

**UNIFORM STANDARD
SPECIFICATIONS
for
PUBLIC WORKS
CONSTRUCTION**

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by the

MARICOPA ASSOCIATION

of

GOVERNMENTS

1996

ARIZONA

METRIC EDITION

FOREWORD

Publication of these Uniform Standard Specifications for Public Works Construction 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, the Maricopa Association of Governments accepted their sponsorship and the responsibility of keeping them current and viable.

These specifications, 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 who could not afford to promulgate such standards for themselves.

A uniform set of specifications, updated and embracing the most modern materials and construction techniques will redound to the benefit of the public and the private contracting industry. Uniform specifications will eliminate conflicts and confusion, lower construction costs, and encourage more competitive bidding by private contractors.

The Uniform Standard Specifications 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 Committee has been established as a permanent organization to continually study and recommend changes to the specifications. Interested parties may address suggested changes and questions to Standard Specifications & Detail Committee, c/o Maricopa Association of Governments, 1820 W. Washington Street, Phoenix, Arizona 85007. These suggestions will be reviewed by the committee and appropriate segments of the industry and cumulative annual revisions will be published in July of each year.

While in the interest of 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.

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Preface to the Metric Edition

The metric system used for the conversion of these specifications and details is designated “SI” from the French name “Le Système International d’Unités.” The fundamental reference guide for metric units is ASTM E 380, “Standard Practice for Use of the International System of Units (SI) (The Modernized Metric System).” The Arizona Department of Transportation publication “Plan Metrication Guidelines” contains an excellent discussion on accuracy, rounding, significant digits, and soft and hard conversions.

The metric edition of the MAG Standard Specifications and Standard Details is a conversion of the English edition as revised through 1996. Two types of conversions were used in developing the metric edition: soft and hard conversion. In a soft conversion, an English measurement is mathematically converted to its exact (or nearly exact) SI equivalent. Soft conversions were used to convert dimensions of manufactured products that would require an extensive retooling expenditure if dimensional changes were made. With hard conversion, the actual dimension is changed to a new rationalized metric dimension that is convenient to work with and remember.

Soft and hard conversions of manufactured products were based on publications and discussions with standards setting agencies and manufacturers groups. When available, soft conversion values are based on the soft conversion values established by manufacturers in describing the dimensions of their products. Hard conversions are also based on the intended or existing practices of manufacturers.

The conversions of a given English measurement may not always result in the same metric value for several reasons:

- The conversion may be a hard conversion.
- The original value may have been nominal.
- The conversion may have been based on information from a standards setting agency or manufacturers association.
- More precision is needed in some conversions than in others. (Example: bolt and hole sizes where fit with existing installations is required.)
- The original value may have been an approximate, non-critical value that is rarely measured. (Example: sidewalk edge radii.)

Users of the metric Standard Specifications and Standard Details are requested to keep the above principles in mind if varying conversions of the same original value are found.

In the English system, there is commonly no distinction between the term “pound” to indicate mass and “pound” to indicate force. In the SI system, mass and force are clearly distinct and have separate units. This document conforms to SI, ASTM, and AASHTO in the units used for mass, force, and stress (pressure.) If the English document used the word weight in the context of mass, the converted edition uses the word mass to conform to the SI mass unit. The term tonne is used for large masses. The terms tonne, metric ton, and megagram are synonymous and are equal to 1000 kilograms.

Slopes are expressed with the vertical component first in conformance to AASHTO and mathematical conventions.

Pipes, valves, and related material sizes are expressed in nominal metric dimensions conforming to ASTM and AASHTO convention. It should be noted that the pipe sizes are soft conversions of the original nominal pipe sizes and that the conversions conform to industry practice.

While every effort has been made to eliminate errors in the conversions, it is likely that some errors have not been detected. Any such errors should be brought to the attention of the Maricopa Association of Governments Specifications and Details Committee.

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TABLE OF CONTENTS

Bond Issue or Budget Project Proposal.	i
Improvement District Project Proposal.	iv
Surety Bond.	vi
Bond Issue or Budget Project Contract.	vii
Improvement District Project Contract.	ix
Contract Performance Bond.	xi
Labor and Material Payment Bond.	xii
Certificate of Insurance.	xiii
Contractors Affidavit.	xv
Authorized Signature Form.	xvii

PART 100 — GENERAL CONDITIONS

SECTION	TITLE	
101	Abbreviations and Definitions.	3
102	Bidding Requirements and Conditions.	14
103	Award and Execution of Contract.	17
104	Scope of Work.	20
105	Control of Work.	23
106	Control of Materials.	28
107	Legal Relations and Responsibility to Public.	31
108	Commencement, Prosecution and Progress.	36
109	Measurements and Payments.	41

PART 200 — EARTHWORK

SECTION	TITLE	
201	Clearing and Grubbing.	51
205	Roadway Excavation.	52
206	Structure Excavation and Backfill.	54
210	Borrow Excavation.	55
211	Fill Construction.	56
215	Earthwork for Open Channels.	58
220	Riprap Construction.	61
225	Watering.	62

