White said workers in the field may not have the specs available. Tom Kaczmarowski recommended to leave it as is, but add a note on where the max values came from. Paul Nebeker said the workers in the field often only have the drawings and the details should lead them back to the specs. Mr. White said this was true for inspectors as well. Rod Ramos said he thought it should be clear in the specifications that if the maximum slope values were exceeded, the ramp needs to be removed.

Warren White asked members to review the changes to Section 340.3.9 Tolerances. He said they added back in a construction tolerance of $\frac{1}{4}$ ” and also wordsmithed the last sentence on the ADA guidelines for slopes. Mr. Herz suggested adding “if not compliant remove and replace.” Mr. White said he could add, “See Note 2” to the details for the maximum slope dimensions. Mr. Badowich said the note refers contractors back to the spec.

The next item of discussion Mr. White brought up was the measurement of the wing. Currently it is shown parallel to the curb, which is how it is defined in PROWAG. This works for straight or radial ramps, but not as well on directional ramps. The revised details show the slope of the wings measured perpendicular to the ramp. This would add a little tolerance in the construction. Craig Sharp asked if not using it parallel might throw it off and not be ADA compliant. Mr. White said it actually makes it flatter, so that wouldn't be a problem.

Peter Kandarlis commented on the tables that added (TYP) to the dimensions for C and D. He said typical does not mean approximate. Rod Ramos gave the example where on the wings it says 10% MAX TYP, means that the other ramps are 10% MAX slope, not that it is typically 10%. Bob Herz suggested changing the C and D dimensions “varies.” Mr. White said that's what they ended up doing on Chandler's details. Mr. Ramos said they show all spot elevations at Scottsdale and said the dimensions of the wings need to be calculated. He said that you can't have a one-size fits all detail. It needs to have an engineer determine the sizes. Brian Gallimore said contractors would like a little flexibility in construction, and allow the curb heights to

vary. Mr. Herz said radial ramps and wing sizes can be calculated to get a hard number, but it doesn't work for directional ramps. Steve Ketchum of Mesa said as long as the grade slope is 2% or less you can provide typical dimensions that work. Mr. Ketchum also asked about other types of ramp details. Mr. White said inline ramps, blended transitions and other options would need to be addressed in future cases. Rod Ramos said ADOT has a table that shows the values for sample ramp locations and directions, but that it is a full page table. Mr. Gallimore said contractors are leery about dimensions that say "varies." Bob Herz said the designer should design them, the construction specs shouldn't dictate it. Jim Badowich said he would be in favor of a table like ADOT uses, because often engineers just spec MAG details, and people in the field would need some guidance.

Mr. White next said the control points were moved to the face of the curb to match Detail 234. The directional ramp details also added note 8 "Ramp alignment should connect control point to control point of receiving ramp within 5 feet" which is needed for a blind cane user to detect the ramp. Other changes included allowing a walking space behind ramps as 5' preferred to match MAG sidewalks. ADA has a minimum of 4' when there are restrictive conditions. Steve Ketchum thought this seemed a reasonable approach.

Bob Herz said these details are for new construction. You would likely need separate ones for retrofits in order to fit within existing right-of-way. Mr. Ketchum said Mesa has retrofit details. Mr. Herz said the county is working on them. Warren White clarified that the draft details meet the current draft PROWAG requirements.

Steve Ketchum asked about signalized vs unsignalized ramps regarding requirements for push buttons. He noted that he also supports the use of directional ramps. Mr. White said during the working group meeting they specifically decided to leave the push-button location off the details leaving the locations to be determined by the traffic engineers. He also asked members to review the case and email him any comments before the next curb ramp working group meeting. He would like to get the case approved this year.

8. Case 16-08: Valve Stem Extension Revisions.

Craig Sharp provided updates to the case based on feedback from the Water/Sewer working group meeting. Revisions included modifying the dimensions for the depth to the collar and the bottom of the nut. It also increased the gap between the dirt ring and riser for more flexibility. The revised case also includes Detail 391-1 since it also has an extension on it.

In the working group it was decided that all installations in dirt should have concrete collars that included reinforcing steel. Mr. Nebeker recommended showing the steel ring location with a large dot rather than a square, and labeling a #4 hoop.

Back on Detail 391-1, Jim Badowich said he would like to see the "middle part" of the adjustment for Type C installations shown if it has a valve extension. He said in the field he has seen installations with several sections stacked creating a snake effect that can stop the extension key from reaching the bottom. He said a uniform piece of pipe should be used. Mr.

Sharp said he would check to see what sized pipe would be appropriate. Mr. Badowich also said to label it as “riser pipe” rather than PVC, because other materials may be used.

Rob Duvall said that on Detail 391-2, Notes #2 and #6 duplicate notes on the drawing. They could be references as “See Note #2” as an example. There was also a missing arrow for the frame and cover note.

Craig Sharp said he would make these changes and would like to put it up for a vote at the next meeting.

9. Case 16-09: Revisions to Section 710 to Remove Low Volume Gyrotory and Marshall Mixes.

Greg Groneberg handed out the latest revisions to Section 710. The case added a new sentence on the second paragraph that stated, “Typically, Marshall mixes are used for residential applications and Gyrotory mixes are used for arterial applications.” This text was added back in to help clarify the preceding sentence. Rod Ramos said Scottsdale had similar language. Peter Kandaris said he preferred changing “residential” to “low volume” and “arterial” to “high volume.” Jim Badowich agreed since they have collectors and other heavy use roads not covered by the residential and arterial terminology. He asked Mr. Groneberg if this was reviewed at the working group meeting. He said that it was and that this was the only issue left to clarify.

Tom Kaczmarowski asked about the line before Table 710-1 that allows thickness of layers to be 150% of the minimum lift thickness. He said that ¾” gyrotory mixes could allow for up to 4-½” lift thicknesses, and wondered if this may be excessive in order to get compaction. Greg Groneberg said Phoenix has used a 3” lift followed by a 2” lift. Mr. Gallimore said the contractor still must meet compaction requirements, which deters the use of that large of a lift thickness. He encouraged members to attend the next working group meeting for more discussion.

10. Case 16-10: Proposed new Section 719 POLYMER MODIFIED TERMINAL BLENDED RUBBERIZED ASPHALTIC CONCRETE

Greg Groneberg introduced a new case for a new Section 719. The terminal blended rubber asphalt section is based on Section 710, but modified for this specific material. Some differences are in Table 719-1, the ½” band is proposed as 90-100 and the 3/8” band at 75-90. They needed to free up some voids for the extra oil. For the 3/8” the typically are near the high end of what is currently allowed at about 82-83, but may want to go higher in some cases.

It was also discussed that the PMTBRAC abbreviation could be removed for clarity. Mr. Groneberg also thought they may want the No. 8 sieve size to be courser such as 34-45. He said this process is being used more and more, typically for overlays. He said it provides better performance in residential areas including cul-de-sacs. Mr. Duval said Phoenix is currently using it with positive results.

Peter Kandarlis asked how the material was for patching. Mr. Groneberg said it is now readily available. Mr. Badowich asked if it was compatible with existing asphalt. Brian Gallimore said it was, and that it is becoming popular as use as a “quiet pavement.” He gave an example of Bell Road near Sun City.

11. Case 16-11: Update to Section 309 Lime Stabilization or Modification of Subgrade

Bob Herz introduced a new case to update Section 309. AASHTO T-26 was discontinued, so he added specifications for the acceptable pH range of water used in the process. He noted that MCDOT had a problem with a contractor using raw non-potable water. Brian Gallimore said he forwarded the proposed change to local contractors and will get comments back to Mr. Herz. Mr. Herz asked for agencies to review the case and comment on the proposed revision.

Mr. Kaczmarowski asked if potable water meets the spec. Mr. Herz said it was inside the pH range. It was recommended to undelete the sentence “Water known to be of potable quality may be used with test.” Mr. Herz said the same water source is to be used for the mix design as to be used during construction.

12. Case 16-12: Revision to Alteration of Work Section 104.2.1

Bob Herz introduced a new case to incorporate MCDOT language into Section 104.2.1. He said MCDOT contracts replace the MAG language, and he thinks this revision would provide stronger protection. He encouraged any agencies that may use the MAG language to review the proposed change and get comments back to him.

13. Case 16-13: Proposed New Detail 115 Temporary Site Access with Trackout Pad

Bob Herz provided a new detail to solve a problem County has had with trackout installations, of rocks being scattered on the roadway and damage to the edge of pavement. The detail helps prevent this and also was requested from the County air quality department. Jim Badowich asked if “cold mix” is the right term, and if so do we have a definition of it? Tom Wilhite was concerned about the gutter flow. Mr. Herz said pipe allows the drainage of upstream ponded water and also allows access over the curb.

Brian Gallimore said other people have used millage instead of asphalt, and he thought it worked well. Mr. Herz said this would only be required on larger subdivisions not for a single lot or small construction site. The track-out pad is for dust control. Dan Nisson said the detail should address pedestrian and bicycle access issues for infill areas or where pedestrian and bicycle facilities already exist. Mr. Badowich thought this could be addressed with a simple note.

14. Case 16-14: Proposed revisions to water meter box and cover details. Revised Details 310-314, 320 and add new Detail 315 for polymer concrete meter box lids.

Warren White introduced a new case to update MAG meter boxes and lids details. He was assisted in developing them by OldCastle and the Water/Sewer Working Group. He said the

covers (Details 310-314) were consolidated into a Detail 310 which replaced cast-iron covers with steel. A new Detail 315 was created to allow polymer lids as an option. Both cover details allow for the use of different types of automatic meter readers (AMR). They can also be used for reclaimed by changing the text and/or color on the lid. Detail 320 was updated to allow alternative materials such as polymer concrete and others as listed in Note #3. Thermoplastics currently are not allowed. These boxes are for general loading in pedestrian areas. (not traffic rated).

Jim Badowich commented that agencies are getting away from metal lids, and many are going to polymer boxes. They wanted to maintain the same sizes so lids are interchangeable. Mr. White said in order to do this the dimensions are not to vary more than 1/16”.

Mr. Badowich asked about the vertical load rating, and said there was discussion at the working group about heavy duty boxes and intermediate traffic. Attendees from OldCastle said that the combination of the lid and box are used to meet loading requirements. Bob Herz asked if the lids have a separate rating (i.e. steel vs. polymer).

15. Case 16-15: Proposed new Detail 319 Traffic Rated Box and Cover

Warren White introduced a separate case for new traffic rated box and cover. They would go together and need to match. In this case, you don't want the lids interchangeable with other non-traffic rated boxes. The boxes and covers will be discussed at the next Water/Sewer Working Group meeting

16. Working Group Reports

Chair Badowich asked for reports from the working group chairs.

a. **Curb Ramp Working Group**

Warren White said one thing not previously discussed was a question on the use of the 7” curb in Tempe that he still needed to get more information on. The next meeting time is to be determined.

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

Due to the length of the meeting, and since many members needed to leave, Jim Badowich decided to quickly wrap up the meeting. He said the notes for all the working groups were in the packet if members wanted to review them. The next meeting of the Water/Sewer Working Group is scheduled for Tuesday, June 21st, at 1:30 in the MAG office.

c. **Asphalt, Materials and Concrete Working Groups**

The next meeting of the joint Asphalt/Materials and Concrete Working Groups is scheduled for Thursday, June 16th at noon. The meetings will be held in the ARPA office, 916 W Adams Street, Phoenix.

d. **Outside ROW Working Group**

Peter Kandaris attended May working group meetings and his comments on outside right-of-way projects are provided in the meeting notes.

17. General Discussion

Jim Badowich said the discussion on Microsurfacing/Microsealing will be postponed until next month.

18. Adjournment

Chair Badowich adjourned the meeting at 3:40 p.m.

2016 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

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

CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE	
	CARRY FORWARD CASES FROM 2015						
15-05	Case 15-05: Proposed Revisions to Section 616 Reclaimed Water Line Construction and NEW Reclaimed Valve Box detail 270-2. Update Detail 270-1.	Chandler	Warren White	03/04/2015 04/06/2016	Voted: 04/06/2016	10 0 2	Yes No Abstain
15-10	Case 15-10: Add subsection 321.10.5.3 "Rehabilitation Work" into the MAG Specifications.	Materials WG	Brain Gallimore	06/03/2015 07/23/2015	Withdrawn 02/03/2016	0 0 0	Yes No Abstain
15-13	Case 15-13: Add text to Section 725.6 to identify what to include in a concrete mix design submittal.	Concrete WG	Jeff Hearne	06/03/2015 04/21/2016	Scheduled: 07/06/2016	0 0 0	Yes No Abstain
	NEW CASES FOR 2016						
16-01	Case 16-01: Miscellaneous Corrections: A. Revise Table 310-1 by deleting "or gradation deficiency" from the Deficiency column for Type IV. B. Correct arrow placement on Detail 507: Encased Concrete Pipe C. Add bullets back into Table 608-2 to make sure Item 3. Surface Survey is included in medium and large projects.	MCDOT	Bob Herz, Arvid Veidmark	01/06/2016 03/02/2016		0 0 0	Yes No Abstain
16-02	Case 16-02: Add requirements for certificate of compliance and certificate of analysis. Add Section 106.2.1 Certificate of Compliance, add Section 106.2.2 Certificate of Analysis, and modify Section 717.2.1.2 Crumb Rubber.	MCDOT	Bob Herz	01/06/2016 05/12/2016		0 0 0	Yes No Abstain
16-03	Case 16-03: Revision to Detail 251 RETURN TYPE DRIVEWAYS. Adjust concrete thickness and concrete class for commercial and industrial driveways to match requirements shown on Detail 250.	MCDOT	Bob Herz	01/06/2016 02/04/2016	Voted: 04/06/2016	12 0 0	Yes No Abstain
16-04	Case 16-04: Review and adjust Section 340.2.1 for withdrawn ASTM C1028 reference.	MCDOT	Bob Herz	02/03/2016 02/04/2016	Voted: 04/06/2016	12 0 0	Yes No Abstain

2016 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

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

CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE	
16-05	Case 16-05: Dual Curb Ramps. New Details 236-1, 236-2, 236-3, 237-1, 237-2, 237-3 and revise Section 340.3.9 Tolerances.	Chandler/ Curb Ramp WG	Warren White	03/02/2016 06/29/2016		0 0 0	Yes No Abstain
16-06	Case 16-06: Update Section 727 Steel Reinforcement to replace withdrawn ASTM A82 and A185 with ASTM A1064.	MCDOT	Bob Herz	04/06/2016	Voted: 05/04/2016	15 0 1	Yes No Abstain
16-07	Case 16-07: Add Atmospheric Corrosion Resistance Low-Alloy Steel (Corten steel) to the Material portion of Section 415 Flexible Metal Guardrail.	MCDOT	Bob Herz	04/06/2016 04/26/2016	Voted: 05/04/2016	15 0 1	Yes No Abstain
16-08	Case 16-08: Separate Valve box Installation and Grade Adjustment. Revise Detail 391-2 to remove Valve Stem extension drawing. Create new Detail 393 for the Valve Stem Extension.	Buckeye Water/Sewer WG	Craig Sharp	05/04/2016 06/21/2016	Scheduled: 07/06/2016	0 0 0	Yes No Abstain
16-09	Case 16-09: Revisions to Section 710 to remove low volume Gyratory and Marshall mixes.	Asphalt WG	Greg Groneberg	05/04/2016 06/20/2016	Scheduled: 07/06/2016	0 0 0	Yes No Abstain
16-10	Case 16-10: Proposed new Section 719 POLYMER MODIFIED TERMINAL BLENDED RUBBERIZED ASPHALTIC CONCRETE	Asphalt WG	Greg Groneberg	06/01/2016 06/24/2016		0 0 0	Yes No Abstain
16-11	Case 16-11: Update to Section 309 Lime Stabilization or Modification of Subgrade	MCDOT	Bob Herz	06/01/2016		0 0 0	Yes No Abstain
16-12	Case 16-12: Revision to Alteration of Work Section 104.2.1	MCDOT	Bob Herz	06/01/2016	Withdrawn 07/06/2016	0 0 0	Yes No Abstain
16-13	Case 16-13: Proposed New Detail 115 Temporary Site Access with Trackout Pad	MCDOT	Bob Herz	06/01/2016		0 0 0	Yes No Abstain
16-14	Case 16-14: Proposed revisions to water meter box and cover details. Revised Details 310-314, 320 and add new Detail 315 for polymer concrete meter box lids.	Chandler/ Water/Sewer WG	Warren White	06/01/2016 07/06/2016		0 0 0	Yes No Abstain

2016 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

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

CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE
16-15	Case 16-15: Proposed new Detail 319 Traffic Rated Water Meter Box and Cover	Chandler/ Water/Sewer WG	Warren White	06/01/2016 07/06/2016		0 Yes 0 No 0 Abstain
16-16	Case 16-16: Revision to Section 717. Change TSR method from AASHTO T-283 to ASTM D 4867 to be consistent with Section 710.	Asphalt WG	Greg Groneberg	07/06/2016		0 Yes 0 No 0 Abstain

725.6 MIX DESIGN PROPORTIONING:

A concrete mix design carrying the producer's designated mix number for each type of concrete being furnished under these specifications shall be submitted to the Engineer at least once each year for approval. Each design shall utilize the proper proportioning of ingredients to produce a concrete mix that is homogeneous and sufficiently workable to provide a consistent and durable concrete product that meets the specified compressive strength and other properties as required by the application.

A concrete mix design submittal shall include the mix identification number and the applicable proportions, weights, and quantities of individual materials incorporated into the mix including the size and source of concrete aggregates, the type and source of cement and fly ash or SCM, and the brand and designation of chemical admixtures or other additives.

In the event there is a modification to the mix design proportions:

(A) Modifications that do not require a new mix design submittal/approval:

- (1) Modifications which do not result in batch target weights for the fine aggregate or combined coarse aggregates changing by more than 5 percent from the original approved mix design.
- (2) Modifications to the percentage of coarse aggregate fractions that do not change the total coarse aggregate volume.
- (3) Modifications to dosages of chemical or air-entraining admixtures, within the manufacturer's recommendations.
- (4) The incorporation or elimination of chemical admixtures which are listed on the mix design to effect a change in the time-of-set (retarders or accelerators).

(B) Modifications that require a new mix design submittal/approval and may require performance verification:

- (1) Modification to the class of concrete per Table 725-1.
- (2) Modification to the type/class/source of cement, fly ash, natural pozzolan, or silica fume.
- (3) Modification to the percentage of fly ash, natural pozzolan, or silica fume.
- (4) Modification to a coarse aggregate size designation.
- (5) Modification of the type of chemical admixture, or the incorporation or elimination, of an air-entraining admixture.
- (6) Modification of coarse or fine aggregate source.



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: January 6, 2016 Revised 2016-06-28
To: MAG Specifications and Details Committee
From: Robert Herz, MCDOT Representative
Subject: Add to Section 106.2 the requirements for certificate of compliance and certificate of analysis. **Case 16-02**

PURPOSE: Define the requirements for certificate of compliance and certificate of analysis referenced in Section 106.2 and modify section **717.2.1.2 Crumb Rubber** to delete references to ADOT specifications for certificates of compliance.

REVISIONS: Add section **106.2.1 Certificate of Compliance**, add section **106.2.2 Certificate of Analysis**, modify section **717.2.1.2 Crumb Rubber**, and modify other various locations within the specifications to have the submission of certificates to the Engineer be upon request.

SECTION 106 - CONTROL OF MATERIALS

106.2 SAMPLES AND TESTS OF MATERIALS:

All materials to be incorporated in the work may be subject to sampling, testing and approval, and samples furnished shall be representative of the materials to be used. The Engineer may select samples, or may require that samples be delivered by the Contractor to a laboratory designated by the Engineer.

