



Public Works Manual

Revised: September 2015



Town of
Gypsum
EST. 1911

TABLE OF CONTENTS

1.0	<u>SEWAGE COLLECTION SYSTEM DESIGN AND LAYOUT</u>	1
1.01	PIPE SIZE	1
1.02	MINIMUM PIPE COVER	1
1.03	MINIMUM SLOPES	1
1.04	MATERIALS	2
1.05	SEWER MAIN EASEMENTS	2
1.06	SEWER SERVICE CONNECTIONS AND SERVICE PIPES	3
1.07	MANHOLES	3
1.07.1	Adjustment Rings	4
1.07.2	Manhole Steps	4
1.07.3	Manhole Covers	4
1.07.4	Invert Channels	4
1.07.5	Connective Materials	4
1.07.6	Manhole Location	5
1.07.7	Cleanouts	5
1.07.8	Drop Manholes	6
1.08	PROTECTION OF WATER SUPPLIES	6
1.08.1	Sand/Oil/Water Separators	6
1.09	TESTS AND INSPECTION	7
1.10	PRESSURE TESTING OF SEWER MAINS AND SERVICE LINES	8
1.10.1	Scope	8
1.10.2	General	8
1.10.3	Pressure Test Equipment	8
1.10.4	Pressure Testing Standard For Sewer Mains:	9
1.11	VACUUM TESTING OF MANHOLES	10
1.11.1	Scope	10
1.11.2	General	11
1.11.3	Vacuum Test	11
1.12	WASTE WATER COMPOSITION	12
2.00	<u>WATER DISTRIBUTION SYSTEM DESIGN AND LAYOUT</u>	12
2.01	SIZING DISTRIBUTION MAINS	12
2.02	FIRE PROTECTION	13
2.02.1	Fire Hydrants	13
2.03	DISTRIBUTION REGULATING AND MONITORING INSTALLATIONS	13

2.03.1 Pressure Reducing Valves (PRV)	14
2.03.2 Air Release/Vacuum Valve.....	14
2.03.3. Main line flow meter.....	14
2.03.4 Pumping Facilities.....	14
2.03.5 Storage Facilities.....	14
2.04 LAYOUT OF THE DISTRIBUTION SYSTEM.....	14
2.05 SERVICE LINE STUB OUT DESIGN AND LAYOUT FOR ALL NEW AND REPLACEMENT SERVICE LINES	16
2.06 MATERIALS FOR SERVICE CONNECTIONS, SERVICE LINES, METERS AND APPURTENANCES	17
2.06.1 Scope	17
2.06.2 Materials.....	17
2.07 JOINT RESTRAINT.....	19
2.08 WATER PIPELINE CONSTRUCTION.....	19
2.09 MATERIALS.....	19
2.10 PIPE INSTALLATION.....	20
2.11 PIPE DEFLECTION.....	23
2.12 TESTING AND ACCEPTANCE	24
2.12.1 Scope Flushing And Disinfection Of Water Lines.....	24
2.12.2 Sterilization Testing And Acceptance Of Water Lines.....	24
2.12.3 Connection To Existing Water Facilities	24
2.13 HYDROSTATIC TESTING.....	25
2.13.1 Scope	25
2.13.2 General	25
2.13.3 Pressure Test.....	25
2.13.4 Leakage Test.....	26
2.13.5 Passing	26
<u>3.00 ROAD AND STREET DESIGN AND LAYOUT.....</u>	26
3.01 STREETS	26
3.02 STREET NAMES	27
3.03 STREET NAME SIGNS	27
3.04 SPECIAL ROAD FEATURES	28
3.04.1 Dead End Streets.....	28
3.04.2 Half Streets.....	28
3.04.3 Reserve Strips.....	28
3.05 ALL WEATHER ACCESS.....	28
3.06 CONSTRUCTION ACCESS	28

