

APPENDIX E WATER MAIN IMPROVEMENT PROJECT DETAIL

This appendix presents cost estimate information and detail tables for all recommended water main improvements included in the proposed City of Grants Pass (City) water system Capital Improvement Program (CIP) presented in **Section 5**. All water main projects are illustrated on Plate 2 in **Appendix A**. Water main projects are prioritized in 5-year, 10-year and 20-year timeframes based on whether the projects are needed to address existing deficiencies (5-year) or projected future needs (10- and 20-year).

Cost Estimate Basis

Water main project costs are estimated based on unit costs by diameter shown in **Table E-1**.

Table E-1
Unit Cost for Water Main Projects

Pipe Diameter	Cost per Linear Foot (\$/LF)
8-inch	\$240
12-inch	\$280
16-inch	\$350

Assumptions:

1. Includes approximately 45 percent allowance for administrative, engineering and other project related costs
2. Ductile iron pipe with an allowance for fittings, valves and services
3. Surface restoration is assumed to be asphalt paving
4. No rock excavation
5. No dewatering
6. No property or easement acquisitions
7. No specialty construction included, cost estimates for proposed water main projects using trenchless construction methods are described later in this section

Trenchless Construction Costs

The recommended CIP presented in **Table 5-4** includes water main projects which involve crossing the I-5 freeway. These projects must be completed using trenchless construction methods, such as, auger boring. Cost estimates for these projects are developed based on MSA's recent experience with 12-inch diameter and larger trenchless water main construction in Oregon and southwest Washington. Estimates are calculated based on the following:

- Assume bore pits at each end of trenchless alignment, approximate planning-level project cost at \$1,500 per foot of excavated depth, allow 2 feet of depth under casing for equipment
- Steel casing with ductile iron carrier pipe, approximate planning-level project cost at \$40 per inch diameter per LF based on casing diameter
 - 12-inch main (carrier pipe) with 24-inch casing = \$960/LF
 - 16-inch main (carrier pipe) with 36-inch casing = \$1,440/LF

Assumptions and Accuracy

Estimated project costs are based upon recent experience with construction costs for similar work in Oregon and southwest Washington and assume improvements will be accomplished by private contractors. Estimated project costs include approximate construction costs and an aggregate 45 percent allowance for administrative, engineering and other project related costs. Estimates do not include the cost of property acquisition. Since construction costs change periodically, an indexing method to adjust present estimates in the future is useful. The Engineering News-Record (ENR) Construction Cost Index (CCI) is a commonly used index for this purpose. For purposes of future cost estimate updating; the current ENR CCI for Seattle, Washington is 10398 (July 2015).

Cost estimates represent opinions of cost only, acknowledging that final costs of individual projects will vary depending on actual labor and material costs, market conditions for construction, regulatory factors, final project scope, project schedule and other factors. The Association for the Advancement of Cost Engineering International (AACE) classifies cost estimates depending on project definition, end usage and other factors. The cost estimates presented here are considered Class 4 with an end use being a study or feasibility evaluation and an expected accuracy range of -30 percent to +50 percent. As the project is better defined, the accuracy level of the estimates can be narrowed.

**Table E-2a
5-Year CIP Water Main Projects**

Project No.	Location	Zone	Diameter (inches)	Length (LF)	Estimated Project Cost
M-1	Redwood Hwy 199 near Henderson Lane	1	8	720	\$ 173,000
M-2	Acacia Lane north of E Park Street	1	8	647	\$ 156,000
M-3	NE Olson Drive - Beacon to Piedmont	2	8	484	\$ 117,000
Zone 2A Hwy 99, Savage, Manzanita Loop					
M-4	NE Savage Street - 7th to 9th	2A	8	809	\$ 195,000
M-5	NE Savage Street - 6th to 7th	2A	8	507	\$ 122,000
M-6	NE 7th Street - Savage to Manzanita	2A	8	657	\$ 158,000
M-7	NE Manzanita Avenue - 6th to 7th	2A	8	508	\$ 122,000
M-8	NE 6th Street - Savage to Manzanita	2A	8	670	\$ 161,000
Existing 2-inch main replacement for fire protection					
M-88	SW Hall Street - G to Jordan and Rock Street dead end, add hydrant	1	8	620	\$ 149,000
M-89	SW Laurel Street - Bridge to Rogue River Ave and Mary Ave dead end, add hydrant	1	8	950	\$ 228,000
M-90	NE Wesley Lane north of Madrone, add 2 hydrants on Wesley, 1 hydrant on Madrone	1	8	445	\$ 107,000
M-96	NE B Street - 8th to Dean, add 2 hydrants	1	8	585	\$ 141,000
M-102	NE Ridge Road south of RJ Drive, add hydrant	4	8	295	\$ 71,000
10th St PRV Zone 2 fire flow improvement adjacent to Hillcrest Cemetery					
M-9	NE 10th Street proposed upper zone Hillcrest main (M-33 or M-40) to PRV	3 or 4	8	590	\$ 142,000
M-10	NE 10th Street proposed PRV (V-5) to existing main north of Dewey Drive	2	8	395	\$ 95,000