The Contracting Agency will pay for the initial or normal test required by the Engineer to guard against unsuitable materials or defective workmanship. Additional tests, required due to failure of the initial or normal test(s), shall be paid for by the Contractor. The Engineer will designate the laboratory which will accomplish the additional test(s).

The procedures and methods used to sample and test materials will be determined by the Engineer. Unless otherwise specified, samples and tests will be made in accordance with either: the Materials Testing Manual of the Contracting Agency; the standard methods of AASHTO or ASTM, which were in effect and published at the time of issuance of the solicitation for a construction price proposal (aka: at the time of advertising for bids).

The laboratory responsible for the test shall furnish at least one copy of the test results to the Contracting Agency's ~~or~~ his designated representative, to the Contractor, and to the appropriate material supplier.

With respect to certain manufactured materials, the Engineer may permit the use of some materials prior to sampling and testing provided they are delivered with either a certificate of compliance or analysis or both, stating that the materials comply in all respects with the requirements of the specifications. These certificates shall be furnished in

triplicate and clearly identify each delivery of materials to the work area. The certificates shall be signed by a person having legal authority to bind the supplier or manufacturer.

106.2.1 Certificate of Compliance: A Certificate of Compliance shall be submitted on the manufacturer's or supplier's official letterhead, and shall contain the following information:

1. The current name, address, and phone number of the manufacturer or supplier of the material or equipment.
2. A description of the material or equipment supplied.
3. Quantity of material represented by the certificate.
4. Means of material identification, such as label, lot number, or marking.
5. A statement that the material complies in all respects with the requirements of the cited specifications. Certificates shall state the name of the specific cited specifications, such as AASHTO M 320, ASTM C494, or specific table or subsection of the Specifications or Special Provisions.
6. A statement that the individual identified in item eight below has the legal authority to bind the manufacturer or the supplier of the material.
7. Project identification: Project name and all associated numbers (agency, Federal, and ADOT TRACS).
8. The name, title, and signature of the responsible individual. The date of the signature shall also be given.

Each of the first six items specified above shall be completed prior to the signing of the certificate as defined in item eight. No certificate will be accepted that has been altered, added to, or changed in any way after the authorized signature has been affixed to the original certificate. However, notations related to project specifics such as project identification, contractor, or quantity shipped are acceptable, provided the basic requirements of the certificate (items one through six) are not affected.

A copy or facsimile reproduction of the original certificate will be acceptable; however, the original certificate shall be made available upon request.

106.2.2 Certificate of Analysis: A Certificate of Analysis shall include all the information required for a Certificate of Compliance and, in addition, shall include the results of all tests required by the specifications.

SECTION 717 - ASPHALT-RUBBER ASPHALT CONCRETE

717.2.1.2 Crumb Rubber: Crumb Rubber shall meet the gradation requirements as shown in Table 717-1 below when tested in accordance with Arizona Test Method 714.

TABLE 717-1	
GRADATION REQUIREMENTS OF CRUMB RUBBER	
Sieve Size	Percent Passing
	Type B
2.36 mm (#8)	
2.00 mm (#10)	100
1.18 mm (#16)	65 - 100
600 µm (#30)	20 - 100
300 µm (#50)	0 - 45
75 µm (#200)	0 - 5

The crumb rubber shall have a specific gravity of 1.15 ± 0.05 and shall be free of wire or other contaminating materials, and shall contain not more than 0.5 percent fabric. Calcium carbonate, up to four percent by weight of the crumb rubber, may be added to prevent the particles from sticking together.

Crumb rubber shall be derived from processing whole scrap tires or shredded tire materials through a process of mechanical grinding at ambient temperature. Use of crumb rubber granules produced from a cryogenic process is prohibited. The tires from which the crumb rubber is produced shall be from automobiles, trucks, or other equipment owned and operated in the United States.

Upon request a Certificates of Compliance conforming to the requirements of Section 106.2 conforming to Arizona State Department of Transportation Standard Specifications for Road and Bridge Construction Section 106.05 shall be submitted. In addition, the Certificates shall that confirms that the rubber is a crumb rubber, derived from processing at ambient temperature, whole scrap tires or shredded tire materials; and the tires from which the crumb rubber is produced is taken from automobiles, trucks, or other equipment owned and operated in the United States. complies with the gradation and specific gravity of this section 717 and is free of wire or other contaminating materials. The Certificates shall also attest verify; that

- The processing does not produce, as a waste product, casings or other round tire material that can hold water when stored or disposed of above the ground.
- The crumb rubber to be used in ARB shall be the type is produced through a process of mechanical grinding at ambient temperature. Use of crumb rubber granules produced from a cryogenic process is prohibited.
- The tires from which the crumb rubber is produced were from automobiles, trucks, or other equipment owned and operated in the United States. (Certificates of Compliance conforming to Arizona State Department of Transportation Standard Specifications for Road and Bridge Construction Section 106.05 shall be submitted.)

CHANGES to other sections that reference 'Certificates of Compliance':

Lime Stabilization or Modification of Subgrade Section 309.2.3 Lime Slurry:

Lime slurry shall be a pumpable suspension of solids in water. The solids portion of the mixture, when considered on the basis of solids content, shall consist principally of hydrated lime of a quality and fineness sufficient to meet Section 309.2.2 requirements. Upon request aA eCertificate of eCompliance shall be provided to the Engineer for each load of lime applied at the project.)

Decorative Asphalt Section 322.2 Materials, revise the second sentence as noted:

All products used in the surfacing system shall meet the minimum physical and performance properties in Table 322-1. The Contractor shall upon request submit a Certificate of Compliance to the Engineer indicating that the materials to be included in the work meet these specification requirements.

Microsurfacing Specifications Section 331.2 Materials:

The Contractor shall supply all materials necessary for the performance of the work in accordance with the specifications. The asphalt emulsion, aggregate, and mineral filler shall be as specified in Section 714. Materials shall be approved by the Engineer prior to the start of construction. When requested by the Engineer Certificates of Compliance shall be provided for accompany each delivery of emulsion.

The Contractor shall be responsible for the safety of all materials of which he has taken delivery until they are in place on the road, and shall take all necessary precautions to avoid loss by fire or theft, or damage by water, and shall bear the cost of replacing any such material that is lost, spilt, destroyed or damaged after delivery.

Concrete Structures Section 505.5.4.2 Anchoring Materials, revise the first paragraph as follows:

Epoxy materials shall be used for anchoring dowels. The Contractor shall upon request submit Certificates of Compliance or Analysis, complete with supporting documentation, to the Engineer for all epoxy materials to be used for anchoring dowels on a specific project, in accordance with the requirements of Section 106.2. The epoxy materials shall be provided by the Contractor in general conformance with the requirements of Section 1015-1— General Requirements of Section 1015— EPOXY MATERIALS of the current Arizona Department of Transportation (ADOT) Standard Specifications for Road and Bridge Construction, amended to date.

Section 505.6.3.3 Construction Requirements, paragraph (1) General, revise the last sentence as noted:

Upon request Certificates of Compliance conforming to the requirements of Section 106.2 shall also be submitted by the Contractor.

Section 711.3 Test Report and Certification:

Test reports and certifications shall be provided to the Engineer when requested by the Engineer. At the time of delivery of each shipment of asphalt, the supplier supplying the material shall deliver to the purchaser 3 certified copies of the test report which shall indicate the name of the refinery and supplier, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, purchase order number, and results of the above specified tests. The test report shall be signed by an authorized representative of the supplier certifying that the product delivered conforms to the specifications for the type and grade indicated.

Until the certified test reports and samples of the material have been checked by the Engineer, that material will be only tentatively accepted by the Contracting Agency. Final acceptance will be dependent upon the determination of the Engineer that the material involved fulfills the requirements prescribed. The certified test reports and the testing required in connection with the reports shall be at no additional cost to the Contracting Agency.

Section 725.2 Cementitious Materials, revise the third paragraph as follows:

Cementitious materials shall be sampled and tested as prescribed in the applicable ASTM specifications. Upon request, ~~the~~ Contractor shall obtain and deliver to the Engineer a ~~certification-Certificate~~ of ~~Ce~~ompliance conforming to the requirements of Section 106.2 signed by the material manufacturer, identifying the cementitious material and stating that the cementitious material delivered to the batching site has been tested in accordance with the specifications and complies with [insert the appropriate specifications]. ~~When requested by the Engineer, the Contractor shall furnish three copies of the cementitious materials certification.~~ The cost of furnishing tested cementitious materials shall be considered as included in the contract ~~bid~~ price and no additional allowance will be made therefore.

Section 725.2.1 Supplementary Cementitious Materials (Pozzolans), revise the third paragraph as follows:

Upon request ~~the~~ Contractor shall obtain and deliver to the Engineer a ~~e~~Certification of ~~e~~Compliance signed by the pozzolan supplier identifying the pozzolanic material and stating the pozzolan delivered to the batching site complies

with the appropriate specifications. The cost of furnishing tested pozzolan shall be considered as included in the contract ~~bid~~-price and no additional allowance will be made therefore.

Steel Reinforcement Section 727.1 General, revise the second paragraph as follows:

No reinforcing steel will be accepted under this specification until it has been approved by the Engineer. When required by the Engineer, the Contractor or supplier shall furnish a spot sample taken on the project and notify the Engineer as to when and where they will be available. Such samples shall be furnished at the expense of the Contractor or supplier, but the cost of any testing that may be required will be borne by the Contracting Agency. Samples shall only be taken in the presence of the Engineer. The Contractor shall furnish 3 certified mill test reports or ~~a~~ Certificates of Compliance for each heat or size of steel which can be clearly identified with the lot. When such information has been furnished, placing of the steel will not be held up until results of spot samples have been received. Unless otherwise specified, all reinforcing steel bars shall be deformed intermediate grade 40 billet steel conforming with ASTM A615 and the shapes shall conform with ASTM B670.

Expansion Joint Filler Section 729.3 Test Report and Shipment Certificate:

~~When requested by the Engineer~~ Each shipment shall be accompanied by a eCertificate of Compliance ~~from the supplier~~ that the material will comply ~~complies~~ with the above specifications ~~and such certificate shall be delivered to the Engineer~~.

Geosynthetics Section 796.3 Test and Certification Requirements:

~~Upon request a~~ Certificates of eCompliance shall be submitted to the eEngineer ~~upon delivery of for~~ material ~~for to be used on a specified project~~. Samples of materials shall be submitted for testing. Each geosynthetic material lot or shipment ~~must is to~~ be approved by the Engineer before the material is ~~may be~~ incorporated into the work.

Testing methods and results shown in the ~~certificate~~ Certificate of eCompliance shall conform to the listed specifications for the proposed geosynthetic ~~use~~. Manufacturer's supporting documentation including, but not limited to, product information sheets, installation procedures and recommendations, recommended use, and project references shall be submitted to the Engineer for product evaluation and approval.

REFERENCE INFORMATION:

Arizona State Department of Transportation Standard Specifications for Road and Bridge Construction Section 106.05 (106CERT, 09/14/12 the Standard Specifications is revised to read:)

SECTION 106 CONTROL OF MATERIAL:

106.05 Certificates:

(A) General:

The contractor shall submit to the Engineer an original or copy of either a Certificate of Compliance or a Certificate of Analysis, as required, prior to the use of any materials or manufactured assemblies for which the specifications require that such a certificate be furnished.

Certificates shall be specifically identified as either a "Certificate of Compliance" or a "Certificate of Analysis".

The Engineer may permit the use of certain materials or manufactured assemblies prior to, or without, sampling and testing if accompanied by a Certificate of Compliance or Certificate of Analysis, as herein specified. Materials or manufactured assemblies for which a certificate is furnished may be sampled and tested at any time, and, if found not in conformity with the requirements of the plans and the specifications, will be subject to rejection, whether in place or not.

Certificates of Compliance and Certificates of Analysis shall comply with the requirements specified herein, the ADOT Materials Testing Manual, and applicable ADOT Materials Policy and Procedure Directives.

(B) Certificate of Compliance:

A Certificate of Compliance shall be submitted on the manufacturer's or supplier's official letterhead, and shall contain the following information:

- (1) The current name, address, and phone number of the manufacturer or supplier of the material.
- (2) A description of the material supplied.
- (3) Quantity of material represented by the certificate.
- (4) Means of material identification, such as label, lot number, or marking.
- (5) A statement that the material complies in all respects with the requirements of the cited specifications. Certificates shall state compliance with the cited specification, such as AASHTO M 320, ASTM C 494; or specific table or subsection of the Arizona Department of Transportation Standard Specifications or Special Provisions. Certificates may cite both, if applicable.
- (6) A statement that the individual identified in item seven below has the legal authority to bind the manufacturer or the supplier of the material.
- (7) The name, title, and signature of the responsible individual. The date of the signature shall also be given.

Each of the first six items specified above shall be completed prior to the signing of the certificate as defined in item seven. No certificate will be accepted that has been altered, added to, or changed in any way after the authorized signature has been affixed to the original certificate. However, notations of a clarifying nature, such as project number, contractor, or quantity shipped are acceptable, provided the basic requirements of the certificate are not affected.

A copy or facsimile reproduction of the original certificate will be acceptable; however, the original certificate shall be made available upon request.

(C) Certificate of Analysis:

A Certificate of Analysis shall include all the information required for a Certificate of Compliance and, in addition, shall include the results of all tests required by the specifications.



Chandler • Arizona
Where Values Make The Difference

MEMORANDUM

Case # 16-05

DATE: July 6, 2016

TO: MAG Specifications and Details Committee Members

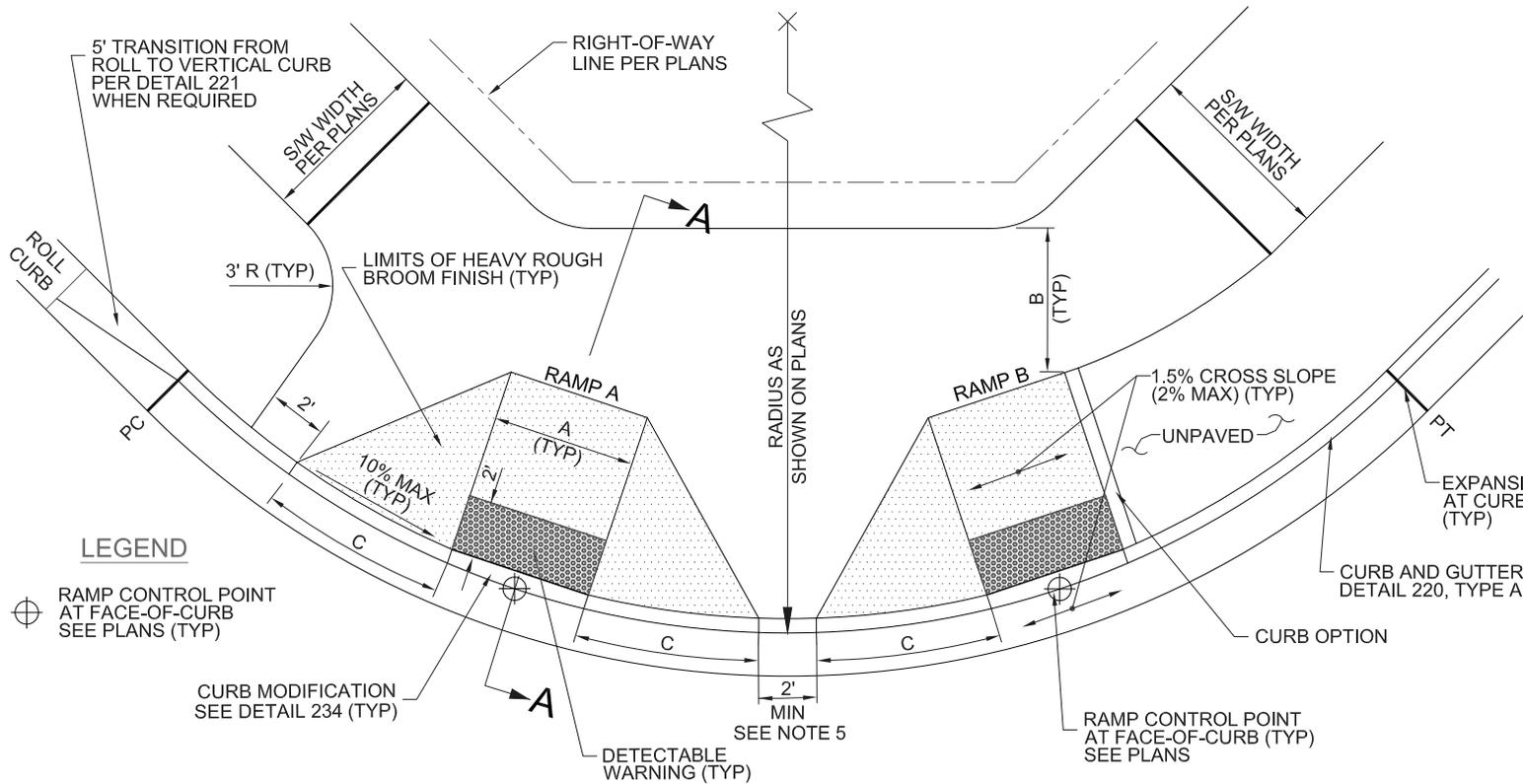
FROM: Warren White, City of Chandler Representative

SUBJECT: Proposed New Dual Curb Ramp Details and Revisions to Section 340

Purpose: Incorporate new standard details for dual curb ramps (radial and directional) and revisions to Section 340 for maximum grade allowances meeting latest ADA requirements. The intention is for construction details to have the “build to” slopes/grades that will allow for tolerance while the specification provides the maximum limits for acceptance.

Revisions:

- General revisions from working group discussion including adding Legend, Ramp A/B label, revisions to table headings and lengths. Section A-A revised to reference Note 2 and 12” Transition Thickness clarified.
- Added Details 236-3 and 237-3 for 20 ft return and options to keep wings within return. Revised detail series titles for 25’ to 35’ radii and 20’. Have not yet added detached detail for 20’ R (TBD).
- No changes to Section 340.3.9 Tolerances from previous package.
- Added revisions to Section 340.5 Measurement provided by Bob Herz. Mainly clarification of measurement for types of curb ramps and number of curb ramps contained within the return.



CURB HEIGHT	RAMP LENGTH	WING LENGTH (C)
6"	6.5'	6.5'
7"	7.5'	7.5'

CURB RAMP RADIUS (F/C)	RAMP WIDTH (A)	WALKWAY WIDTH (B)
25' AND GREATER	5' MIN	*5' MIN

*4' MIN WHEN RESTRICTIVE CONDITIONS EXIST.

