

July 28, 2010

Members of the MAG Specifications and Details Committee

Jesse Gonzales, City of Peoria, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF AGENDA

Wednesday, August 4, 2010 at 1:30 p.m.
MAG Office, Second Floor, Cholla Room
302 North First 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 Jesse Gonzales at 623-773-7548 or Gordon Tyus, MAG staff at 602-254-6300.

Please park in the garage under the building, bring your ticket, parking will be validated. For those using transit, Valley Metro/RPTA will provide transit tickets for your trip. For those using bicycles, please lock your bicycle in the bike rack in the garage.

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. Your attendance at the meeting is strongly encouraged.

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

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

AGENDA

<u>ITEM</u>	<u>COMMITTEE ACTION REQUESTED</u>
1. <u>Call to Order</u>	1. No action required.
2. <u>Approval of July 7, 2010 Meeting Minutes</u>	2. Corrections and approval of July 7, 2010 minutes.
3. <u>2009 & 2010 Cases</u>	3. Review of 2009 & 2010 cases.
4. <u>General Discussion</u>	4. Open general discussion.
5. <u>Request for Agenda Items</u>	5. Request desired new agenda items
6. <u>Adjournment</u>	6. No action required.

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

July 7, 2010

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

AGENCY MEMBERS

Jim Badowich, Avondale	Mike Samer, Mesa
Scott Zipprich, Buckeye	Jesse Gonzales, Peoria, Chairman
Warren White, Chandler	Syd Anderson, Phoenix (St. Trans.)
* Dennis Teller, El Mirage	Jami Erickson, Phoenix (Water)
Edgar Medina, Gilbert	Mark Palichuk, Queen Creek
Tom Kaczmarowski, Glendale	* Rodney Ramos, Scottsdale
Troy Tobiasson, Goodyear, Vice Chairman	* Jason Mahkovtz, Surprise
Shimin Li, Maricopa County (Envir. Div.)	Tom Wilhite, Tempe
Bob Herz, MCDOT	

ADVISORY MEMBERS

* John Ashley, ACA	Jeff Hearne, ARPA
Amanda McGennis, AGC (proxy)	Yvonne Martinez, SRP (proxy)
Kwigs Bowen, NUCA	* Paul R. Nebeker, Independent
Tony Braun, NUCA	Mike Smith, ARPA
* Brian Gallimore, AGC	

MAG ADMINISTRATIVE STAFF

Gordon Tyus

* Members not attending or represented by proxy.

GUESTS/VISITORS

Bill Davis, NUCA
Brian Schram, Rinker Materials
Ann Seiden, Southwest Gas

1. Call to Order

Chairman Jesse Gonzales called the meeting to order at 1:32 p.m.

2. Approval of Minutes

The members reviewed the June 2, 2010 meeting minutes. Jesse Gonzales noted a misspelling of “committed” in the last sentence on Case 09-15. Warren White introduced a motion to accept the minutes with the correction noted by Mr. Gonzales. Tom Kaczmarowski seconded the motion. A voice vote of all ayes and no nays was recorded.

3. 2009 Cases (old cases)

a. Case 09-13 – ADA-Compliant Dual Sidewalk Ramps: *Develop ADA-compliant details for 35-foot and 20-foot corner radius dual sidewalk ramps.* Case sponsor, Jesse Gonzales, withdrew the case for consideration with the intention reintroducing it in the future when he has more time to devote to it. He also suggested a working group on this issue may be appropriate.

b. Case 09-14 – Revise Ramps for ADA Compliance: *Revise Details 231, 232, 233 and 234 to obtain compliance with ADA requirements.* Bob Herz passed out revised detail drawings with all the ramp details renumbered (235-1 through 235-5) to simplify the references to different ramp options. Mr. Herz asked if the committee had any preference on how sidewalks wider than 5’ would be brought into the ramp – either by moving the sidewalk closer to the curb as shown on detail 235-1, or moving the sidewalk back to be even with the end of the ramp. He asked members to send him any additional comments.

c. Case 09-15 – Revisions to Section 610.4 for Water Line Handling: *Modify Section 610.4 to clarify water line pipe protection measures at the job site prior to placement (during storage or staging) to help prevent contamination.* Chairman Gonzales asked case sponsor Tom Wilhite if he thought it was ready for a vote in August. Mr. Wilhite said he had no further changes but was waiting for feedback from the Water/Pipe working group. Vice-chair Troy Tobiasson said they discussed this as a priority issue for the working group to address. Mr. Tyus advised that since this case was introduced in 2009, time was running out on it, and suggested that if additional changes could not be completed this year, the case could be withdrawn and reintroduced later, or the language as now submitted could be voted on, with a new case to be submitted in the future to address additional changes, if needed.

4. 2010 Cases (new cases)

d. Case 10-01 – Miscellaneous Bloopers: *Correct typographic errors.* Bob Herz provided a new blooper case (10-01f) to correct typographic errors in Table 702-1. Mr. Herz suggested leaving the case open in case additional errors were found.

e. Case 10-02 – Utility Pothole Repair: *Revise and add keyhole repair to Detail 212 and add new Sections 355 and 708.* Warren White provided a handout with revisions to

Sections 355 and 708 based on feedback received from Maricopa County. Since the revisions were fairly extensive, Mr. White proposed postponing the vote until next month, and asked for feedback from members. Mr. Herz commented that notes in Detail 212 should be consistent with the CLSM specifications.

f. Case 10-03 – Modify Section 336 Pavement Matching and Surfacing Replacement: *Revise Section 336 to be in conformance with changes made last year to Detail 200-1 and Detail 200-2.* Yvonne Martinez, substituting for Peter Kandaris, asked for additional comments. During the June meeting, Mr. Kandaris suggested a vote during the August meeting.

g. Case 10-05 – Revise FOREWORD: *Clarify use of the MAG Specifications and Details for Public Works document.* Jesse Gonzales provided updated versions of the Foreword to the MAG Specifications, and also a Foreword for the proposed specifications for outside the right-of-way. Mr. Gonzales confirmed that both were considered part of this case, and asked for comments from the committee.

h. Case 10-06 – Revise Controlled Low Strength Materials (CLSM) Specifications: *Update the CLSM specifications in Sections 604 and 728 to match current industry standards.* Jeff Hearne of ARPA said the latest version was provided in the agenda packet, and made only minor changes from the previous month, which was to include language about rejecting ready-mix concrete without approval in both sections. Mr. Hearne said he was ready for a vote on the case. Mr. Gonzales moved, and Mr. Herz seconded the motion to approve Case 10-06 for adoption into the MAG Specifications and Details. A roll call vote was taken. The motion passed: 12 yes, 0 no, 0 abstaining, 3 not present.

i. Case 10-07 – Revise Detail 230 – Sidewalks to change minimum from 4’ to 5’: *Revise the minimum sidewalk width to match the minimum ADA requirements for two wheel chairs to pass, and to allow a wheel chair to u-turn.* Bob Herz asked if there were any comments on the case. Syd Anderson of Phoenix said that they intended to keep 4’ as a minimum sidewalk width, and that if the case passed they would use a supplement to keep Phoenix at 4’ because they have right-of-way issues in parts of the city. Mike Samer of Mesa said they also want to keep the 4’ minimum. Bob Herz said that 5’ minimum sidewalks were required to meet ADA requirements unless the sidewalk was periodically widened to allow wheelchairs to pass each other. Mr. Samer said Mesa did use this option. Bob Herz said many jurisdictions that use the MAG specifications, may not be aware that the detail currently in MAG does not meet ADA, and thought that it should be at least 5’ minimum because it would satisfy ADA without additional modifications. Members also discussed right-of-way issues, and said that 5’ sidewalks do fit inside the typical 50’ ROW, including parkways, but they could also be affected by local zoning requirements. Mr. Herz moved, and Mr. Tobiasson seconded the motion to approve Case 10-07 for adoption into the MAG Specifications and Details. A roll call vote was taken. The motion passed: 9 yes, 3 no, 0 abstaining, 3 not present.

j. Case 10-08 – Revise Section 717 Asphalt Rubber. *Revise Section 717 ASPHALT-RUBBER to obtain a uniform specification.* Bob Herz said he had no changes from the previous month, but was planning to incorporate feedback from Jeff Benedict of ARPA and was waiting for comments from other jurisdictions. Syd Anderson said he would provide comments from Phoenix by the next meeting. Mr. Herz asked for additional comments from any of the jurisdictions using rubberized asphalt.

k. Case 10-09 – Revise Safety Rail Detail 145. *Adjust Detail 145 to comply with AASHTO pedestrian loading requirements.* Mr. Herz said he had received a request to keep the safety rail as is, but exclude it from use as bridge railing. It was suggested that a note be added to the detail limiting its use. Scott Zipprich said that the railing does not meet UBC building code requirements, which means it cannot be used at a fire exit, or where building codes require a railing at a 42” or greater drop in elevation. Mr. Zipprich said he would also check on its use between lots at different elevations. Mr. Herz said the railing was on box culverts and headwalls. Additional comments were requested.

l. Case 10-10 – Proposed New Detail 122 – Pavement Marker for Fire Hydrants. *The new detail would standardize placement of fire hydrant markers and enhance public safety.* Bob Herz asked if members had comments on placement of the hydrant markers. He explained that they were not placed on the center lines to avoid conflicts with striping. Jami Erickson said the Phoenix fire department doesn’t use them because they are not replaced after street resurfacing. Mr. Herz said he thought the detail was needed so jurisdictions like Maricopa County would know where to replace them after street work.

m. Case 10-11 – Revise Detail 110 – Plan Symbols. *Update and expand graphic standards to have plans be more uniform among MAG agencies.* Mr. Herz asked if there were any symbols the committee did not like, or should not be included. In response to a question on how to distinguish between existing and proposed symbols, Mr. Tyus said the Symbols Working Group discussed using either screened or dashed symbols for existing symbols as determined by current jurisdiction practice. Mr. Herz said that he didn’t think the ‘A’ POLE W/TRAFFIC SIGNAL HEAD was necessary and planned to remove it since traffic symbols are more specialized.

n. Case 10-12 – New Section 361 – Shallow Depth Fiber Optic Micro-Conduit Installation. *Provide specifications for the installation of underground fiber optic micro-conduit telecommunications facilities within the public right-of-way.* The sponsor, Rod Ramos, was not present to answer questions about the case. Bob Herz said Maricopa County does not like this draft specification because it does not meet their minimum depth requirements. Other members had similar issues and recalled problems with shallow depth cable installations in the past.

o. Case 10-13 – Revisions to Subsection 618.2 and Section 765 Regarding Rubber Gaskets. *Revise RCP joint specifications to be consistent from section to section and to be consistent with industry standards as commonly accepted amongst agencies in the region.* Troy Tobiasson of Goodyear introduced this new case to correct inconsistencies between 50% and 60% rubber requirements of gaskets. He said manufacturers do not

make gaskets with 60% rubber, and suggested the specifications be modified to reference national specifications such as ASTM C 443. Bob Herz suggested that for street work AASHTO specifications may be more appropriate. Brian Schram of Rinker Materials assisted Mr. Tobiasson in developing the case and was present to provide information on current practice in the industry. Mr. Herz, Mr. Schram and Mr. Tobiasson said they would get together after the meeting to clarify and mark-up suggested changes, and submit them at the next meeting.

5. General Discussion:

Specifications and Details Outside the Right-of-Way Working Group Update

Yvonne Martinez relayed that Mr. Kandarlis was sorry that he was unable to attend the June 29th working group meeting, but proposed the next meeting of the working group be scheduled for Tuesday, July 27th at 1:30 at the ARPA office. Jeff Hearne said he would check with ARPA to reserve the space. Jesse Gonzales said he filled in for Peter Kandarlis at the last meeting using the check list Mr. Kandarlis provided as a guide. Mr. Gonzales said the list was very helpful in not only determining if a detail or specification applied outside the right-of-way, but also if it needed to be revised or removed from the MAG Specifications and Details book.

Water/Pipe Working Group Update

Troy Tobiasson gave a brief summary of the June 16th meeting and asked if there was a better meeting day so more people could attend. By process of elimination Thursdays were determined to be the best day for members to participate. The working group meetings would then be scheduled for the third Thursday of the month, which for the next meeting would be July 22nd at 10:00 at the MAG office. Jami Ericson said Larry Smith or Lucy Graham would attend from Phoenix. Shimin Li of Maricopa County would try to attend along with Mr. Tobiasson, Mr. Badowich, Mr. Zipprich, Mr. Gonzales and a representative from NUCA.

Reclaimed Water

Jesse Gonzales said he has been participating in a working group of the state blue-ribbon panel on water sustainability that focused on the retrofit and infrastructure of reclaimed water systems. He explained that the working group identified a goal of bringing reclaimed water specifications and regulations to a state-wide level, and that this could cause local municipalities to lose their ability to manage their reclaimed water facilities and infrastructure. He said he was asked to attend the next meeting of the MAG intergovs to explain the situation. Gordon Tyus said the intergovs were supplied a list of the committee membership, so they may be contacting you about this issue. Other related issues discussed included permits required by the County Health department for use of reclaimed water, and the use of reclaimed water in concrete mixes.

ASTM Portal

Gordon Tyus said that since we are in the new fiscal year, funding for this project was available, and he was looking for guidance from the committee to move forward. Amanda

McGinnis asked if advisory members serving on the committee also had access. Mr. Tyus believed the current proposal by ASTM did not include access by advisory members, but only member agencies, but that he would check with ASTM to see if some accommodation could be made for advisory members currently on the committee. Mr. Gonzales proposed a motion to recommend that MAG implement the ASTM Portal project. Mr. Tobiasson seconded the motion. A voice vote of all ayes and no nays was recorded.

6. Adjournment:

The meeting was adjourned at 3:05 p.m.

2010 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

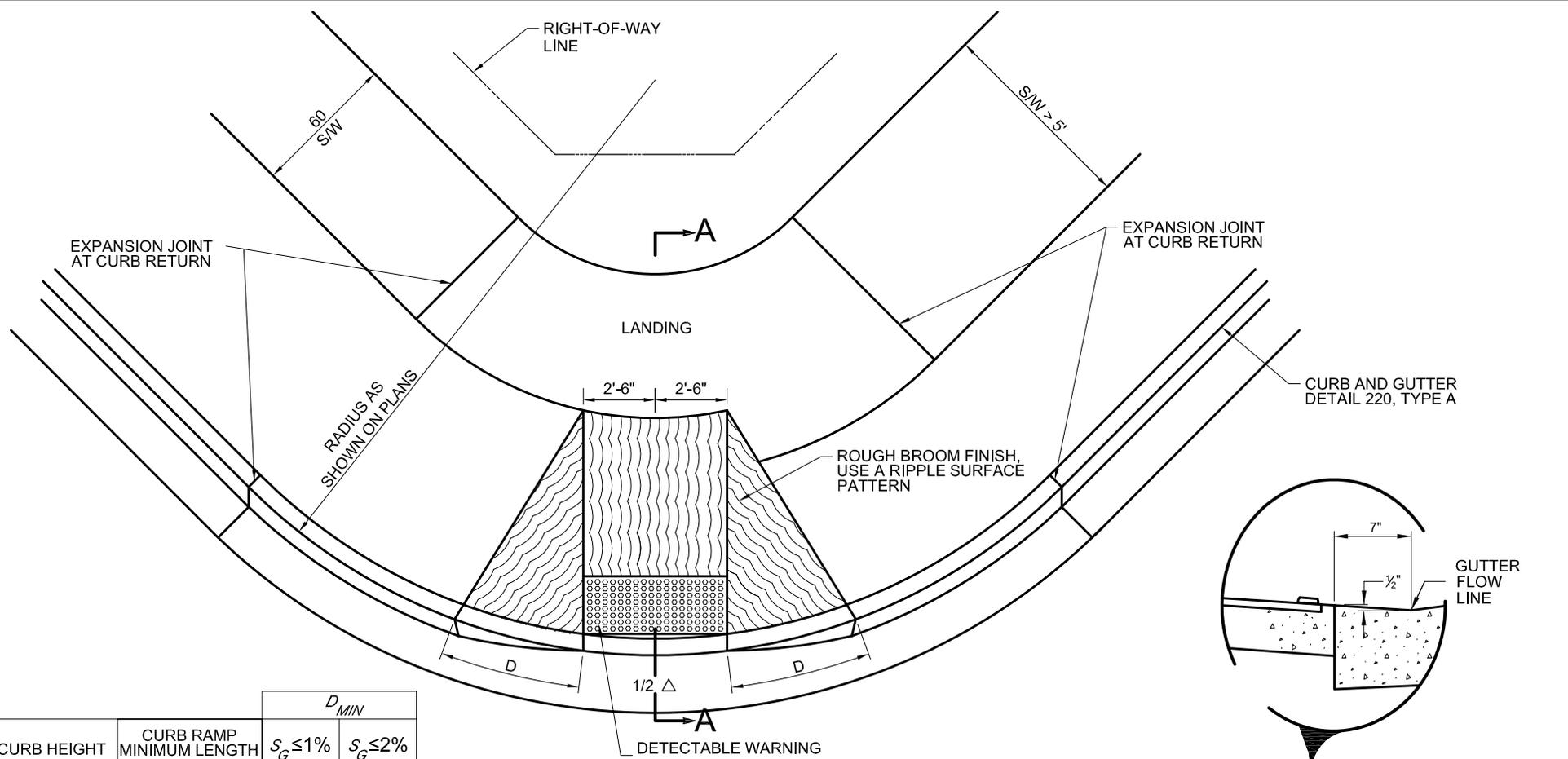
(Updated information can be found on the website: <http://www.mag.maricopa.gov/detail.cms?item=11284>)

CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE	
09-13	Case 09-13 : Dual Curb Ramp Details	Peoria	Jesse Gonzales	07/01/2009 02/03/2010	Withdrawn 07/07/2010	0 0 0	Yes No Abstain
09-14	Case 09-14 : Revise Ramps for ADA Compliance, Details 231, 232, 233 and 234	MCDOT	Bob Herz	07/01/2009 06/02/2010		0 0 0	Yes No Abstain
09-15	Case 09-15 : Revisions to Section 610.4: Pipe Protection	Tempe	Tom Wilhite	07/01/2009 04/07/2010		0 0 0	Yes No Abstain
10-01	Miscellaneous Bloopers: Case 10-01A : Revisions to Section 317 Asphalt Milling Case 10-01B : Correct Table 715-1 and Section 340.2.1 Case 10-01C : Correct table reference in Section 321.10.2 Case 10-01D : Correct corrupted note on Detail 221 Case 10-01E : Correct typographic and spelling errors in Detail 100 and Sections 410.1, 611.11 and 741.2.1 Case 10-01F : Correct typographic errors in Table 702-1.	MCDOT Chandler MCDOT	Bob Herz Warren White Bob Herz	01/06/2010 07/07/2010	10-01B 4/07/10 (approved)	0 0 0	Yes No Abstain
10-02	Case 10-02 : Utility Pothole Repair: Revise and add keyhole repair to Detail 212. New Sections 355 and 708.	Chandler	Warren White Peter Kandararis	02/03/2010 04/07/2010		0 0 0	Yes No Abstain
10-03	Case 10-03 : Modifications Section 336 Pavement Matching and Surfacing Replacement.	SRP	Peter Kandararis	03/03/2010 04/07/2010		0 0 0	Yes No Abstain
10-04	Case 10-04 : Revise Section 109.8: Remove quotations of ARS from text located in Section 109.8 PAYMENT FOR DELAY.	MCDOT	Bob Herz	03/03/2010	06/02/2010	13 0 0	Yes No Abstain
10-05	Case 10-05 : Revise FOREWARD to clarify use of the <i>MAG Specifications and Details for Public Works Construction</i> document.	Peoria	Jesse Gonzales	03/03/2010 05/05/2010		0 0 0	Yes No Abstain
10-06	Case 10-06 : Revise Controlled Low Strength Material Specifications in Sections 604, 701 and 728.	ARPA	Jeff Hearne	04/07/2010 06/03/2010	07/07/2010	12 0 0	Yes No Abstain

2010 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

(Updated information can be found on the website: <http://www.mag.maricopa.gov/detail.cms?item=11284>)

CASE	DESCRIPTION	PROPOSED BY	MEMBER	SUBMITTAL DATE Last Revision	VOTE DATE	VOTE	
10-07	Case 10-07 : Revise Detail 230 - SIDEWALKS to change the minimum sidewalk width from 4' to 5'.	MCDOT	Bob Herz	04/07/2010 05/05/2010	07/07/2010	9 3 0	Yes No Abstain
10-08	Case 10-08 : Re-write Section 717 ASPHALT-RUBBER.	MCDOT	Bob Herz	05/05/2010		0 0 0	Yes No Abstain
10-09	Case 10-09 : Revise Detail 145 SAFETY RAIL to comply with AASHTO pedestrian loading requirements.	MCDOT	Bob Herz	05/05/2010		0 0 0	Yes No Abstain
10-10	Case 10-10 : New Detail 122 PAVEMENT MARKER FOR FIRE HYDRANTS.	MCDOT	Bob Herz	05/05/2010		0 0 0	Yes No Abstain
10-11	Case 10-11 : Revise Detail 110 PLAN SYMBOLS. Update and expand graphic standards and symbols.	MCDOT	Bob Herz	05/05/2010		0 0 0	Yes No Abstain
10-12	Case 10-12 : New Section 361 – Shallow Depth Fiber Optic Micro-Conduit Installation.	Scottsdale	Rod Ramos	05/05/2010		0 0 0	Yes No Abstain
10-13	Case 10-13 : Revisions to Subsection 618.2 and Section 765 – Revise RCP joint specification to be consistent between sections and with industry standards.	Goodyear	Troy Tobiasson	07/07/2010		0 0 0	Yes No Abstain



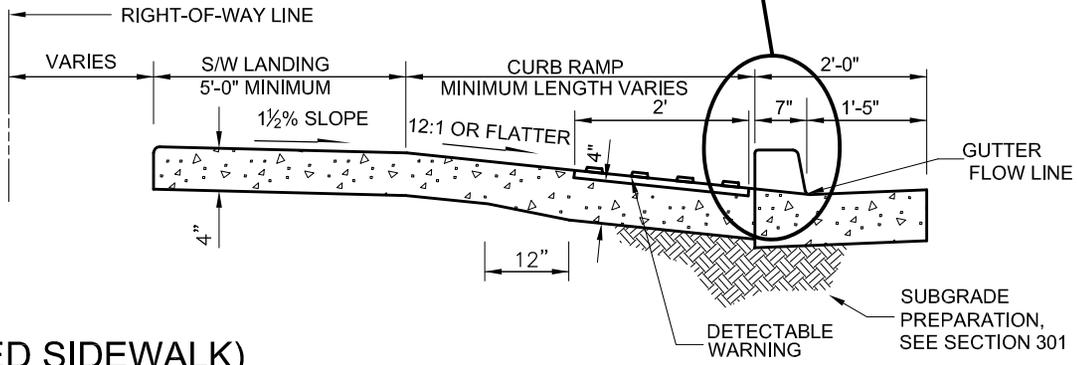
CURB HEIGHT	CURB RAMP MINIMUM LENGTH	D_{MIN}	
		$S_G \leq 1\%$	$S_G \leq 2\%$
4"	5'	4.0'	4.5'
6"	7½'	6.0'	6.5'
7"	9'	6.5'	7.5'

S_G = MAXIMUM GUTTER SLOPE WITHIN RAMP LIMITS

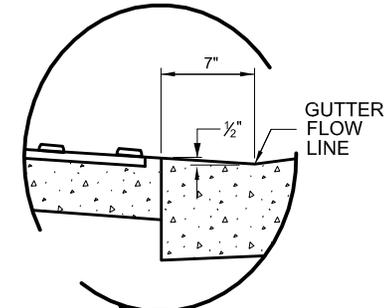
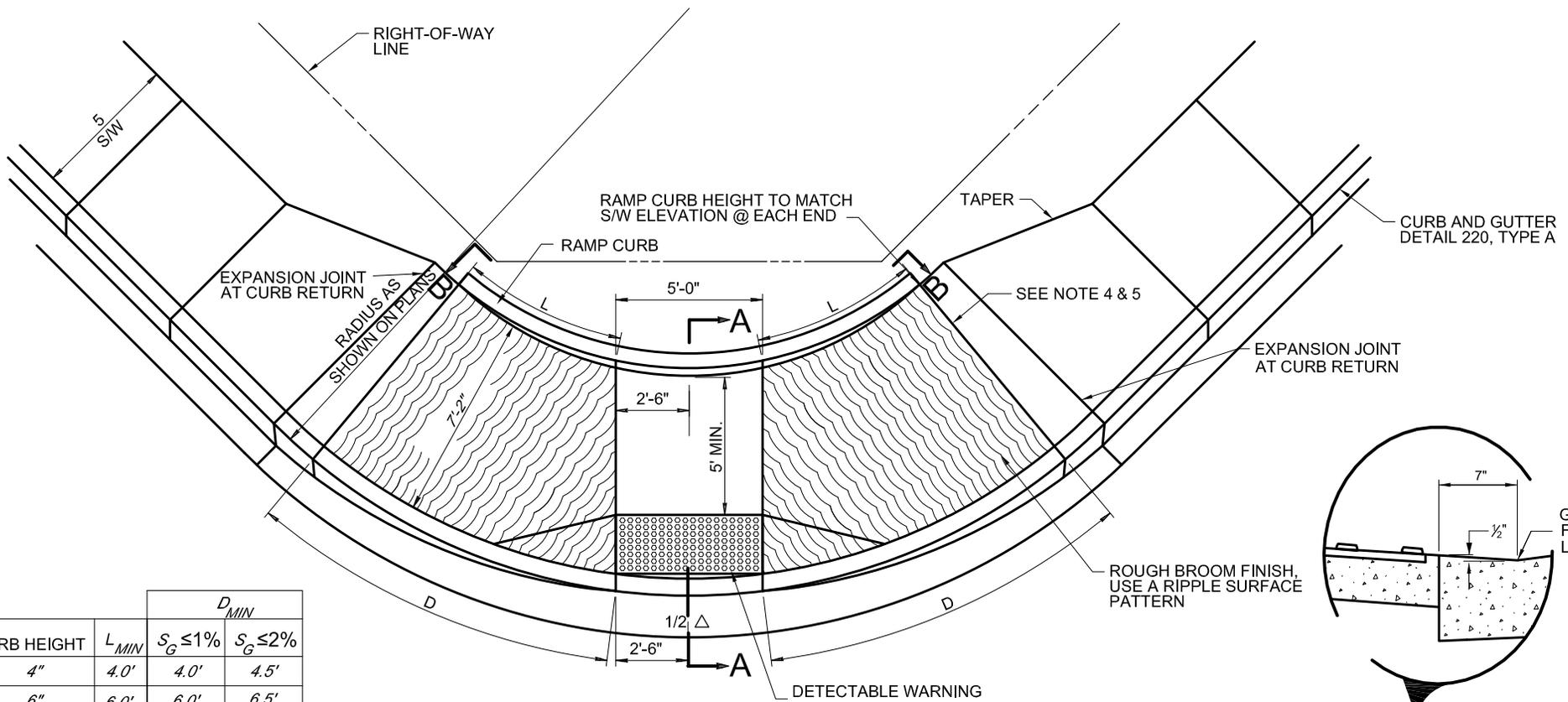
NOTES:

1. CLASS 'B' CONCRETE PER SECTION 725.
2. EXPANSION JOINTS SHALL CONFORM TO SECTION 340.
3. SIDEWALK SURFACE TO MATCH
1½% SLOPE FROM TOP OF CURB
4. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
5. DETAIL IS ADA COMPLIANT FOR $S_G \leq 2\%$.

TYPE 'A' (DETACHED SIDEWALK)



SECTION A-A

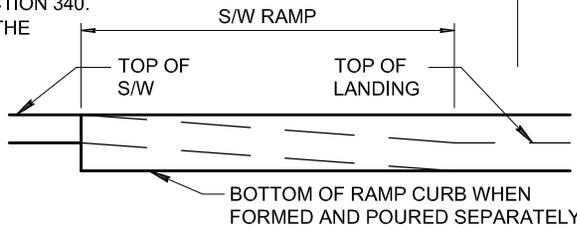


CURB HEIGHT	L_{MIN}	D_{MIN}	
		$S_G \leq 1\%$	$S_G \leq 2\%$
4"	4.0'	4.0'	4.5'
6"	6.0'	6.0'	6.5'
7"	7.0'	6.5'	7.5'

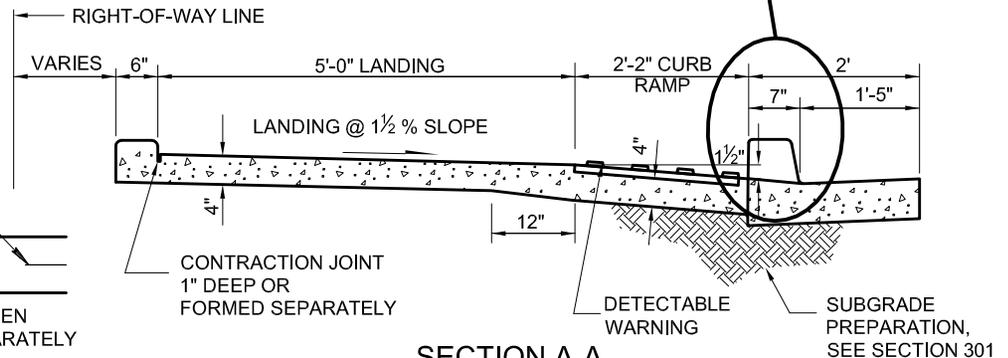
S_G = MAXIMUM GUTTER SLOPE WITHIN RAMP LIMITS

NOTES:

1. CLASS 'B' CONCRETE PER SECTION 725.
2. EXPANSION JOINTS SHALL CONFORM TO SECTION 340.
3. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
4. INCREASE 'L' OR 'D' AS NEEDED TO HAVE THE TOP OF RAMP FORM A RADIAL LINE.
5. WHEN TOP OF RAMP IS LESS THAN 4' FROM CURB RETURN, EXTEND RAMP TO THE CURB RETURN.
6. DETAIL IS ADA COMPLIANT FOR $S_G \leq 2\%$.



SECTION B-B

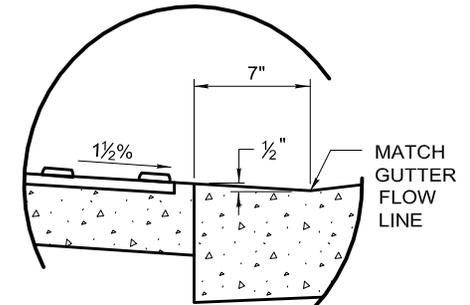
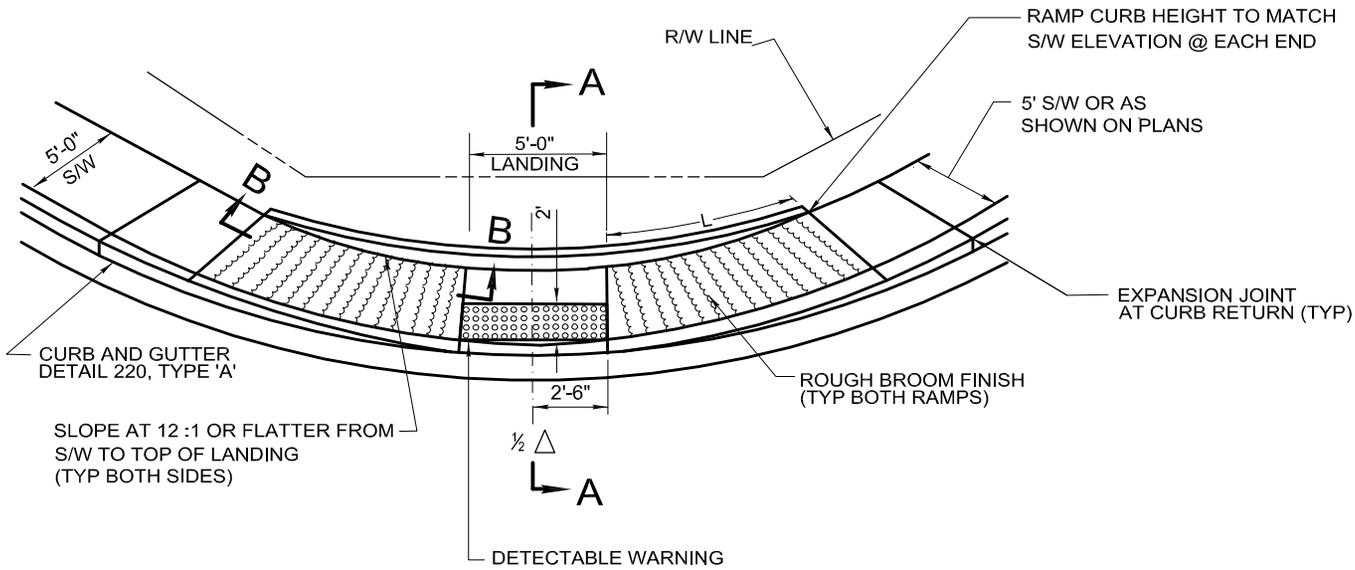


SECTION A-A

TYPE 'B'

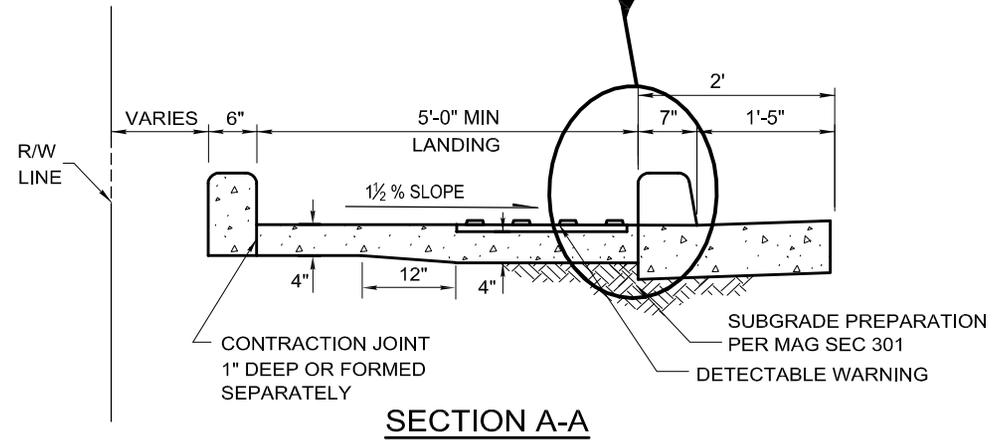
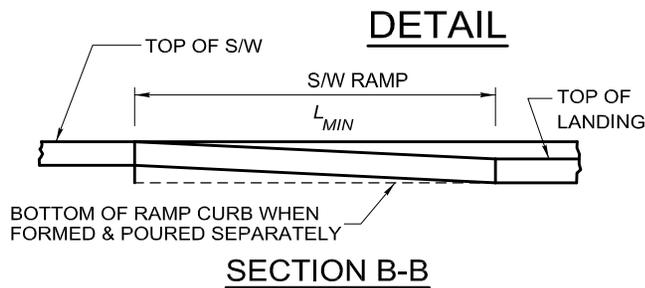
NOTES:

1. CLASS 'B' CONCRETE CONSTRUCTION PER SECTION 725.
2. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENT.
3. RAMP LONGITUDINAL SLOPE SHALL BE 12:1 OR FLATTER.
4. RAMP CROSS SLOPE SHALL BE 1½%.
5. DETAIL IS ADA COMPLIANT FOR CURB RADII ≥ 20' AND GUTTER SLOPE ≤ 2.0%.



