

# *APPENDIX A*

*Figures*



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Figure 1 – City Limits, UGB, and Topography

Figure 2 – Topography and Soils

Figure 3 – FEMA Flood Hazard Zones

Figure 4 – Wetlands

Figure 5 – Major Basins

Figure 6 – Modeled Stormwater System

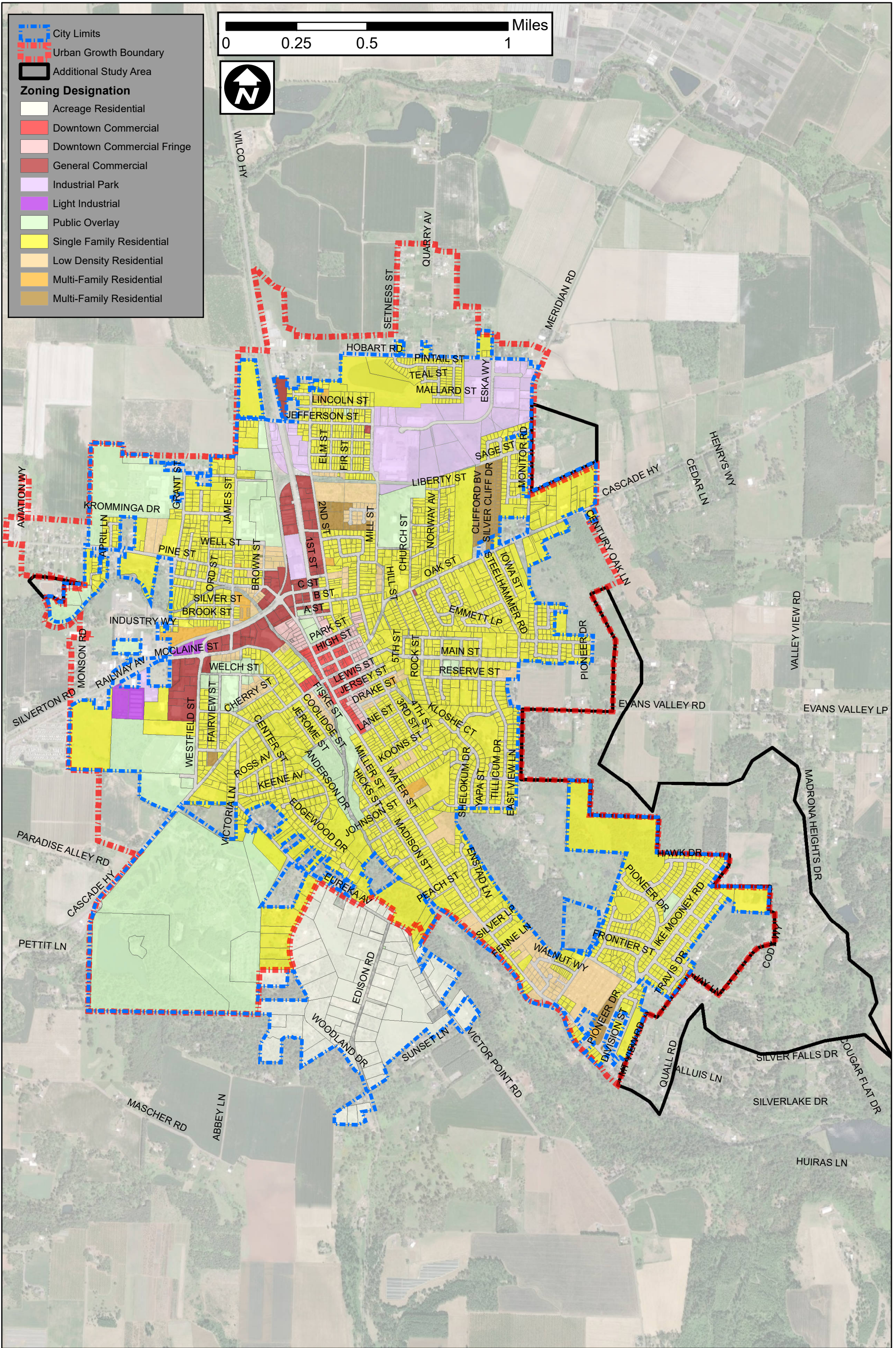
Figure 7 – Model Subbasins

Figure 8 – Existing System Evaluation

Figure 9 – Capital Improvement Plan







**Figure 1**

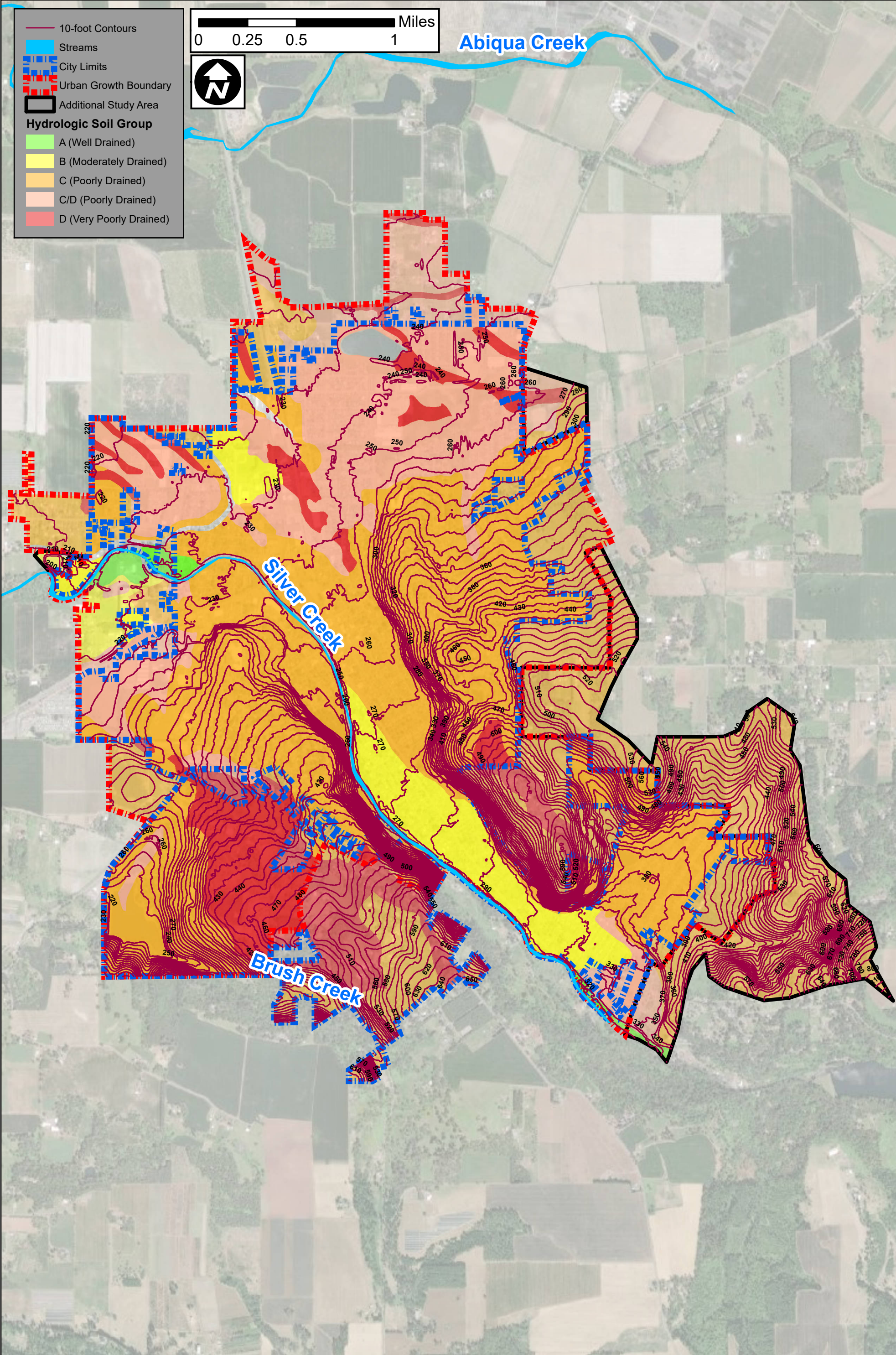
**City Limits, UGB, and Zoning**

City of Silverton, OR

**Stormwater Master Plan Update**







Document Path: J:\215004 Silverton Gen Eng\TO 25 - Stormwater Master Plan\GIS\MXD\Report Figures\Figure 2 - Topography and NRCS Soils.mxd

**Figure 2**

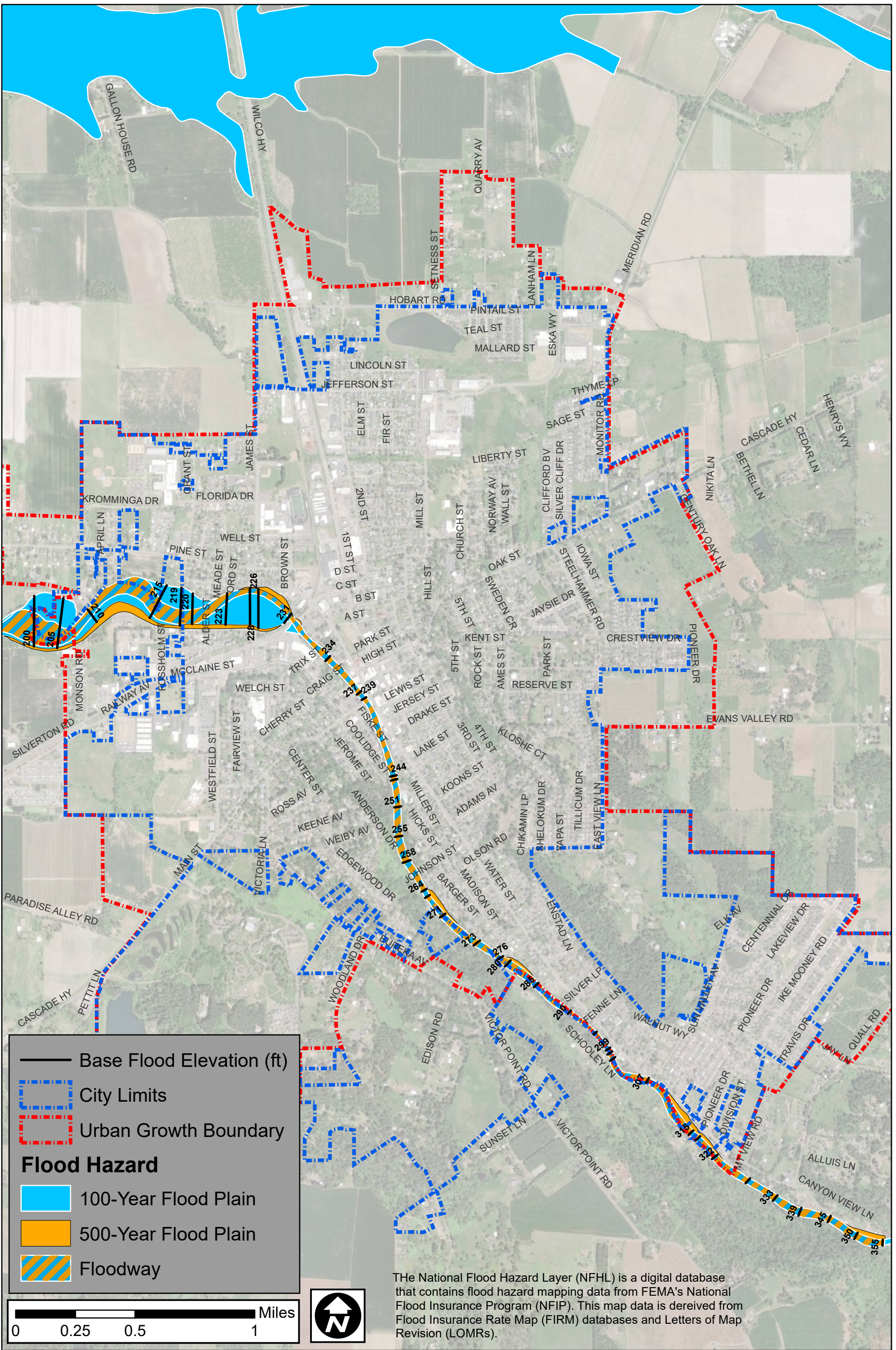
**Topography and Hydrologic Soil Groups**

City of Silverton, OR

Stormwater Master Plan Update





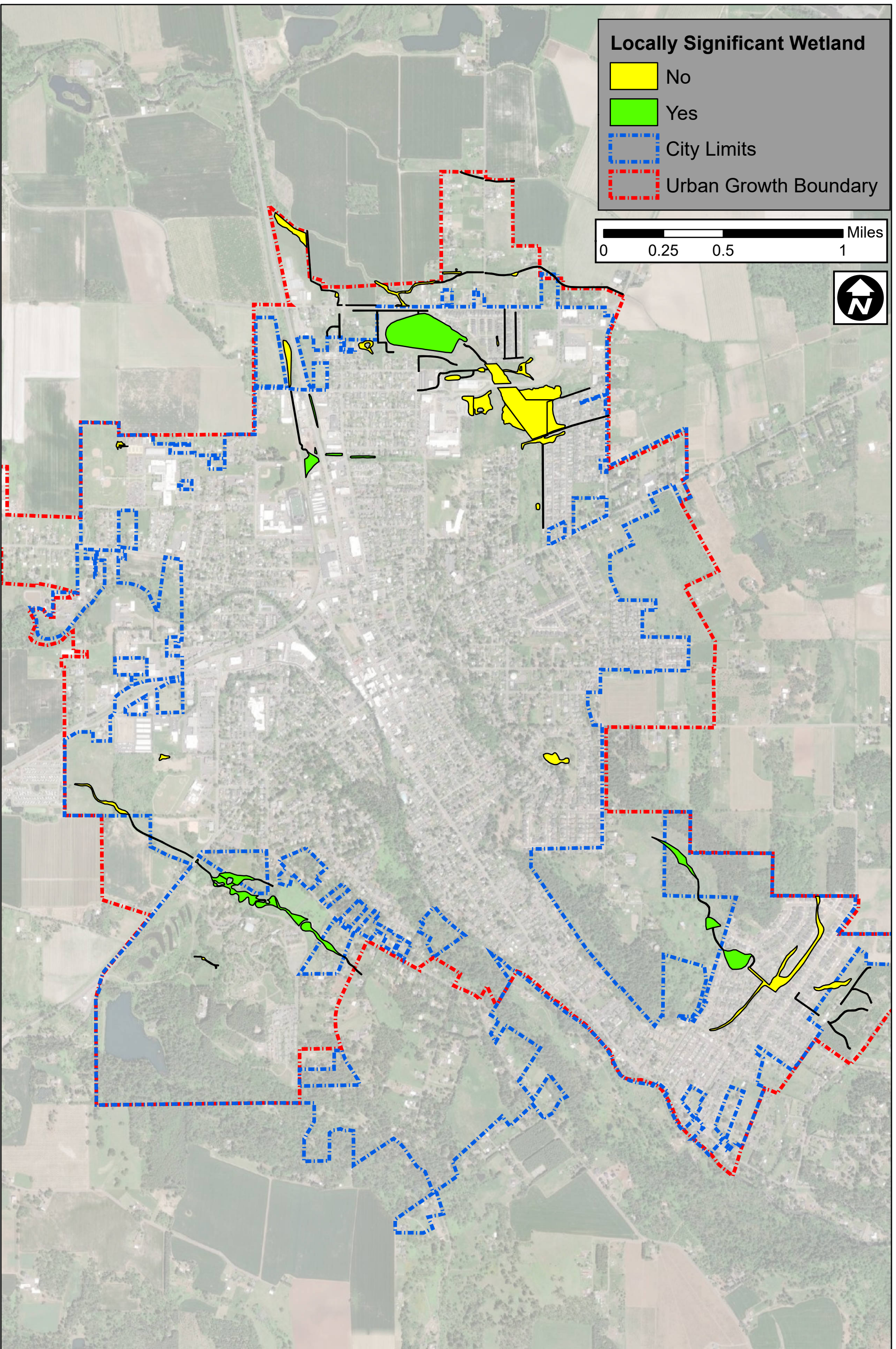


**Figure 3**

**FEMA Flood Hazards**



Document Path: J:\215004 Silverton Gen Eng\TO 25 - Stormwater Master Plan\GIS\MXD\Report Figures\Figure 4 - Wetlands.mxd



**Figure 4**

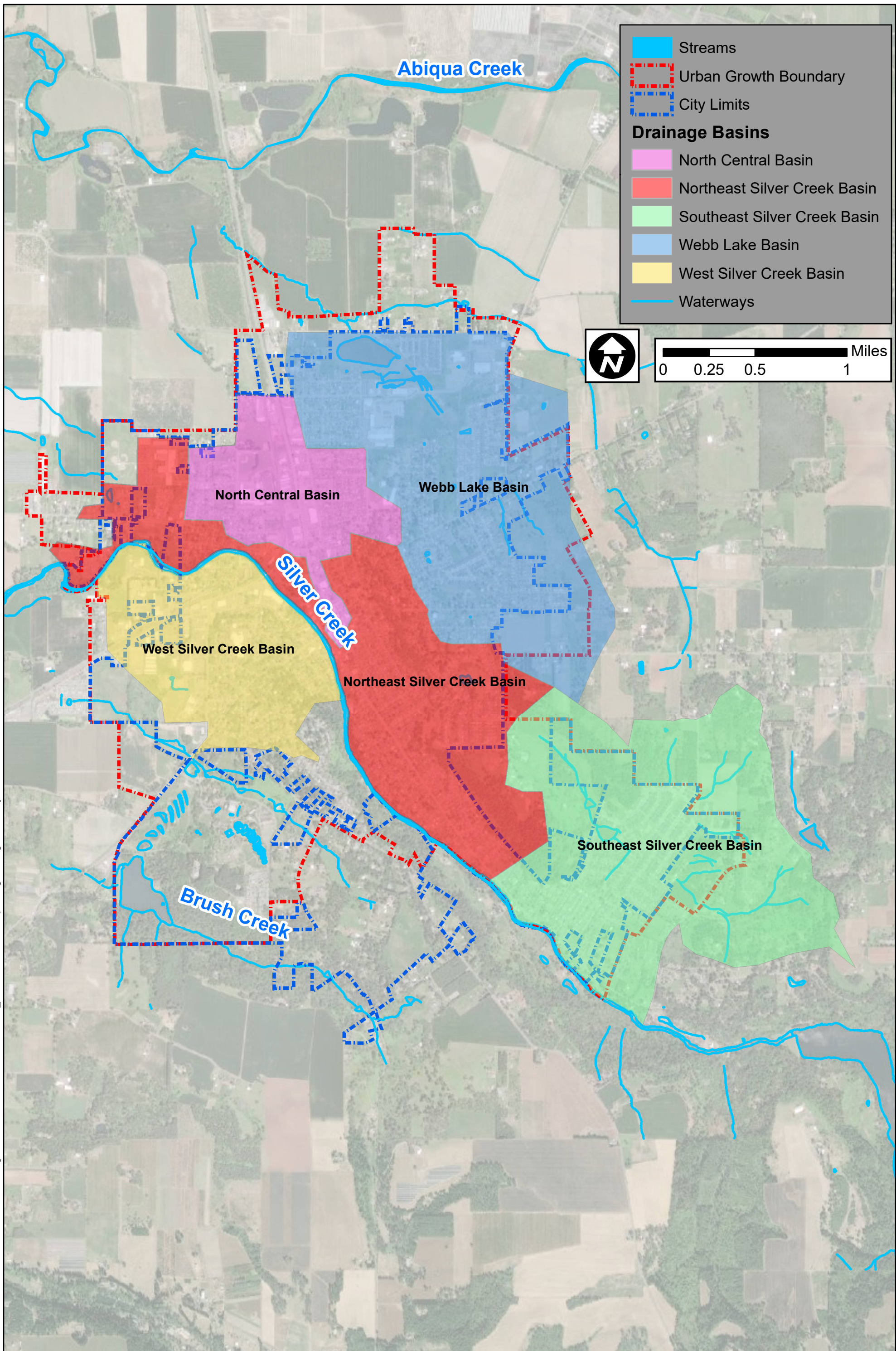
**Local Wetland Inventory**

City of Silverton, OR

Stormwater Master Plan Update







Document Path: J:\215004 Silverton Gen Eng\TO 25 - Stormwater Master Plan\lb\_PLAN\GIS\MXD\Report Figures\Figure 5 - Major Basins.mxd

**Figure 5**

**Major Drainage Basins**





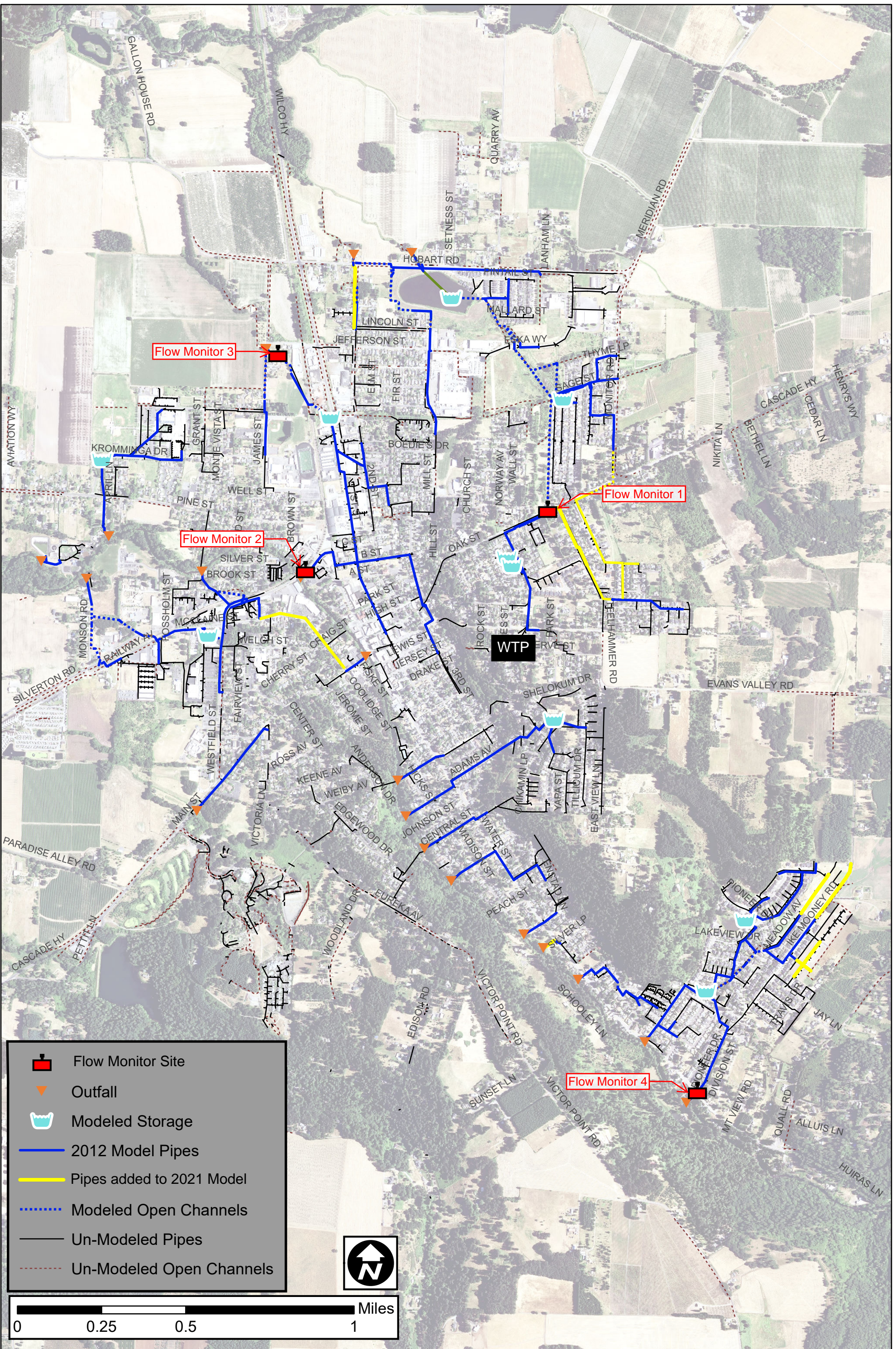
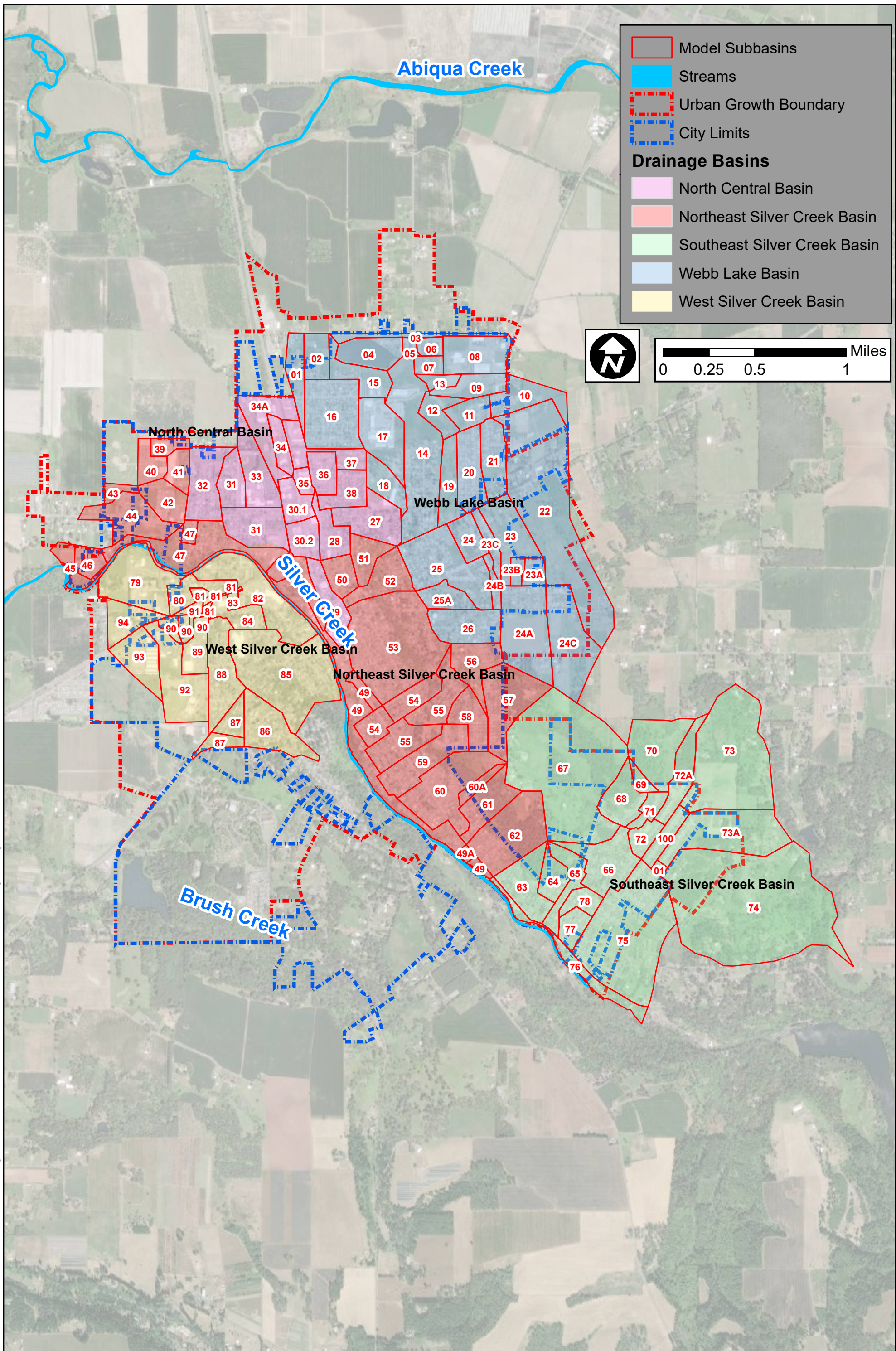


Figure 6

Modeled Stormwater System





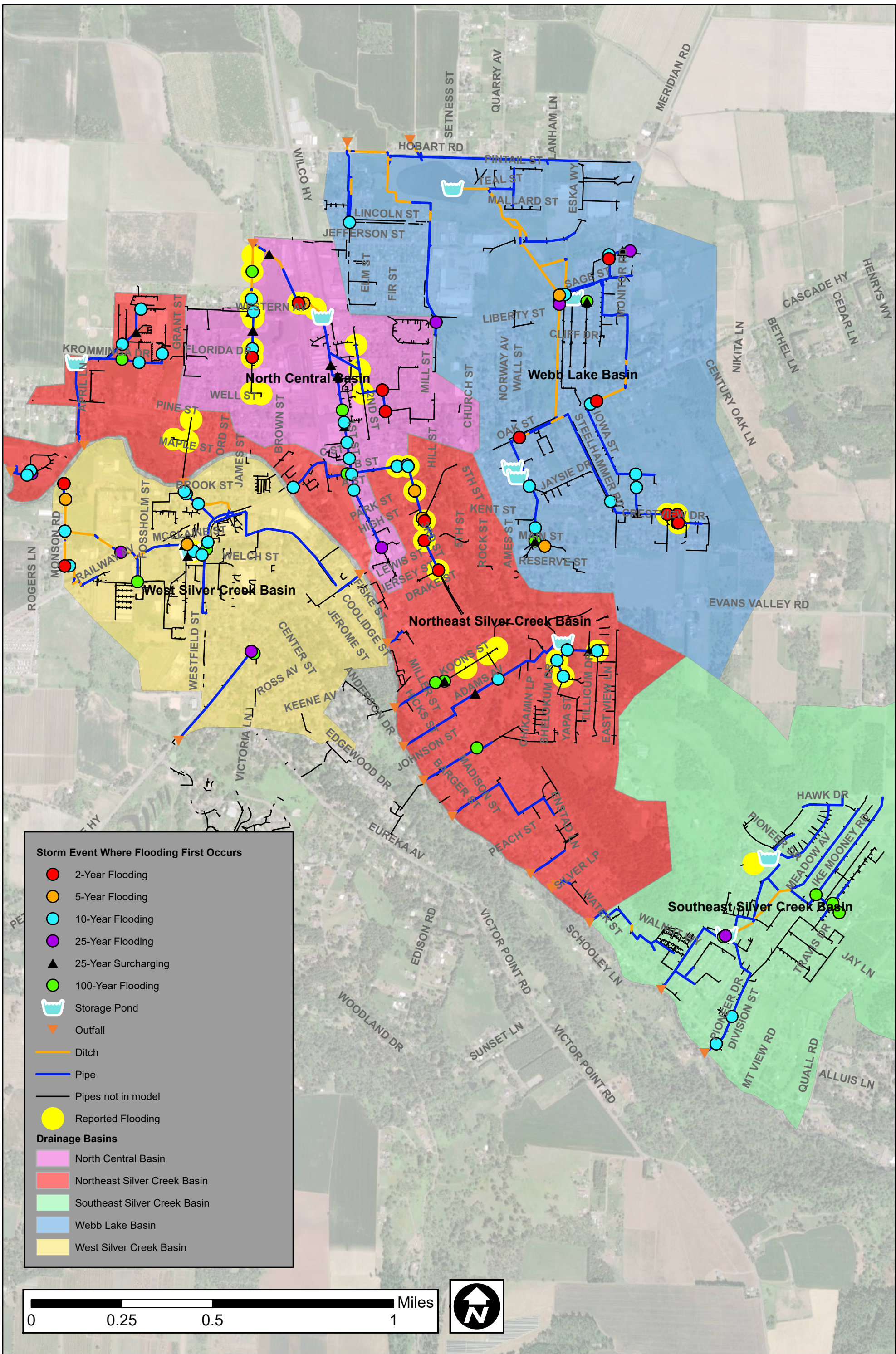
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**Figure 7**

