



FINAL RECOMMENDATIONS REPORT

for the

INVENTORY OF SUPPLEMENTS

to the

MAG Specifications and Details for Public Works Construction

**UNIFORM STANDARD
SPECIFICATIONS
for
PUBLIC WORKS
CONSTRUCTION**

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1998
ARIZONA
(Includes revisions through 2007)

January 2007



This document contains the final recommendations developed as a result of the specification and detail inventory performed by AZ-FLASH. The recommendations contained within highlight key areas that we feel should be addressed by MAG. The section suggests items that may be revised, deleted or added to the current standards. Where appropriate the recommendations also references member agency supplements that can be used as models for modification of the existing standards.

AZ FLASH COMPANIES, LLC

1501 PROGRESS STREET, BLACKSBURG, VA 24060 ♦ 602-561-3727 ♦ AZ-FLASH@HOTMAIL.COM

January 31, 2007

Maricopa Association of Governments
Attention: Gordon Tyus
302 North 1st Avenue, Suite 300
Phoenix, Arizona 85003

Dear Gordon,

This letter is written to transmit the final recommendations report for the Maricopa Association of Governments (MAG) Specifications and Details Inventory. AZ-FLASH Companies, LLC, has completed the final task within our contract #313 dated June 6, 2006.

Contained within the attached document are the final recommendations based upon the completed inventory.

Should you have any questions regarding this document, please feel free to contact me at 602-561-3727 or at cfiori1331@yahoo.com

Thank you for the opportunity to participate in this project.

Sincerely,

Christine M. Fiori, PhD, PE
Project Manager



PART 100—General Conditions

The supplements included in the *General Conditions* section consist of procedural changes, elaborations, and language on subject matters not included in the MAG document. The procedural changes are minor in count and extent; however, it may be beneficial to review given the shift to varying methods of contracting. Topics that contained noteworthy elaborations included:

- Safety, Health, and Sanitation
- Public Convenience and Safety
- Community Relations
- Commencement, Prosecution, Progress
- Measurement and Payment
- Subject matters that may be considered for addition to the MAG standard include: WBE, MBE, and DBE inclusion; Environmental Permits (i.e. SWPPP and Air Quality), and Value Engineering.



PART 200—Earthwork

The supplements included in the *Earthwork* section were primarily related to structural items, backfill, and stabilization. This section was modified primarily by MCDOT, while all other municipalities for the most part concurred with the MAG specifications.

- MCDOT supplements add further sections as well as define many specific sub-sections. Possibly incorporate some of the MCDOT supplements into MAG. These sections include those that address:
 - Structure removal
 - Structural backfill
 - Dewatering operations
 - Cement stabilization
 - Rip-rap placement.
- Basically all other municipalities concur with MAG specs for section 200 without any changes.



PART 300—Streets and Related Work

The supplements included in the *Streets and Related Work* section were primarily related to individual municipalities location and soil conditions. Other additions dealt with paving materials and methods, compaction issues, pavement type and replacement issues.

- Most municipalities modify the subgrade preparation specifications in **Section 301**. These changes typically consist of further description of depths, increased detail to compaction percentages for various operations, areas and materials, and changes to the percent compaction for streets, roadways, etc.
- **Section 310** has supplements from a few municipalities to further detail the plasticity and other soil qualities typical to their area of the Phoenix metro area.
- It is suggested that MAG consider adding a small section on asphalt milling operations (approx. Section 317).
- In **Section 321.3** it would be beneficial to add some specifics for thinner lift thicknesses, for example, less than two inches shall be placed only when temperature is 50 degrees and rising.
- A few municipalities call for various pavement deficiency remedies, particularly suited to their operations. However, most are very similar. Possibly adopt a uniform standard that is a compromise between the cities.
- **Section 321**—Overall, there are many supplements in this section. While it is difficult to determine generalized specifications for paving and asphalt due to the various mix designs and asphalt properties, a more detailed paving specification section is definitely needed. One possible action that would make this easier would be to unify the types of asphalt mixes used in the Phoenix metro area. By selecting only the best performing mixes for each area, writing specifications would be much more manageable.
- **Section 336.2.4**—Permanent pavement replacement needs to be more specific and include more details for various scenarios and types of replacement (T-top, etc).
- **Section 340**—requires more specifics on material types, and especially construction methods for various improvements such as curbs.
- Within **Section 342** a specification that addresses pavers is needed.



PART 400—Right-of-Way and Traffic Control

The supplements included in the Right-of-Way and Traffic Control section were focused upon traffic control devices, pavement markings and overall guidelines.

