

# **CITY OF GRASS VALLEY**



**PUBLIC WORKS DEPARTMENT - ENGINEERING DIVISION**

**CONSTRUCTION STANDARDS**

**AND**

**STANDARD DETAILS**

**Revision: May 2016**

# TABLE OF CONTENTS

## Section 1

### Purpose, Definitions and Abbreviations (PD)

1-1	Purpose	PD 1
1-2	Construction Practice	PD 1
1-3	Definitions	PD 1
1-4	Abbreviations	PD 4
1-5	Updates	PD 6

## Section 2

### Responsibilities and Requirements (RR)

2-1	General	RR 1
2-2	Developer's Responsibility	RR 1
	A. Consulting Engineer Change	RR 1
	B. Inspection and Other Fees	RR 1
	C. Overtime Inspection Fees	RR 2
	D. Plan Revisions During Construction	RR 2
	E. Plans and Permits	RR 2
	F. Record Drawings	RR 3
2-3	Contractor's Responsibility	RR 3
	A. Blasting and Explosive Requirements	RR 3
	B. Cultural Resources	RR 3
	C. Concrete Truck Washout Areas	RR 3
	D. Construction Safety	RR 3
	E. Contractor Employee Vehicle Parking	RR 3
	F. Dust Control	RR 3
	G. Emergency Contact Person	RR 4
	H. Fluid Discharge	RR 4
	I. Hazardous Materials	RR 4
	J. Inspection Requirements	RR 4
	K. Interruption of Parking Areas	RR 5
	L. Material Disposal	RR 5
	M. Materials Approval	RR 5
	N. Notification/Preconstruction Meeting	RR 5
	O. Personnel	RR 6
	P. Plans	RR 6
	Q. Preservation of Property	RR 6
	R. Record Drawings	RR 6
	S. Staking	RR 6
	T. Storm Water Pollution Prevention Plan (SWPPP)	RR 6
	U. Street Cleaning	RR 6
	V. Survey Monuments	RR 6
	W. Temporary Fencing	RR 6
	X. Trenching Safety	RR 7
	Y. Traffic Control	RR 7
	Z. Trailer and Material Storage	RR 9
	AA. U.S.A. Markings	RR 9
	BB. Weather	RR 9
	CC. Working Hours	RR 9
	DD. Public Works Contractor Registration Program	PR 9

2-4	Residential Occupancies During Subdivision Building	RR 9
	A. Barricades	RR 9
	B. Debris	RR 9
	C. Erosion Control	RR 9
	D. Landscaping Materials	RR 10
	E. Other Requirements	RR 10
	F. Street Cleaning	RR 10
	G. Street Lighting	RR 10
	H. Street Parking	RR 10
2-5	Requirements for Subdivision Certificate of Completion (C.O.C.)	RR 10
	A. Landscaping	RR 10
	B. Final Inspection	RR 11
	C. Bond	RR 11
	D. Fees	RR 11
	E. Pad Certificates	RR 11
	F. Record Drawings	RR 11
	G. Certificate of Completion	RR 11
2-6	Warranty and Guarantee	RR 11
	A. Security	RR 11
	B. Repairs	RR 11
	C. Obligations	RR 12
	D. Release of Security	RR 12

### **Section 3 Streets (ST)**

3-1	General	ST 1
3-2	Existing Roadway Disturbance	ST 1
	A. Existing Stub Street Connection	ST 1
	B. Street Widening	ST 1
	C. Sawcutting Existing Streets	ST 1
	D. Adjacent Roadway Excavation	ST 1
	E. Pavement Milling Requirements	ST 1
3-3	Construction Staking	ST 1
3-4	Utility Relocation	ST 2
3-5	Trench Work	ST 2
	A. Existing Pavement Trenching	ST 2
	B. Trench T-Cut	ST 2
	C. Weather	ST 2
	D. Water in Trench	ST 2
	E. Unsuitable Trench Bottom	ST 2
	F. Trench Backfill	ST 3
	G. Inspection	ST 4
	H. Temporary Surfacing	ST 4
	I. Steel Plates	ST 4
3-6	Installation	ST 4
	A. General	ST 4
	B. Subgrade	ST 4
	C. Aggregate Base	ST 5
	D. Concrete	ST 5
	E. Asphalt Concrete Paving	ST 8
	F. Sound and Retaining Walls	ST 9
	G. Survey Monuments	ST 9