LEGEND

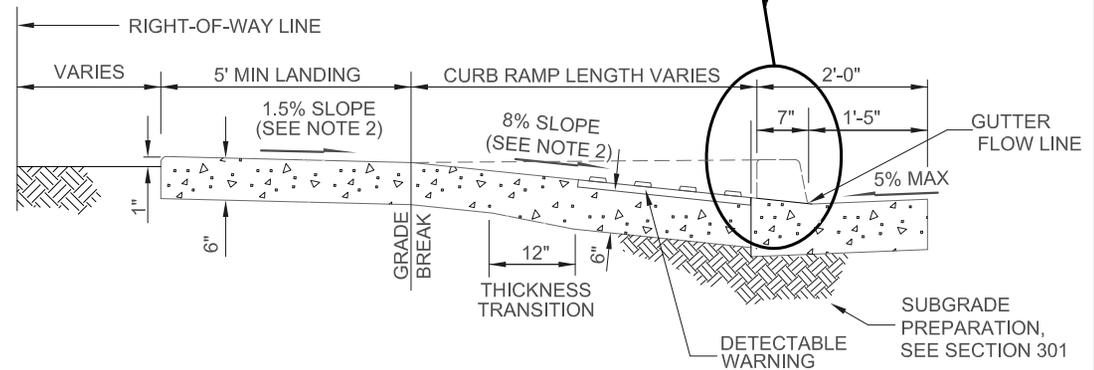
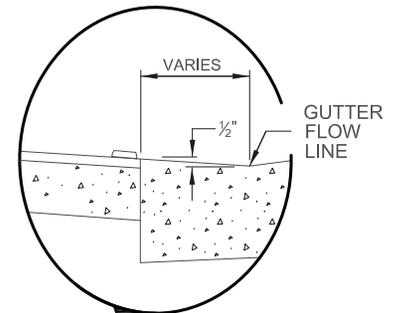
⊕ RAMP CONTROL POINT AT FACE-OF-CURB SEE PLANS (TYP)

⊕ CURB MODIFICATION SEE DETAIL 234 (TYP)

⊕ DETECTABLE WARNING (TYP)

NOTES:

1. CLASS 'A' CONCRETE PER SECTION 725, PC TO PT.
2. CONSTRUCTION INCLUDING EXPANSION JOINTS AND MAXIMUM SLOPES SHALL CONFORM TO SECTION 340.
3. SIDEWALK SURFACE TO MATCH 1.5% SLOPE FROM TOP OF CURB.
4. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
5. DISTANCE BETWEEN RAMPS MAY BE ADJUSTED TO IMPROVE CROSSING ALIGNMENT WITH OPPOSING RAMP WHEN ALLOWED BY THE JURISDICTIONAL AGENCY.
6. SPECIAL DESIGN IS REQUIRED FOR GUTTER GRADES GREATER THAN 2%.



SECTION A-A

DETAIL NO.

236-2



STANDARD DETAIL
ENGLISH

DUAL CURB RAMP (RADIAL, 25' - 35' R)
DETACHED SIDEWALK

PROPOSED

01-01-2017

DETAIL NO.

236-2

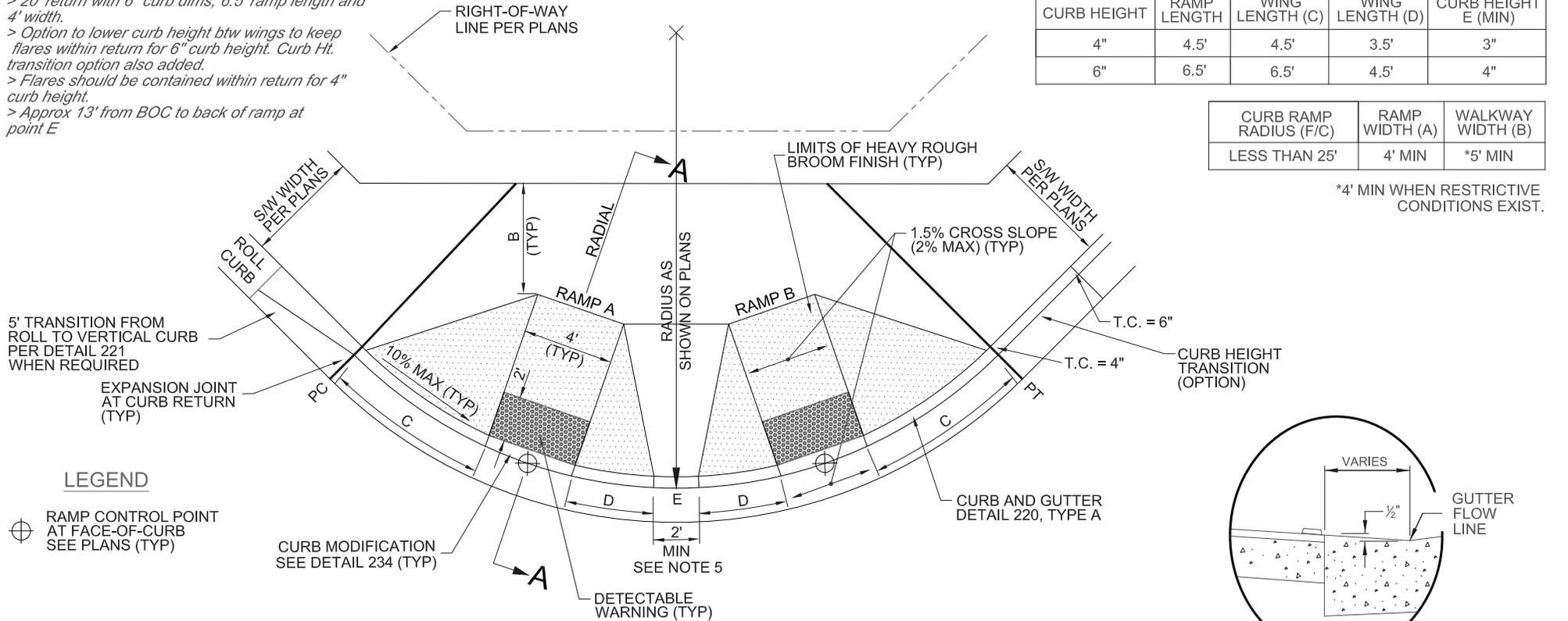
DRAFT NOTES:

- > 20' return with 6" curb dims, 6.5' ramp length and 4' width.
- > Option to lower curb height btw wings to keep flares within return for 6" curb height. Curb Ht. transition option also added.
- > Flares should be contained within return for 4" curb height.
- > Approx 13' from BOC to back of ramp at point E

CURB HEIGHT	RAMP LENGTH	WING LENGTH (C)	WING LENGTH (D)	CURB HEIGHT E (MIN)
4"	4.5'	4.5'	3.5'	3"
6"	6.5'	6.5'	4.5'	4"

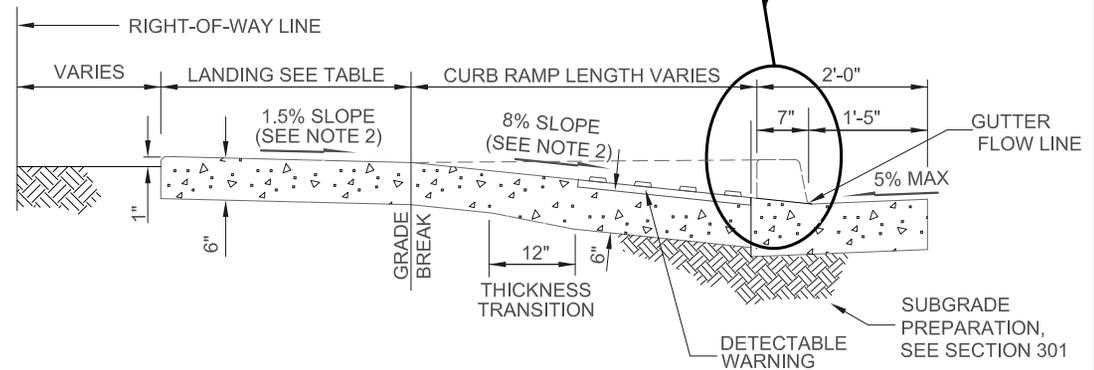
CURB RAMP RADIUS (F/C)	RAMP WIDTH (A)	WALKWAY WIDTH (B)
LESS THAN 25'	4' MIN	*5' MIN

*4' MIN WHEN RESTRICTIVE CONDITIONS EXIST.



NOTES:

1. CLASS 'A' CONCRETE PER SECTION 725, PC TO PT.
2. CONSTRUCTION INCLUDING EXPANSION JOINTS AND MAXIMUM SLOPES SHALL CONFORM TO SECTION 340.
3. SIDEWALK SURFACE TO MATCH 1.5% SLOPE FROM TOP OF CURB.
4. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
5. DISTANCE BETWEEN RAMPS MAY BE ADJUSTED TO IMPROVE CROSSING ALIGNMENT WITH OPPOSING RAMP WHEN ALLOWED BY THE JURISDICTIONAL AGENCY.
6. SPECIAL DESIGN IS REQUIRED FOR GUTTER GRADES GREATER THAN 2%.



SECTION A-A

DETAIL NO.

236-3



STANDARD DETAIL
ENGLISH

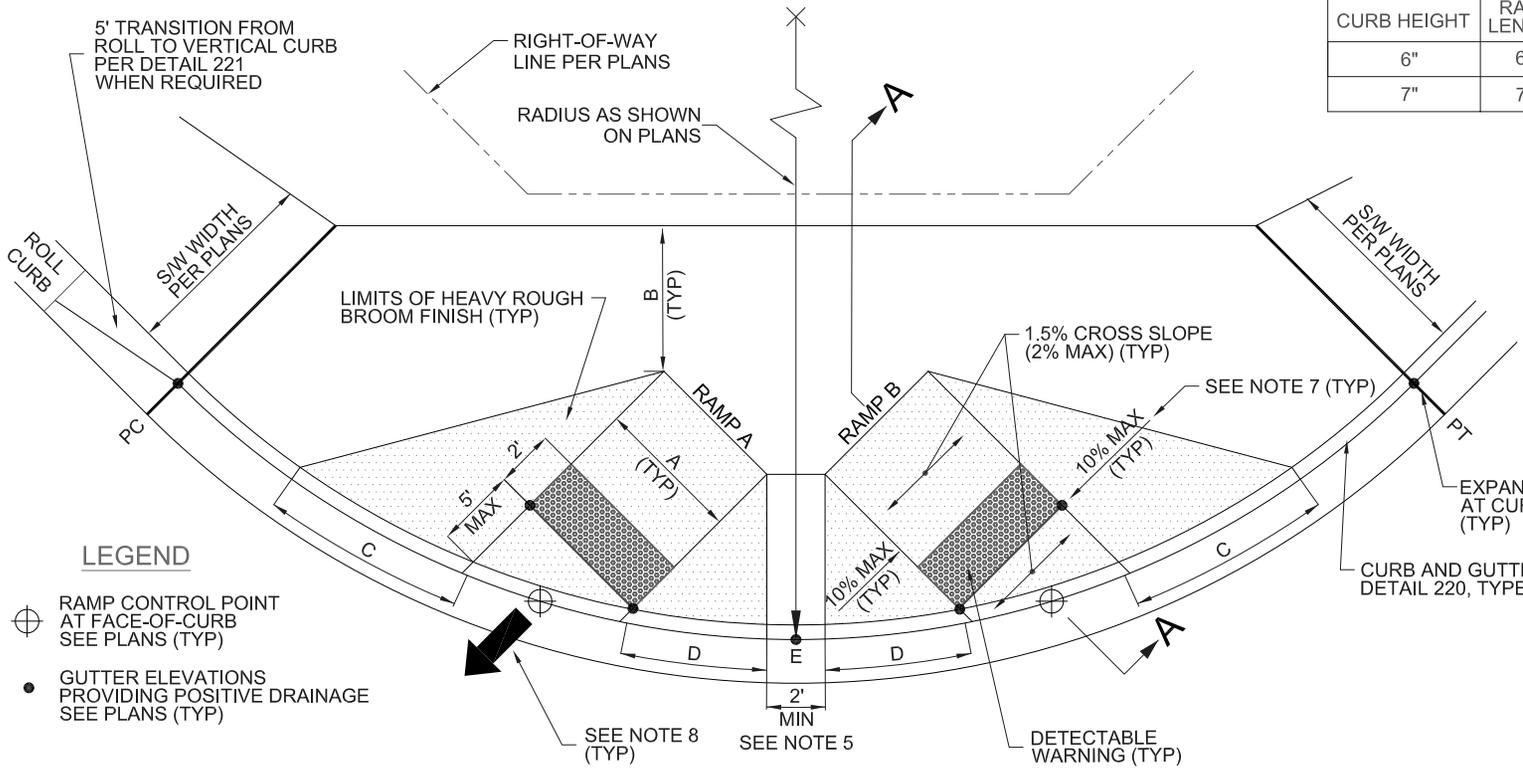
DUAL CURB RAMP (RADIAL, 20' R)
ATTACHED SIDEWALK

PROPOSED

01-01-2017

DETAIL NO.

236-3



CURB HEIGHT	RAMP LENGTH	WING LENGTH (C)	WING LENGTH (D)	CURB HEIGHT E (MIN)
6"	6.5'	6.5'	4.5'	4"
7"	7.5'	7.5'	5.5'	4"

CURB RAMP RADIUS (F/C)	RAMP WIDTH (A)	WALKWAY WIDTH (B)
25' AND GREATER	5' MIN	*5' MIN

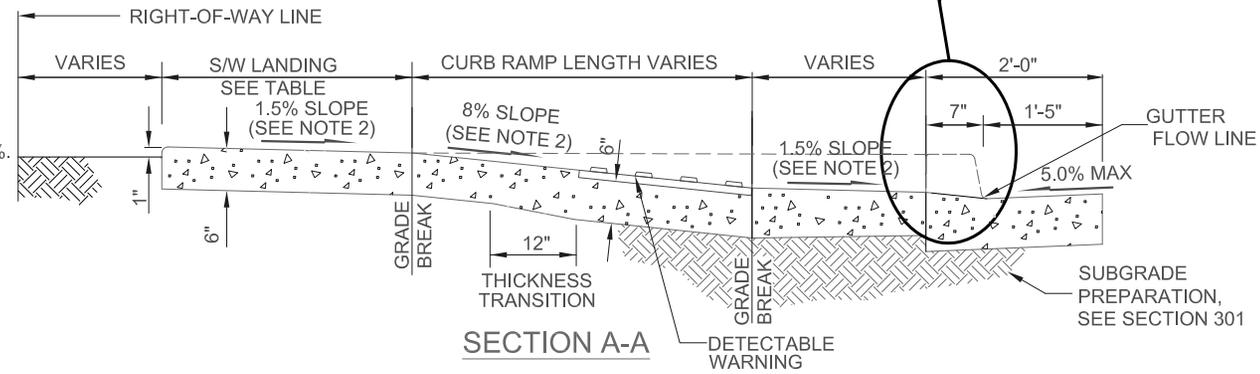
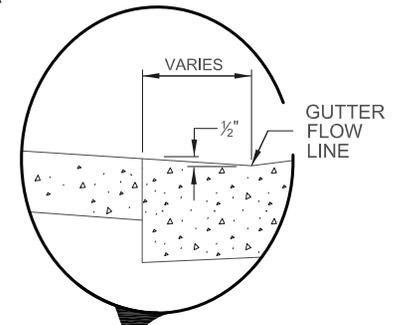
*4' MIN WHEN RESTRICTIVE CONDITIONS EXIST.

LEGEND

- ⊕ RAMP CONTROL POINT AT FACE-OF-CURB SEE PLANS (TYP)
- GUTTER ELEVATIONS PROVIDING POSITIVE DRAINAGE SEE PLANS (TYP)

NOTES:

1. CLASS 'A' CONCRETE PER SECTION 725, PC TO PT.
2. CONSTRUCTION INCLUDING EXPANSION JOINTS AND MAXIMUM SLOPES SHALL CONFORM TO SECTION 340.
3. SIDEWALK SURFACE TO MATCH 1.5% SLOPE FROM TOP OF CURB.
4. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
5. DISTANCE BETWEEN RAMPS MAY BE ADJUSTED TO IMPROVE CROSSING ALIGNMENT WITH OPPOSING RAMP WHEN ALLOWED BY THE JURISDICTIONAL AGENCY.
6. SPECIAL DESIGN IS REQUIRED FOR GUTTER GRADES GREATER THAN 2%.
7. WING SLOPE SHALL NOT EXCEED 10% MEASURED PERPENDICULAR TO RAMP.
8. RAMP ALIGNMENT SHOULD CONNECT CONTROL POINT TO CONTROL POINT OF RECEIVING RAMP WITHIN 5 FEET.



DETAIL NO.
237-1

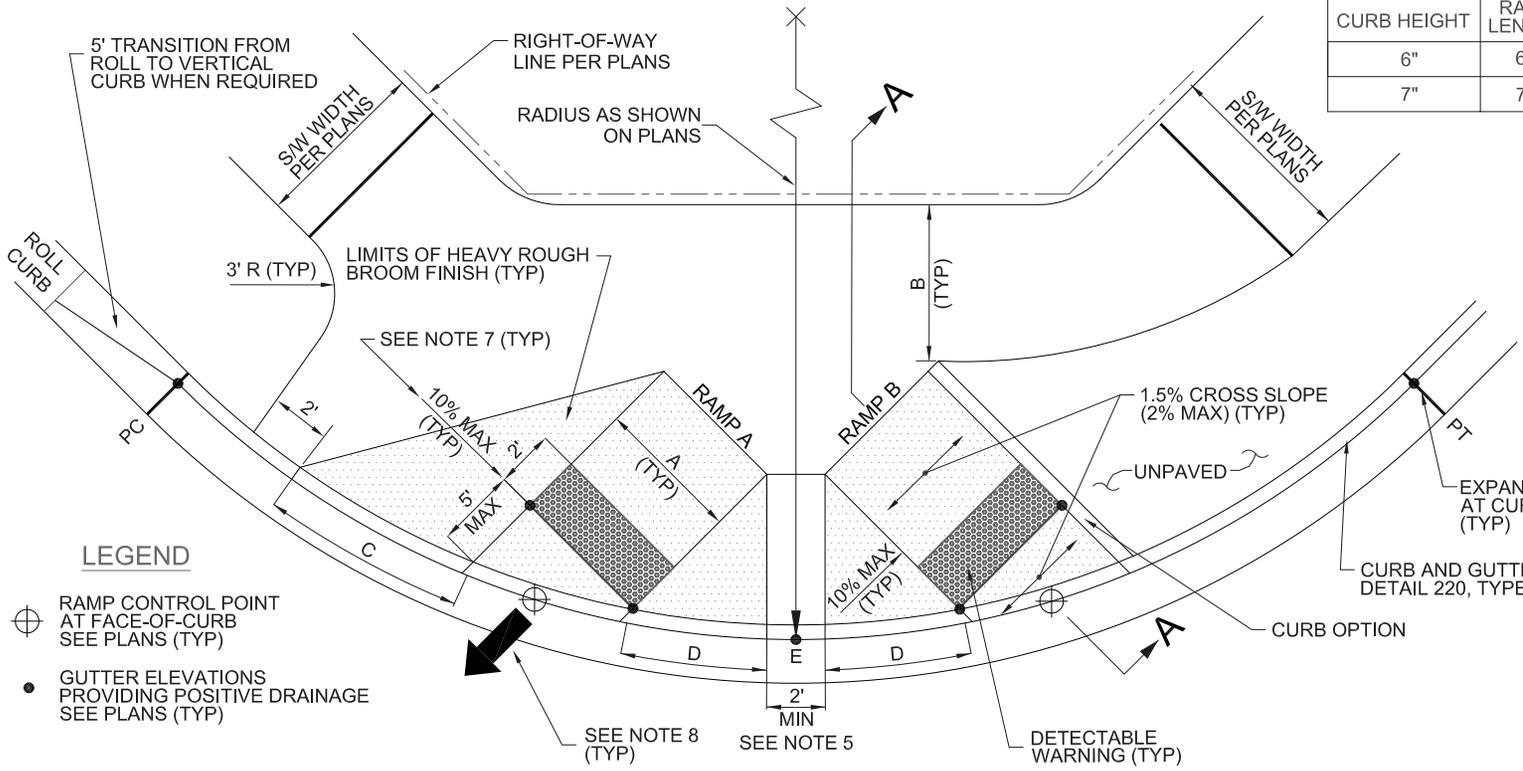


STANDARD DETAIL
ENGLISH

**DUAL CURB RAMP (DIRECTIONAL, 25' - 35'R)
ATTACHED SIDEWALK**

PROPOSED
01-01-2017

DETAIL NO.
237-1



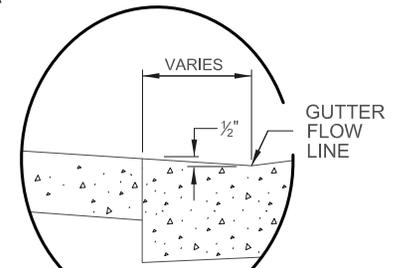
CURB HEIGHT	RAMP LENGTH	WING LENGTH (C)	WING LENGTH (D)	CURB HEIGHT E (MIN)
6"	6.5'	6.5'	4.5'	4"
7"	7.5'	7.5'	5.5'	4"

CURB RAMP RADIUS (F/C)	RAMP WIDTH (A)	WALKWAY WIDTH (B)
25' AND GREATER	5' MIN	*5' MIN

*4' MIN WHEN RESTRICTIVE CONDITIONS EXIST.