**Table E-2b
5-Year CIP Water Main Projects (cont'd)**

Project No.	Location	Zone	Diameter (inches)	Length (LF)	Estimated Project Cost
Zone 4 Proposed Ausland Reservoir and Pump Station Mains					
M-34	NE Ausland Drive - Scoville to Ausland Pump Station	4	12	285	\$ 80,000
M-35	NE Ausland Drive - Ausland P.S. to UGB	4	12	956	\$ 268,000
M-36	existing UGB boundary east of Scoville - Ausland to Oak Dale	4	12	1,159	\$ 325,000
M-37	NE Oak Dale Drive - UGB to Spring Mt Rd	4	12	439	\$ 123,000
M-38	Spring Mt Road - Oak Dale to Greenfield	4	12	1,344	\$ 377,000
M-39	NE Greenfield Road - Spring Mt to I-5 crossing at Cedar Lp	4	12	1,107	\$ 310,000
M-40	southside I-5 and Hillcrest - I-5 crossing to Beacon Drive	4	12	2,498	\$ 700,000
M-41	Proposed Ausland Reservoir (R-13) transmission main	4	12	1,232	\$ 345,000
M-52	Trenchless I-5 Crossing at Cedar Loop	4	12	382	\$ 369,000
5-year Water Main Improvements Subtotal					\$5,034,000

**Table E-3a
10-Year CIP Water Main Projects**

Project No.	Location	Zone	Diameter (inches)	Length (LF)	Estimated Project Cost
Existing 2-inch main replacement for fire protection					
M-91	SW Lee Lane and Oak Street south of Central Avenue, add 4 hydrants	1	8	1,080	\$ 260,000
M-97	SW Greenwood Avenue - I Street to loop with High Street, add hydrant	1	8	490	\$ 118,000
M-98	SW Greenwood Avenue - K Street to Westholm Park, add hydrant	1	8	395	\$ 95,000
M-99	SW K Street - Oak to Judson, add 1 hydrant at Judson, 1 hydrant east of Oak	1	8	325	\$ 78,000
M-100	SE Rose Place west of SE N Street, add hydrant	1	8	310	\$ 75,000
M-101	SE Waterman and SE Gene Lane south of Portola, add hydrant on each lane	1	8	600	\$ 144,000
Zone 2MW Future Meadow Wood Mains					
M-58	Proposed Meadow Wood Reservoir (R-16) transmission	2MW	16	503	\$ 177,000
M-59	Meadow Wood Reservoir transmission loop	2MW	16	414	\$ 145,000
Meadow Wood Loop					
M-60	Cloverlawn Drive - Robertson Lane to Crestview Loop	2MW	12	996	\$ 279,000
M-61	Cloverlawn Drive - Crestview to Overland Drive	2MW	12	731	\$ 205,000
M-62	Overland Drive - Cloverlawn to existing main near Trollview	2MW	12	1,309	\$ 367,000
Zone 2NH Future New Hope Mains					
M-63	Proposed New Hope Reservoir (R-17) transmission	2NH	16	1,592	\$ 558,000
Williams Hwy Loop					
M-64	Williams Hwy - Valle Vista to Twisted Pine Drive	2NH	12	981	\$ 275,000
M-65	Williams Hwy - Twisted Pine Drive to Espy Road	2NH	12	1,155	\$ 324,000
Coach Drive Loop					
M-66	Coach Dr - Morris Ln to Allenwood	2NH	12	2,651	\$ 743,000
M-67	Coach Dr - Allenwood to Landau Ln	2NH	12	955	\$ 268,000
M-68	Coach Drive - Landau to Curtis	2NH	12	1,299	\$ 364,000