CST

	H.	Street Barricades	ST 9
	I.	Pavement Removal	ST 9
	J.	Utility Boxes	ST 10
	K.	Slurry Seal	ST 10
	L.	Raising Iron to Finished Grade	ST 10
3-7		Signs	ST 10
	A.	Street Signs	ST 10
	B.	Sign Posts	ST 10
	C.	Roadside Signs	ST 11
3-8		Traffic Stripes and Pavement Markings	ST 11
	A.	Material	ST 11
	B.	Removal	ST 12
	C.	Thermoplastic Application	ST 12
3-9		Materials	ST 13
	A.	Aggregate Base and Subbase	ST 13
	B.	Asphalt Concrete	ST 13
	C.	Concrete	ST 13
	D.	Concrete Curing Compound	ST 13
	E.	Epoxies, Patching Material	ST 13
	F.	Filter Fabric	ST 13
	G.	Reinforcement Bar	ST 13
	H.	Sign Posts	ST 14
	I.	Slurry Seal	ST 14
	J.	Truncated Domes	ST 14

STANDARD DETAILS

Attached at end of section

ST-1	TYPICAL TRAFFIC CONTROL LANE CLOSURE/TRANSITION
ST-2	UTILITY TRENCH BEDDING, BACKFILL AND PAVING
ST-3	CURB, GUTTER AND SIDEWALK
ST-4	CURB RAMP DETAIL, CASE "A"
ST-5	CURB RAMP DETAIL, CASE "B"
ST-6	CURB RAMP DETAIL, CASE "C"
ST-7	BARRIER CURB AND VALLEY GUTTER
ST-8	MEDIAN ISLAND
ST-9	RESIDENTIAL AND COMMERCIAL DRIVEWAY
ST-10	BUS TURNOUT CONCRETE SLAB
ST-11	BUS STOP SHELTER PAD
ST-12	SHARED USE PATH
ST-13	RESIDENTIAL ALLEY
ST-14	MINOR RESIDENTIAL STREET (PARKING ONE-SIDE)
ST-15	MINOR RESIDENTIAL STREET (NO PARKING)
ST-16	PRIMARY RESIDENTIAL STREET
ST-17	COLLECTOR STREET (NO PARKING)
ST-18	MODIFIED COLLECTOR STREET 1
ST-19	MODIFIED COLLECTOR STREET 2
ST-20	COLLECTOR STREET (WITH PARKING)
ST-21	ARTERIAL STREET
ST-22	CUL-DE-SAC STREET
ST-23	STANDARD ELBOW
ST-24	RESIDENTIAL BULBED INTERSECTION
ST-25	RESIDENTIAL RAISED INTERSECTION
ST-26	LANDSCAPE SIGHT DISTANCE
ST-27	SIGHT DISTANCE REQUIREMENTS

ST-28	ADJUST UTILITY COVER/MANHOLE TO GRADE
ST-29	SIDEWALK BARRICADE
ST-30	PEDESTRIAN BARRICADE
ST-31	END OF STREET TIMBER BARRICADE
ST-32	BOLLARD
ST-33	STREET NAME SIGN
ST-34	BOXED SURVEY MONUMENT
ST-35	TRASH ENCLOSURE
ST-36	SPEED HUMP
ST-37	ACCESS ROAD GROOVING
ST-38	UTILITY LINE LOCATIONS

