

TABLE OF CONTENTS
ST. GEORGE CITY STANDARD SPECIFICATIONS

1.1 INTRODUCTION	1-1
1.2 DEFINITIONS	1-1
1.3 BONDS AND INSURANCE	1-8
1.4 STARTING and COMPLETING THE WORK	1-8
1.5 BEFORE CONSTRUCTION BEGINS	1-8
1.6 PRECONSTRUCTION CONFERENCE	1-8
1.7 APPROVED DOCUMENTS INTENT	1-8
1.8 AMENDING AND SUPPLEMENTING the APPROVED DRAWINGS	1-9
1.9 UNDERGROUND FACILITIES SHOWN OR INDICATED	1-9
1.10 UNDERGROUND FACILITIES NOT SHOWN OR INDICATED	1-10
1.11 REFERENCE POINTS AND MONUMENTS	1-10
1.12 CONTRACTOR'S RESPONSIBILITIES /SUPERVISION/SUPERINTENDENCY	1-10
1.13 SAFETY AND PROTECTION	1-11
1.14 SITE EMERGENCIES	1-12
1.15 AUTHORIZED VARIATIONS IN WORK	1-12
1.16 REJECTING DEFECTIVE WORK	1-12
1.17 WARRANTY AND GUARANTEE	1-12
1.18 INSPECTIONS AND OBSERVATIONS	1-12
1.19 CONTRACTOR EMPLOYEES	1-13

r, r.2 09/04

1.20	HISTORIC, ARCHAEOLOGICAL OR PALEONTOLOGICAL DISCOVERIES	1-13
1.21	WORKING HOURS	1-13
1.22	UNCOVERING WORK	1-13
1.23	CITY'S REPRESENTATIVE MAY STOP THE WORK	1-14
1.24	CORRECTION OR REMOVAL OF DEFECTIVE WORK BY CONTRACTOR	1-14
1.25	ONE YEAR CORRECTION PERIOD	1-14
1.26	ACCEPTANCE OF DEFECTIVE WORK	1-14
1.27	CORRECTION OR REMOVAL OF DEFECTIVE WORK BY OWNER	1-14
1.28	WORK FULLY COMPLETED	1-15
1.29	FINAL INSPECTION	1-15
1.31	FINAL ACCEPTANCE	1-15
1.32	SUSPENSION OF WORK	1-15
2.1	INTRODUCTION	2-1
2.2	CONSTRUCTION DRAWINGS	2-1
2.2.1		2-3
2.2.2	CURB AND GUTTER, DRAINAGE, SIDEWALKS AND STREETS	2-4
2.2.3	SEWER	2-4
2.2.4	CULINARY WATER	2-4
2.2.5	POWER	2-4
2.2.6	DETAIL SHEETS	2-5
2.2.7	GRADING PLAN	2-5
2.2.8	GENERAL UTILITY LOCATION INFORMATION	2-8
2.2.9	DRAWING SUBMITTALS	2-7
2.3	INSPECTION, TESTING AND QUALITY CONTROL	2-7
2.3.1	REQUESTS FOR INSPECTION	2-7
2.3.2	CONSTRUCTION COMPLETION INSPECTION (FINAL INSPECTION)	2-8
2.3.3	GUARANTEE OF WORK	2-8