**Model Subbasins**



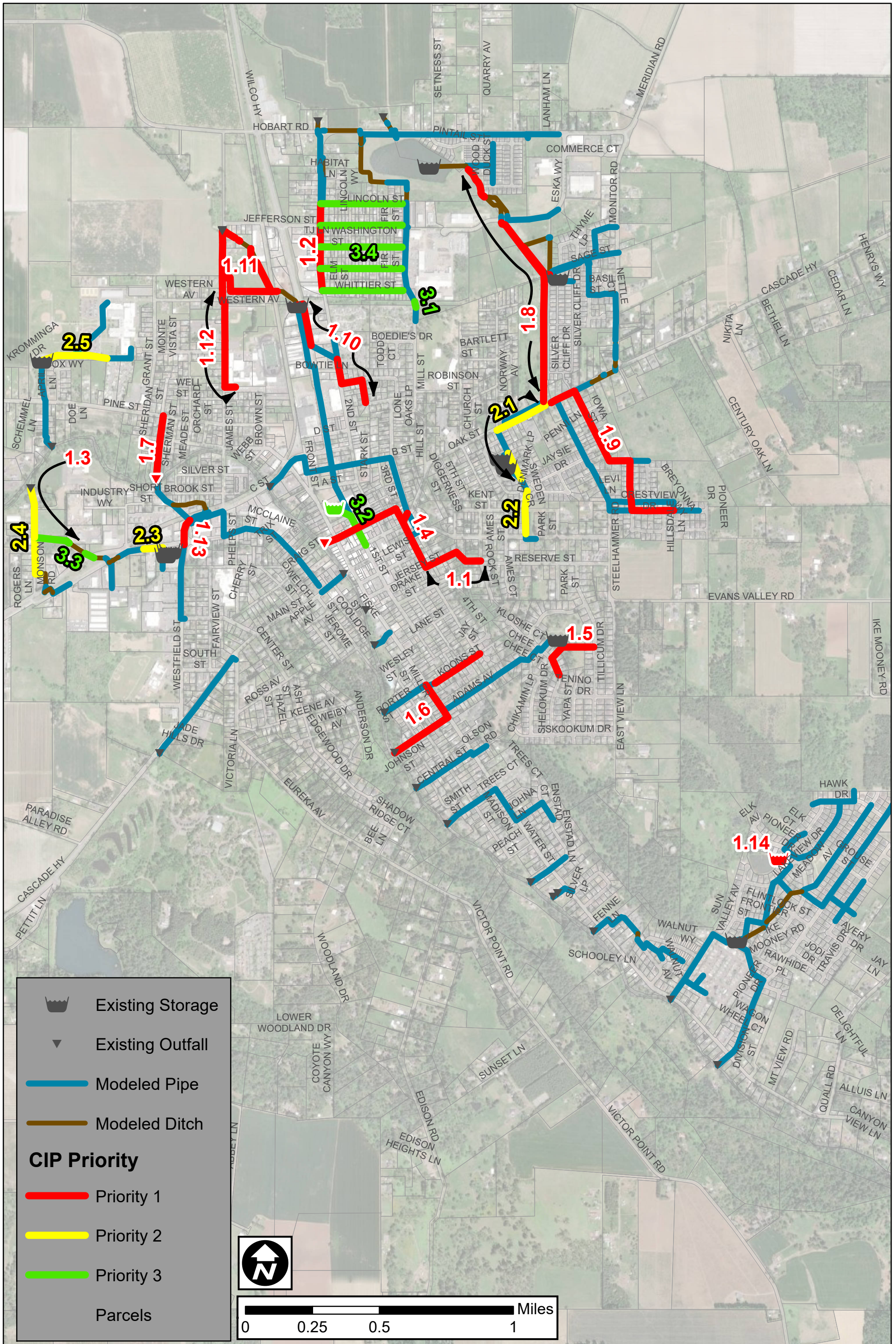




**Figure 8**

**Existing System Evaluation**





**Figure 9**

**Capital Improvement Plan**

City of Silverton, OR

**Stormwater Master Plan Update**



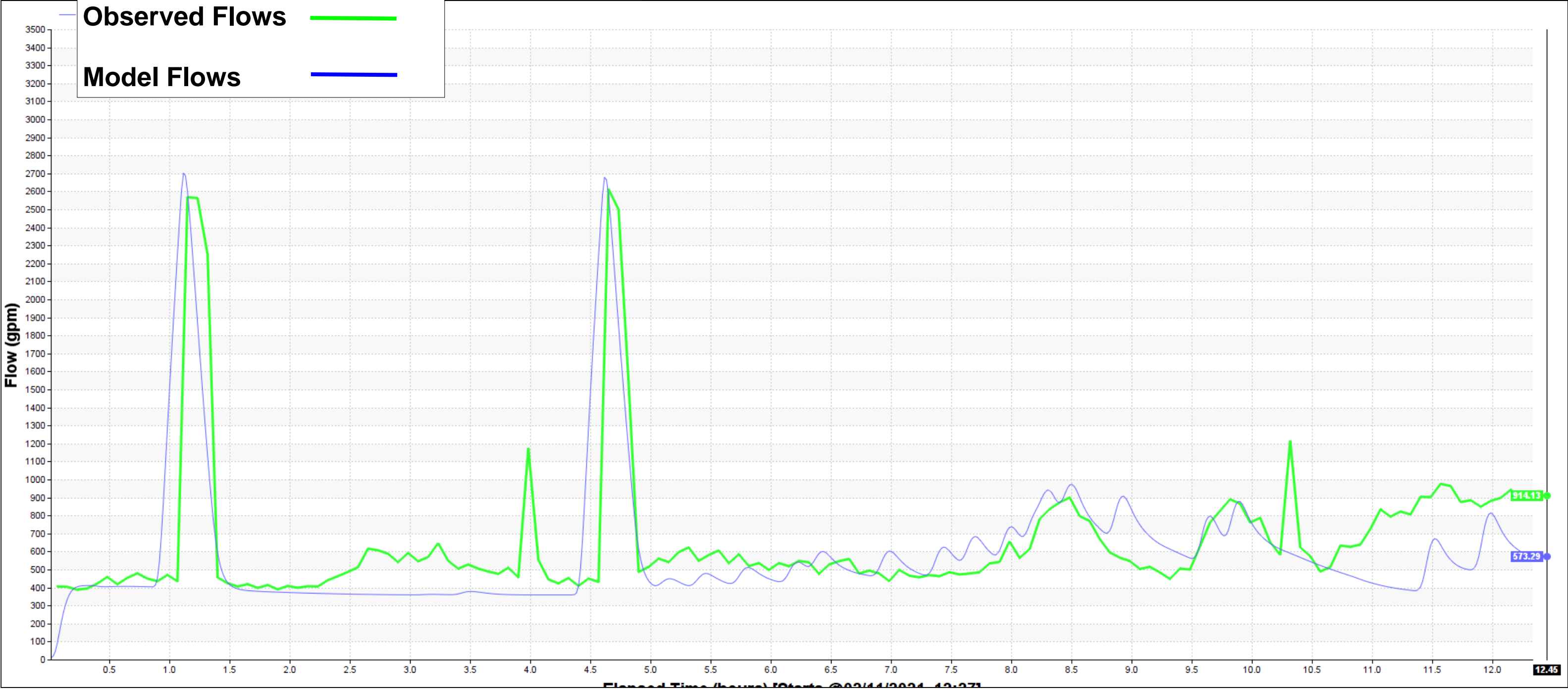


# ***APPENDIX B***

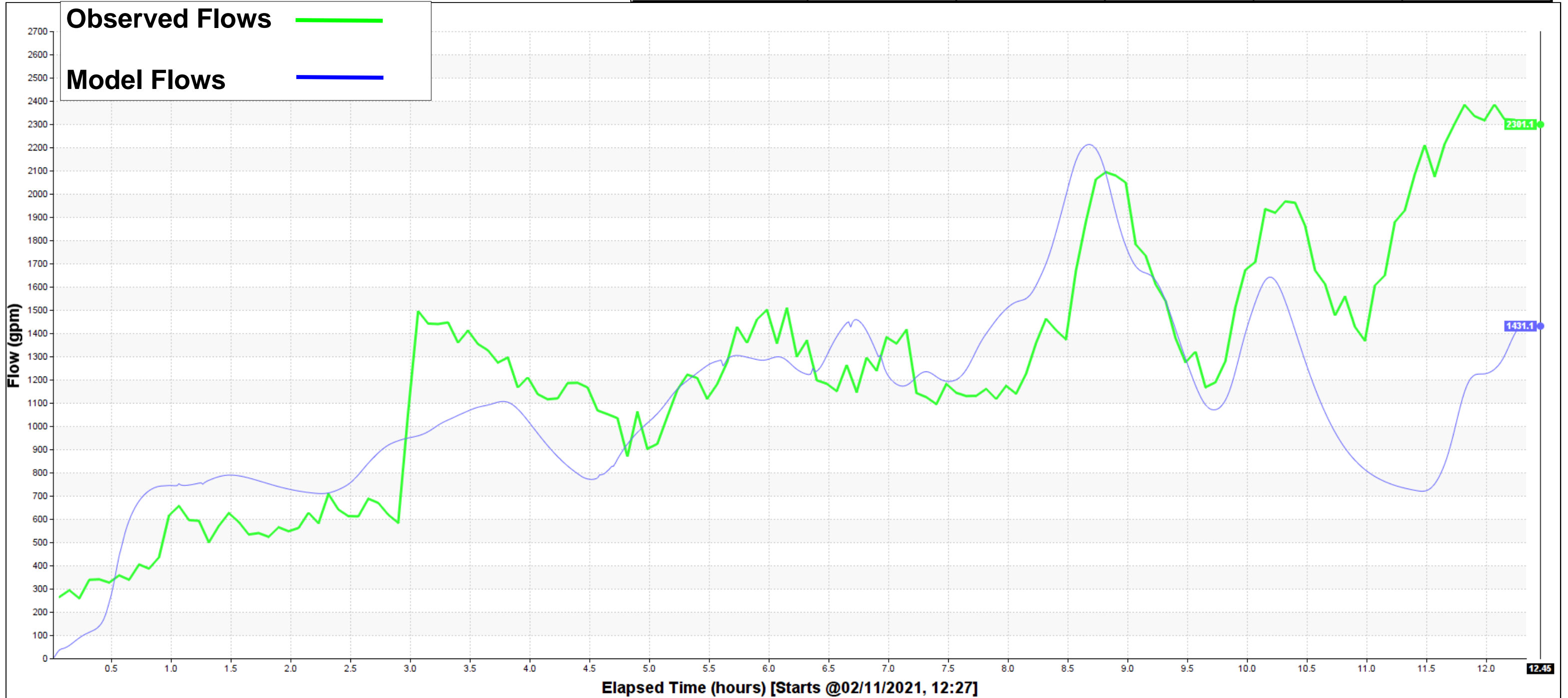
## *Calibration Summary*



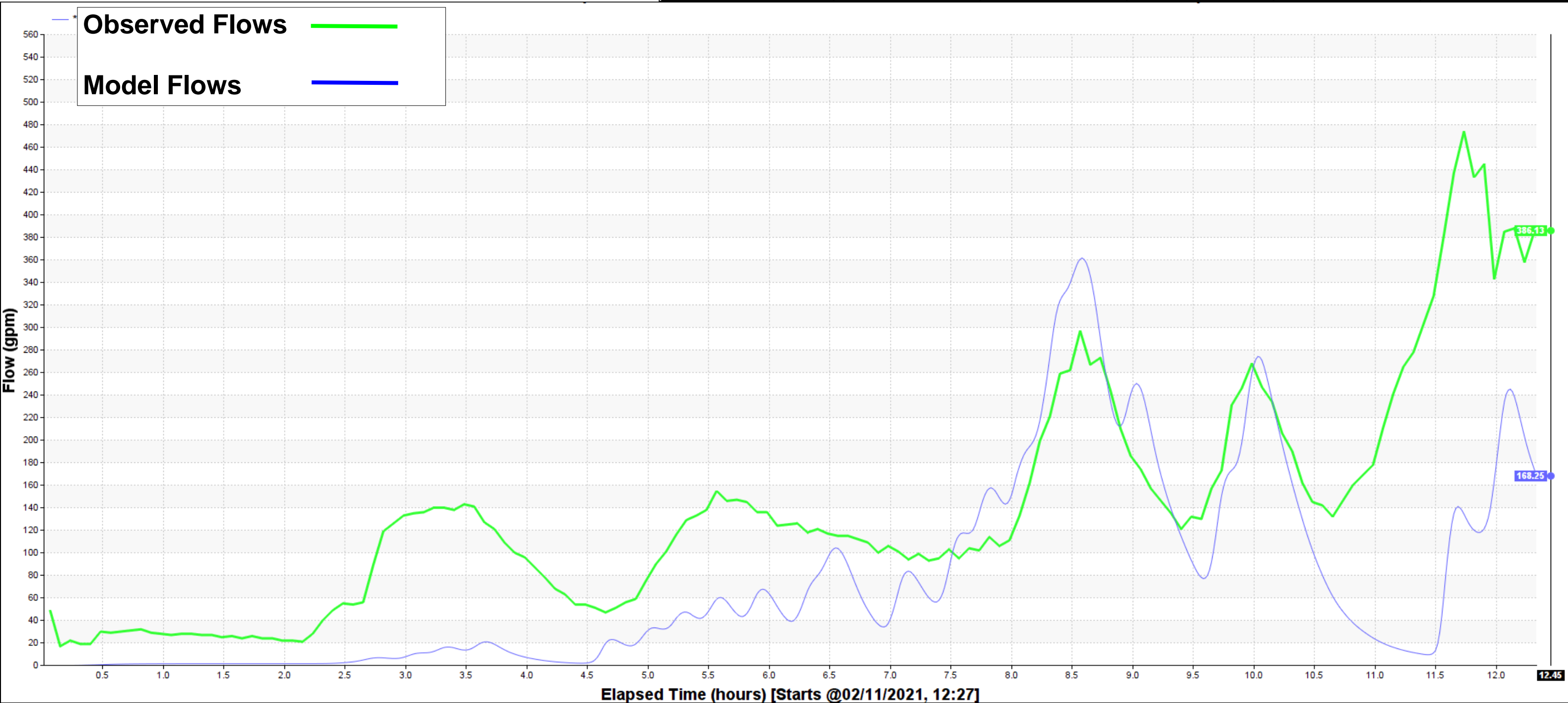
Site 1 - (19-14)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	0.05*S	+2.5%	10 gpm/jct, 400 gpm total	-20%
Event 2: March 5th (8.5 Hrs)	0.49	0.15*S	+2.5%	10 gpm/jct, 400 gpm total	+3%
Event 3: March 14th (7 Hrs)	0.29	0.001	+2.5%	10 gpm/jct, 400 gpm total	+11%



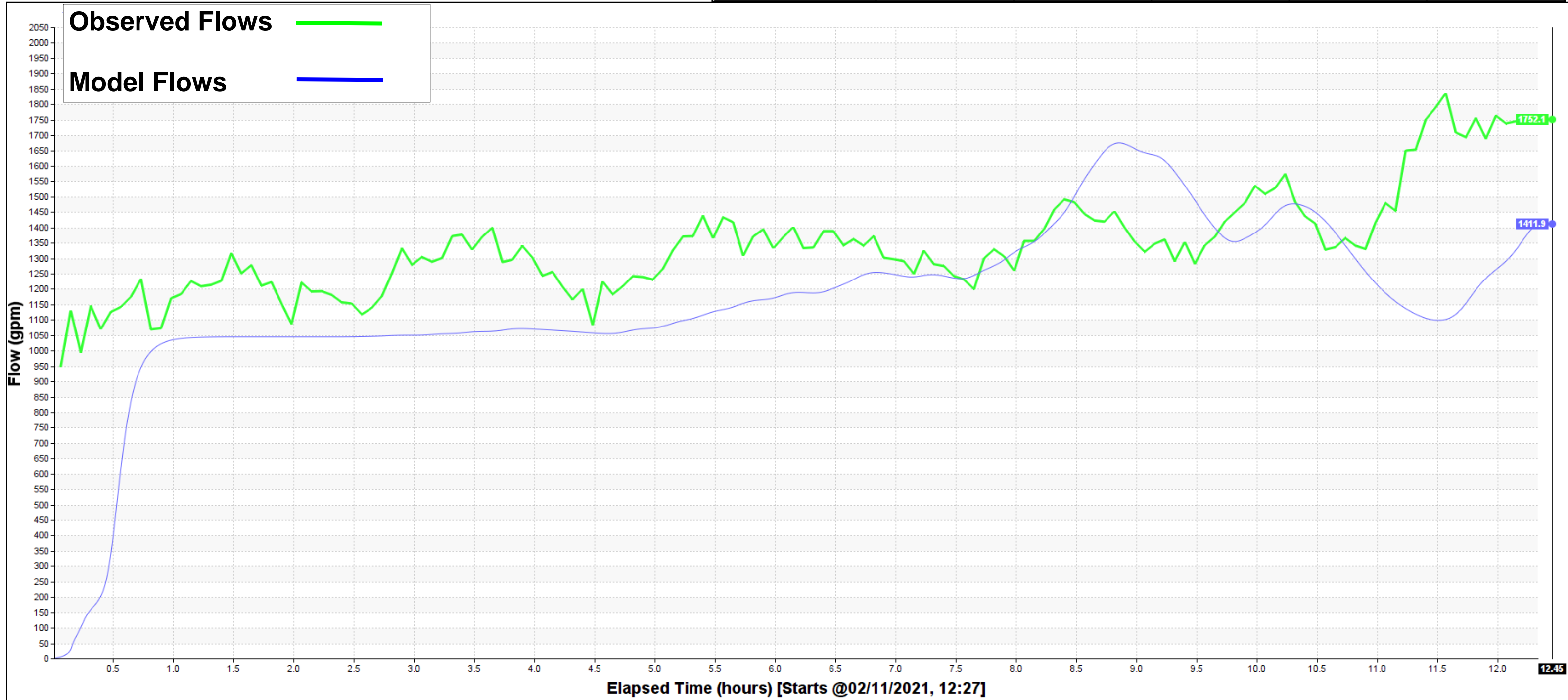
Site 2 - (17-06)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	0.05*S	+4.0%	20 gpm/jct, 700 gpm total	+6%
Event 2: March 5th (8.5 Hrs)	0.49	0.001	+4.0%	None	+3%
Event 3: March 14th (7 Hrs)	0.29	.05*S	+4.0%	None	+4%



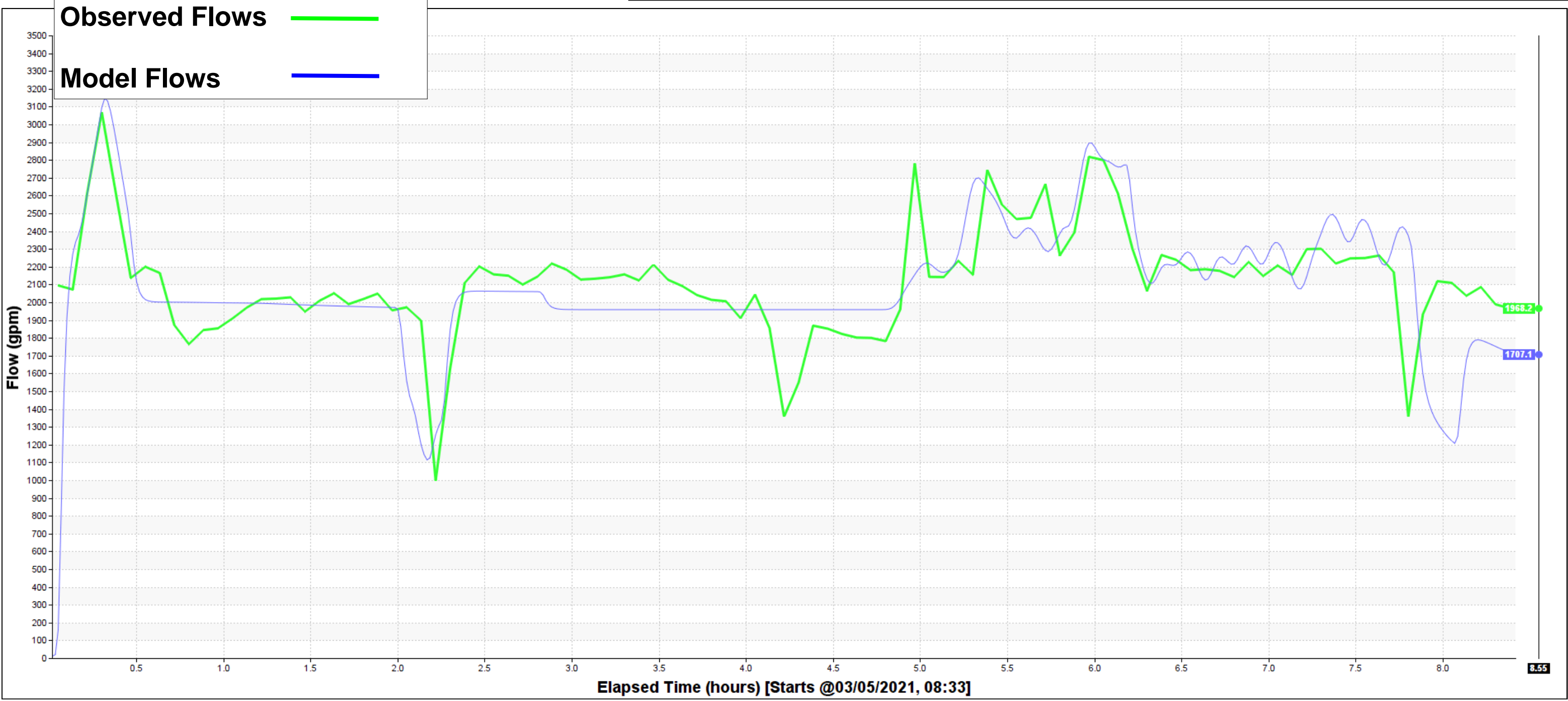
Site 3 - (160-12)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	.075*S	-5.0%	None	+22%
Event 2: March 5th (8.5 Hrs)	0.49	.05*S	-5.0%	None	+12%
Event 3: March 14th (7 Hrs)	0.29	.075*S	-5.0%	None	-8%



Site 4 - (107-31)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	0.025*S	None	22 gpm/jct, 1760 gpm total	+6%
Event 2: March 5th (8.5 Hrs)	0.49	0.05*S	None	20 gpm/jct, 1,600 gpm total	+2%
Event 3: March 14th (7 Hrs)	0.29	0.001	None	20 gpm/jct, 1,600 gpm total	-0.2%

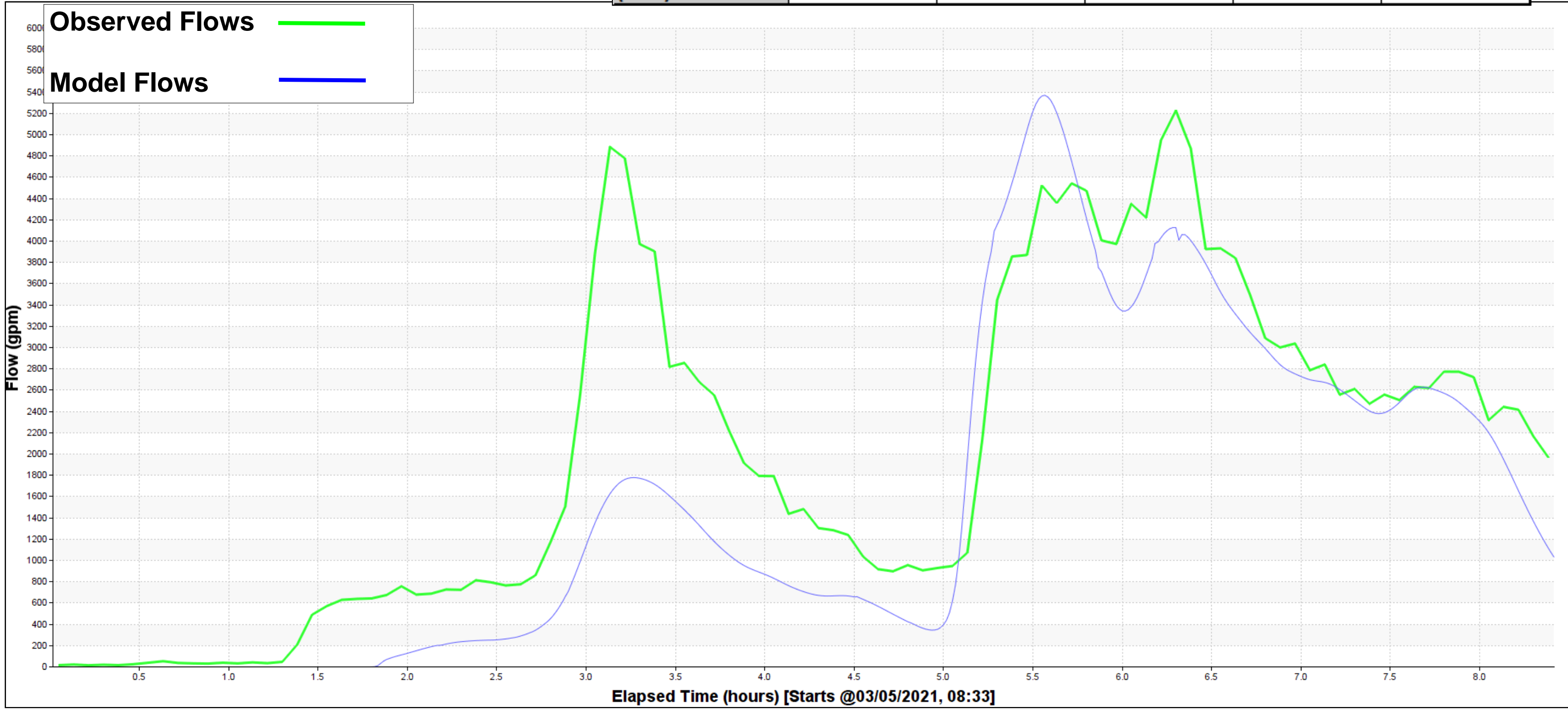


Site 1 - (19-14)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	0.05*S	+2.5%	10 gpm/jct, 400 gpm total	-20%
Event 2: March 5th (8.5 Hrs)	0.49	0.15*S	+2.5%	10 gpm/jct, 400 gpm total	+3%
Event 3: March 14th (7 Hrs)	0.29	0.001	+2.5%	10 gpm/jct, 400 gpm total	+11%





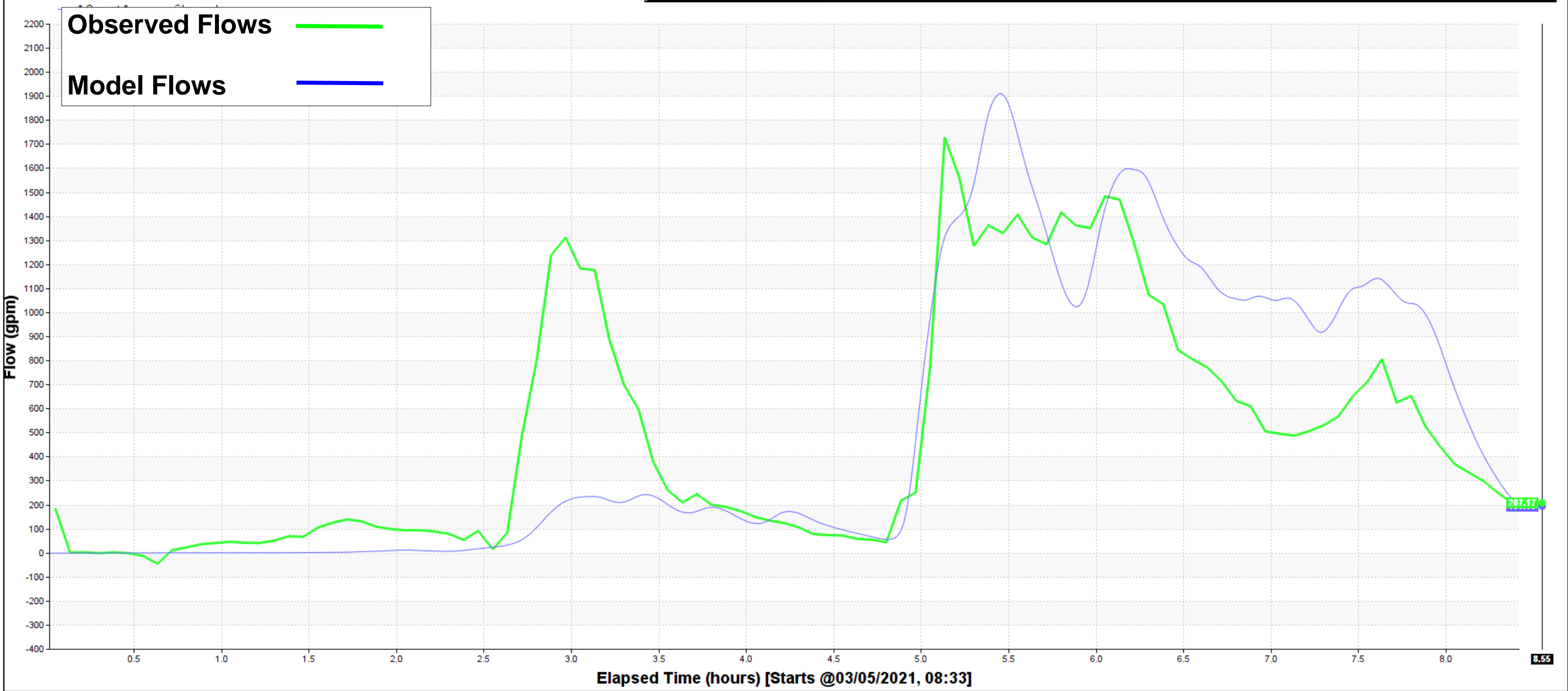
Site 2 - (17-06)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	0.05*S	+4.0%	20 gpm/jct, 700 gpm total	+6%
Event 2: March 5th (8.5 Hrs)	0.49	0.001	+4.0%	None	+3%
Event 3: March 14th (7 Hrs)	0.29	.05*S	+4.0%	None	+4%



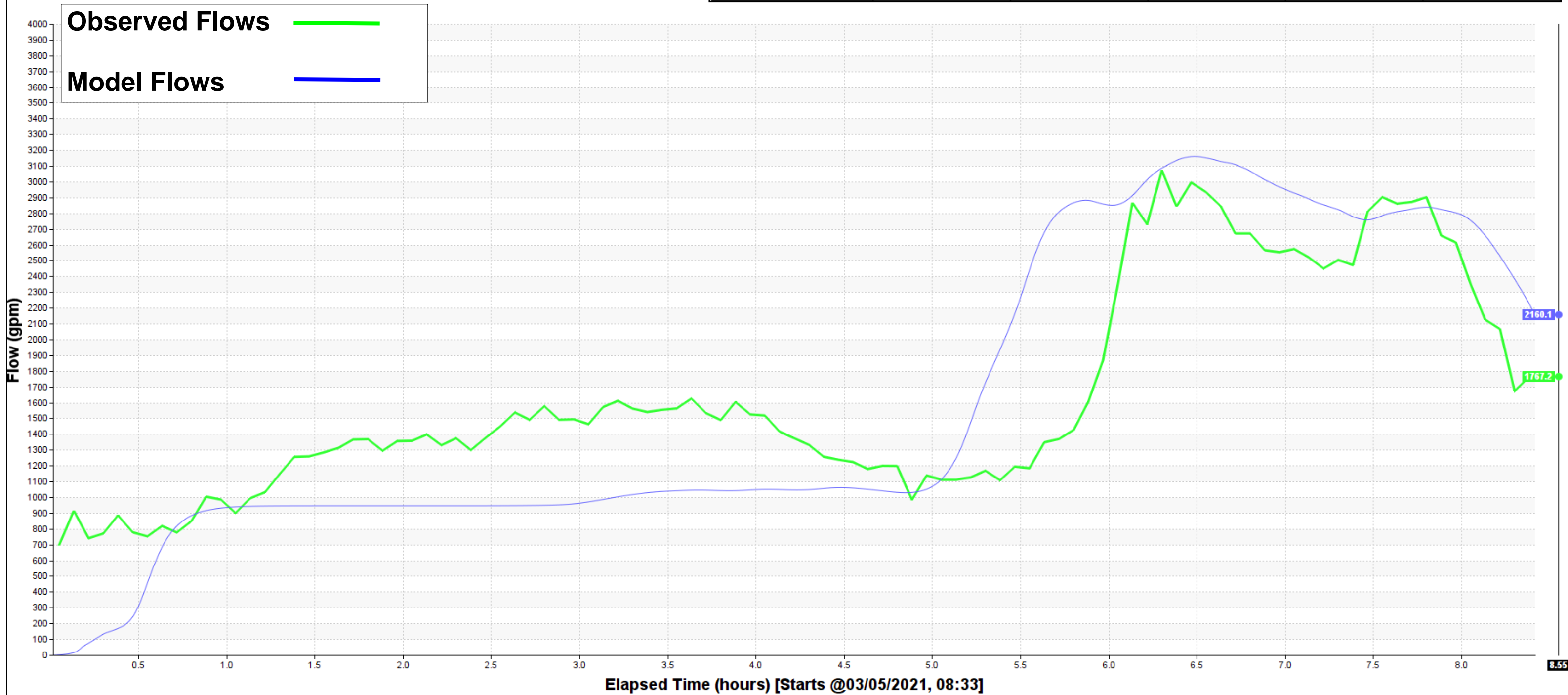


### Site 3 - (160-12)

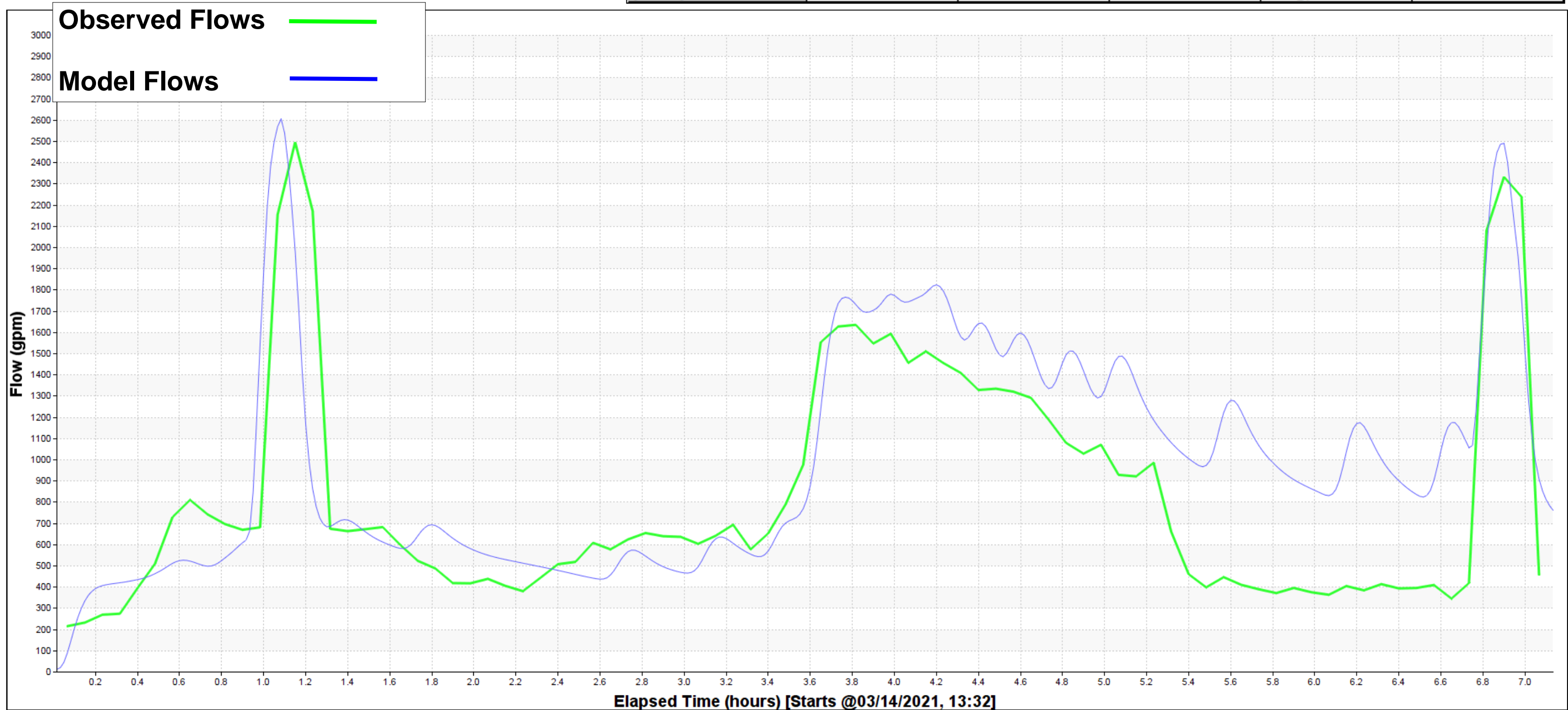
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	.075*S	-5.0%	None	+22%
Event 2: March 5th (8.5 Hrs)	0.49	.05*S	-5.0%	None	+12%
Event 3: March 14th (7 Hrs)	0.29	.075*S	-5.0%	None	-8%



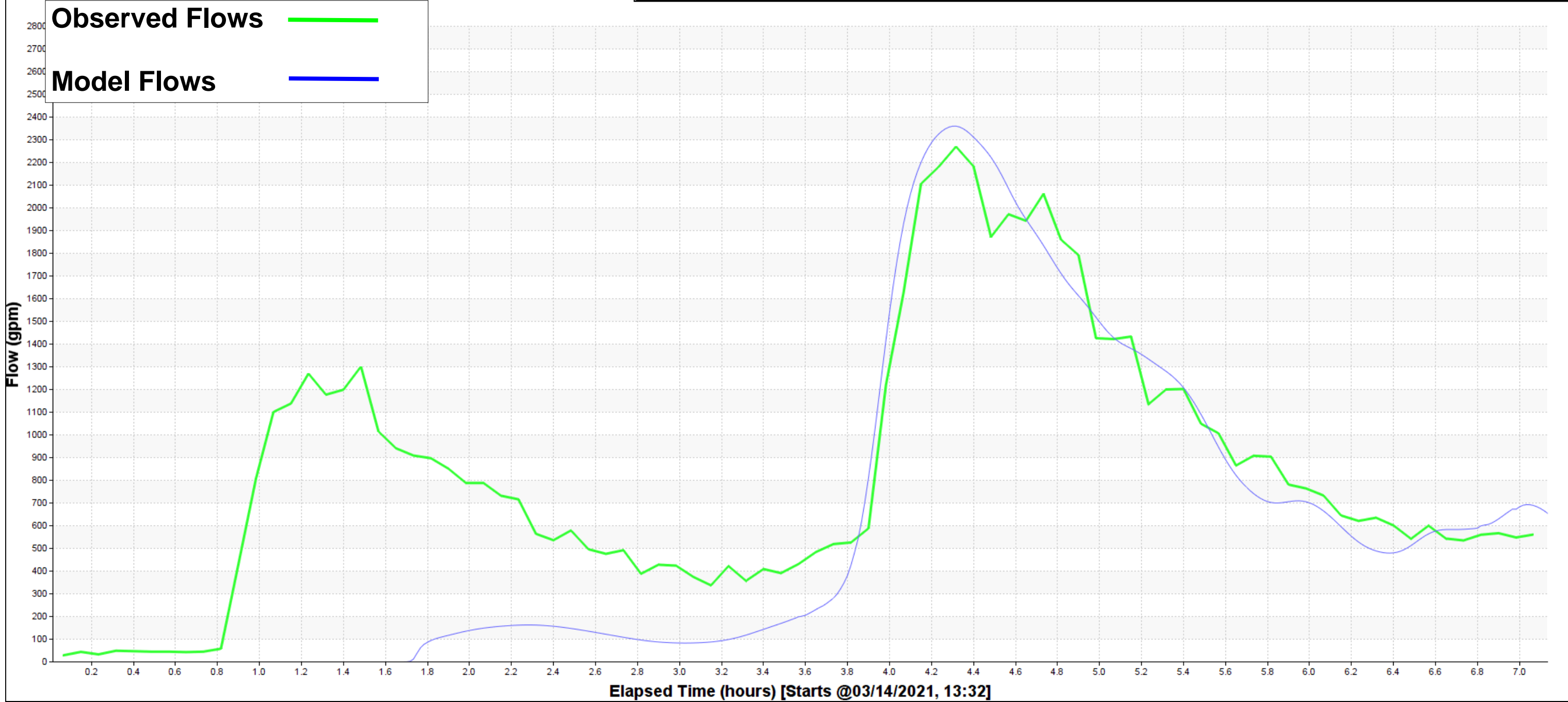
Site 4 - (107-31)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	0.025*S	None	22 gpm/jct, 1760 gpm total	+6%
Event 2: March 5th (8.5 Hrs)	0.49	0.05*S	None	20 gpm/jct, 1,600 gpm total	+2%
Event 3: March 14th (7 Hrs)	0.29	0.001	None	20 gpm/jct, 1,600 gpm total	-0.2%



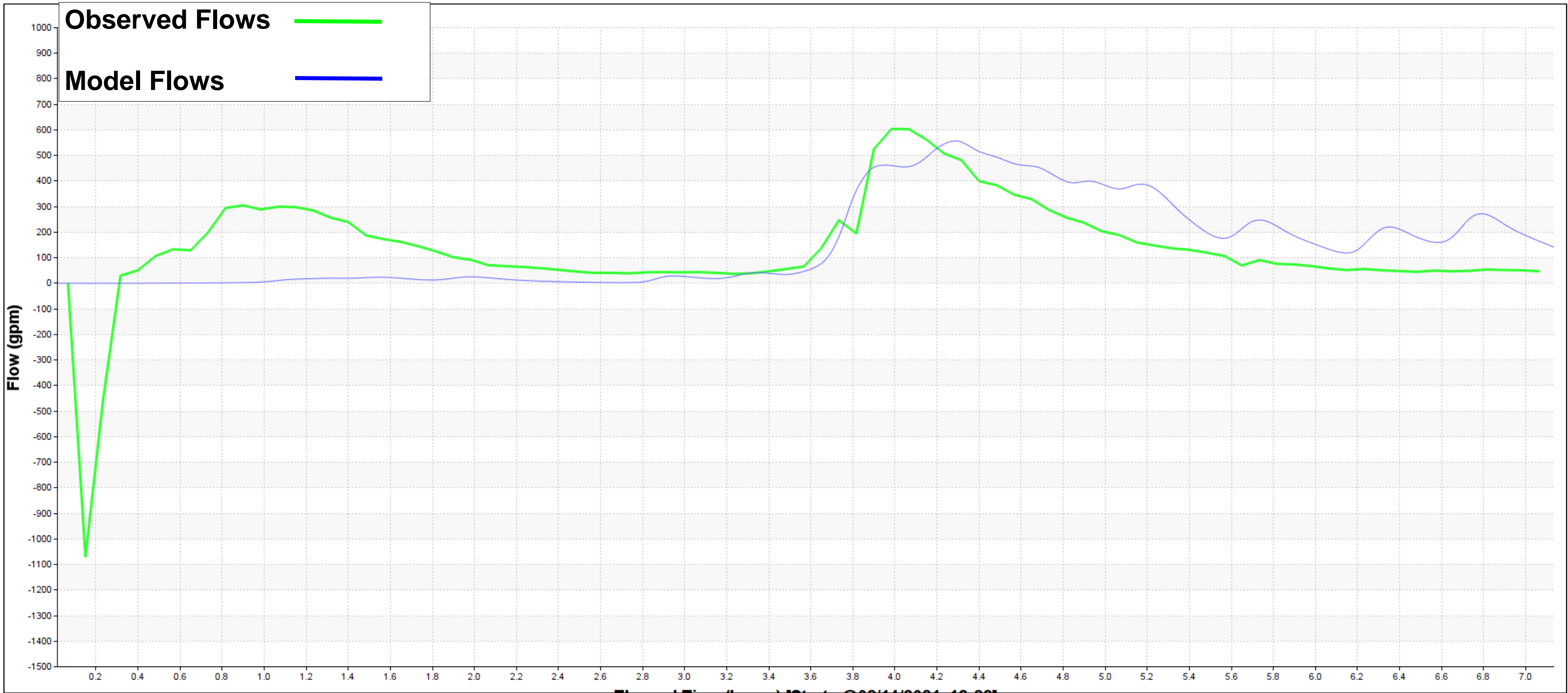
Site 1 - (19-14)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	0.05*S	+2.5%	10 gpm/jct, 400 gpm total	-20%
Event 2: March 5th (8.5 Hrs)	0.49	0.15*S	+2.5%	10 gpm/jct, 400 gpm total	+3%
Event 3: March 14th (7 Hrs)	0.29	0.001	+2.5%	10 gpm/jct, 400 gpm total	+11%