## Section 4 Water Supply System (W)

4-1	General	W 1
4-2	Connection to Existing Facilities	W 1
	A. System Tap	W 1
	B. System Tie-In	W 1
4-3	Construction Staking	W 2
4-4	Concrete Cradles, Arches & Encasements	W 2
	A. Placement	W 2
	B. Installation	W 2
4-5	Trenching and Backfill	W 2
	A. Excavations	W 2
	B. Bell Holes	W 2
	C. Pipe Support	W 2
	D. Trench Backfill and Compaction	W 2
4-6	Pipe Installation	W 3
	A. Storage of Pipe	W 3
	B. Pipe Placement	W 3
	C. Joints	W 3
	D. Manufacturer's Recommendations	W 3
	E. Mechanical Restraint	W 3
	F. Tracing Wire	W 3
	G. Marking Tape	W 3
	H. Marking Pipe in Unpaved Areas	W 4
	I. Protection of Underground Metal	W 4
	J. Polyvinyl Chloride (PVC) Pressure Pipe Installation	W 4
	K. Ductile Iron Pipe (DIP)	W 5
	L. Ductile Iron Pipe Fittings	W 5
	M. Transitions Between DIP and PVC	W 5
	N. Boring of Water Lines	W 5
	O. Vertical Elevation Change	W 5
	P. Bridges and Casings	W 6
4-7	Service Installation	W 6
	A. Continuity of Installation	W 6
	B. Separation of Taps, Service Saddles and Fittings	W 6
	C. Wrapping Service Saddles	W 6
	D. Service Manifolds	W 6
	E. Backflow Prevention Device	W 6
	F. Freeze Protection for Backflow Assemblies	W 6
	G. Marking Residential Water Service	W 6

	H. Caps on Service Saddles	W 6
4-8	Abandonment of Services and Mains	W 6
4-9	Appurtenances Installation	W 7
	A. Encasement	W 7
	B. Gate Valves and Extensions	W 7
	C. Coating Buried Nuts and Bolts	W 7
	D. Reflectors for Fire Hydrants	W 7
	E. Paint for Fire Hydrants	W 7
	F. Blow-Offs for Dead-End Lines	W 7
	G. Insulating Kits	W 7
4-10	Testing Procedures	W 7
	A. Pressure Test	W 7
	B. Chlorine Disinfection	W 8
	C. Water Quality Testing	W 9
	D. Tying Into the City System	W 9
	E. Continuity Testing	W 9
	F. Corrosion Protection System Testing	W 9
4-11	Repairing Installed Improvements	W 10
	A. Damaged or Failed Pipe Sections	W 10
	B. Backfill	W 10
	C. Encasement Repair	W 10
4-12	Punchlist Process	W 10
4-13	Materials	W 10
	A. Water Main	W 10
	B. Services	W 10
	C. Appurtenances	W 12

STANDARD DETAILS Attached at end of section

W-1	¾" & 1" SERVICES
W-2	1-½" & 2" SERVICES
W-3	4" AND LARGER SERVICES
W-4	REDUCED PRESSURE BACKFLOW ASSEMBLY 2" AND SMALLER SERVICE
W-5	FIRE PROTECTION ASSEMBLY / DOUBLE CHECK VALVE
W-6	FIRE HYDRANT ASSEMBLY
W-7	CONSTRUCTION WATER DETAIL
W-8	SADDLE DETAIL
W-9	GATE VALVE AND BOX
W-10	2" BLOWOFF ASSEMBLY
W-11	1" AND 2" AIR RELEASE VALVE ASSEMBLY
W-12	TRACING WIRE SPLICE
W-13	EXOTHERMIC WELD
W-14	SHALLOW WATER MAINS
W-15	THRUST BLOCKS
W-16	WATER QUALITY SAMPLING STATION
W-17	INDOOR REDUCED PRESSURE BACKFLOW DEVICE
W-18	APPROVED METHODS FOR FILLING WATER TANKERS
W-19	¾" & 1" DOUBLE WATER SERVICE

