

February 23, 2010

Members of the MAG Specifications and Details Committee

Jesse Gonzales, City of Peoria, Chairman

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF AGENDA

Wednesday, March 3, 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 February 3, 2010 Meeting Minutes</u>	2. Corrections and approval of February 3, 2010 minutes.
3. <u>2009 & 2010 Cases</u>	3. Review of 2009 & 2010 cases. New cases.
4. <u>General Discussion</u>	4. Presentation by Joe Bacik of American Ductile Iron Pipe on pipe protection. 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

February 3, 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	Jeff Van Skike, 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
Bob Herz, MCDOT	Tom Wilhite, Tempe

ADVISORY MEMBERS

John Ashley, ACA	Jeff Hearne, ARPA
Kwigs Bowen, NUCA	Peter Kandaris, SRP
Jeff Benedict, AGC	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

Phil Cisneros, Southwest Gas
Kenny Pollock, Southwest Gas
Ann Seiden, Southwest Gas
Niranjan Vescio, Stronggo

1. Call to Order

Chairman Jesse Gonzales called the meeting to order at 1:30 p.m.

2. Approval of Minutes

The members reviewed the January 6, 2010 meeting minutes. Bob Herz suggested corrections to the minutes to clarify the purposes of detectable warning domes in Case 09-13, correct the title of Case 09-14, and correct the wording for the motion to re-admit NUCA as an Advisory member with Kwigs Bowen as the primary representative and Tony Braun as the alternate. Gordon Tyus noted the misspelling of Mike Samer. Jeff Van Skike introduced a motion to accept the minutes with the corrections noted above. Bob Herz 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: ADA-compliant details for 35-foot and 20-foot corner radius dual sidewalk ramps. Jesse Gonzales provided handouts comparing proposed sidewalk ramps with those currently used by the City of Phoenix. He also provided information about the City of Chicago's policy and ramp details (similar to those proposed) that were the result of a lawsuit. Members discussed the pros and cons of each design. The Chicago ramps are better aligned with the crosswalk, but questions were raised about maintenance issues, and the small curb at the corner. The Phoenix design has less sediment problems, but they are not necessarily aligned to the crosswalks. Mr. Gonzales suggested that if the committee preferred the Phoenix design, MAG could modify the Phoenix details instead.

There was also discussion about the truncated dome detectable warnings, and their shape and alignment. When the detectable warnings are placed in a rectangular grid, a small curved concrete piece in front of the warning has become a maintenance issue as it tends to break apart; however, if the curve is cut into the detectable warning material it can cut through the domes. Miranjan Vescio of Stronggo suggested that if a standard detail was adopted that specified the curve required, detectable warnings could be designed to avoid this problem.

b. Case 09-14 – Revise Ramps for ADA Compliance: Revising Details 231, 232, 233 and 234 to obtain compliance with ADA requirements. Bob Herz provided an updated drawing for Detail 232. The revised detail was designed to meet ADA by having a minimum 5' sidewalk/landing area with a back curb, and a detectable warning that went straight back. Comments included correcting the title to match existing detail 232. Mr. Herz said he expected to have new drawings for the other ramp details at the next meeting.

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. Paul Nebeker said he and Jesse Gonzales met with Joe Bacik of American Pipe Supply to discuss experiences with pipe protection methods including capping ends. Mr. Nebeker said that problems due to contraction and expansion of pipes caused the caps to pop off. He also said that Mr. Bacik was willing to give a presentation at a future meeting on his field experiences.

Tom Wilhite reiterated the need to keep pipe clean throughout the process, not to rely on cleaning it afterwards. He also said current specifications don't give inspectors the teeth necessary to deal with water quality problems. Paul Nebeker suggested that other parts of the specifications could be updated to inspect the pipe when delivered, and keep it grade separated and covered when stored on site, and best practices when laying pipe.

Discussion included the flushing procedure and tests used after installation. It was agreed that the current MAG 2" flow does not flush debris from pipe, and that perhaps a same diameter flush should be used instead. Troy Tobiasson described the preconstruction water guidelines used by the City of Goodyear. They were adopted to solve frequent water quality problems and excessive water use in flushing pipes. They require contractors to rent meters and use backflow prevention, and charges them for water used for flushing and for required testing. They are also required to schedule flushing times with the water department.

Additional discussion included testing for HPCs and the time allowed for chlorination and disinfection of pipes. It was suggested that a working group be formed to investigate the issue of pipe protection, testing and related issues. Mr. Tobiasson was tasked with getting key agency and advisory members together to begin work on these issues.

4. 2010 Cases (new cases)

d. Case 10-01a – Miscellaneous Bloopers: Correct typographic errors in Section 317 Asphalt Milling. Bob Herz asked the committee for any additional comments on the case.

e. Case 10-02 – Utility Pothole Repair: Revise and add keyhole repair to Detail 212. Warren White submitted this case to revise Detail 212 to include an alternate method of utility pothole repair using a keyhole. This method currently is primarily used by Southwest Gas. The procedure creates a core that is removed so work can be done and then replaces it, usually on the same day. The new detail makes minor corrections to the existing pothole detail and adds a type "B" keyhole repair detail with general notes on the procedure.

Ann Sieden, Phil Cisneros and Kenny Pollock from Southwest Gas introduced themselves, and described the keyhole repair process. Questions included use by other utilities (it has been used by the water district in Las Vegas) and if there were problems with compaction and failures. Kenny Pollock said this method has been used since 1990 without failure. CLSM is not used, but rather mechanical compaction is performed and monitored for quality control by use a compaction wave measuring device. A bonding agent is also added around and below the pavement core, which strengthens and seals the repair. He also said the bonding agent is commercially available to contractors. Bob Herz said there should be written specifications for the keyhole coring and repairing process in addition to the detail. Peter Kandarlis said the idea was to get the detail out for committee comment, with the goal to keep the process as generic as possible, but additional specifications could be added. Ann Sieden said that Southwest Gas was willing to give a

presentation on the process to committee members at a future meeting, and provide written materials on the process.

5. General Discussion:

Reflective Street Markers

Bob Herz suggested that since Rod Ramos was not present at the meeting, this issue be postponed to a future meeting when Mr. Ramos would be able to present Scottsdale Detail 2363. Chairman Gonzales concurred.

ARPA Concrete Working Group Meeting

Jeff Herne described the progress of the working group on the process of updating the Controlled Low Strength Materials (CLSM) sections of the MAG Specifications. He said that in addition to revising the materials section (728) the group was also planning to revise the applications section (604). He noted there was good discussion on methods of testing the flow of the mix at the last meeting. Mr. Herne announced the next meeting of the Concrete Working Group would be Thursday, February 11, 2010 at 1:30 p.m. at the ARPA office.

MAG Trash Rack Detail 502-2

Jesse Gonzales handed out some possible revisions to Detail 502-2 to prevent trash from going around the rack as it currently is designed. Redlines added to Detail 502-2 showed bars flayed out on each side to help create a barrier to trash entering the pipe. He also handed out a sample detail of a commercial grate installation for reference. Mr. Gonzales said Phoenix has a detail, but it is designed more for the outlet end, to prevent access to the pipe. He said there often are problems with contractors using the trash rack/inlet and access barrier/outlet interchangeably. Peter Kandarlis said he could bring in sample details that SRP uses, and Scott Zipprich said he had photos he can share.