PART 300 — STREETS AND RELATED WORK

SECTION	TITLE	
301	Subgrade Preparation.	67
310	Untreated Base.	68
311	Soil-Cement Base Course.	69
312	Cement Treated Base.	71
313	Bituminous Treated Base Course.	75
315	Bituminous Prime Coat.	77
320	Road-Mixed Surfacing.	79
321	Asphalt Concrete Pavement.	81
322	Asphalt Concrete Overlay.	90
323	Heater Remix Resurfacing.	91
324	Portland Cement Concrete Pavement.	92
329	Tack Coat.	101
330	Asphalt Chip Seal.	102
331	Precoated Chip Seal.	105
332	Asphalt Emulsion Slurry Seal Coat.	105
333	Fog Seal Coats.	108
334	Preservative Seal for Asphalt Concrete.	109
335	Hot Asphalt-Rubber Seal.	110

336	Pavement Matching and Surface Replacement.....	112
340	Concrete Curb, Gutter, Sidewalk, Driveways and Alley Entrances.	116
341	Terrazo Sidewalks.	118
342	Decorative Pavement, Concrete Paving, Stone or Brick.	120
343	Exposed Aggregate Paving.....	122
345	Adjusting Frames, Covers, Valve Boxes and Water Meter Boxes.....	122
350	Removal of Existing Improvements.	123
360	Telecommunications Installation.	125

PART 400 — RIGHT-OF-WAY AND TRAFFIC CONTROL

SECTION	TITLE	
401	Traffic Control.	129
405	Monuments.....	131
410	Precast Safety Curbs.....	131
415	Flexible Metal Guardrail.	132
420	Chain Link Fences.	134
424	Parkway Grading.	136
425	Topsoils.	136
430	Landscaping and Planting.....	137
440	Sprinkler Irrigation System Installation.	141

PART 500 — STRUCTURES

SECTION	TITLE	
501	Driving Piles.....	149
505	Concrete Structures.	154
506	Precast Prestressed Concrete Members.	163
510	Concrete Block Masonry.	170
511	Brick Masonry.	171
515	Steel Structures.....	173
520	Steel and Aluminum Handrails.....	176
525	Pneumatically Placed Mortar.	177
530	Painting.....	179

PART 600 — WATER AND SEWER

SECTION	TITLE	
601	Trench Excavation, Backfilling and Compaction.....	187
602	Encasement of Water or Sewer Pipe by Jacking or Tunneling Operation.	193
603	Installation For High Density Polyethylene Pipe.	195
605	Subdrainage.	197
610	Water Line Construction.	200
611	Disinfecting Water Mains.....	209
615	Sewer Line Construction.	212
616	Reclaimed Water Line Construction.....	217
618	Storm Drain Construction with Concrete Pipe.	218
620	Cast-In-Place Concrete Pipe.....	221
621	Corrugated Metal Pipe and Arches.....	225
625	Manhole Construction and Drop Sewer Connections.....	226
630	Tapping Sleeves, Valves and Valve Boxes on Water Lines.....	228
631	Water Taps and Meter Service Connections.....	234

PART 700 — MATERIALS

SECTION	TITLE	
701	Rock, Gravel and Sand.....	239
702	Base Materials.	241
703	Riprap.....	243
705	Portland Cement Treated Base.....	244

709	Reclaimed Asphalt Pavement	244
710	Asphalt Concrete.	245
711	Paving Asphalt.	253
712	Liquid Asphalt.	256
713	Emulsified Asphalts.	259
715	Slurry Seal Materials.	262
716	Cover Material.	264
717	Asphalt-Rubber.	266
718	Preservative Seal for Asphalt Concrete.	267
719	Recycled Asphalt Concrete Hot Mixed.	268
725	Portland Cement Concrete.	272
726	Concrete Curing Materials.	280
727	Steel Reinforcement.	280
728	Lean Grout ABC Slurry.	281
729	Expansion Joint Filler.	281
735	Reinforced Concrete Pipe.	283
736	Non-Reinforced Concrete Pipe.	287
737	Asbestos-Cement Pipe and Fittings for Storm Drain and Sanitary Sewer.	289
738	High Density Polyethylene Pipe & Fittings for Storm Drains & Sanitary Sewers.	290
741	Lining for Reinforced Concrete Sanitary Sewer Pipe.	292
743	Vitrified Clay Pipe.	295
744	ABS Truss Pipe and Fittings.	296
745	PVC Sewer Pipe and Fittings.	298
750	Iron Water Pipe and Fittings.	299
752	Asbestos-Cement Water Pipe and Fittings.	300
753	Galvanized Pipe and Fittings.	301
754	Copper Pipe, Tubing and Fittings.	301
755	Polyethylene Pipe for Water Distribution.	301
756	Fire Hydrants.	303
757	Sprinkler Irrigation System.	304
758	Concrete Pressure Pipe - Steel Cylinder Type.	307
760	Coating Corrugated Metal Pipe and Arches.	307
761	Structural Plate Pipe, Arches and Pipe Arches.	309
765	Rubber Gaskets for Concrete Pipe.	310
770	Structural and Rivet Steel, Rivets, Bolts, Pins and Anchor Bolts.	311
771	Galvanizing.	312
772	Chain Link Fence.	313
775	Brick and Concrete Block.	317
776	Masonry Mortar and Grout.	318
778	Lumber.	320
779	Wood Preservatives.	321
780	Timber Piles.	322
781	Steel Piles.	322
782	Concrete Piles.	323
785	Steel Castings.	323
786	Bronze Castings.	324
787	Gray Iron Castings.	325
790	Paint.	326
792	Dust Palliative.	329
795	Landscape Material.	331
INDEX		335

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