## Section 5 Sanitary Sewer System (SS)

5-1	General	SS 1
5-2	Connection to Existing Facilities	SS 1
	A. System Tap	SS 1

	B.	Existing Sewer Stubs	SS 1
	C.	Sewer System Outfalls	SS 1
5-3		Construction Staking	SS 1
5-4		Concrete Cradles, Arches and Encasements	SS 1
	A.	Pipe Supports and Anchors	SS 2
	B.	Cradles and Arches	SS 2
	C.	Concrete	SS 2
5-5		Trenching and Backfill	SS 2
	A.	Excavations	SS 2
	B.	Bell Holes	SS 2
	C.	Pipe Support	SS 2
	D.	Trench Backfill and Compaction	SS 2
5-6		Pipe Installation	SS 2
	A.	Pipe Cleanliness	SS 2
	B.	Placing Pipe	SS 3
	C.	Joining Pipe	SS 3
	D.	Manufacturer's Recommendations	SS 3
	E.	Markings in Unpaved Areas	SS 3
	F.	Ductile Iron Pipe Installation	SS 3
	G.	Transitions from Vitrified Clay Pipe	SS 3
	H.	Boring	SS 4
	I.	Backfill Tape	SS 4
5-7		Manhole Installation	SS 4
	A.	Top of Manhole in Pavement	SS 5
	B.	Top of Manhole Off Roadway	SS 5
	C.	Frame and Lid	SS 5
	D.	Existing Manholes	SS 5
	E.	Bases	SS 5
	F.	Adjusting Manholes	SS 5
	G.	60" and 72" Diameter Manholes	SS 5
	H.	Epoxy Coated Manholes	SS 5
	I.	Manhole Backfill	SS 6
5-8		Service Installation	SS 6
	A.	Marking Residential Sewer Services	SS 6
	B.	Backflow Prevention	SS 7
5-9		Testing of Installed Improvements	SS 7
	A.	Sewer Mains and Services	SS 7
	B.	Manholes	SS 8
5-10		Punchlist Process	SS 9
5-11		Abandoning Sewer Stubs and Services	SS 9
5-12		Materials	SS 9
	A.	Sewer Mains and Service Laterals	SS 9
	B.	Manholes	SS 9
	C.	Appurtenances	SS 11
	D.	Back Flow Prevention Devices	SS 11
	E.	Sewer Lift Stations	SS 11
STANDARD DETAILS			Attached at end of section
	SS-1	STANDARD SEWER MANHOLE	
	SS-2	SEWER MANHOLE FRAME AND COVER	
	SS-3	SEWER SERVICES	
	SS-4	SEWER SERVICE CLEANOUT	
	SS-5	SEWER AND WATER SEPARATION DETAILS	

SS-6	STANDARD SEWER LIFT STATION SITE PLAN
SS-7	OUTSIDE DROP CONNECTION
SS-8	INSIDE DROP SEWER MANHOLE
SS-9	STANDARD SEWER AIR RELEASE VALVE

## Section 6 Storm Drainage (SD)

6-1	General	SD 1
6-2	Construction Staking	SD 1
6-3	Drainage Inlet Installation	SD 1
6-4	Manhole Installation	SD 1
	A. Bases	SD 1
	B. Cones	SD 2
	C. Joints	SD 2
	D. Connections	SD 2
	E. Grade Rings	SD 2
	F. Frames and Covers	SD 2
	G. Adjusting Existing Manhole Frames	SD 3
	H. Manhole Backfill	SD 3
6-5	Junction Boxes/Vaults	SD 3
6-6	Area Drains	SD 3
6-7	Trenching and Backfill	SD 3
	A. Excavation	SD 3
	B. Pipe Support	SD 3
	C. Trench Backfill and Compaction	SD 3
6-8	Pipe Installation	SD 4
	A. Laying Pipe	SD 4
	B. HDPE Pipe Testing	SD 4
	C. Pipe Laying Tolerances	SD 5
	D. Reinforced Concrete Pipe	SD 5
	E. CMP Pipe	SD 5
	F. Pavement Cutting and Repaving	SD 5
	G. Cleaning of Storm Drain System	SD 5
6-9	Channel Lining Installations	SD 5
	A. Surface Preparation	SD 5
	B. Reinforcement	SD 5
	C. Joints	SD 5
	D. Weep Holes	SD 5
	E. Cutoff Walls	SD 6
6-10	Materials	SD 6
	A. Backfill Material	SD 6
	B. Drainage Inlets	SD 6
	C. Manholes	SD 6
	D. Storm Drain Pipe	SD 7
	E. Stormwater Treatment Devices	SD 7
	F. Slurry Cement Backfill	SD 7
	G. Lined Channels	SD 8
STANDARD DETAILS		Attached at end of section
DR-1	STANDARD PRECAST DRAINAGE MANHOLE	
DR-2	TYPE A & B SADDLE MANHOLE	
DR-3	STANDARD DRAINAGE MANHOLE FRAME AND COVER	
DR-4	EROSION CONTROL PIPE DISCHARGE	
DR-5	EROSION CONTROL DITCH DISCHARGE	