Forward to the Specifications Book

Peter Kandarlis described a problem SRP recently had with a large engineering firm that used the MAG Specifications inappropriately and sometimes incorrectly on a recent private development. He said he was working on a draft to update the Forward to the MAG Specifications to better explain the intended purpose and scope of the document in relationship to public works/right of way projects and private development projects. Several members related problems of using MAG specification inappropriately, and the need for specific engineering on projects. Jesse Gonzales also mentioned the need for a separate guide for public works projects not in the right-of-way. Members were supportive of updating the forward and encouraged Mr. Kandarlis to bring a draft to a future meeting.

6. Adjournment:

The meeting was adjourned at 3:20 p.m.

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February 2010

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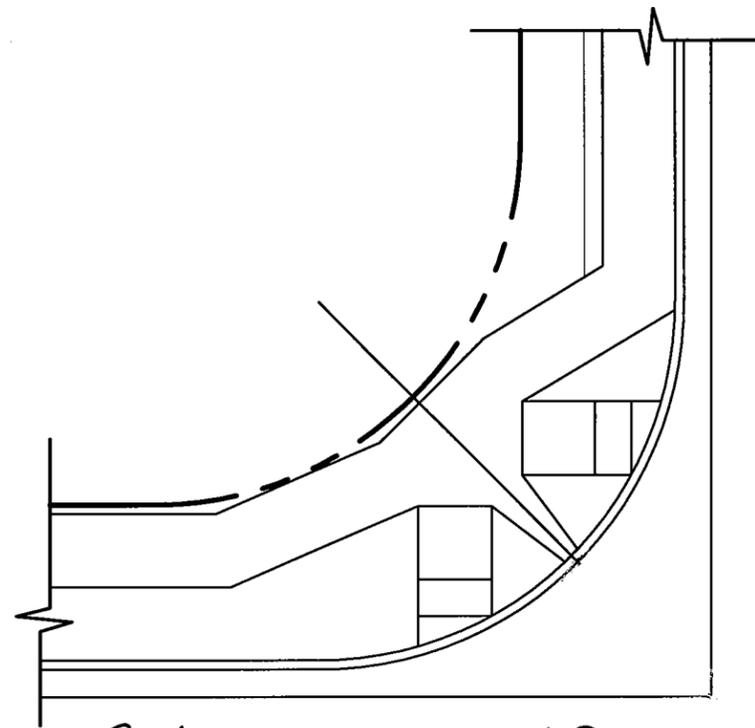
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2010 PROPOSED REVISIONS TO MAG SPECIFICATIONS AND DETAILS

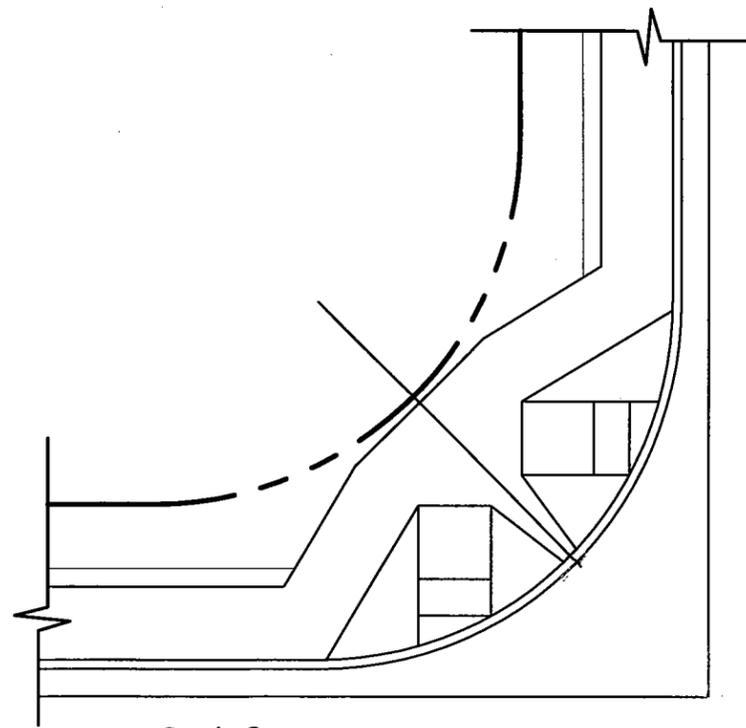
(Updated information can be found on the website: <http://www.mag.maricopa.gov/detail.cms?item=11284>)

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		0 Yes 0 No 0 Abstain
09-14	Case 09-14 : Revise Ramps for ADA Compliance, Details 231, 232, 233 and 234	MCDOT	Bob Herz	07/01/2009 02/03/2010		0 Yes 0 No 0 Abstain
09-15	Case 09-15 : Revisions to Section 610.4: Pipe Protection	Tempe	Tom Wilhite	07/01/2009		0 Yes 0 No 0 Abstain
10-01	Case 10-01 : Miscellaneous Bloopers: A. Section 317 Asphalt Milling	MCDOT	Bob Herz	01/06/2010		0 Yes 0 No 0 Abstain
10-02	Case 10-02 : Utility Pothole Repair: Revise and add keyhole repair to Detail 212	Chandler	Warren White	02/03/2010		0 Yes 0 No 0 Abstain
10-03						0 Yes 0 No 0 Abstain
10-04						0 Yes 0 No 0 Abstain
10-05						0 Yes 0 No 0 Abstain
10-06						0 Yes 0 No 0 Abstain
10-07						0 Yes 0 No 0 Abstain

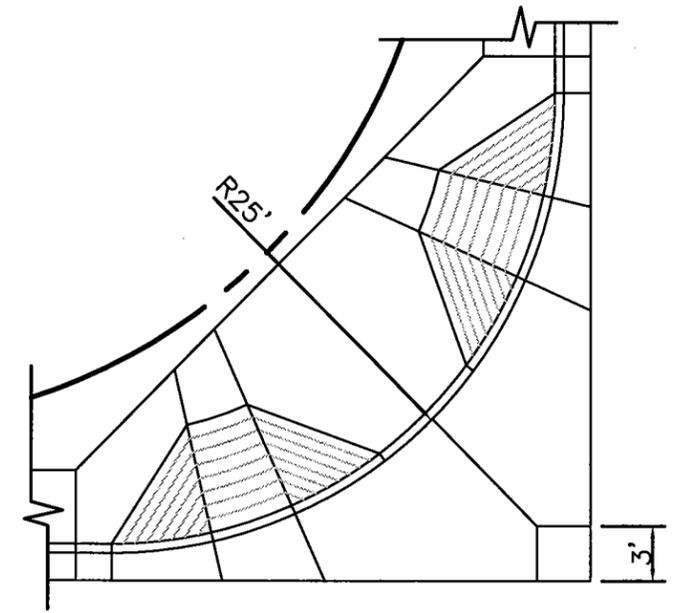
* Case was approved with verbal modifications at time of voting.