CURB HEIGHT	L_{MIN}	
	$S_G \leq 1\%$	$S_G \leq 2\%$
4"	5.0'	6.0'
6"	7.0'	8.5'

S_G = MAXIMUM GUTTER SLOPE WITHIN RAMP LIMITS



TYPE 'C'

DETAIL NO.

235-3



STANDARD DETAIL
ENGLISH

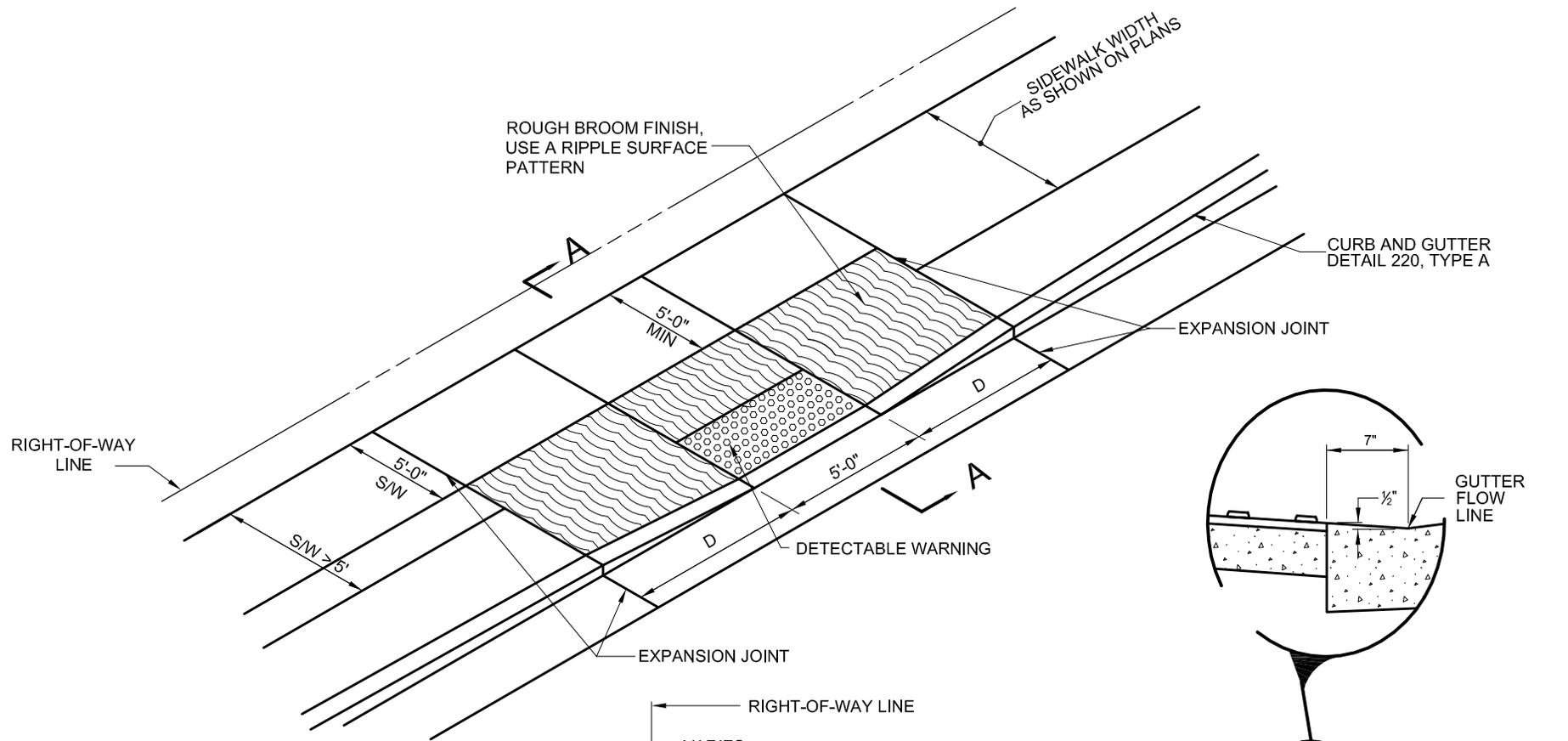
CURB RAMPS

REVISED

01-01-2011

DETAIL NO.

235-3

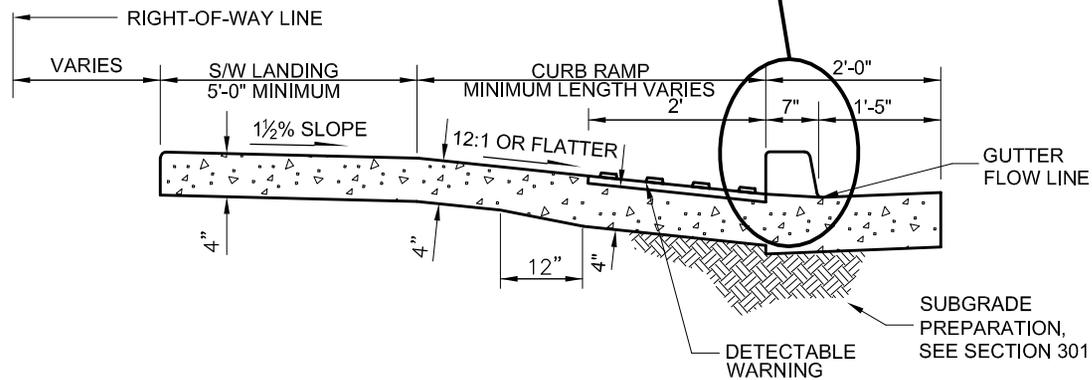


CURB HEIGHT	CURB RAMP MINIMUM LENGTH	D_{MIN}	
		$S_G \leq 1\%$	$S_G \leq 2\%$
4"	5'	4.0'	4.5'
6"	7 1/2'	6.0'	6.5'
7"	9'	6.5'	7.5'

S_G = MAXIMUM GUTTER SLOPE WITHIN RAMP LIMITS

NOTES:

1. CLASS 'B' CONCRETE PER SECTION 725.
2. EXPANSION JOINTS SHALL CONFORM TO SECTION 340.
3. SIDEWALK SURFACE TO MATCH 1 1/2 % SLOPE FROM TOP OF CURB.
4. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
5. DETAIL IS ADA COMPLIANT FOR $S_G \leq 2\%$.



SECTION A-A

TYPE 'D' DETACHED SIDEWALK

DETAIL NO.
235-4

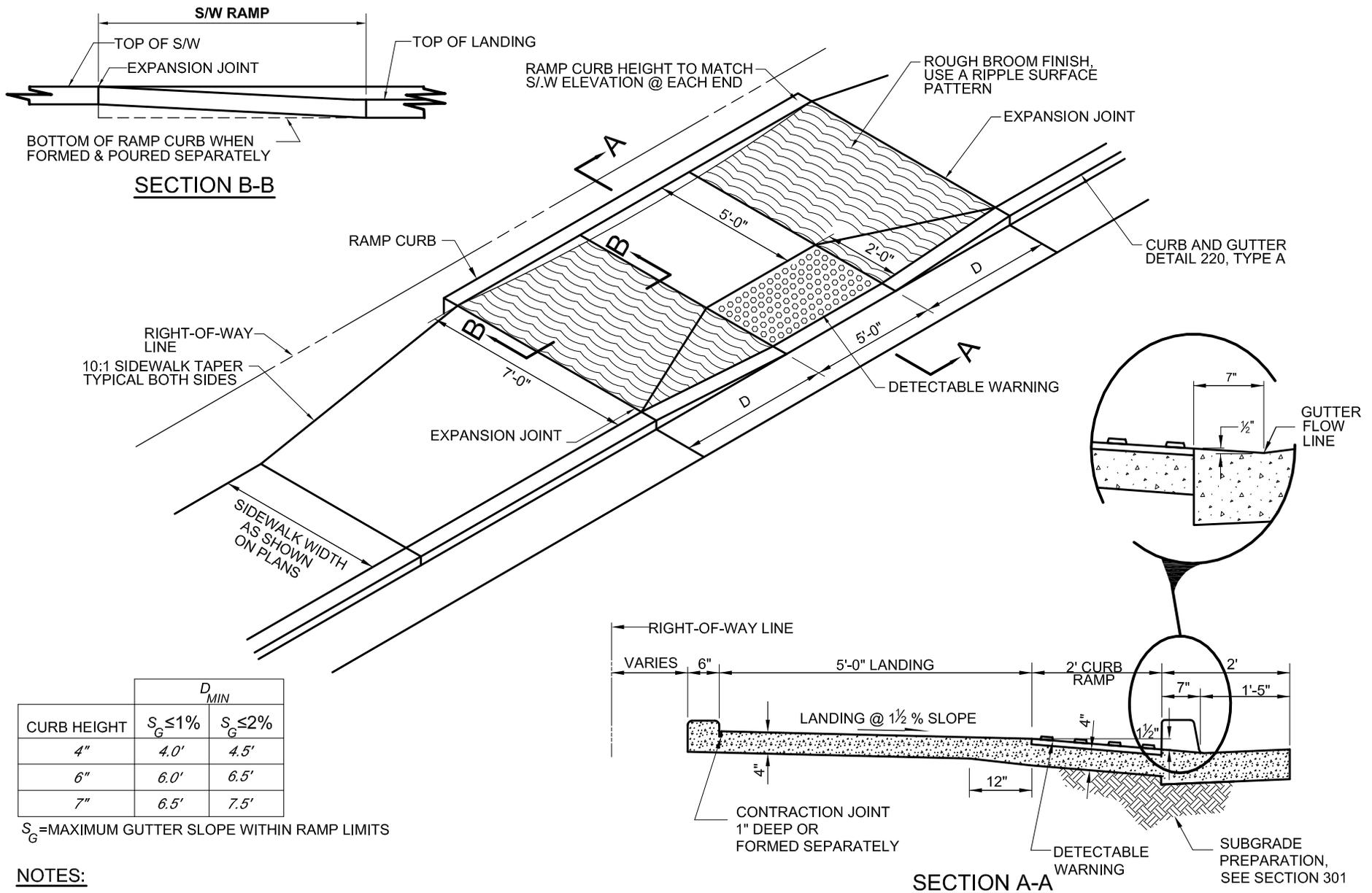


STANDARD DETAIL
ENGLISH

CURB RAMPS

REVISED
01-01-2011

DETAIL NO.
235-4



TYPE 'E'

DETAIL NO.
235-5



STANDARD DETAIL
ENGLISH

CURB RAMPS

REVISED
01-01-2011

DETAIL NO.
235-5

610.4 CONSTRUCTION METHODS:

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

- (A) 36 inches for mains smaller than 12 inches.
- (B) 48 inches for mains 12 inches and larger.

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

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

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

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

- Deleted: while it is being placed in the line.
- Deleted: At
- Deleted: the open ends of t
- Deleted: closed
- Deleted: .

Where restrained joints are specified on mains sixteen (16) inches in diameter and smaller, ductile iron pipe shall be used with an approved joint restraint method.

On mains sixteen (16) inches in diameter and larger where plans specify welding joints and where ductile iron pipe is furnished, joints shall be restrained by an approved joint restraint method for the distance specified.

Except as otherwise required in this specification, the special provisions, or by the Engineer, trench excavation, backfilling and compaction shall be in accordance with the requirements of Section 601. Backfilling may be accomplished as soon as the pipe line has been installed to the satisfaction of the Engineer, subject to the requirements for testing, as contained below.

Hydrostatic testing shall be in accordance with this specification.

All corporation stops used for testing and chlorination shall be left in the pipe line with the stop closed and all connecting pipe removed.

Curb stops with flushing pipes or fire hydrants shall be installed at the ends of dead-end mains according to standard details.

Thrust blocks shall be installed in accordance with this specification.

Valve boxes and covers shall be according to standard details.

Asbestos-cement pipe shall be installed in accordance with AWWA C-603, except pipe and fittings shall be in accordance with Section 752.

Cast iron pipe shall be installed in accordance with AWWA C-600, except pipe and fittings shall be in accordance with Section 750.



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: January 6, 2010
To: MAG Specifications and Details Committee
From: Robert Herz, MCDOT Representative
Subject: Miscellaneous Bloopers

Case 10-01A

PURPOSE: Correct typographical errors.

REVISION: Correct wrong words in section 317.2 as indicated below:

SECTION 317
ASPHALT MILLING

317.1 DESCRIPTION:

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

317.2 CONSTRUCTION REQUIREMENTS

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

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

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

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

The Contractor shall immediately notify the Engineer when:

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

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

317.3 MEASUREMENT AND PAYMENT:

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

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



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: May 5, 2010

To: MAG Specifications and Details Committee

From: Robert Herz, MCDOT Representative

Subject: Miscellaneous Bloopers

Case 10-01 C

PURPOSE: Correct typographical error in section 321.10.2.

REVISION: The incorrect table is referenced in the top paragraph of page 321-7. The reference to Table 321-6 is to be changed to Table 321-5.

See attached sheet

321-5

SECTION 321

accordance with AASHTO T312. The maximum theoretical density shall be tested in accordance with the requirements of AASHTO T209. Effective voids determined on the laboratory compacted specimens will be determined at a minimum of once per lot in accordance with the requirements of AASHTO T269. Should the testing for effective air voids not meet the "Full Payment" or "No Corrective Action" requirements of Table 321-6, additional testing for laboratory air voids on the remaining sublots will be performed as necessary to determine the extent of the deficiency. Acceptance testing results will be furnished to the contractor within five working days of receipt of samples by the acceptance laboratory.

The allowable deviations for acceptable production of each measured characteristic from the values established in the JMF for each subplot are as follows:

TABLE 321-3	
ACCEPTANCE LIMITS FOR ASPHALT CONCRETE	
Maximum Aggregate Size	100% passing
Nominal Maximum Aggregate Size	±7%
No. 8 Sieve to the Nominal Maximum Aggregate Size	±6%
No. 100 and No. 30 Sieves	±4%
No. 200 Sieve	±2%

If the results from a single acceptance sample fall outside of the acceptance limits in Table 321-3 a second sample shall be taken and if the second acceptance sample is also outside of the acceptance limits in Table 321-3 the Contractor shall cease production of asphalt concrete. Production shall not begin again until calibration test results verify that adjustments made to materials or proportions yield a gradation that falls within acceptance limits in Table 321-3.

The asphalt binder content shall be considered acceptable if it is within ± 0.40% of the mix design target value.