Site 2 - (17-06)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	0.05*S	+4.0%	20 gpm/jct, 700 gpm total	+6%
Event 2: March 5th (8.5 Hrs)	0.49	0.001	+4.0%	None	+3%
Event 3: March 14th (7 Hrs)	0.29	.05*S	+4.0%	None	+4%

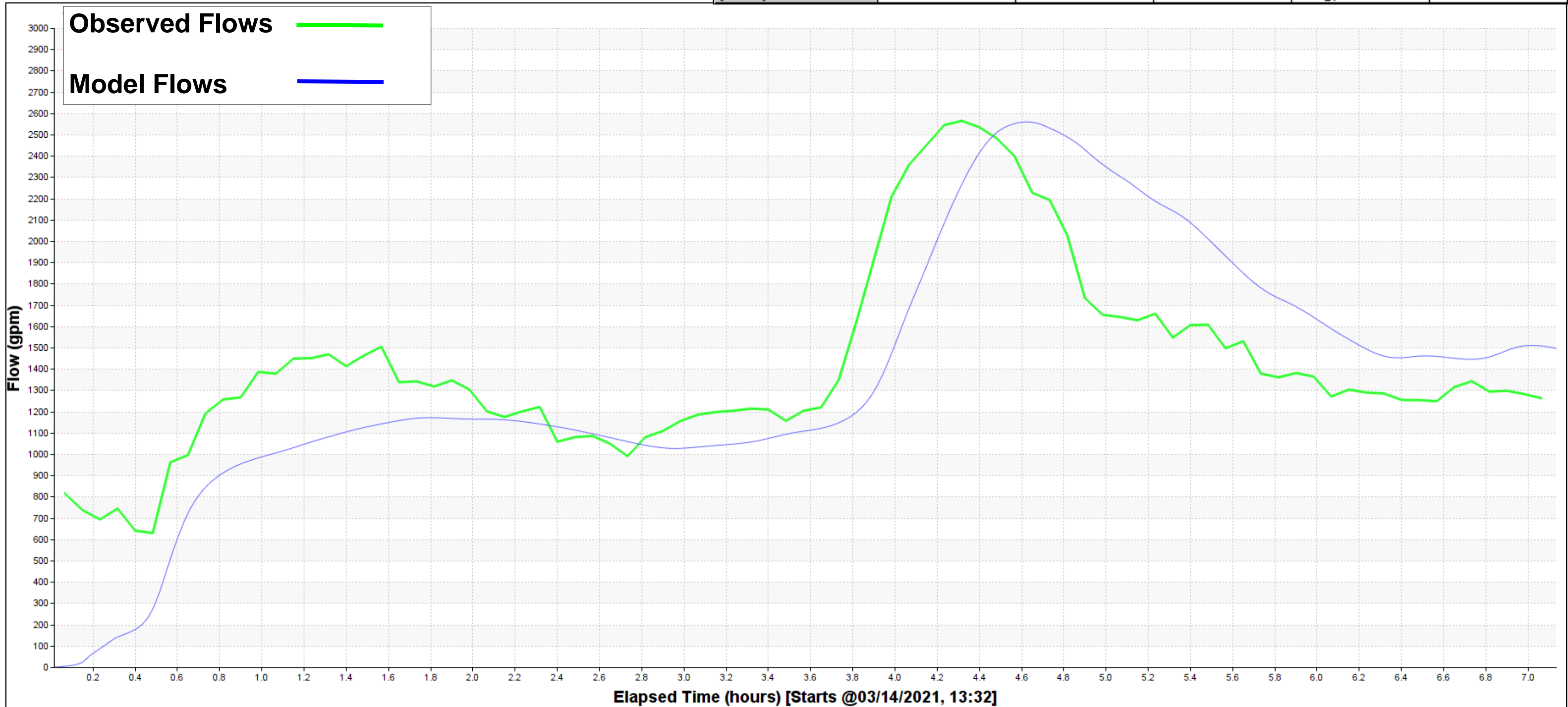


Site 3 - (160-12)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	.075*S	-5.0%	None	+22%
Event 2: March 5th (8.5 Hrs)	0.49	.05*S	-5.0%	None	+12%
Event 3: March 14th (7 Hrs)	0.29	.075*S	-5.0%	None	-8%





Site 4 - (107-31)					
	Total Rainfall (in)	Initial Abs. Value	CN Adjustment	Baseflow	Model Peak to Observed Peak
Event 1: Feb 11th - 12th (13 Hrs)	0.41	0.025*S	None	22 gpm/jct, 1760 gpm total	+6%
Event 2: March 5th (8.5 Hrs)	0.49	0.05*S	None	20 gpm/jct, 1,600 gpm total	+2%
Event 3: March 14th (7 Hrs)	0.29	0.001	None	20 gpm/jct, 1,600 gpm total	-0.2%



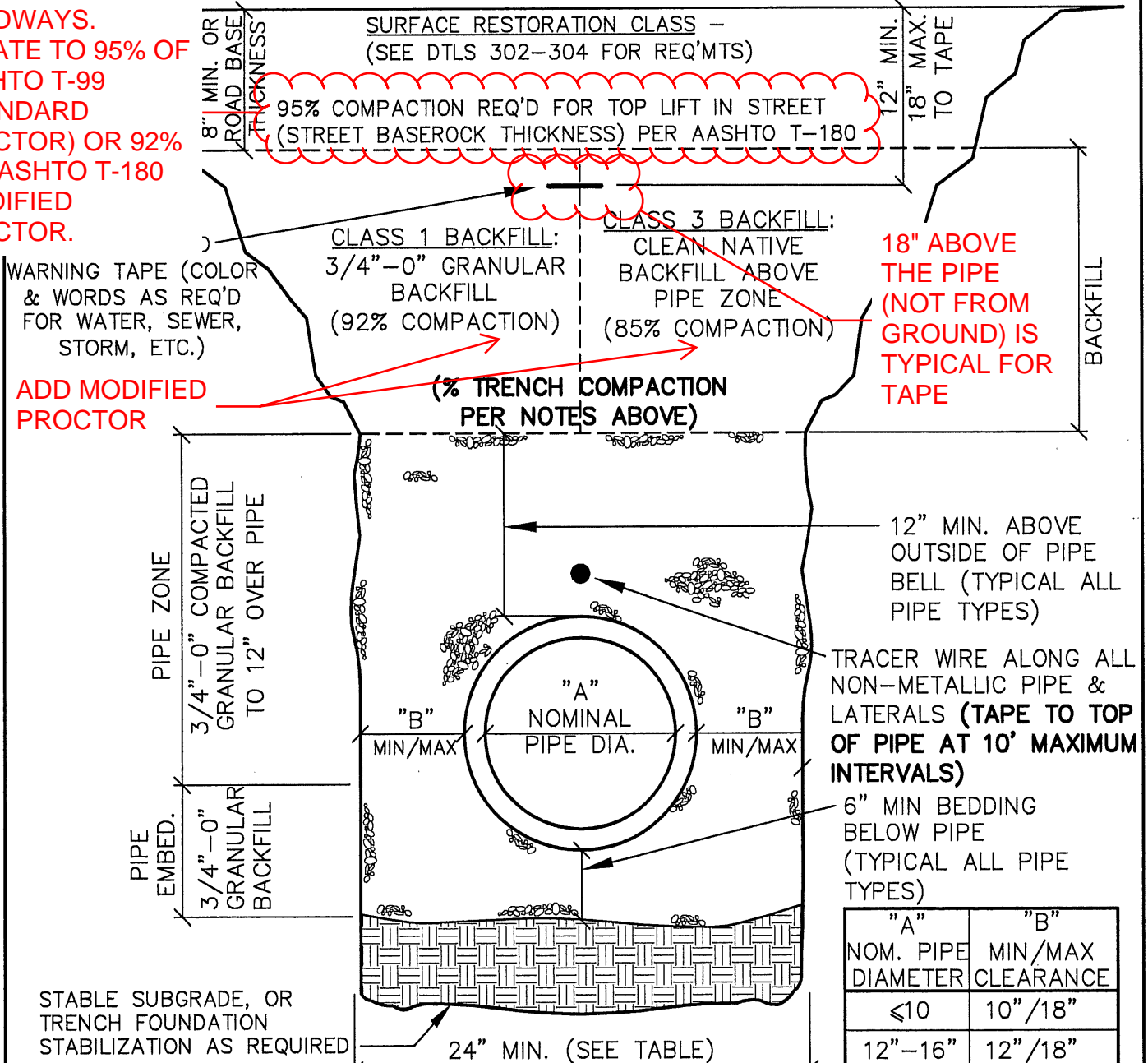
# *APPENDIX C*

*Standard Details Review*



TRENCH COMPACTION: CLASS 1 GRANULAR BACKFILL – 92% OPTIMUM PER AASHTO T-180 (MODIFIED PROCTOR)  
 CLASS 3 NATIVE BACKFILL – 85% OPTIMUM PER AASHTO T-180

NOT NEEDED FOR ROADWAYS.  
 UPDATE TO 95% OF AASHTO T-99 (STANDARD PROCTOR) OR 92% OF AASHTO T-180 (MODIFIED PROCTOR).



ADD MODIFIED PROCTOR

18" ABOVE THE PIPE (NOT FROM GROUND) IS TYPICAL FOR TAPE

(% TRENCH COMPACTION PER NOTES ABOVE)

12" MIN. ABOVE OUTSIDE OF PIPE BELL (TYPICAL ALL PIPE TYPES)

TRACER WIRE ALONG ALL NON-METALLIC PIPE & LATERALS (TAPE TO TOP OF PIPE AT 10' MAXIMUM INTERVALS)

6" MIN BEDDING BELOW PIPE (TYPICAL ALL PIPE TYPES)

"A" NOM. PIPE DIAMETER	"B" MIN/MAX CLEARANCE
≤10	10"/18"
12"–16"	12"/18"
18"–21"	16"/24"
24"–30"	18"/30"
>30"	24"/36"

(SEE NOTE 4)

**NOTES:**

1. CLASS 1 GRANULAR BACKFILL REQ'D. UNDER ALL EXISTING OR FUTURE IMPROVED AREAS (INCLUDING SIDEWALKS).
2. WHERE NEW PIPING IS IN SAME ALIGNMENT AS EXISTING PIPING, THE PIPE EMBEDMENT SHALL EXTEND TO A MIN. OF 6" BELOW THE NEW PIPING OR 6" BELOW EXISTING PIPING, WHICHEVER IS DEEPER.
3. FOR FLEXIBLE PIPE, BOTTOM OF TRENCH SHORING SHALL BE ABOVE PIPE SPRINGLINE PRIOR TO COMPACTING BACKFILL BELOW THE PIPE SPRINGLINE AND UNDER THE PIPE HAUNCHES.
4. MINIMUM CLEARANCES SHOWN ("B") ASSUMES STANDARD 6" WALL TRENCH BOXES SET ON TRENCH BOTTOM, AND REPRESENTS WIDTH REQUIRED TO CONSOLIDATE GRANULAR MATERIAL UNDER PIPE HAUNCHES (TO AVOID LOSS OF SIDE SUPPORT WHEN TRENCH BOX IS MOVED OR PULLED FORWARD). TRENCH WIDTH REDUCTION REQUIRES PRIOR APPROVAL BASED ON ACTUAL TRENCH SHORING PROPOSED.

LAST REVISION DATE: JAN 2016	
<b>TRENCH BACKFILL, BEDDING, AND PIPE ZONE</b>	
(NTS)	
SILVERTON, OR	DETAIL NO. 301



PLACE 4" MIN. THICKNESS, CL.'C' A.C. IN TWO EQUAL LIFTS, OR THICKNESS OF REMOVED PAVEMENT, WHICHEVER IS GREATER, TO 91% OPT. DENSITY PER RICE STD. METHOD.

4' MINIMUM

SEAL SURFACE OVER JOINT WITH TACK MATERIAL AND SAND (AC PATCH ONLY)

MIN. TRENCH PATCH WIDTH  
ROLLER WIDTH PLUS 2"

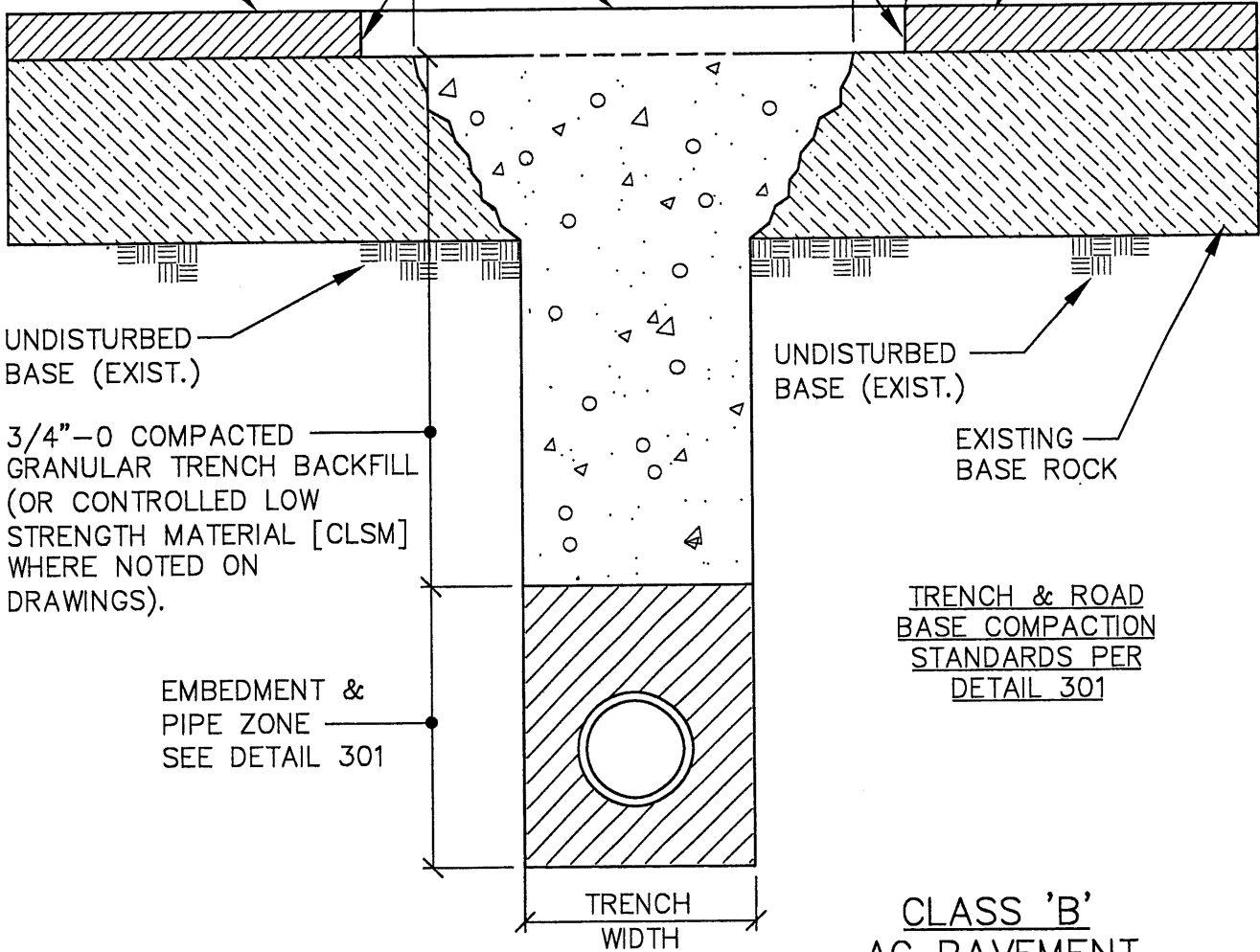
EXISTING PAVEMENT

6" MIN.

TACK COAT CUT EDGES

6" MIN.

EXISTING PAVEMENT



UNDISTURBED BASE (EXIST.)

3/4"-0 COMPACTED GRANULAR TRENCH BACKFILL (OR CONTROLLED LOW STRENGTH MATERIAL [CLSM] WHERE NOTED ON DRAWINGS).

EMBEDMENT & PIPE ZONE  
SEE DETAIL 301

UNDISTURBED BASE (EXIST.)

EXISTING BASE ROCK

TRENCH & ROAD  
BASE COMPACTION  
STANDARDS PER  
DETAIL 301

**CLASS 'B'**  
**AC PAVEMENT  
RESTORATION**

**NOTES:**

1. ALL EXISTING AC OR PCC PAVEMENT SHALL BE SAWCUT PRIOR TO REPAVING.
2. PCC CONCRETE PAVEMENT SHALL BE REPLACED WITH 3300 PSI PCC TO A MINIMUM THICKNESS OF 6" OR TO THE THICKNESS OF REMOVED CONCRETE, WHICHEVER IS GREATER.
3. FOR PAVED DRIVEWAYS (EXCEPT COMMERCIAL OR INDUSTRIAL) WITH LESS THAN 4" EXISTING AC, PAVEMENT THICKNESS MAY BE REDUCED TO 3" AC IN 2 LIFTS, AND OVERCUT MAY BE REDUCED TO 3" EACH SIDE.

LAST REVISION DATE: NOV 2015	
<b>MINOR OR PRIVATE STREET AND AC DRIVEWAY CUT SURFACE RESTORATION (NTS)</b>	
SILVERTON, OR	DETAIL NO. <b>302</b>

4' MINIMUM

PLACE 4" MIN. THICKNESS, CL. 'C' A.C. IN LIFTS. COMPACT TO 91% OPTIMUM DENSITY PER RICE STD. METHOD. (MATCH EXTG AC THICKNESS)

18" MIN. WIDTH PRE-TACKED PAVING FABRIC (MIRAFI MTK, PETROTAC OR EQUAL), SIDE & END JOINTS.

SEAL SURFACE OVER JOINT WITH TACK MATERIAL AND SAND.

MIN. TRENCH PATCH WIDTH ROLLER WIDTH PLUS 2"

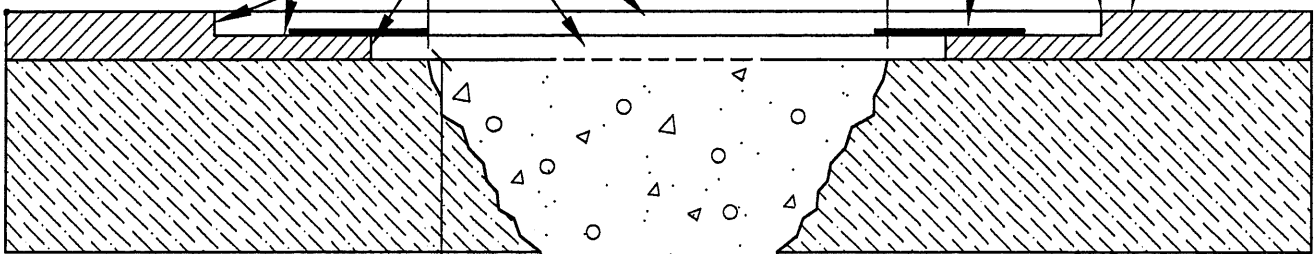
GRIND 24" BENCH INTO EXTG AC PAVEMENT. SEE NOTE 1 BELOW (18" MIN. WIDTH AFTER SAWCUT).

6" MIN.

TACK COAT CUT EDGES & GRIND AREAS

6" MIN.

EXISTING PAVEMENT



UNDISTURBED BASE (EXIST.)

3/4"-0 GRANULAR BACKFILL (OR 'CONTROLLED LOW STRENGTH MATERIAL [CLSM] WHERE NOTED ON DRAWINGS) FROM 12" OVER PIPE TO BOTTOM OF AC (BACKFILL TYPE AS INDICATED ON DWGS). FOR CSLM, STEEL PLATE FOR 24 HOURS PRIOR TO PLACING COLD MIX OR AC SURFACE RESTORATION.

UNDISTURBED BASE (EXIST.)

EXISTING BASE ROCK

TRENCH & ROAD BASE COMPACTION STANDARDS PER DETAIL 301

EMBEDMENT & PIPE ZONE SEE DETAIL 301

**SURFACE MAINT UNTIL FINAL AC.** TRENCHES IN PAVED AREAS SHALL BE STEEL PLATED OR COLD PATCHED (AND MAINTAINED) AT THE END OF EACH WORKDAY. FINAL HOT PATCH REPAVING TO OCCUR W/IN 14 DAYS OF EXCAVATION UNLESS OTHERWISE APPROVED PER PWDS G.11.b. REMOVE ALL COLD PATCH PRIOR TO FINAL PAVING.

TRENCH WIDTH

**NOTES:**

1. FOLLOWING BACKFILL COMPACTION OR CLSM INSTALLATION, GRIND 24" WIDE BENCH IN EXISTING AC ON BOTH SIDES & TRENCH ENDS, 2" DEEP OR HALF THE DEPTH OF EXISTING AC (3" MAX).
2. AFTER GRINDING, SAWCUT ALONG TRENCH SIDES, 6" BACK FROM TRENCH EDGE.
3. BASE LIFT(S). TACK COAT EDGES, INSTALL/COMPACT BASE LIFTS (3" MAX LIFT) TO LEVEL OF BENCH GRIND.
4. FINISH LIFT. INSTALL JOINT SEAL FABRIC, TACK COAT GRIND SURFACES & EDGES, & INSTALL TOP LIFT OF AC. SAND SEAL ALL JOINTS (REMOVE EXCESS SAND AFTER CURE).

**CLASS 'A' AC PAVEMENT RESTORATION**

LAST REVISION DATE: NOV 2015	
AC STREET CUT SURFACE RESTORATION W/BENCH GRIND (NTS)	
SILVERTON, OR	DETAIL NO. 302A

NOT REVIEWED

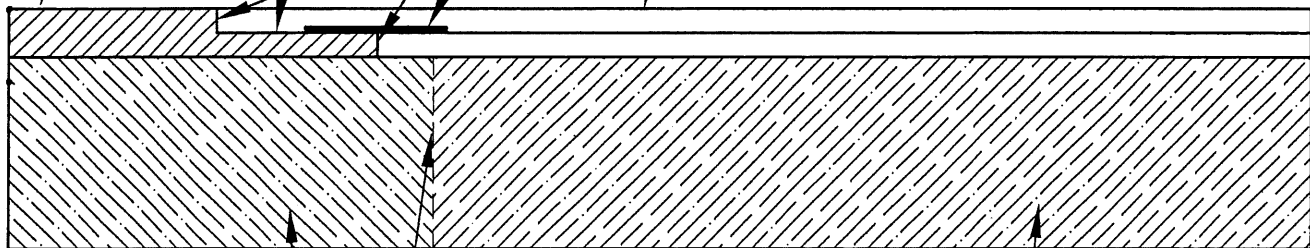
GRIND 24" BENCH INTO  
EXTG AC PAVEMENT.  
SEE NOTE 1 BELOW  
(18" MIN. WIDTH  
AFTER SAWCUT).

18" MIN. WIDTH  
PRE-TACKED PAVING  
FABRIC (MIRAFI MTK,  
PETROTAC OR EQUAL)

PLACE A.C. IN MIN. TWO LIFTS (CL. 'C'  
OVER CL. 'B'), OVERALL THICKNESS  
AS NOTED ON DWGS (3" MIN.).  
COMPACT TO 91% OPTIMUM DENSITY  
PER RICE STD. METHOD.

EXISTING  
PAVEMENT

TACK COAT CUT EDGES & ALL GRIND SURFACES



UNDISTURBED  
SUBGRADE (EXIST.)

\*\*SAWCUT LINE (& NEW BASEROCK),  
DISTANCE FROM EXISTING EDGE AC  
AS SHOWN ON DWGS (6"-12" TYP)

COMPACTED  
SUBGRADE (NEW)

EXISTING  
BASE ROCK

NEW COMPACTED  
BASE ROCK

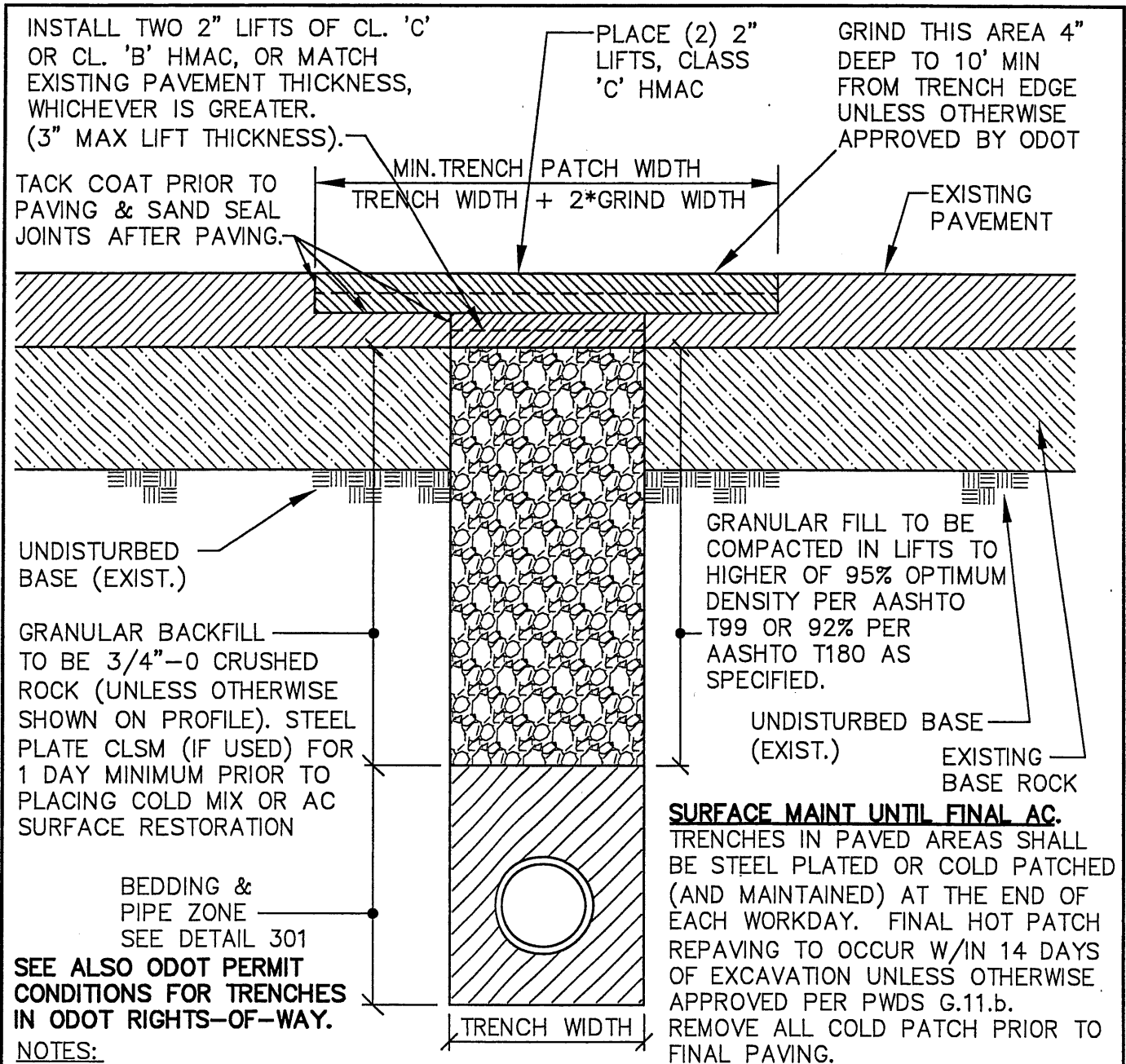
**\*\*BENCH GRIND REQUIREMENT SHOWN DOES NOT REPLACE ANY REQUIREMENT NOTED ON DRAWINGS FOR SAWCUT BACK FROM EDGE OF EXISTING AC & INSTALLATION OF NEW BASEROCK. BENCH GRIND REQUIREMENT APPLIES AFTER ALL EXCAVATION & BASEROCK PLACEMENT (PRIOR TO PAVING), TO AVOID FULL DEPTH AC JOINTS.**

NOTES:

1. PRIOR TO SAWCUTTING, GRIND 24" WIDE BENCH IN EXISTING AC 2" DEEP. (BENCH TO EXTEND TO A POINT 18" MINIMUM BACK FROM FINAL SAWCUT LOCATION)
2. FOLLOWING GRINDING, SAWCUT PAVEMENT EDGES 6" BACK FROM EDGE.
3. TACK COAT CUT EDGES AND INSTALL BASE LIFT OF AC LEVEL WITH GROUND BENCH.
4. INSTALL PAVING FABRIC AT ALL JOINTS, TACK COAT ALL GRIND SURFACES & EDGES, INSTALL TOP LIFT OF AC.
5. SAND SEAL ALL JOINTS (REMOVE EXCESS SAND AFTER CURE).
6. ALONG WIDENED STREETS, THE CONTRACTOR SHALL VERIFY THAT THE PROPOSED CURB/GUTTER ELEVATIONS MATCH THE EXISTING EDGE OF PAVEMENT, BASED ON THE DESIGN STREET CROSS SLOPES SHOWN ON THE DRAWINGS AND THE SPECIFIED CURB EXPOSURE. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER PRIOR TO PLACEMENT OF CURB FORMS OR STRINGLINE. CURBS WHICH ARE PLACED TOO HIGH OR TOO LOW SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE CITY.

LAST REVISION DATE: JULY 2015	
<b>AC STREET CUT FOR STREET WIDENING OR EXTENSION</b>	
(NTS)	
SILVERTON, OR	DETAIL NO. 302B

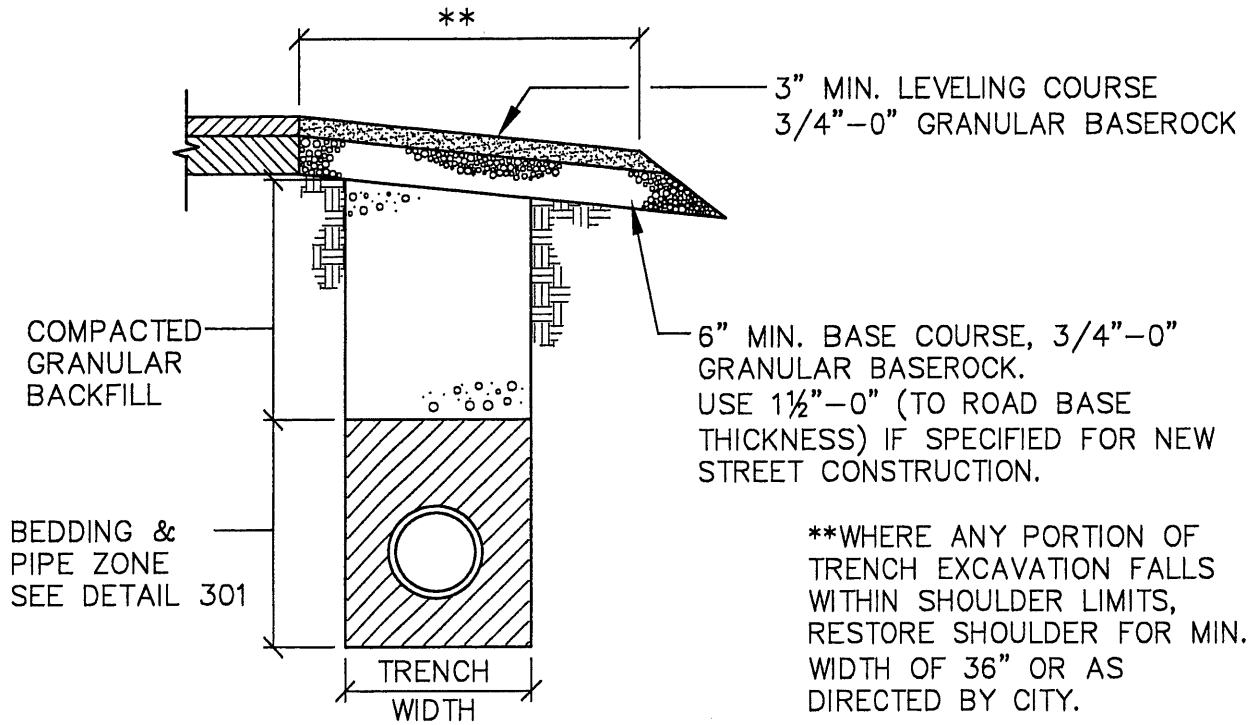
NOT REVIEWED



1. COMPACT ALL A.C. LIFTS TO 91% OPTIMUM DENSITY PER RICE STANDARD METHOD.
2. ASPHALT EMULSION TACK COAT SHALL BE USED TO SEAL THE HMAC TO THE EDGES OF THE EXISTING AC PAVEMENT. ALL AC PAVEMENT CUTS SHALL BE VERTICAL, CLEAN & ASPHALT SAND SEALED ALONG ALL EDGES AFTER INSTALLATION.
3. ALL PAVEMENT CUT AREAS SHALL BE COLD PATCHED OR PLATED AT THE END OF EACH WORK SHIFT, & THE PLATES OR PATCH MAINTAINED UNTIL FULL PAVEMENT RESTORATION IS MADE W/HMAC. COLD PATCH (IF USED) SHALL BE REPLACED WITH HOT MIX HMAC WITHIN FIVE CALENDAR DAYS OR AS DIRECTED BY THE DISTRICT MANAGER OR REPRESENTATIVE IN WRITING.
4. HMAC SHALL BE A COMMERCIALY PRODUCED PLANT MIXTURE CONFORMING TO ODOT STANDARDS ("B" OR "C" DESIGNATION REFERS TO AGGREGATE SIZE ONLY).
5. 48" MINIMUM COVER IS REQUIRED FOR ALL GAS, ELECTRIC, TELEPHONE, FIBER OPTIC AND OTHER POTENTIALLY DANGEROUS/HIGH IMPACT UTILITY FACILITIES, ALL OTHER FACILITIES REQUIRE 36" MINIMUM COVER DEPTH.

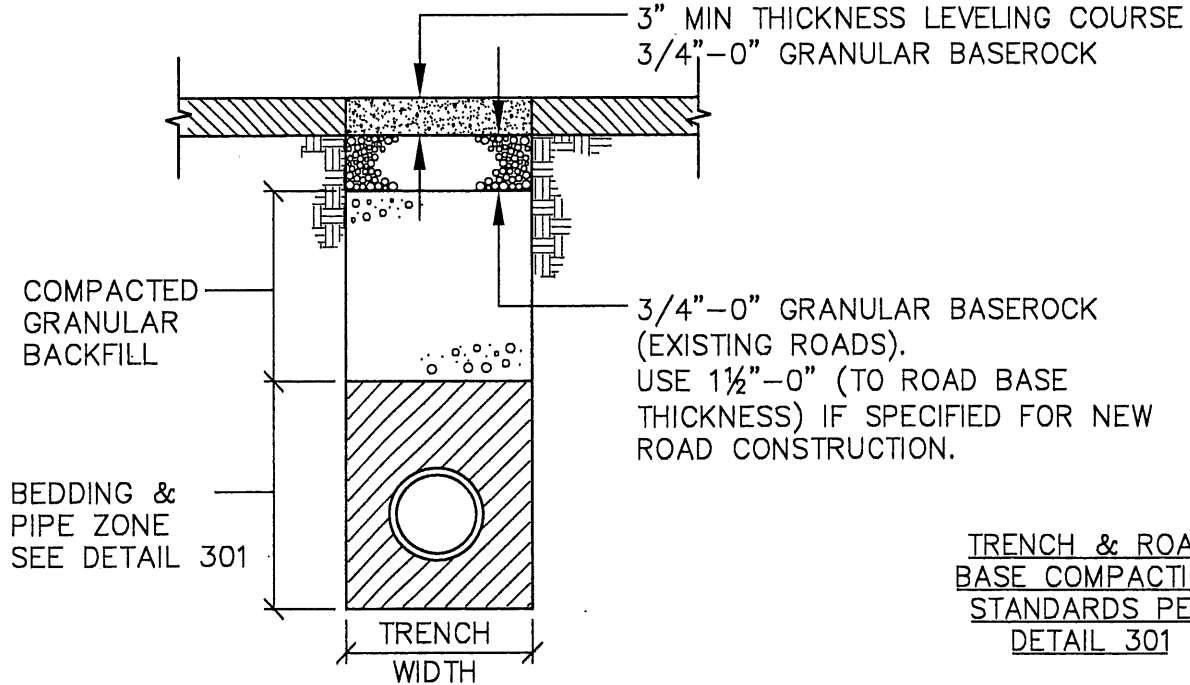
LAST REVISION DATE: JULY 2015	
<b>ODOT TRENCH CROSSING, TRENCH BACKFILL &amp; SURFACE RESTORATION</b> (NTS)	
SILVERTON, OR	DETAIL NO. 302D





**CLASS 'C'**  
GRAVEL SHOULDER RESTORATION

\*\*WHERE ANY PORTION OF TRENCH EXCAVATION FALLS WITHIN SHOULDER LIMITS, RESTORE SHOULDER FOR MIN. WIDTH OF 36" OR AS DIRECTED BY CITY.