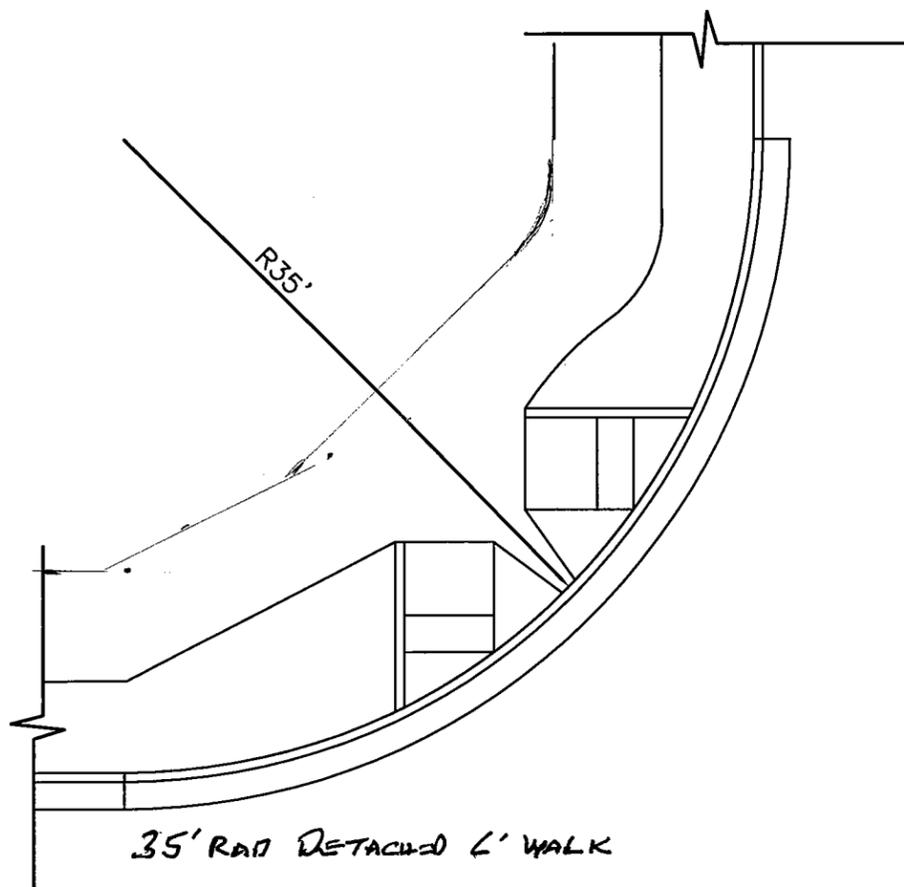
20' RADIUS ATTACHED & DETACHED



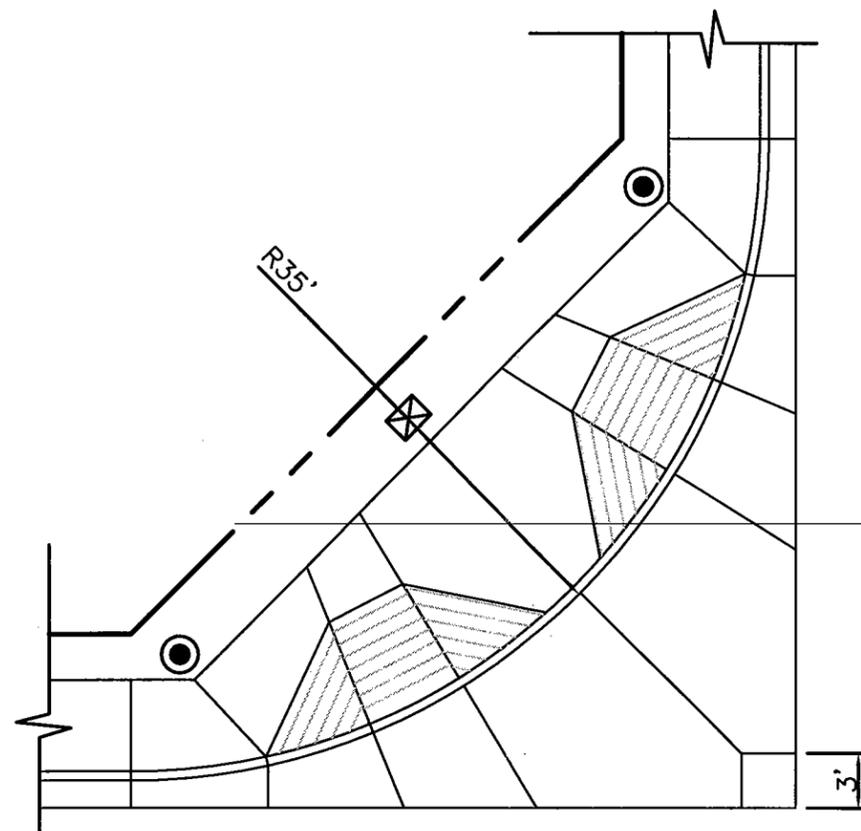
20' RADIUS ATTACHED



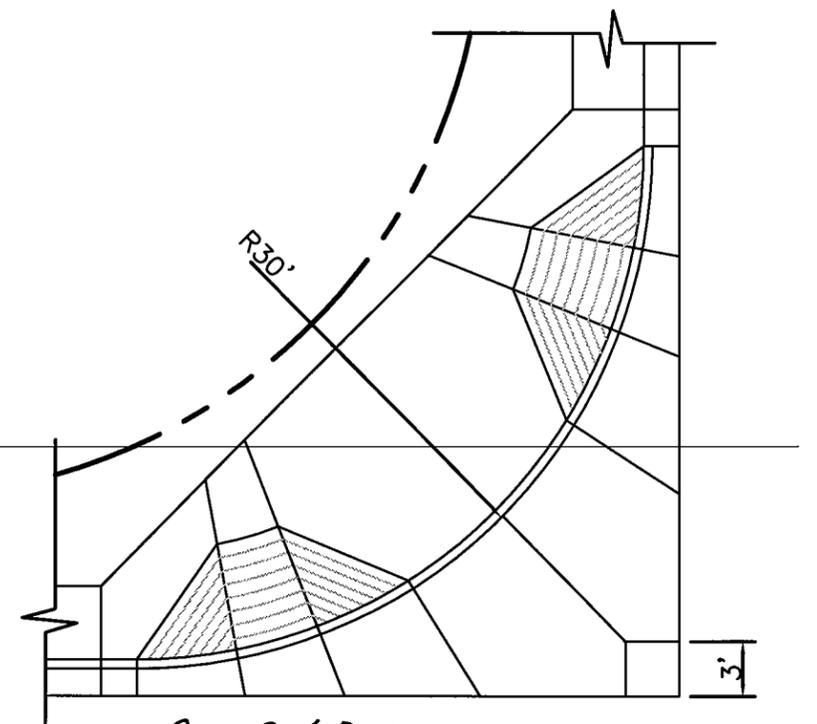
PHX 25' RAD.



35' RAD DETACHED L' WALK



PHX 35' RAD



PHX 30' RAD.

Watch Your Step!

Contributed by AnneMarie "Bemmie" Eustace
Monday, 11 January 2010

Don't get blindsided by proposed amendments to the ADA.

The federal Access Board spent the early part of this decade revamping the Americans with Disabilities Act Accessibility Guidelines (ADAAG) in order to better align the law with existing building codes and clarify specific provisions. In the process, numerous requirements became more stringent, others became more lenient and new sections were added.