TABLE 321-4		
ASPHALT BINDER CONTENT CORRECTIVE ACTION FOR DEVIATIONS		
	When the contracting agency is the owner:	When the contracting agency is not the owner (i.e. permits):
Deviation from that permitted	Payment Reduction (\$ per ton of asphalt concrete)	Corrective Action
0.0 to 0.1% points	\$2.00	EA (see 321.10.6)
Over 0.1 to 0.2% points	\$6.00	EA (see 321.10.6)
Over 0.2% points	Removal*	Removal*

Note: Removal* refers to Section 321-10.6

TABLE 321-5		
LABORATORY VOIDS ACCEPTANCE AND PENALTIES		
	When the contracting agency is the owner:	When the contracting agency is not the owner (i.e. permits):
Laboratory Air Voids (Measured at N_{des} or 75 blows as applicable)	Payment Reduction (\$ per ton of asphalt concrete)	Corrective Action
Less than 1.5%	Removal*	Removal*
1.5-2.0%	\$2.50	EA (see 321.10.6)
2.1-2.7%	\$1.00	EA (see 321.10.6)
2.8-6.2%	Full Payment	No corrective action
6.3-6.9%	\$1.00	EA (see 321.10.6)
7.0-8.0%	\$2.50	EA (see 321.10.6)
Greater than 8.0%	Removal*	Removal*

Note: Removal* refers to Section 321-10.6



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: June 2, 2010
To: MAG Specifications and Details Committee
From: Robert Herz, MCDOT Representative
Subject: Miscellaneous Bloopers

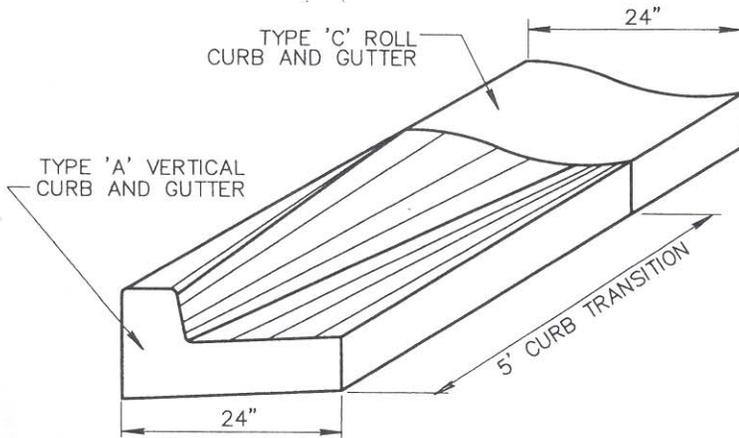
Case 10-01 D

PURPOSE: Correct corrupted note on detail 221.

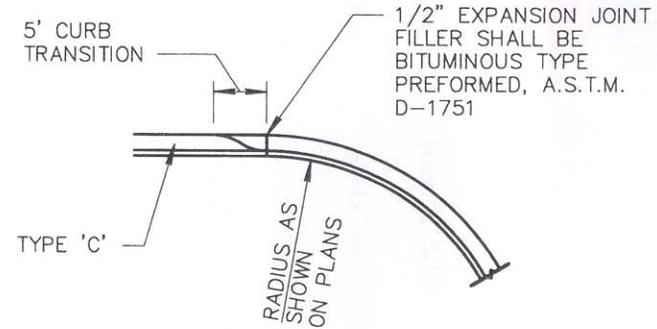
REVISION: Note 1. located under Curb and Gutter Transitions is to be revised as follows:

1. TRANSITIONS WILL BE PAID FOR AS THE PREDOMINANT TYPE OF CURB AND GUTTER BEING TRANSITIONED. WHEN TYPE 'A' CURB AND GUTTER ARE USED AT CURB RETURNS AND TYPE 'C' CURB AND GUTTER IS PREDOMINANTLY USED ELSEWHERE, THE TYPE 'A' TO TYPE 'C' TRANSITIONS SHALL BE MEASURED AND PAID FOR AS TYPE 'C' CURB AND GUTTER.

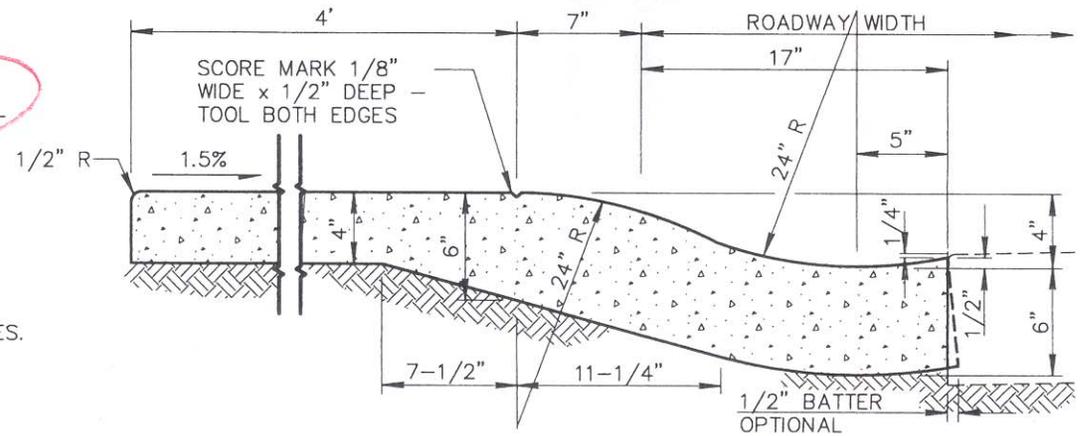
CURB TRANSITION TYPE 'A' TO TYPE 'C'



CURB AND GUTTER TRANSITION



INTEGRAL ROLL CURB, GUTTER AND SIDEWALK



NOTES: (CURB AND GUTTER TRANSITIONS)

1. THE CURB TRANSITION WILL BE PAID FOR AS TYPE 'C'. WHEN A PROJECT RETURN AND GUTTER THROUGHOUT, THE ENTIRE RETURN AND GUTTER THROUGHOUT, THE ENTIRE RETURN SHALL BE MEASURED AND PAID FOR AS TYPE 'A'.
2. WHERE PROPOSED CONSTRUCTION IS TO BE CONNECTED TO EXISTING CURB AND GUTTER, THE TRANSITION SHALL BE INDICATED ON PLANS.
3. CLASS 'B' CONCRETE PER SECT. 725.
4. TRANSITION BETWEEN TYPICAL SECTIONS SHALL BE ACCOMPLISHED BY THE USE OF DIRECT STRAIGHT LINE TRANSITIONS OF THE FLOW LINE AND OTHER SURFACE FEATURES.

BAD NOTE TO BE REPLACED

NOTES: (INTEGRAL ROLL CURB, GUTTER AND SIDEWALK)

1. CONCRETE TO BE MONOLITHIC POUR. EXPOSED SURFACE FINISH AS PER SIDEWALK AND GUTTER DETAIL.
2. CONTRACTION JOINT SPACING 5' MAXIMUM.
3. EXPANSION JOINTS PER SECT. 340.
4. CLASS 'B' CONCRETE PER SECT. 725.

DETAIL NO.

221



STANDARD DETAIL
ENGLISH

**CURB AND GUTTER TRANSITION TYPE A TO TYPE C
INTEGRAL ROLL CURB, GUTTER AND SIDEWALK**

REVISED

01-01-2008

DETAIL NO.

221



Chandler • Arizona
Where Values Make The Difference

MEMORANDUM

Case # 10-XX

DATE: June 2, 2010
TO: MAG Specifications and Details Committee Members
FROM: Warren White, City of Chandler Representative
SUBJECT: (4) Additional Miscellaneous Bloopers

Please see the attached mark-ups of proposed blooper corrections. Here is a summary:

- Index Page 1/2 Std Dtl 100 – ‘300 Series Water “Infromation” (sic) misspelled ‘Information’.
- Page 310-1 Untreated Base – First sentence in Section 310.1 “Untreated base, ie select or aggregate base course, shall comply with Subsection unless...” should read ‘Subsection 702.2’.
- Page 611-3 , Section 611.11 Rate of Application – Third paragraph from the top of page. Measurement of flow of water would be by a ‘pitot’ gauge, not “pilot”.
- Page 741-1, Section 741.2.1 Material Composition – Third paragraph. Liner plate ‘shall be non-conductive’ to bacterial growth, not “nonconductive”.

100 SERIES: GENERAL INFORMATION

- 101 GENERAL INFORMATION
- 110 PLAN SYMBOLS
- 112 DIMENSIONING FOR ROAD IMPROVEMENT PLANS
- 120-1 SURVEY MARKER
- 120-2 SURVEY MARKER (FOR UNINCORPORATED AREAS OF THE COUNTY)
- 130 BARRICADES
- 131 STREET SIGN BASE
- 135-1 STEEL GUARD RAIL
- 135-2 STEEL GUARD RAIL
- 135-3 STEEL GUARD RAIL
- 135-4 STEEL GUARD RAIL
- 140 BOLLARD
- 141 HAZARD MARKER
- 145 SAFETY RAIL
- 150 PRECAST SAFETY CURB
- 160 6' CHAIN LINK FENCE AND GATE
- 170 TYPICAL RUNWAY OR TAXIWAY LIGHTING DETAIL
- 190 ROCK CORRECTION PROCEDURE FOR MAXIMUM DENSITY DETERMINATION

200 SERIES: STREET INFORMATION

- 200-1 BACKFILL, PAVEMENT AND SURFACE REPLACEMENT
- 200-2 BACKFILL, PAVEMENT AND SURFACE REPLACEMENT PAVEMENT SECTION AT TERMINATION
- 201 ALLEY DETAILS (PAVED AND UNPAVED)
- 202 SCUPPERS
- 203 EQUIPMENT CROSSING
- 204 PAVED TURNOUTS
- 206-1 CONCRETE SCUPPER
- 206-2 CONCRETE SCUPPER
- 206-3 CONCRETE SCUPPER
- 210 RESIDENTIAL SPEED HUMP
- 211 STANDARD TRENCH PLATING DETAIL
- 212 UTILITY POTHOLE REPAIR
- 220-1 CURB AND GUTTER - TYPES 'A', 'B', 'C', AND 'D'
- 220-2 CURB AND GUTTER - TYPES 'E' AND 'F'
- 221 CURB AND GUTTER TRANSITION TYP A TO TYPE C INTEGRAL ROLL CURB, GUTTER AND SIDEWALK
- 222 SINGLE CURB - TYPES 'A', 'B' AND TERMINATION
- 223 MEDIAN NOSE TRANSITION
- 224 JOINT FOR DRAINAGE INLETS AND MANHOLE COVERS
- 225 CONCRETE PAVERS
- 230 SIDEWALKS
- 231 SIDEWALK RAMPS - TYPE 'A'

200 SERIES: STREET INFORMATION (CONTINUED)

- 232 SIDEWALK RAMPS - TYPE 'B'
- 233 SIDEWALK RAMPS - TYPE 'C'
- 234 SIDEWALK RAMPS - TYPE 'D'
- 240 VALLEY GUTTER
- 250-1 DRIVEWAY ENTRANCES WITH DETACHED SIDEWALK
- 250-2 DRIVEWAY ENTRANCES WITH SIDEWALK ATTACHED TO CURB
- 251 RETURN TYPE DRIVEWAYS
- 252 BUS AND PARKING BAYS
- 260 ALLEY ENTRANCE (WITH COMBINED CURB AND GUTTER)
- 261 ALLEY ENTRANCE (WITH ROLL TYPE CURB AND GUTTER)
- 262 WING TYPE ALLEY ENTRANCE (WITH COMB. CURB & GUTTER)
- 263 WING TYPE ALLEY ENTRANCE (WITH ROLL CURB & GUTTER)
- 270 FRAME AND COVER (AND GRADE ADJUSTMENTS)

300 SERIES: WATER INFORMATION INFORMATION

- 301 BLOCKING FOR WATER GATE AND BUTTERFLY VALVES
- 302-1 JOINT RESTRAINT WITH TIE RODS
- 302-2 JOINT RESTRAINT WITH TIE RODS
- 303-1 JOINT RESTRAINT FOR DUCTILE IRON AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES
- 303-2 JOINT RESTRAINT FOR DUCTILE IRON AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES
- 310 CAST IRON WATER METER BOX COVER NO. 1
- 311 CAST IRON WATER METER BOX COVER NO. 2
- 312 CAST IRON WATER METER BOX COVER NO. 3
- 313 CAST IRON WATER METER BOX COVER NO. 4
- 314 CAST IRON WATER METER BOX COVER NO. 5
- 320 CONCRETE WATER METER BOXES
- 321 STANDARD WATER METER VAULT
- 340 INSTALLING TAPPING SLEEVES AND VALVES
- 342 CONCRETE PRESSURE PIPE TAPPING SLEEVE
- 345-1 3", 4", 6" WATER METER
- 345-2 4", 6", WATER METER WITH ON-SITE FIRE HYDRANTS
- 346 FIRE LINE DETECTOR CHECK VAULT
- 360 FIRE HYDRANT INSTALLATION
- 362 LOCATIONS FOR NEW HYDRANTS
- 370 VERTICAL REALIGNMENT OF WATER MAINS
- 380 THRUST BLOCKS FOR WATER LINES
- 381 ANCHOR BLOCKS FOR VERTICAL BENDS
- 389 CURB STOP WITH VALVE BOX AND COVER
- 390 CURB STOP WITH FLUSHING PIPE
- 391-1 VALVE BOX INSTALLATION AND GRADE ADJUSTMENT
- 391-2 VALVE BOX INSTALLATION
- 392 DEBRIS CAP INSTALLATION

DETAIL NO.

100-1



STANDARD DETAIL
ENGLISH

INDEX (PAGE 1 OF 2)

DETAIL NO.

100-1

SECTION 310

UNTREATED BASE

702.2
✓

310.1 DESCRIPTION:

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

310.2 PLACING:

Untreated base 6 inches or less in compacted thickness may be placed in a single layer and those more than 6 inches in thickness shall be built up in successive layers of approximately equal compacted thickness not to exceed a maximum thickness of 6 inches. The requirements which follow are applicable to all types of material.

After distributing, the base material shall first be watered and then immediately bladed to a uniform layer that will net, after rolling, the required thickness. If the materials deposited are not uniformly blended together, the blading operation shall be continued to such extent as may be necessary to eliminate segregation. The quantity of water applied shall be that amount which will assure proper compaction resulting in a relative density of not less than 100 percent as determined under Section 301. Care shall be exercised in connection with watering operations to avoid wetting the subgrade or any lower base course to detrimental extent.

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

Untreated base may vary not more than 1/2 inch above or below required grade and cross-section.

310.3 DEFICIENCY:

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

TABLE 310-1		
THICKNESS AND PLASTICITY DEFICIENCY		
Type	Deficiency	Corrective Measure
I	1/2 inch or more but less than 1 inch thickness	Place asphalt chip seal using precoated chips in accordance with Section 330 for the full roadway width over the area involved but for not less than 660 feet or one City block in length.
II	1 inch or more in thickness	Place an additional asphalt concrete overlay, a 9.5 mm mix, of 1/2 the thickness of the deficiency in thickness for the full roadway width over the area involved, not less than 660 feet or one City block in length.
III	A plasticity index of 6 to 7 inclusive*	Place an asphalt concrete overlay 1/2 inch in thickness over the same total area as required for Type I and II.
IV	A plasticity index of over 7*	Remove deficient material from affected area and replace with material complying with the specifications.

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

310.4 PAYMENT:

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

End of Section

SECTION 611

On lines 12 inches in diameter or less, determination of the rate of flow of water into the line to be treated may be made by starting with the line full of water and measuring the rate of discharge at a hydrant located at the end of the pipe farthest away from the point of chlorine application.

For lines larger than 12 inches in diameter, the disinfection operation is generally started with the line empty.

Measurement of the flow of water into and out of all lines shall be made by means of a ~~pilot~~ gage, current type meter, or other approved device.

pitot

611.12 PREVENTING REVERSE FLOW:

Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Check valves shall be used to accomplish this.

611.13 RETENTION PERIOD:

Treated water shall be retained in the pipe long enough to destroy all nonspore-forming bacteria. This period should be at least 24 hours and should produce no less than 10 ppm residual chlorine at the extreme end of the line at the end of the retention period.

NOTE: If the circumstances are such that less than a 24 hour retention period must be used, the chlorine concentration shall be increased to 100 ppm. Under these conditions, special care should be taken to avoid attack on pipes, valves, hydrants and other appurtenances.

611.14 CHLORINATING VALVES AND HYDRANTS:

In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipeline is filled with the chlorinating agent.

611.15 FINAL FLUSHING, SAMPLING AND TESTING:

Following chlorination, all treated water in the newly laid pipeline shall be thoroughly flushed until the replacement water throughout the new pipeline can be proved, by laboratory testing, comparable in quality to the water served to the public from the existing water system. Prior to sampling for laboratory testing, the residual chlorine throughout the length of the pipeline shall be reduced to 1.0 ppm or less. Once the required residual chlorine level in the pipeline is achieved, samples shall be taken as outlined below.

The Contracting Agency or its authorized representative will collect all samples for testing of the new water mains. To initiate the sampling and testing, the Contractor will present to the Contracting Agency a written request for such work no later than 24 hours prior to the time when samples are to be taken.

Samples shall be taken from a tap and riser located and installed in such a way as to prevent outside contamination. Samples shall never be taken from an unsterilized hose or fire hydrant, because such samples will seldom meet bacteriological standards. The number of sampling locations shall be as follows: Waterlines up to but less than 150 feet in length require one sampling riser installed as near the end as possible; lines 150 feet to 300 feet in length, two sampling risers, one near each end of the line; lines 300 to 3,000 feet in length, a minimum of three sampling risers. In addition, dead ends on main lines should be represented with a sampling riser.

The number of samples taken at each sampling location shall be determined by the Contracting Agency based on one of the following methods.

(A) One sample from each sampling location which is examined and analyzed in the laboratory over a three day (72 hour) period.

SECTION 741

LINING FOR REINFORCED CONCRETE SANITARY SEWER PIPE

741.1 GENERAL:

The interior area of the reinforced concrete pipe as indicated on the plans, shall be sealed and protected with lining, as specified below.

The installation and application of the pipe lining shall be accomplished by the supplier of the reinforced concrete pipe.