2.3.4	QUALITY CONTROL TESTING	2-9
2.3.5	TEST REPORTS	2-9
2.4	DRAWINGS OF RECORD	2-9
2.5	BARRICADES AND WARNING SIGNS - WORK AREA PROTECTION.....	2-10
2.5.1	GENERAL TRAFFIC CONTROL REQUIREMENTS	2-10
2.6	COOPERATION WITH UTILITIES	2-13
2.7	COOPERATION BETWEEN CONTRACTORS	2-13
2.8	CONSTRUCTION STAKES, LINES AND GRADES	2-13
2.9	USE OF EXPLOSIVES	2-15
2.9.1	PERMITS AND BLAST PLAN	2-15
2.9.2	GENERAL BLASTING CRITERIA	2-15
2.9.3	LOGS	2-17
2.10	PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE. . .	2-18
2.11	SURVEY MONUMENTS.	2-18
2.12	HAZARDOUS MATERIALS DISCOVERIES	2-19
2.13	IMPROVEMENT SEQUENCE	2-20
3.1	INTRODUCTION	3-1
3.2	STREET DESIGN	3-3
3.2.1	3-3
3.2.2	ROADWAY NETWORK DESIGN	3-6
3.2.4	TECHNICAL DESIGN REQUIREMENTS	3-7
3.2.5	PAVEMENT STRUCTURAL DESIGN ..	3-16
3.2.6	CURB SIDE MAIL BOXES.	3-18
3.2.7	SIGNS AND PAVEMENT MARKING. . .	3-18
3.2.8	UNDERGROUND WATER	3-19
3.3	OFF-SITE IMPROVEMENT SOIL STUDY GUIDELINES	3-21
3.4	DRAINAGE AND FLOOD CONTROL DESIGN.....	3-23
3.4.1	GENERAL REQUIREMENTS	3-24
3.4.2	DESIGN CRITERIA - STREETS	3-25
3.4.3	DESIGN CRITERIA - STORM DRAINS	3-17

3.4.4	DESIGN CRITERIA - CULVERTS	3-27
3.4.5	DESIGN CRITERIA - BRIDGES	3-27
3.4.6	DESIGN CRITERIA - CHANNELS	3-28
3.4.7	DESIGN CRITERIA - STORAGE FACILITIES	3-29
3.4.8	FLOODPLAINS	3-30
3.4.9	EROSION CONTROL	3-31
3.5	SANITARY SEWER DESIGN	3-33
3.5.1	DESIGN FLOWS	3-33
3.5.2	MINIMUM SIZE AND DEPTH	3-34
3.5.3	ALIGNMENT	3-35
3.5.4	SERVICE CONNECTIONS	3-35
3.5.5	MANHOLES	3-37
3.5.6	UTILITY CLEARANCES	3-37
3.5.7	SUSPENDED CROSSINGS	3-38
3.5.8	PRESSURE (FORCE) MAINS	3-39
3.6	CULINARY WATER DESIGN	3-41
3.6.1	DESIGN FLOW PRESSURE	3-41
3.6.2	FLOW DESIGN CRITERIA	3-41
3.6.3	MINIMUM SIZE AND DEPTH	3-41
3.6.4	VALVES AND HYDRANTS	3-42
3.6.5	PRESSURE REDUCING VALVES	3-42
3.6.6	FIRE HYDRANT SPACING AND LOCATION	3-42
3.6.7	FIRE FLOW REQUIREMENTS	3-43
3.6.8	MISCELLANEOUS WATER SYSTEM DESIGN CRITERIA	3-44
3.6.9	NETWORK HYDRAULIC ANALYSIS	3-46
3.7	SECONDARY WATER OR WASTEWATER REUSE IRRIGATION SYSTEM	3-49
3.8	OTHER UTILITIES SYSTEMS DESIGN	3-51
3.8.1	RESPONSIBILITY	3-51
3.8.2	STREET LIGHTS	3-51
3.8.3	BURIAL OF LINES	3-51
3.8.4	LAYOUT	3-51
3.8.5	FRONT LOT LINE SYSTEMS	3-51
3.8.6	QUALITY CONTROL	3-51
3.9	TRAFFIC STANDARDS	3-53
3.9.1	ACCESS CONTROL	3-53
3.9.2	TRAFFIC IMPACT STUDIES	3-53