DR-6	HEADWALL	
DR-7	PIPE INLET STRUCTURE	
DR-8	PIPE INLET/OUTLET STRUCTURE AND TRASH RACK	
DR-9	LINED CHANNEL SECTION	
DR-10	TRENCH DEPTH & MINIMUM COVER REQUIREMENTS	

## Section 7 Grading (GR)

7-1	General	GR 1
7-2	Construction Staking	GR 1
	A. Channels	GR 1
	B. Erosion Control Measures	GR 1
	C. Pads	GR 1
	D. Retaining Walls	GR 1
	E. Roadways	GR 1
7-3	Installation	GR 1
	A. Channels	GR 1
	B. Storm Water Pollution Prevention Plan (SWPPP)	GR 1
	C. Erosion Control Measures	GR 1
	D. Pads	GR 3
	E. Retaining Walls	GR 4
	F. Roadways	GR 4
	G. Trees	GR 4
	H. Grading Adjacent to Wetlands	GR 5
7-4	Materials	GR 6
	A. Wetland Preserve Fencing	GR 6
7-5	Soil Testing Procedures and Frequencies	GR 6
	A. Field Testing	GR 6
	B. Minimum Reporting Requirements	GR 7
	C. Trench Backfill Testing Frequencies	GR 7

### STANDARD DETAILS

Attached at end of section

GR-1	CLASS 1 LOT GRADING
GR-2	LOT GRADING CLASS II AND III
GR-3	EXTERIOR PERIMETER PROPERTY LINE GRADING
GR-4	INTERIOR PROPERTY LINE GRADING
GR-5	TREE PROTECTION

## Section 8 Landscaping and Irrigation (LS)

8-1	General	LS 1
8-2	Irrigation Installation	LS 1
	A. Trenching	LS 1
	B. Backfill	LS 1
	C. Control Wiring	LS 1
	D. Irrigation Controller	LS 2
	E. Conduits	LS 2
	F. PVC/ Brass Pipe	LS 2
	G. Sprinkler Heads	LS 3
	H. Valves	LS 3
	I. Valve Boxes	LS 3
8-3	Irrigation Testing	LS 3
	A. Service Lines and Irrigation Main	LS 3
	B. Leak Repair	LS 4

	C.	Electrical System	LS 4
8-4		Planting Installation	LS 4
	A.	Soil Preparation	LS 4
	B.	Soil Conditioning	LS 4
	C.	Fine Grading	LS 4
	D.	Tree, Shrub and Ground Cover Planting	LS 4
	E.	Hydromulch Seeding	LS 5
	F.	Seeding	LS 6
	G.	Sod Planting	LS 6
8-5		Maintenance Period	LS 6
	A.	Preliminary Inspection	LS 6
	B.	Maintenance Period	LS 6
	C.	Overall Maintenance Requirements	LS 6
	D.	Watering	LS 7
	E.	Lawn Maintenance	LS 7
8-6		Final Inspection and Acceptance	LS 7
	A.	Final Inspection	LS 7
	B.	Corrective Work	LS 7
	C.	Acceptance	LS 7
8-7		Guarantee	LS 7
	A.	Plants	LS 7
	B.	Irrigation	LS 8
8-8		Irrigation Materials	LS 8
	A.	Electrical	LS 8
	B.	Pull Box Covers	LS 8
	C.	Irrigation Controller	LS 8
	D.	Pipes and Fittings	LS 9
	E.	PVC Pipe Cements	LS 9
	F.	Sprinkler Heads	LS 9
	G.	Sprinkler Risers	LS 10
	H.	Valves and Valve Boxes	LS 10
8-9		Planting Materials	LS 10
	A.	Backfill	LS 10
	B.	Fertilizer	LS 10
	C.	Herbicide	LS 10
	D.	Hydromulch Seeding	LS 10
	E.	Imported Topsoil	LS 11
	F.	Mulch	LS 11
	G.	Plant Stock and Ground Cover	LS 11
	H.	Seed	LS 12
	I.	Soil Amendment	LS 12
	J.	Tree Stakes	LS 12