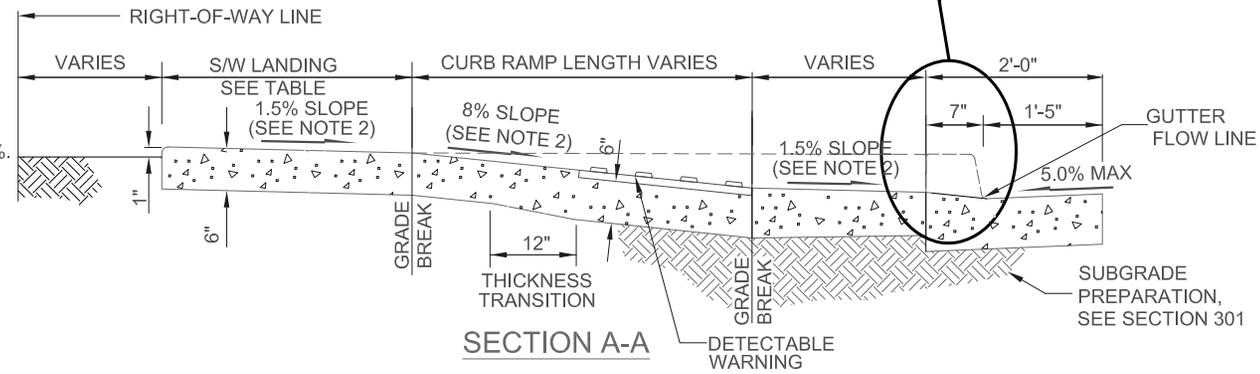
LEGEND

- ⊕ RAMP CONTROL POINT AT FACE-OF-CURB SEE PLANS (TYP)
- GUTTER ELEVATIONS PROVIDING POSITIVE DRAINAGE SEE PLANS (TYP)



NOTES:

1. CLASS 'A' CONCRETE PER SECTION 725, PC TO PT.
2. CONSTRUCTION INCLUDING EXPANSION JOINTS AND MAXIMUM SLOPES SHALL CONFORM TO SECTION 340.
3. SIDEWALK SURFACE TO MATCH 1.5% SLOPE FROM TOP OF CURB.
4. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
5. DISTANCE BETWEEN RAMPS MAY BE ADJUSTED TO IMPROVE CROSSING ALIGNMENT WITH OPPOSING RAMP WHEN ALLOWED BY THE JURISDICTIONAL AGENCY.
6. SPECIAL DESIGN IS REQUIRED FOR GUTTER GRADES GREATER THAN 2%.
7. WING SLOPE SHALL NOT EXCEED 10% MEASURED PERPENDICULAR TO RAMP.
8. RAMP ALIGNMENT SHOULD CONNECT CONTROL POINT TO CONTROL POINT OF RECEIVING RAMP WITHIN 5 FEET.



DETAIL NO.

237-2



STANDARD DETAIL
ENGLISH

**DUAL CURB RAMP (DIRECTIONAL, 25' - 35'R)
DETACHED SIDEWALK**

PROPOSED

01-01-2017

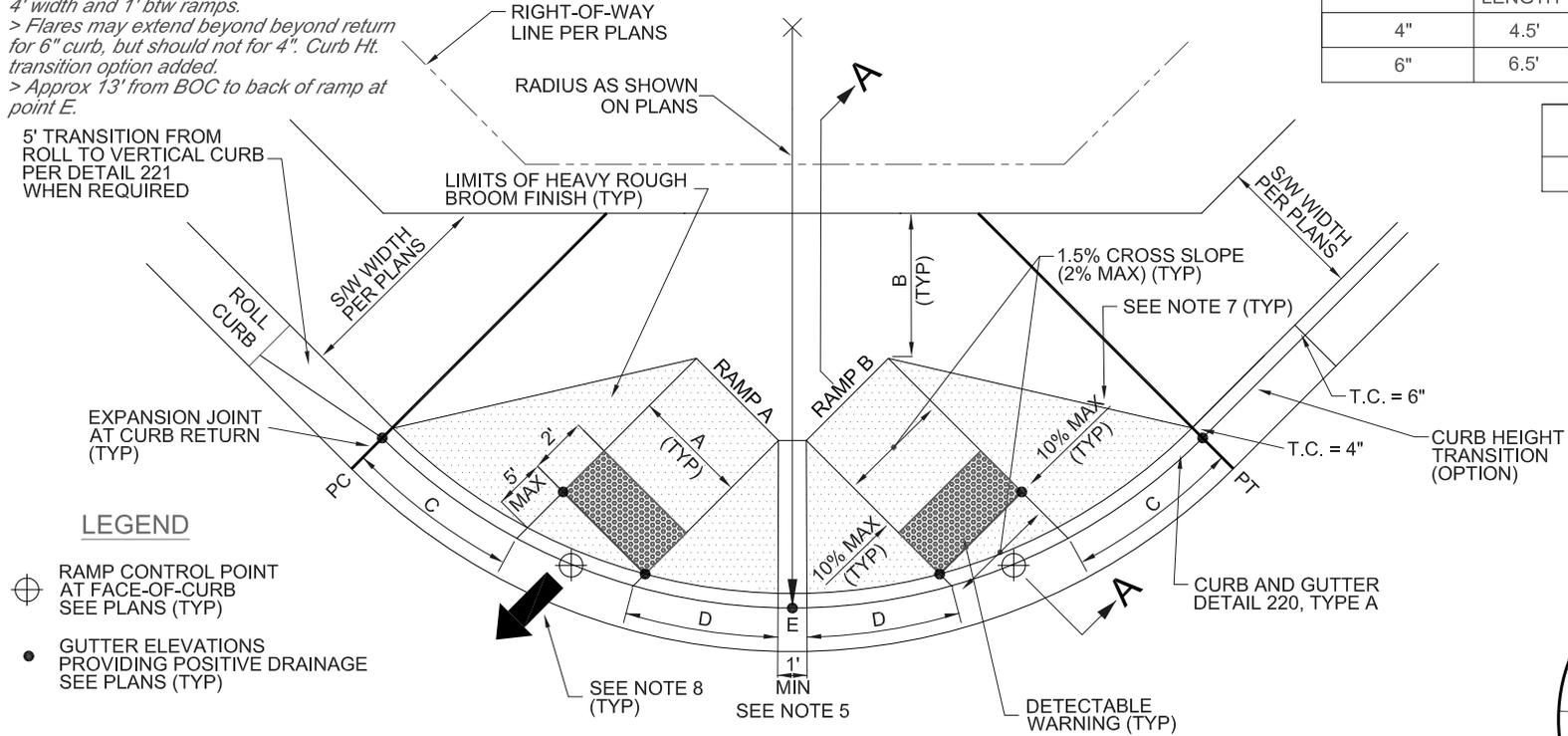
DETAIL NO.

237-2

DRAFT NOTES:

> 20' return with 6" curb, 6.5' ramp length, 4' width and 1' btw ramps.
 > Flares may extend beyond beyond return for 6" curb, but should not for 4". Curb Ht. transition option added.
 > Approx 13' from BOC to back of ramp at point E.

5' TRANSITION FROM ROLL TO VERTICAL CURB PER DETAIL 221 WHEN REQUIRED



CURB HEIGHT	RAMP LENGTH	WING LENGTH (C)	WING LENGTH (D)	CURB HEIGHT E (MIN)
4"	4.5'	4.5'	3.5'	3"
6"	6.5'	6.5'	4.5'	4"

CURB RAMP RADIUS (F/C)	RAMP WIDTH (A)	WALKWAY WIDTH (B)
LESS THAN 25'	4' MIN	*5' MIN

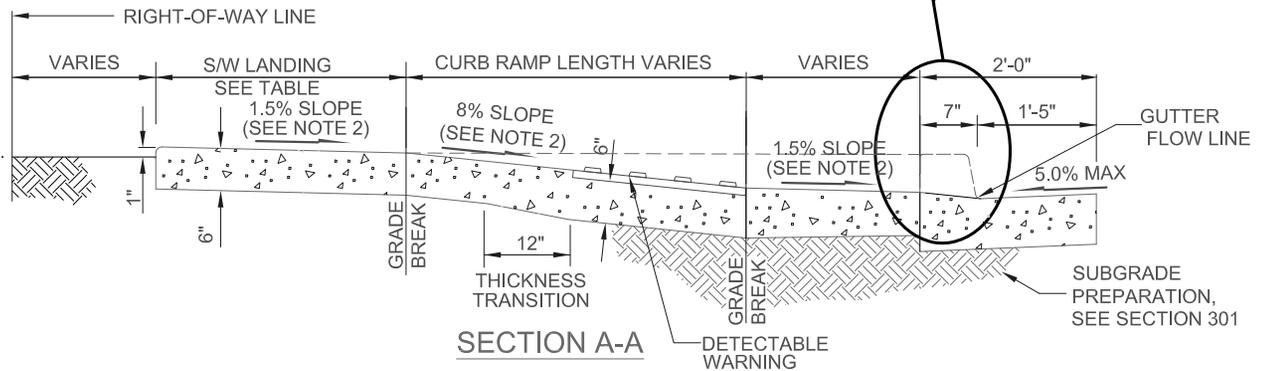
*4' MIN WHEN RESTRICTIVE CONDITIONS EXIST.

LEGEND

- ⊕ RAMP CONTROL POINT AT FACE-OF-CURB SEE PLANS (TYP)
- GUTTER ELEVATIONS PROVIDING POSITIVE DRAINAGE SEE PLANS (TYP)

NOTES:

1. CLASS 'A' CONCRETE PER SECTION 725, PC TO PT.
2. CONSTRUCTION INCLUDING EXPANSION JOINTS AND MAXIMUM SLOPES SHALL CONFORM TO SECTION 340.
3. SIDEWALK SURFACE TO MATCH 1.5% SLOPE FROM TOP OF CURB.
4. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
5. DISTANCE BETWEEN RAMPS MAY BE ADJUSTED TO IMPROVE CROSSING ALIGNMENT WITH OPPOSING RAMP WHEN ALLOWED BY THE JURISDICTIONAL AGENCY.
6. SPECIAL DESIGN IS REQUIRED FOR GUTTER GRADES GREATER THAN 2%.
7. WING SLOPE SHALL NOT EXCEED 10% MEASURED PERPENDICULAR TO RAMP.
8. RAMP ALIGNMENT SHOULD CONNECT CONTROL POINT TO CONTROL POINT OF RECEIVING RAMP WITHIN 5 FEET.



DETAIL NO.

237-3



STANDARD DETAIL
ENGLISH

**DUAL CURB RAMP (DIRECTIONAL, 20 'R)
ATTACHED SIDEWALK**

PROPOSED

01-01-2017

DETAIL NO.

237-3

Section 340 Concrete Curb, Gutter, Sidewalk, Curb Ramps, Driveway and Alley Entrance

340.5 MEASUREMENT:

340.5.1 Concrete Curbs and Gutters: ~~of~~The various types curb and gutter shown on the plans and in the proposal will be measured along gutter flow line through inlets, catch basins, driveways, curb ramps, etc., by the lineal foot to the nearest foot for each type, complete in place. Measurement for curb terminations and transitions shall be included with the linear measurement of the various types of curb or curb and gutter as shown on the plans and in the proposal.

Curb and gutter type shall be based on the configuration of the final exposed surfaces. The increased curb and gutter depth required at valley gutter aprons or driveways shall not be measured as a separate pay item; any additional Contractor cost shall be included in the unit cost associated with the valley gutter, driveway or other associated item.

340.5.2 Concrete Flat Work: Sidewalks, driveways, alley intersections, valley gutters and aprons will be measured to the nearest square foot complete in place.

~~Detectable warnings shall not be measured for payment. Detectable warnings are considered integral to the walking surface that they form a part of and the cost is included in the related pay item.~~

340.5.3 Curb Ramp Installations: Curb ramp installations shall be measured as complete installed units. Curbing (single curb or curb and gutter) located at the edge of roadway shall be measured and paid for separately. The surface area of curb ramps shall not be included in the measured quantity for sidewalk. Detectable warnings are an integral part of curb ramp installations and shall not be measured for payment. Detectable warnings are considered integral. Ramp curbs are an integral part of parallel curb ramp and combination curb ramp installations and shall not be measured. to the walking surface that they form a part of and the cost is included in the related pay item.

~~and shall include the ramp curb and the walking surfaces between the ramp curb and back of curb and gutter or single curb. Single curb or curb and gutter located at the edge of roadway shall be measured and paid for separately. The surface area of curb ramps shall not be included in the measured quantity for sidewalk. Curb ramps located within a curb return shall include the entire curb return area excluding the edge of roadway curbing. Curb ramp installations shall be categorized and measured by curb return radius, the number of curb ramps (one or two) contained within the return, and the type of curb ramps (perpendicular, parallel, or combination).~~

Each curb ramp not located within a curb return shall be categorized by type and measured as a complete unit. Perpendicular curb ramps shall include the area from the back of curb between the outer edges of the ramp wings to the top of the curb ramp, ending prior to and excluding the top landing. The landing area at the top of the perpendicular curb ramp is to be included in the measured sidewalk area. Parallel and combination curb ramps shall include the ramp curb and all surfaces between the ramp curb and the back edge of the roadway curbing.

340.6 PAYMENT:

Payment will be made in accordance with the unit prices ~~or lump sums~~ as set forth in the proposal. Such payment shall include full compensation for furnishing all labor, material, tools and equipment and accomplishing all work in conformance with the contract documents.

Over-excavation of soft, expansive or unsuitable materials and installation of granular materials will be paid separately and as a separate pay item, not included within the above measured pay items.

Section 340 Concrete Curb, Gutter, Sidewalk, Curb Ramps, Driveway and Alley Entrance

340.5 MEASUREMENT:

340.5.1 Concrete Curbs and Gutters: The various types curb and gutter shown on the plans and in the proposal will be measured along gutter flow line through inlets, catch basins, driveways, curb ramps, etc., by the lineal foot to the nearest foot for each type, complete in place. Measurement for curb terminations and transitions shall be included with the linear measurement of the various types of curb or curb and gutter as shown on the plans and in the proposal.

Curb and gutter type shall be based on the configuration of the final exposed surfaces. The increased curb and gutter depth required at valley gutter aprons or driveways shall not be measured as a separate pay item; any additional Contractor cost shall be included in the unit cost associated with the valley gutter, driveway or other associated item.

340.5.2 Concrete Flat Work: Sidewalks, driveways, alley intersections, valley gutters and aprons will be measured to the nearest square foot complete in place.

340.5.3 Curb Ramp Installations: Curb ramp installations shall be measured as complete installed units. Curbing (single curb or curb and gutter) located at the edge of roadway shall be measured and paid for separately. The surface area of curb ramps shall not be included in the measured quantity for sidewalk. Detectable warnings are an integral part of curb ramp installations and shall not be measured. Ramp curbs are an integral part of parallel curb ramp and combination curb ramp installations and shall not be measured.

Curb ramps located within a curb return shall include the entire curb return area excluding the edge of roadway curbing. Curb ramp installations shall be categorized and measured by curb return radius, the number of curb ramps (one or two) contained within the return, and the type of curb ramps (perpendicular, parallel, or combination).

Each curb ramp not located within a curb return shall be categorized by type and measured as a complete unit. Perpendicular curb ramps shall include the area from the back of curb between the outer edges of the ramp wings to the top of the curb ramp, ending prior to and excluding the top landing. The landing area at the top of the perpendicular curb ramp is to be included in the measured sidewalk area. Parallel and combination curb ramps shall include the ramp curb and all surfaces between the ramp curb and the back edge of the roadway curbing.

340.6 PAYMENT:

Payment will be made in accordance with the unit prices as set forth in the proposal. Such payment shall include full compensation for furnishing all labor, material, tools and equipment and accomplishing all work in conformance with the contract documents.

Over-excavation of soft, expansive or unsuitable materials and installation of granular materials will be paid separately and not included within the above measured pay items.