All work for and in connection with the installation of lining in concrete pipe and the field sealing of joints shall be done in strict conformance with all applicable published specifications, instructions and recommendations of the approved lining manufacturer. The pipe supplier shall furnish all labor, material and equipment to successfully accomplish the lining.

741.2 MATERIALS:

741.2.1 Material Composition: The material shall be a liner plate which is a combination of inert, synthetic resins, pigments, and plasticizers, compounded to make permanently flexible sheets.

The liner plate shall be resistant to the following: Oxidizing agents, sulfuric, phosphoric, nitric, chromic, oleic, and stearic acids; sodium and calcium hydroxides; ammonia, sodium, calcium, magnesium, and ferric chlorides; ferric sulfate, petroleum oils and greases; vegetable and animal oils, fats, greases and soaps.

Liner plate shall be impermeable to sewage gasses and liquids and shall be ~~nonconductive~~ **non-conductive** to bacterial or fungus growth. All liner plates shall be factory checked electrically to insure freedom from any porosity with a high voltage holiday detector set at a minimum of 20,000 volts.

Joint strips and welding strips shall have the same composition and corrosion resistance as liner plate, but shall not have locking extensions.

The lining shall have good impact resistance, shall be flexible and shall have an elongation sufficient to bridge up to 1/4 inch setting crack which may take place in the pipe or in the joint after installation, without damage to the lining.

Once cast into the pipe, the lining shall be permanently and physically attached to the concrete by a locking extension and shall not rely on an adhesive bond.

741.2.2 Material Details and Dimensions: The liner plate shall not be less than 0.065 inches in thickness. Locking extension shall be of the same material as the liner and shall be integrally extruded with the sheets. If steel bands are used to secure the liner plate to the forms transversely, strap channels shall be integrally molded into the sheet.

Liner plate shall be supplied as pipe size sheets fabricated by shop welding together the basic size sheets.

Joint straps shall be 4 inches \pm 0.25 inches in width and shall have each edge beveled prior to application.

Welding strips shall be 1 inch \pm 0.125 inch in width and shall have the edges beveled at time of manufacture.

The Contractor shall submit a shop drawing showing liner plate details for approval by the Engineer, prior to fabrication of the pipe.

741.3 Installation of Liner Plate: The installation of liner plate, including the welding of all joints, shall be done in accordance with the manufacturer's recommendations. Nailing through the plate will not be tolerated. Liner plate shall be installed with locking extensions parallel with the longitudinal axis of the sewer, unless otherwise shown on the plans. All joints between individual sheets or sections of liner plates shall be continuously heat-welded by the use of welding strips of the same kind and equivalent thickness of material as the liner plates (with the exception of the integral extension ribs).

Liner plate shall be held snugly in place against inner forms by means of light gage steel wire, light steel banding straps or other suitable means. If steel banding straps are used, they shall be applied in strap channels provided for this purpose.



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: July 7, 2010

To: MAG Specifications and Details Committee

From: Robert Herz, MCDOT Representative

Subject: Miscellaneous Bloopers

Case 10-01F

PURPOSE: Correct typographical errors in Table 702-1.

REVISION: Correct Sieve size designation in Table 702-1

See attached sheet

SECTION 702

BASE MATERIALS

702.1 GENERAL:

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

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

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

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

702.2 CRUSHED AGGREGATE:

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

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

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

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

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



Chandler • Arizona
Where Values Make The Difference

MEMORANDUM

Case # 10-02

DATE: February 3, 2010

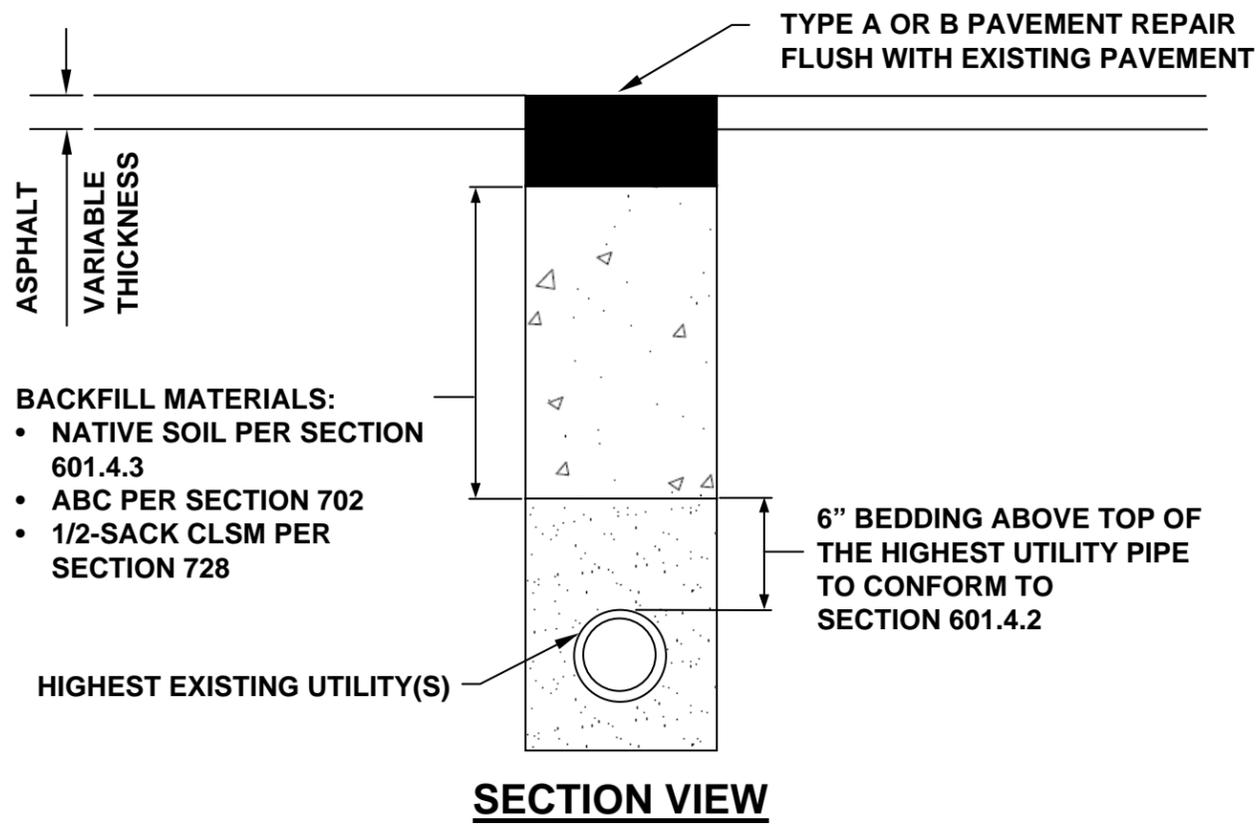
TO: MAG Specifications and Details Committee Members

FROM: Warren White, City of Chandler Representative

SUBJECT: Modifications to Detail 212: Utility Pothole Repair, Keyhole Repair Option

Attached is a revision to Detail 212 reorganizing and adding a Type B - Keyhole Repair option. The changes also include a spelling correction and addition of a MAG section backfill material reference. This repair methodology has been in place for a number of years and has been used within multiple municipalities within the Valley. The City of Chandler is currently accepting this technology on a case-by-case basis and wishes to have a standard in place. Our preference would be to incorporate this option into a MAG detail in lieu of adding supplemental agency standards.

Keyhole pavement cutting technology is a cleaner, quicker way to cut city streets in order to access underground facilities. The process involves cutting an 18-24" core, then backfilling the hole with native soil (or agency specific requirements) and reinstating the original core by bonding it to the cut pavement. The process is complete after a few hours at which time traffic lanes can be re-opened.

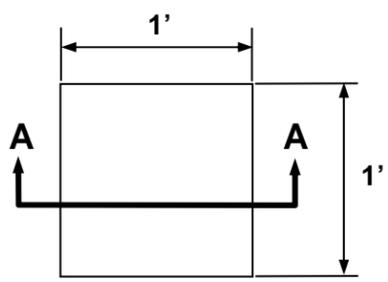


SECTION VIEW

TYPE B – PAVEMENT REPAIR

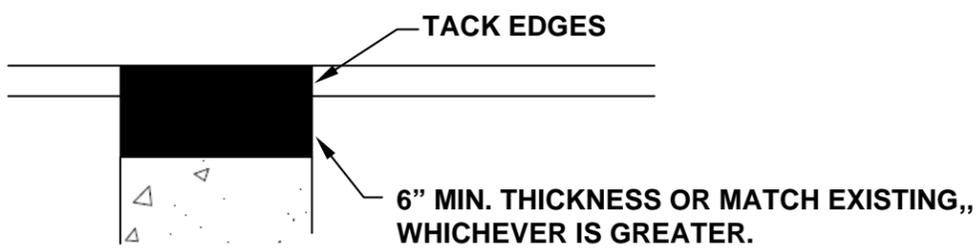
- NOTES:
1. CUT, REMOVE AND REPLACE PAVEMENT PLUG IN ACCORDANCE WITH SECTION 355.
 2. PLACE BACKFILL IN ACCORDANCE WITH SECTION 355.
 3. BONDING MATERIAL SHALL BE AS SPECIFIED IN SECTION 708.

TYPE A – PAVEMENT REPAIR

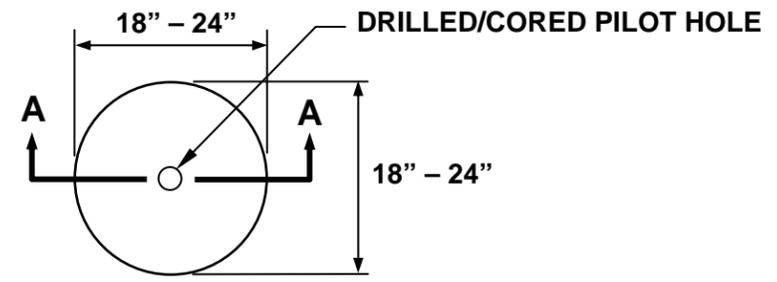


PLAN VIEW

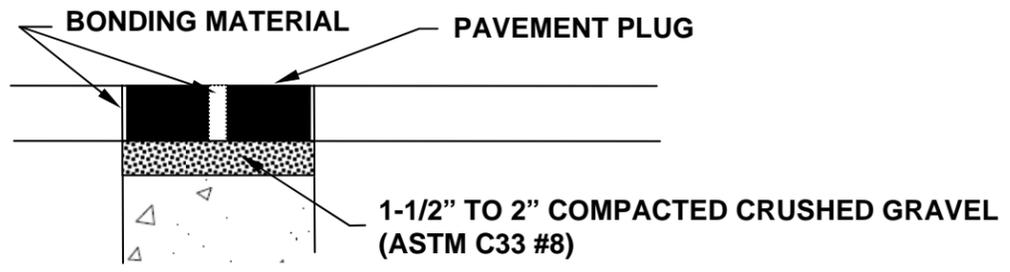
- NOTES:
1. DIMENSIONS ARE NOMINAL.
 2. EDGES SHALL BE CUT TO A NEAT VERTICAL FACE.
 3. PLACE CLSM BACKFILL IN ACCORDANCE WITH SECTION 604.
 4. PLACE AGENCY-APPROVED ASPHALT CONCRETE IN MAXIMUM 2" LIFTS.



SECTION A-A



PLAN VIEW



SECTION A-A

SECTION 355

KEYHOLE-UTILITY POTHOLES - KEYHOLE METHOD**355.1 DESCRIPTION:**

This specification covers the requirements for keyhole coring, vacuum excavation, backfilling, and reinstatement of the keyhole-asphalt core into asphalt asphalt-concrete pavements ~~to allow for underground utility repairs.~~

355.2 ~~KEYHOLE~~-EXCAVATION

~~Keyhole~~-Excavation ~~shall be the operation of~~requires coring a circular hole through ~~the roadway~~asphalt pavement using ~~diamond~~-drilling/coring equipment ~~to and remove removal of~~ the asphalt ~~concrete courses of flexible~~ pavement core. The vertical alignment of the ~~keyhole~~-coring saw operation shall be perpendicular to the horizon and ~~the~~ cutting shall be extended ~~to~~ the full depth of the existing pavement section.

~~Unless otherwise approved by the Engineer, keyhole~~ Pavement cores shall not be greater than 24 inches in diameter, shall not be spaced closer than 3 feet ~~from each other~~between cores (edge to edge), shall not contain a joint or any pavement cracks greater than 1/8-inch wide, and shall ~~not only~~ be performed-obtained from pavements where the asphalt concrete section is ~~less than at least~~ at least 4 inches thick.

~~Cuts shall be performed with an approved keyhole coring saw.~~

Contractor shall place a temporary mark (paint or chalk) on the keyhole-pavement core and adjacent pavement prior to cutting to insure that the keyhole-pavement core is-when replaced will have the same orientation as ~~originally~~ found in the original pavement.

Pavement cores shall be either removed from the work site or stored in a safe and secure on-site location. The cores shall be made readily available for restoring the keyholereinstatement into the pavement.

~~Soils within potholes~~ shall be removed by air/vacuum extraction methods to expose utilities. The zone of soil removal shall remain essentially within a vertical plane extending below the edges of the core hole.

The Contractor shall remove-dispose of all excess materials ~~excavated by keyhole excavation off site at their expense.~~

355.3 BACKFILL AND COMPACTION

355.3.1 Backfill Using Mechanical Compaction: ~~Agency approved~~ Backfill ~~below repair~~ shall be ABC aggregate base per Section 702 or native soil per Sections 601.4.3, placed in maximum 10-inch loose lifts.

Backfill compaction ~~quality~~ shall be determined by use of a compression wave amplitude monitoring device manufactured specifically for the purpose of measuring soil compaction. This device shall measure the compression wave amplitude as compaction progresses using below grade ~~disposable~~ piezoelectric transducer wave sensors and an above-grade electronic monitor. The device shall signal the operator of successful compaction ~~when~~ (the compaction wave amplitude becomes asymptotic ~~to~~ for continued compaction effort) for each lift.

Backfill soil shall be ~~compacted to~~ within 3 percent of optimum moisture content during compaction. Moisture content shall be determined in accordance with AASHTO T-217.

~~Place~~ A ~~disposable~~ compaction sensor shall be placed at the bottom of the first loose lift. A new sensor shall be placed for every 48 inches of compacted fill depth. ~~Remove Backfill soil and sensor if the disposable sensor fails during compaction and repeat repairs with a new sensor.~~

Pneumatic compaction equipment (pneumatic rammers or equivalent) shall be used for compaction of the backfill material. The size of the compactor shall not exceed one-half the diameter of the ~~cored~~ keyhole.

Mechanical compaction on each lift shall be continued until the electronic monitor signals that compaction is complete. A new lift shall not be placed until a positive signal has been received. Remove backfill soil and sensor if the monitor does not give a positive compaction signal after repeated compaction ~~workefforts~~. Repeat backfilling and compaction with a new sensor.

355.3.2 Slurry Backfill: If mechanical compaction is not successful, the Contractor shall use ½-sack CLSM in accordance with ~~MAG~~-Section 728.

355.3.3 Leveling Course: A 1-1/2-inch to 2-inch thick leveling course of compacted crushed gravel meeting the requirements of ASTM C33, No. 8 coarse aggregate shall be placed above the backfill and directly below the asphalt concrete pavement section.

355.4 PAVEMENT RESTORATION

The pavement surface ~~cut by keyhole coring~~ shall be restored to its original condition with setting the reinstated pavement core flush with and in ~~the its~~ original orientation ~~as the existing surface, matching existing asphalt concrete surface appearance.~~

Bonding agent meeting the requirements of ~~MAG-Section~~ 708 shall be used for keyhole pavement core reinstatement. Excess bonding material shall be removed from the restored pavement surface. A "patched" appearance shall be avoided in surface restoration wherever possible.

~~Unless otherwise approved,~~ The contractor shall reinstate the bonded keyhole pavement core within 24 hours of cutting the pavement. ~~Keyhole openings~~ Holes ~~allowed to be left open~~ greater longer than 24 hours ~~of after~~ cutting shall be covered with an approved steel road plate capable of supporting traffic loads. The steel plate must be rounded with a fitted collar that, when

inserted into the ~~keyhole~~, will prevent the ~~steel platehole cover~~ from tipping, tilting, bouncing or spinning out of the hole under traffic conditions. An asphalt mix shall be used to ramp pavement up to the steel plate along all edges.

355.5 SURFACE TOLERANCES

The reinstated core shall be flush and level with the adjacent pavement. Gaps attributable to the positioning of the core shall be less than 1/16-inch between the bottom of a minimum 3-foot long straightedge and the surface of the pavement in any direction on the surface of the keyhole core, except across the pavement crown or drainage gutters.

355.6 DEFICIENCIES

Where the ~~keyhole-pavement~~ core is found to be fractured or defective upon removal, or becomes damaged after removal and prior to reinstating ~~the keyhole cuts~~, the defective or damaged core shall not be used to reinstate the pavement. Pavement ~~repair at damaged keyhole core locations~~ shall be ~~cut and patch repaired~~ in accordance with ~~MAG-Detail 211212~~, Type A Pavement Repair.