3.07 DETERMINATION OF DESIGN CAPACITY - VEHICLES PER DAY (VPD)	29
3.08 EXISTING DESIGNATED ROUTES	31
3.10 PEDESTRIAN/BIKE PATHS	32
3.11 ROAD SECTION DESIGN BY GEOTECHNICAL ENGINEER	32
3.12 SUBGRADE STABILIZATION IN AREAS OF POTENTIALLY HIGH GROUNDWATER	32
3.13 ACCESS POINTS	32
3.14 INTERSECTIONS	33
3.15 INTERSECTION SIGHT DISTANCE	33
3.15.1 Signs at Intersections	34
3.15.2 Traffic Control Devices	34
3.16 UTILITIES AND STREET CONSTRUCTION	34
3.17 STREET LIGHTS	35
3.18 PAVEMENT MARKING	35
3.18.1 Scope	35
3.18.2 Specifications.....	35
3.18.3 Materials.....	35
3.18.4 Pavement Preparations And Application	35
3.18.5 Crosswalks And In-Pavement Directional Arrows	36
3.19 GUARDRAIL	36
3.20 ROAD AGGREGATE	36
3.20.1 Scope	36
3.20.2 Materials.....	36
3.20.3 Placing.....	37
3.20.4 Proof Rolling, Stability	37
3.21 CURB, GUTTER & SIDEWALK	37
3.21.1 Scope	37
3.21.2 Materials.....	37
3.21.3 Subgrade Preparation	38
3.21.4 Concrete Placement	38
3.21.5 Finishing	38
3.21.6 Stripping Forms	39
3.21.7 Jointing	39
3.21.8 Curing.....	39
3.21.9 Tolerances.....	39
3.22 STREET CUT	40
3.22.1 Work Commencement and Permitting	40
3.22.2 Materials and Placement.....	40
3.22.3 Schedule	41
3.22.4 Temporary Pavement Patch	41
3.22.5 Roadway Usage Between Operations	41

3.23 PARKING LOT LAYOUT	42
3.24 ALLEYS	42
3.25 BLOCKS.....	43
4.00 <u>DRAINAGE ANALYSIS AND SYSTEMS DESIGN CRITERIA</u>	43
4.01 GENERAL	43
4.02 OFF SITE DRAINAGE AND BASE STORM DISCHARGE	43
4.03 MINOR STORM EVENT AND MITIGATION BY DETENTION	44
4.04 DEBRIS FLOW MANAGEMENT SYSTEMS.....	44
4.05 CALCULATION METHODS	45
4.06 DRAINAGE DESIGN CRITERIA	47
4.07 STORM DRAINAGE.....	49
4.07.1 Scope	49
4.07.2 Materials.....	49
4.07.3 Certification by Manufacturer	50
4.07.4 Pipe Installation	50
4.07.5 Manholes.....	50
4.07.6 Manholes and Catch Basins	50
4.07.7 Tests	51
4.07.8 Pipe Bedding and Trench Backfill.....	51
5.00 <u>UNDERDRAINS AND SUBSURFACE DRAINAGE SYSTEMS</u>	54
5.01 GENERAL	54
5.02 PIPE SIZE AND GRADES	54
5.03 CLEANOUTS AND MANHOLES.....	54
5.04 SUBSURFACE DRAINAGE	54
5.04.1 Scope	54
5.04.2 Materials.....	55
6.00 <u>EROSION AND SILTATION CONTROL AND REVEGETATION</u>.....	55
6.01TEMPORARY AND PERMANENT EROSION CONTROL DURING CONSTRUCTION	55
6.02 REVEGETATION.....	57
6.02.1 Certification by Manufacturer	58
6.02.2 Temporary Erosion Control	58
6.02.3 Permanent Erosion Control.....	58
6.03 DUST CONTROL	59