CITY OF BUCKEYE
Engineering Department

Case Number: 16-08

Date: April 25, 2016

To: MAG Specifications and Details Committee

From: Craig Sharp

RE: Separate Valve box Installation and Grade Adjustment

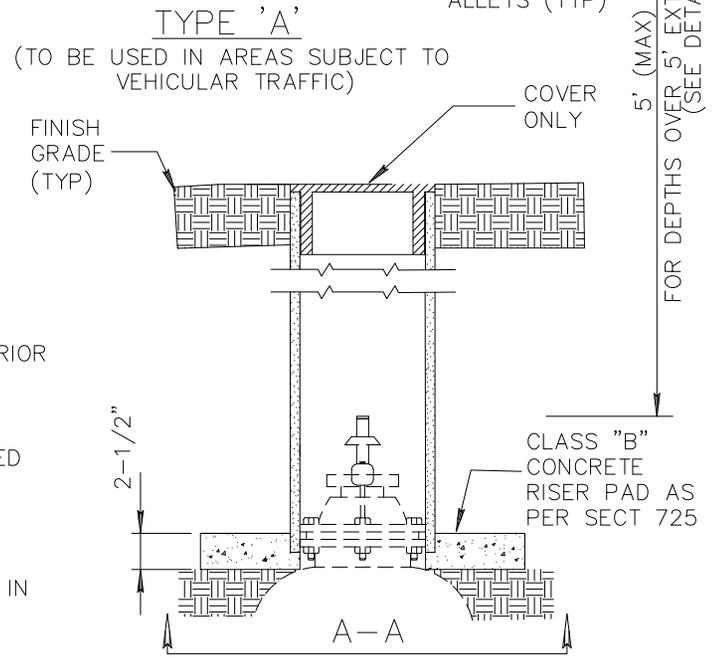
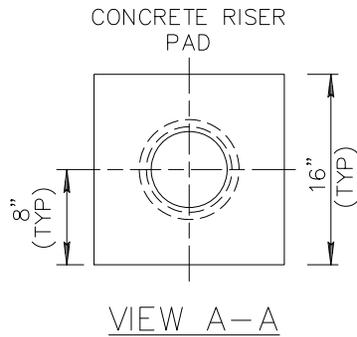
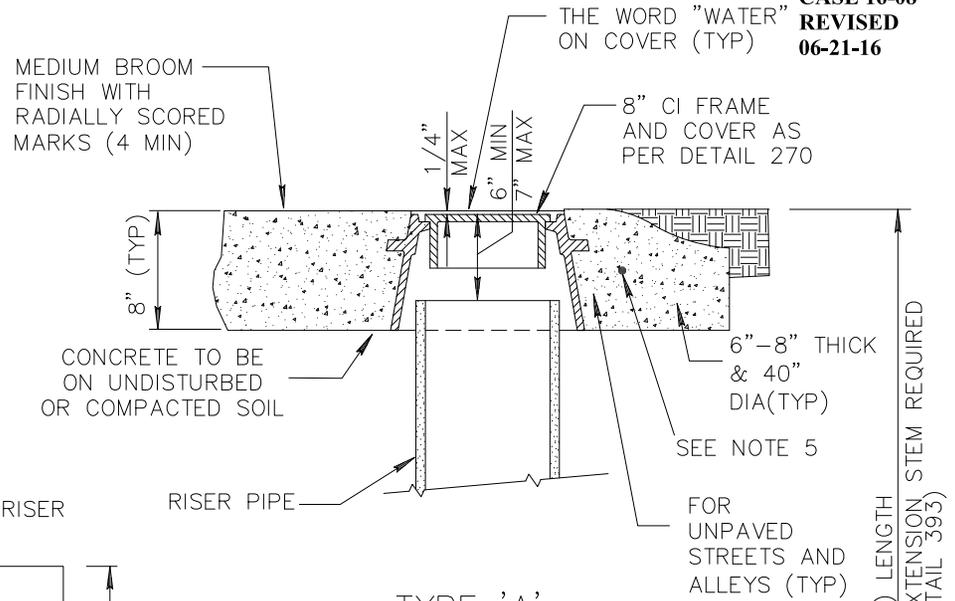
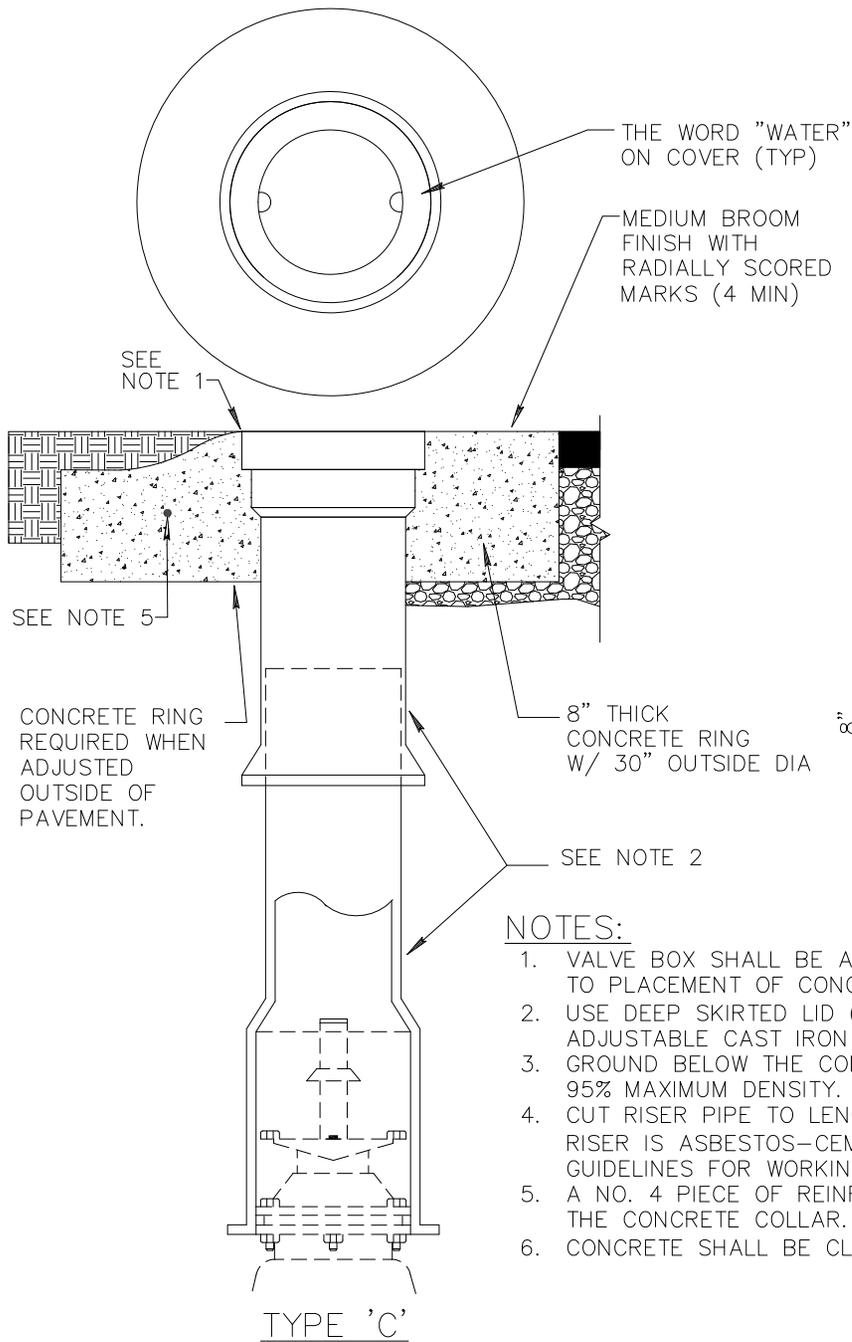
Purpose: The valve adjustment and valve extension should be two separate details. This case intends to separate and update the two details.

Revisions:

- Revise Detail 391-2 to separate the Valve Stem extension drawing from the adjustment drawing
- Create new Detail 393 for the valve stem extension.
- Modified detail 391-1 to be consistent with 391-2 and 393

Please find attached new drawing of valve stem extension and revised existing details.

Updated – June 21, 2016

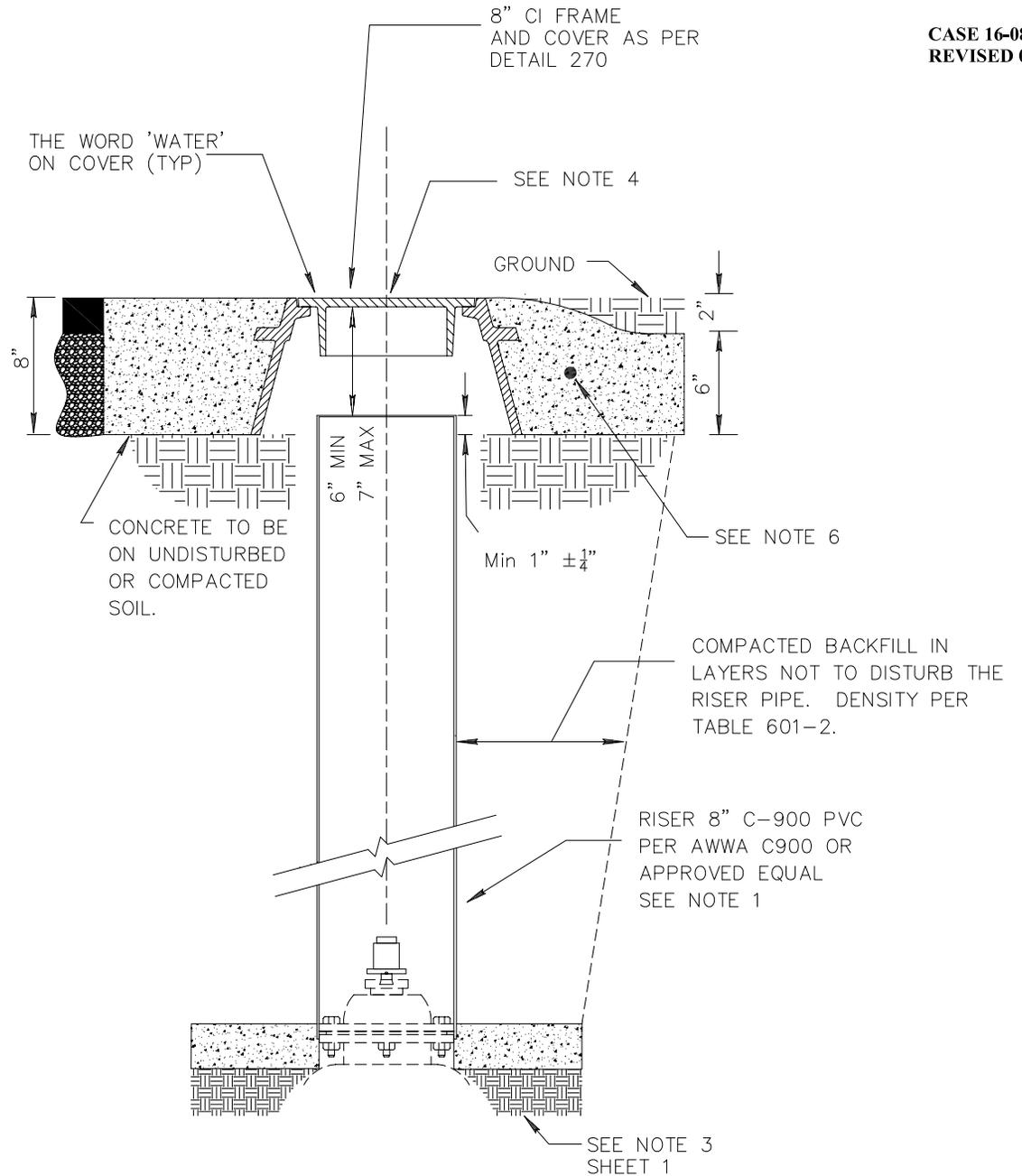


- NOTES:**
1. VALVE BOX SHALL BE ADJUSTED TO THE FINISHED GRADE PRIOR TO PLACEMENT OF CONCRETE.
 2. USE DEEP SKIRTED LID (4" OR MORE) TYPE, SLIDING ADJUSTABLE CAST IRON VALVE BOX C.I. MIN 30,000 P.S.I.
 3. GROUND BELOW THE CONCRETE RISER PAD TO BE COMPACTED 95% MAXIMUM DENSITY.
 4. CUT RISER PIPE TO LENGTH IN FIELD. **CAUTION:** IF EXISTING RISER IS ASBESTOS-CEMENT PIPE (ACP) FOLLOW OSHA GUIDELINES FOR WORKING WITH ACP.
 5. A NO. 4 PIECE OF REINFORCING STEEL SHALL BE CENTERED IN THE CONCRETE COLLAR.
 6. CONCRETE SHALL BE CLASS "AA" PER SECTION 725.

NOTES:

1. IF TWO OR MORE SECTIONS OF PIPE ARE USED TO MAKE THE VALVE BOX RISER, THEY SHALL BE COUPLED OR BONDED TO FORM DEBRIS-TIGHT JOINTS.
2. ALL CONCRETE SHALL BE MAG CLASS 'AA' CONCRETE PER SECTION 725 WITH RADIAL SCORED JOINTS AND MEDIUM BROOM FINISH.
3. CONCRETE COLLAR TO BE 40" SQUARE OR ROUND.
4. VALVE BOX SHALL BE CENTERED AROUND THE OPERATING NUT.
5. THE TOP OF THE VALVE SHALL BE KEPT CLEAN.
6. A NO.4 PIECE OF REINFORCING STEEL SHALL BE CENTERED IN THE CONCRETE COLLAR

**CASE 16-08
REVISED 06-21-16**



DRAFT

391-2



STANDARD DETAIL
ENGLISH

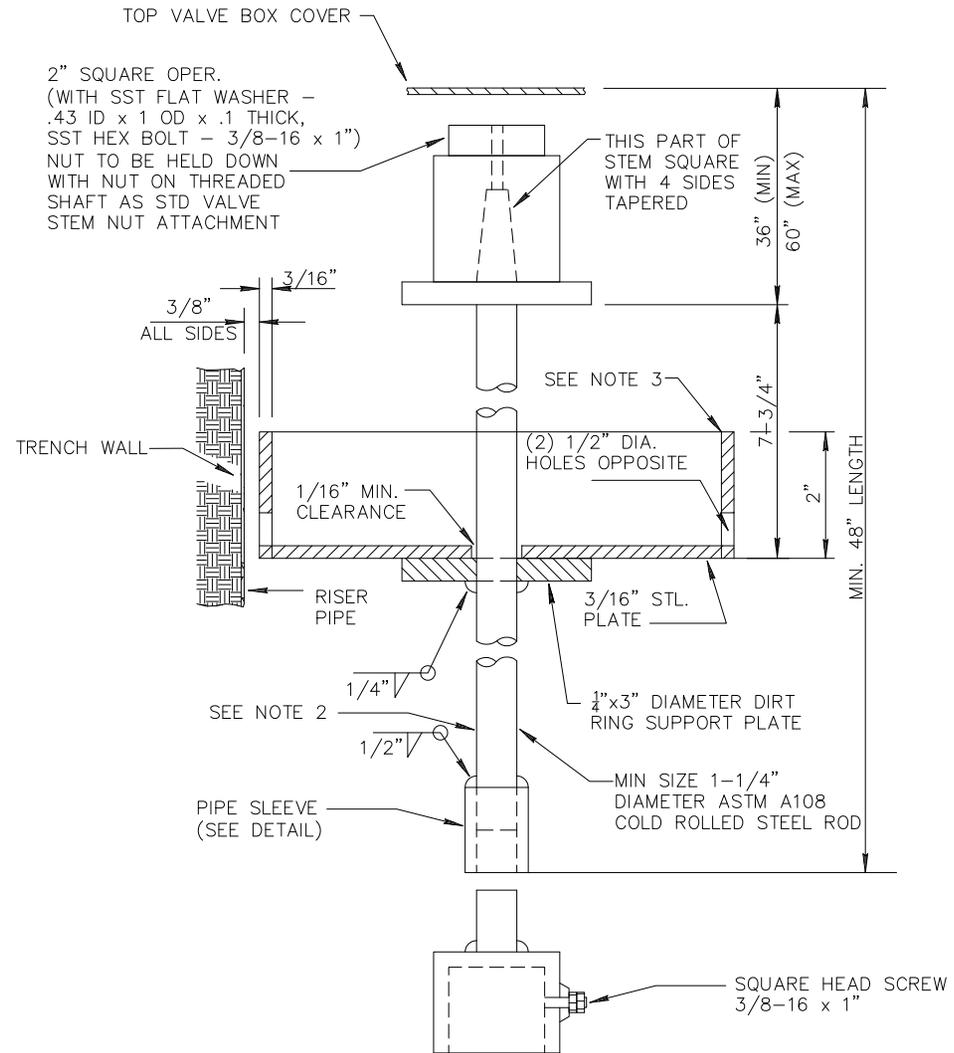
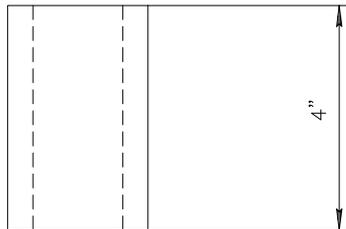
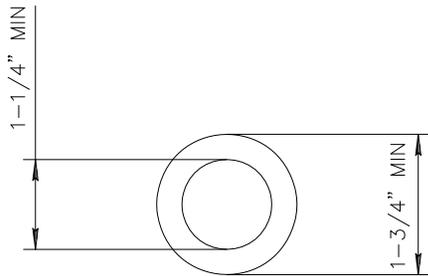
VALVE BOX INSTALLATION
AND GRADE ADJUSTMENT

REVISED
DRAFT
01-01-2017

DETAIL NO.
391-2

PIPE SLEEVE DETAIL

MATL: STEEL PER ASTM A513



NOTES:

1. EXTENSION STEM: WITH SQUARE SOCKET ON BOTTOM TO FIT 2" SQUARE VALVE OPERATING NUT. EXTENSION OF VALVE STEMS REQUIRED ON ALL VALVES INSTALLED WHERE THE OPERATING NUT IS OVER 5' BELOW THE SURFACE. LENGTH TO FIT EACH INSTALLATION. OPERATING NUT TO BE HELD ON TOP OF EXTENSION WITH STOP NUT.
2. STEM PAINTING: ALL STEEL TO HAVE A PRIME COAT OF PAINT NO. 1-D AND ONE HEAVY APPLICATION (FINISH COAT) OF PAINT NO. 9 AS PER SECT. 790.
3. DIRT RING TO FLOAT FREELY ON THE TOP OF THE SUPPORT PLATE.

SECTION 710

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, and 3/4 inch. 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.

The following table (Table [710-1](#)) displays the recommended range for lift thickness for various asphalt concrete mix designations found within Section [710](#). Please note that the ~~se~~minimum lift thicknesses 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~~ Maximum 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 FOR ASPHALT CONCRETE MIXES		
<u>Asphalt Concrete Mix Designation (inches)</u>	<u>Minimum Lift Thickness Marshall Mixes</u>	<u>Minimum Lift Thickness Gyratory Mixes</u>
<u>3/8"</u>	<u>1.0 inches</u>	<u>1.5 inches</u>
<u>1/2"</u>	<u>1.5 inches</u>	<u>2.0 inches</u>
<u>3/4"</u>	<u>2.5 inches</u>	<u>3.0 inches</u>

TABLE 710-1				
RECOMMENDED LIFT THICKNESS FOR ASPHALT CONCRETE MIXES				
<u>Asphalt Concrete Mix Designation (inches)</u>	<u>Minimum Lift Thickness Marshall Mixes</u>	<u>Maximum Lift Thickness Marshall Mixes</u>	<u>Minimum Lift Thickness Gyratory Mixes</u>	<u>Maximum Lift Thickness Gyratory Mixes</u>
<u>3/8"</u>	<u>1.0 inches</u>	<u>2.0 inches</u>	<u>1.5 inches</u>	<u>3.0 inches</u>
<u>1/2"</u>	<u>1.5 inches</u>	<u>3.0 inches</u>	<u>2.0 inches</u>	<u>3.0 inches</u>
<u>3/4"</u>	<u>2.5 inches</u>	<u>4.0 inches</u>	<u>3.0 inches</u>	<u>4.0 inches</u>

710.2 MATERIAL:

710.2.1 Asphalt Binder: The asphalt binder specified in this section has been developed for use in desert climate conditions. When used 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.

SECTION 710

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	Requirements
Fractured Faces, % (Coarse Aggregate Only)	Arizona 212	85, 1 or more 80, 2 or more
Uncompacted Voids, % Min.	AASHTO T-304, Method A	45
Flat & Elongated Pieces, % 5:1 Ratio	ASTM D4791	10.0 Max.
Sand Equivalent, %	AASHTO T-176	50 Min.
Plasticity Index	AASHTO T-90	Non-plastic
L.A. Abrasion, % Loss	AASHTO T-96	9 max. @ 100 Rev. 40 max. @ 500 Rev.
Combined Bulk Specific Gravity	AI MS-2/SP-2	2.35 – 2.85
Combined Water Absorption	AI MS-2/SP-2	0 – 2.5%

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

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

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

710.2.3 Reclaimed Asphalt Pavement (RAP): When allowed by the Engineer, Reclaimed Asphalt Pavement (RAP), as defined in Section [701.5](#), may be used in asphalt concrete provided all requirements of Section [710](#) are met. References to use of RAP in Section [710](#) apply only if RAP is used as part of the mixture.

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

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

In addition to the requirements of Section [710.3.1](#), the job mix formula shall indicate the percent of asphalt RAP and the percent and performance grade of virgin (added) asphalt binder.