r, r.2 09/04

3.10 SURVEY MONUMENTATION STANDARDS	3-57
3.10.1 GENERAL REQUIREMENTS	3-57
3.10.2 MONUMENTS	3-57
3.10.3 TYPES OF MONUMENTS	3-58
4.1	4-1
4.2 SURVEY REQUIREMENTS	4-2
4.3 EARTHWORK	4-3
4.3.1	4-3
4.3.2 CONSTRUCTION METHODS	4-3
4.3.3 QUALITY CONTROL	4-6
4.3.4 SPECIAL REQUIREMENTS	4-7
4.4 PIPELINE CONSTRUCTION	4-09
4.4.1 MATERIALS	4-09
4.4.2 CONSTRUCTION METHODS	4-24
4.4.3 QUALITY CONTROL	4-38
4.5 ROADWAY CONSTRUCTION	4-46
4.5.1 GENERAL REQUIREMENTS	4-46
4.5.2 CONSTRUCTION STAKING	4-48
4.5.3 GRADE CONTROL SYSTEMS	4-47
4.5.4 GEOTECHNICAL INVESTIGATION	4-48
4.5.5 ROADWAY SUBGRADE	4-48
4.5.6 SUBBASE - CLASS I AND CLASS II	4-51
4.5.7. UNTREATED ROADBASE - ONE INCH AND THREE-QUARTER INCH	4-53
4.5.8 PRIME COAT	4-55
4.5.9 TACK COAT	4-57
4.5.10 DENSE-GRADED ASPHALT	4-58
4.5.11 HYDRATED LIME FOR ASPHALT MIXTURE	4-60
4.5.12 AGGREGATE	4-61
4.5.13 STORING, MIXING AND SHIPPING OF PLANT MIX BITUMINOUS PAVEMENTS	4-63
4.5.14 Asphalt Concrete Surge And Storage Silos	4-66
4.5.15 Shipping Asphalt Mixtures	4-67
4.5.16 Surface Preparation For Asphalt Overlays	4-67
4.5.17 Adjustment of Manhole And Utility Covers	4-67
4.5.18 Asphalt Paving Equipment	4-67
4.5.19 Rollers	4-69
4.5.20 Weather And Date Limitations	4-69

4.5.21 Spreading And Finishing	4-70
4.5.22 Rolling And Compacting	4-72
4.5.23 Open-graded Wearing Course	4-74
4.5.24 Acceptance Testing Requirements And Tolerances	4-70
4.6 Bituminous Seal Coat (Chip Seal)	4-85
4.6.1 Material Specifications	4-85
4.6.2 Aggregate Quality Control	4-86
4.6.3 Equipment	4-88
4.6.4 Bituminous Chip Seal Construction Methods	4-89
4.7 Asphalt Emulsion Seal Coat (Slurry Seal)	4-94
4.7.1 Material Specifications	4-94
4.7.2 Material Quality Control	4-98
4.7.3 Equipment	4-98
4.7.4 Asphalt Emulsion Slurry Construction Methods	4-99
4.8 Concrete Work	4-103
4.8.1 Materials	4-103
4.8.2 Construction Methods And Equipment	4-110
4.8.3 Quality Control	4-123
4.9 Restoration of Existing Surface Improvements	4-120
4.9.1 Introduction	4-120
4.9.2 Gravel Surfaces	4-120
4.9.3 Bituminous Surfaces	4-120
4.9.4 Concrete Surfaces	4-121

Section 5 - Signing and Pavement Markings

5.1 Introduction	5-1
5.2 Signing Materials, Fabrication and Placement	5-1
5.2.1 Street Name Signs	5-1
5.2.2 Traffic Signs	5-1
5.2.3 Visibility	5-1
5.3 Pavement Markings	5-2
5.3.1 Line Types	5-2
5.3.2 Pavement Word and Symbol Markings	5-2
5.3.3 Traffic Paint	5-2
5.3.4 Temporary Markings	5-3
5.3.5 Raised Pavement Markers	5-3

r, r.2 09/04

Section 6 - Street Lighting	
6.1 Introduction	6-1
6.2 Streetlight Pole	6-1
6.3 Policy Number 5.6 "Street Lights and Yard Lights"	6-1
Section 7 - Power System	
7.1 Introduction	7-1
7.2 Electric Services	7-1
7.2.1 Power Connection	7-1
7.2.2 Electric Service Agreement	7-1
7.2.3 Customer Service Facilities	7-1
7.3 Materials and Workmanship	7-2
7.4 Control of Ground Water	7-2
7.5 Excavation and Backfill	7-2
7.6 Concrete	7-3
7.7 Meters	7-3