6.03.1 Scope	59
6.03.2 Topsoil.....	59
6.03.3 Revegetation Procedure.....	60
6.04 RESTORATION OF GROUNDS.....	61
6.04.1 Scope	61
6.04.2 Alternative Protection	62
6.04.3 Maintenance	62
6.04.4 Success and Approval of Revegetation Work.....	63
7.00 <u>EXCAVATION</u>.....	63
7.01 SCOPE.....	63
7.02 CLASSIFICATION	63
7.03 UNCLASSIFIED EXCAVATION	63
7.04 BLASTING.....	64
7.05 USE OF EXCAVATED MATERIALS.....	64
7.06 DISPOSAL OF WASTE OR SURPLUS MATERIALS.....	64
7.07 BRACING AND SHORING	64
7.08 STRUCTURE AND TRENCH EXCAVATION.....	64
7.09 BORROW EXCAVATION	64
7.10 OVEREXCAVATION	65
7.11 DEWATERING	65
7.12 SITE PREPARATION.....	65
8.00 <u>EARTH FILL</u>	65
8.01 SCOPE.....	65
8.02 MATERIALS	65
8.03 FOUNDATION PREPARATION	65
8.04 PLACEMENT.....	66
8.05 CONTROL OF MOISTURE CONTENT	66
8.06 COMPACTION	67
8.07 REMOVAL AND REPLACEMENT OF DEFECTIVE FILL	67
8.08 TESTING	67

8.09 LIMITS OF CONTRACTOR WORK ACTIVITY	67
9.00 <u>SHALLOW UTILITIES (UNDER GROUND ELECTRIC, TELEPHONE, CABLE TELEVISION, NATURAL GAS & IRRIGATION)</u>	68
9.01 SCOPE	68
9.02 SPECIAL CONDUIT ENCASEMENT	68
9.03 SHALLOW UTILITY INSTALLATION	68
10.00 <u>PORTLAND CEMENT CONCRETE</u>	69
10.01 MATERIALS	69
10.02 PROPORTIONING	70
10.03 STRENGTH REQUIRED	70
10.04 APPLICABLE STANDARDS	70
10.05 REINFORCEMENT STEEL	70
10.06 MIXING AND HAULING	70
10.07 FORMING	70
10.08 PLACING	71
10.09 VIBRATING	71
10.10 JOB CONDITIONS	71
10.11 TESTING	72
11.00 <u>HOT BITUMINOUS PAVEMENT TESTING</u>	73
11.01 SCOPE	73
11.02 REFERENCE SPECIFICATIONS	73
11.03 MATERIALS	73
11.04 CONSTRUCTION	73
12.00 <u>TRAFFIC REGULATION</u>	73
12.01 SCOPE	73
12.02 FLAG PERSON (S)	74

12.03 WARNING SIGNS AND LIGHTS	74
13.00 <u>TESTING AND INSPECTION</u>	74
13.01 SCOPE.....	74
13.02 COMPACTION TESTING.....	74
13.03 CONCRETE TESTING	75
13.04 WELDING INSPECTION AND TESTING.....	75
13.05 NOTIFICATION of the TOWN OF GYPSUM by the CONTRACTOR of WORK SCHEDULE	75
13.06 STOPPAGE OF WORK	76
13.07 SEWER INSPECTION/VIDEO	76
14.00 <u>RECORD DRAWINGS</u>.....	76
14.01 SCOPE.....	76
14.02 RECORDING DURING CONSTRUCTION.....	76
14.03 SUBMISSION	78
APPENDIX A -- STANDARD DETAILS FOR SEWER	
APPENDIX B – STANDARD DETAILS FOR WATER	
APPENDIX C – STANDARD DETAILS FOR ROAD	
APPENDIX D – STANDARD DETAILS FOR STORM SEWER	

AUTHORITY

The following special conditions and design criteria (Gypsum Public Works Manual) shall be used in the preparation of design plans and specifications for land development and public works projects in the Town of Gypsum, Colorado.

The applicant is responsible for complete compliance with these specifications. The Gypsum Public Works Manual will take precedence over the Town of Gypsum's review. The Town of Gypsum is not responsible for omissions that may occur during its plan review process. Variances are allowed only after approval by the Town Council.