

Manual of
Standard Plans

2007
EDITION



A Manual for General Contractors and the Construction Industry

Manual of
Standard Plans

2007
EDITION

Published by
Utah LTAP Center
Utah State University
8205 Old Main Hill
Logan UT 84322-8205
(800) 822-8878 or (435) 797-2931

A Manual for General Contractors and the Construction Industry

Copyright © 1997

**UTAH CHAPTER
AMERICAN PUBLIC WORKS ASSOCIATION**

**UTAH CHAPTER
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA**

Non-commercial, educational and scientific use of this document by regulatory agencies is regarded as a fair use and not a violation of copyright. Regulatory agencies may make additional copies of any part of this document for their own internal use. Copies may also be made available to the public by regulatory agencies as required by law.

Printed in the United States of America

First printing July, 1997 - 600 copies
Second Printing, January 2002 - 1,200 copies
Third Printing, January 2007, 2,000 copies

PREFACE

With the help of the Utah Chapter of the Associated General Contractors of America, the Standard Plans Committee worked under the jurisdiction of the Utah Chapter of the American Public Works Association and first published this manual in 1997.

This manual was developed from standard plans published by Cities, Counties and various improvement districts along the Wasatch front. Representatives from various municipalities and utility districts participated in the review of this document.

The original edition contained compromises where divergent views had to be reconciled. Generally these views had to do with differences in established local practice with no clear-cut superiority of one method over another. This edition is a result of various changes and improvements approved by the Standard Plans Committee.

This Manual is published as a service to cities, counties and public agencies in the State of Utah. It is intended as a useful guide, rather than as a codification of the best standards that exclude other standards. Certainly, in many instances, there are other ways of accomplishing the desired construction utilizing alternate methods and materials.

The construction industry has embraced this manual because it provides construction uniformity among contracting agencies that have adopted the use of this manual.

To recommend an improvement to this document, submit the following information to the chairman of the Standard Specifications and Drawings Subcommittee. The web site is (<http://utah.apwa.net>).

- Identification of the problem.
- Recommendation of how to solve the problem.
- Provision of recommended text or drawing supporting the recommendation.

Construction experts and design professionals will carefully review the proposed changes in open meetings.

REFERENCE

The term "APWA Section" which is used on the plans refers to specification sections published by the Utah Chapter of the American Public Works Association in the document entitled "Manual of Standard Specifications". The Manual of Standard Specifications has been in existence since 1991 and was originally entitled "Utah Public Works General Conditions and Standard Specifications for Construction".

ENGLISH EQUIVALENT

Metric	Recommended English Equivalent
2.36 mm	1/8 in.
4.75 mm	1/4 in.
9.5 mm	3/8 in.
12.5 mm	1/2 in.
19.0 mm	3/4 in.
25.0 mm	1 in.
37.5 mm	1-1/2 in.
75 mm	3 in.
150 mm	6 in.
200 mm	8 in.
250 mm	10 in.
300 mm	12 in.

Metric	Recommended English Equivalent
400 mm	15 in.
500 mm	18 in.
600 mm	2 ft.
800 mm	2 1/2 ft.
900 mm	3 ft.
1.00m	3 1/2 ft.
1.25 m	4 ft.
1.50 m	5 ft.
1.75 m	6 ft.
2.00 m	7 ft.
2.50 m	8 ft.

The "Recommended English Equivalents" are rounded for use in interpreting metric sizes

SLOPE

Rise : length	Percent	Degrees
1 : 6.25	16.00	9.0903
1 : 8	12.50	7.1250
1 : 8.33	12.00	6.8455
1 : 10	10.00	5.7106
1 : 12	8.33	4.7636
1 : 13	7.69	4.3987
1 : 14	7.14	4.0856
1 : 15	6.67	3.8241
1 : 16	6.25	3.5763
1 : 17	5.88	3.3665
1 : 18	5.55	3.1798
1 : 19	5.26	3.0128
1 : 20	5.00	2.8624
1 : 30	3.33	1.9092
1 : 50	2.00	1.1458
1 : 100	1.00	0.5729

CONTENTS

Preface.....	i
Reference	i
English equivalent.....	ii
Slope	ii
Contents.....	iii

PART 1 – GENERAL REQUIREMENTS ← Click to open part 1

Contract Closeout	
110 Arrow diagram for project close-out	3
Erosion Control	
121 Straw bale barrier	5
122 Silt fence.....	7
123 Diversion dike	9
124 Inlet protection	11
125 Equipment and vehicle wash down area	17
126 Stabilized roadway entrance	19
127 Utility Line Location in Street Right of Way.....	Appendix A