STANDARD DETAILS

Attached at end of section

LSC-1	TREE PLANTING
LSC-2	GROUND COVER PLANTING
LSC-3	SHRUB PLANTING DETAIL
LSC-4	IRRIGATION THRUST BLOCK DETAIL
LSC-5	ABOVE GROUND EMITTER
LSC-6	POP UP SPRAY HEAD
LSC-7	GATE VALVE (3" AND SMALLER)
LSC-8	QUICK COUPLING VALVE
LSC-9	ELECTRIC CONTROL AND GATE VALVE

## Section 9 Signals and Lighting (SG)

9-1	General	SG 1
9-2	Foundations	SG 1
9-3	Standard, Steel Pedestal and Post	SG 1
	A. Four Section Displays	SG 1
	B. Five Section Displays	SG 1
	C. Field Welding	SG 1
	D. Future Tenons	SG 1
9-4	Conduit Material	SG 1
9-5	Conduit Installation	SG 1
	A. Depth	SG 1
	B. Signal Interconnect	SG 2
	C. End Sealing	SG 2
	D. Trench Width	SG 2
	E. Trench Backfill	SG 2
9-6	Pull Boxes	SG 2
	A. Locations	SG 2
	B. Conduit	SG 2
	C. Box Type	SG 2
	D. Abandoned Boxes	SG 2
9-7	Conductors	SG 2
	A. Grounding Conductors	SG 2
	B. Identification	SG 2
	C. Signal Interconnect	SG 2
	D. Wiring Installation	SG 3
9-8	Bonding and Grounding	SG 3
	A. Grounding Electrodes	SG 3
	B. Grounding Connections	SG 3
	C. Bonding	SG 3
9-9	Testing	SG 3
	A. Ground Testing	SG 3
	B. Functional Testing	SG 3
9-10	Emergency Vehicle Preemption Equipment	SG 3
	A. Existing Signals	SG 4
	B. Labels	SG 4
9-11	Signal Sections	SG 4
	A. Signal Faces	SG 4
	B. Backplates	SG 4
	C. Front Screen	SG 4
	D. Terminal Compartments	SG 4
	E. Extra Support	SG 4
	F. Sealing	SG 4
9-12	Pedestrian Displays and Signals	SG 5
	A. Type	SG 5
	B. Mounting	SG 5
9-13	Detection	SG 5
	A. Camera Units	SG 5
	B. Detector Boards	SG 5
	C. Video Monitor	SG 5
9-14	Vehicle Detectors	SG 5
	A. Loop Wire	SG 5

	B.	Hand Holes	SG 5
	C.	Verification	SG 5
	D.	New Pavement Installation	SG 5
	E.	Labels	SG 6
	F.	Testing	SG 6
	G.	Circuitry	SG 6
9-15		Accessible Pedestrian Signals and Push Button Assemblies	SG 6
9-16		Existing Electrical Equipment	SG 6
9-17		Street Light Poles	SG 7
	A.	Galvanized Steel Poles	SG 7
	B.	Aluminum Poles	SG 7
9-18		Street Light Service	SG 7
	A.	Direct Service	SG 7
	B.	Multiple Service	SG 7
9-19		Luminaires	SG 7
	A.	LED Street Luminaires	SG 7
	B.	Photoelectric Controls	SG 7
	C.	Shielding	SG 7
9-20		Painting	SG 8
	A.	Cleaning	SG 8
	B.	Coating	SG 8
	C.	Spot Finishing	SG 8
	D.	Painting	SG 8
STANDARD DETAILS			Attached at end of section
	SG-1	STREET LIGHT POLE	