The new regulations that impact the development community are covered under Title III of the Americans with Disabilities Act (ADA) addressing both commercial buildings and public accommodations. The Access Board's final version, commonly referred to as the 2004 ADAAG, has been under close scrutiny by the US Department of Justice since that time. In the meantime, the department continues to consider and evaluate final public comment that was solicited in the summer of 2008. It is expected that the final version, along with the implementation date, will be issued as early this spring. Be advised that Title III of the ADA law is expected to get a lot tougher.

Safe-Harbor Provision

The Justice Department is considering incorporating a "safe-harbor" provision into the new law offering protection to those businesses that have demonstrated through action, a willingness to comply with the ADA law as it was previously written. This provision would essentially "grandfather in" those companies in spite of the fact that the prior upgrades would now fall into non-compliance based on the adoption of the new provisions.

However, the safe-harbor provision is not without controversy and as a result, the Justice Department is considering the opposition's position in making a final determination on the proposed ruling. Unfortunately, if the provision is not implemented, that would mean bad news for those businesses that have lived by the law in the past, as they would now be forced to repeat prior upgrades at a big expense.

Proposed Modifications

Developers should be aware of the proposed changes that might mean ADA design upgrades. Consistent with current regulations, at least one accessible route is required to building entrances from public streets, public sidewalks and public transportation stops. However, the most significant proposed change in this section addresses the need to provide multiple routes in the case where the site has multiple arrival points. If a shopping center includes boundary streets with sidewalks and bus stops, then an accessible route must be provided from both. In order to accommodate additional accessible routes, the design typically cuts through large parking lots, resulting in diminished parking spaces or landscaped areas. Of course, these types of zoning regulations must be met in addition to the ADA requirements, possibly warranting increased land area. Limited exceptions are under consideration, however, the majority of shopping centers and malls, along with most large commercial developments must still provide the additional routes based on the proposed law.

The size of the accessible parking spaces and access aisles are not proposed to change, however the number of van accessible spaces increases in the new code and there is a change in the shared access aisle regulation. In some cases the proposed law would require a dedicated, as opposed to a shared access aisle.

Van accessible parking spaces are required to be a minimum of eight-feet wide with an eight-foot access aisle; standard accessible parking spaces must be at least eight-feet wide with a five-foot access aisle. The universal design allows all accessible parking spaces to be used as van spaces if designed with an 11 foot width and a five-foot access aisle. Some states, such as Florida, exceed the universal design and require a 12 foot wide accessible stall with a five-foot access aisle. The federal provision for the number of van accessible spaces is currently one van accessible for every eight accessible spaces required. This provision is increasing to require one van accessible parking space for every six accessible spaces provided, though both currently require a minimum of one van accessible space.

Also, the current regulation allows access aisles for accessible parking spaces to be shared, and while that provision remains, an exception for angled parking will require the access aisle to be located on the passenger side. In the event that large shopping-center developers are seeking to control traffic flow by incorporating angled parking, additional space in the parking field will be required.

This requirement will also have an impact on the size of outparcels designated for quick-service restaurants. As many have drive-thru elements, there is a need to incorporate one-way traffic flow on-site resulting in angled parking. The federally-proposed mandate proposes that each accessible space have its own access aisle. Given the need to connect an accessible route to the public way and have at least one additional access aisle, up to two parking spaces are absorbed. This increases the challenge of fitting all the zoning requirements such as minimum parking, minimum open space and landscaping requirements on a small outparcel. This may result in the need to carve out slightly larger outparcels in order to comply with all the regulations.

State and Federal Consistency

There are numerous states that have adopted the federal law and are currently using the ADAAG as a base design requirement. However, often state law goes beyond the incorporation of the federal design guidelines by imposing even more stringent standards with the addition of a number of accessibility requirements that exceed the federal mandates.

Expect confusion to be rampant among designers and reviewing agencies during the time period when the state laws have not yet been updated to be consistent with the new federal guidelines. For example, since the Florida Building Code's accessibility chapter is incorporated into the state statutes, the state will be required to take legislative action in order to adopt the new federal regulations. In states where legislative action is needed to adopt the new ADAAG requirements, the process may not unfold quickly and as a result, facility designers and code enforcement officials will find themselves in a difficult predicament. In the case where the new federal regulations might reduce the requirement for a particular accessibility feature, if a state's accessibility guidelines call for a more stringent interpretation, the state law will rule. For example, the proposed federal regulations eliminate detectable warnings from curb ramps, but until Florida laws officially adopt the new federal standards, the detectable warnings on curb ramps will still be required. Each state may handle this transition differently; details should be confirmed at the local and state level prior to the design phase.

Detectable Warning Placement Remains Unpredictable

The placement of detectable warnings, typically in the form of truncated domes, is undoubtedly one of the most misunderstood areas of the current ADAAG. The intent of the warnings is to alert a person with visual impairment to a hazardous area; the raised domes are easily detected with the use of a cane.

These detectable warnings are required on transportation platforms, on curb ramps, and in the case where the accessible route penetrates a vehicular hazardous area. However, since the definition of vehicular hazardous areas has remained open to a wide array of interpretation, the placement of the detectable warnings is often unpredictable from one location to another. For example, one site may provide detectable warnings at the end of the access aisles, the head of parking spaces or on the slope of recessed sidewalks, among others; another site may not provide this feature in these locations at all due to the inconsistency of the ADAAG as it currently reads.

For example, if the accessible route from the public sidewalk intersects a drive aisle in the parking lot, then it would be appropriate to install detectable warnings on both sides of the driveway. This would ensure that those with low visual acuity are made aware of dangerous areas prior to entry. However, the law is murky regarding the definition of a "vehicular hazardous area" so it's unclear whether or not a parking space and/or access aisle would fall into that category. Many claim that the access aisle for accessible parking is a loading/unloading area and walking route, therefore not used for vehicles; if so, then detectable warnings would not be required between the accessible parking and the sidewalk at the head of the accessible parking spaces. At the same time, some designers will choose to add detectable warnings at the head of the accessible parking spaces under the auspices that they should be considered hazardous since vehicles are moving within the parking space.