- There exists a need for a more detailed section on traffic control devices, methods, etc. Throughout the specification the references to the traffic control manual are good and may serve as a foundation for new specifications.
- It is suggested to add a specification section specifically addressing pavement marking. The City of Scottsdale has a detailed specification on this operation.
- It is suggested that a specification section be added to address traffic signals.
- Consider moving the Parkway grading (**Section 424**) to the earthwork in section 200 or be more specifically involved in landscaping.
- **Section 430** needs more extensive information and guidelines, similar to the City of Phoenix specifications
- MCDOT's section 460 should be incorporated as a whole or in parts into the MAG specifications.



PART 500—Structures

The Structures Section is widely accepted, with Maricopa County the only member agency to offer supplements. Of the noteworthy supplements Maricopa County included the additional subject of drilled shaft foundations, and elaboration on Reinforcement and Payment (Dimensional Tolerances).



PART 600—Water and Sewer

The Water and Sewer section included a variety of Supplements that related to trenching, water line and sewer line installations. It is recommended to review the City of Chandler, the City of Phoenix and the City of Scottsdale specifications for this entire section. Primary areas of supplements included:

- Within **Section 610** the majority of the supplements were related to the fittings of the testing of those fittings.
- **Section 618, 620 and 625** should be reviewed and possibly include the references from other member agencies.

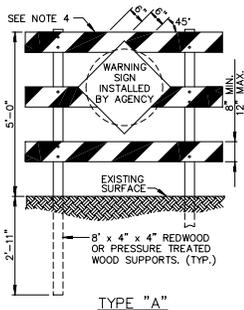


PART 700—Materials

The Materials Sections includes a wide variety of Supplements, which are minor in scale. The subject matters that are more expansive in their scale of Supplements are:

- Asphalt Concrete
- Pipe Materials

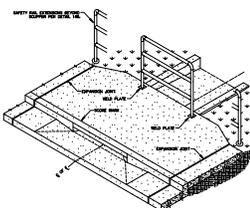
The series containing frequent supplements were Series 200: Streets Information and Series 300: Water Information. The miscellaneous category was primarily comprised of Traffic Light standards, Landscaping and Signage.



SERIES 100—General Information

There was not a large amount of supplements within this section. Each municipality uses some form of a general information section within their supplements that identifies the basic city policies. The detail supplements that were most notable in the series include the following:

- Eight municipalities had very similar details for Barricades of different types.
- The MAG sign post installation detail had modifications by seven municipalities. The municipalities all had similar standards, and it is suggested that this be standardized. City of Scottsdale 2131 is a good example.
- The Safety Rail detail is modified by six municipalities, however, all of the details are extremely similar. The key difference is the heading under which the detail is noted within each document. It is suggested that a standard be adopted.
- Currently MAG does not have a detail relating to refuse enclosures or related items. Several cities have excellent details, however, this is not recommended to be added as a MAG detail.

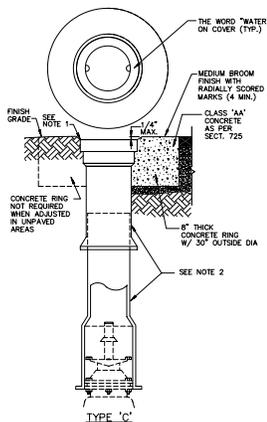


SERIES 200—Streets Information

The streets information series contained several modifications to MAG details. A majority of the modifications are similar for each municipality and the changes are minor. It is suggested that the following details be uniform and that MAG consider updating them to incorporate the minor alterations.

- The MAG pavement replacement detail has modifications by nine municipalities. This detail should be updated and standardized throughout the County.
- MAG addresses residential speed humps, however, it is suggested that a detail be adopted for traffic calming devices. The City of Phoenix has an excellent series of details to use as a model.

- There are several supplements to the Sidewalk Ramp standards. These should be reviewed and standardized, to include the ADA retrofits. Maricopa Count DOT is a good example for the ADA retrofits, while for all other sidewalk ramps, the MAG standards are acceptable.
- MAG should consider adding a detail that addresses commercial driveways.
- Several cities have details that depict base course depths, typical street cross-sections and standard utility locations. It is suggested that MAG investigate the possibility of a uniform detail for these items.
- Most municipalities have their own street light details. While these details for architectural or decorative light poles are unique for certain cities, the majority of the details involve standard poles, fixtures and wiring. It is suggested that there be a uniform street light standard for typical poles and their installations.

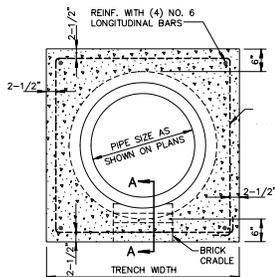


SERIES 300—Water Information

The supplements within the Water Information series contained a large amount of changes relating to fire hydrants, water meter connections, backflow prevention devices and check valves. The most notable supplements are detailed below.