**Table E-3b
10-Year CIP Water Main Projects (cont'd)**

Project No.	Location	Zone	Diameter (inches)	Length (LF)	Estimated Project Cost
Zone 1 Cloverlawn & Grandview Loop					
M-78	Cloverlawn Drive - Fruitdale Drive to SE Grandview Ave	1	12	831	\$ 233,000
M-79	Cloverlawn Drive - Grandview to existing dead end west of SE Joel Dr	1	12	966	\$ 271,000
M-80	SE Grandview Avenue - Cloverlawn to existing dead end east of Haviland	1	12	481	\$ 135,000
Zone 1 Lincoln Road Loop					
M-84	Lincoln Road - Upper River Road to SW J Street	1	12	823	\$ 231,000
M-85	Lincoln Road - SW J to Bridge Street	1	12	1,159	\$ 325,000
M-86	Grant Street Zone 2 loop - NW B Street to Grant & A	2	8	586	\$ -
M-87	NE 9th Street - Tokay Canal to Hillcrest Drive	2	12	920	\$ 258,000
10-year Water Main Improvements Subtotal					\$ 6,069,000

**Table E-4a
20-year CIP Water Main Improvements**

Project No.	Location	Zone	Diameter (inches)	Length (LF)	Estimated Project Cost
Existing 2-inch main replacement for fire protection					
M-92	NW Hillside Drive north of Sunset Drive, add hydrant	2	8	210	\$ 51,000
M-93	NW Clarke Street - A to D, add hydrants at C and D	1	8	790	\$ 190,000
M-94	NE Sherman Lane east of Beacon Drive, add hydrant	1	8	395	\$ 95,000
M-95	NE Clyde Place west of Baker, add hydrant	1	8	350	\$ 84,000
Zone 2H merge Harbeck (2HK) & Hilltop (2HT)					
M-11	Zone 2H - connect SE Independence & Hilltop Drives	2H	12	790	\$ 222,000
M-12	Zone 2H - loop with Zone 1 - Independence Dr & Grandview Ave	2H	8	1,290	\$ 310,000
Zone 2 East Expansion - Spalding Industrial Area					
M-13	Adjacent to Holiday Inn property - Foothill & Fairview to Hwy 199	2	12	597	\$ 168,000
M-14	Trenchless crossing under Hwy 199 - Holiday Inn to Foothill Blvd at Masonic Cemetery	2	12	238	\$ 230,000
M-15	NE Foothill Blvd - Masonic Cemetery to Aurora Ave	2	12	1,234	\$ 346,000
M-16	NE Foothill Blvd - Aurora Ave to Ament Road	2	12	885	\$ 248,000
M-17	Ament Road - Foothill to reservoir transmission M-18	2	12	1,530	\$ 429,000
M-18	Proposed Pearce Park Reservoir (R-19) transmission main	2	12	1,788	\$ 501,000
M-19	Spalding Industrial area north of Industry Dr- Ament Rd to Lawless Ln	2	12	1,388	\$ 389,000
M-20	Ament Road - reservoir transmission (M-18) to Ament Rd PRV (V-1)	2	12	726	\$ 204,000
M-21	south Spalding Industrial loop	2	12	1,981	\$ 555,000
M-22	NE A Street - Oregon Ave to Foothill Blvd southeast of Royal Drive	2	12	394	\$ 111,000

**Table E-4b
20-year CIP Water Main Improvements (cont'd)**

Project No.	Location	Zone	Diameter (inches)	Length (LF)	Estimated Project Cost
Zone 3 Expansion north of I-5					
<i>Granite Hill to Scoville Loop</i>					
M-24	Granite Hill Road - Mallory Heights Dr to Scenic Dr	3	12	1,387	\$ 389,000
M-25	NW Scenic Drive - Granite Hill to Scoville	3	12	1,787	\$ 501,000
M-26	Zone 3 north loop - Granite Hill to Scoville & Ausland	3	12	1,872	\$ 525,000
<i>Scoville to Spring Mountain Loop</i>					
M-27	NE Scenic Drive - Scoville to Oak Dale Dr	3	8	753	\$ 181,000
M-28	NE Oak Dale Drive - Scenic to Spring Mt Rd alignment	3	8	1,340	\$ 322,000
M-29	Spring Mt Rd alignment - Oak Dale Dr to Greenfield	3	8	1,316	\$ 316,000
M-30	NE Greenfield Road - Spring Mt Rd to existing dead end	3	12	1,028	\$ 288,000
<i>Spring Mountain to Hillcrest Loop, I-5 crossing at Cedar Loop</i>					
M-31	NE Greenfield Road - Spring Mountain to I-5 crossing at Cedar Lp	3	12	1,072	\$ 301,000
M-32	Trenchless I-5 Crossing at Cedar Loop	3	12	382	\$ 369,000
M-33	southside I-5 and Hillcrest - I-5 crossing to Beacon Drive	3	12	2,334	\$ 654,000
M-42	Zone 4 NE Hillcrest Drive - Vertical Dr to Hillcrest Lane - when existing mains move to Zone 3, see detail in Appendix C	3	12	256	\$ 72,000
<i>I-5 crossing at Humane Society</i>					
M-43	Adjacent to Humane Society north of I-5 - Granite Hill & Scenic to I-5 crossing (M-44)	3	16	684	\$ 240,000
M-44	Trenchless I-5 Crossing at Humane Society	3	16	228	\$ 330,000
Zone 3 Vine Street Loop - Highland to Hawthorne					
M-45	NW Vine Street - I-5 crossing to Hawthorne	3	12	708	\$ 199,000
M-46	NW Vine Street - I-5 crossing to Highland Ave	3	12	2,843	\$ 797,000