PART 2 - ROADWAY ← Click to open part 2

Abbreviations and Symbols	
201 Abbreviations and symbols for roadway drawings.....	23
Curb, Gutter, Driveway, Sidewalk	
205 Curb and gutter	25
209 Curbs	29
211 Waterway	31
213 Waterway transition structure.....	33
215 Dip driveway approach.....	35
216 Mountable curb driveway approach	37
221 Flare driveway approach	39
222 Saw-cut driveway approach	43
225 Open driveway approach	45
229 Piped driveway approach	47
231 Concrete sidewalk	51
232 Patterned concrete park strip	53
235 Corner curb cut assembly	55
236 Tangent curb cut assembly	61
237 Islands and median	67
238 Detectable warning surface.....	69
241 Parking meter post	71
242 Form strip filler	73
Roadways	
251 Asphalt concrete pavement tie in	75

254S	Bike Path-Bike Lane Typical Section.....	Appendix A
------	--	------------

267S	Minimum Recommended Turnaround for Cul-de-sac.....	Appendix A
------	--	------------

268S	Alternate Turn Around.....	Appendix A
------	----------------------------	------------

269S	Typical Street Cross Section.....	Appendix A
------	-----------------------------------	------------

PART 2 - ROADWAY (Continued)

264S	Private Street Cross Section.....	Appendix A
------	-----------------------------------	------------

252	Curb and gutter replacement without pavement tie in	77
-----	---	----

253	Asphalt concrete pavement overlay	79
-----	---	----

255	Asphalt concrete "T" patch	83
-----	----------------------------------	----

256	Concrete pavement patch	87
-----	-------------------------------	----

261	Concrete pavement joints	89
-----	--------------------------------	----

265	Crack sealing – asphalt pavement.....	93
-----	---------------------------------------	----

266	Crack filling – asphalt pavement	95
-----	--	----

270S	Typical Alley Cross Section.....	Appendix A
------	----------------------------------	------------

Survey Monument

271	Corner and boundary markers	97
-----	-----------------------------------	----

272	Monument cap and base.....	99
-----	----------------------------	----

273	Frame and cover for monument.....	101
-----	-----------------------------------	-----

274	274S Survey monument placement under pavements.....	Appendix A 103
-----	---	----------------

275	Cover collar for survey monuments	105
-----	---	-----

General

291	Defective concrete.....	107
-----	-------------------------	-----

292	Street name sign (typical).....	109
-----	---------------------------------	-----

PART 3 - STORM DRAIN ← Click to open part 3

Abbreviations and Symbols

301	Abbreviations and symbols for storm drains	113
-----	--	-----

Catch Basins, Inlets, Outlets and Hardware

302	30" Frame and cover	115
-----	---------------------------	-----

303	44" Frame and cover	119
-----	---------------------------	-----

304	48" Cover and frame	121
-----	---------------------------	-----

305	51" Cover and frame	123
-----	---------------------------	-----

308	35 1/2" Grate and frame with adjustable curb box.....	129
-----	---	-----

309	47 3/4" Grate and frame.....	131
-----	------------------------------	-----

310	48" Grate and frame	135
-----	---------------------------	-----

315	Catch basin.....	137
-----	------------------	-----

316	Combination inlet/cleanout box	141
-----	--------------------------------------	-----

317	Curb inlet/outlet	143
-----	-------------------------	-----

320	Debris grate inlet	147
-----	--------------------------	-----

321	Automatic flap gate (pressurized storm drains)	149
-----	--	-----

322	Curb outlet	151
-----	-------------------	-----

323	Pipe outfall access control rack.....	153
-----	---------------------------------------	-----

Cleanout Box and Hardware

330	Cleanout box	155
-----	--------------------	-----

331	Cleanout box	157
-----	--------------------	-----

332	Cast in-place manhole.....	159
-----	----------------------------	-----

335	Adjust reinforced concrete deck to grade	161
-----	--	-----

PART 3 – STORM DRAIN (Continued)

Manhole and Hardware	
341	Precast manhole 163
345	Concrete deck 167
360	Raise frame to grade – plastic form 169
361	Raise frame to grade – grade ring 171
362	Cover collar for storm drains 173
Piping	
372	Area drain 175
373	Concrete pier 177
Trenching	
381	Trench Backfill 179
382S	Pipe Laying Flow Chart and Drawing.....Appendix A