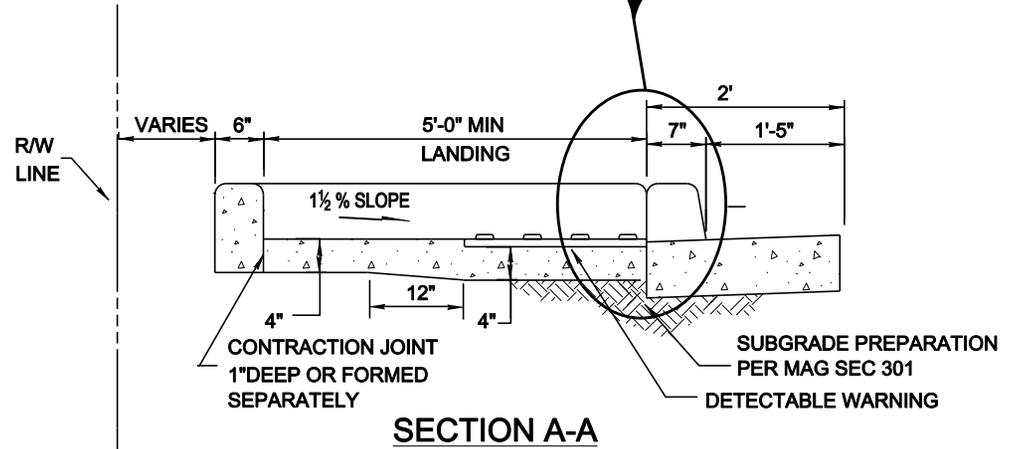
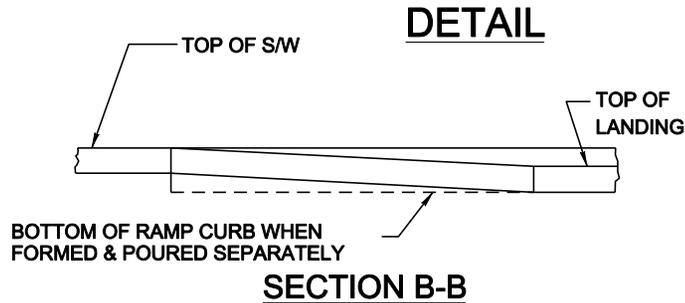
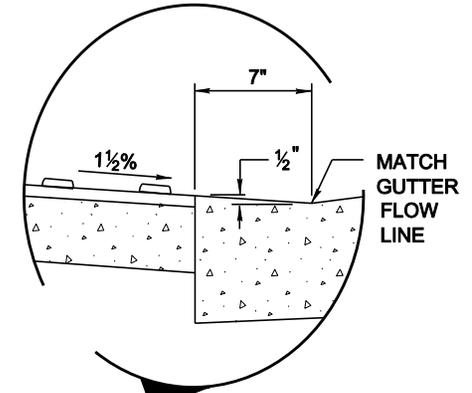
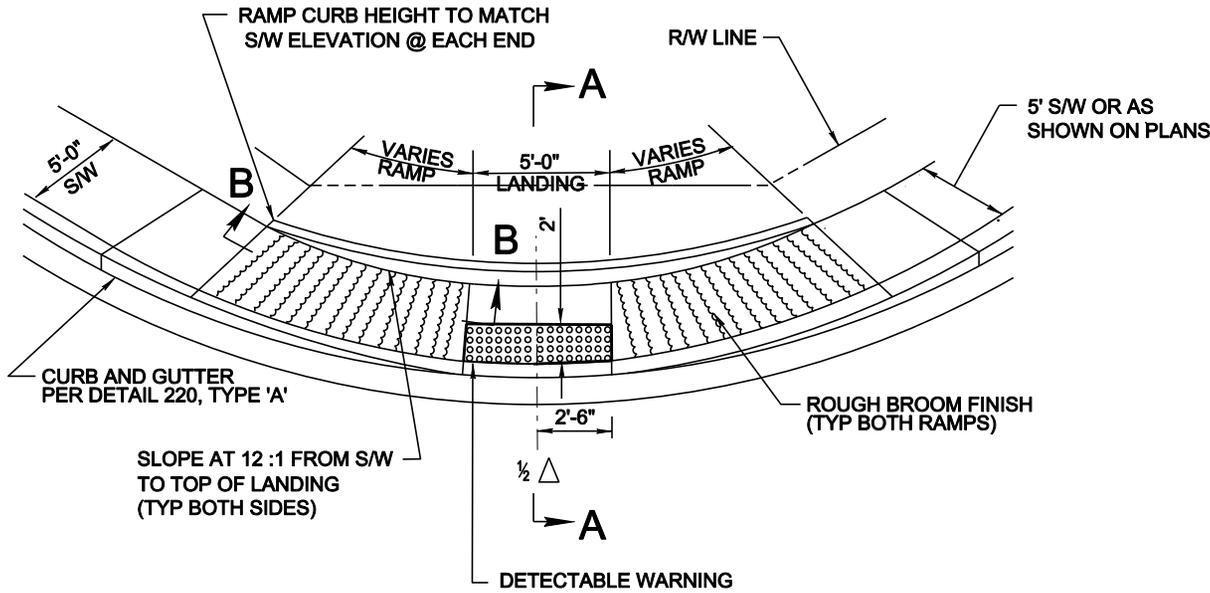
The proposed 2004 regulations address this maze of confusion by eliminating the requirement of detectable warnings completely, with the exception of transportation platforms. However, this proposed modification may not solve the problem. Independent of the Department of Justice (DOJ), the Department of Transportation (DOT) has formally adopted the 2004 ADAAG regulations; however, DOT chose to keep the detectable warning requirements for curb ramps in the public right-of-ways (ROWs). As a result, DOT requires detectable warnings on curb ramps in the ROWs but this would not be required by DOJ on private commercial property,

The lengthy waiting period for the issuance of the final ruling by the US Department of Justice for the new Title III ADA law regulations is nearing closure. In the interim, business owners, land developers, civil engineers, designers, contractors and building officials should become familiar with the proposed changes for existing commercial facilities and public accommodations, as well as alterations to existing facilities and new construction projects. The modifications could be substantial; both small and large business owners and developers across the board will need to address both financial and legal considerations in preparation for the newly imposed ruling. Unfortunately, the law will be inherently fraught with confusion relevant to the transition and application of the current and new law. SLDT

About the author: AnneMarie "Bemie" Eustace is director of site development for Interplan LLC, and has followed the ADA law since its inception in 1990. She can be contacted at: BEustace@interplanllc.com or 407 645-5008 or 800 373-5552.

NOTES:

1. CLASS 'B' CONCRETE CONSTRUCTION AS 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%





Chandler • Arizona
Where Values Make The Difference

MEMORANDUM

Case # 10-02

DATE: February 3, 2010

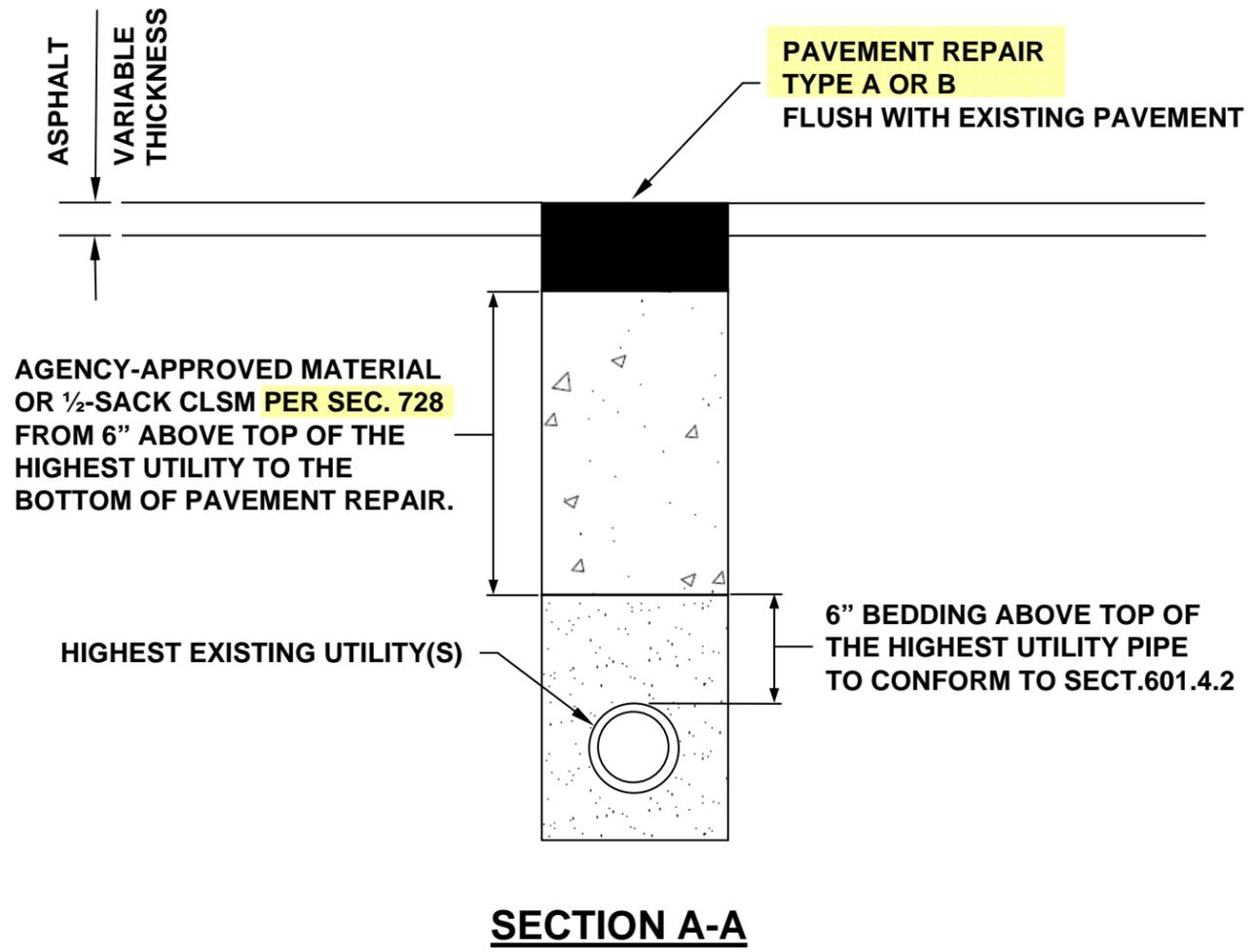
TO: MAG Specifications and Details Committee Members

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.

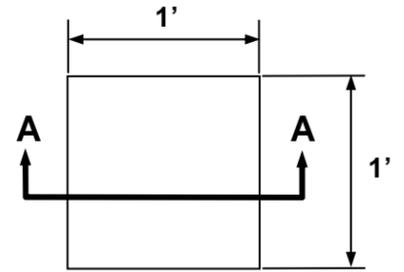


TYPE B – KEYHOLE REPAIR

NOTES:

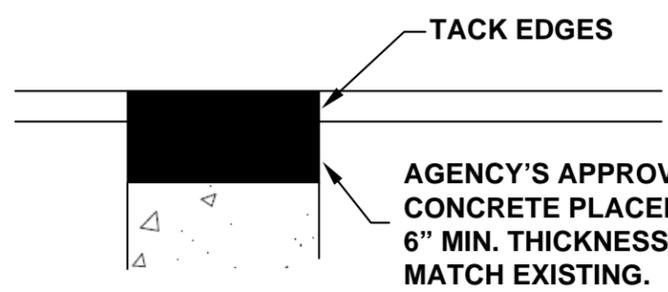
1. CUT AND REMOVE PAVEMENT PLUG WITH AN APPROVED KEYHOLE CORING DEVICE. PAVEMENT TO BE CORED SHALL CONTAIN NO CRACKS AND SHALL BE AT LEAST 4" THICK.
2. BONDING MATERIAL SHALL BE A SINGLE COMPONENT CEMENTITIOUS, RAPID HARDENING, HIGH STRENGTH, WATERPROOF BONDING AGENT THAT ALLOWS THE CORE ABLE TO SUPPORT AT LEAST TWO TIMES AASHTO H-25 LOADING WITHIN 30 MINUTES OF APPLICATION. BOND AGENT MUST SHOW A MINIMUM 20 PSI BOND STRENGTH (ASTM C882) AND A MINIMUM 200 PSI COMPRESSIVE STRENGTH (ASTM C109) IN 30 MINUTES.
3. AGENCY-APPROVED BACKFILL BELOW REPAIR SHALL BE ABC, GRANULAR, OR NATIVE SOIL PER SECTIONS 702 AND 601 PLACED IN MAXIMUM 10-INCH LOOSE LIFTS.
4. FILL KEYHOLE WITH BONDING MATERIAL DURING REPAIR.

TYPE A – CUT & PATCH REPAIR

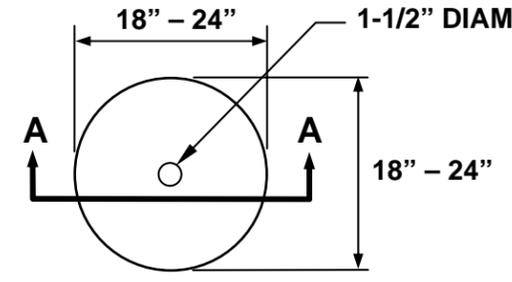


NOTE: EDGES SHALL BE CUT TO A NEAT VERTICAL FACE.

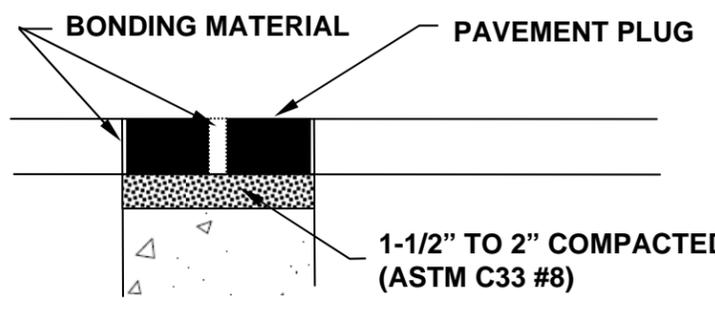
POT HOLE PLAN VIEW
(NOMINAL DIMENSIONS)