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

SECTION 710

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

710.3 MIX DESIGN REQUIREMENTS:

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

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

- (1) The name and address of the testing organization and the person responsible for the mix design report.
- (2) The mix plant identification and/or location, as well as the supplier or producer name.
- (3) A description of all products that are incorporated in the asphalt concrete along with the sources of all products, including admixtures and asphalt binder, and their method of introduction.
- (4) The supplier and grade of asphalt binder, the source and type of mineral aggregate, and the percentage of asphalt binder and mineral admixture used.
- (5) The percentage of RAP and RAP Binder being contributed to the total mix shall be included in the mix design report.
- (6) The mix design report shall state whether Gyratory or Marshall and size designation.
- (7) The results of all testing, determinations, etc., such as: specific gravity and gradation of each component, water absorption, sand equivalent, loss on abrasion, fractured coarse aggregate particles, Tensile Strength Ratio (ASTM [D4867](#)), 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.
- (8) The laboratory mixing and compaction temperature ranges for the supplier and grade of asphalt binder used within the mix design.
- (9) A specific recommendation for design asphalt binder content and any limiting conditions that may be associated with the use of the design, such as minimum percentages of crushed or washed fine aggregate.
- (10) The supplier’s product code, the laboratory Engineer’s seal (signed and dated), and the date the design was performed.
- (11) If a Warm Mix Technology or additive is used; the following shall be included:
 - Technology type and supporting manufacturer information; including instructions pertaining to laboratory mixture temperatures and curing.
 - Amount (%) of additive (technology) used in the mixture.
 - Attached copy of the ADOT approved product list, showing additive/technology
 - Minimum plant production temperature shall not fall below manufacturer’s recommendation.

SECTION 710

- Minimum field compaction temperature shall be identified.
- Identify any special mixing or compaction temperatures or special methods to be used when conducting Quality Assurance or Quality Control testing of field collected samples. Example: if the field collected samples of warm mix asphalt can be treated as conventional hot asphalt mix, provide the equivalent conventional hot asphalt mix compaction temperature.

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 use additional mixing plants without prior approval of the Engineer. Any changes in the plant operation, the producer’s pit, the asphalt binder, including modifiers in the asphalt binder, or any other item that will cause an adjustment in the mix, shall be justification for a new mix design to be submitted.

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

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

TABLE 710-3				
MARSHALL MIX DESIGN CRITERIA				
Criteria	Requirements			Designated Test Method
	3/8” Mix	1/2” Mix	3/4” Mix	
1. Voids in Mineral Aggregate: %, min	15.0	14.0	13.0	AI MS-2
2. Effective Voids: %, Range	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	AI MS-2
4. Dust to Eff. Asphalt Ratio, Range **	0.6-1.4	0.6-1.4	0.6-1.4	AI MS-2
5. Tensile Strength Ratio: % Min.	65	65	65	ASTM D4867
6. Dry Tensile Strength: psi, Min.	100	100	100	ASTM D4867
7. Stability: pounds, Minimum	2,000	2,500	2,500	AASHTO T-245
8. Flow: 0.01-inch, Range	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	
1-1/4 inch				
1 inch				100
3/4 inch		100		90 – 100
1/2 inch	100	85 – 100		---
3/8 inch	90-100	62 – 85		62 – 77

SECTION 710

No. 8	45-60	40 – 50	35 – 47
No. 40	10-22	10 – 20	10 – 20
No. 200	2.0 – 10.0	2.0 – 10.0	2.0 – 8.0

* Unless otherwise approved by the Engineer.

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

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

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

Number of Gyrations	
N_{ini}	8
N_{des}	100
N_{max}	160

The corrected density of the specimens shall be less than 89.0 percent of maximum theoretical density at N_{ini} . The corrected density of the specimens shall be less than 98.0 percent of maximum theoretical density at N_{max} . The Gyratory mix shall comply with the criteria in Table [710-5](#).

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

SECTION 710

No. 200	2.0-8.0	2.0-7.5	2.0-6.5
---------	---------	---------	---------

* Unless otherwise approved by the Engineer.

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

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

- End of Section -

POLYMER MODIFIED ~~TERMINAL BLENDED RUBBERIZED~~ ASPHALTIC CONCRETE

719.1 DESCRIPTION:

The work under this section shall consist of furnishing, proportioning and mixing all the ingredients necessary to produce a polymer modified ~~terminal blended rubberized~~-asphalt concrete (PM~~TBRAC~~) material. PM~~TBRAC~~ mixes may be used for all traffic conditions, as determined by the agency

719.2 MATERIALS:

719.2.1 Binder 76-22-~~TR~~ (PM~~TBRAC~~): The binder used in PM~~TBRAC~~ shall meet the requirements of Table 711-2 as specified by the engineer.

719.2.2 Aggregate: Coarse and fine aggregates shall conform to the applicable requirements of Tables 719-1 and 719-2 below. 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 is material retained above the Number 8 sieve and fine aggregate is material passing the Number 8 sieve. Aggregates shall be free of deleterious materials, clay balls, and adhering films or other material that prevent thorough coating with the asphalt cement. Mineral aggregate shall conform to the following requirements when tested in accordance with the applicable test methods.

TABLE 719-1	
MIX DESIGN GRADATION REQUIREMENTS WITH MINERAL ADMIXTURE	
Sieve Size	Percent Passing
1" (25 mm)	100
¾" (19 mm)	100
½" (12.5 mm)	90-100
⅜" (9.5 mm)	75-90
No. 8 (2.36 mm)	40-50
No. 40 (425 µm)	10-20
No. 200 (75 µm)	2.0-10.0

The combined aggregate properties shall conform to the requirements of Table 719-2.

719.2.3 Mineral Admixture: Mineral admixture used in PM~~TBRAC~~ shall be dry hydrated lime conforming to the requirements of ASTM [C1097](#) or Portland cement conforming to ASTM [C150](#) for Type II, or ASTM [C595](#) for Type IP. The minimum mineral admixture content will be 1.0 percent, by weight of total aggregate. Mineral admixture shall be considered part of the total weight of aggregate and all combined specific gravity and combined water absorption calculations for aggregates and mineral admixture will be done in accordance with the latest edition of the Asphalt Institute’s Manual MS-2 (AI MS-2).

TABLE 719-2		
COARSE/FINE AGGREGATE REQUIREMENTS		
Characteristics	Test Method	Requirements
Fractured Faces, % (Plus No. 8)	ARIZ-212	85, 1 fracture 80, 2 or more
Uncompacted Voids, %	AASHTO T-304, Method A	45.0
Sand Equivalent (Minus No. 4)	AASHTO T-176	50 minimum
Plasticity Index	AASHTO T-89 & T-90	Non Plastic
L.A. Abrasion, % Loss	AASHTO T-96	9 max. @ 100 Rev. 40 max. @ 500 Rev.
Combined Bulk Specific Gravity	AI MS-2	2.35-2.85
Combined Water Absorption, %	AI MS-2	0-2.5

719.3 MIX DESIGN REQUIREMENT:

719.3.1 General: The mix design for PM~~TBR~~AC 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 shall identify this as a Marshall 75-blow mix design
- (6) The results of all testing, determinations, etc., such as: specific gravity and gradation of each component, water absorption, sand equivalent, loss on abrasion, fractured coarse aggregate particles, Tensile Strength Ratio (ASTM [D4867](#)), 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, ~~and a copy of the supplier’s temperature-viscosity curve~~ and specific gravity at 77°F.
- (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 use additional mixing plants without prior approval of the Engineer. A new mix design shall be submitted when any changes occur 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.

719.3.2 Mix Design Criteria: The mix design shall be performed by the Marshall Mix Design method. A minimum of 4 points will be used to establish the mix design results. The oven aging period for Marshall mix design samples shall be 2 hours.

719.3.2.1 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 use the compactive effort of 75 blows per side of specimen, unless specified otherwise by the engineer. The mix shall comply with the criteria in Table [719-3](#).

The mix design for PM~~TBR~~AC shall be prepared by a laboratory that is accredited through the AASHTO

SECTION 719 Case 16-10 6/24/16

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 Asphalt Concrete Mix Design Engineer” within ADOT’s list of approved laboratories.

The date of the design shall not be older than two years from the date of submittal, unless supportive documentation is provided and approved by the Engineer.

Mix designs are subject to approval by the Engineer.

TABLE 719-3		
MARSHALL MIX DESIGN CRITERIA		
Criteria	Requirements	Designated Test
	1/2” Mix	Method
1. Binder Content, Minimum	6.1%	---
2. Voids in Mineral Aggregate: %, min	14	AI MS-2
3. Effective Voids: %, Range	4.0±0.2	AI MS-2
4. Absorbed asphalt: %, Range*	0-1.0	AI MS-2
5. Dust to Eff. Asphalt Ratio, Range **	0.6-1.4	AI MS-2
6. Tensile Strength Ratio: % Min.	65	ASTM D4867
7. Dry Tensile Strength: psi, Min.	100	ASTM D4867
8. Stability: pounds, Minimum	2,500	ASTM D6926
9. Flow: 0.01-inch, Range, Minimum	8	ASTM D6927
10. Mineral Aggregate Grading	---	AASHTO T-27 & T11

* 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



Chandler • Arizona
Where Values Make The Difference

MEMORANDUM

Case # 16-14

DATE: July 6, 2016

TO: MAG Specifications and Details Committee Members

FROM: Warren White, City of Chandler Representative

SUBJECT: Proposed Revisions to Water Meter Box and Cover Details

Purpose: Revise water meter box and cover detail no's 310-314 and 320 based on current practice and agency needs.

Revisions (update):

Detail No. 310 Steel Water Meter Box Cover

- Note 1 – lid material per ASTM.
- Added notes 4 and 5.
- General cleanup, removed letter J and shifted all other letters accordingly.
- Revised A and C dimensions to allow for 1/8" gap on each side.

Detail No. 315 Polymer Concrete Water Meter Box Cover

- Cleaned up optional AMR hole detail making dimensions easier to understand.
- Revised A and B dimensions to allow for 1/8" gap on each side.

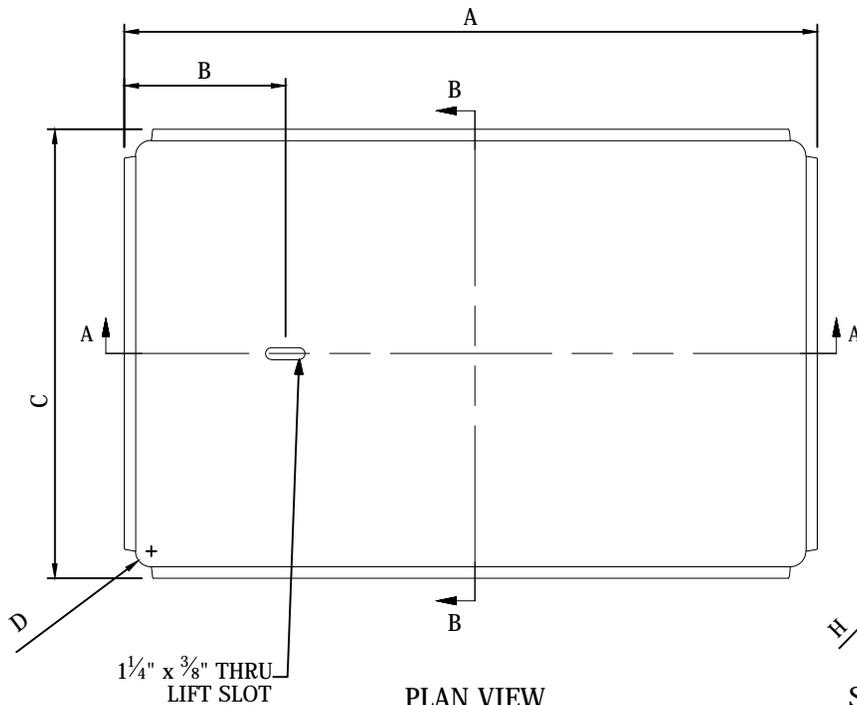
Detail No. 320 Water Meter Boxes

- Some revisions to dimensions.

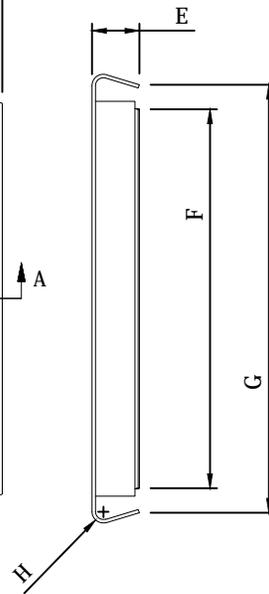
DRAFT
6-22-2016

NOTES:

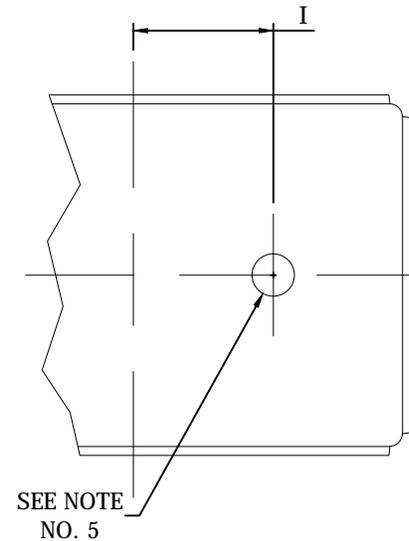
1. STEEL LID MATERIAL TO BE PER ASTM A786
2. POTABLE WATER PAINTED BLACK AND RECLAIMED WATER PAINTED PANTONE PURPLE 512
3. DIMENSIONS SHOWN SHOULD NOT VARY MORE THAN A $\frac{1}{16}$ OF AN INCH
4. ALL COVERS MADE OUT OF DIAMOND CHECKER PLATE
5. STANDARD AMR HOLE 2" PER AGENCY OR STANDARD SPECIFICATION



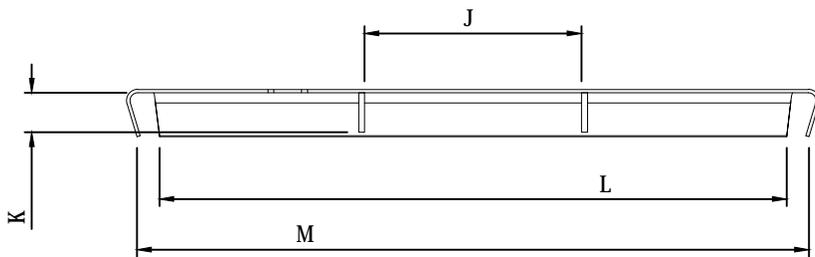
PLAN VIEW



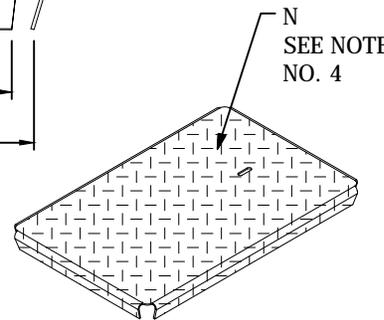
SECTION B-B



AMR DETAIL OPTION



SECTION A-A



STEEL WATER METER COVER DIMENSIONS				
DIMS	COVER NUMBER			
	1	2	3	4
A	15-3/4"	21-7/8"	26"	30-3/8"
B	3-7/8"	4-1/2"	2-1/8"	4-5/8"
C	9"	14"	15"	19-1/2"
D	1/2"	1/2"	1/2"	1/2"
E	1-1/2"	1-1/2"	2-1/4"	1-1/2"
F	7-1/8"	12"	13"	17-3/4"
G	8-1/4"	13-12"	14-1/8"	19-1/4"
H	1/8"	1/4"	1/8"	1/4"
I	3-3/4"	6-5/8"	9"	12-1/4"
J	NA	6-7/8"	8-1/2"	7-3/8"
K	NA	1-1/4"	1-1/4"	1-1/4"
L	13-7/8"	19-7/8"	24"	28-1/8"
M	15"	21-1/4"	25-1/8"	29-3/4"
N	14 GAUGE	12 GAUGE	12 GAUGE	12 GAUGE

DETAIL NO.
310



STANDARD DETAIL
ENGLISH

STEEL WATER METER BOX COVER

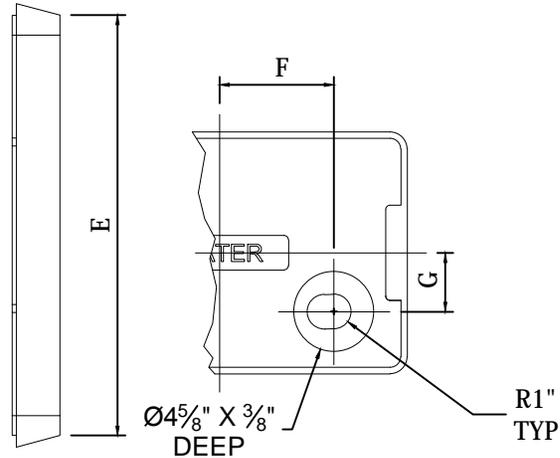
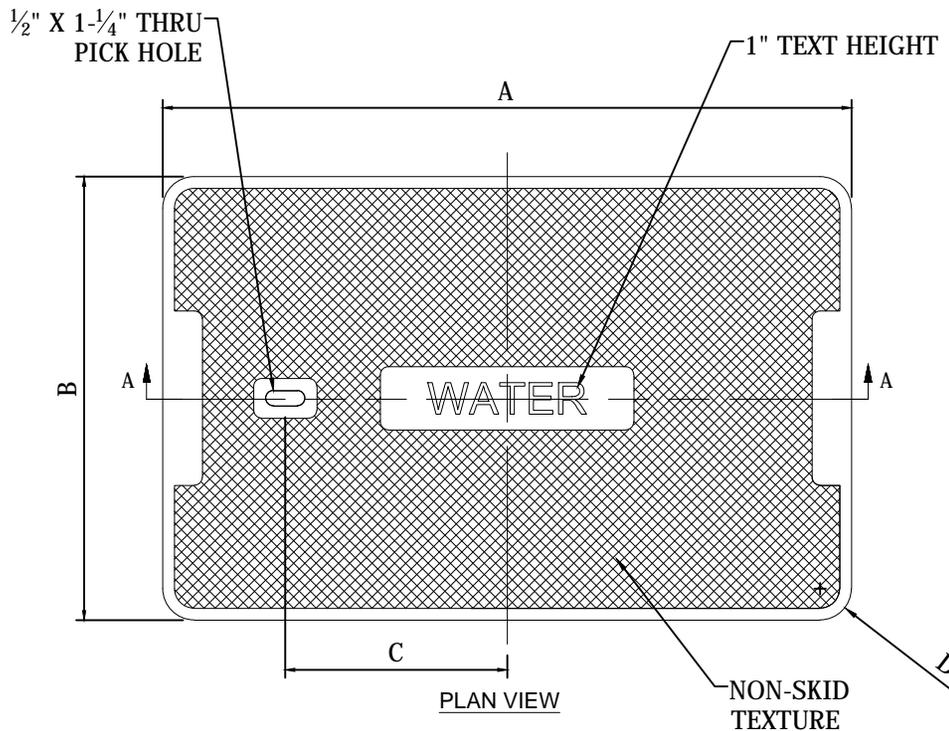
REVISED
1-1-2017

DETAIL NO.
310

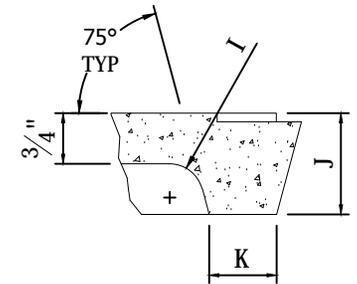
DRAFT
6-22-2016

NOTES:

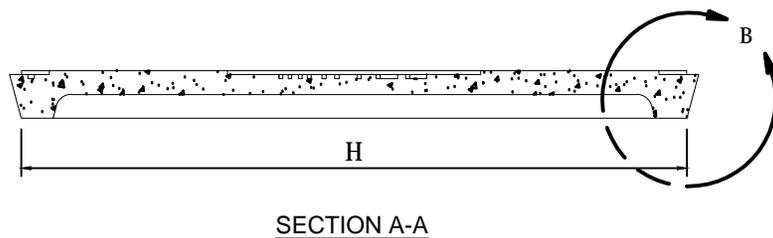
- POTABLE WATER TINTED GRAY AND RECLAIMED WATER TINTED PANTONE PURPLE 512
- DIMENSIONS SHOWN SHOULD NOT VARY MORE THAN A $\frac{1}{16}$ OF AN INCH
- ALTERNATIVE MATERIALS MAY INCLUDE "SHEET MOLDED COMPOUND" (SMC), AND "BULK MOLDED COMPOUND" (BMC). INJECTION MOLDED THERMOPLASTICS ARE NOT ACCEPTABLE MATERIALS