- It is recommended that MAG add a detail to address reclaimed water valve boxes as several cities are using reclaimed water for irrigation purposes. The City of Scottsdale 2315 is example of such a detail.
- MAG does not address water service connections. The City of Phoenix P1342 is example of typical connection detail that may be adopted.
- A common supplement to MAG is a butterfly valve manhole.
- Four cities modified the 3", 4", or 6" water meter detail. It is suggested that MAG review that detail to incorporate these slight modifications.
- MAG does not address fire lines and fire hydrant in much depth. There are many supplements from the majority of the cities that provide greater detail and may be used as a model. City of Phoenix, Scottsdale, Chandler and Glendale are all good examples to follow.
- MAG **detail 370** is the vertical realignment of a water line. There are three cities that have modified the detail.
- Four cities have modified MAG **detail 391-1** which is a valve adjustment. This is a detail that is recommended to be standardized.

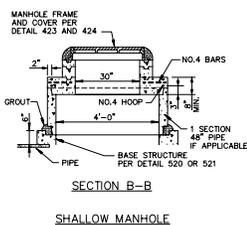
- It is suggested that the manhole cover detail be updated to include Potable and Non-potable manhole lids.
- Waterline suspensions are not addressed in MAG, Phoenix has a good example.
- City of Scottsdale has a good detail for water quality sampling station that incorporates most of the modifications completed by other municipalities.
- City of Scottsdale also has a good detail for a chlorine injection tap.
- MAG does not address pipe bedding for water lines. There are many cities that supplement this item. It is recommended that MAG develop a standard pipe bedding detail for the typical pipe situations encountered.
- City of Scottsdale has a good example of a detail for utility separation. MAG does not address this issue.
- Guard posts for Hydrants and backflow devices are not addressed in MAG. Good examples are Phoenix and Goodyear.
- MAG needs to add details regarding backflow prevention assemblies, pressure vacuum breakers, and reduced pressure principle backflow prevention assembly. There are many supplements to these items.
- There are a few cities that have supplements of an inclined water tower and or water fill tank. City of Scottsdale has good examples.



SERIES 400—Sewer Information

The supplements contained within the Sewer Information section primarily related to specific municipality issues, such as manhole covers.

- Consider adding a standard for V.C.P. trench loading, if enough member agencies utilize the material. City of Goodyear and City of Phoenix have good details.



SERIES 500 – Irrigation and Storm Drain Information

The supplements contained within the Irrigation and Storm Drain Information sections were minor in nature and minimal in quantity.

- Consider evaluating the need for standardizing Catch Basins and Storm inlet grates. City of Phoenix has excellent details in this area.



It is not feasible to evaluate and debate the validity of each and every supplement to the MAG Standards. MAG must acknowledge that their standards are the backbone of Valley infrastructure. MAG must reach out to emerging communities and encourage their adoption of the Standards, while satisfying the needs of their more established members.

The intent of MAG Standards should be focused on the major areas that affect the engineering integrity of a city's infrastructure and public safety, which the Standards accomplish; however, MAG must consider the inclusion of Street Lighting and Traffic Control Standards.

MAG must acknowledge that communities seek to distinguish themselves from one another, and that communities throughout the Valley are at varying stages of development. The focus of the standards if revised should reflect that issue, but seek to unify common infrastructure items. There is no need for MAG to involve itself in subjects such as Landscaping, City Street Signage, Park development, or Bus shelters.

Member agencies should be encouraged to adopt the MAG numerical system for their details. While quite an undertaking, this would simplify design and construction review processes and overall save the communities valuable tax dollars. MAG must establish a system for the timely, effective review, adoption, and inclusion of members supplements into the Standards. This system should eliminate the need for members to develop Standards that MAG has Sections covering.

It is suggested that the results of this inventory be used as the framework to develop a master set of County wide specifications and details. A document of this sort would be beneficial to the contracting community and also save the member agencies time and money by potentially reducing the amount of change orders. If it is not feasible to include the exact wording from each municipality specification supplement into the MAG book or one common publication due to update times and issues of each municipality needing to review for accuracy, one possible solution may be to put as note at the end of a subsection that has supplements. For example, for section 610.3 in MAG, stating something similar to, "Please see Scottsdale section 610.3.1 and Mesa section 610 for additional information or specifications."



Lastly it is suggested that the MAG Details should include some additional sections to make organization and references easier. Additionally, traffic control and traffic signalization and street lighting should be added as their own sections.