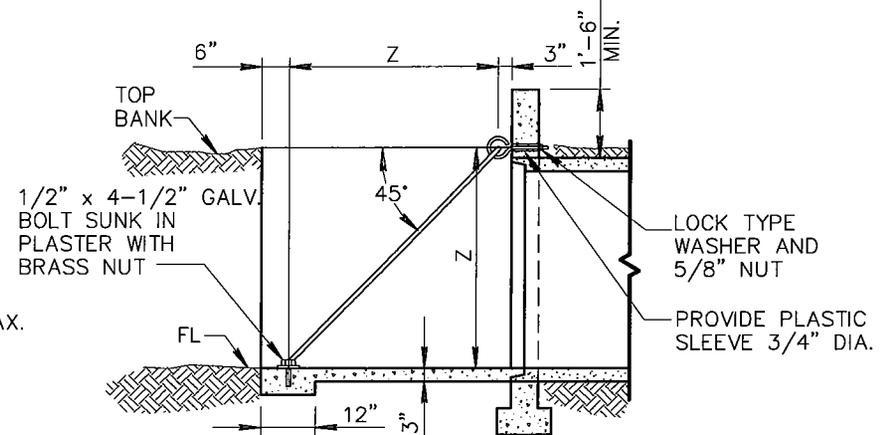
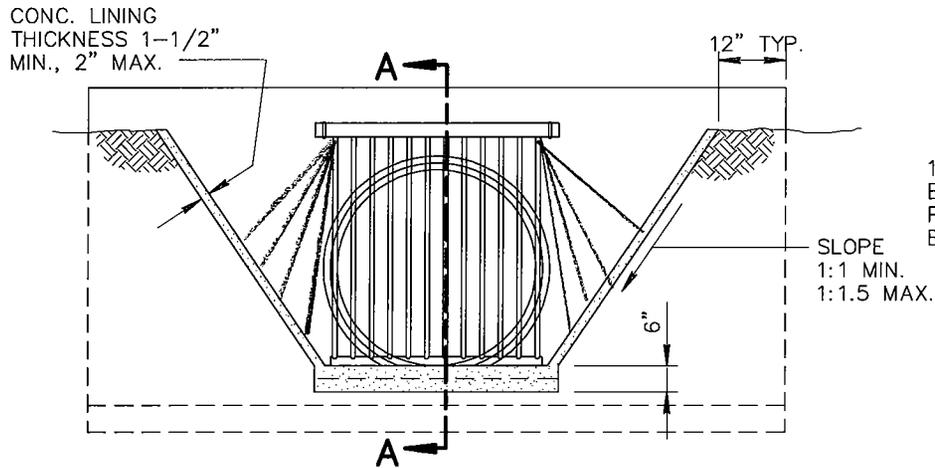
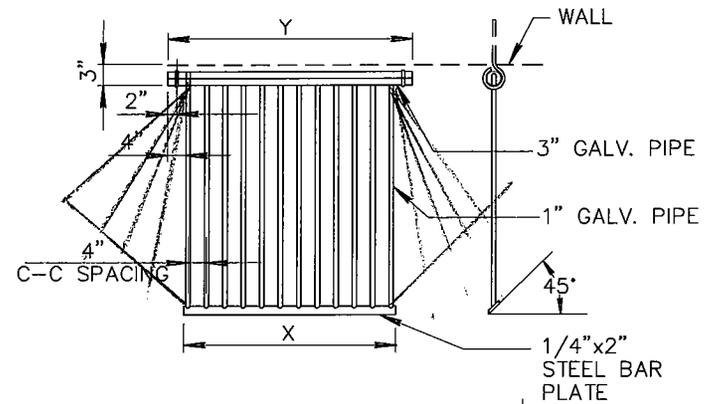
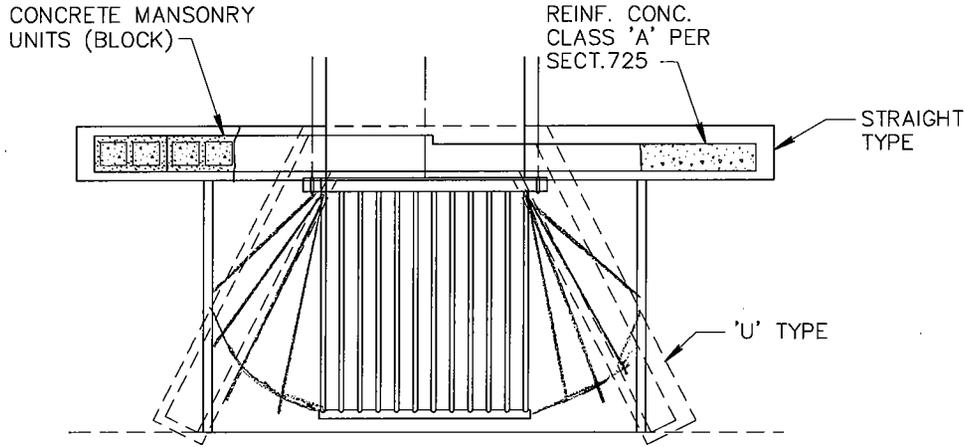
POT HOLE PROFILE



POT HOLE PLAN VIEW
(NOMINAL DIMENSIONS)

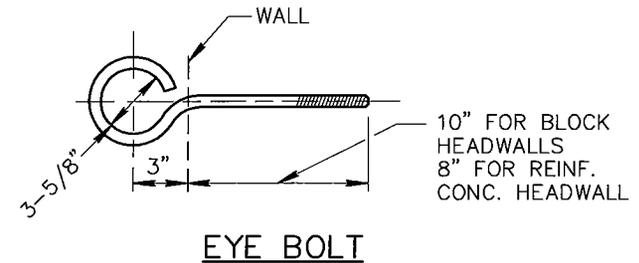


POT HOLE PROFILE



SECTION A-A

TYPE BASED ON PIPE SIZE						
TYPE	PIPE SIZE	NO. OF BARS	LENGTH OF BARS	DIMENSIONS		
				X	Y	Z
A	18"	6	3'-7"	1'-9"	2'-5"	2'-5"
	24"	8	3'-7"	2'-5"	3'-1"	2'-5"
B	30"	10	4'-4 1/4"	3'-1"	3'-9"	2'-11 1/2"
C	36"	10	5'-1 1/2"	3'-1"	3'-9"	3'-6"
D	42"	12	5'-10 5/8"	3'-9"	4'-5"	4'-0 1/2"
E	48"	14	6'-7 3/4"	4'-5"	5'-1"	4'-7"



DETAIL NO.
502-2

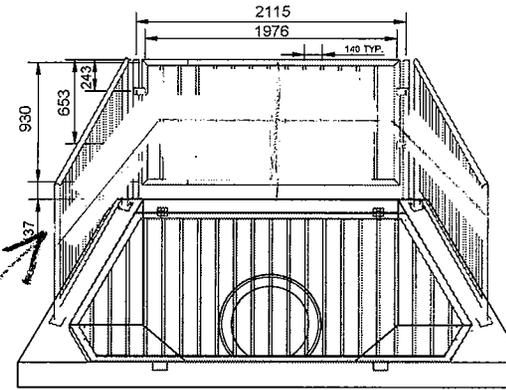
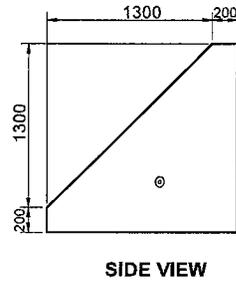
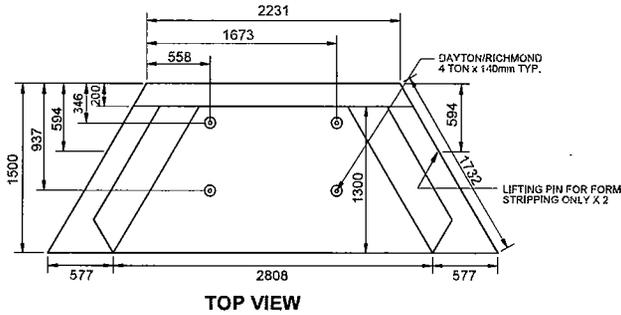