SLOTTED AMR DETAIL OPTION



DETAIL B



SECTION A-A

POLYMER CONCRETE COVER DIMENSIONS				
DIMS	COVER NUMBER			
	1	2	3	4
A	15-3/4"	21-7/8"	26"	30-3/8"
B	9"	14"	15"	19-1/2"
C	5"	7"	9"	10"
D	3/4"	1"	3/8"	3/8"
E	8-1/2"	13-1/4"	14-1/8"	19"
F	4-3/8"	6-5/8"	8"	10-3/4"
G	3/4"	3-3/8"	3-3/4"	6-1/4"
H	15-3/8"	21"	25-1/8"	29-1/2"
I	3/8"	1/2"	1"	1/4"
J	1-1/2"	1-1/2"	2-1/4"	1-1/2"
K	3/4"	1"	1"	1"

DETAIL NO.
315



STANDARD DETAIL
ENGLISH

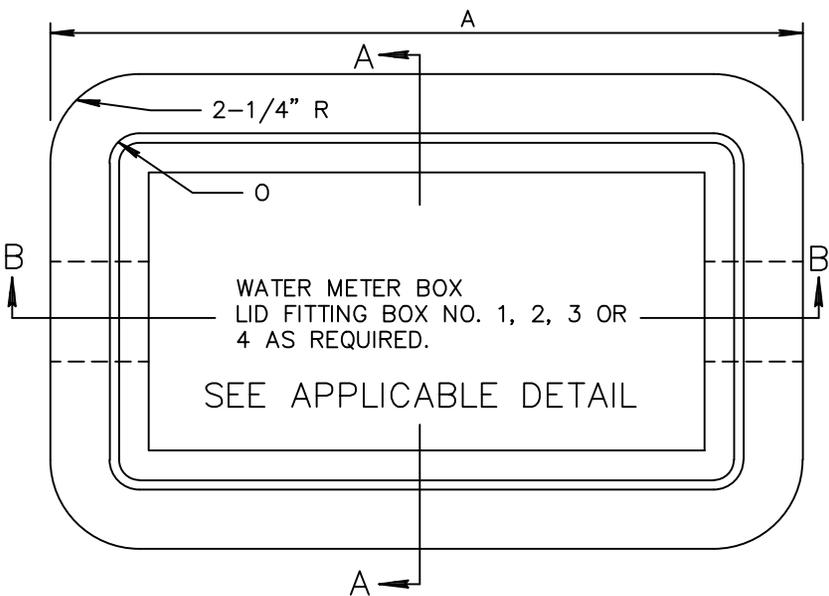
POLYMER CONCRETE
WATER METER BOX COVER

REVISED
1-1-2017

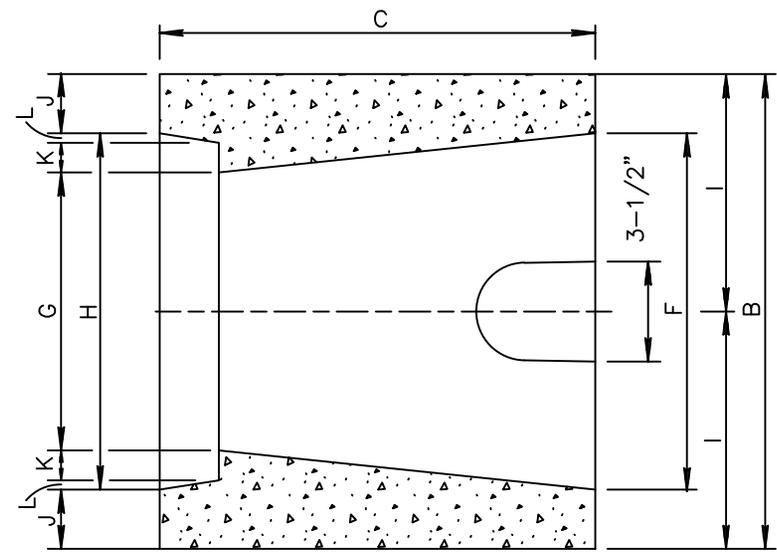
DETAIL NO.
315

NOTES:

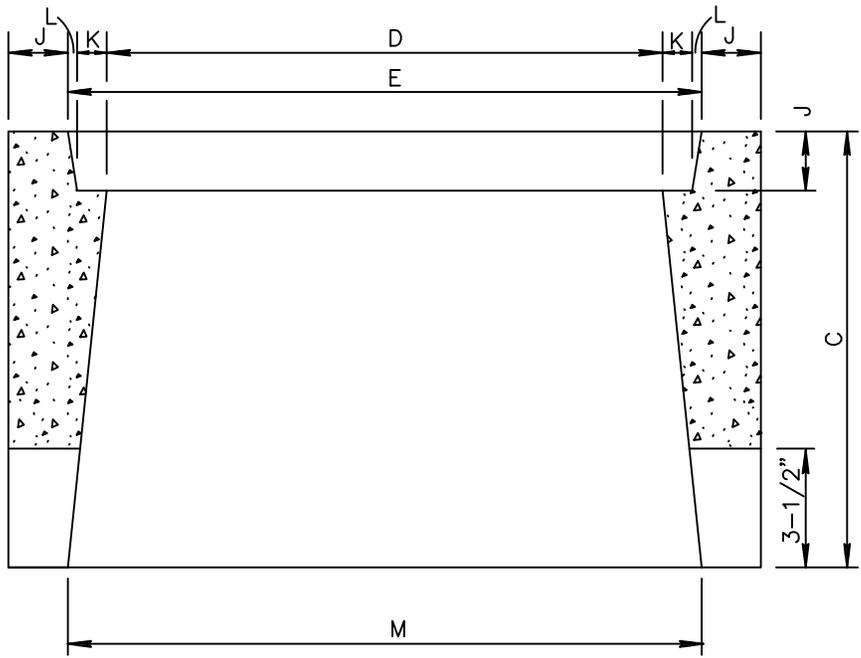
1. THE METER BOXES SHALL CONFORM TO THE DIMENSIONS AS SHOWN AND SHALL BE MADE OF PORTLAND CEMENT CONCRETE POURED AND TAMPED (OR VIBRATED) IN TRUE FORMS.
2. USE CLASS 'AA' CONCRETE PER SECT. 725.
3. ALTERNATIVE MATERIALS MAY INCLUDE "POLYMER CONCRETE", "SHEET MOLDED COMPOUND" (SMC), AND "BULK MOLDED COMPOUND" (BMC). INJECTION MOLDED AND ROTATIONALLY MOLDED THERMOPLASTICS ARE NOT ACCEPTABLE
4. VERTICAL LOAD RATING OF 3,000 lbs. (MINIMUM) TO 10,000 lbs. (COVER SHALL WITHSTAND THE MINIMUM TEST LOAD APPLIED OVER 10X10 STEEL PLATE WITH 1/2" RUBBER BACKING BETWEEN PLATE AND COVER, LOCATED IN CENTER OF COVER, WITH NO PERMANENT DEFLECTION OR DAMAGE TO LID OR BODY AFTER LOAD IS RELEASED)
5. DIMENSIONS SHOWN SHOULD NOT VARY MORE THAN A 1/16 OF AN INCH



PLAN VIEW



SECTION A-A



SECTION B-B

METER BOX DIMENSIONS				
DIMS	BOX NUMBER			
	1	2	3	4
A	18-1/2"	25"	28-3/8"	33-1/8"
B	11-3/4"	17-1/4"	17-5/8"	22-3/8"
C	12"	12"	12"	12"
D	14"	20"	24"	27-3/4"
E	16"	22-1/8"	26-1/4"	30-5/8"
F	9-1/4"	14-1/2"	15-1/8"	19-3/4"
G	7"	12-1/2"	13"	17"
H	9-1/4"	14-1/4"	15-1/4"	19-3/4"
I	5-7/8"	8-5/8"	8-7/8"	11-1/8"
J	1-1/2"	1-1/2"	2-1/4"	1-1/2"
K	3/4"	1/2"	3/4"	5/8"
L	1/4"	1/2"	1/2"	5/8"
M	16"	21-7/8"	26"	30-1/2"
O	1/2"	1/2"	1/2"	5/8"
	5/8" OR 3/4" METER	1" METER	1-1/2" METER	2" METER



Chandler • Arizona
Where Values Make The Difference

MEMORANDUM

Case # 16-15

DATE: July 6, 2016

TO: MAG Specifications and Details Committee Members

FROM: Warren White, City of Chandler Representative

SUBJECT: Proposed Addition of Traffic Rated Box and Cover Detail No. 319

Purpose: Need for box that can withstand continuous traffic

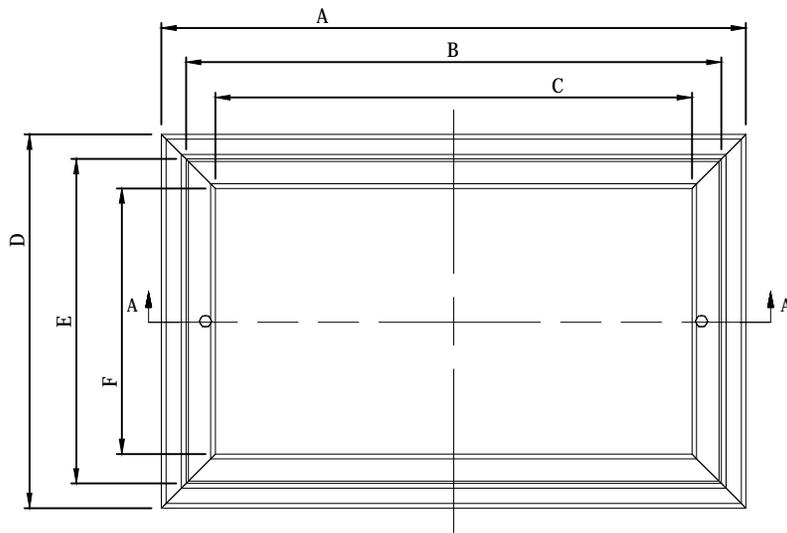
Revisions (update):

- Revision to note 1, adding Lid and Box combination must meet AASHTO H20.

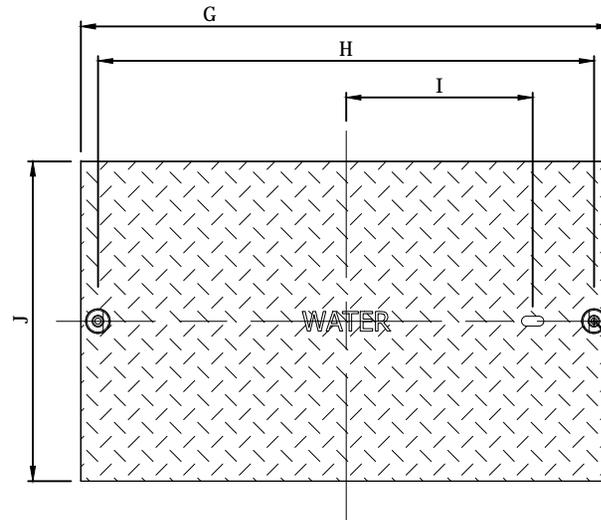
DRAFT
6-22-2016

NOTES:

1. LID AND BOX COMBINATION NEEDS TO MEET AASHTO H20
2. DIMENSIONS SHOWN SHOULD NOT VARY MORE THAN A $\frac{1}{16}$ OF AN INCH
3. MARKINGS PER AGENCY AND/OR UTILITY

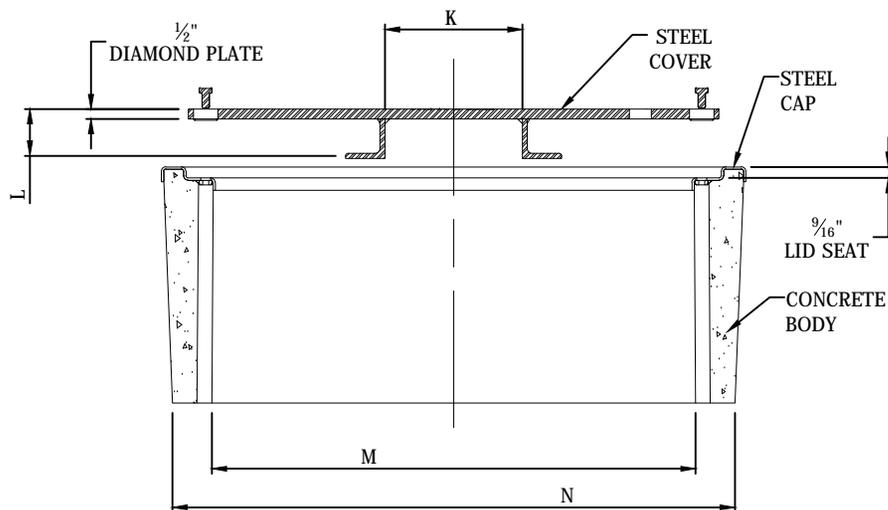


BOX ONLY - TOP VIEW

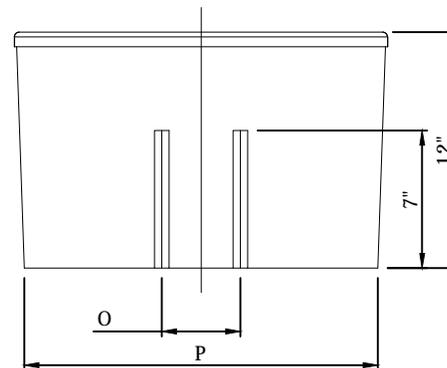


COVER ONLY - TOP VIEW

Ø1- $\frac{1}{8}$ " X $\frac{1}{2}$ " DEEP
Ø $\frac{5}{16}$ " THRU
2 PLACES



SECTION A-A BODY AND COVER



END VIEW

TRAFFIC BOX DIMENSIONS		
DIMS	BOX NUMBER	
	(1324)	(1730)
A	29- $\frac{3}{4}$ "	36- $\frac{7}{8}$ "
B	27- $\frac{1}{4}$ "	33- $\frac{1}{2}$ "
C	24- $\frac{1}{4}$ "	30"
D	19"	23- $\frac{3}{4}$ "
E	16- $\frac{1}{2}$ "	20- $\frac{1}{2}$ "
F	13- $\frac{1}{2}$ "	17"
G	27"	33- $\frac{1}{4}$ "
H	25- $\frac{1}{4}$ "	31- $\frac{1}{4}$ "
I	9- $\frac{1}{2}$ "	12- $\frac{1}{8}$ "
J	16- $\frac{1}{4}$ "	20- $\frac{1}{4}$ "
K	7"	10- $\frac{3}{4}$ "
L	2- $\frac{1}{2}$ "	3- $\frac{1}{2}$ "
M	24- $\frac{5}{8}$ "	30- $\frac{5}{8}$ "
N	28- $\frac{5}{8}$ "	35- $\frac{7}{8}$ "
O	4"	5- $\frac{3}{4}$ "
P	18"	22- $\frac{5}{8}$ "

DETAIL NO.
319



STANDARD DETAIL
ENGLISH

TRAFFIC RATED
BOX AND COVER

REVISED
1-1-2017

DETAIL NO.
319

Case 16-16 Roadmap

Revision to Section 717

1. To change TSR method from AASHTO T-283 to ASTM D 4867 to make consistent with Section 710.
 - a. The only difference between the tests is the AASHTO test includes a freeze/thaw cycle

ASPHALT-RUBBER ASPHALT CONCRETE

717.1 DESCRIPTION:

The work under this section shall consist of furnishing, proportioning and mixing all the ingredients necessary to produce an asphalt-rubber Asphalt Concrete (ARAC) material. ARAC 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.

717.2 MATERIALS:

717.2.1 Asphalt-Rubber Binder (ARB): The blended ARB shall meet the criteria list below. The ARB may be blended in a dedicated blending and storage unit connected to the hot plant or at the asphalt binder supplier's facility.

717.2.1.1 Asphalt Cement: Asphalt cement shall conform to the requirements of Section [711](#).

717.2.1.2 Crumb Rubber: Crumb Rubber shall meet the gradation requirements as shown in Table [717-1](#) below when tested in accordance with Arizona Test Method 714.

TABLE 717-1	
GRADATION REQUIREMENTS OF CRUMB RUBBER	
Sieve Size	Percent Passing
2.00 mm (#10)	100
1.18 mm (#16)	65 - 100
600 μm (#30)	20 - 100
300 μm (#50)	0 - 45
75 μm (#200)	0 - 5

The crumb rubber shall have a specific gravity of 1.15 ± 0.05 and shall be free of wire or other contaminating materials, and shall contain not more than 0.5 percent fabric. Calcium carbonate, up to four percent by weight of the crumb rubber, may be added to prevent the particles from sticking together.

Certificates of Compliance conforming to Arizona State Department of Transportation Standard Specifications for Road and Bridge Construction Section 106.05 shall be submitted. In addition, the Certificates shall confirm that the rubber is a crumb rubber, derived from processing at ambient temperature, whole scrap tires or shredded tire materials; and the tires from which the crumb rubber is produced is taken from automobiles, trucks, or other equipment owned and operated in the United States. The Certificates shall also verify that the processing does not produce, as a waste product, casings or other round tire material that can hold water when stored or disposed of above the ground. The crumb rubber to be used in ARB shall be the type produced through a process of mechanical grinding at ambient temperature. Use of crumb rubber granules produced from a cryogenic process is prohibited.

717.2.1.3 ARB Proportions and Properties: Ground crumb rubber in ARB shall be a minimum of 18 percent by weight of total binder.

ARB shall be Type 1 unless otherwise specified and conform to the requirements of Table [717-2](#).

TABLE 717-2			
PHYSICAL PROPERTIES OF ARB			
Property	Requirement		
	Type 1	Type 2	Type 3
Grade of base asphalt cement	PG 64-16	PG 58-22	PG 52-28
Rotational Viscosity*; 350° F, Pascal seconds	1.5-4.0	1.5-4.0	1.5-4.0
Penetration; 39° F (4° C), 200g, 60 sec. (ASTM D5); dmm, min	10	15	25
Softening Point; (ASTM D36); °F, min.	135	130	125
Resilience; 77°F (ASTM D5329); %, min	25	20	15
* The Viscometer used must be a hand held rotational viscometer, such as a Rion (formerly Haake) Model VT – 04, or an equivalent, using Rotor No. 1. The rotor, while in the off position, shall be completely immersed in the binder at a temperature from 350° to 355° F for a minimum heat equilibrium period of 60 seconds, and an average viscosity determined from three separate constant readings (± 0.5 pascal-seconds) taken within a 30 second time frame with the viscotester level during testing and turned off between readings. Continuous rotation of the rotor may cause thinning of the material immediately in contact with the rotor, resulting in erroneous results.			

717.2.1.4 ARB Design: At least two weeks prior to paving, the Contractor shall submit an ARB design prepared by an ADOT approved laboratory. Such design shall meet the requirements specified herein. The design shall show the values obtained from the required tests, along with the following information: percent, grade and source of the asphalt cement used; and percent, gradation and source(s) of the crumb rubber used, as well as the ARB blending location: on-site or at the asphalt binder supplier's facility.