A ~~keyhole-pavement~~ core is considered unacceptable when one of the following conditions exist:

- a) The ~~keyhole~~-core contains any vertical cracks wider than 1/8-inch extending full depth or partial depth through the core; or
- b) Any deteriorated piece of the ~~keyhole~~-core is larger than 10 percent of the overall area of the ~~keyhole~~-core.
- c) Two or more successive layers of asphalt concrete in the ~~keyhole~~-core become horizontally delaminated and cannot be rebounded to each other with the bonding compound.

All ~~keyhole-unacceptable pavement~~ cores ~~that are damaged or do not meet the surface tolerances~~ shall be removed from the job site ~~at the Contractor's expense. All repair work shall be at the Contractor's expense.~~

355.7 MEASUREMENT

Each acceptable utility pothole repair shall be counted. No distinction shall be made based on size of the utility pothole or method of repair. ~~Measurement will be made for Each reinstated keyhole core up to 24 inches in diameter.~~

355.8 PAYMENT

Payment at the contract price for utility pothole repair complete in place ~~the above item~~ shall be full compensation for all labor, equipment and material required ~~to do for a complete in place installation. Payment includes the work including~~ traffic control and disposal of all excess

| ~~materials, coring, sawcutting, vacuum excavation, backfill material, bonding material and asphalt concrete.~~

SECTION 708
KEYHOLE ASPHALT BONDING MATERIALS

708.1 GENERAL:

This specification covers the materials required to bond undamaged keyhole asphalt pavement cores to the asphalt concrete pavement from which it was originally removed ~~as shown in MAG Detail 211, Type B.~~

708.2 MATERIALS:

Bonding material shall be a single component cementitious, rapid hardening, high strength, waterproof bonding agent conforming to the physical properties shown in Table 708-1.

Table 708-1		
Bond Material Properties		
Property	ASTM Test Method	Requirements
Bond Strength, psi	C882	20 min.
Compressive Strength, psi, (70 degrees F., 30 minute cure)	C109	200 min.

Bonding material shall be impervious to water penetration at the joint after application curing. ~~The bonding material is required to securely bond the undamaged keyhole core to the pavement or sidewalk and to fill the annular space at the joint.~~

708.3 FIELD TESTING OF BONDING MATERIAL

Bonding material shall, within 30 minutes at minimum ambient temperature of 70 degrees F., allow ~~the an 18" diameter~~ core to support ~~an equivalent~~ traffic load ~~condition of equivalent to~~ at least three (3) times the AASHTO H-25 standard wheel load.

The bonding material is required to securely bond the asphalt concrete core to asphalt concrete pavement and to fill all voids between the core and pavement and within the core.

708.34 TEST REPORT AND CERTIFICATION

Specifications and test results for the bonding material shall be submitted to the Agency for review and approval before use.

SECTION 336

PAVEMENT MATCHING AND SURFACING REPLACEMENT

336.1 DESCRIPTION:

Street and alley pavement and surfacing within the Contracting Agency's rights-of-way, removed by construction activities or to be widened or matched in connection with the improvement of Public Works, shall be placed as shown on the plans and applicable standard details, in accordance with this specification and/or the special provisions.

Asphalt concrete roadway pavement replacement shall be constructed in accordance with Type A, B, ~~D or E~~ T-Top of ~~standard details~~ Standard Detail 200 and, as indicated in the Contracting Agency Special Provisions or on the plans, ~~and as required by Sections 321 and 710.~~

Portland cement concrete pavement replacement shall be in accordance with Type C of the Standard Details, 200 and as required by Sections 324-505 and 725.

~~ABC or decomposed granite~~ All other surface replacement in the right-of-way but not in paved roadways shall be constructed in accordance with Type ~~F-D~~ of ~~standard details~~ Standard Detail 200 and as indicated in the Contracting Agency Special Provisions or on the plans ~~and in Section 702.~~

Temporary pavement replacement shall be constructed as required below herein.

Pavements to be matched by construction of new pavements adjacent to or at the ends of a project shall be saw cut in accordance with these specifications and where shown on the plans.

Pavement and surfacing replacement within ADOT rights-of-way shall be constructed in accordance with their permits and/or specification requirements.

336.2 MATERIALS AND CONSTRUCTION METHODS:

Materials and construction methods used in the replacement of pavement and surfacing shall conform to the requirements of all applicable standard details and specifications, latest revisions.

336.2.1 Pavement Widening or Extensions: Existing pavements which are to be matched by pavement widening or pavement extension shall be trimmed to a neat true line with straight vertical edges free from irregularities with a saw specifically designed for this purpose. The minimum depth of cut shall be 1 ½ inches or D/4, whichever is greater.

The existing pavement shall be cut and trimmed after placement of required ABC and just prior to placement of asphalt concrete for pavement widening or extension, and the trimmed edges shall be painted with a light coating of asphalt cement or emulsified asphalt immediately prior to constructing the new abutting asphalt concrete pavements. No extra payment shall be provided for these items and all costs incurred in performing this work shall be incidental to the widening or pavement extension.

The exact point of matching, termination, and overlay may be adjusted in the field, if necessary, by the Engineer or designated representative.

336.2.2 Pavement to be Removed: Existing asphalt pavement to be removed for trenches or for other underground construction or repairs shall be cut by a device capable of making a neat, straight and smooth cut without damaging

adjacent pavement that is not to be removed. The Engineer's decision as to the acceptability of the cutting device and manner of operation shall be final. If saw cutting, only, is to be utilized, it will be so specified in the plans or special provisions.

In lieu of cutting trenches across driveways, curbs and gutters, sidewalks, alley entrances, and other types of pavements, the Contractor may, when approved by the Engineer, elect to tunnel or bore under such structures and pavements.

When installations are within the street pavement and essentially parallel to the center line of the street, the Contractor, with approval of the Engineer, may elect to bore or tunnel all or a portion of the installation. In such installations, the seal coat requirements, as discussed in Section 336.2.4, will be modified as follows:

(A) If the pavement cuts (bore pits, recovery pits, etc.) are 300 feet or more apart, the bore or tunneled distance will not be considered as part of the open trench and the seal coat may not be required.

(B) If the pavement cuts (bore pits, recovery pits, etc.) are less than 300 feet apart, the distance between the cuts will be considered the same as a trench cut and the distance will be added to any trench cut distances.

336.2.3 Temporary Pavement Replacement: Temporary pavement replacement, as required in Section 601, may be with cold-mix asphalt concrete, with a minimum thickness of 2 inches, using aggregate grading in accordance with Section 710. Permanent pavement replacement shall replace temporary repairs within 5 working days after completion of temporary work.

Temporary pavement replacement shall be used in lieu of immediate placement of single course permanent replacement or the first course of two course pavement replacement only on transverse lines such as spur connections to inlets, driveways, road crossings, etc., when required by the Engineer, by utilities or others who subcontract their permanent pavement replacement, under special prior arrangement; or for emergency conditions where it may be required by the Engineer. Temporary pavement replacement shall be placed during the same shift in which the backfill to be covered is completed.

Rolling of the temporary pavement replacement shall conform to the following:

(A) Initial or breakdown rolling shall be followed by rolling with a pneumatic-tired roller. Final compaction and finish rolling shall be done by means of a tandem power roller.

(B) On small areas or where equipment specified above is not available or is impractical, the Engineer will approve the use of small vibrating rollers or vibrating plate type compactors provided comparable compaction is obtained.

The surface of the temporary pavement shall be finished off flush with the adjacent pavement.

336.2.4 Permanent Pavement Replacement and Adjustments:

336.2.4.1 Permanent Pavement Replacement: Pavement replacement for longitudinal trenches (essentially parallel to traffic) greater than 50 feet in length and transverse cuts of any length shall be at least a two-course pavement replacement. Pavement replacement for longitudinal trenches less than 50 feet in length, bell holes and similar small areas may be a single course provided the layer thickness complies with the requirements of Section 321.5.4. All pavement replacement shall match gradation and thickness of the existing pavement. Pavement replacement shall be compacted to the same density specified for asphalt concrete pavements in Section 321.

Unless otherwise noted, pavement replacement shall comply with the following:

(A) Single course pavement replacement shall consist of a 1/2" or 3/4" mix in accordance with Section 710.

(B) The base course(s) of a multi-course pavement replacement shall consist of a 3/4" mix in accordance with Section 710.

(C) The surface course of a multi-course pavement replacement shall consist of a 3/8" or 1/2" mix in accordance with Section 710 to match the existing surface. The surface course shall not be placed sooner than 2 weeks after the base course, except where the trench crosses a signalized intersection. In this case the surface course shall be placed within 48 hours, or the crossing pavement replacement shall be a single course as specified above.

(D) Where the base course is to be placed with non-compactive equipment, it shall be not less than 2 inches in thickness and the material shall be immediately rolled with a pneumatic-tired roller. The surface course shall be of sufficient depth to provide the total required compaction thickness of the two courses, but not more than 1 inch.

(E) Where the trench is 6 feet or more in width, all courses shall be placed with self-propelled spreading and compacting equipment. When the trench is from 6 to 8 feet in width, self-propelled spreading and compacting equipment shall not be wider than 8 feet. All courses, except the surface course, shall be of a compacted thickness of not less than 1 1/2 inches.

(F) Placement of the surface course is to be by means which will result in a surface texture satisfactory to the Engineer and flush with the existing pavement.

The pavement replacement surface shall not vary more than 1/4 inch from the lower edge of a straightedge placed across the replacement pavement surface between edges of the existing matched surfaces. When the pavement replacement includes replacement of the roadway crown, the surface smoothness shall comply with requirements of Section 321.

Laying a single course or the base course(s) of the asphalt concrete pavement replacement shall never be more than 600 feet behind the ABC placement for the pavement replacement.

The trench must be compacted to its required density, and required ABC must be in place and compacted prior to the placement of the asphalt concrete.

~~Pavement replacement for cuts essentially parallel to the street centerline and greater than 50 feet in length shall be two-course pavement replacement as hereinafter specified. For cuts greater than 600 feet in length the entire area shall then be slurry seal coated in accordance with Section ~~330-332~~(coated chips) or as otherwise specified. This seal coat shall extend from the edge of pavement or lip of gutter to the street centerline except that on residential streets less than 36 feet face to face of curb or where the pavement patch straddles the centerline, the entire width of street shall be seal coated.~~

In lieu of placing the seal coat as required previously, and with approval of the Contracting Agency, the Contractor may deposit with the Contracting Agency for credit to the Street Maintenance Department, a negotiated agreed upon amount. The Street Maintenance Department will incorporate this work into their street maintenance program.

~~Pavement replacement for cuts parallel to the street centerline less than 50 feet in length, transverse cuts, bell holes and similar small areas shall match gradation and thickness of the existing pavement. These one-course pavement patches shall be compacted with a vibratory roller to the same density specified for asphalt concrete pavements.~~

~~Laying of single course or the base course of the asphalt concrete pavement replacement where a two-course replacement is applicable shall never be more than 600 feet behind the ABC placed for the pavement replacement.~~

~~The trench must be compacted to its required density, and required ABC must be in place prior to the placement of the asphalt concrete.~~

~~Single course replacement shall consist of a 1/2 inch or 3/4 inch mix placed and finished as directed by the Engineer.~~

~~The base course of two course pavement replacement shall consist of a 3/4 inch mix in accordance with Section 710.~~

~~Where the base course is to be placed with non compactive equipment, it shall be not less than 2 inches in thickness and the material shall be immediately rolled with a pneumatic tired roller. The surface course shall be of sufficient depth to provide the total required compacted thickness of the two courses, but not more than 1 inch.~~

~~Where the trench is 6 feet or more in width, all courses, single or both courses of the two course pavement replacement, shall be laid with a self propelled compacting, spreading equipment. When the trench is from 6 to 8 feet in width, the self propelled compacting, spreading equipment shall not be wider than 8 feet. All courses, except the surface course, shall be of a compacted thickness of not less than 1 1/2 inches.~~

~~The surface course shall consist of a 3/8 inch mix in accordance with Section 710 as specified by the Engineer to match the existing surface. The surface course shall not be placed sooner than 2 weeks after the base course, except where the trench crosses a signalized intersection. In this case the surface course shall be placed within 48 hours, or the crossing pavement replacement shall be single course as specified above.~~

~~Placement of the surface course is to be by means which will result in a surface texture satisfactory to the Engineer, and flush with the existing pavement.~~

~~Where deep lift asphalt concrete (asphalt concrete base and asphalt concrete wearing course) exists, the base course replacement shall be made in lifts not exceeding 6 inches in compacted thickness to within 1/2 inch of the finish grade.~~

336.2.4.2 Adjustments: When new or existing manholes, valves, survey monuments, clean outs, etc. fall within the limits of the permanent pavement replacement as discussed in this Section, the Contractor shall be responsible for adjusting the various items to the new pavement surface or as directed by the Engineer. This will include but not be limited to slurry and chip seals.

The Contractor will coordinate with the Engineer and with representatives of the various utilities regarding the adjustment and inspection of the work. The Contractor shall be responsible for obtaining and complying with all specifications, special requirements, details, etc. of the Utility Company regarding the adjustments. When adjusting the Agency's utilities, survey monuments, etc., the adjustment will comply with these Specifications and Details.

The work will be done in compliance with OSHA standards and regulations regarding confined space entry. The Contractor shall remove all material attached to the lids and/or covers including that of prior work. The method of removal shall be approved by the Engineer and/or the Utility Representative.

336.3 TYPES AND LOCATIONS OF PAVEMENT AND SURFACING REPLACEMENT:

Normally, the type of pavement replacement and backfill required will be noted on the plans or specified in other portions of the contract documents and construction will be in accordance with Detail 200-1 and 200-2. ~~This detail requires that a 12 inches "T" Top be utilized when normal traffic flow is perpendicular to any one of the four sides of the trench excavation. Therefore, Type A pavement replacement will require a "T" Top whenever the trench crosses a street or goes through an intersection and at the end(s) if they terminate in the street. Type B pavement replacement will require the "T" Top on the sides that are perpendicular to normal traffic flow.~~

If a type is not noted on the plans or specified in the special provisions, the following criteria will govern:

Type A ~~pavement replacement, including the “T” Top~~ trench repair will be utilized on all streets where the excavation is ~~parallel to the centerline of the street~~ essentially longitudinal or parallel to traffic.

~~Type B pavement replacement, including the “T” T-Top~~ trench repair will be utilized on all streets where the excavation is essentially transverse ~~to the centerline of the street~~ or not parallel to traffic, including trenches that go through an intersection. Type B trench repair may be used to repair transverse trenches if specified by the Agency.

Type C ~~pavement replacement~~ trench repair will be used to match existing portland cement concrete pavement.

Type D ~~pavement replacement may~~ trench repair will be utilized to repair asphalt concrete, portland cement and concrete aggregate surfaces in the right-of-way, but not in paved roadways. It may also be used when the condition of the existing pavement does not justify construction of Type A, ~~or Type B or T-Top trench repair~~. Prior written approval of the Engineer is required for this condition.

~~Type F pavement replacement will be utilized to match existing ABC or decomposed granite roadways.~~

Where a longitudinal trench is partly in pavement, the pavement shall be replaced to the outside edge of the existing pavement, on a straight line, as indicated on the plans. Measurements for payment shall be from the inner limit of pay width allowed below, to the outside edge of the existing pavement as defined herein.

Where no part of a trench is in pavement, surfacing replacement will only be specified where existing surfacing materials have been removed.

When a trench cut is in aggregate surfaced area, the surfacing replacement shall be of a like type and depth as the existing material, compacted to the densities required in Section 601.

336.4 MEASUREMENT:

Measurement for payment and surfacing replacement shall be by the square yard, based upon actual field measurement of the area covered except as noted below.

(A) In computing pay quantities for replacement Types ~~A, B, and FE~~, pay widths will be based on the actual field measured width, however the boundaries of the measurement will not extend further than ½ the distance, either side, from the centerline of the pipe as depicted on Table 601-1, Maximum Width At Top Of Pipe Greater Than O.D. Of Barrel.

(B) In computing pay quantities for replacement Types T-Top, A, C, and D, ~~E, and F~~, pay widths will be based on the actual field measured width, however the boundaries of the measurement will not extend further than ½ the distance plus 12 inches, either side, from the centerline of the pipe as depicted on Table 601-1, Maximum Width At Top Of Pipe Greater Than O.D. Of Barrel.

(C) Where a longitudinal trench is partly in pavement, computations of pay quantities shall be based on the limitations specified above.

(D) The length of pavement and surfacing replacement shall be measured through any manhole, valve box, or other structure constructed in the pipe line, and any pavement or surface replacement and/or seal treatment in excess of the above pay widths shall be considered and included in the bid item for such structure.

(E) Any pavement replacement in excess of the specified pay widths necessitated by the installation of valves, tapping sleeves and valves, valve by-passes, and concrete thrust blocks shall be included in the bid price for these items.

(F) When special provisions allow deviations from the trench widths specified in Section 601, the above allowed pay widths for pavement replacement may be altered where so specified.

(G) Measurement of pavement and surfacing replacement shall be made along the finished surface of the ground to the nearest foot, and shall be computed to the nearest square yard.