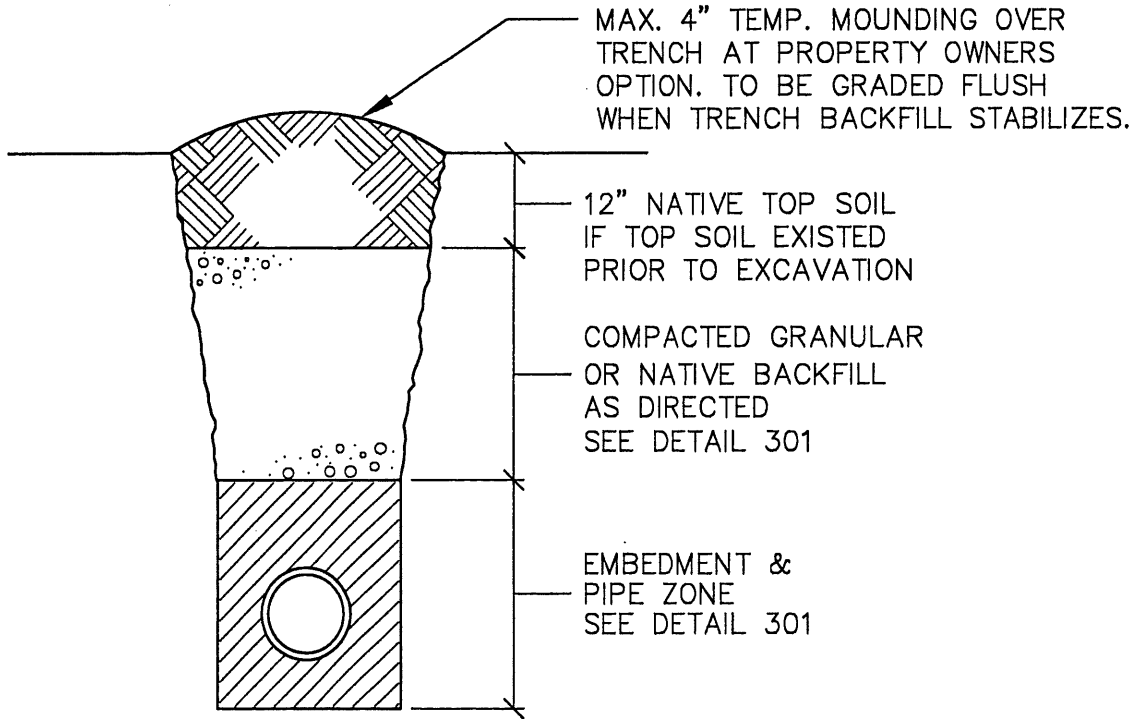
**CLASS 'D'**  
GRAVEL STREET RESTORATION

TRENCH & ROAD  
BASE COMPACTION  
STANDARDS PER  
DETAIL 301

NOTES:

1. SHOULDER ROCK TO BE COMPACTED TO ROAD BASEROCK STANDARDS.

LAST REVISION DATE: NOV 2015	
<b>GRAVEL SURFACE RESTORATION</b>	
(NTS)	
SILVERTON, OR	DETAIL NO. <b>303</b>



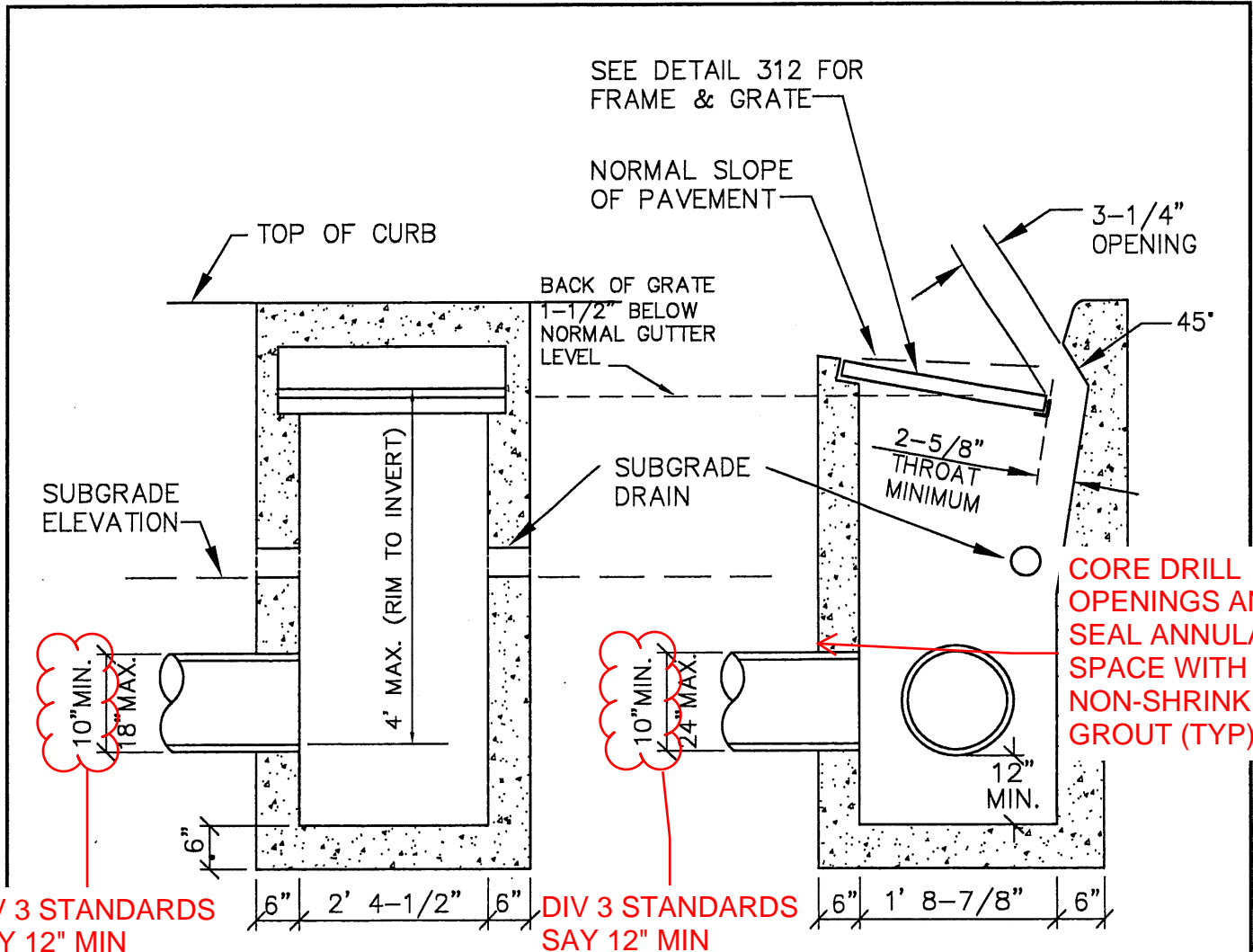
CLASS 'E'  
UNIMPROVED & OPEN AREAS

TRENCH & ROAD  
BASE COMPACTION  
STANDARDS PER  
DETAIL 301

NOTES:

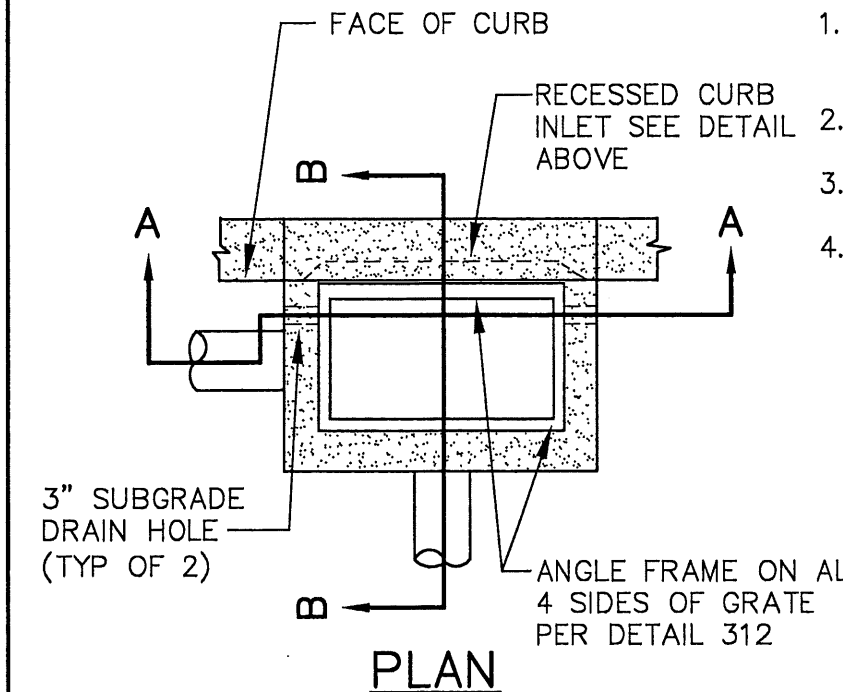
1. ANY TRENCH SETTLEMENT DURING WARRANTY PERIOD SHALL BE CORRECTED AT CONTRACTOR'S EXPENSE, INCLUDING SURFACE RESTORATION.

LAST REVISION DATE: NOV 2015	
NATIVE SURFACE RESTORATION	
(NTS)	
SILVERTON, OR	DETAIL NO. 304



**SECTION A-A**

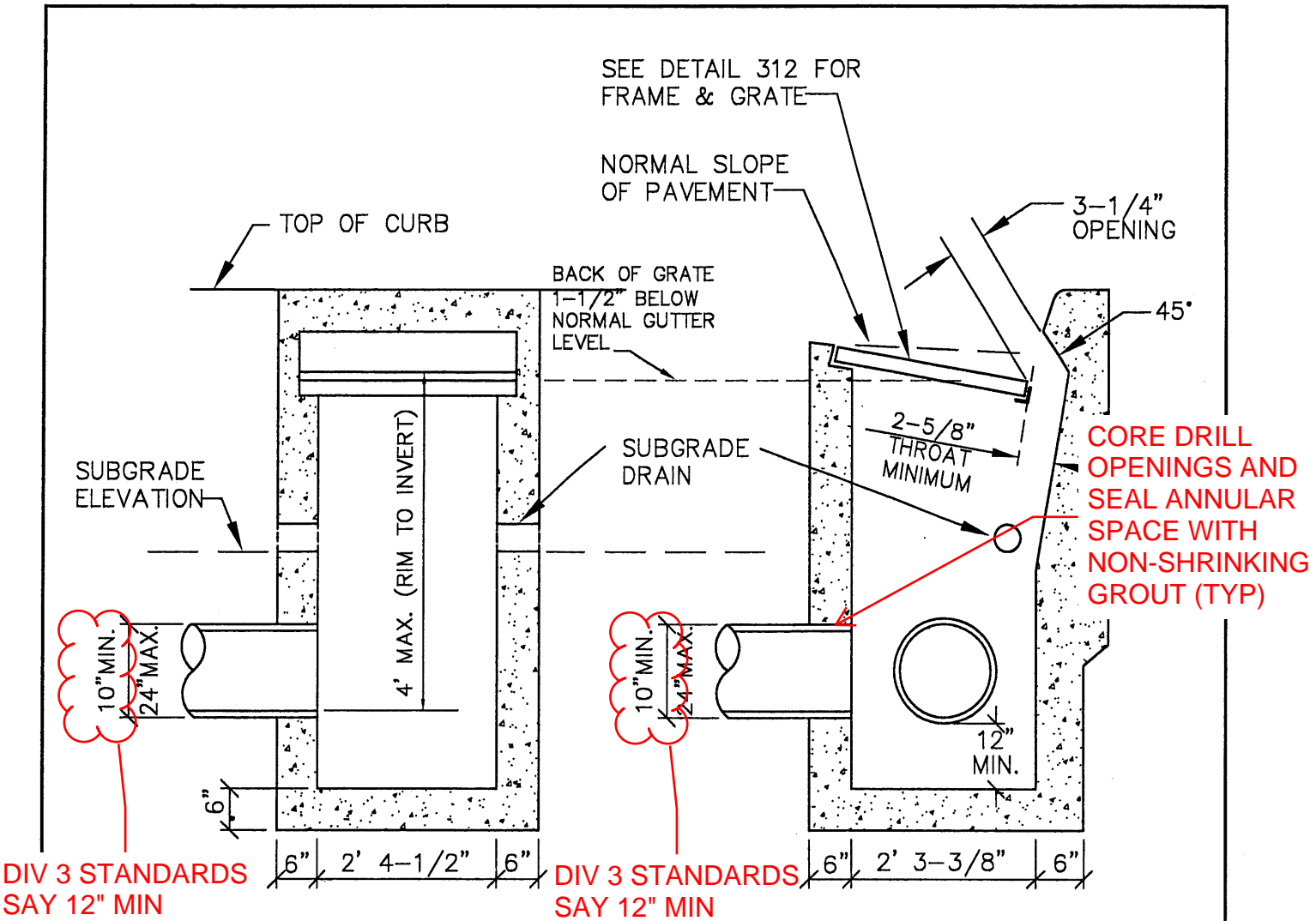
**SECTION B-B**



**PLAN**

**NOTES:**

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. ALL CONCRETE TO BE 3300 PSI @ 28 DAYS.
3. MATCH EXISTING CURB UNLESS OTHERWISE NOTED.
4. CURB-INLET NOTCH TO BE ELIMINATED AT DROP CURB LOCATIONS WHERE APPROVED BY THE PUBLIC WORKS DIRECTOR.
5. **INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL**
6. **PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497**



**SECTION A-A**

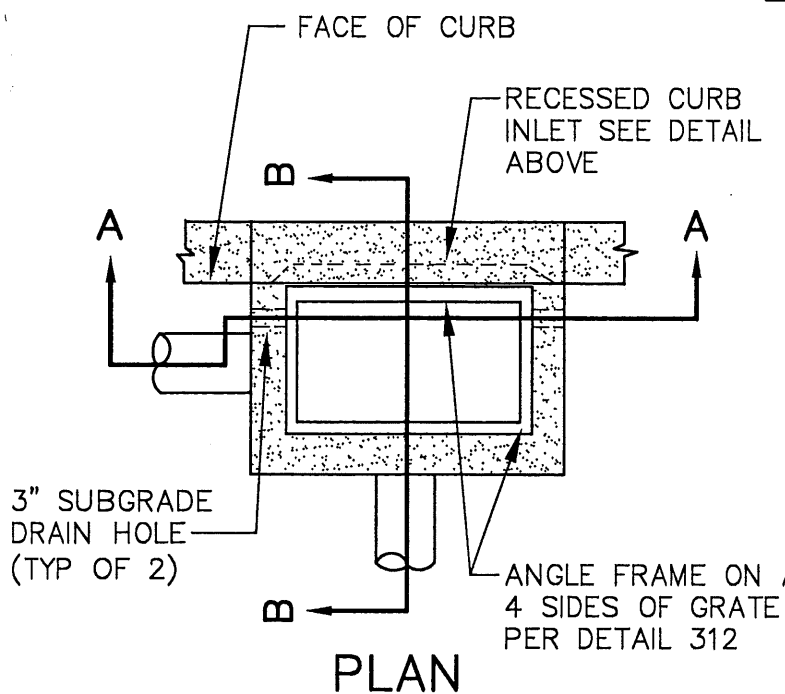
**SECTION B-B**

**NOTES:**

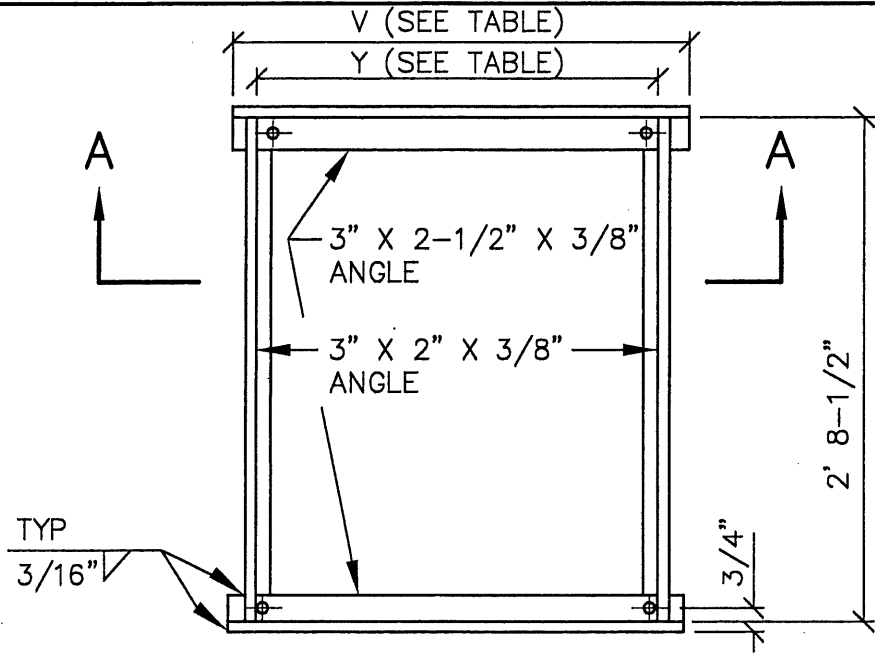
1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. ALL CONCRETE TO BE 3300 PSI @ 28 DAYS.
3. MATCH EXISTING CURB UNLESS OTHERWISE NOTED.
4. CURB-INLET NOTCH TO BE ELIMINATED AT DROP CURB LOCATIONS WHERE APPROVED BY THE PUBLIC WORKS DIRECTOR.

**5. INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL**

**6. PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497**



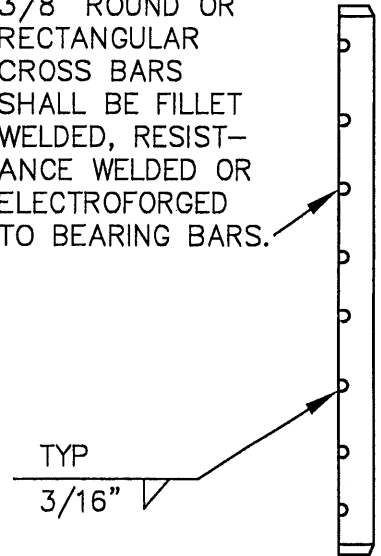




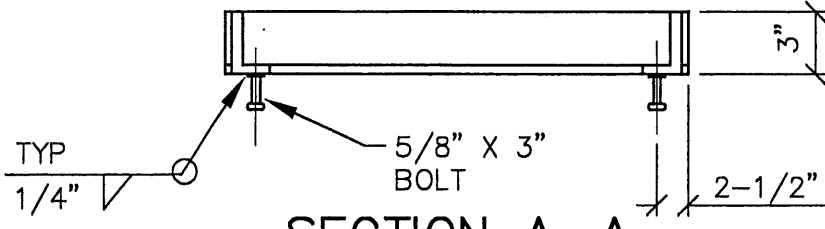
**PLAN**

**NOTE:**

3/8" ROUND OR RECTANGULAR CROSS BARS SHALL BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS.

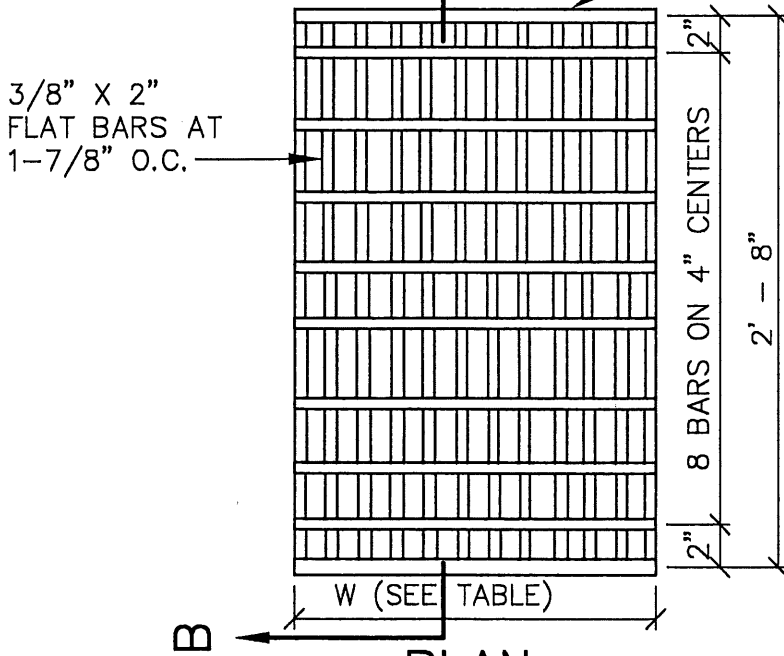


**SECTION B-B**



**SECTION A-A**

3/8" X 2" FLAT BAR EA. END



**PLAN**

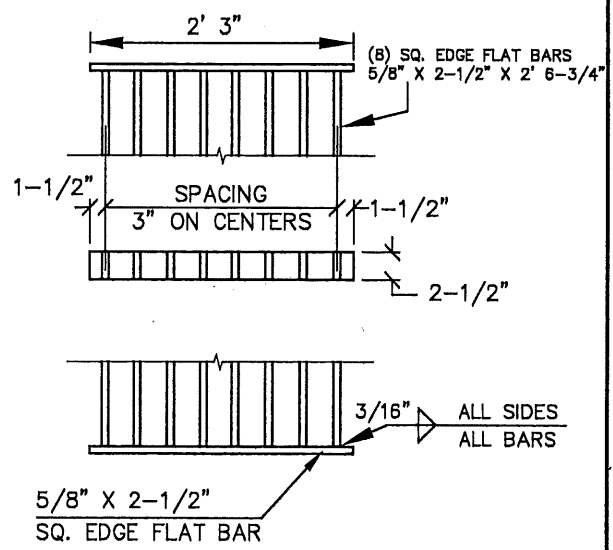
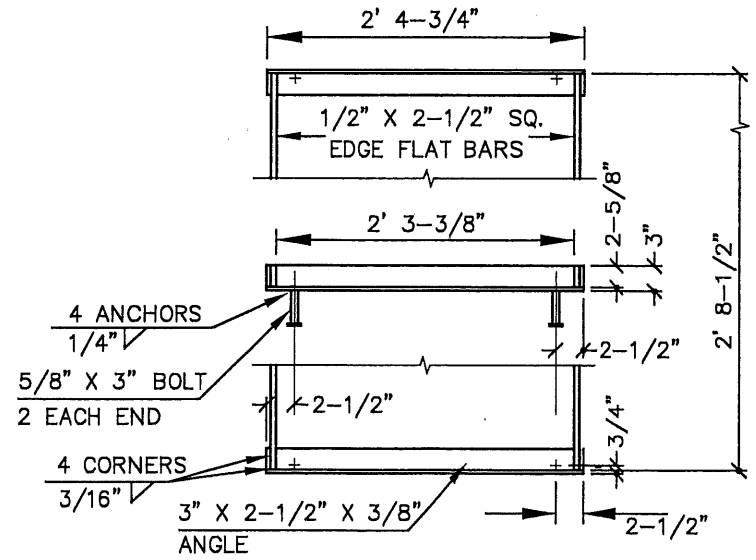
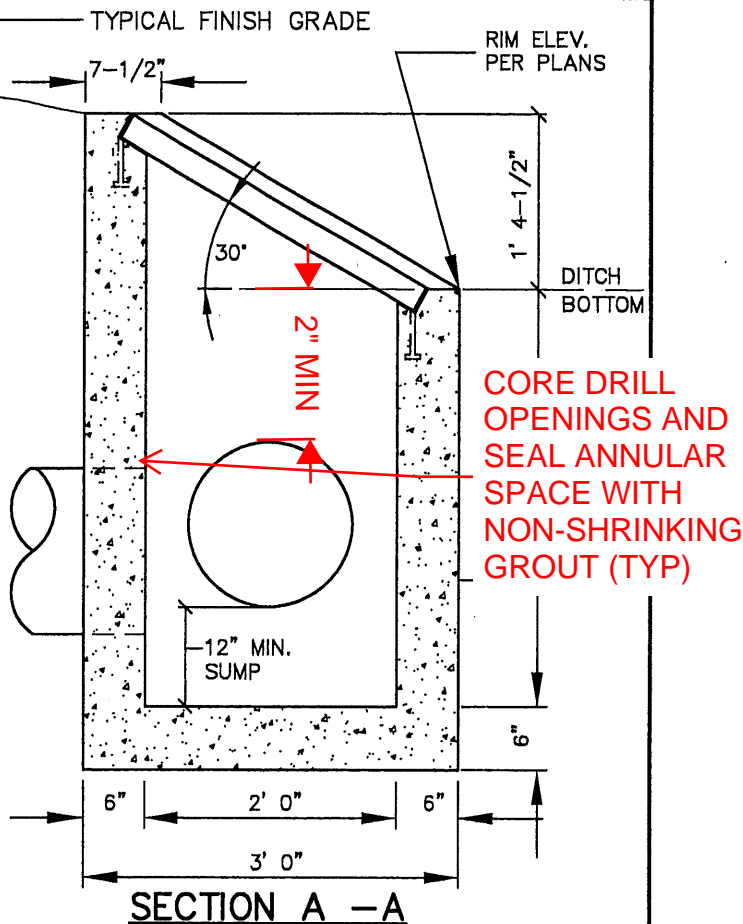
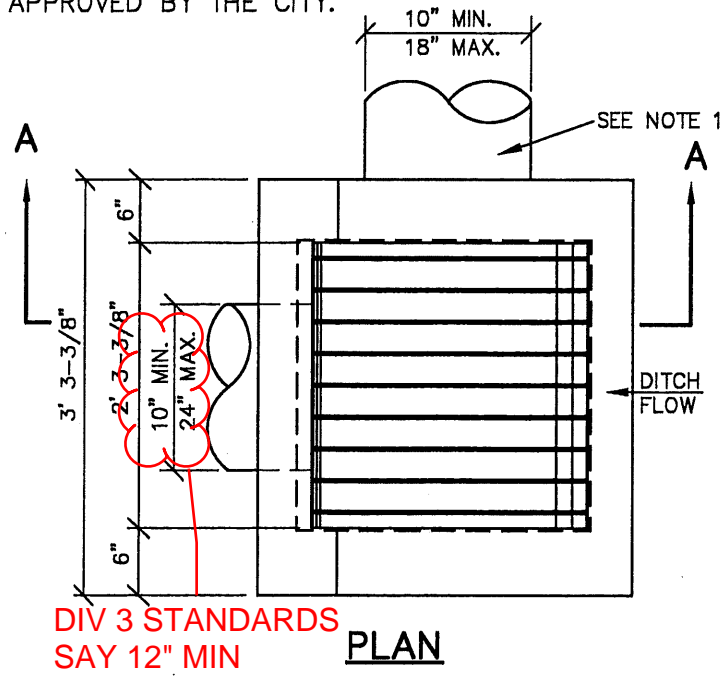
**NOTE:**

1. USE VERTICAL BEADS IN CORNERS, FILLET WELD JOINT ON BOTTOM OF FRAME. GRATE MUST REST FLAT ON FRAME SURFACE.
2. ALL STEEL SHALL BE ASTM A-36.
3. ANGLE FRAME REQUIRED ON ALL FOUR SIDES OF GRATE OPENING AS SHOWN.

INLET TYPE	FRAME			GRATE	
	V	Y	W	NO. OF BARS	REMARKS
STANDARD	1' 10-3/4"	1' 9-3/8"	1'- 9"	12	1-GRATE
OVERSIZE	2' 4-3/4"	2' 3-3/8"	1' 1-1/2"	8	2-GRATES

LAST REVISION DATE: JULY 2015	COPYRIGHT 1996 WESTECH ENGINEERING, INC.
<b>CATCH BASIN GRATE DETAILS</b>	
(NTS)	
SILVERTON, OR	DETAIL NO. <b>312</b>

**NOTE:** CONTRACTOR TO VERIFY CB DATA & FINISH GRADE ELEV'S PRIOR TO INSTALLATION TO ENSURE THAT TOP OF CB DOES NOT EXTEND ABOVE SURROUNDING GRADE UNLESS OTHERWISE SPECIFICALLY NOTED ON THE DRAWINGS OR APPROVED BY THE CITY.

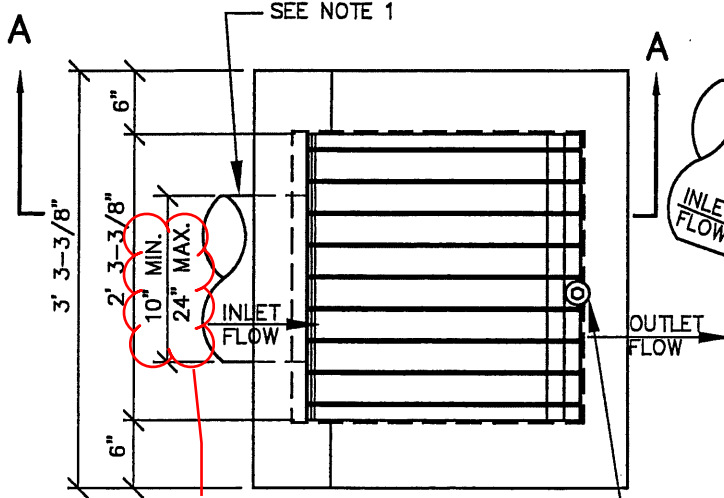


**NOTES:**

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. FRAME & GRATE SHALL BE ASTM A-36 STEEL, HOT-DIPPED GALV. AFTER CONSTRUCTION.
3. ALL CONCRETE TO BE 3000 PSI MIN AT 28 DAYS.
4. PRIOR TO CB INSTALLATION, CONTRACTOR SHALL VERIFY RIM ELEVATIONS LISTED AGAINST DITCH & FINISH GRADE ELEVATIONS, & NOTIFY CITY OF ANY DISCREPANCIES.

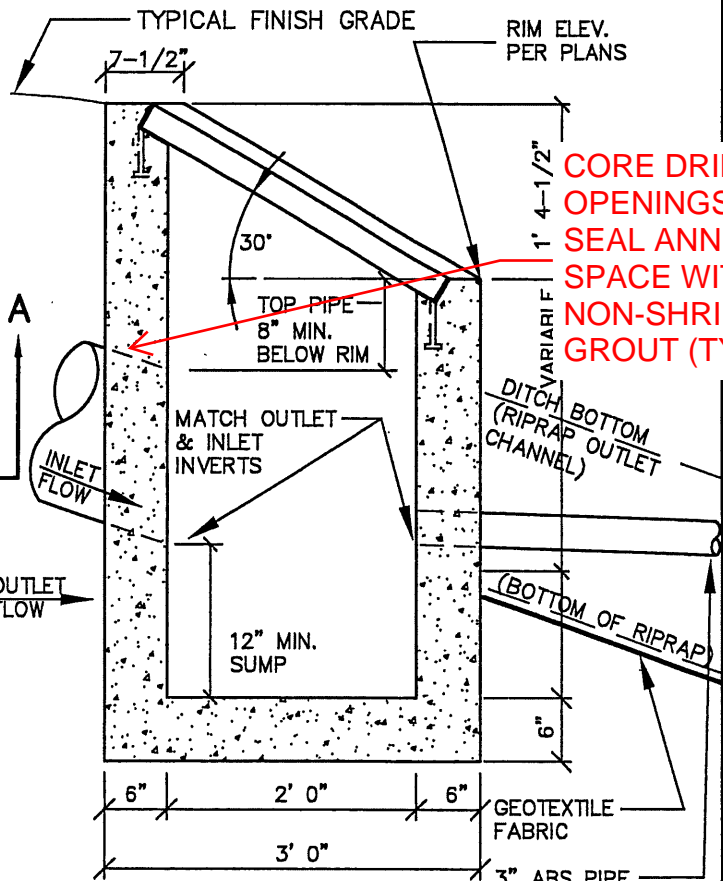
5. INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL
6. PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497

**NOTE:** CONTRACTOR TO VERIFY FINISH GRADE ELEV'S PRIOR TO INSTALLATION TO ENSURE THAT TOP OF OUTLET STRUCTURE DOES NOT EXTEND ABOVE SURROUNDING GRADE UNLESS OTHERWISE NOTED ON DWGS OR APPROVED BY CITY. PROVIDE OUTLET PIPE & OUTLET CHANNEL (LENGTH & CONFIGURATION PER NOTE 4) AS NOTED UNLESS OTHERWISE SHOWN ON APPROVED DWGS OR REQUIRED BY CITY.



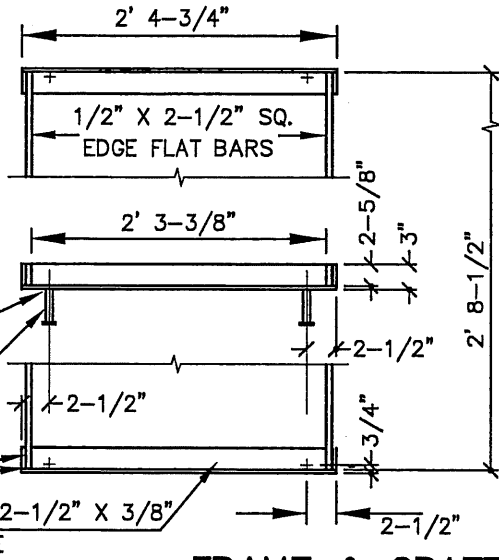
**DIV 3 STANDARDS SAY 12" MIN PLAN**

INSTALL SINGLE 1/2" ST. STEEL EXPANSION ANCHOR BOLT & 2" PLATE WASHER UNLESS OTHERWISE APPROVED OR REQUIRED BY CITY

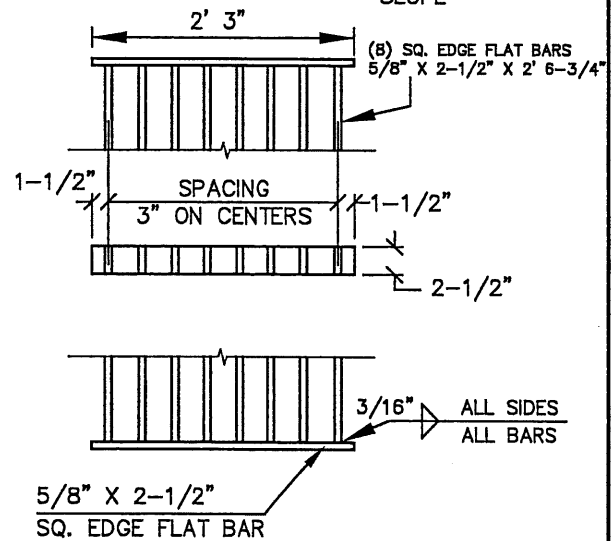


**SECTION A - A**

**CORE DRILL OPENINGS AND SEAL ANNULAR SPACE WITH NON-SHRINKING GROUT (TYP)**



**FRAME & GRATE**



**NOTES:**

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. FRAME & GRATE SHALL BE ASTM A-36 STEEL, HOT-DIP GALV AFTER CONSTRUCTION.
3. ALL CONCRETE TO BE 3300 PSI MIN AT 28 DAYS.
4. PROVIDE RIPRAP OUTLET CHANNEL (TYP 18" MIN THICK) W/2H:1V SIDE SLOPES, 12" MIN CHANNEL DEPTH & LENGTH AS NOTED ON DRAWINGS (10' MIN). PROVIDE GEOTEXTILE UNDER RIPRAP TO TOP OF BANK (NO LAPS). USE 5"-12" GRADED ANGULAR RIPRAP (TYP), FILL VOIDS BETWEEN STONE WITH 3/4"-0 BASEROCK.

5. INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL
6. PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497

FOR USE ONLY WHERE SPECIFICALLY APPROVED BY PUBLIC WORKS DIRECTOR AND CITY ENGINEER.

1/2" DIA GALVANIZED DEBRIS RODS, GROUT INTO CURB @ BASE

TOP OF CURB

NORMAL SLOPE OF GUTTER PAN

STUD ANCHORS 3 MIN.

1/4" x 3-1/2" x 1" GALVANIZED STEEL CHANNEL W/ANCHORS

2%

BOTTOM OF INLET 1-1/2" BELOW NORMAL GUTTER LEVEL

CORE DRILL OPENINGS AND SEAL ANNULAR SPACE WITH NON-SHRINKING GROUT (TYP)

SUBGRADE ELEVATION

SUBGRADE DRAIN

4' 6" MAX. (RI)

10" MIN. 18" MAX.

10" MIN. 24" MAX.

12" MIN.

DIV 3 STANDARDS SAY 12" MIN

DIV 3 STANDARDS SAY 12" MIN

SECTION A-A

SECTION B-B

CAST IRON MANHOLE FRAME & LID (PROVIDE ANTI-SLIP DIAMOND GROOVE PATTERN IN SIDEWALK AREAS)

NOTES:

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. ALL CONCRETE TO BE 3500 PSI @ 28 DAYS.
3. MATCH EXISTING CURB UNLESS OTHERWISE NOTED.

4. INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL

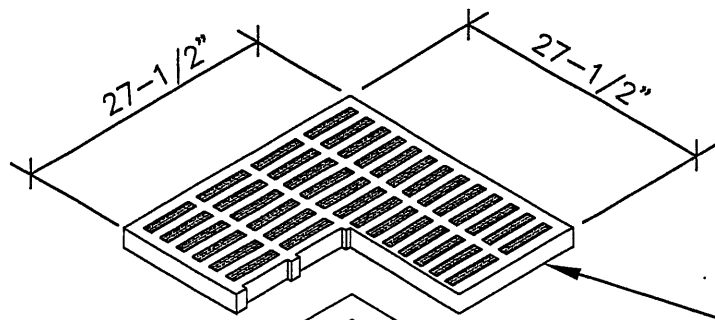
5. PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497

3" SUBGRADE DRAIN HOLE (TYP OF 2)

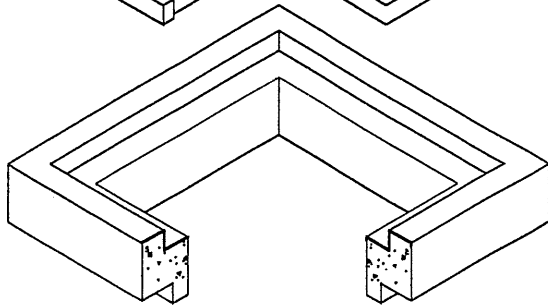
FACE OF CURB

PLAN



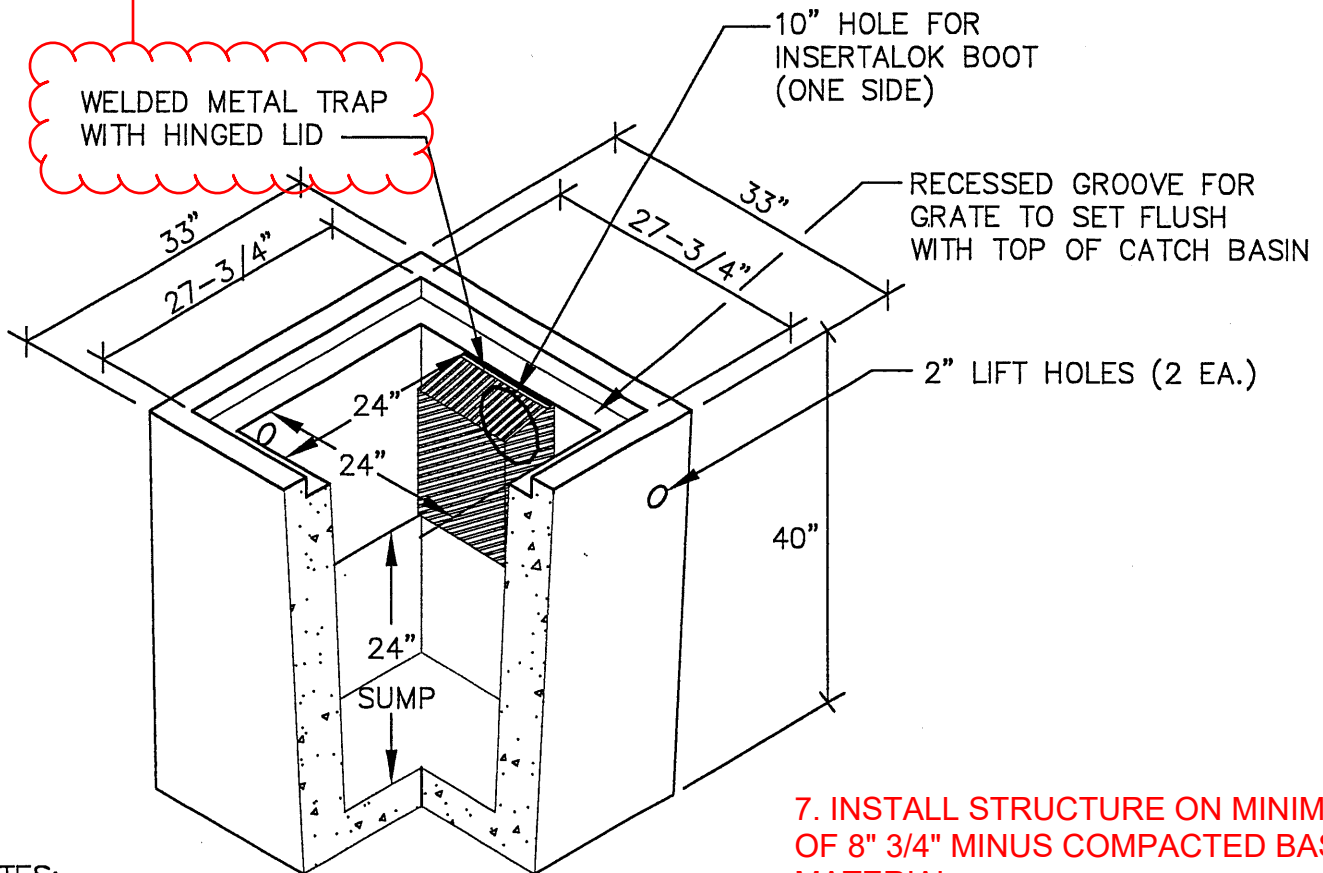
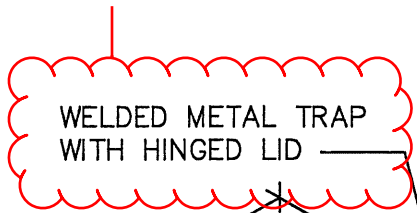


CAST IRON GRATE  
TRAFFIC LOADING



4", 6" AND 12"  
RISERS FOR ADJUSTMENT

ADD "OR EQUAL"



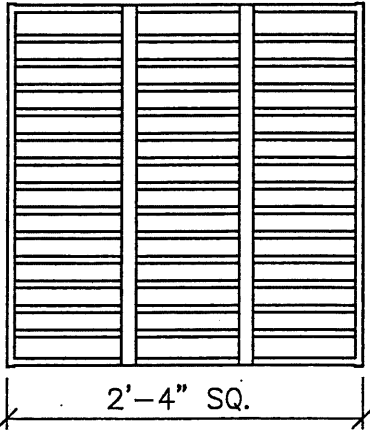
**NOTES:**

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. CONCRETE SHALL BE 4000 PSI @ 28 DAYS.
3. REBAR SHALL CONFORM TO ASTM A615 GRADE 60.
4. REBAR SHALL BE MIN. #4 BARS @ 6" C.C.
5. SET CB SQUARE WITH BUILDINGS OR WITH EDGE OF PARKING LOT OR DRIVEWAY WHEREIN IT LIES.
6. ADJUST PAVING SO WATER FLOWS TO CB WITH NO PONDING

7. INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL

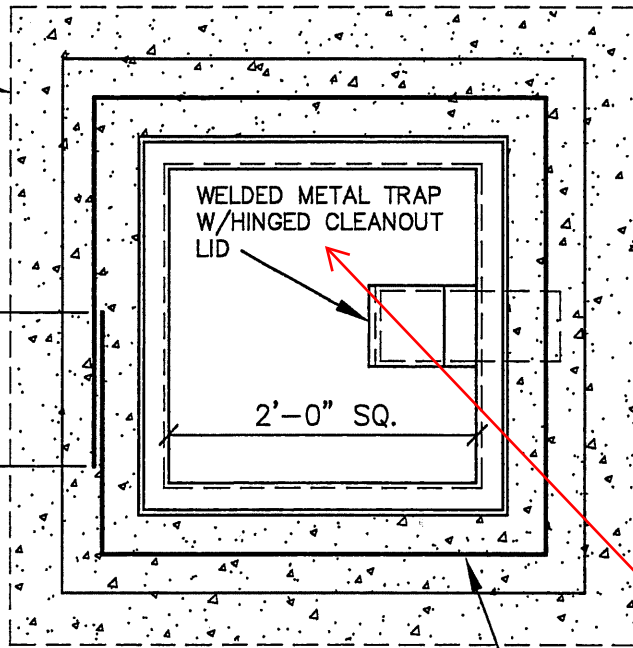
8. PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497

CAST-IN-PLACE  
REINFORCED CONCRETE  
SUPPORT COLLAR



GRATE: WELDED STEEL DROP-IN  
BAR GRATE (ASTM A36).  
END BARS: 1/2" X 2"  
CROSS BARS: 1/2" X 2" @ 2" O.C.  
BIKE STRAPS: 1/8" X 1" (2 REQ'D)  
16,000 LB. UNIFORM LOAD CAPACITY

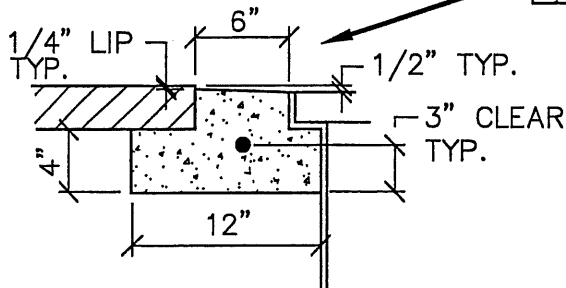
**GRATE DETAIL**



**PLAN VIEW**

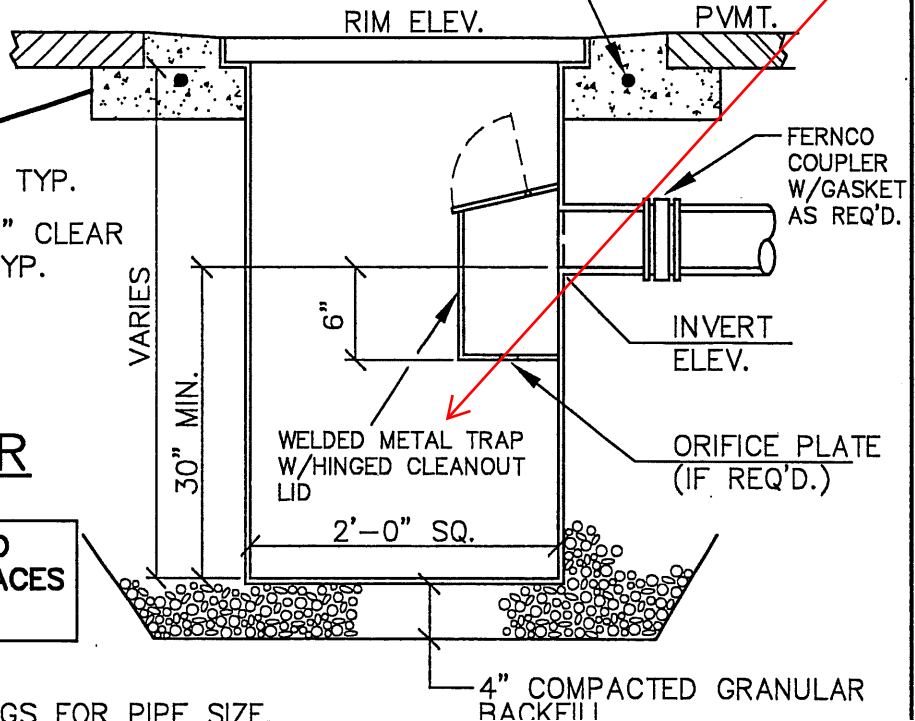
#4 REBAR  
CONTINUOUS

ADD "OR EQUAL"



**CONCRETE COLLAR**

CONSTRUCT BASIN OF WELDED  
1/4" STEEL. COAT ALL SURFACES  
WITH ASPHALTIC PAINT.



**NOTES:**

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. OUTLET: SIZE AS REQ'D. FOR INDICATED PIPE SIZE.
3. FOR JUNCTION BOX, REPLACE GRATE WITH 3/4" STEEL PLATE. DRILL ONE, 1" LIFTING HOLE, CENTERED IN ONE END OF THE PLATE. WELD SHIMS TO RIM AS REQUIRED TO RAISE PLATE TO RIM ELEVATION.
4. SET CB SQUARE WITH BUILDINGS OR WITH EDGE OF PARKING LOT OR DRIVEWAY WHEREIN IT LIES.
5. ADJUST PAVING SO WATER FLOWS TO CB WITH NO PONDING.

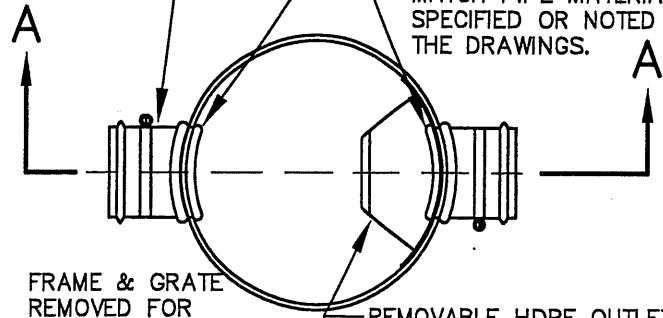
6. INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL

7. PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497



SEE NOTE 5  
(RE: INLET)

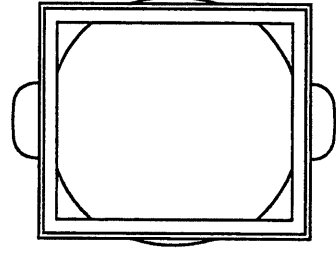
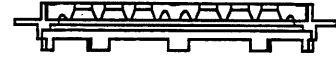
INSERTA-TEE CONNECTION,  
SEE NOTE 3 & 4.  
INSERTA-TEE SOCKET TO  
MATCH PIPE MATERIAL  
SPECIFIED OR NOTED ON  
THE DRAWINGS.



FRAME & GRATE  
REMOVED FOR  
CLARITY

**PLAN**

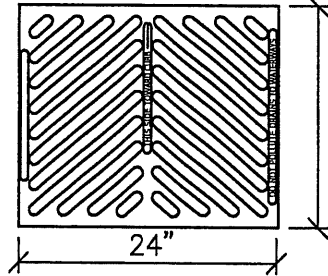
REMOVABLE HDPE OUTLET TRAP  
REQUIRED ON ALL PRIVATE CATCH  
BASINS (OMIT FOR FLOW-THRU JUNCTION  
STRUCTURES). ALL CLIPS & HARDWARE  
TO BE STAINLESS STEEL.



FRAME TO INCLUDE TABS THAT  
MATCH BASIN OD TO PREVENT  
DISPLACEMENT. FRAME BODY TO  
BEAR ON COMPACTED BASEROCK  
(SEE SECTION A-A)

**FRAME**

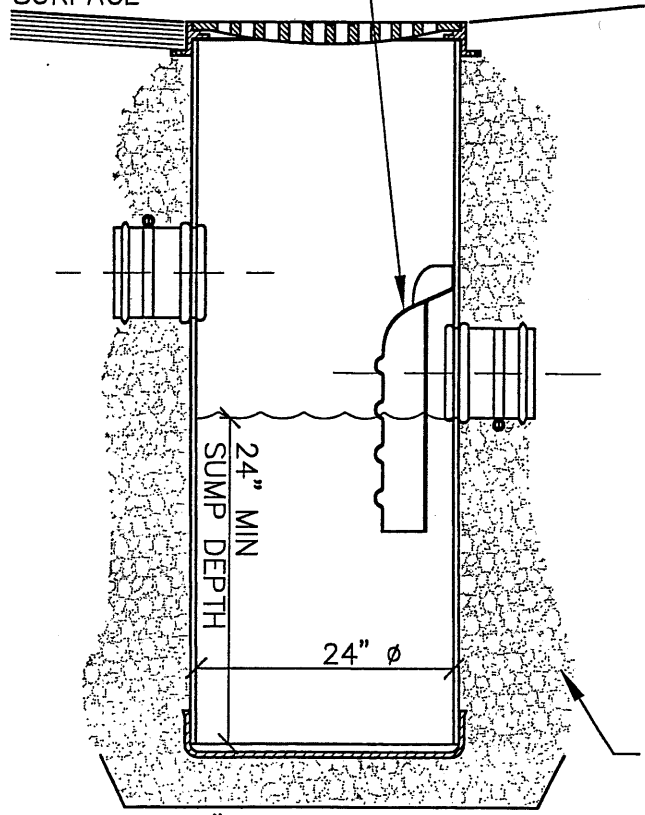
44 X SLOT  $\phi$  1.00 THRU



APPROX. DRAIN AREA =  
202.48 SQ IN

**GRATE**

PAVED  
SURFACE



MIN 4" GRANULAR BEDDING

**SECTION A-A**

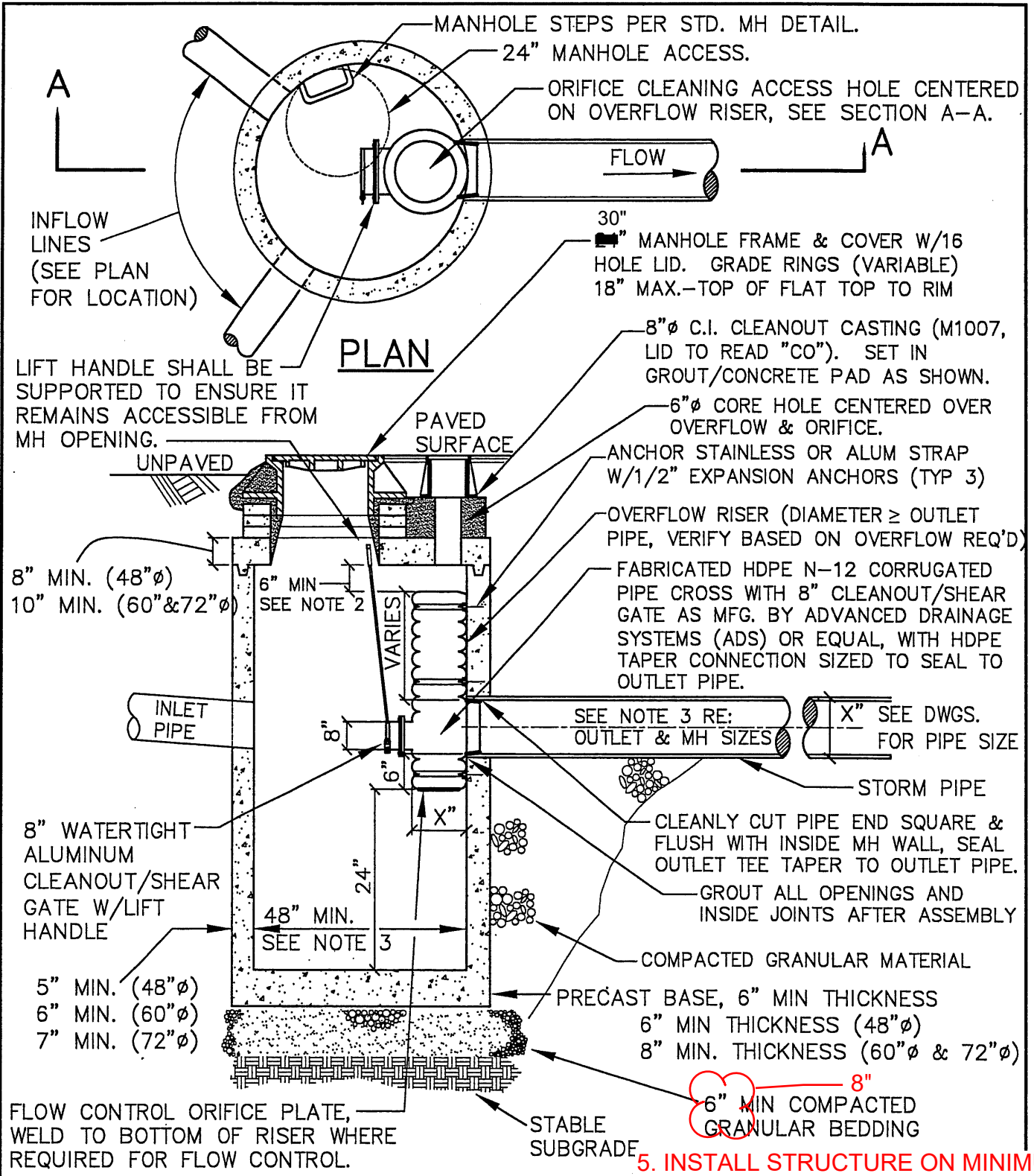
COMPACTED GRANULAR BACKFILL  
AROUND CATCH BASINS & AREA  
DRAINS (GRADE AS REQUIRED TO  
SUPPORT GRATE FRAME).

**NOTES:**

1. NYLOPLAST TRAFFIC RATED DRAIN BASIN OR APPROVED EQUAL W/NYLOPLAST FRAME & GRATE.
2. HERRING-BONE STYLE GRATE TO BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION, ORIENTATION AND INVERT ELEVATIONS.
4. CONNECTIONS TO PVC CATCH BASIN TO BE INSERTA-TEE STYLE FITTINGS (FACTORY OR FIELD INSTALLED).
5. FLOW-THRU CONFIGURATION SHOWN IS ALLOWED ONLY FOR AREA DRAINS OR JUNCTION BOXES.
6. SET CB GRATE SQUARE WITH BUILDINGS OR WITH EDGE OF PARKING LOT OR DRIVEWAY WHEREIN IT LIES.
7. ADJUST PAVING OR GRADING SO WATER FLOWS TO STRUCTURE INLET WITH NO PONDING.

NOTE: PER ORS 92.044(7),  
AREA DRAIN MUST BE SET  
1' MINIMUM CLEAR FROM  
ANY SURVEY MONUMENT

LAST REVISION DATE: JULY 2015	JO #
<b>PARKING LOT CATCH BASIN (TRAFFIC RATED PVC w/TRAP, DUCTILE IRON FRAME/GRATE)</b> (NTS)	
SILVERTON, OR	DETAIL NO. 317



**PLAN**

**SECTION A-A**

**NOTES:**

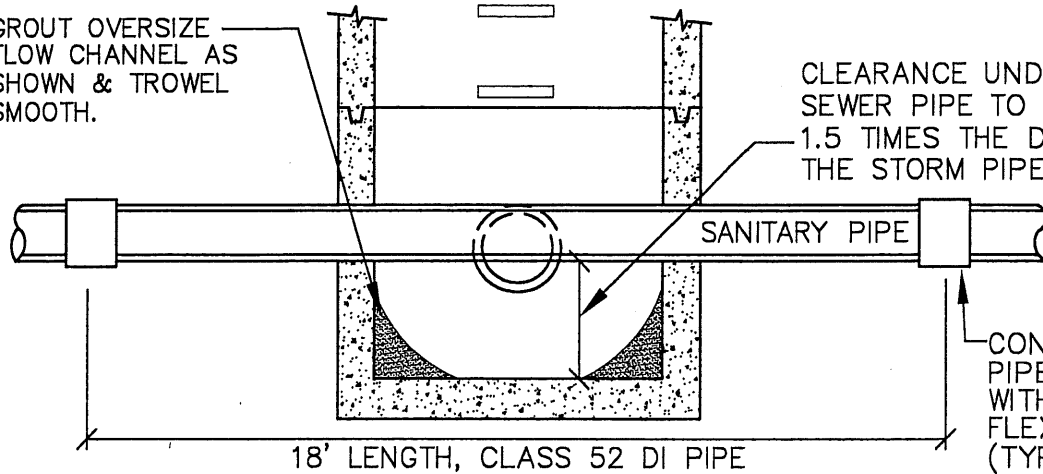
1. PRECAST SECTIONS SHALL CONFORM TO ASTM C-478.
2. DISTANCE FROM TOP OF OVERFLOW TO MH RIM SHALL BE BASED ON OVERFLOW CAPACITY CALC'S BY DESIGN ENGINEER (ASSUME ORIFICE CONTROL).
3. 60" MINIMUM DIA. MANHOLE REQUIRED FOR OUTLET PIPE LARGER THAN 15" OR INLET > 21".
4. ORIFICE CLEANING ACCESS TO BE 6" CORE HOLE THROUGH FLAT-TOP (CENTERED ON OVERFLOW) WITH CI CLEANOUT BOX GROUTED TO SLAB. CORE DRILL HOLE ON SITE AFTER PAVED.

5. INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL
6. PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497



GROUT OVERSIZE FLOW CHANNEL AS SHOWN & TROWEL SMOOTH.

CLEARANCE UNDER SANITARY SEWER PIPE TO BE A MINIMUM OF 1.5 TIMES THE DIAMETER OF THE STORM PIPE



## SECTION THRU SANITARY SEWER

MANHOLE FRAME AND COVER

SET FRAME IN NON-SHRINK GROUT

CORE DRILL OPENINGS AND SEAL ANNULAR SPACE WITH NON-SHRINKING GROUT (TYP)

VMT.

UNPAVED

GRADE RINGS (VARIABLE) 18" MAX.—TOP OF FLAT TOP TO RIM

FLAT TOP SECTION, 8" MIN THICKNESS

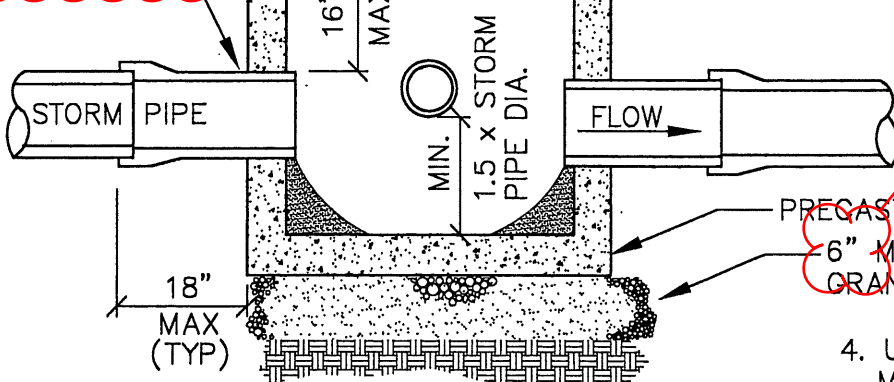
5" MIN. THICK

INSIDE DIAMETER

SEE NOTES

SEE DRAWINGS FOR INVERT ELEVATIONS AND PIPE ALIGNMENTS.

12" TYP  
ALL OPENINGS CORED DRILLED.



8"  
6" MIN THICKNESS (48"φ)  
8" MIN. THICKNESS (60"φ & 72"φ)

PRECAST BASE, 6" MIN THICKNESS

6" MIN COMPACTED GRANULAR BEDDING

## SECTION THRU STORM

STABLE SUBGRADE

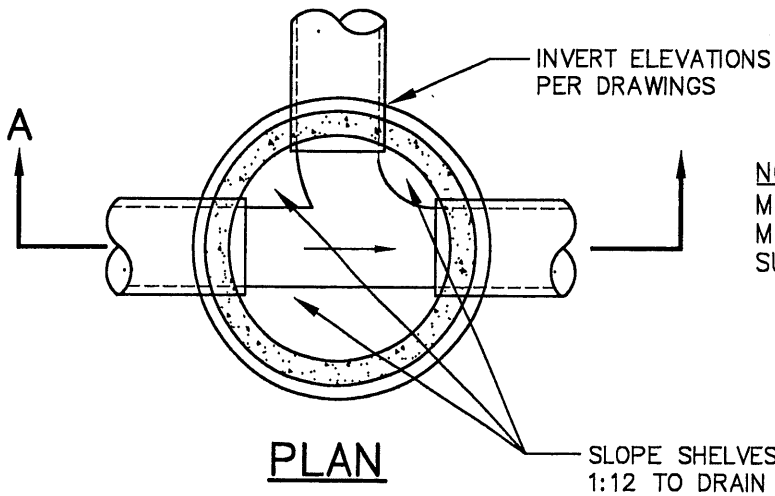
4. USE OF KUENZI MANHOLES MUST BE APPROVED ON A CASE BY CASE BASIS BY THE PUBLIC WORKS DIRECTOR.

### NOTES:

1. UNLESS OTHERWISE SHOWN ON DRAWINGS, USE 48" MANHOLE FOR SANITARY SEWER UP TO 12" DIA. & STORM DRAIN UP TO 18" DIAMETER.
2. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478. WATERTIGHT O-RING OR MASTIC KEYLOCK JOINTS REQUIRED.
3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD.

5. INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL

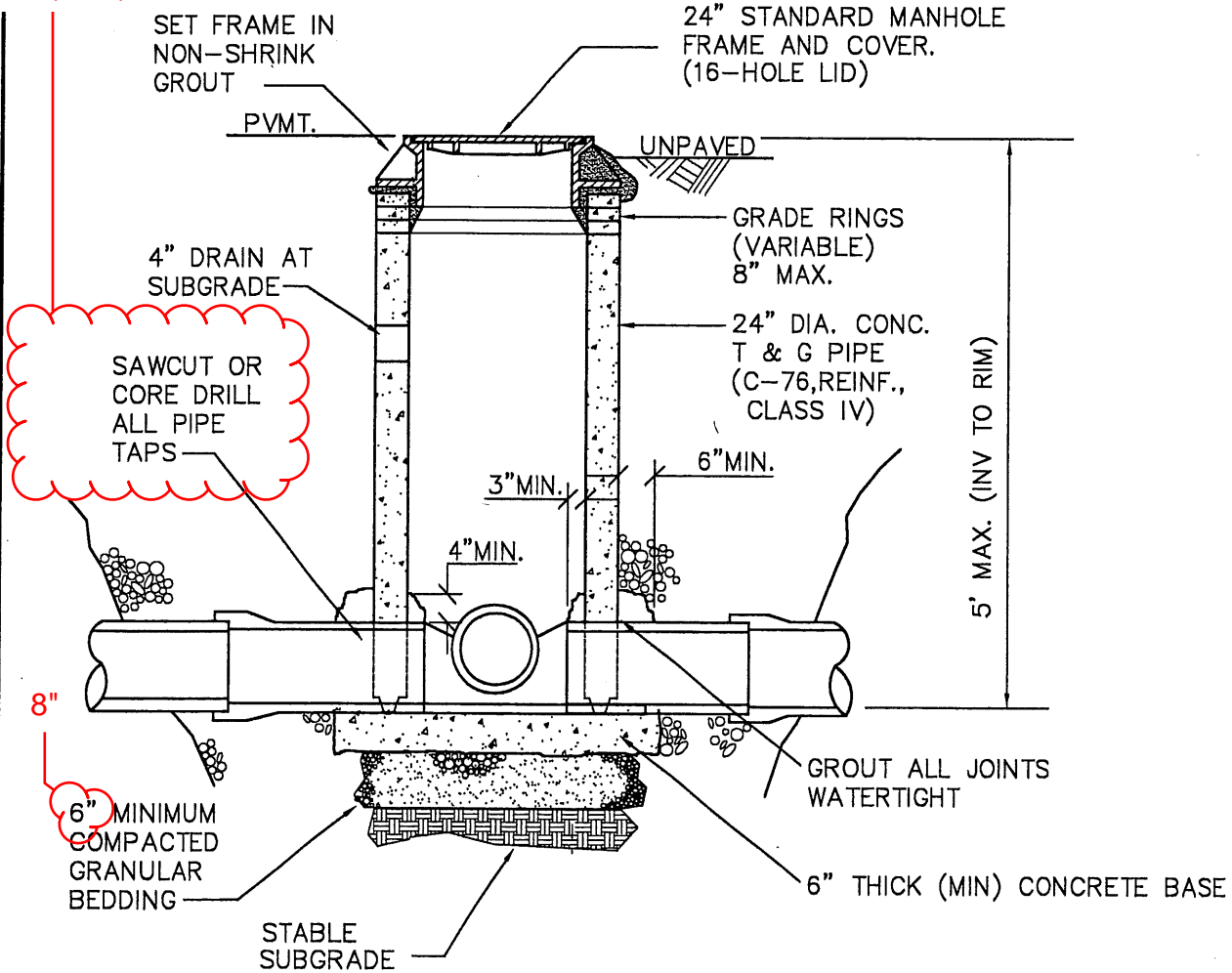
6. PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497



NOTE: PER ORS 92.044(7),  
MANHOLE MUST BE SET 1'  
MINIMUM CLEAR FROM ANY  
SURVEY MONUMENT

CORE DRILL  
OPENINGS AND  
SEAL ANNULAR  
SPACE WITH  
NON-SHRINKING  
GROUT (TYP)

**PLAN**



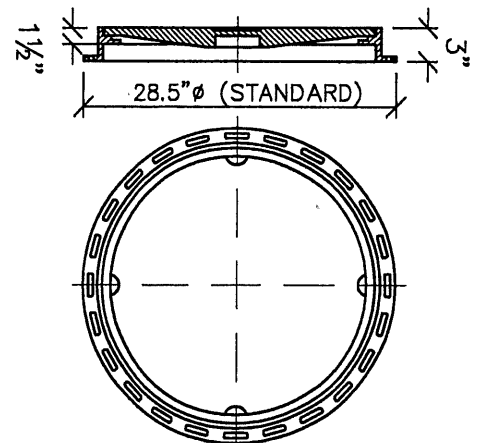
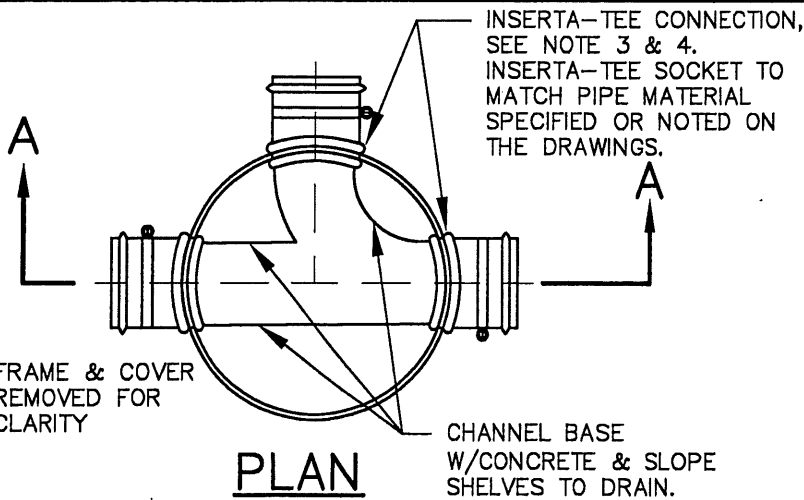
**SECTION A-A**

**NOTE:**

1. MAXIMUM PIPE NUMBER & DIAMETERS AS FOLLOWS:  
 12" DIAMETER OR LESS - 4 MAXIMUM.  
 15" DIAMETER - 2 MAXIMUM.  
 ALL OTHER CONFIGURATIONS REQUIRE STANDARD MANHOLE.
2. USE OF PUBLIC 24" STORM MANHOLE MUST BE APPROVED  
 ON A CASE BY CASE BASIS BY THE PUBLIC WORKS  
 DIRECTOR.

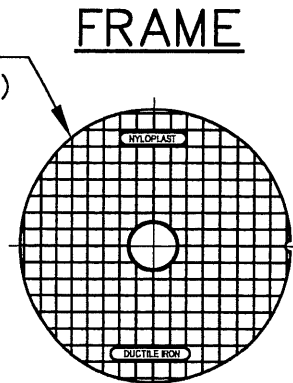
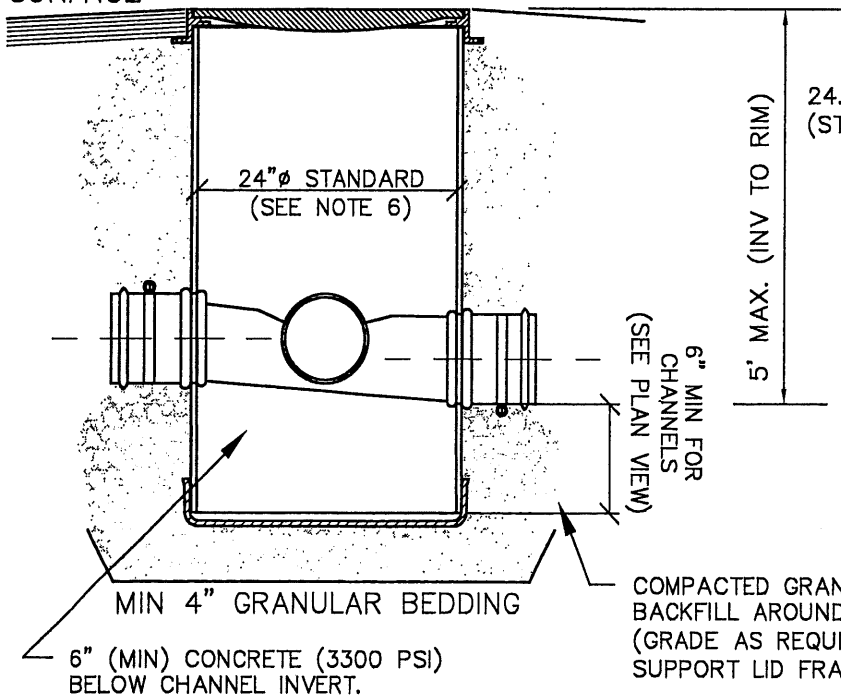
LAST REVISION DATE: NOV 2015	
<b>24" DIA. STORM MANHOLE</b>	
(NTS)	
SILVERTON, OR	DETAIL NO. <b>350</b>





FRAME TO INCLUDE TABS THAT MATCH BASIN OD TO PREVENT DISPLACEMENT. FRAME BODY TO BEAR ON COMPACTED BASEROCK (SEE SECTION A-A)

PAVED SURFACE



PROVIDE A MINIMUM OF (2) 1" DIAMETER PICK HOLES IN SOLID LID, OR PROVIDE STANDARD 16-HOLE STORM MANHOLE LID.

