Grants Pass Stormwater Master Plan

Final

February 2016

KELLER associates

February 2016

City of Grants Pass, Oregon

Stormwater Master Plan

Final

KELLER associates

KELLER associates

Keller Associates
707 13th St. SE. Suite 280
Salem, OR 97301

212047/5/S15-013

REGISTERED PROFESSIONAL ENGINEER
2/15/16
83510PE
OREGON
NOV. 10, 2009
PETER OLSEN

EXPIRES: 12/31/16

Signed by:
Peter Olsen, P.E.
Project Manager

TABLE OF CONTENTS

Acronyms, Abbreviations, and Selected Definitions

Executive Summary

ES1. Introduction ES-1
ES2. Things As They Are Today ES-1
ES3. A Clear Path Forward ES-3
ES4. How much will all of this Cost? ES-5
ES5. Conclusion ES-5

Section 1 - Introduction

1.1. Master Plan Phases 1-1
1.2. Phase 1 Summary 1-1
1.3. Phase 2 Summary 1-2
1.4. Phase 3 Summary 1-2
1.5. Phase 4 Summary 1-2
1.6. Phase 5 Summary 1-2
1.7. GPID 1-2
1.8. NPDES MS4 Phase II 1-3
1.9. Hydraulic Computer Model 1-3
1.10. Updates To the 2007 Draft Master Plan 1-4

Section 2 - Study Area

2.1. Study Area 2-1
2.2. Physical Environment 2-1
2.2.1. Climate 2-1
2.2.2. Soils 2-1
2.2.3. Topography 2-1
2.3. Stormwater Basins 2-2
2.4. Land Use 2-2
2.5. UGB Status 2-2

Section 3 - Basis for Evaluation

3.1 Irrigation Network Conditions 3-1
3.2 Planning Criteria 3-1
3.3 Policy and Standards 3-2
3.3.1 Design Storms 3-2

3.3.2 Pipe Parameters 3-4
3.3.3 Infiltration Policies 3-5
3.3.4 Roof Drains 3-5

Section 4 - Model Methodology

4.1 Key Assumptions 4-1
4.1.1 Basins and Boundary Conditions 4-2
4.1.2 Pipes, Ponds, and Channels 4-2
4.1.3 Flow Redirection and Connectivity 4-2
4.2 Surveying Activities 4-2
4.3 Flow Monitoring 4-3
4.4 Calibration 4-3
4.5 Irrigation Facilities and Operating Scenarios 4-6
4.6 Comparison with Redwood Ave. Drainage Study 4-6
4.7 Comparison with County 2D Model 4-7

Section 5 - Existing System Conditions

5.1 Field Evaluations Summary 5-1
5.2 Model Evaluations 5-1
5.2.1 Flooding Areas and Alternative Analysis 5-1

Section 6 - Capital Improvement Plan

6.1 Capital Improvement Projects and Operational Changes 6-1
6.1.1 Method of Prioritization 6-2
6.1.2 Allen-Fruitdale Recommended Improvements & Operational Changes 6-2
6.1.3 Gilbert Recommended Improvements & Operational Changes 6-6
6.1.4 Sand Recommended Improvements & Operational Changes 6-8
6.1.5 Skunk-Jones Recommended Improvements & Operational Changes 6-11
6.2 Costs 6-13
6.3 Coordination with Other Jurisdictions, One System 6-16

Section 7 - Maintenance, Replacement, and Staffing

7.1 Background 7-1
7.2 System Maintenance 7-1
7.2.1 Pipelines 7-1
7.2.2 Catch Basins 7-2
7.2.3 Detention Facilities, Open Channels and Water Quality Structures 7-2
7.2.4 Street Sweeping 7-3
7.2.5 Costs 7-3
7.3 Pipeline Replacement 7-4
7.4 NPDES MS4 Phase II Permitting Requirements 7-4

7.5 Summary.....7-5

TABLES:

Table 2-1 Climatological Data (1895-2015) – Grants Pass, Oregon
Table 2-2 Percent of Study Area Draining for Each Major Drainage Basin
Table 3-1 Storm Drainage Design Criteria Comparison
Table 3-2 24-hour Storm Depths
Table 3-3 Minimum Pipe Slopes
Table 4-1 Comparison of Modeled Flow to Flow Monitoring Results at Flow Monitoring Locations
Table 4-2 Comparison of 1D and 2D Model Locations
Table 6-1 Priority 1A Improvements
Table 6-2 Priority 1B, 2A, & 2B Improvements
Table 6-3 Priority 3A, 3B, 3C, & 4 Improvements
Table 7-1 Sweeping Frequency
Table 7-2 O&M/Replacement Staffing Summary

CHARTS:

Chart 3-1 Type IA 25-Year, 24-Hour Hyetograph
Chart 4-1 Comparison of Modeled Flow to Flow Monitoring Results at Ballinger Drive & Greenwood Avenue

APPENDIX A – FIGURES

Figure 1: Land Use and Study Area
Figure 2: Soils
Figure 3: Topography and Flood Plain
Figure 4: Major Basins
Figure 5A: Allen-Fruitdale Modeled Lines
Figure 5B: Gilbert Modeled Lines
Figure 5C: Sand Modeled Lines
Figure 5D: Skunk-Jones Modeled Lines
Figure 6A: Minor Basins – Allen-Fruitdale
Figure 6B: Minor Basins – Gilbert
Figure 6C: Minor Basins – Sand
Figure 6D: Minor Basins – Skunk-Jones
Figure 7: Comparison of 2007 and 2015 Model
Figure 8A: Allen-Fruitdale Existing System
Figure 8B: Gilbert, Skunk, Jones Existing System
Figure 8C: Sand Existing System
Figure 9A: Flooding Nodes – Allen-Fruitdale
Figure 9B: Flooding Nodes – Gilbert
Figure 9C: Flooding Nodes – Sand
Figure 9D: Flooding Nodes – Skunk-Jones
Figure 10A: Problem Areas – Allen-Fruitdale
Figure 10B: Problem Areas – Gilbert
Figure 10C: Problem Areas – Sand
Figure 10D: Problem Areas – Skunk-Jones
Figure 11A: CIP – Allen-Fruitdale
Figure 11B: CIP – Gilbert
Figure 11C: CIP – Sand

Figure 11D: CIP – Skunk-Jones
Figure 12A: CIP Prioritization – Allen-Fruitdale
Figure 12B: CIP Prioritization – Gilbert
Figure 12C: CIP Prioritization – Sand
Figure 12D: CIP Prioritization – Skunk-Jones

APPENDIX B – MODEL DATA AND RESULTS

APPENDIX C – FLOW MONITORING DATA AND MODEL CALIBRATION

APPENDIX D – COMPARISONS WITH OTHER MODELS

APPENDIX E – EXISTING FIELD CONDITIONS

Rating System
Figures

APPENDIX F – CIP

ACRONYMS, ABBREVIATIONS, AND SELECTED DEFINITIONS

Add'l	additional
AF	Allen-Fruitdale basin
BMPs	best management practices
CAD	computer aided design
CCTV	closed-circuit television
cf	cubic feet
cfs	cubic feet per second
CIP	Capital Improvement Plan
DEQ	Department of Environmental Quality
e.g.	abbreviation meaning "for example"
EPA	Environmental Protection Agency
F	farenheit
FEMA	Federal Emergency Management Agency
ft	feet (or) foot
FTE	full-time employee
G	Gilbert basin
GPID	Grants Pass Irrigation District
gpm	gallons per minute
HEC-1	Hydrologic Engineering Center software
i.e.	abbreviation for "that is"
in	inch
min	minute
MOU	memorandum of understanding
MS4	Municipal Separate Storm Sewer System
NOAA	National Oceanic and Atmospheric Administration
NPDES	national pollution discharge elimination system
NRCS	National Resource Conservation Service
ODOT/APWA	Oregon Department of Transportation/American Public Works Association
PVC	polyvinyl chloride plastic
RVCOG	Rogue Valley Council of Governments
S	Sand Creek basin
SBUH	Santa Barbara Urban Hydrograph
SDC	system development charge
SJ	Skunk-Jones basin
SWMM	stormwater management model
SWMP	stormwater master plan
TMDL	total maximum daily load
TR-55	Technial Release 55 "Urban Hydrology for Small Watersheds"
UGB	urban growth boundary
XPSWMM	software modeling package
1D	one dimensional
2D	two dimensional