**STANDARD DETAIL
ENGLISH**

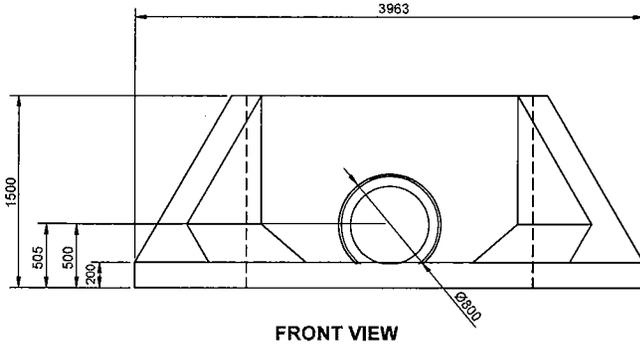
TRASH RACK

REVISED
01-01-2004

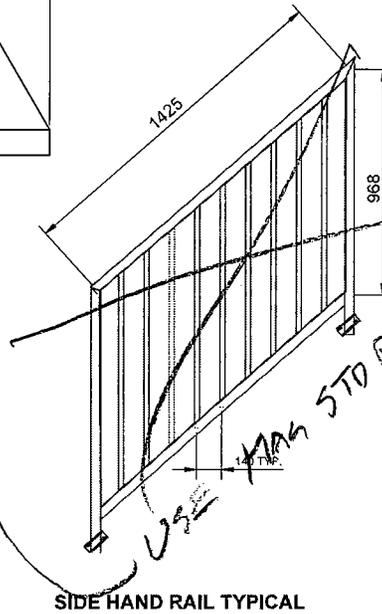
DETAIL NO.
502-2



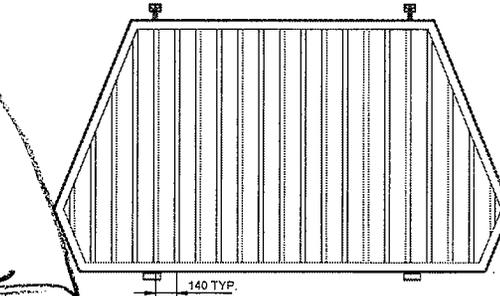
HAND RAIL



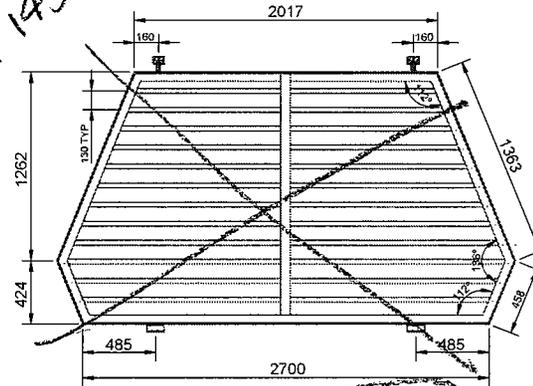
FRONT VIEW



SIDE HAND RAIL TYPICAL

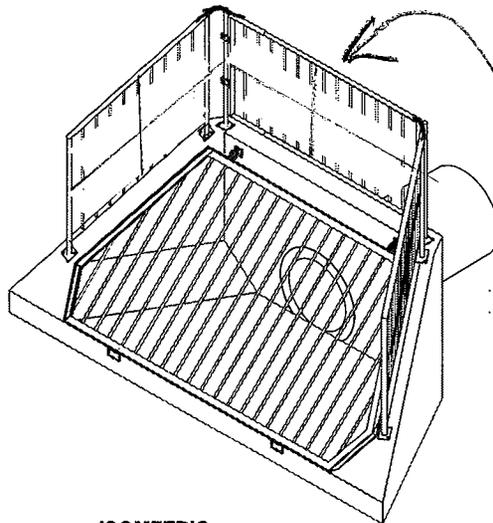


INFLOW GRATE



OUTFLOW GRATE

TYPICAL GRATE



ISOMETRIC

SHAW SUPPLIED ITEMS	
3	STAINLESS STEEL "L" BRACKETS
6	190mm (3/4") STAINLESS DROP-IN ANCHORS
6	190mm (3/4") x 380mm (1 1/2") BOLTS
6	190mm (3/4") WASHERS

NOTES

- GENERAL**
- FOR HANDLING, STORAGE, TRANSPORTATION AND ERECTION PROCEDURES PLEASE REFER TO "HEADWALL INSTALLATION GUIDE" AND "DAYTON/RICHMOND GUIDELINES FOR HANDLING CONCRETE PIPE AND UTILITY PRODUCTS".
 - WEIGHT = 4700 kg
 - TOLERANCE FOR STRUCTURAL ELEMENTS, MATERIALS & CONSTRUCTION CONFORM TO CANCSA A23.4 "PRECAST CONCRETE" CLAUSE 10.
 - PRECAST HEADWALL MUST BE FASTENED TO REINFORCED CONCRETE PIPE WITH SHAW SUPPLIED HARDWARE (SEE HEADWALL INSTALLATION GUIDE)
- GEOTECHNICAL**
- GEOTECHNICAL ENGINEER TO PROVIDE ON-SITE INSPECTION FOR PLACEMENT AND COMPACTION OF BACKFILL.
- DESIGN**
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH CANCSA S6.06 UNDER THE FOLLOWING DESIGN PARAMETERS:
 - DESIGN LIVE LOAD = CL-475
 - DESIGN DEAD LOAD = 24.1V
 - EARTH FILL TOP SLOPE
 - CONCRETE UNIT WEIGHT = 24.0 kN/m³
 - SOIL/BACKFILL UNITWEIGHT = 22.0 kN/m³
- REINFORCEMENT**
- ALL REINFORCING STEEL SHALL BE GRADE 400 AND CONFORM TO CANCSA G30.18 (LATEST EDITION).
 - ALL WELDED WIRE MESH SHALL HAVE A Fy = 485 MPa AND CONFORM TO CANCSA G30.14 AND G30.15 (LATEST EDITION).
 - ALL REINFORCING SHALL BE DETAILED, FABRICATED, PLACED AND SUPPORTED IN ACCORDANCE WITH CANCSA A23.4 (LATEST EDITION).
 - THE CONCRETE COVER OVER PRINCIPAL REINFORCING SHALL BE 50mm + 10mm AS REQUIRED BY ENVIRONMENTAL EXPOSURE 8.11.2.2 (a) IN CANCSA S6.06.
- CONCRETE**
- CONCRETE MIX DESIGNS SHALL CONFORM TO REQUIREMENTS:
 - CONCRETE STRENGTH = 28 MPa AT TIME OF STRIPPING
 - DESIGN CONCRETE STRENGTH OF 45 MPa AT 28 DAYS OR TIME OF SHIPPING
 - 5% TO 7% AIR ENTRAINMENT
 - OLEN HOLE AGGREGATE SHALL BE USED WITH A NOMINAL AGGREGATE SIZE OF 13mm
 - CONCRETE CURING SHALL BE IN CONFORMANCE WITH CANCSA A23.1 (LATEST EDITION).
 - SHAW CONCRETE BATCH No. SHALL BE 406.
- ITEMS INCLUDED:**
- 1 HW400SH
 - 2 HW1500H OR HW1900V
- | REV. NO. | REASON | DATE |
|----------|--------|------|
| | | |
- SHAW PIPE**
- DRAWING NO. _____
- OWNER: STANDARD HEADWALL 1500 X 1500 C/W 600 PIPE
- DRAWING NO. _____
- CONTRACTOR: STANDARD LAYOUT HAND RAILS INFLOW / OUTFLOW GRATES
- DATE: 22 JANUARY 2008 SCALE: AS NOTED
- DRAWN: N. DIMOCK CHECKED: N. WELCHOW
- SHEET 1 OF 1



Figure 5.14. Hinged steel debris rack in urban area. Due to nature of debris and possible entry by children, bar spacing is close.



Figure 5.15. Steel debris rack in urban area.