336.5 PAYMENT:

Direct payment for pavement or surfacing replacement will be made for replacement over all pipe trench cuts except as otherwise allowed in the special provisions. Payment for replacements over other work shall be included in the cost of constructing that work, in accordance with the applicable standard details and specifications.

Payment for temporary pavement replacement shall be included in the cost of the pipe.

When a Contractor has the option of either jacking and/or boring or open cut construction, and elects to construct a pipeline by the jacking and/or boring method, he will be paid for the replacement of such items of work as pavement, curb and gutter, sidewalk, driveway, and alley entrances, as allowed for open cut construction.

FOREWORD

Publication of these Uniform Standard Specifications and Details for Public Works Construction [Within Public Rights of Way](#) fulfills the goal of a group of agencies who joined forces in 1966 to produce such a set of documents. Subsequently, in the interest of promoting county-wide acceptance and use of these standards and details, the Maricopa Association of Governments accepted their sponsorship and the responsibility of keeping them current and viable.

These specifications and details, representing the best professional thinking of representatives of several Public Works Departments, reviewed and refined by members of the construction industry, were written to fulfill the need for uniform rules governing public works construction performed for Maricopa County and the various cities and public agencies in the county. It further fulfills the need for adequate standards by the smaller communities and agencies [within Maricopa County](#) who could not afford to promulgate such standards for themselves. [Agencies in other regions or climes within the state of Arizona wishing to apply these specifications may need to make adjustments for local conditions.](#)

[These uniform specifications and details are intended to aid the private construction industry in providing modern materials and construction techniques, eliminate conflicts and confusion, lower construction costs and encourage more competitive bidding by private contractors for the benefit of public works construction in the right-of-way. Use of these standards for projects outside of the right-of-way should be reviewed by professional engineers and architects and applied with care to insure relevance to the planned work.](#)

[Specifications and details contained herein should be incorporated into project plans and specifications after careful review by the design engineer or architect of specific project needs. Not all specifications will apply to all projects as these standards are developed to meet a variety of public works needs. Prepared plans and specifications should clearly call out specific uniform specifications and details required for the project.](#)

[Uniform specifications and details are not a substitute for good engineering judgment. Unique conditions will arise that are outside the scope of these standards. When this happens, professional engineers and architects are required to use their judgment to amend these standards to best meet site-specific project needs in accordance with rules set forth by the State of Arizona and policy statements made by the Arizona State Board of Technical Registration.](#)

The Uniform Standard Specifications and Details for Public Works Construction will be revised periodically and reprinted to reflect advanced thinking and the changing technology of the construction industry. To this end a Specifications and Details Committee has been established as a permanent organization to continually study and recommend changes to the Specifications and Details. Interested parties may address suggested changes and questions to:

Standard Specifications & Details Committee
c/o Maricopa Association of Governments
302 North First Avenue, Suite 300
Phoenix, Arizona, 85003.

These suggestions will be reviewed by the committee and appropriate segments of the industry and cumulative annual revisions will be published the first of each year. A copy of this publication is available for review on the internet at the website listed below.

Please follow the links to the publications page and look for *Uniform Standard Specifications for Public Works Construction and/or Uniform Standard Details for Public Works Construction Within Public Rights of Way*:

www.mag.maricopa.gov

While in the interest of **regional** uniformity, it is hoped that all using agencies will adopt these standards with as few changes as possible, it is recognized that because of charter requirements and for other reasons, some agencies will find it necessary to modify or supplement certain requirements. **In the interest of reducing a proliferation of agency specific modifications it is strongly recommended that the agency representatives to MAG bring their modifications for consideration by the committee for inclusion into these standards.**

FOREWARD

Public Works Construction ~~Not in~~ Outside the Right of Way

This document has been prepared as a supplement to the Uniform Standard Specifications for Public Works Construction as adopted by the Maricopa Association of Governments (MAG) and is to be used for onsite development that is not associated with public right of way construction. ~~While~~ ~~†The standards within this supplement~~ ~~hese standards~~ are intended to apply to all agency public works development projects within Maricopa County, ~~they are intended to be utilized in applicable agency developments~~ such as libraries, equipment yards, service centers, recreational facilities or other public agency building sites. They may also serve as a guide for non-agency private development should the design professional find they are useful.

~~We~~ With this supplement, the MAG Specifications and Details Committee attempts to achieve maximum uniformity of planning, engineering, and construction practices for agency work outside the public right of way ~~and as applicable as outlined above~~. These are minimum standards and are intended to assist, but not to substitute for competent work by engineering and design professionals. Special conditions or environmental constraints may require a more stringent design than would normally be required under ~~these Standards~~ this supplement. It is not the intent to ~~unreasonably~~ limit any innovative effort which could result in a superior project design or meet specific design objectives. A proposed design which ~~is different than~~ varies from these ~~Development Guidelines~~ standards will be evaluated on the basis that the proposed design will produce a comparable or superior result, ~~and that is~~ in every way adequate for the user, and the public.



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: April 29, 2010

To: MAG Specifications and Details Committee

From: Robert Herz, MCDOT Representative

Subject: Section 717 ASPHALT-RUBBER

Case 10-08

PURPOSE: Revise Specification Section 717 ASPHALT-RUBBER to obtain a uniform specification.

REVISION: The attached sheets represent a re-write of the current specification to match MCDOT's current requirements. Other agencies are requested to indicate how their requirements may differ so that the specification can be modified to accommodate the needs of all agencies.

SECTION 717

ASPHALT- RUBBER

717.1 DESCRIPTION:

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

717.2 MATERIALS:

717.2.1 Asphalt-Rubber:

Asphalt Cement: Asphalt cement shall conform to the requirements of Section 711.

Rubber: Rubber shall meet the following gradation requirements when tested in accordance with Arizona Test Method 714.

Sieve Size	Percent Passing
#10 (2.00 mm)	100
#16 (1.18 mm)	65 - 100
#30 (600 μm)	20 - 100
#50 (300 μm)	0 - 45
#200 (75 μm)	0 - 5

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

717.2.2 Asphalt-Rubber Proportions and Properties: Ground rubber in asphalt-rubber shall be a minimum of 20 percent and a maximum of 22 percent by weight of the asphalt cement.

Asphalt shall be Type 1 unless otherwise specified and conform to the following:

Property	Requirement		
	Type 1	Type 2	Type 3
Grade of base asphalt cement	PG 64-16	PG 58-22	PG 52-28
Rotational Viscosity*; 351°F (177°C); Pascal seconds (cps)	1.5-4.0 (1500-4000)	1.5-4.0 (1500-4000)	1.5-4.0 (1500-4000)
Penetration; 39°F (4°C), 200g, 60 sec. (ASTM D 5); in (dmm), min	0.04 (10)	0.06 (15)	0.10 (25)
Softening Point; (ASTM D 36); °F (°C), min.	135 (57)	129 (54)	126 (52)
Resilience; 77°F (25°C) (ASTM D 3407);%,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°F 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.			

717.2.3 Asphalt-Rubber Design: At least two weeks prior to the use of asphalt-rubber, the Contractor shall submit an asphalt-rubber 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 rubber used.

717.3 CONSTRUCTION REQUIREMENTS:

717.3.1 Mixing of Asphalt-Rubber: The temperature of the asphalt-cement shall be between 375°F (191°C) and 425°F (218°C) prior to the addition of rubber. No agglomerations of rubber particles in excess of 2" in the least dimension shall be allowed in the mixing chamber. The ground rubber and asphalt-cement shall be accurately proportioned in accordance with the design and thoroughly mixed prior to the beginning of the one-hour reaction period. Reaction time may be decreased to 45-minutes if documentation is provided that the physical properties of the mix design requirements are consistently met using a 45-minute reaction period. The Contractor shall document that the proportions are accurate and that the rubber has been uniformly incorporated into the mixture. Additionally, the Contractor shall demonstrate that the rubber particles have been thoroughly mixed such that they have been "wetted." The occurrence of rubber floating on the surface or agglomerations of rubber particles shall be evidence of insufficient mixing. The temperature of the asphalt-rubber immediately after mixing shall be between 350°F (177°C) and 400°F (204°C). Reaction time shall start after all of the material for the batch has been mixed and the minimum reaction temperature of 350°F (177°C) has been achieved.

Prior to use, the viscosity of the asphalt-rubber shall be tested by the use of a rotational viscometer, which is to be furnished by the Contractor or supplier. The Contractor shall provide a qualified person to perform the testing.

717.3.2 Handling of Asphalt-Rubber: Once the asphalt-rubber has been mixed, it shall be kept thoroughly agitated during periods of use to prevent settling of the rubber particles. During the production of asphaltic concrete the temperature of the asphalt-rubber shall be maintained between 325°F (163°C) and 400°F (204°C). However, in no case shall the asphalt-rubber be held for more than 10 hours at these temperatures. It shall be allowed to cool to a temperature of 250°F (121°C) or less and held at that temperature for not more than four days. The process of cooling and reheating shall not be allowed more than one time for a batch of asphalt rubber binder.

For each load or batch of asphalt-rubber, the Contractor shall provide the Engineer with the following documentation:

- (A) The source, grade, amount and temperature of the asphalt cement prior to the addition of rubber.
- (B) The source and amount of rubber and the rubber content expressed as percent by the weight of the asphalt cement.
- (C) Times and dates of the rubber additions and resultant viscosity test.
- (D) A record of the temperature, with time and date reference for each load or batch. The record shall begin at the time of the addition of rubber and continue until the load or batch is completely used. Readings and recordings shall be made at every temperature change in excess of 52°F (11°C), and as needed to document other events which are significant to batch use and quality.

– End of Section –



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: May 5, 2010

To: MAG Specifications and Details Committee

From: Robert Herz, MCDOT Representative

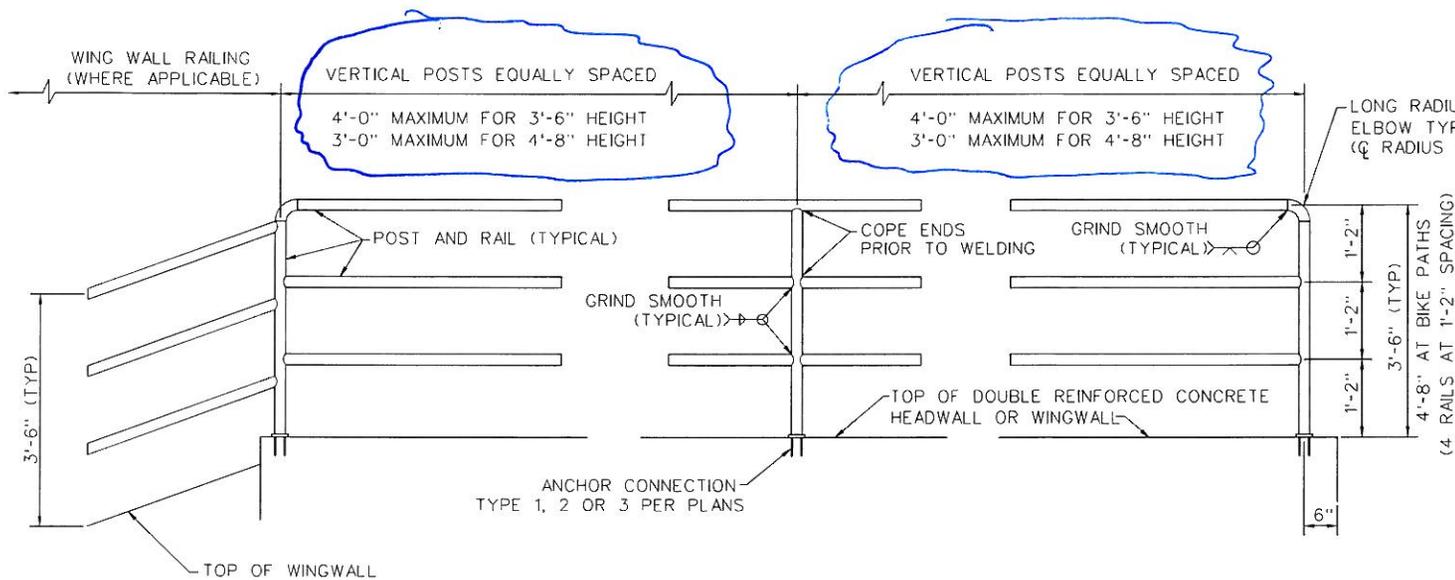
Subject: Proposed revision to Detail 145 – SAFETY RAIL

Case 10-09

PURPOSE: Adjust detail to comply with AASHTO pedestrian loading requirements.

REVISION: Revise in note 1 the grade of ASTM A53 steel pipe from grade A ($F_y = 30\text{ksi}$) to grade B ($F_y = 35\text{ksi}$). Revise post spacing from 8'-0" maximum to 4'-0" maximum for 3'-6" rail and to 3'-0" maximum for the 4'-8" rail.

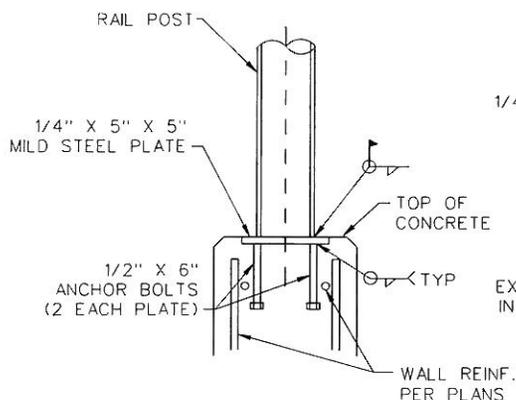
DISCUSSION: AASHTO pedestrian bridge rail loading is 50 plf applied to the top of rail. Keeping the 8'-0" maximum post spacing would required the post diameter to be increased to a 2" diameter schedule 80 pipe for a 3'-6" high rail and require a 2½" diameter schedule 40 pipe for a 4'-8" high rail.



ELEVATION

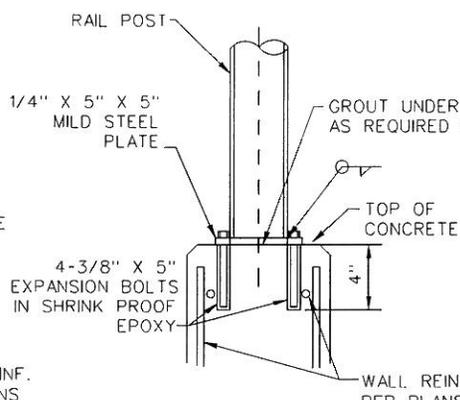
NOTES:

1. POSTS AND RAILS SHALL BE 1.5" SCHEDULE 40 HOT-DIPPED GALVANIZED STEEL PIPE ASTM A 53, **GRADE B** (2.72 ±.1/F, 1.9" O.D.). GALVANIZING SHALL BE IN ACCORDANCE WITH SECTION 771.
2. PAINT RAIL PER MAG SPECIFICATIONS SECTION 530 WHEN REQUIRED BY PLANS. SHOP PRIME WITH RUST INHIBITING PRIMER (FIELD REPAIR PRIMER AS NEEDED). COLOR PER PLANS.
3. VERTICAL POSTS TO BE EVENLY SPACED.
4. REMOVE ALL SHARP EDGES.
5. INSTALL SAFETY RAIL AS REQUIRED BY PLANS OR SPECIFICATIONS.
6. THE EMBEDMENT FOR ANCHOR TYPES 1, 2 AND 3 SHALL BE LOCATED INSIDE THE WALL REINFORCEMENT CAGE.



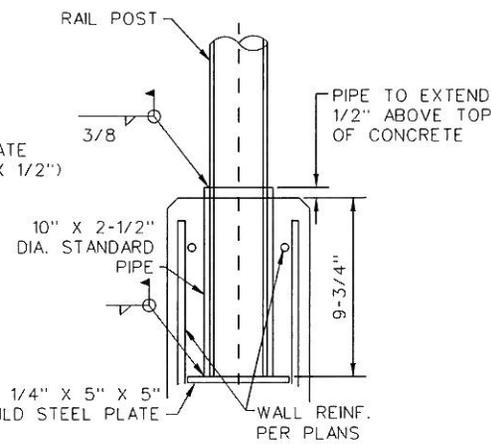
TYPE 1

ANCHOR PLATE DETAIL



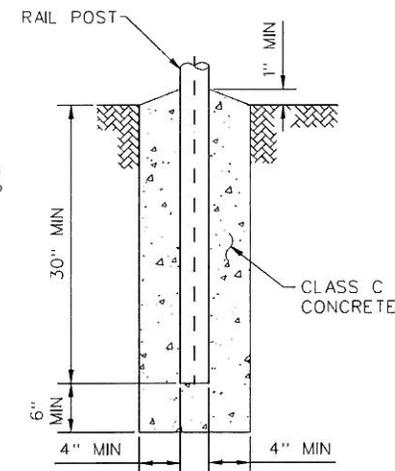
TYPE 2

EXPANSION BOLT DETAIL



TYPE 3

PIPE SLEEVE DETAIL



TYPE 4

GROUND INSTALLATION DETAIL

NOTE: SEE PLANS FOR ANCHORAGE DETAILS FOR ATTACHMENT TO SINGULARLY REINFORCED AND NON-REINFORCED WALLS.

DETAIL NO.