**SOLID LID**

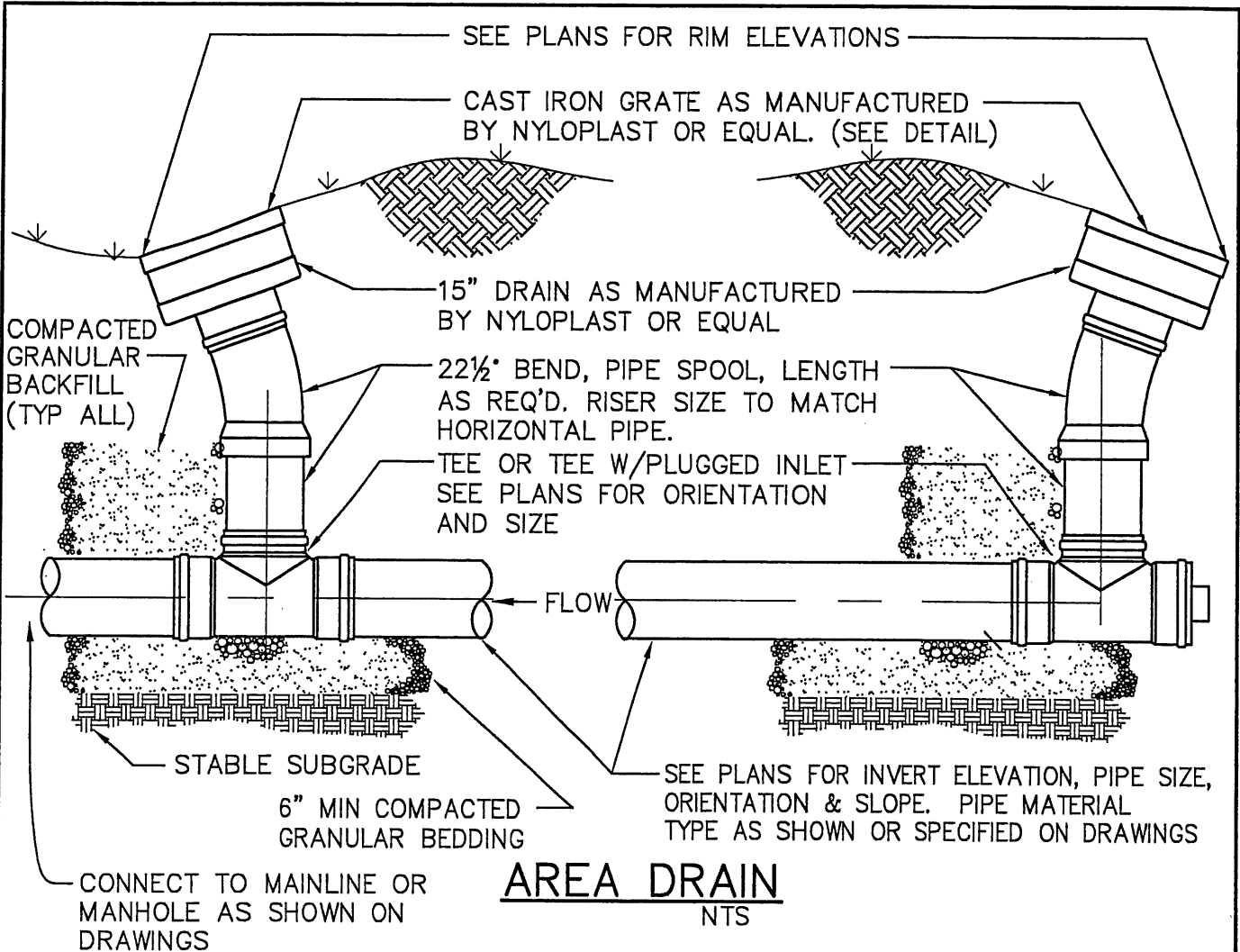
NOTE: PER ORS 92.044(7), MANHOLE MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

**NOTES:**

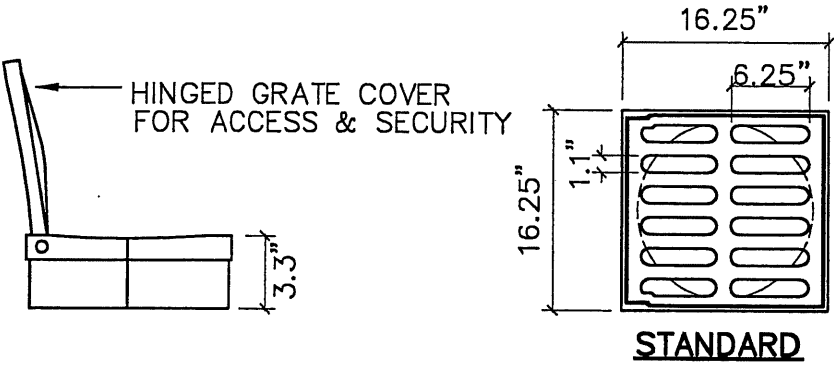
1. NYLOPLAST TRAFFIC RATED DRAIN BASIN OR APPROVED EQUAL WITH NYLOPLAST FRAME & MH LID.
2. MH FRAME & COVER TO BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION, ORIENTATION AND INVERT ELEVATIONS.
4. CONNECTIONS TO PVC MANHOLE TO BE INSERTA-TEE STYLE FITTINGS (FACTORY OR FIELD INSTALLED).
5. FIVE (5) FOOT MAXIMUM ALLOWABLE DEPTH FROM RIM TO OUTLET INVERT (DEEPER APPLICATIONS REQUIRE 48" MANHOLE).
6. MAXIMUM NUMBER & CONFIGURATION OF PIPE CONNECTIONS TO BE BASED ON INSERTA-TEE RECOMMENDATIONS. PROVIDE 30" DIAMETER BASIN & 30" SOLID COVER IF REQUIRED DUE TO NO. OF PIPES, SPACING &/OR ANGLES (30" MH TO MEET ALL DETAIL REQUIREMENTS SHOWN EXCEPT DIAMETER).

7. USE OF PUBLIC 24" STORM MANHOLE MUST BE APPROVED ON A CASE BY CASE BASIS BY THE PUBLIC WORKS DIRECTOR.

LAST REVISION DATE: NOV 2015	JO #
24" DIA. STORM MANHOLE (TRAFFIC RATED PVC W/SOLID DUCTILE IRON FRAME/COVER) (NTS)	
SILVERTON, OR	DETAIL NO. 351



**AREA DRAIN**  
NTS

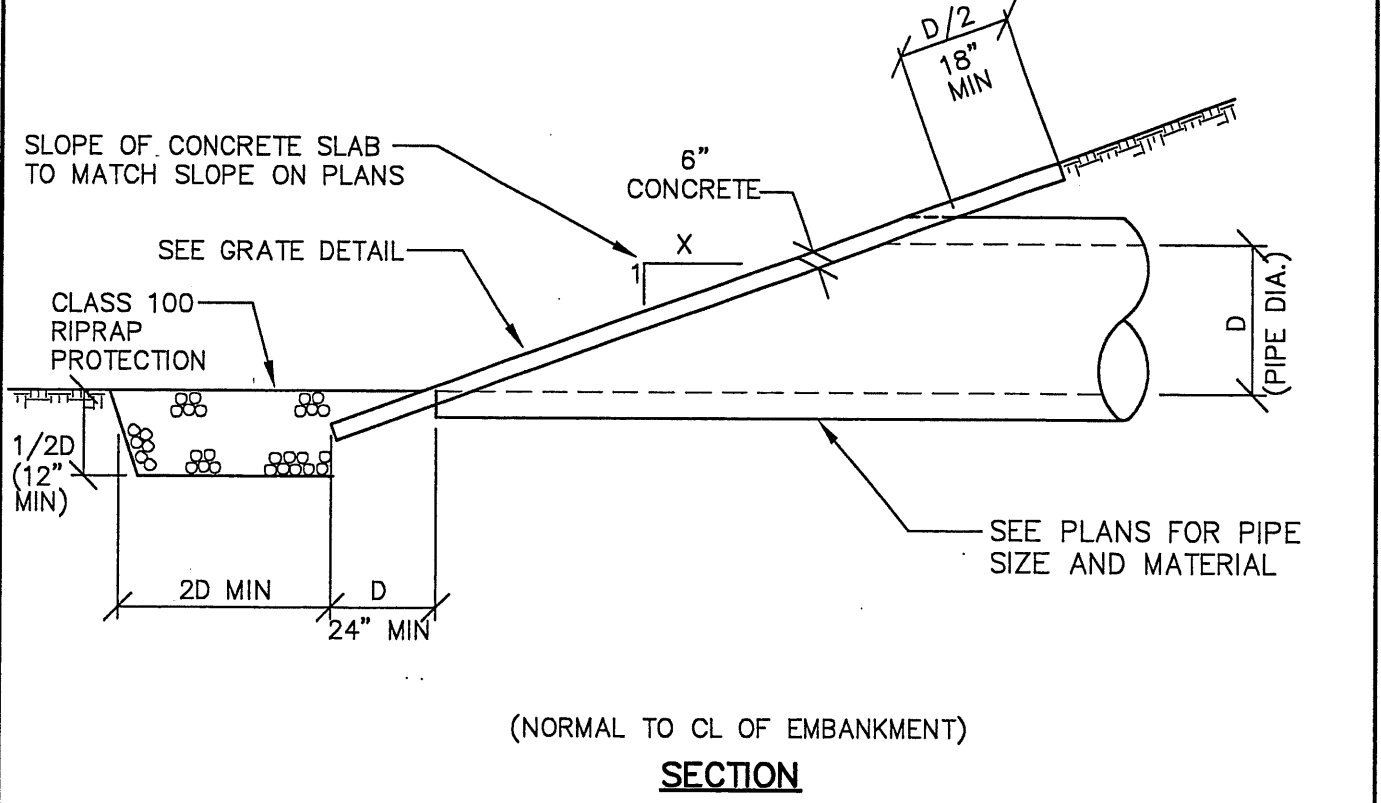
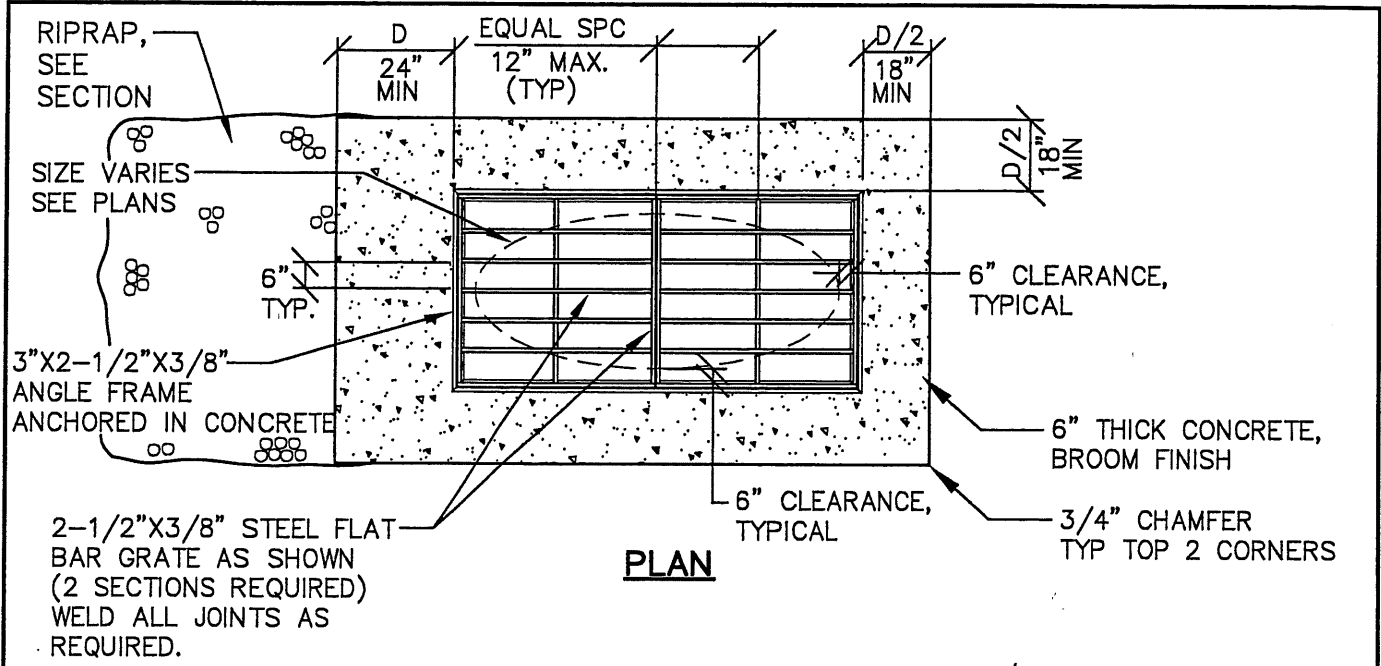


**15" CAST IRON GRATE DETAIL**  
NTS

- NOTES:**
1. AREA DRAIN NOT FOR USE IN AREAS SUBJECT TO VEHICLE TRAFFIC.
  2. USE WATERTIGHT GASKETED FITTINGS AND ADAPTORS FOR ALL PIPE CONNECTIONS.
  3. ALL GRATES IN PEDESTRIAN AREAS SHALL CONFORM WITH ADA REQUIREMENTS, INCLUDING GRATE OPENING SIZE.

LAST REVISION DATE: JULY 2015	JO # STANDARD
<b>PRIVATE AREA DRAIN, NON-TRAFFIC AREAS</b>	
(NTS)	
SILVERTON, OR	DETAIL NO. <b>355</b>



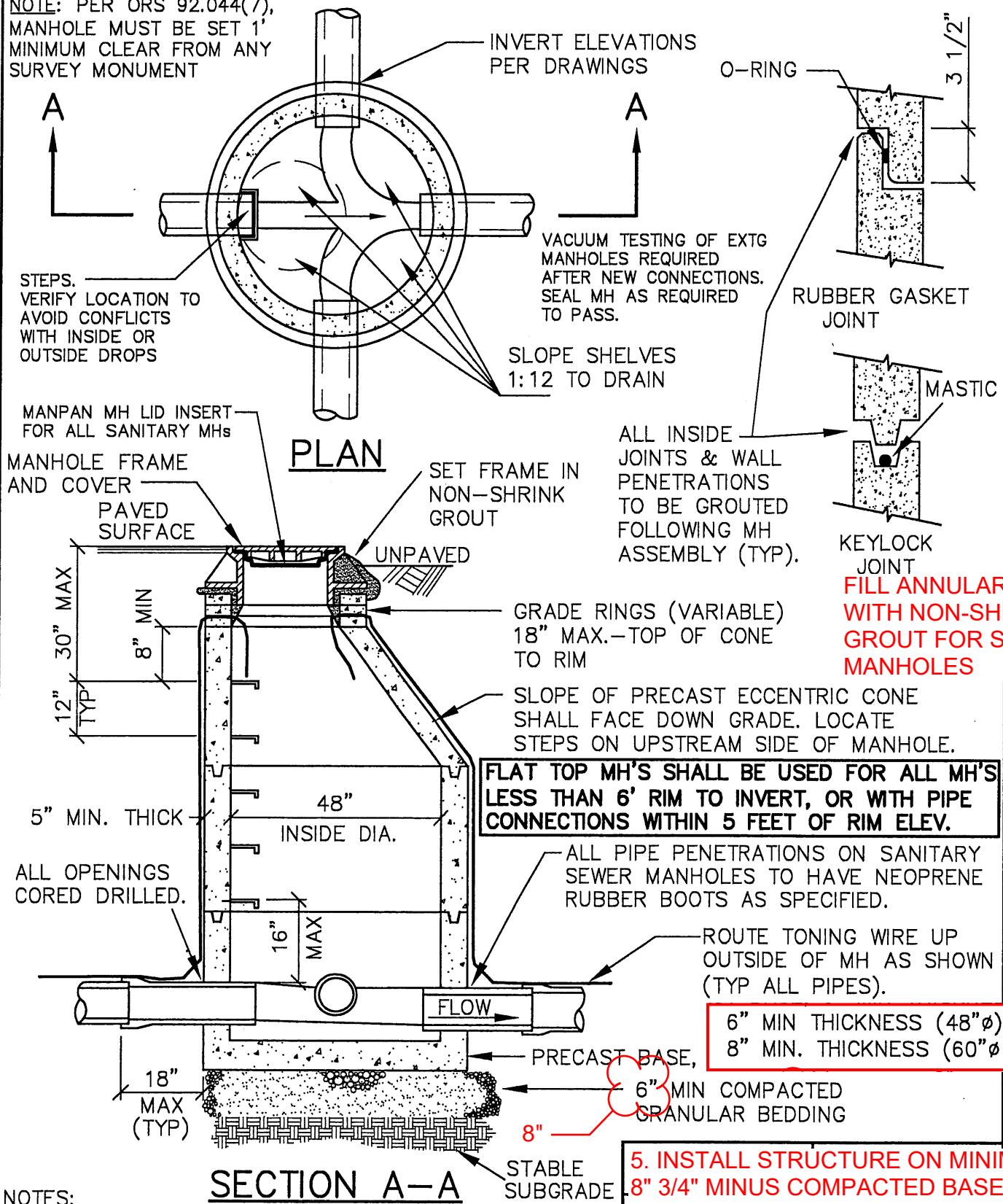


**NOTES:**

1. SEE CONSTRUCTION DRAWINGS FOR PIPE SIZE, LOCATION AND INVERT ELEVATION.
2. FRAME AND GRATE SHALL BE ASTM A-36 STEEL, HOT DIP GALVANIZED AFTER CONSTRUCTION.
3. ALL CONCRETE TO BE 3300 PSI AT 28 DAYS.

LAST REVISION DATE: JULY 2015	
<b>CONCRETE PIPE END CAP WITH GRATE</b> (NTS)	
SILVERTON, OR	DETAIL NO. <b>362</b>

NOTE: PER ORS 92.044(7),  
MANHOLE MUST BE SET 1'  
MINIMUM CLEAR FROM ANY  
SURVEY MONUMENT



NOTES:

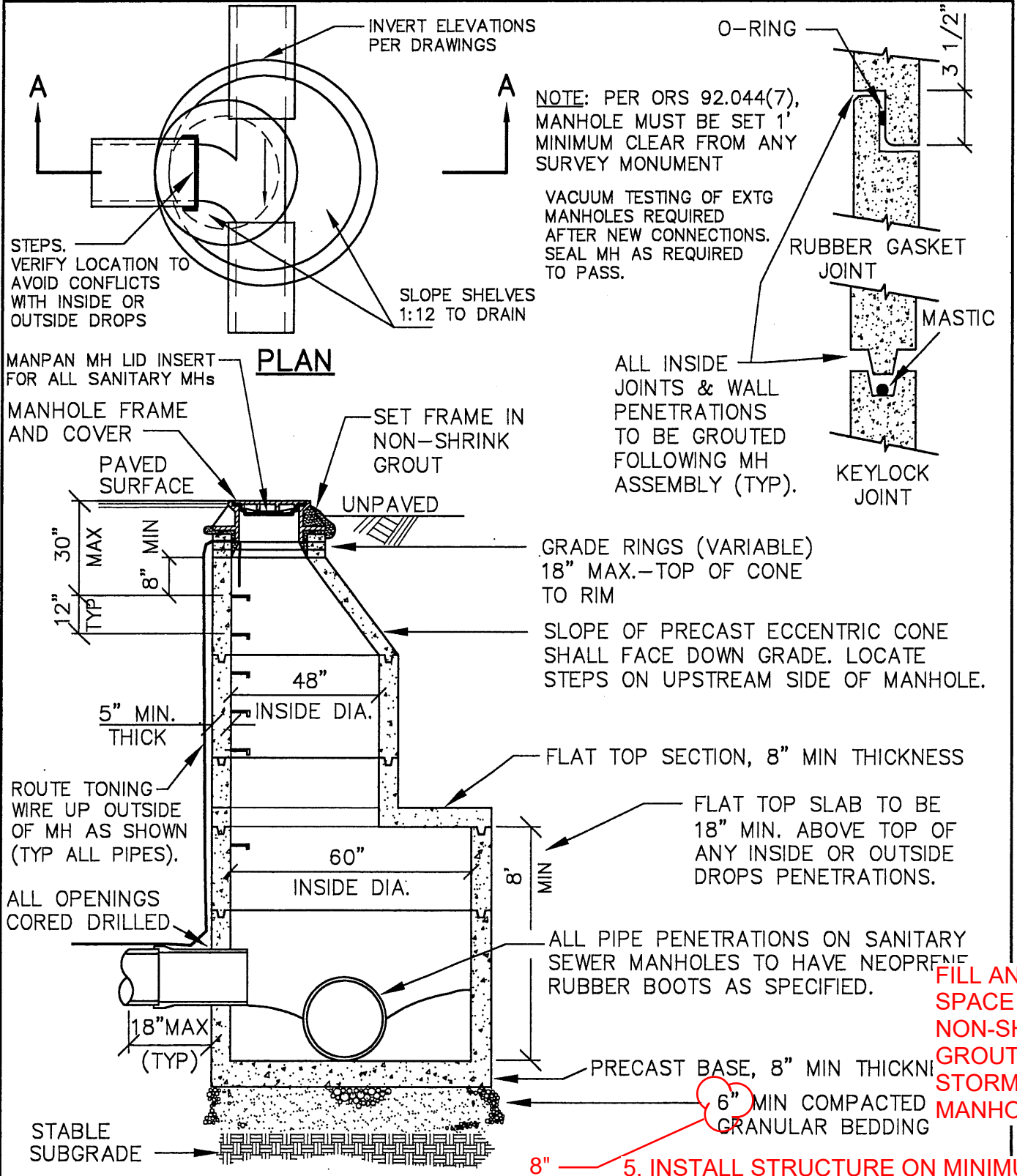
1. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
2. WATERTIGHT O-RING OR MASTIC KEYLOCK JOINTS REQUIRED.
3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD. ADD STEPS TO EXTG CONNECTION MH IF EXTG STEPS ARE ABSENT.

**FLAT TOP MH'S SHALL BE USED FOR ALL MH'S LESS THAN 6' RIM TO INVERT, OR WITH PIPE CONNECTIONS WITHIN 5 FEET OF RIM ELEV.**

**6" MIN THICKNESS (48"φ)  
8" MIN. THICKNESS (60"φ & 72"φ)**

5. INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL
6. PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497





**SECTION A-A**

**NOTES:**

1. PRECAST SECTIONS SHALL MEET OR EXCEED ASTM C-478.
2. WATERTIGHT O-RING OR MASTIC KEYLOCK JOINTS REQUIRED.
3. STEPS TO BE POLYPROPYLENE PLASTIC WITH GRADE 60 REINFORCING ROD. ADD STEPS TO EXTG CONNECTION MH IF EXTG STEPS ARE ABSENT.

5. INSTALL STRUCTURE ON MINIMUM OF 8" 3/4" MINUS COMPACTED BASE MATERIAL
6. PRECAST STRUCTURE TO BE APPROVED BY CITY, REINFORCEMENT FOR PRECAST CATCH BASIN SHALL BE REBAR MEETING ASTM A-615, GRADE 60 OR WELDED WIRE MEETING ASTM A-497





CLEANOUT COVERS: ALL SEWER CLEANOUT LIDS TO READ "SEWER"  
 ALL STORM CLEANOUT LIDS TO READ "STORM" OR "C/O".

1. NON-TRAFFIC AREAS:

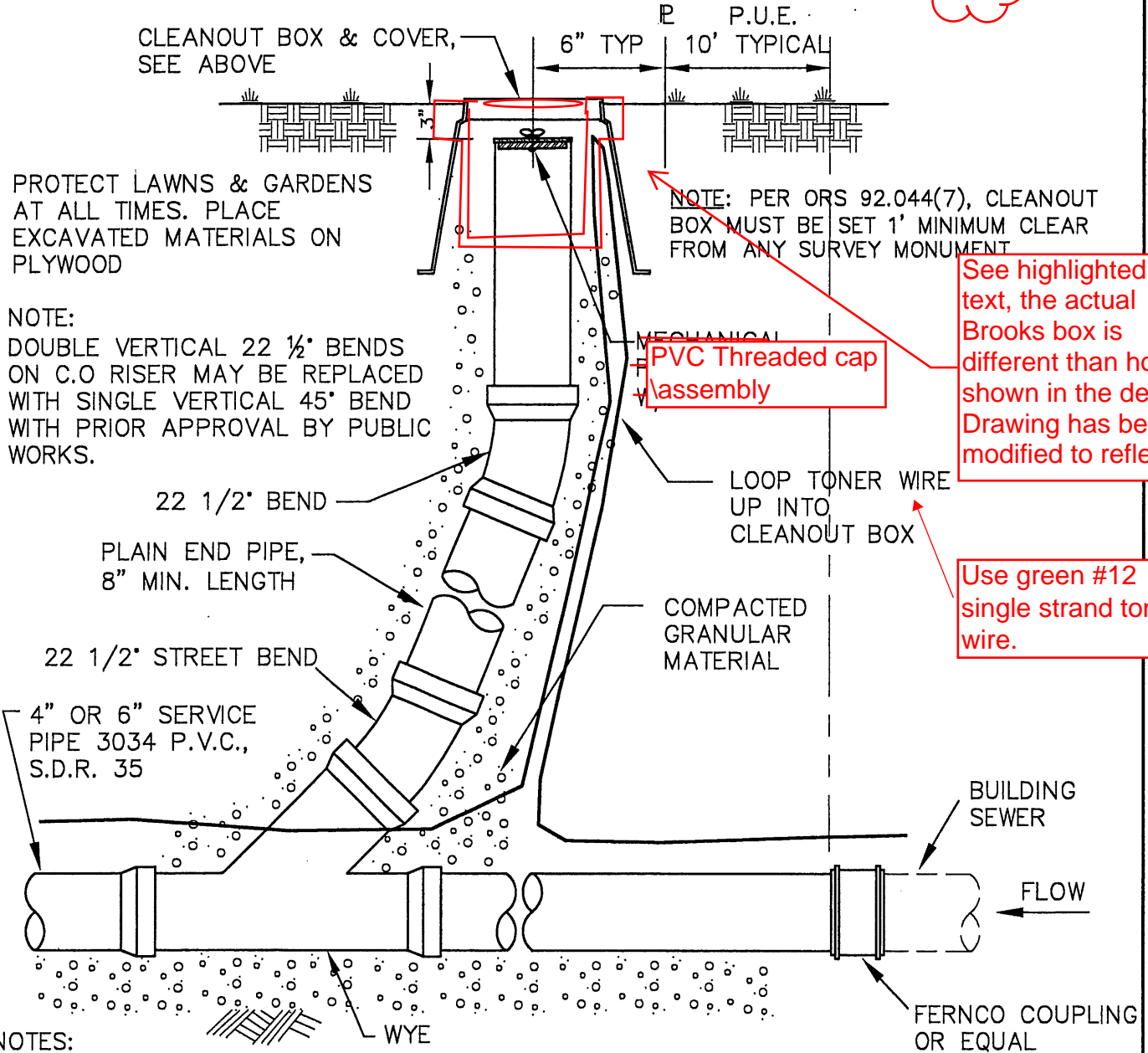
CARSON MODEL 910 T-COVER OR EQUAL (GREEN FOR SEWER, GREY FOR STORM).

2. TRAFFIC AREAS, INCLUDING DRIVEWAYS:

BROOKS #1RT VALVE BOX & LID "TRAFFIC" STYLE OR EQUAL  
 (WORDING AS NOTED PER ABOVE).

(FOR CI CLEANOUTS IN UNPAVED AREAS, SET IN 6" THICK CONCRETE PAD)

COLLAR



PROTECT LAWNS & GARDENS AT ALL TIMES. PLACE EXCAVATED MATERIALS ON PLYWOOD

NOTE: DOUBLE VERTICAL 22 1/2° BENDS ON C.O RISER MAY BE REPLACED WITH SINGLE VERTICAL 45° BEND WITH PRIOR APPROVAL BY PUBLIC WORKS.

NOTE: PER ORS 92.044(7), CLEANOUT BOX MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

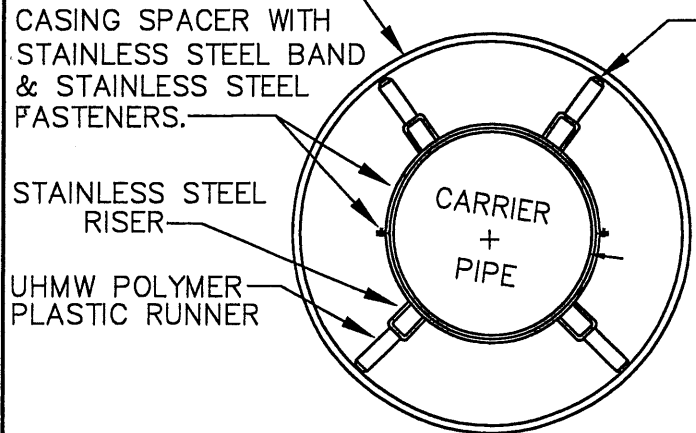
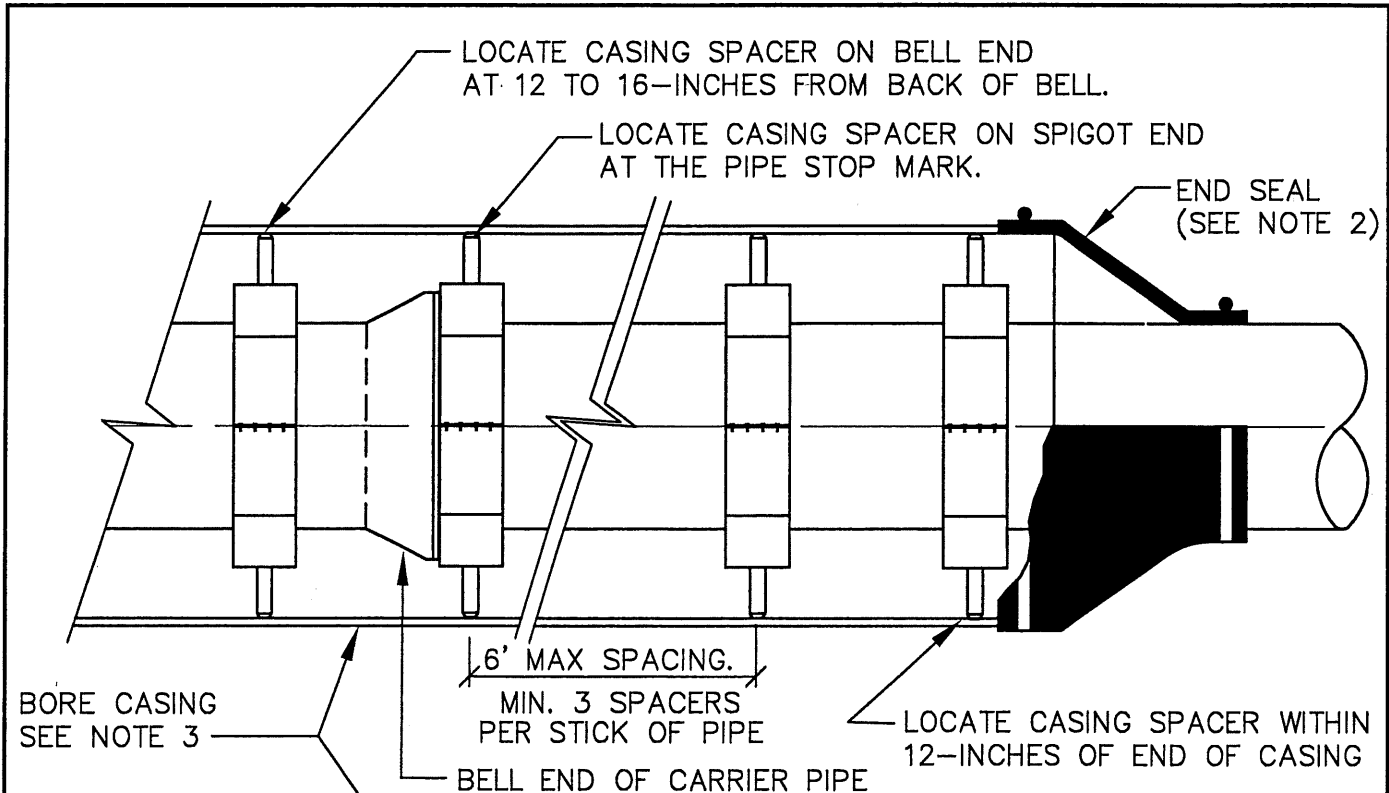
See highlighted text, the actual Brooks box is different than how shown in the detail. Drawing has been modified to reflect.

PVC Threaded cap assembly

Use green #12 single strand tone wire.

- NOTES:
- CLEANOUT RISER SHALL BE SAME SIZE AND MATERIAL AS LATERAL PIPE.
  - PROVIDE C.I. BOX FOR CLEANOUTS LOCATED IN DRIVEWAYS OR TRAFFIC AREAS (PROVIDE 6" THICK CONCRETE PAD THAT IS 6" LARGER THAN OUTSIDE DIM OF CLEANOUT BOX).
  - CLEANOUT PIPE SHALL BE LEFT A MINIMUM OF 18" ABOVE EXISTING GRADE UNTIL ALL CURBING IS INSTALLED AND ALL PRIVATE UTILITY TRENCHES ARE BACKFILLED. CLEANOUTS SHALL THEN BE SET NO MORE THAN 6" BELOW FINISH GRADE, AND CLEANOUT BOXES SET FLUSH WITH FINISH GRADE.

LAST REVISION DATE: NOV 2015	COPYRIGHT 1996 WESTECH ENGINEERING, INC.
<b>STANDARD SERVICE LATERAL CLEANOUT (SEWER &amp; STORM)</b>	
(NTS)	
SILVERTON, OR	DETAIL NO. <b>416</b>



SEE NOTE 5 FOR RUNNER TO BORE CLEARANCE REQUIREMENTS FOR GRAVITY CARRIER PIPES.

CARRIER PIPE DIAMETER	MIN. DIA. CASING (*1, *2)	MIN CASING WALL THICKNESS (INCH)
6"	12"	0.25 (1/4)
8"	14"	0.25 (1/4)
10"	16"	0.312 (5/16)
12"	18"	0.375 (3/8)

\*1: CASING SIZE LISTED IS FOR PRESSURE PIPE. LARGER DIA CASING REQ'D FOR GRAVITY PIPE.  
 \*2: SEE PWDS 5.8.m FOR GRAVITY PIPE CASING SIZE REQUIREMENTS OR LARGER CASING SIZES.

**NOTES:**

1. CASING SPACERS - APS MODEL SSI, CALPICO M-SS SERIES OR APPROVED EQUIV. 4"-18" CARRIER PIPE, USE 8" WIDE BAND. >18" CARRIER PIPE, USE 12" WIDE BAND.
2. SEAL BOTH ENDS OF BORE CASING WITH END SEALS. WITHOUT SAND FILL, USE APS MODEL AZ OR APPROVED EQUIV. FASTEN TO CASING AND CARRIER PIPE WITH ST. STEEL BANDS. WITH SAND FILL, USE GROUT END CAPS (PLUG VENT TUBES AFTER SAND FILL)
3. CASING SHALL BE WELDED SMOOTH STEEL PIPE CONFORMING TO ASTM A-53, GRADE B OR APPROVED EQUIVALENT (Fy = 35,000 psi).
4. CARRIER PIPE DIAMETER & MATERIAL AS PER DWGS.
5. FOR GRAVITY SEWER OR STORM CARRIER PIPES, THE CASING ANNULAR SPACE SHALL BE COMPLETELY FILLED WITH SAND TO PREVENT FLOATATION OF CARRIER PIPE BY GROUNDWATER.
6. CARRIER PIPE SHALL BE COMPLETELY FILLED WITH WATER PRIOR TO INSTALLING OR BLOWING SAND.
7. INCREASE CASING DIA AS REQ'D TO ALLOW TRIMMING OF CASING SPACERS ON GRADE CRITICAL BORES

LAST REVISION DATE: JULY 2015	COPYRIGHT 1998 WESTECH ENGINEERING, INC.
<b>BORE CASING, CARRIER PIPE AND CASING SPACER DETAIL</b> (NTS)	
SILVERTON, OR	DETAIL NO. <b>508</b>





# STORM SEWER MANDREL TEST REPORT

Project Location: (City)	Project Name:
Inspector: (Print)	Date: (Separate Report Required for Each Test Session)
Mandrel Diameters Verified? Yes / No	

Station (& Manhole #)		Size & Material	Length (ft)	Results	Backfill Compaction Completed?	Date Sewer Flushed & Cleaned	Comments
From	To						
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		

1. Mandrel testing shall be conducted on a manhole to manhole (or cleanout) basis and shall be done after the line has been completely flushed out with water.
2. Mandrel testing shall be conducted after trench backfill and compaction has been completed.
3. The mandrel diameter shall be 95% of the pipe initial inside diameter. The inspector shall verify the diameter of each mandrel used during each test session.