**Table E-4c
20-year CIP Water Main Improvements (cont'd)**

Project No.	Location	Zone	Diameter (inches)	Length (LF)	Estimated Project Cost
Proposed Zone 4N					
M-47	Highland Avenue - proposed Zone 4N Pump Sta (P-4) to Morewood Ln	4N	16	938	\$ 329,000
M-48	Highland Avenue - proposed Zone 4N Pump Station (P-4) to I-5 crossing	4N	16	561	\$ 197,000
M-49	Highland Avenue I-5 crossing	4N	16	490	\$ 510,000
M-50	Highland Avenue - I-5 crossing to 3044 Highland	4N	16	1,628	\$ 570,000
M-51	Highland Avenue - 3044 Highland to proposed PRV (V-2)	4N	16	1,114	\$ 390,000
Zone 1 Spalding Industrial area Loop					
M-53	Ament Rd - proposed PRV (V-1) to Spalding Ave	1	12	616	\$ 173,000
M-54	NE Spalding Avenue - Shannon Ln to Ament Rd	1	12	1,074	\$ 301,000
M-55	Shannon Lane - Spalding Ave to Portola Dr	1	12	1,623	\$ 455,000
M-56	NE Industry Drive - existing dead end to Spalding Ave	1	12	404	\$ 114,000
M-57	NE Spalding Avenue - Ament to Pearce Park Rd	1	12	1,138	\$ 319,000
Proposed Laurel Ridge Reservoir and Blue Gulch Loop					
M-69	Proposed Laurel Ridge Reservoir (R-14) transmission	4LR	12	778	\$ 218,000
M-70	Future NW Crown Street alignment - Starlite to Blue Gulch PRV (V-3)	4LR	12	789	\$ 221,000
M-71	Blue Gulch loop - PRV (V-3) to NW B Street	3BG	12	1,363	\$ 382,000
M-72	Blue Gulch loop - NW B Street to PRV (V-6)	3BG	12	701	\$ 197,000
M-73	Blue Gulch loop - proposed B Street PRV (V-6) to Starlite Place	3BG	12	1,171	\$ 328,000
M-74	NW Starlite Place - Blue Gulch loop (M-73) to existing Zone 3S mains at Starlite PRV	3BG	12	461	\$ 130,000
M-75	Zone 2 B Street loop - proposed B Street PRV (V-6) to Crescent Drive	2	12	1,406	\$ 394,000

**Table E-4d
20-year CIP Water Main Improvements (cont'd)**

Project No.	Location	Zone	Diameter (inches)	Length (LF)	Estimated Project Cost
Proposed Zone 1 Fruitdale					
M-76	Fruitdale Creek Trail - proposed Overland PRV (V-4) to Hamilton Lane	1	8	1,815	\$ 436,000
M-77	Hamilton Lane - Fruitdale Creek Trail to SE Jerrine Street Zone 1 mains	1	8	535	\$ 129,000
M-81	Fruitdale Driven - Hamilton Lane to Mt Baldy Road	1	12	2,743	\$ 769,000
M-82	Mount Baldy Road - Fruitdale Dr to Rogue River Hwy 99	1	8	1,027	\$ 247,000
M-83	Rogue River Hwy 99 - Mt Baldy Road to Hamilton Lane	1	8	2,105	\$ 506,000
20-year Water Main Improvements Subtotal					\$16,932,000