145



STANDARD DETAIL
ENGLISH

SAFETY RAIL

REVISED

01-01-2011

DETAIL NO.

145



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

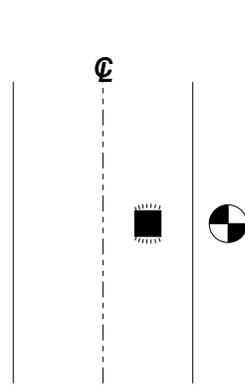
Date: May 5, 2010

To: MAG Specifications and Details Committee

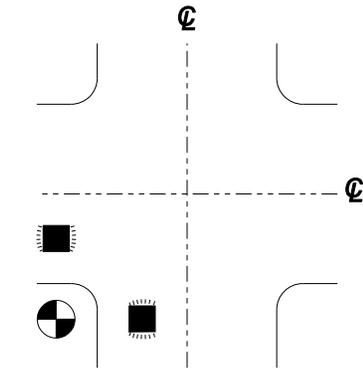
From: Robert Herz, MCDOT Representative

Subject: Proposed New Detail 122 – PAVEMENT MARKER FOR FIRE HYDRANTS **Case 10-10**

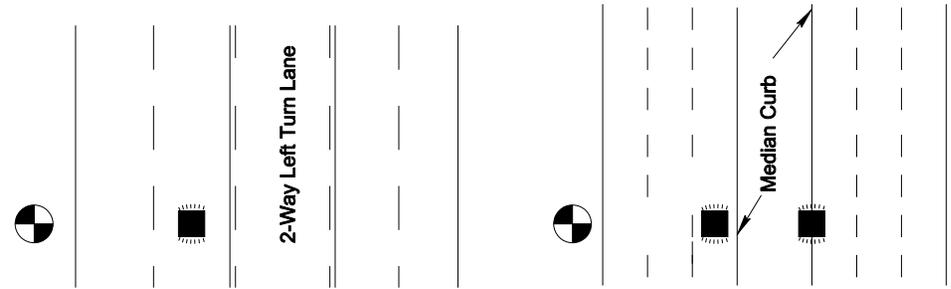
PURPOSE: Standardize placement of fire hydrant markers. Enhance public safety.



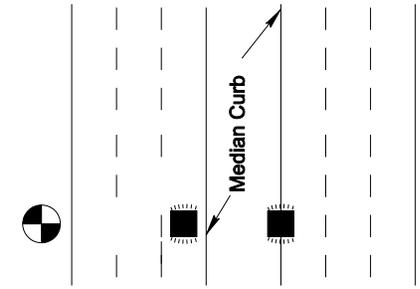
LOCAL STREET



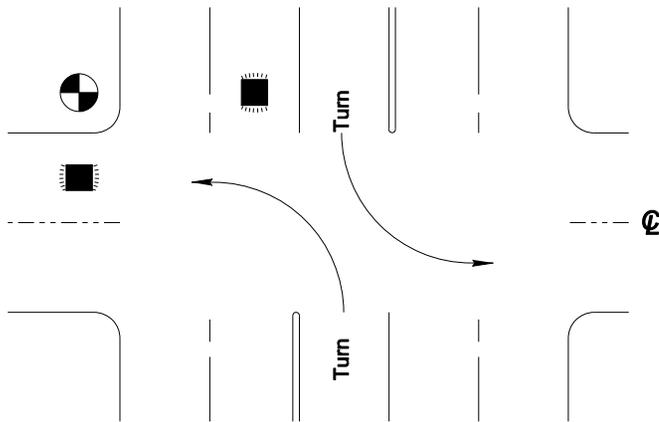
LOCAL CROSS STREET INTERSECTION



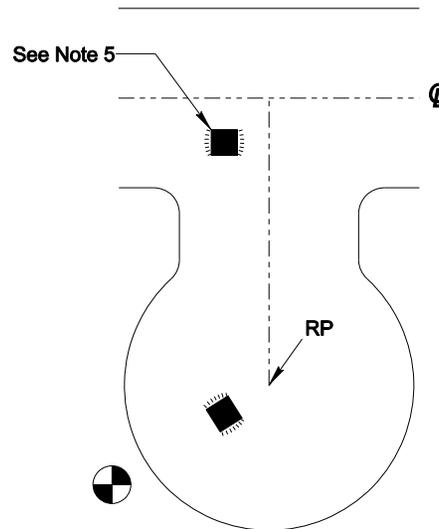
MULTI-LANE STREET W/ TWO WAY LEFT TURN LANE



MULTI-LANE STREET W/ RAISED MEDIAN



FOUR LANE STREET WITH TURN LANE AT INTERSECTION



CUL-DE-SAC

NOTES:

1. LOCATE PAVEMENT MARKER IN CENTER OF TRAVEL LANE AND ALIGN WITH HYDRANT.
2. FOR MULTIPLE LANE ROADS LOCATE PAVEMENT MARKER IN LEFT MOST THROUGH TRAFFIC LANE.
3. ADJUST MARKER LOCATION TO BE LOCATED OUTSIDE OF ANY DELINEATED CROSSWALK AREA.
4. FOR HYDRANT LOCATED ON FAR SIDE OF RAISED MEDIAN, LOCATE PAVEMENT MARKER ON TOP OF MEDIAN CURB ALIGNED WITH HYDRANT.
5. OMIT FOR CUL-DE-SAC GREATER THAN 250' IN LENGTH.
6. FIRE HYDRANT PAVEMENT MARKERS SHALL BE 2-WAY REFLECTIVE BLUE: ADOT TYPE BB, 911A-BLUE BY FIRE LITE AMERACE CORPORATION, OR APPROVED EQUAL.



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: May 5, 2010

To: MAG Specifications and Details Committee

From: Robert Herz, MCDOT Representative

Subject: Proposed revision to Detail 110 – PLAN SYMBOLS

Case 10-11

PURPOSE: Update and expand graphic standards to have plans be more uniform among MAG agencies.

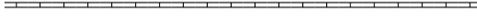
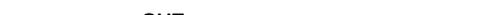
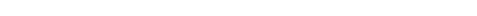
REVISION: Added line types and symbols, identify conduit material of underground utilities, require underground utility conduits greater than 12-inch diameter to be drawn to actual width.

Added line types:

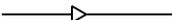
- Right of way
- Property
- Easement
- Jurisdictional boundary
- Chain link fence
- Barbed wire fence
- Wood fence
- Block wall

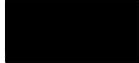
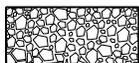
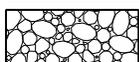
Added symbols:

- Utility meter
- Monitory well
- Wood utility pole
- Steel utility pole
- Concrete utility pole
- Pole mounted light
- Signal pole
- Double post sign
- Cellular tower
- Pull box
- Video detection camera
- Traffic signal indication
- Left turn signal indication
- Right turn signal indication

SECTION LINE		CHAIN LINK FENCE	
R/W		BARBED WIRE FENCE	
EASEMENT		BLOCK WALL	
PROPERTY LINE (OPTION 1)		WOOD FENCE	
PROPERTY LINE (OPTION 2)		GAS LINE (12" & SMALLER)	 4" G (MATERIAL)
JURISTICTIONAL BOUNDARY (OPTION 1)		GAS LINE * (GREATER THAN 12")	 15" G (MATERIAL)
JURISTICTIONAL BOUNDARY (OPTION 2)		SEWER LINE (12" & SMALLER)	 8" S (MATERIAL)
ROADWAY CENTERLINE		SEWER LINE * (GREATER THAN 12")	 18" S (MATERIAL)
UNDERGROUND ELECTRIC BURIED CABLE		NEW STORM DRAIN PIPE *	
UNDERGROUND ELECTRIC CONDUIT		STORM DRAIN * (GREATER THAN 12")	 18" SD (MATERIAL)
UNDERGROUND ELECTRIC DUCT BANK		IRRIGATION LINE (12" & SMALLER)	 4" IRR (MATERIAL)
OVERHEAD ELECTRIC		IRRIGATION LINE * (GREATER THAN 12")	 15" IRR (MATERIAL)
UNDERGROUND TELEPHONE LINE		NEW IRRIGATION LINE *	
OVERHEAD TELEPHONE LINE		WATER LINE (12" & SMALLER)	 4" W (MATERIAL)
FIBER OPTIC		WATER LINE * (GREATER THAN 12")	 36" W (MATERIAL)
CABLE TELEVISION			
OVERHEAD CABLE TELEVISION			
TELEPHONE DUCT BANK			

* SCALE TO ACTUAL WIDTH

UTILITY METER 
 SEWER CLEANOUT 
 FIRE HYDRANT 
 WATER METER 
 UTILITY MANHOLE 
 IRRIGATION STANDPIPE 
 UTILITY VALVE 
 SEWER SERVICE CONNECTION 
 MONITORING WELL 
 REDUCER 
 WOOD UTILITY POLE 
 STEEL UTILITY POLE 
 CONCRETE UTILITY POLE 
 STREET LIGHT ON MAST ARM 
 POLE MOUNTED LIGHT 
 ELECTRIC, GAS METER 
 TRANSFORMER 

DOWN GUY & ANCHOR 
 CELLULAR TOWER 
 BITUMINOUS (SECTION) 
 CONCRETE (SECTION) 
 AGGREGATE BASE COURSE (SECTION) 
 RIPRAP (PLAN & SECTION) 
 OBLITERATE PAVEMENT 
 TAPERED MILL 
 UNIFORM MILL 
 EARTH (SECTION) 
 SURVEY MONUMENT 
 SURVEY MONUMENT IN HANDHOLE 
 MAIL BOX 
 SIGNAL POLE 
 SINGLE POST SIGN 
 DOUBLE POST SIGN 
 STREET NAME SIGN 

TRAFFIC SIGNAL INDICATION 
 LEFT TURN SIGNAL INDICATION 
 RIGHT TURN SIGNAL INDICATION 
 VIDEO DETECTION CAMERA 
 PULL BOX 
 'A' POLE W/TRAFFIC SIGNAL HEAD 

DETAIL NO.
110-1



STANDARD DETAIL
ENGLISH

PLAN SYMBOLS

REVISED

DETAIL NO.
110-1

SECTION 361
SHALLOW DEPTH FIBER OPTIC MICRO-CONDUIT INSTALLATION

361.1 DESCRIPTION:

This work shall consist of the installation of underground fiber optic micro-conduit telecommunications facilities within the public right-of-way.

361.2 TRENCHING, BACKFILL AND RESTORATION:

All work shall be done in accordance with Section _____

361.3 MICRO-CONDUIT INSTALLATION:

(A) "Trunk Lines" Cable providing telecommunications service by connecting regions or states or by connecting central offices within a metropolitan area. Such cable shall be installed as described below:

(B) Telecommunications cables other than "trunk lines" shall be installed as described below:

361.4 CABLE LOCATING (FIBER OPTIC):

Tracing or locating wire shall be installed with the cable.

361.5 PAYMENT:

Payment will be made at the contract unit price bid per lineal foot.

Subject: Revision to Subsection 618.2 & Section 765

Purpose: Revise RCP joint specification to be consistent from section to section and to be consistent with industry standards and as commonly accepted amongst agencies in the region.

Revision: Revise Subsection 618.2 per the attachments and remove Section 765.

Discussion: Subsection 618.2 contains a requirement for 60% by volume first grade rubber. This is inconsistent with the 50% requirement of Section 765 and industry standards. According to representatives of the two main concrete pipe gasket suppliers in the country (Hamilton Kent & Press-Seal), the 50% requirement is an industry standard. To meet a 60% requirement, a new rubber compound would need to be formulated at significant cost for negligible benefit. It's also unclear whether such a compound would meet the other physical performance requirements that the gaskets are expected to meet.

Section 765 makes reference to neoprene gaskets and o-ring gaskets. These are two requirements that are typically not applied to storm drainage projects. At one time, o-ring joints were normally required when watertight joints were desired. Now, however, step joints are common in applications requiring watertight joints. Attached is a copy of a typical step joint detail. This joint performs very similarly to an o-ring joint in most cases, and will meet the 13 psi hydrostatic test requirement of ASTM C 443. Neoprene gaskets are typically only needed where oil resistance is required. In the rare cases where oil resistance is actually required, the project plans and specifications can make such a reference.

Also, both 618.2 and 765 reference gasket material and performance requirements which are not typical and/or not consistent with national standards. A more straightforward approach would be to reference specifications such as ASTM C 443 (Standard Specifications for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets) which references ASTM C 1619 (Standard Specifications for Electrometric Seals for Joining Concrete Structures). This can be done in Subsection 618.2, and by referencing ASTM C 443 there is no longer a need for Section 765 because it would be redundant.

These proposed revisions to Subsection 618.2 and Section 765 are consistent with industry standards nationwide and with what is typically supplied to local projects and is accepted by agencies in the region through the submittal process.

618.2 MATERIALS: (Revised 7-9-10)

The concrete pipe and HDPE pipe, specials, joints, gaskets, and testing shall be according to Sections 620 or 735, 736 and 738, except as specified below or as modified by special provisions.

(A) Specials: Pipe specials such as closure pieces, wyes, tees, bends, and manhole shafts shall be provided as indicated on the plans, and such specials shall be made equal in strength, diameter, and other physical characteristics to the standard straight pipe lengths by the use of extra concrete, extra reinforcing, or steel items. Drawings of specials shall be submitted to the Engineer for approval before their fabrication.

(B) Rubber Gasket Joints: When rubber gasket pipe is used, the joint shall be sealed with a continuous ring gasket made of a special composition rubber of such size and cross section as to fill ~~completely~~ the recess annular space provided for it. The gasket shall be the sole element depended upon to make the joint watertight, and shall have smooth surfaces, free from pits, blisters, porosity, and other imperfections. ~~The rubber compound shall contain not less than 60% by volume of first grade synthetic rubber.~~

~~The remainder of the compound shall consist of pulverized fillers free from rubber substitutes, reclaimed rubber and deleterious substances. The compound shall meet the following physical requirements when tested in accordance with appropriate ASTM Specifications:~~

~~(1) Tensile Strength of the compound shall be at least 2,100 psi, ASTM D 412.~~

~~(1) Rubber Gaskets for RCP shall be in accordance with ASTM C 443 or AASHTO M 315.~~

~~(2) Elongation at Rupture shall be at least 400%, ASTM D 412.~~

~~(3) Shore Durometer Hardness, Type A, Value 40 – 60(±5), ASTM D 2240.~~

~~(4) Cold Flow: The percentage shall not exceed 20. The determination shall be made in accordance with Method B ASTM D 395, with the following exception. The disc shall be 1/2" thick and the diameter shall be that of the rubber gasket. The gaskets shall not be exposed to direct sunlight for a time greater than needed to accomplish normal installation.~~

~~(5) Specific Gravity shall be consistent within +0.05 and shall be between 0.95 and 1.45, ASTM D 297.~~

~~(6) (2) Rubber Gaskets for HDPE pipe shall be in accordance with Subsection 738.2.3.~~

(C) Water Stops: Water stops will be required when connecting HDPE pipe to concrete structures, manholes, etc. The water stop shall comply with Section 738 and will be installed per manufacturer recommendations.

(D) Cement Mortar Joints for RCP will be in accordance with Subsection 736.3.

SECTION 765 (Revised 7-9-10)

RUBBER GASKETS FOR CONCRETE PIPE

765.1 GENERAL:

The joints of concrete pipe shall be O-ring rubber gasket joints conforming to ASTM C 361 except the composition and properties of the rubber gaskets shall be as follows:

All rubber gaskets shall be extruded or molded and cured in such a manner as to be dense, homogeneous, and free from porosity and other imperfections. The tolerance for any diameter measured at any cross section shall be \pm one thirty second inch. All gaskets shall be manufactured from a synthetic rubber compound in which the elastomer is chloroprene (ASTM SAE Designation Type SC) exclusively. Said compound shall contain not less than 50 percent by volume of neoprene, shall contain no deleterious substances, and shall conform to Table 765-1.

Physical Properties	Value	Method of Test
Tensile strength, Min. psi	1500	ASTM D 412
Elongation at break, Min. %	42.5	ASTM D 412
Shore durometer hardness, Type A. (1)	40-60	ASTM 2240
Compression set, Max. % of original deflection, (2)	20	ASTM D 395
Accelerated aging, tensile strength, % (3)	80	ASTM D 572
Max. increase over original shore durometer value after accelerated aging	8	ASTM D 2240
Specific Gravity	0.95-1.45 ± 0.05	ASTM D 297

Notes:

(1) Pipe manufacturer shall select value suitable to type of joint.

(2) Use Method B, except disc shall be 1/2 inch long section of rubber gasket stock.

(3) Percent of tensile strength, after aging by the oxygen pressure chamber (96 hours, $158 \pm 1.8/F$, 300 ± 15 psi), of the tensile strength before aging.

It is the intent of these specifications that the gasket container shall be a preformed rectangular groove or step so constructed that when 2 pipes are joined together the rubber gasket shall be compressed and for all practical purposes substantially fill and be largely confined within the rectangular groove.

The Contractor shall submit for approval details of the shape and size of the gaskets he proposes to furnish. The Contractor shall submit certified test results in triplicate showing the physical properties of the materials used in the manufacturer of gaskets.