TABLES
TABLE OF CONTENT

Table #	Table Name	
3.1	Street Cross-Section Configuration	3-5
3.2	Access Distance From Corner	3-9
3.3	Street/Gutter Capacity for 10-Year Event	3-26
3.4	Sanitary Sewer Design Flows	3-33
3.5	Sanitary Sewer Minimum Slopes	3-34
3.6	Sanitary Sewer Laterals	3-36
4.1	Backfill Material	4-27
4.2	Minimum Roadway Structural Requirements	4-50
4.3	Subbase Aggregate Gradation	4-53
4.4	Roadbase Aggregate Gradation	4-55
4.5	Paving Grade Liquid Asphalt Requirements	4-59
4.6	Marshall Design Requirements	4-61
4.7	Dense-Graded Asphalt Aggregate Gradation	4-63
4.8	Climate Limitations	4-72
4.9	Open-Graded Asphalt Aggregate Gradation	4-77
4.10	Rubberized Liquid Asphalt Requirements	4-78
4.11	Gradation of Aggregate for Chip Seal Coats	4-90
4.12	Slurry Seal Test Specification/Emulsion	4-100
4.13	Slurry Seal Test Specification/Residue	4-100
4.14	Slurry Seal Test Specification/Job Mixture	4-101
4.15	Slurry Mixture Gradation	4-102
4.16	Concrete Mix Specifications	4-115
4.17	Reinforcing Bar Clearance	4-121

r, r.2, 09/04

Page Left Blank Intentionally

r, r.2, 09/04

FORWARD

The *Standard Specification for Design and Construction* for the City of St. George was last published in May 1987. This 1987 edition and its associated addendums provided a service to the engineers, contractors, developers and other interested parties.

This new edition, July 2000, under the same title is designed to replace the 1987 edition. It is intended to provide standard requirements for installation of materials and systems in publicworks environments. Consequently, these standards and specifications will be used for all infrastructure work located within public streets, rights-of-ways, easements and other necessary locations within the City of St. George.

The original draft of this manual was prepared in conjunction with efforts provided by the Southern Utah Chapter of the American Public Works Association (APWA) Specification Committee. The contents of the APWA document have been modified by the St. George City Public Works and Water and Power Departments to meet the needs and requirements of the City of St. George.

The standards contained herein are considered the minimums and should be treated as such. Nothing in these standards shall be construed to prohibit the design and construction of higher type improvements, as approved by the City Engineer.

These STANDARD SPECIFICATIONS FOR DESIGN AND CONSTRUCTION meet with the full approval of the City Public Works Director, dated July 1, 2000.

**Larry H. Bulloch P.E.
Public Works Director**

Approved for use, subject to conditions, by the City Council of the City of St. George in June of 2000.



The City of St. George
 Standard Specifications for Design and Construction
 Clarifications / Revisions / Amendments /

Date: September 22, 2004

No.	Date	Description	Effective date	Comments
-----	------	-------------	----------------	----------

Clarifications:

1	Oct. 2003	Clarifies use of 4" x 8" concrete testing specimen	Nov. 2003	Method used by testing firms

Revisions:

1.	Feb. 2003	Modifies the use of Fly Ash in Concrete Section 4.8.E	Feb. 2003	This change was approved by council on Feb. 20, 2003 due to the nature of the issue.
2	Aug. 2004	Changes to Section 3.5, Sanitary Sewer	Aug. 2004	Minor changes to various specifications and drawings.

Addendums:

1	Feb. 2003	Revised table on page 4-16 to remove the use of HDPE in small pipes.	Nov. 2003	

Amendments:

1.	5/21/01	Adds changes to date along with those changes resulting from resolution of conditions of approval	various*	Various conditions were implemented upon resolution of issues with SHUBA.