# *APPENDIX D*

## *Capital Improvement Plan*



Client: City of Silverton

Project: Stormwater Master Plan



Capital Improvement Plan - Summary Table

Project ID	Project Name	Total Estimated Cost (2022 Dollars)	SDC Eligibility (%)	Cost Allocated to Growth	Cost Allocated to City
<b>Priority 1 Improvements</b>					
1.1	Rock Street Stormwater Improvements (Northeast Silver Creek)	\$770,000	0%	\$0	\$770,000
1.2	2nd Street and Lincoln Street (Webb Lake)	\$1,700,000	0%	\$0	\$1,700,000
1.3	Public Works Shop Decant Facility Roof Structure	\$184,000	0%	\$0	\$184,000
1.4	3rd Street and Jersey Street to Mill and B Street (Northeast Silver Creek)	\$3,600,000	0%	\$0	\$3,600,000
1.5	Abiqua Heights, upstream of storage pond (Northeast Silver Creek)	\$900,000	11%	\$100,000	\$800,000
1.6	Koons Street and Adams Avenue to Silver Creek (Northeast Silver Creek)	\$3,300,000	12%	\$390,000	\$2,910,000
1.7	Sheridan Street to Silver Creek (Northeast Silver Creek)	\$710,000	0%	\$0	\$710,000
1.8	Olson's Ditch at Sage Street (Webb Lake)	\$1,100,000	9%	\$100,000	\$1,000,000
1.9	Crestview Drive, Breyonna Way, Iowa Street, and Oak Street (Webb Lake)	\$3,200,000	4%	\$110,000	\$3,090,000
1.10	Lone Oaks Loop and 2nd Street to Bowtie Lane (North Central)	\$2,500,000	0%	\$0	\$2,500,000
1.11	Davisson Baseball Fields (North Central)	\$2,700,000	3%	\$90,000	\$2,610,000
1.12	James Street and Schlador to Western Avenue (North Central)	\$1,900,000	33%	\$630,000	\$1,270,000
1.13	Westfield Street and C Street (West Silver Creek)	\$630,000	6%	\$40,000	\$590,000
1.14a	Pioneer Lake Geotechnical Investigation	\$60,000	23%	\$10,000	\$50,000
1.14b	Pioneer Lake Improvements	\$780,000	23%	\$180,000	\$600,000
<b>Total Priority 1 Improvement Costs (Rounded)</b>		<b>\$24,000,000</b>	<b>-</b>	<b>\$1,700,000</b>	<b>\$22,400,000</b>
<b>Priority 2 Improvements</b>					
2.1	Norway Street to Oak Street (Webb Lake)	\$2,000,000	8%	\$150,000	\$1,850,000
2.2	Main Street by Water Treatment Plant (Webb Lake)	\$490,000	9%	\$40,000	\$450,000
2.3	McClaine Street and Railway Street (West Silver Creek)	\$460,000	0%	\$0	\$460,000
2.4	Monson Road (West Silver Creek)	\$650,000	16%	\$110,000	\$540,000
2.5	Silverton High School, Kromminga Drive (Northeast Silver Creek)	\$1,100,000	0%	\$0	\$1,100,000
2.6	Stormwater Master Plan Update	\$200,000	100%	\$200,000	\$0
<b>Total Priority 2 Improvement Costs (Rounded)</b>		<b>\$4,900,000</b>	<b>-</b>	<b>\$500,000</b>	<b>\$4,400,000</b>
<b>Priority 3 Improvements</b>					
3.1	Mill Street (Webb Lake)	\$350,000	0%	\$0	\$350,000
3.2	1st Street Detention Pond (North Central)	\$1,500,000	0%	\$0	\$1,500,000
3.3	Between Silverton Road NE and Railway Street (West Silver Creek)	\$790,000	16%	\$130,000	\$660,000
3.4	Webb Lake Local Street Improvements (Webb Lake)	\$5,900,000	0%	\$0	\$5,900,000
3.5	Stormwater Master Plan Update #2	\$330,000	100%	\$330,000	\$0
<b>Total Priority 3 Improvement Costs (Rounded)</b>		<b>\$8,900,000</b>	<b>-</b>	<b>\$460,000</b>	<b>\$8,400,000</b>
<b>Total Improvement Costs (Rounded)</b>		<b>\$37,800,000</b>	<b>-</b>	<b>\$2,700,000</b>	<b>\$35,200,000</b>
<p><i>The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented herein.</i></p>					



Client: City of Silverton

Project: Stormwater Master Plan



<b>Project Title: Rock Street Stormwater Improvements (Northeast Silver Creek)</b> Project Identifier: 1.1		<b>Location: Rock Street to 3rd Street</b>			
<b>Need for Project:</b> - The City has reported stormwater deficiencies along Rock Street. <b>Objective:</b> - Install new stormwater infrastructure to drain Rock Street into the existing stormwater system along 3rd Street. <b>Design Considerations:</b> - Requires easement through private property. - Coordinate with CIP Project 1.2. Capacity issues were identified in downstream pipe network along 3rd Street. - Pipes sized assuming slopes approximately follow existing surface grade.					
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
12-inch Pipe - Excavation, Backfill	870	LF	\$ 160	\$ 140,000	
48-Inch, Standard Manhole	4	EA	\$ 8,000	\$ 32,000	
Concrete Inlet, Standard Side Inlet	7	EA	\$ 2,100	\$ 15,000	
Asphalt Pavement Roadway Restoration (Full Lane)	340	LF	\$ 110	\$ 38,000	
Soil Surface Repair, Seeding, and Stabilization	530	LF	\$ 5	\$ 3,000	
Rock Excavation (assumes rock depth of 5 ft BGS)	226	CY	\$ 300	\$ 68,000	
Easement / Right-of-Way Acquisition	4,000	SF	\$ 10	\$ 40,000	
Traffic Control - Without Flagging	1	LS	\$ 11,000	\$ 11,000	
<b>Construction Subtotal</b>					<b>\$ 347,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 35,000	
Bonding			2.5%	\$ 9,000	
Contractor Overhead and Profit			10%	\$ 35,000	
Prevailing Wages			2.5%	\$ 9,000	
Contingency			30%	\$ 104,000	
<b>Total Construction Subtotal</b>					<b>\$ 539,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			10%	\$ 54,000	
Engineering - Construction Contract Administration			3%	\$ 13,000	
Engineering -- Inspection			8%	\$ 43,000	
Permitting			LS	\$ 25,000	
Geotechnical Investigation			LS	\$ 10,000	
Surveying			LS	\$ 5,000	
Environmental			LS	\$ 5,000	
Legal, Administrative, and Funding			1.0%	\$ 5,000	
Inflation (5 Years)			2.5%	\$ 71,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 770,000</b>

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Client: City of Silverton  
 Project: Stormwater Master Plan



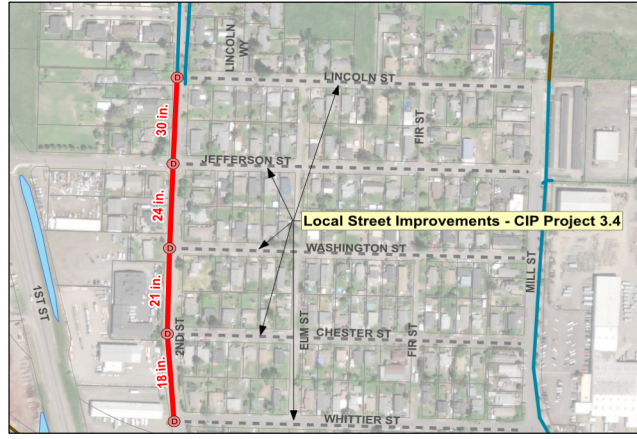
**Project Title: 2nd Street and Lincoln Street (Webb Lake)**  
 Project Identifier: 1.2

**Location: North 2nd Street**

**Need for Project:**  
 - The City has reported stormwater deficiencies along North 2nd Street and Lincoln Street.

**Objective:**  
 - Continue the installation of stormwater infrastructure along North 2nd Street to Whittier Street to reduce localized ponding.

**Design Considerations:**  
 - Additional connecting stormwater improvements along local streets included in CIP Project 3.4  
 - Pipes sized to convey runoff collected by future local street stormwater networks.  
 - Consider installing infiltration planters in available landscape strips to address water quality and provide some reduction in peak flow. (Note, proposed pipes were sized assuming no detention).



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
18-inch Pipe - Excavation, Backfill	310	LF	\$ 185	\$ 58,000	
21-inch Pipe - Excavation, Backfill	310	LF	\$ 195	\$ 61,000	
24-inch Pipe - Excavation, Backfill	300	LF	\$ 205	\$ 62,000	
30-inch Pipe - Excavation, Backfill	300	LF	\$ 230	\$ 69,000	
60-Inch, Standard Manhole	3	EA	\$ 14,000	\$ 42,000	
72-Inch, Standard Manhole	2	EA	\$ 16,500	\$ 33,000	
Concrete Inlet, Standard Side Inlet	15	EA	\$ 2,100	\$ 32,000	
Asphalt Pavement Roadway Restoration (Full Lane)	1,220	LF	\$ 110	\$ 135,000	
Rock Excavation (assumes rock depth of 5 ft BGS)	758	CY	\$ 300	\$ 228,000	
Traffic Control - With Flagging	1	LS	\$ 35,000	\$ 35,000	
<b>Construction Subtotal</b>					<b>\$ 755,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 76,000	
Bonding			2.5%	\$ 19,000	
Contractor Overhead and Profit			10%	\$ 76,000	
Prevailing Wages			2.5%	\$ 19,000	
Contingency			30%	\$ 227,000	
<b>Total Construction Subtotal</b>					<b>\$ 1,172,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			10%	\$ 117,000	
Engineering - Construction Contract Administration			3%	\$ 29,000	
Engineering -- Inspection			8%	\$ 94,000	
Permitting			LS	\$ 10,000	
Geotechnical Investigation			LS	\$ 25,000	
Surveying			LS	\$ 15,000	
Environmental			LS	\$ 5,000	
Legal, Administrative, and Funding			1.0%	\$ 12,000	
Inflation (5 Years)			2.5%	\$ 154,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 1,700,000</b>

The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.



Client: City of Silverton  
 Project: Stormwater Master Plan



<b>Project Title: Public Works Shop Decant Facility Roof Structure</b> Project Identifier: 1.3		<b>Location: Public Works Shop</b>			
<u>Need for Project:</u> - The City has a decant storage facility to dispose of stormwater waste. The facility is not currently covered. <u>Objective:</u> - Construct a roof structure over storage bays and install an additional covered storage bay to increase storage capacity.					
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Construct Roof Structure and Additional Bay	1	LS	\$ 184,000	\$ 184,000	
<i>Construction Subtotal</i>					<b>\$ 184,000</b>
<b>Total Project Costs (rounded)</b>					<b>\$ 184,000</b>

*The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.*



<p><b>Project Title: 3rd Street and Jersey Street to Mill and B Street (Northeast Silver Creek)</b></p> <p>Project Identifier: 1.4</p>	<p><b>Location: 3rd Street to High Street</b></p>
<p><u>Need for Project:</u></p> <ul style="list-style-type: none"> <li>- Existing pipes along 3rd Street and Mill Street to B Street do not have capacity to convey peak flows from the 25-year design storm.</li> </ul> <p><u>Objective:</u></p> <ul style="list-style-type: none"> <li>- Divert flows away from the existing pipe along Mill Street and B Street to a new pipe network and outfall to Silver Creek</li> </ul> <p><u>Design Considerations:</u></p> <ul style="list-style-type: none"> <li>- Additional permitting requirements for constructing a new stormwater outfall to Silver Creek</li> <li>- Construct new outfall above the 100-year flood plain and outside of environmentally sensitive areas (i.e., wetlands or the ordinary high water mark of Silver Creek).</li> <li>- Consider installing infiltration planters in available landscape strips to address water quality and provide some reduction in peak flow. (Note, proposed pipes were sized assuming no detention).</li> <li>- Crossing of ODOT ROW (Water Street, 1st Street, and Oak Street)</li> <li>- Rock excavation may be necessary because of pipe upsize.</li> <li>- <b>Coordinate with CIP Project 1.3</b></li> </ul>	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 78,000	\$ 78,000	
24-inch Pipe - Excavation, Backfill	130	LF	\$ 205	\$ 27,000	
30-inch Pipe - Excavation, Backfill	700	LF	\$ 230	\$ 161,000	
36-inch Pipe - Excavation, Backfill	1,300	LF	\$ 245	\$ 319,000	
Abandonment of existing pipeline	600	LF	\$ 25	\$ 15,000	
Abandonment of existing manholes	2	EA	\$ 4,000	\$ 8,000	
72-Inch, Standard Manhole	8	EA	\$ 16,500	\$ 132,000	
ODOT Type G-2, Catch Basin with Connector Pipe	9	EA	\$ 3,500	\$ 32,000	
Concrete Inlet, Standard Side Inlet	16	EA	\$ 2,100	\$ 34,000	
Concrete Headwall and Outlet Protection	1	EA	\$ 16,000	\$ 16,000	
Lean Concrete Trench Backfill Under ODOT Roadways	215	LF	\$ 165	\$ 36,000	
Asphalt Pavement Roadway Restoration (Full Lane)	2,130	LF	\$ 110	\$ 235,000	
Rock Excavation (assumes rock depth of 5 ft BGS)	1,284	CY	\$ 300	\$ 386,000	
ADA Ramp Reconstruction (Compliance)	18	EA	\$ 4,600	\$ 83,000	
Easement / Right-of-Way Acquisition	1,400	SF	\$ 10	\$ 14,000	
Traffic Control - With Flagging	1	LS	\$ 58,000	\$ 58,000	
<b>Construction Subtotal</b>					<b>\$ 1,634,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 163,000	
Bonding			2.5%	\$ 41,000	
Contractor Overhead and Profit			10%	\$ 163,000	
Prevailing Wages			2.5%	\$ 41,000	
Contingency			30%	\$ 490,000	
<b>Total Construction Subtotal</b>					<b>\$ 2,532,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			10%	\$ 253,000	
Engineering - Construction Contract Administration			3%	\$ 63,000	
Engineering -- Inspection			8%	\$ 203,000	
Permitting			LS	\$ 25,000	
Geotechnical Investigation			LS	\$ 63,000	
Surveying			LS	\$ 15,000	
Environmental			LS	\$ 25,000	
Legal, Administrative, and Funding			1.0%	\$ 25,000	
Inflation (5 Years)			2.5%	\$ 333,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 3,600,000</b>

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Client: City of Silverton  
 Project: Stormwater Master Plan



<b>Project Title: Abiqua Heights, upstream of storage pond (Northeast Silver Creek)</b> Project Identifier: 1.5		<b>Location: Shelokum and Tilicum Drive</b>				
<u>Need for Project:</u> - Existing pipes upstream of the Abiqua Heights Storage Pond do not have capacity to convey peak flows from the 25-year design storm. <u>Objective:</u> - Upsize the existing pipes and maintain existing alignment to reduce flooding <u>Design Considerations:</u> - Coordinate with development which may occur to the undeveloped area southeast of the storage pond - Abiqua Heights Storage Pond has been identified as a wetland in Local Wetlands Inventory from 2000 which may complicate the project. A wetland determination is recommended. - Pipe and manholes along Shelokum Drive are > 15 feet deep						
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)	
<b>Goods and Services</b>						
Demolition and Removal of existing structures	1	LS	\$ 18,000	\$ 18,000		
15-inch Pipe - Excavation, Backfill	440	LF	\$ 170	\$ 75,000		
15-inch Pipe - Excavation, Backfill (> 10' depth)	250	LF	\$ 255	\$ 64,000		
21-inch Pipe - Excavation, Backfill	110	LF	\$ 195	\$ 22,000		
21-inch Pipe - Excavation, Backfill (> 10' depth)	110	LF	\$ 295	\$ 33,000		
24-inch Pipe - Excavation, Backfill	20	LF	\$ 205	\$ 5,000		
48-Inch, Standard Manhole	4	EA	\$ 12,000	\$ 48,000		
60-Inch, Standard Manhole	1	EA	\$ 21,000	\$ 21,000		
Concrete Headwall and Outlet Protection	1	EA	\$ 16,000	\$ 16,000		
Concrete Inlet, Standard Side-Inlet with Connector Pipe	3	EA	\$ 3,200	\$ 10,000		
Soil Surface Repair, Seeding, and Stabilization	530	LF	\$ 5	\$ 3,000		
Gravel Surface Repair	120	LF	\$ 10	\$ 2,000		
Asphalt Pavement Roadway Restoration (Full Lane)	250	LF	\$ 110	\$ 28,000		
Rock Excavation (assumes rock depth of 5 ft BGS)	94	CY	\$ 300	\$ 29,000		
Traffic Control - Without Flagging	1	LS	\$ 10,000	\$ 10,000		
<b>Construction Subtotal</b>					<b>\$ 384,000</b>	
<b>Additional Elements (estimated % of above)</b>						
Mobilization and Administration			10%	\$ 38,000		
Bonding			2.5%	\$ 10,000		
Contractor Overhead and Profit			10%	\$ 38,000		
Prevailing Wages			2.5%	\$ 10,000		
Contingency			30%	\$ 115,000		
<b>Total Construction Subtotal</b>					<b>\$ 595,000</b>	
<b>Plans and Contract Documents</b>						
Engineering Design and Bid Phase Services			15%	\$ 89,000		
Engineering - Construction Contract Administration			5%	\$ 30,000		
Engineering -- Inspection			8%	\$ 48,000		
Permitting			LS	\$ 10,000		
Geotechnical Investigation			LS	\$ 12,000		
Surveying			LS	\$ 8,000		
Environmental			LS	\$ 10,000		
Legal, Administrative, and Funding			2.5%	\$ 15,000		
Inflation (5 Years)			2.5%	\$ 78,000		
<b>Total Project Costs (rounded)</b>					<b>\$ 900,000</b>	

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Client: City of Silverton  
 Project: Stormwater Master Plan

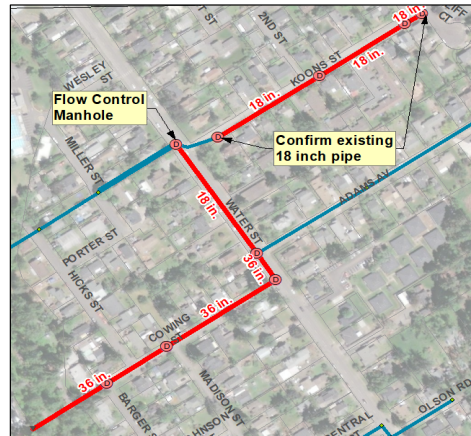


<b>Project Title: Koons Street and Adams Avenue to Silver Creek (Northeast Silver Creek)</b>  Project Identifier: 1.6	<b>Location: Koons Street and Adams Avenue</b>
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**Need for Project:**  
 - Existing pipes along Koons Street, and Cowing Street do not have capacity to convey peak flows from the 25-year design storm.

**Objective:**  
 - Divert flows from Koons Street to upsized pipe on Cowing Street to existing outfall.

**Design Considerations:**  
 - Confirm if there is an existing 18-inch pipe along Koons Street from Cliff Court to Water Street  
 - Pipe must be replaced through the outfall, therefore environmental permitting is likely required.  
 - Confirm existing pipe downstream of Koons Street is not underneath existing homes and the pipe should be inspected with CCTV to determine condition.  
 - Pipeline along Water Street and flow control manhole are within ODOT ROW  
 - Install pollution control manhole because outfall is upstream of the Silver Creek raw water intake



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 67,000	\$ 67,000	
18-inch Pipe - Excavation, Backfill	1,190	LF	\$ 185	\$ 221,000	
36-inch Pipe - Excavation, Backfill (> 10' depth)	1,000	LF	\$ 370	\$ 370,000	
48-Inch, Standard Manhole	4	EA	\$ 8,000	\$ 32,000	
72-Inch, Standard Manhole (>10' depth)	4	EA	\$ 33,000	\$ 132,000	
Flow Control Manhole	1	EA	\$ 15,000	\$ 15,000	
Pollution Control Manhole	1	EA	\$ 10,000	\$ 10,000	
Concrete Headwall and Outlet Protection	1	EA	\$ 16,000	\$ 16,000	
ODOT Type G-2, Catch Basin with Connector Pipe	4	EA	\$ 3,500	\$ 14,000	
Concrete Inlet, Standard Side Inlet	9	EA	\$ 2,100	\$ 19,000	
Soil Surface Repair, Seeding, and Stabilization	260	LF	\$ 5	\$ 2,000	
Lean Concrete Trench Backfill Under ODOT Roadways	550	LF	\$ 165	\$ 91,000	
Asphalt Pavement Roadway Restoration (Half Lane)	1,920	LF	\$ 55	\$ 106,000	
Rock Excavation (assumes rock depth of 5 ft BGS)	583	CY	\$ 300	\$ 176,000	
ADA Ramp Reconstruction (Compliance)	16	EA	\$ 4,600	\$ 74,000	
Traffic Control - With Flagging	1	LS	\$ 58,000	\$ 58,000	
<b>Construction Subtotal</b>					<b>\$ 1,403,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 140,000	
Bonding			2.5%	\$ 35,000	
Contractor Overhead and Profit			10%	\$ 140,000	
Prevailing Wages			2.5%	\$ 35,000	
Contingency			30%	\$ 421,000	
<b>Total Construction Subtotal</b>					<b>\$ 2,174,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			15%	\$ 326,000	
Engineering - Construction Contract Administration			5%	\$ 109,000	
Engineering -- Inspection			8%	\$ 174,000	
Permitting		LS		\$ 25,000	
Geotechnical Investigation		LS		\$ 43,000	
Surveying		LS		\$ 15,000	
Environmental		LS		\$ 25,000	
Legal, Administrative, and Funding			2.5%	\$ 54,000	
Inflation (5 Years)			2.5%	\$ 286,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 3,300,000</b>

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Client: City of Silverton  
 Project: Stormwater Master Plan



**Project Title: Sheridan Street to Silver Creek (Northeast Silver Creek)**  
**Location: Sheridan Street**  
 Project Identifier: 1.7

**Need for Project:**

- City has observed flooding and ponding within this area due to lack of effective stormwater infrastructure

**Objective:**

- Install new trunkline to relieve City identified flooding and ponding.

**Design Considerations:**

- Additional permitting requirements for constructing a new stormwater outfall to Silver Creek
- Construct new outfall above 100-year flood plain and outside of environmentally sensitive areas (i.e., wetlands or the ordinary high water mark of Silver Creek).
- Crossing of ODOT ROW (Pine Street)
- Consider installing infiltration planters in available landscape strips to address water quality and provide some reduction in peak flow (Note, proposed pipes were sized assuming no detention).



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 14,000	\$ 14,000	
12-inch Pipe - Excavation, Backfill	900	LF	\$ 160	\$ 144,000	
48-Inch, Standard Manhole	3	EA	\$ 8,000	\$ 24,000	
Concrete Headwall and Outlet Protection	1	EA	\$ 16,000	\$ 16,000	
ODOT Type G-2, Catch Basin with Connector Pipe	3	EA	\$ 3,500	\$ 11,000	
Concrete Inlet, Standard Side Inlet	2	EA	\$ 2,100	\$ 5,000	
Soil Surface Repair, Seeding, and Stabilization	500	LF	\$ 5	\$ 3,000	
Lean Concrete Trench Backfill Under ODOT Roadways	40	LF	\$ 165	\$ 7,000	
Asphalt Pavement Roadway Restoration (Half Lane)	360	LF	\$ 55	\$ 20,000	
Asphalt Pavement Roadway Restoration (Full Lane)	40	LF	\$ 110	\$ 5,000	
ADA Ramp Reconstruction (Compliance)	6	EA	\$ 4,600	\$ 28,000	
Traffic Control - Without Flagging	1	LS	\$ 12,000	\$ 12,000	
<b>Construction Subtotal</b>					<b>\$ 289,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 29,000	
Bonding			2.5%	\$ 7,000	
Contractor Overhead and Profit			10%	\$ 29,000	
Prevailing Wages			2.5%	\$ 7,000	
Contingency			30%	\$ 87,000	
<b>Total Construction Subtotal</b>					<b>\$ 448,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			15%	\$ 67,000	
Engineering - Construction Contract Administration			5%	\$ 22,000	
Engineering -- Inspection			8%	\$ 36,000	
Permitting			LS	\$ 25,000	
Geotechnical Investigation			LS	\$ 9,000	
Surveying			LS	\$ 8,000	
Environmental			LS	\$ 25,000	
Legal, Administrative, and Funding			2.5%	\$ 11,000	
Inflation (5 Years)			2.5%	\$ 59,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 710,000</b>

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Client: City of Silverton  
 Project: Stormwater Master Plan

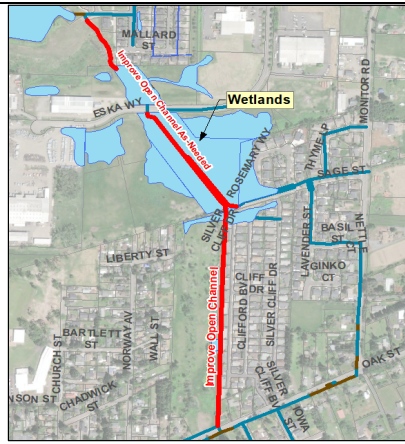


<b>Project Title: Olson's Ditch at Sage Street (Webb Lake)</b> Project Identifier: 1.8	<b>Location: Olson's Ditch</b>
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**Need for Project:**  
 - Olson's Ditch has been observed to be eroding and flows back up in the ditch.

**Objective:**  
 - Improve the ditch to handle peak design flows from the 25-year storm. Armor ditch section near Sage Street where ditch changes direction.

**Design Considerations:**  
 - Some of the ditch sections are within designated wetlands identified in the City's Local Wetland Inventory. A wetland determination is recommended.  
 - Likely requires hydraulic modeling to confirm improvements will not adversely affect wetland function.



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Ditch Dredging/Cleanout	3,300	LF	\$ 20	\$ 66,000	
Open Channel Improvement - Rip Rap and Energy Dissipators	3,300	LF	\$ 100	\$ 330,000	
<b>Construction Subtotal</b>					<b>\$ 396,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 40,000	
Bonding			2.5%	\$ 10,000	
Contractor Overhead and Profit			10%	\$ 40,000	
Prevailing Wages			2.5%	\$ 10,000	
Contingency			30%	\$ 119,000	
<b>Total Construction Subtotal</b>					<b>\$ 615,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			30%	\$ 185,000	
Engineering - Construction Contract Administration			10%	\$ 62,000	
Engineering -- Inspection			8%	\$ 49,000	
Permitting			LS	\$ 25,000	
Geotechnical Investigation			LS	\$ 12,000	
Surveying			LS	\$ 15,000	
Environmental			LS	\$ 25,000	
Legal, Administrative, and Funding			3%	\$ 15,000	
Inflation (5 Years)			2.5%	\$ 81,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 1,100,000</b>

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**Client: City of Silverton**  
**Project: Stormwater Master Plan**



<b>Project Title: Crestview Drive, Breyonna Way, Iowa Street, and Oak Street (Webb Lake)</b> Project Identifier: 1.9		<b>Location: Crestview Drive and Steelhammer Road</b>				
<b>Need for Project:</b> - Flooding has been observed along Crestview Drive and Steelhammer Road. Flooding was projected downstream along Breyonna Way and Iowa Street. <b>Objective:</b> - Install new pipe and upsize existing pipe along Crestview Drive, Breyonna Way, Iowa Street, and Oak Street to alleviate flooding and surcharging from 25-year storm event. <b>Design Considerations:</b> - Coordinate project timeline with development along pipeline corridor - Oak Street is within ODOT ROW. May trigger sidewalk construction on south side of Oak Street. - Consider installing infiltration planters in available landscape strips to address water quality and provide some reduction in peak flow (Note proposed pipes were sized assuming no detention).						
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)	
<b>Goods and Services</b>						
Demolition and Removal of existing structures	1	LS	\$ 65,000	\$ 65,000		
30-inch Pipe - Excavation, Backfill	2,640	LF	\$ 230	\$ 608,000		
36-inch Pipe - Excavation, Backfill	360	LF	\$ 245	\$ 89,000		
60-Inch, Standard Manhole	9	EA	\$ 14,000	\$ 126,000		
72-Inch, Standard Manhole	2	EA	\$ 16,500	\$ 33,000		
Connect to Existing Manhole	2	EA	\$ 1,750	\$ 4,000		
ODOT Type G-2, Catch Basin with Connector Pipe	4	EA	\$ 3,500	\$ 14,000		
Concrete Inlet, Standard Side-Inlet with Connector Pipe	16	EA	\$ 3,200	\$ 52,000		
Concrete Headwall and Outlet Protection	1	EA	\$ 16,000	\$ 16,000		
Lean Concrete Trench Backfill Under ODOT Roadways	370	LF	\$ 165	\$ 62,000		
Asphalt Pavement Roadway Restoration (Half Lane)	2,650	LF	\$ 55	\$ 146,000		
Rock Excavation (assumes rock depth of 5 ft BGS)	219	CY	\$ 300	\$ 66,000		
ADA Ramp Reconstruction (Compliance)	2	EA	\$ 4,600	\$ 10,000		
Traffic Control - With Flagging	1	LS	\$ 70,000	\$ 70,000		
<b>Construction Subtotal</b>					<b>\$ 1,361,000</b>	
<b>Additional Elements (estimated % of above)</b>						
Mobilization and Administration			10%	\$ 136,000		
Bonding			2.5%	\$ 34,000		
Contractor Overhead and Profit			10%	\$ 136,000		
Prevailing Wages			2.5%	\$ 34,000		
Contingency			30%	\$ 408,000		
<b>Total Construction Subtotal</b>					<b>\$ 2,109,000</b>	
<b>Plans and Contract Documents</b>						
Engineering Design and Bid Phase Services			15%	\$ 316,000		
Engineering - Construction Contract Administration			5%	\$ 105,000		
Engineering -- Inspection			8%	\$ 169,000		
Permitting			LS	\$ 10,000		
Geotechnical Investigation			LS	\$ 42,000		
Surveying			LS	\$ 25,000		
Environmental			LS	\$ 25,000		
Legal, Administrative, and Funding			2.5%	\$ 53,000		
Inflation (5 Years)			2.5%	\$ 277,000		
<b>Total Project Costs (rounded)</b>					<b>\$ 3,200,000</b>	

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**Client: City of Silverton**  
**Project: Stormwater Master Plan**



<b>Project Title: Lone Oaks Loop and 2nd Street to Bowtie Lane (North Central)</b> Project Identifier: 1.10		<b>Location: Lone Oaks Loop, 2nd Street, and 1st Street</b>			
<p><u>Need for Project:</u></p> <ul style="list-style-type: none"> <li>- Existing pipes Along Lone Oaks Loop and along 1st Street do not have capacity to convey peak flows from the 25-year design storm.</li> </ul> <p><u>Objective:</u></p> <ul style="list-style-type: none"> <li>- Upsize existing pipes along Lone Oaks Loops and install new pipe on east side of 1st Street.</li> </ul> <p><u>Design Considerations:</u></p> <ul style="list-style-type: none"> <li>- Pipeline discharge across 1st Street is into designated wetlands and private property</li> <li>- 1st Street is within ODOT ROW</li> <li>- Consider installing infiltration planters in available landscape strips to address water quality and provide some reduction in peak flow (Note, proposed pipes were sized assuming no detention).</li> </ul>					
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 47,000	\$ 47,000	
24-inch Pipe - Excavation, Backfill	1,000	LF	\$ 205	\$ 205,000	
30-inch Pipe - Excavation, Backfill	290	LF	\$ 230	\$ 67,000	
36-inch Pipe - Excavation, Backfill	350	LF	\$ 245	\$ 86,000	
60-Inch, Standard Manhole	4	EA	\$ 14,000	\$ 56,000	
72-Inch, Standard Manhole	4	EA	\$ 16,500	\$ 66,000	
Concrete Inlet, Standard Side Inlet	10	EA	\$ 2,100	\$ 21,000	
ODOT Type G-2, Catch Basin with Connector Pipe	5	EA	\$ 3,500	\$ 18,000	
Concrete Headwall and Outlet Protection	1	EA	\$ 16,000	\$ 16,000	
Asphalt Pavement Roadway Restoration (Full Lane)	1,540	LF	\$ 110	\$ 170,000	
Highway Boring (<24-inch pipe)	100	LF	\$ 900	\$ 90,000	
ADA Ramp Reconstruction (Compliance)	4	EA	\$ 4,600	\$ 19,000	
Rock Excavation (assumes rock depth of 5 ft BGS)	292	CY	\$ 300	\$ 88,000	
Traffic Control - With Flagging	1	LS	\$ 45,000	\$ 45,000	
<b>Construction Subtotal</b>					<b>\$ 994,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 99,000	
Bonding			2.5%	\$ 25,000	
Contractor Overhead and Profit			10%	\$ 99,000	
Prevailing Wages			2.5%	\$ 25,000	
Contingency			30%	\$ 298,000	
<b>Total Construction Subtotal</b>					<b>\$ 1,540,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			15%	\$ 231,000	
Engineering - Construction Contract Administration			5%	\$ 77,000	
Engineering -- Inspection			8%	\$ 123,000	
Permitting			LS	\$ 10,000	
Geotechnical Investigation			LS	\$ 77,000	
Surveying			LS	\$ 10,000	
Environmental			LS	\$ 10,000	
Legal, Administrative, and Funding			10%	\$ 154,000	
Inflation (5 Years)			2.5%	\$ 202,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 2,500,000</b>

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Client: City of Silverton

Project: Stormwater Master Plan

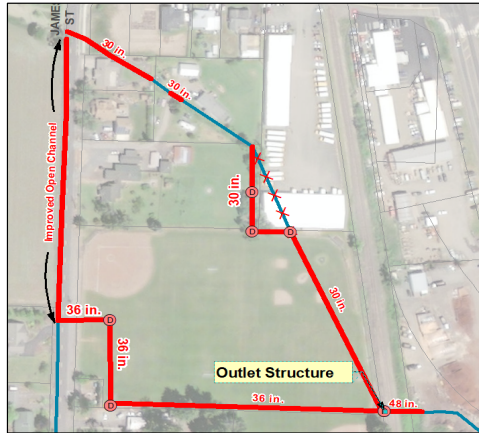


<b>Project Title: Davisson Baseball Fields (North Central)</b>	<b>Location: Davisson Baseball Fields</b>
Project Identifier: 1.11	

**Need for Project:**  
 - The existing culvert and pipes through Davisson Baseball Fields. The pipes are undersized and do not have capacity to convey peak flows from the 25-year design storm.

**Objective:**  
 - Upsize existing pipes and install new pipeline draining toward James Street Ditch.

**Design Considerations:**  
 - Replace box culvert beneath the railroad (could be considered a minor structure versus culvert per RR owner)  
 - Improved open channel should be 4' deep, 4' bottom, and 8' top width or equal capacity. Line with rip rap and energy dissipation to reduce erosion. Likely requires larger easement for ROW and relocation of power poles.  
 - Abandon existing pipeline underneath the structure.  
 - Consider installing infiltration planters in available landscape strips to address water quality and provide some reduction in peak flow (Note, proposed pipes were sized assuming no detention).  
 - Culvert replacement beneath railroad may trigger other requirements and can take +1 year to design / permit.  
 - RR Culvert flowline requirements will govern designs.



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 49,000	\$ 49,000	
30-inch Pipe - Excavation, Backfill	960	LF	\$ 230	\$ 221,000	
36-inch Pipe - Excavation, Backfill	880	LF	\$ 245	\$ 216,000	
48-inch Culvert - Excavation, Backfill	80	LF	\$ 300	\$ 24,000	
Abandonment of existing pipeline	230	LF	\$ 25	\$ 6,000	
60-Inch, Standard Manhole	3	EA	\$ 14,000	\$ 42,000	
72-Inch, Standard Manhole	2	EA	\$ 16,500	\$ 33,000	
Concrete Outlet Flow Control Structure	1	EA	\$ 15,000	\$ 15,000	
Concrete Headwall	5	EA	\$ 10,000	\$ 50,000	
Ditch Dredging/Cleanout	750	LF	\$ 20	\$ 15,000	
Open Channel Improvement - Rip Rap and Energy Dissipators	750	LF	\$ 100	\$ 75,000	
Asphalt Pavement Roadway Restoration (Full Lane)	60	LF	\$ 110	\$ 7,000	
Soil Surface Repair, Seeding, and Stabilization	1,470	LF	\$ 5	\$ 8,000	
Rock Excavation (assumes rock depth of 5 ft BGS)	279	CY	\$ 300	\$ 84,000	
Easement / Right-of-Way Acquisition	17,000	SF	\$ 10	\$ 170,000	
Traffic Control - Without Flagger	1	LS	\$ 5,000	\$ 5,000	
<b>Construction Subtotal</b>					<b>\$ 1,020,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 102,000	
Bonding			2.5%	\$ 26,000	
Contractor Overhead and Profit			10%	\$ 102,000	
Prevailing Wages			2.5%	\$ 26,000	
Contingency (increased contingency because of RR culvert replacement)			40%	\$ 408,000	
<b>Total Construction Subtotal</b>					<b>\$ 1,684,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			15%	\$ 253,000	
Engineering - Construction Contract Administration			5%	\$ 84,000	
Engineering -- Inspection			8%	\$ 135,000	
Permitting			LS	\$ 25,000	
Geotechnical Investigation			LS	\$ 34,000	
Surveying			LS	\$ 15,000	
Environmental			LS	\$ 5,000	
Legal, Administrative, and Funding			10%	\$ 168,000	
Inflation (5 Years)			2.5%	\$ 221,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 2,700,000</b>

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Client: City of Silverton  
 Project: Stormwater Master Plan



**Project Title: James Street and Schlador to Western Avenue (North Central)**  
 Project Identifier: 1.12

**Location: James Street**

**Need for Project:**

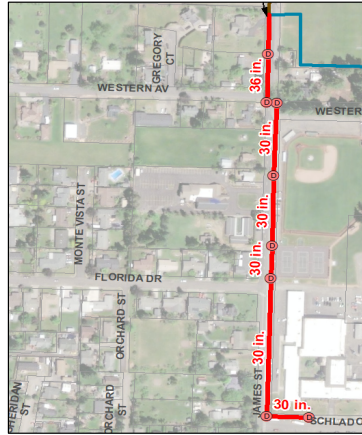
- The existing pipes along James Street do not have capacity to convey peak flows from the 25-year design storm.

**Objective:**

- Upsize existing pipes to convey design storm.

**Design Considerations:**

- Can be completed concurrently with Project 1.7, but must be completed after James Street Ditch is improved.
- Consider installing infiltration planters in available landscape strips to address water quality and provide some reduction in peak flow (Note, proposed pipes were sized assuming no detention.)