717.2.2 Aggregate: Coarse and fine aggregates shall conform to the applicable requirements of Tables [717-3](#) and [717-4](#) below. 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 is material retained above the Number 8 sieve and fine aggregate is material passing the Number 8 sieve. Aggregates shall be free of deleterious materials, clay balls, and adhering films or other material that prevent thorough coating with the asphalt cement. Mineral aggregate shall conform to the following requirements when tested in accordance with the applicable test methods.

TABLE 717-3		
MIX DESIGN GRADATION REQUIREMENTS WITH MINERAL ADMIXTURE		
Overlay Thickness	1" & 1- 1/2"	2"
Sieve Size	Percent Passing	Percent Passing
1" (25 mm)	100	100
3/4" (19 mm)	100	95-100
1/2" (12.5 mm)	95-100	78-92
3/8" (9.5 mm)	78-92	61-75
No. 4 (4.75 mm)	28-45	30-40
No. 8 (2.36 mm)	15-25	15-25
No. 30 (600 μ m)	5-15	5-15
No. 200 (75 μ m)	3.0-7.0	2.0-6.0

The combined aggregate properties shall conform to the requirements of Table [717-4](#).

TABLE 717-4		
COARSE/FINE AGGREGATE REQUIREMENTS		
Characteristics	Test Method	Requirements
Fractured Faces, % (Plus No. 8)	ARIZ-212	85, 1 fracture 80, 2 or more
Uncompacted Voids, %	ARIZ-247	45.0 (High Traffic Volume) 42.0 (Low Traffic Volume)
Sand Equivalent (Minus No. 4)	AASHTO T-176	65 minimum
Plasticity Index	AASHTO T-89 & T-90	Non Plastic
L.A. Abrasion, % Loss	AASHTO T-96	9 max. @ 100 Rev. 40 max. @ 500 Rev.
Combined Bulk Specific Gravity	AI MS-2	2.35-2.85
Combined Water Absorption, %	AI MS-2	0-2.5

717.2.3 Mineral Admixture: Mineral admixture used in ARAC shall be dry hydrated lime conforming to the requirements of ASTM [C1097](#) or Portland cement conforming to ASTM [C150](#) for Type II, or ASTM [C595](#) for Type IP. The minimum mineral admixture content will be 1.0percent, by weight of total aggregate.

717.3 MIX DESIGN REQUIREMENT:

717.3.1 General: The mix design for ARAC 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 Asphalt Concrete Mix Design Engineer” within ADOT’s list of approved laboratories.

The date of the design shall not be older than two years from the date of submittal, unless supportive documentation is provided and approved by the Engineer.

The mix design method used shall be in accordance with the Marshall Mix procedure, 75 blows, as described in Arizona Test Method 832 “Marshall Mix Design Method for Asphaltic Concrete (Asphalt Rubber) [AR-AC]” with the exceptions that:

- (1) Mineral admixture shall be considered part of the total weight of aggregate and all combined specific gravity and combined absorption calculations for aggregates and mineral admixture will be done in accordance with Asphalt Institute’s Manual MS-2.
- (2) Course aggregate shall be separated from the fine aggregate on the #8 sieve.

Mix designs are subject to approval by the Engineer.

717.3.2 Mix Design Criteria: The mix shall comply with the criteria in Table [717-5](#).

TABLE 717-5		
MARSHALL MIX DESIGN CRITERIA		
Criteria	Low Volume Traffic	High Volume Traffic
ARB Content		
1” and 1-1/2” Overlay Thickness	8.4% minimum	8.0% minimum
2” Overlay Thickness	N/A	7.0% minimum
Mixture Air Voids, %	3.5-4.5	4.5-5.5
Voids in Mineral Aggregate, %	19.0 min	19.0 min
Tensile Strength Ratio, ASTM D 4867/AASHTO T 283	65% minimum	65% minimum
Marshall Stability, pounds minimum	800	800
Marshall Flow, 0.01 inch minimum	16	16

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.

SECTION 717 Case 16-16 6/17/2016

- (2) The mix plant identification and/or location, as well as the supplier or producer name.
- (3) The traffic condition (low or high traffic) and lift thickness.
- (4) A description of all products that are incorporated in the ARAC along with the sources of all products, including the base asphalt cement, crumb rubber, mineral aggregate, and admixtures.
- (5) The results of all testing, determinations, etc., such as: specific gravity and gradation, water absorption, sand equivalent, loss on abrasion, fractured coarse aggregate particles, Tensile Strength Ratio (~~ASTM D 4867AASHTO T-283~~), Marshall bulk density, stability and flow, asphalt absorption, percent air voids, voids in mineral aggregate, and mineral admixture content. 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 and plots of the compaction curves.
- (6) The laboratory mixing and compaction temperature ranges for the ARB used within the mix design.
- (7) A specific recommendation for design ARB 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.
- (8) The supplier's product code, the laboratory Engineer's seal (signed and dated), and the date the design was completed.
- (9) The ARB design.

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 ARB, or any other item that will cause an adjustment in the mix, shall be justification for a new mix design to be submitted.

- End of Section

Curb Ramp Working Group Meeting

Meeting Notes
June 8, 2016

Opening:

The meeting of the Specifications and Details Curb Ramp Working Group was called to order by chair Warren White on June 8, 2016, at 9:00 p.m. in the MAG Palo Verde Room.

1. Attendance

Brian Gallimore (AGC), Greg Potter (Sunrise Engineering), Bob Herz (MCDOT), Craig Sharp (Buckeye), Gordon Tyus (MAG), and Warren White (Chandler)

2. MCDOT Curb Ramp Details

Bob Herz provided handouts of the county's radial curb ramp details. He said the County is using 4" thick Class "B" concrete because they have not had breakage problems as reported by cities, and the ramps would be less expensive to construct. Brian Gallimore said contractors have been picking the more stringent detail and using Class "A" concrete because the ramps are less likely to break during the construction of subdivision developments.

3. Curb Ramp Draft Details (Details 236-1, 236-2, 237-1, 237-2)

Greg Potter of Sunrise Engineering described the process they typically go through in determining ramp details. He said for agency projects, they typically work out all the specific dimensions and control points, but for subdivisions they typically just call out a MAG or agency detail.

For identifying the ramp locations, Craig Sharp said they can start with the control point and move forward from there in laying out the ramps. Mr. Tyus asked that if the length of ramp wings stated "varies" rather than giving a dimension, how the contractors could build them if the designer does not provide the dimensions. Mr. Potter thought there would need to be an education process for engineers to know they have to locate the control points and for inspectors as well. Mr. White passed out the ADOT ramp detail which was confirmed to be compliant. Everyone agreed that special details were needed for retrofits where right-of-way was limited or site specific conditions require may need a special design.

There was discussion about the construction process as far as staking points, setting the forms and adjusting them as necessary after checking slopes. Mr. Gallimore said they need some tolerance and leeway to make adjustments in the field. Mr. Sharp noted that concrete is heavy and placing it can shift the forms.

Mr. White asked for suggestions on revising the draft MAG details. Some discussion points are summarized below:

Radial Ramps

- Increase the length of the wing (C in the table) by half a foot. Not make this a minimum or TYP but a fixed distance. This length ensures compliance with the 10:1 maximum slope for ramp wings for all gutter slopes of 2% or less.

- Increase ramp lengths to compensate for the 1.5% sidewalk slope from top of curb. Mr. Herz suggested recalculating the ramp length values to ensure the additional 1.5% slope rise of the sidewalk is taken into account; the values shown are too low.
- Dimension the landing (in the section view) as 5' min. Also remove maximum slopes and replace with "See Note 2".
- Remove the cross-slope arrow notes from the landing area.
- Suggestions on how to best locate the control points of the ramps, whether or not show the angle lines like on the MCDOT details. Mr. Herz suggested the control point should be located by a hard dimension along the face of curb from the beginning, center, or end point of the curb return and not by a centerline station and offset distance and not by use of an angle. Locating control points by an angle or by station and offset can only be accomplished by surveyors. Dimensioning the control point location allows the contractor and inspector to verify the location was correctly staked.

Directional Ramps

- Dimension the landing (in the section view) as 5' min. Also remove maximum slopes and replace with "See Note 2".
- Remove the cross-slope arrow notes in the landing area.
- Decided to leave the curb option in the details, although the sidewalk up to it may still need adjustment.
- There was discussion on the need to have on the plan view both note 7 and the 10% max wing slope. Mr. Gallimore suggested keeping both, Mr. Herz agreed.
- For directional ramps, there was discussion about how to locate the control point from the center front of curb, and also the language of Note 8, regarding the use of the word "should."
- Removing the 1.5% slope note for the landing on the section view of the directional ramps. This may not be typical since the landing is shared by both ramps.

Radial & Directional Ramps

- May need to create a separate detail for 25' and smaller radius curb returns since compliant design will often impact areas beyond the PC/PT.
- Mr. Herz suggested labeling ramps A and B so the same detail could be used when only one ramp is needed, allowing it to be called out separately.
- Mr. Tyus suggested that if not used for new construction, we remove the 7" curb option from the tables. Many concurred with the suggestion.
- Where to change concrete thickness for the ramps and sidewalks was discussed. Keeping the 6" depth for the entire curb return seemed to have general concurrence.
- Existing payment requirements in Section 340 will need to be revised since curb ramp payment areas are currently defined by ramp curb limits and the details have no ramp curbs. Mr. Gallimore said Phoenix is paying per unit, but thought that it is difficult to bid without knowing what kind of ramps will be placed. Since dual ramps greatly impact the entire curb return, it was thought that the entire curb return should be a pay item and separate pay items be provided for each curb return radius and the number of curb ramps in the curb return.

4. Revisions to Specifications

Warren White asked about changes to the specifications. The group recommended adjusting the information on payment in Section 340. Mr. White said he would make the changes to the specs and details that were discussed, and plans to have them ready to go out in the next committee agenda packet.

5. Adjournment

The meeting was adjourned at 11:10 p.m.

MAG Asphalt & Materials Working Groups

Meeting Notes

Thursday, June 16, 2016, 12:00 pm at the ARPA Offices

Present:

See attached attendance sheet. Brian Gallimore & Greg Groneberg chaired this portion of the meeting.

Discussion:

- 1) Case 16-02 Certificates of Compliance/Analysis
A list compiled by the City of Phoenix was presented that identified other potential sections that may need text revisions in relation to this case. Some revisions to other sections have been sent to Mr. Herz for review as he is still working on many items.
- 2) Case 16-09 - MAG Section 710 revisions
One punctuation error was identified and corrected. The comment about identifying common mix applications was deleted as well as some proposed maximum lift thicknesses have been added for clarity stemming from the last MAG committee meeting.
- 3) Case 16-10 - Proposed New MAG Section 719 (proposed)
The proposed grading bands were discussed at length with Phoenix and MCDOT and appears the proposed bands are acceptable. There was further discussion on the binder being used as well as the name of the section. The name of the proposed section has been modified and have an upcoming subcommittee meeting (prior to MAG) to further this discussion.
- 4) Follow Up – A continuing discussion on MAG Section 310 was had in reference to language and methods regarding rock correction procedures. Adjoining sections were identified that may be impacted by any change to this section. This is still under review and will be addressed further at the next meeting. Additionally, MAG 321 is continued to be reviewed in regards to miscellaneous/trench paving and methods for testing. This will also be discussed further in the next meeting.
- 5) New Business – Two new items addressed in # 2 (lift thickness) & #3 were (binder type) discussed. Additionally, a possible revision to Section 321 in regard to clarifying penalty tables and the coring method/procedure was brought forth. This will be further addressed in a subcommittee meeting taking place at Speedie on June 24th. Information from this meeting will be disseminated at the MAG meeting as necessary as well as the next monthly working group.

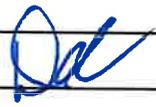
Date for Next Meeting

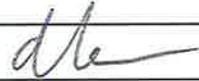
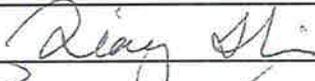
The next meeting is scheduled for **July 21, 2016 @ 12:00 pm** in the ARPA offices.

Anyone who wishes to attend is welcome

MAG Working Group

Thursday, June 16, 2016

Company Name	Name	E-mail Address	Signature
Alon Asphalt	Mo Rahman	mo.rahman@alonusa.com	
AMEC Foster Wheeler	Scott Thompson	scott.thompson@amecfw.com	
AMEC Foster Wheeler	Bob Kostelny	robert.kostelny@amecfw.com	
City of Goodyear	Rob Godwin	rob.godwin@goodyearaz.gov	
City of Peoria	Scott Clark	scott.clark@peoriaaz.com	
City of Phoenix	Rob Duvall	robert.duvall@phoenix.gov	
City of Scottsdale	Rod Ramos	rramos@scottsdaleaz.gov	
Cutler Repaving	Bob Erdman	berdman@cutlerrepaving.com	
Desert Ready Mix	Manny Mungaray	manny@desertrm.com	
DGA	Peter Kandaris	pkandaris@digioiagray.com	
Drake	John McClafferty	jmccclafferty@drakeus.com	
Fisher Industries	Doug Laquey	dlaquey@fisherind.com	
Fisher Sand & Gravel	Trey Billingsley	tbillingsley@fisherind.com	
Hanson	Brian Newman	brian.newman@hanson.com	
MAG	Gordon Tyus	gtvus@azmag.gov	
MCDOT	Robert Herz	rherz@mail.maricopa.gov	
Southwest Asphalt	Greg Groneberg	ggroneberg@fisherind.com	
Southwest Asphalt	Richard Kissling	rkissling@fisherind.com	
Southwest Rock Products	Kevin Moss	kmoss@southwestrockproducts.com	
Speedie & Associates	Don Cornelison	dcornelison@speedie.net	
SRMG - ARPA	Jeff Hearne	jhearne@srmaterials.com	

Company Name	Name	E-mail Address	Signature
Western Refining	Sam Huddleston	sam.huddleston@wnr.com	
WSP	Brian Gallimore	bgallimore@wspinc.net	
WTI	Phillip Feliz	phil.f@wt-us.com	
Vulcan	Alex Carter	cartera@vmcmail.com	
Vulcan	Llyoyc Glover	gloverl@vmcmail.com	
MCDOT	John Shi	johnshi@mail.maricopa.gov	
THE GILBERT AZ	TOBY CROOKS	toby.crooks@gilbertaz.gov	
Town of Gilbert	Chance Baldwin	Chance.baldwin@gilbertaz.gov	
COP	PETER RUPAL	peter.rupal@phoenix.gov	
HollyFrontier	Broad Schmitz	bradley.schmitz@hollyfrontier.com	

Water/Sewer Working Group Meeting

Meeting Notes

June 21, 2016

Opening:

A meeting of the Specifications and Details Water/Sewer Working Group was called to order by chair Jim Badowich on June 21, 2016, at 1:30 p.m. in the MAG Cottonwood Room.

1. Introductions/Attendance

David Allred (Avondale), Tony Ayala (Avondale), Jim Badowich (Avondale), Chris Considine (Oldcastle), Jami Erickson (Phoenix), Craig Sharp (Buckeye), Brian Sitarz (Oldcastle), Gordon Tyus (MAG).

2. Case 16-01: Misc. Corrections

Jim Badowich asked if anyone had any related blooper cases to discuss. None were announced.

3. Case 16-08: Valve Stem Extension Sleeve

Craig Sharp provided handouts of the latest version of the case. He said the details were updated based on feedback from the committee, including adding dots for the reinforcing steel rings. The packet also included a flyer showing the risers for the Type C valves can be ordered up to 82" long. It was suggested to remove references to manufacturers from the details. Mr. Sharp said that plastic seal cups were also available. Mr. Badowich asked why the lids couldn't be manufactured to twist to lock on, making them less likely to pop-up. Mr. Tyus noted there should be a small gap on some of the extension lines.

4. Meter Boxes/Vaults

Brian Sitarz handed out updated Details 310, 315 and 320 for Case 16-14 (Revisions to Water Meter Box and Cover Details). He also brought in example boxes and lids including both concrete and polymer boxes and several different lids to demonstrate how lids fit (or didn't fit) on different boxes. Tony Ayala also brought a few different sized lids to test. Mr. Badowich said that to maintain interchangeability of the lids, he wanted to stick to the current MAG dimensions, but thought the tolerances may need to be reviewed. Manufacturers may have to adjust the box sizes to match, but cities can always choose what they want to use. Avondale and Buckeye are currently using polymer boxes, whereas Ms. Erickson stated that Phoenix is planning to continue using the concrete boxes.

On Detail 310 it was suggested to label dimension J as 2" since it is the same for all sizes. Mr. Tyus suggested stating what the ASTM A786 reference in Note 1 was referring to. The polymer lids (Detail 315 have a slotted AMR hole to allow it to work universally.

Mr. Sitarz also provided copies of Case 16-15 for traffic-rated boxes and covers (Detail 319). Ms. Erickson noticed that there was a typo for the AASHTO reference in Note 1. They are designed to meet H20 rating. Mr. Sitarz said he would make revisions to the details as suggested and provided them to Mr. Tyus for the next agenda packet.

5. Section 611: Water/Sewer Testing

Tony Ayala introduced David Allred who has been working on a draft of testing requirements for Avondale. Mr. Badowich said it would need to be reformatted to fit in the MAG standards and numbering system. Mr. Allred said they are now using Colilert water testing which is quicker and cheaper than HPC testing. Jim Badowich asked them to make sure the draft follows AWWA guidelines.

Mr. Allred said the draft references the current edition (2015) of AWWA. Mr. Badowich said he wanted to provide several testing options in the MAG spec to try and be more inclusive and reduce agency supplements. He said he would like to continue working on this issue this year with the goal of introducing a case next January.

6. Extra Protection/Reclaimed Water

Mr. Badowich said MAG needs to address this since there are different types of lines (sewer, storm sewer, reclaimed, well water, potable, etc.) that may have different separation needs. He said sleeving should be an option.

7. Updates on MCAQD and NESHAP concerns about asbestos in manholes/vaults

Mr. Allred said he thought this issue had been resolved, but Ms. Erickson said Phoenix still has put manhole rehab on hold.

8. Other Discussions

Mr. Allred asked if the group had input on gravity grease interceptors. Mr. Badowich said that there is an outside right-of-way working group that is addressing details and issues and it may be appropriate that that group to look at the issue.

9. Next Meeting

The next meeting is planned for 1:30 on Tuesday, July 19th at the MAG offices.

10. Adjournment

The meeting was adjourned at 3:40 p.m.

MAG Discussion Topic:

DOJ/DOT's requirement to provide curb ramps when streets, roads or highways are altered through **resurfacing**. Terminology has caused some confusion.

- The DOT/DOJ supplement Q&A in many cases states the best practice is for the public entity to work together with the State transportation agency and the FHWA Division to come to an agreement on how to consistently handle these situations and document their decisions. (<http://www.ada.gov/doj-fhwa-ta-supplement-2015.html>)
- The FHWA Q&A (item 18) they mention that the DOJ does consider resurfacing beyond normal maintenance to be an alteration. **The FHWA has determined that maintenance activities include actions that are intended to preserve the system, retard future deterioration, and maintain the functional condition of the roadway without increasing the structural capacity.** (http://www.fhwa.dot.gov/civilrights/programs/ada_sect504qa.cfm#q18)

MAG Revisions:

- 1) Revise specs to include language regarding intention to maintain pavement only vs. specs that when applied may increase structural capacity. Add this statement to the General section.
- 2) In particular, revise Section 331 and 714 renaming from Microsurfacing to Microsealing, and replace 'surfacing' to 'sealing' within.

FHWA Approval:

Provide DRAFT MAG Specifications to FHWA through MAG Street Committee for discussion and final approval.