PART 4 - SANITARY SEWER ← Click to open part 4

Abbreviations and Symbols	
401	Abbreviations and symbols for sewer 185
Manholes and Hardware	
402	30" Frame and cover 187
411	Sanitary sewer manhole..... 189
412	Invert cover..... 191
413	Cover collar for sanitary sewer manhole..... 193
Piping	
431	Sewer lateral connection 195
432	Sewer lateral relocation..... 197
433	Pipe drop..... 199
434S	Pressure Line Sewer Cleanout.....Appendix A
Liquid Separation Systems	
441	Grease trap..... 201
441S	Grease Trap and Sampling Manhole.....Appendix A
Trenching - See Trenching requirements under Section 3	
435S	Combination Air Valve Vault.....Appendix A

PART 5 - WATER SYSTEMS ← Click to open part 5

Abbreviations and Symbols	
501	Abbreviations and symbols for water 205

PART 5 – WATER SYSTEMS (Continued)

Concrete Boxes and Hardware

502 27" Frame and cover 207
503 38" Frame and cover 209
505 Concrete boxes 211

Fire Hydrants

511 Fire hydrant with valve..... 213
512S Yard Hydrant Supplemental.....Appendix A

Meters

521 3/4" and 1" meter..... 215
522 1 1/2" and 2" meter..... 217
523 3" & 4" Compound meter with 2" bypass 219
525 6" Compound meter with 2" bypass 221
527 8" Compound meter with 2" bypass 223
529 10" Turbo meter with 6" turbo meter and 2" bypass 225

Monitoring Systems

535 Electrolysis monitoring station details 227

Piping

541 Water service line..... 229
542 Waterline loop 231
543 Fire hydrant relocation..... 233
551 3/4" and 1" Service taps 235
552 1 1/2" and 2" Service taps 237

Trust Blocks

561 Direct bearing thrust block..... 239
562 Tie-down thrust restraints..... 241

Trenching - See Trenching requirements under Section 3

Valves

571 2" Washout valve 243
572 Detector check valve with 3/4" bypass meter 245
573 6" Pressure reducing valve with 2" bypass 247
574 Cover collar for water valve boxes 249
575 Air release assembly 251

General

593 Pressurized irrigation water and potable water interface 253

PART 6 - IRRIGATION AND LANDSCAPING ← Click to open part 6

Abbreviations and Symbols

601 Abbreviations and symbols for irrigation and landscaping..... 259

Gravity Flow System

611 Curb inlet box for irrigation 261

613 Irrigation diversion box 263

614 Irrigation diversion box 265

Heads

621 Stationary head 267

622 Pop-up head..... 269

Valves

631 Backflow preventer 271

632 Drain valve..... 273

633 Control valve..... 275

635 Isolation shut-off valve..... 277

Electrical

651 Wire runs for landscape irrigation 279

Trees and Plants

681 Tree 281

683 Shrubs and bushes 283

PART 7 - COMMUNICATIONS, LIGHTING, TRAFFIC CONTROL ← Click to open part 7

COMMUNICATIONS

LIGHTING

Street Lighting

710 Riser 287

730 Collar for street light pole 289

731 Pull box..... 291

732 Trench for street light conduit..... 293

733 Joint use trench – street lighting..... 297

736 Street light pole terminal 299

737 Street light meter pedestal 301

741 Screw-in base street light pole 303

742 Direct burial street light pole 305

PART 7 – COMMUNICATIONS, LIGHTING, TRAFFIC CONTROL (Continued)

TRAFFIC CONTROL

Light Pole Standards

751	Signal pole foundation.....	307
752	Signal pole wiring	309

Speed Humps

761	Speed Bump.....	311
762	Speed Table	313

PART 8 - GENERAL FACILITIES ← Click to open part 8

Design Standards

805	Design vehicle – type A.....	317
805	Design vehicle – type B.....	319

Security Fencing

831	Chain link fence.....	321
-----	-----------------------	-----

Miscellaneous

880	Bus stop pad	323
881S	Bus Pull-out - Type 1.....	Appendix A
882S	Bus Pull-out - Type 2.....	Appendix A

TOPICAL INDEX	325
----------------------	-------	------------

END OF CONTENTS

901S	Front Load Solid Waste Bin Enclosure.....	Appendix A
------	---	------------