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 39,000	\$ 39,000	
30-inch Pipe - Excavation, Backfill	1,370	LF	\$ 230	\$ 316,000	
36-inch Pipe - Excavation, Backfill	180	LF	\$ 245	\$ 45,000	
48-inch Pipe - Excavation, Backfill	150	LF	\$ 300	\$ 45,000	
60-Inch, Standard Manhole	6	EA	\$ 14,000	\$ 84,000	
72-Inch, Standard Manhole	2	EA	\$ 16,500	\$ 33,000	
Concrete Inlet, Standard Side-Inlet with Connector Pipe	14	EA	\$ 3,200	\$ 45,000	
Concrete Headwall and Outlet Protection	1	EA	\$ 16,000	\$ 16,000	
Asphalt Pavement Roadway Restoration (Half Lane)	1,700	LF	\$ 55	\$ 94,000	
Rock Excavation (assumes rock depth of 5 ft BGS)	188	CY	\$ 300	\$ 57,000	
Traffic Control - Without Flagging	1	LS	\$ 51,000	\$ 51,000	
<b>Construction Subtotal</b>					<b>\$ 825,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 83,000	
Bonding			2.5%	\$ 21,000	
Contractor Overhead and Profit			10%	\$ 83,000	
Prevailing Wages			2.5%	\$ 21,000	
Contingency			30%	\$ 248,000	
<b>Total Construction Subtotal</b>					<b>\$ 1,281,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			15%	\$ 192,000	
Engineering - Construction Contract Administration			5%	\$ 64,000	
Engineering -- Inspection			8%	\$ 102,000	
Permitting			LS	\$ 5,000	
Geotechnical Investigation			LS	\$ 26,000	
Surveying			LS	\$ 15,000	
Environmental			LS	\$ 5,000	
Legal, Administrative, and Funding			3%	\$ 32,000	
Inflation (5 Years)			2.5%	\$ 168,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 1,900,000</b>

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Client: City of Silverton  
 Project: Stormwater Master Plan



**Project Title: Westfield Street and C Street (West Silver Creek)**  
 Project Identifier: 1.13

**Location: Westfield Street to C Street**

**Need for Project:**

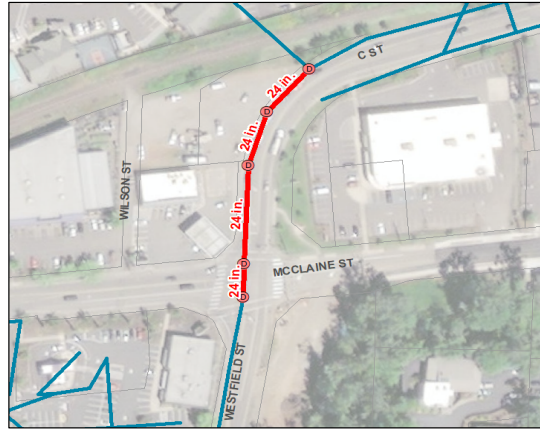
- The existing pipes along Westfield Street and C Street do not have capacity to convey peak flows from the 25-year design storm.

**Objective:**

- Upsize existing pipes to convey design storm.

**Design Considerations:**

- The intersection of C Street, McClaine Street, and Westfield Street is within ODOT ROW.
- Proposed project assumes that ODOT will not require that water quality or flow control be provided for contributing impervious areas within ODOT ROW.
- Should coordinate with ODOT to determine when intersection improvements are planned and include project with it.
- Consider adding trench drains on McClaine Street to intercept springs/seeps on south side of road, from edge of previous roadway project to the intersection (may have minor ADA / sidewalk improvements).
- Consider installing infiltration planters in available landscape strips to address water quality and provide some reduction in peak flow (Note, proposed pipes were sized assuming no detention).



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 13,000	\$ 13,000	
24-inch Pipe - Excavation, Backfill	360	LF	\$ 205	\$ 74,000	
60-Inch, Standard Manhole	5	EA	\$ 14,000	\$ 70,000	
ODOT Type G-2, Catch Basin with Connector Pipe	4	EA	\$ 3,500	\$ 14,000	
Concrete Inlet, Standard Side-Inlet with Connector Pipe	2	EA	\$ 3,200	\$ 7,000	
Asphalt Pavement Roadway Restoration (Half Lane)	310	LF	\$ 55	\$ 18,000	
Asphalt Pavement Roadway Restoration (Full Lane)	50	LF	\$ 110	\$ 6,000	
Lean Concrete Trench Backfill Under ODOT Roadways	80	LF	\$ 165	\$ 14,000	
Rock Excavation (assumes rock depth of 5 ft BGS)	31	CY	\$ 300	\$ 10,000	
ADA Ramp Reconstruction (Compliance)	4	EA	\$ 4,600	\$ 19,000	
Traffic Control - Without Flagging	1	LS	\$ 20,000	\$ 20,000	
<b>Construction Subtotal</b>					<b>\$ 265,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 27,000	
Bonding			2.5%	\$ 7,000	
Contractor Overhead and Profit			10%	\$ 27,000	
Prevailing Wages			2.5%	\$ 7,000	
Contingency			30%	\$ 80,000	
<b>Total Construction Subtotal</b>					<b>\$ 413,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			15%	\$ 62,000	
Engineering - Construction Contract Administration			5%	\$ 21,000	
Engineering -- Inspection			8%	\$ 33,000	
Permitting			LS	\$ 5,000	
Geotechnical Investigation			LS	\$ 8,000	
Surveying			LS	\$ 15,000	
Environmental			LS	\$ 5,000	
Legal, Administrative, and Funding			3%	\$ 10,000	
Inflation (5 Years)			2.5%	\$ 54,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 630,000</b>

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**Client: City of Silverton**  
**Project: Stormwater Master Plan**



<p><b>Project Title: Pioneer Lake Geotechnical Investigation</b>          Project Identifier: 1.14a</p>	<p><b>Location: Pioneer Lake (Lakeview Drive)</b></p>				
<p><u>Need for Project:</u>          - Pioneer Lake is not properly lined and water floods across Lakeview Drive from water seeping through the bottom or walls of Pioneer Lake</p> <p><u>Objective:</u>          - Determine the cause of seepage across Lakeview Drive and stop any further drainage.</p> <p><u>Design Considerations:</u>          - Complete geotechnical investigation before proceeding with improvements.          - Consider installing impermeable liner or grout curtain depending on results from geotechnical report.          - Pioneer lake is owned and maintained by the home owner's association. The City should coordinate with the HOA as necessary</p>					
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Geotechnical Investigation	1	LS	\$ 60,000	\$ 60,000	
				<b>Construction Subtotal</b>	<b>\$ 60,000</b>
				<b>Total Project Costs (rounded)</b>	<b>\$ 60,000</b>

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Client: City of Silverton  
 Project: Stormwater Master Plan



<b>Project Title: Pioneer Lake Improvements</b> Project Identifier: 1.14b	<b>Location: Pioneer Lake (Lakeview Drive)</b>
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**Need for Project:**  
 - Pioneer Lake is not properly lined and water floods across Lakeview Drive from water seeping through the bottom or walls of Pioneer Lake

**Objective:**  
 - Address seepage across Lakeview Drive and stop any further drainage by installing a bentonite cutoff wall

**Design Considerations:**  
 - Project approach may vary depending on results from the geotechnical investigation (Project 1.10a).  
 - Assumes 10 ft deep bentonite cutoff wall around the southern perimeter of the pond (250 LF)  
 - Consider installing impermeable liner depending on results from geotechnical report. This project Assumes groundwater influence which prevents installation of a liner.



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Bentonite Cutoff Wall (10 ft. deep)	2,500	SF	\$ 120	\$ 300,000	
<b>Construction Subtotal</b>					<b>\$ 300,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 30,000	
Bonding			2.5%	\$ 8,000	
Contractor Overhead and Profit			10%	\$ 30,000	
Prevailing Wages			2.5%	\$ 8,000	
Contingency			50%	\$ 150,000	
<b>Total Construction Subtotal</b>					<b>\$ 526,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			15%	\$ 79,000	
Engineering - Construction Contract Administration			5%	\$ 26,000	
Engineering -- Inspection			8%	\$ 42,000	
Permitting			LS	\$ 5,000	
Geotechnical Investigation			LS	\$ -	
Surveying			LS	\$ 8,000	
Environmental			LS	\$ 5,000	
Legal, Administrative, and Funding			3%	\$ 13,000	
Inflation (5 Years)			2.5%	\$ 69,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 780,000</b>

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Client: City of Silverton

Project: Stormwater Master Plan



<b>Project Title: Norway Street to Oak Street (Webb Lake)</b> Project Identifier: 2.1		<b>Location: Norway Street to Oak Street</b>				
<p><u>Need for Project:</u>                  - The existing pipes along Norway Street and Oak Street do not have capacity to convey peak flows from the 25-year design storm.</p> <p><u>Objective:</u>                  - Upsize pipes along Norway Street and install new pipe along north side of Oak Street</p> <p><u>Design Considerations:</u>                  - Some of the ditch sections are within designated wetlands                  - Oak Street is within ODOT ROW and may trigger sidewalk, curb, and gutter replacement.                  - Consider installing infiltration planters in available landscape strips to address water quality and provide some reduction in peak flow (Note, proposed pipes were sized assuming no detention).</p>						
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)	
<b>Goods and Services</b>						
Demolition and Removal of existing structures	1	LS	\$ 38,000	\$ 38,000		
21-inch Pipe - Excavation, Backfill	400	LF	\$ 195	\$ 78,000		
30-inch Pipe - Excavation, Backfill	810	LF	\$ 230	\$ 187,000		
36-inch Culvert - Excavation, Backfill	60	LF	\$ 200	\$ 12,000		
60-Inch, Standard Manhole	5	EA	\$ 14,000	\$ 70,000		
ODOT Type G-2, Catch Basin with Connector Pipe	5	EA	\$ 3,500	\$ 18,000		
Concrete Inlet, Standard Side-Inlet with Connector Pipe	7	EA	\$ 3,200	\$ 23,000		
Concrete Headwall and Outlet Protection	2	EA	\$ 16,000	\$ 32,000		
Asphalt Pavement Roadway Restoration (Half Lane)	1,530	LF	\$ 55	\$ 85,000		
Lean Concrete Trench Backfill Under ODOT Roadways	810	LF	\$ 165	\$ 134,000		
Rock Excavation (assumes rock depth of 5 ft BGS)	199	CY	\$ 300	\$ 60,000		
ADA Ramp Reconstruction (Compliance)	6	EA	\$ 4,600	\$ 28,000		
Traffic Control - With Flagging	1	LS	\$ 36,000	\$ 36,000		
<b>Construction Subtotal</b>					<b>\$ 763,000</b>	
<b>Additional Elements (estimated % of above)</b>						
Mobilization and Administration			10%	\$ 76,000		
Bonding			2.5%	\$ 19,000		
Contractor Overhead and Profit			10%	\$ 76,000		
Prevailing Wages			2.5%	\$ 19,000		
Contingency			30%	\$ 229,000		
<b>Total Construction Subtotal</b>					<b>\$ 1,182,000</b>	
<b>Plans and Contract Documents</b>						
Engineering Design and Bid Phase Services			15%	\$ 177,000		
Engineering - Construction Contract Administration			5%	\$ 59,000		
Engineering -- Inspection			8%	\$ 95,000		
Permitting		LS		\$ 25,000		
Geotechnical Investigation		LS		\$ 24,000		
Surveying		LS		\$ 10,000		
Environmental		LS		\$ 5,000		
Legal, Administrative, and Funding			2.5%	\$ 30,000		
Inflation (10 Years)			2.5%	\$ 331,000		
<b>Total Project Costs (rounded)</b>					<b>\$ 2,000,000</b>	

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Client: City of Silverton  
 Project: Stormwater Master Plan



<b>Project Title: Main Street by Water Treatment Plant (Webb Lake)</b> Project Identifier: 2.2		<b>Location: Main Street</b>				
<u>Need for Project:</u> - The existing pipes along Main Street do not have capacity to convey peak flows from the 25-year design storm. <u>Objective:</u> - Upsize pipes from Main Street to Sweden Circle <u>Design Considerations:</u> - Project generally within private property.						
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)	
<b>Goods and Services</b>						
Demolition and Removal of existing structures	1	LS	\$ 9,000	\$ 9,000		
18-inch Pipe - Excavation, Backfill	600	LF	\$ 185	\$ 111,000		
48-Inch, Standard Manhole	4	EA	\$ 8,000	\$ 32,000		
Soil Surface Repair, Seeding, and Stabilization	600	LF	\$ 5	\$ 3,000		
Rock Excavation (assumes rock depth of 5 ft BGS)	89	CY	\$ 300	\$ 27,000		
<b>Construction Subtotal</b>					<b>\$ 182,000</b>	
<b>Additional Elements (estimated % of above)</b>						
Mobilization and Administration			10%	\$ 18,000		
Bonding			2.5%	\$ 5,000		
Contractor Overhead and Profit			10%	\$ 18,000		
Prevailing Wages			2.5%	\$ 5,000		
Contingency			30%	\$ 55,000		
<b>Total Construction Subtotal</b>					<b>\$ 283,000</b>	
<b>Plans and Contract Documents</b>						
Engineering Design and Bid Phase Services			20%	\$ 57,000		
Engineering - Construction Contract Administration			10%	\$ 28,000		
Engineering -- Inspection			8%	\$ 23,000		
Permitting			LS	\$ -		
Geotechnical Investigation			LS	\$ -		
Surveying			LS	\$ 5,000		
Environmental			LS	\$ -		
Legal, Administrative, and Funding			2.5%	\$ 7,000		
Inflation (10 Years)			2.5%	\$ 79,000		
<b>Total Project Costs (rounded)</b>					<b>\$ 490,000</b>	

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Client: City of Silverton  
 Project: Stormwater Master Plan



<b>Project Title: McClaine Street and Railway Street (West Silver Creek)</b> Project Identifier: 2.3		<b>Location: McClaine Street and Railway Street</b>			
<u>Need for Project:</u> - The existing pipes along McClaine Street do not have capacity to convey peak flows from the 25-year design storm. <u>Objective:</u> - Upsize pipes along McClaine Street <u>Design Considerations:</u> - McClaine Street is within ODOT ROW. - Consider increasing development's detention to reduce peak flows and eliminate need for project.					
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 8,000	\$ 8,000	
15-inch Pipe - Excavation, Backfill	270	LF	\$ 170	\$ 46,000	
48-Inch, Standard Manhole	3	EA	\$ 8,000	\$ 24,000	
ODOT Type G-2, Catch Basin with Connector Pipe	4	EA	\$ 3,500	\$ 14,000	
Asphalt Pavement Roadway Restoration (Half Lane)	270	LF	\$ 55	\$ 15,000	
Lean Concrete Trench Backfill Under ODOT Roadways	270	LF	\$ 165	\$ 45,000	
ADA Ramp Reconstruction (Compliance)	4	EA	\$ 4,600	\$ 19,000	
<b>Construction Subtotal</b>					<b>\$ 171,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 17,000	
Bonding			2.5%	\$ 4,000	
Contractor Overhead and Profit			10%	\$ 17,000	
Prevailing Wages			2.5%	\$ 4,000	
Contingency			30%	\$ 51,000	
<b>Total Construction Subtotal</b>					<b>\$ 264,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			20%	\$ 53,000	
Engineering - Construction Contract Administration			10%	\$ 26,000	
Engineering -- Inspection			8%	\$ 21,000	
Permitting			LS	\$ -	
Geotechnical Investigation			LS	\$ -	
Surveying			LS	\$ 5,000	
Environmental			LS	\$ -	
Legal, Administrative, and Funding			5.0%	\$ 13,000	
Inflation (10 Years)			2.5%	\$ 74,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 460,000</b>

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Client: City of Silverton  
 Project: Stormwater Master Plan



**Project Title: Monson Road (West Silver Creek)**  
 Project Identifier: 2.4

**Location: Monson Road**

Need for Project:

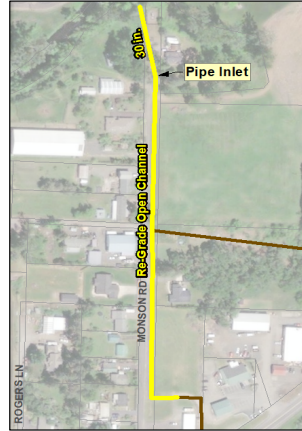
- The existing open channel along Monson Road is graded away from Silver Creek and floods along the roadway.

Objective:

- Re-grade the open channel and line with rip-rap. Upsize the outfall pipe.

Design Considerations:

-Maintain existing ditch dimensions to convey peak flows.  
 -Owned and maintained by Marion County



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 11,000	\$ 11,000	
30-inch Pipe - Excavation, Backfill	220	LF	\$ 230	\$ 51,000	
Outfall Restoration	1	EA	\$ 6,000	\$ 6,000	
Concrete Headwall and Outlet Protection	2	EA	\$ 16,000	\$ 32,000	
Ditch Dredging/Cleanout	1,050	LF	\$ 20	\$ 21,000	
Open Channel Improvement - Rip Rap and Energy Dissipators	1,050	LF	\$ 100	\$ 105,000	
Asphalt Pavement Roadway Restoration (Half Lane)	110	LF	\$ 55	\$ 7,000	
Soil Surface Repair, Seeding, and Stabilization	110	LF	\$ 5	\$ 1,000	
<b>Construction Subtotal</b>					<b>\$ 234,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 23,000	
Bonding			2.5%	\$ 6,000	
Contractor Overhead and Profit			10%	\$ 23,000	
Prevailing Wages			2.5%	\$ 6,000	
Contingency			30%	\$ 70,000	
<b>Total Construction Subtotal</b>					<b>\$ 362,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			15%	\$ 54,000	
Engineering - Construction Contract Administration			5%	\$ 18,000	
Engineering -- Inspection			8%	\$ 29,000	
Permitting			LS	\$ 25,000	
Geotechnical Investigation			LS	\$ 7,000	
Surveying			LS	\$ 10,000	
Environmental			LS	\$ 25,000	
Legal, Administrative, and Funding			5.0%	\$ 18,000	
Inflation (10 Years)			2.5%	\$ 101,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 650,000</b>

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Client: City of Silverton  
 Project: Stormwater Master Plan



<b>Project Title: Silverton High School, Kromminga Drive (Northeast Silver Creek)</b> Project Identifier: 2.5	<b>Location: Silverton High School</b>
<u>Need for Project:</u> - The existing pipes along Kromminga Drive do not have capacity to convey peak flows from the 25-year design storm. <u>Objective:</u> - Upsize existing pipes to convey design storm. <u>Design Considerations:</u> -Not owned or maintained by the City of Silverton.	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 20,000	\$ 20,000	
24-inch Pipe - Excavation, Backfill	470	LF	\$ 205	\$ 97,000	
36-inch Pipe - Excavation, Backfill	460	LF	\$ 245	\$ 113,000	
60-Inch, Standard Manhole	2	EA	\$ 14,000	\$ 28,000	
72-Inch, Standard Manhole	3	EA	\$ 16,500	\$ 50,000	
Concrete Inlet, Standard Side-Inlet with Connector Pipe	4	EA	\$ 3,200	\$ 13,000	
Concrete Headwall and Outlet Protection	1	EA	\$ 16,000	\$ 16,000	
Asphalt Pavement Roadway Restoration (Full Lane)	450	LF	\$ 110	\$ 50,000	
Soil Surface Repair, Seeding, and Stabilization	480	LF	\$ 5	\$ 3,000	
Rock Excavation (assumes rock depth of 5 ft BGS)	34	CY	\$ 300	\$ 11,000	
Traffic Control - Without Flagging	1	LS	\$ 28,000	\$ 28,000	
<b>Construction Subtotal</b>					<b>\$ 429,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 43,000	
Bonding			2.5%	\$ 11,000	
Contractor Overhead and Profit			10%	\$ 43,000	
Prevailing Wages			2.5%	\$ 11,000	
Contingency			30%	\$ 129,000	
<b>Total Construction Subtotal</b>					<b>\$ 666,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			15%	\$ 100,000	
Engineering - Construction Contract Administration			5%	\$ 33,000	
Engineering -- Inspection			8%	\$ 53,000	
Permitting			LS	\$ 5,000	
Geotechnical Investigation			LS	\$ 13,000	
Surveying			LS	\$ 15,000	
Environmental			LS	\$ 5,000	
Legal, Administrative, and Funding			3%	\$ 17,000	
Inflation (10 Years)			2.5%	\$ 187,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 1,100,000</b>

The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.



**Client: City of Silverton**  
**Project: Stormwater Master Plan**

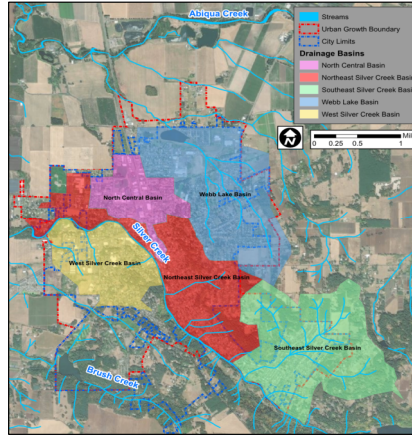


**Project Title: Stormwater Master Plan Update**  
**Project Identifier: 2.6**

**Location: Whole System**

Need for Project:  
 - Recommended to update stormwater master plan every 5-10 years

Objective:  
 - Re-assess needs, priorities, and properly allocate budgets to address system deficiencies.



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Stormwater Master Plan Update	1	LS	\$ 200,000	\$ 200,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 200,000</b>

*The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.*

Client: City of Silverton  
 Project: Stormwater Master Plan



Project Title: Mill Street (Webb Lake)		Location: Mill Street			
Project Identifier: 3.1					
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 4,000	\$ 4,000	
18-inch Pipe - Excavation, Backfill	90	LF	\$ 185	\$ 17,000	
48-inch, Standard Manhole	2	EA	\$ 8,000	\$ 16,000	
Asphalt Pavement Roadway Restoration (Half Lane)	30	LF	\$ 55	\$ 2,000	
Railroad Boring	60	LF	\$ 900	\$ 54,000	
<b>Construction Subtotal</b>					<b>\$ 93,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 9,000	
Bonding			2.5%	\$ 2,000	
Contractor Overhead and Profit			10%	\$ 9,000	
Prevailing Wages			2.5%	\$ 2,000	
Contingency			30%	\$ 28,000	
<b>Total Construction Subtotal</b>					<b>\$ 143,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			30%	\$ 43,000	
Engineering - Construction Contract Administration			15%	\$ 21,000	
Engineering -- Inspection			8%	\$ 11,000	
Permitting			LS	\$ 25,000	
Geotechnical Investigation			LS	\$ 7,000	
Surveying			LS	\$ 2,000	
Environmental			LS	\$ -	
Legal, Administrative, and Funding			5.0%	\$ 7,000	
Inflation (20 Years)			2.5%	\$ 91,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 350,000</b>
Project Title: 1st Street Detention Pond (North Central)		Location: 1st Street and Park Street			
Project Identifier: 3.2					
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 34,000	\$ 34,000	
21-inch Pipe - Excavation, Backfill	600	LF	\$ 195	\$ 117,000	
60-inch, Standard Manhole	3	EA	\$ 14,000	\$ 42,000	
Flow Control Manhole	1	EA	\$ 15,000	\$ 15,000	
ODOT Type G-2, Catch Basin with Connector Pipe	10	EA	\$ 3,500	\$ 35,000	
Concrete Outlet Flow Control Structure	1	EA	\$ 15,000	\$ 15,000	
Concrete Headwall and Outlet Protection	1	EA	\$ 16,000	\$ 16,000	
Detention Pond Excavation, removal, and grading	4,800	CY	\$ 30	\$ 144,000	
Hydroseeding, Planting, and Other Restoration Features	1	AC	\$ 5,000	\$ 5,000	
Water Quality Planing and Seeding	1	AC	\$ 45,000	\$ 45,000	
Asphalt Pavement Roadway Restoration (Half Lane)	600	LF	\$ 55	\$ 33,000	
Lean Concrete Trench Backfill Under ODOT Roadways	600	LF	\$ 165	\$ 99,000	
ADA Ramp Reconstruction (Compliance)	24	EA	\$ 4,600	\$ 111,000	
<b>Construction Subtotal</b>					<b>\$ 434,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 43,000	
Bonding			2.5%	\$ 11,000	
Contractor Overhead and Profit			10%	\$ 43,000	
Prevailing Wages			2.5%	\$ 11,000	
Contingency			30%	\$ 130,000	
<b>Total Construction Subtotal</b>					<b>\$ 672,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			20%	\$ 134,000	
Engineering - Construction Contract Administration			10%	\$ 67,000	
Engineering -- Inspection			8%	\$ 54,000	
Permitting			LS	\$ 25,000	
Geotechnical Investigation			LS	\$ 13,000	
Surveying			LS	\$ 10,000	
Environmental			LS	\$ 25,000	
Legal, Administrative, and Funding			5.0%	\$ 34,000	
Inflation (20 Years)			2.5%	\$ 429,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 1,500,000</b>

Client: City of Silverton  
 Project: Stormwater Master Plan



Project Title: Between Silverton Road NE and Railway Street (West Silver Creek)		Location: Silverton Road NE and Railway Street			
Project Identifier: 3.3					
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Demolition and Removal of existing structures	1	LS	\$ 12,000	\$ 12,000	
24-inch Culvert - Excavation, Backfill	190	LF	\$ 170	\$ 33,000	
Concrete Headwall and Outlet Protection	4	EA	\$ 16,000	\$ 64,000	
Highway Boring (<24-inch pipe)	140	LF	\$ 900	\$ 126,000	
Soil Surface Repair, Seeding, and Stabilization	50	LF	\$ 5	\$ 1,000	
Ditch Dredging/Cleanout	500	LF	\$ 20	\$ 10,000	
<b>Construction Subtotal</b>					<b>\$ 246,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 25,000	
Bonding			2.5%	\$ 6,000	
Contractor Overhead and Profit			10%	\$ 25,000	
Prevailing Wages			2.5%	\$ 6,000	
Contingency			30%	\$ 74,000	
<b>Total Construction Subtotal</b>					<b>\$ 382,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			15%	\$ 57,000	
Engineering - Construction Contract Administration			5%	\$ 19,000	
Engineering -- Inspection			8%	\$ 31,000	
Permitting			LS	\$ 10,000	
Geotechnical Investigation			LS	\$ 8,000	
Surveying			LS	\$ 5,000	
Environmental			LS	\$ 10,000	
Legal, Administrative, and Funding			5.0%	\$ 19,000	
Inflation (20 Years)			2.5%	\$ 244,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 790,000</b>
Project Title: Webb Lake Local Street Improvements (Webb Lake)		Location: Lincoln, Jefferson, Washington, Chester, and Whittier Street			
Project Identifier: 3.4					
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
12-inch Pipe - Excavation, Backfill	5,500	LF	\$ 160	\$ 880,000	
48-Inch, Standard Manhole	15	EA	\$ 8,000	\$ 120,000	
Concrete Inlet, Standard Side Inlet	45	EA	\$ 2,100	\$ 95,000	
Asphalt Pavement Roadway Restoration (Full Lane)	5,500	LF	\$ 110	\$ 605,000	
Rock Excavation (assumes rock depth of 5 ft BGS)	713	CY	\$ 300	\$ 214,000	
Traffic Control - Without Flagging	1	LS	\$ 62,000	\$ 62,000	
		0	\$ -	\$ -	
<b>Construction Subtotal</b>					<b>\$ 1,976,000</b>
<b>Additional Elements (estimated % of above)</b>					
Mobilization and Administration			10%	\$ 198,000	
Bonding			2.5%	\$ 49,000	
Contractor Overhead and Profit			10%	\$ 198,000	
Prevailing Wages			2.5%	\$ 49,000	
Contingency			30%	\$ 593,000	
<b>Total Construction Subtotal</b>					<b>\$ 3,063,000</b>
<b>Plans and Contract Documents</b>					
Engineering Design and Bid Phase Services			10%	\$ 306,000	
Engineering - Construction Contract Administration			3%	\$ 92,000	
Engineering -- Inspection			8%	\$ 245,000	
Permitting			LS	\$ 5,000	
Geotechnical Investigation			LS	\$ 10,000	
Surveying			LS	\$ 50,000	
Environmental			LS	\$ 10,000	
Legal, Administrative, and Funding			5.0%	\$ 153,000	
Inflation (20 Years)			2.5%	\$ 1,956,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 5,900,000</b>
Project Title: Stormwater Master Plan Update #2		Location: Whole System			
Project Identifier: 3.5					
General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
<b>Goods and Services</b>					
Stormwater Master Plan Update (assumes 2.5% inflation for 20 years)	1	LS	\$ 330,000	\$ 330,000	
<b>Total Project Costs (rounded)</b>					<b>\$ 330,000</b>



# *APPENDIX E*

*Model Parameters*



Client: City of Silverton  
 Project: Stormwater Master Plan  
 Project No.: 215004-025

Subcatchment Parameters and 25-Year Storm Event Results

Subbasin ID	Load Placement ID	Area (acres)	Time of Concentration (min)	NRCS Curve Number	25-Year Storm Event		
					Total Precipitation (in)	Total Runoff Depth (in)	Peak Runoff (gpm)
BASIN_01	KJ-44	12.1	50	87.0	4.0	2.6	2,720
BASIN_02	BASIN-02	11.1	30	80.0	4.0	2.0	2,191
BASIN_03	BASIN-03	6.8	21	89.4	4.0	2.8	2,395
BASIN_04	BASIN-04	16.9	24	93.0	4.0	3.2	6,387
BASIN_05	BASIN-05	2.6	20	86.2	4.0	2.5	809
BASIN_06	BASIN-06	4.5	10	90.8	4.0	3.0	2,180
BASIN_07	BASIN-07	5.2	14	88.9	4.0	2.8	2,088
BASIN_08	BASIN-08	23.6	51	85.0	4.0	2.4	4,837
BASIN_09	BASIN-09	12.4	48	83.0	4.0	2.2	2,364
BASIN_10	BASIN-10	18.0	50	80.0	4.0	2.0	2,899
BASIN_100	KJ-74	8.7	10	90.9	4.0	3.0	4,241
BASIN_101	KJ-100	1.4	10	86.8	4.0	2.6	575
BASIN_11	BASIN-11	10.2	25	84.0	4.0	2.3	2,648
BASIN_12	NODE904	10.5	47	80.0	4.0	2.0	1,737
BASIN_13	BASIN-13	4.5	27	78.0	4.0	1.9	840
BASIN_14	BASIN-14	56.3	100	83.0	4.0	2.2	7,899
BASIN_15	BASIN-15	15.1	85	85.0	4.0	2.4	2,497
BASIN_16	BASIN-16	36.1	56	88.0	4.0	2.7	8,114
BASIN_17	BASIN-17	25.7	25	88.0	4.0	2.7	7,977
BASIN_18	BASIN-18	12.3	25	77.0	4.0	1.8	2,211
BASIN_19	BASIN-19	14.7	33	80.0	4.0	2.0	2,803
BASIN_20	BASIN-20	19.6	26	87.0	4.0	2.6	5,759
BASIN_21	BASIN-21	17.4	20	83.0	4.0	2.3	4,714
BASIN_22	BASIN-22	112.2	60	76.0	4.0	1.7	13,300
BASIN_23	KJ-208	23.4	44	77.0	4.0	1.8	3,347
BASIN_23A	KJ-222	5.8	10	85.0	4.0	2.4	2,223
BASIN_23B	KJ-184	3.4	10	88.0	4.0	2.7	1,494
BASIN_23C	KJ-190	6.4	10	88.0	4.0	2.7	2,782
BASIN_24	KJ-306	11.2	13	87.8	4.0	2.8	4,747
BASIN_24A	NODE1489	40.0	37	84.8	4.0	2.5	9,964
BASIN_24B	KJ-300	4.3	23	87.8	4.0	2.8	1,469
BASIN_24C	NODE1487	37.6	37	84.8	4.0	2.5	9,370
BASIN_25	BASIN-25	29.8	11	90.9	4.0	3.0	14,055
BASIN_25A	14-15A	10.6	44	86.4	4.0	2.5	2,464
BASIN_25B	13-22	10.1	11	90.9	4.0	3.0	4,777
BASIN_26	BASIN-26	22.0	35	88.7	4.0	2.7	6,146
BASIN_27	BASIN-27	22.1	18	92.1	4.0	3.1	9,097
BASIN_28	BASIN-28	12.6	46	90.5	4.0	2.9	3,391
BASIN_29	BASIN-29	15.9	31	96.7	4.0	3.6	5,987
BASIN_30.1	BASIN-30.1	10.6	18	96.7	4.0	3.6	4,912
BASIN_30.2	BASIN-30.2	11.0	18	96.7	4.0	3.6	5,125
BASIN_31	BASIN-31	22.3	35	90.6	4.0	2.9	6,696
BASIN_31A	BASIN-31	12.4	35	90.6	4.0	2.9	3,733
BASIN_32	BASIN-32	23.5	20	85.0	4.0	2.4	7,008
BASIN_33	BASIN-33	21.2	57	87.3	4.0	2.6	4,592
BASIN_34	BASIN-34	7.7	10	96.5	4.0	3.6	4,415
BASIN_34A	NODE1501	21.8	57	94.6	4.0	3.3	6,132
BASIN_35	BASIN-35	4.1	37	98.0	4.0	3.7	1,463
BASIN_36	BASIN-36	10.7	32	90.5	4.0	2.9	3,334
BASIN_37	BASIN-37	14.7	37	91.5	4.0	3.0	4,459
BASIN_38	BASIN-38	13.0	15	90.9	4.0	3.0	5,466
BASIN_39	BASIN-39	5.3	35	95.0	4.0	3.4	1,848
BASIN_40	BASIN-40	6.7	10	95.0	4.0	3.4	3,721

Client: City of Silverton  
 Project: Stormwater Master Plan  
 Project No.: 215004-025

Subcatchment Parameters and 25-Year Storm Event Results

Subbasin ID	Load Placement ID	Area (acres)	Time of Concentration (min)	NRCS Curve Number	25-Year Storm Event		
					Total Precipitation (in)	Total Runoff Depth (in)	Peak Runoff (gpm)
BASIN_41	BASIN-41	8.1	30	85.0	4.0	2.4	2,068
BASIN_42	BASIN-42	13.8	35	90.0	4.0	2.9	4,062
BASIN_43	BASIN-43	3.8	10	79.0	4.0	1.9	1,089
BASIN_44	BASIN-44	26.0	59	84.0	4.0	2.3	4,790
BASIN_45	BASIN-45	7.8	41	68.8	4.0	1.2	631
BASIN_46	BASIN-46	7.7	21	85.0	4.0	2.4	2,248
BASIN_47	BASIN-47	35.4	56	79.0	4.0	1.9	5,146
BASIN_48	BASIN-48	13.6	20	91.4	4.0	3.0	5,252
BASIN_49	BASIN-49	41.6	81	78.0	4.0	1.8	4,894
BASIN_49A	24-41	1.8	10	73.9	4.0	1.6	380
BASIN_49C	KJ-110	4.2	81	78.0	4.0	1.8	500
BASIN_50	BASIN-50	10.3	18	87.6	4.0	2.7	3,572
BASIN_51	BASIN-51	11.7	18	85.7	4.0	2.5	3,746
BASIN_52	BASIN-52	17.3	20	85.7	4.0	2.5	5,316
BASIN_53	BASIN-53	75.3	30	81.9	4.0	2.2	16,495
BASIN_54	BASIN-54	12.1	14	81.0	4.0	2.1	3,381
BASIN_54A	BASIN-54	8.6	14	81.0	4.0	2.1	2,409
BASIN_55	BASIN-55	35.8	30	81.0	4.0	2.1	7,480
BASIN_55A	18-20	19.0	30	81.0	4.0	2.1	3,970
BASIN_56	BASIN-56	17.5	18	85.1	4.0	2.4	5,451
BASIN_57	BASIN-57	32.1	76	82.6	4.0	2.2	4,966
BASIN_58	BASIN-58	14.8	15	90.3	4.0	2.9	6,086
BASIN_59	BASIN-59	25.1	20	78.0	4.0	1.9	5,210
BASIN_60	24-19	39.2	41	77.0	4.0	1.8	5,781
BASIN_60A	BASIN-60	4.5	41	77.0	4.0	1.8	663
BASIN_61	BASIN-61	18.1	25	75.0	4.0	1.6	2,862
BASIN_62	BASIN-62	37.8	39	76.0	4.0	1.7	5,345
BASIN_63	BASIN-63	21.9	25	81.0	4.0	2.1	4,911
BASIN_64	BASIN-64	10.1	30	71.0	4.0	1.4	1,122
BASIN_65	BASIN-65	12.9	26	79.0	4.0	1.9	2,557
BASIN_66	BASIN-66	26.1	25	85.1	4.0	2.4	7,145
BASIN_67	BASIN-67	119.5	41	79.3	4.0	1.9	20,115
BASIN_68	BASIN-68	16.8	46	80.9	4.0	2.1	2,932
BASIN_69	BASIN-69	3.8	33	79.0	4.0	1.9	678
BASIN_70	BASIN-70	29.4	25	70.0	4.0	1.3	3,219
BASIN_71	BASIN-71	6.5	41	91.9	4.0	3.1	1,912
BASIN_72	BASIN-72	7.5	30	87.3	4.0	2.6	2,118
BASIN_72A	KJ-80	16.5	40	75.0	4.0	1.6	2,165
BASIN_73	KJ-64	77.2	58	70.0	4.0	1.3	6,042
BASIN_73A	KJ-88	43.8	57	75.0	4.0	1.6	4,977
BASIN_74	KJ-102	156.4	54	70.0	4.0	1.3	12,597
BASIN_75	BASIN-75	83.7	46	80.5	4.0	2.0	14,338
BASIN_76	BASIN-76	14.8	16	66.3	4.0	1.1	1,354
BASIN_77	BASIN-77	8.5	48	83.0	4.0	2.2	1,633
BASIN_78	BASIN-78	7.4	20	86.0	4.0	2.5	2,314
BASIN_79	BASIN-79	34.3	51	78.0	4.0	1.8	4,902
BASIN_80	BASIN-80	11.6	43	87.4	4.0	2.6	2,841
BASIN_81	Dec-90	0.7	10	94.8	4.0	3.4	385
BASIN_82	BASIN-82	37.1	20	87.0	4.0	2.6	12,061
BASIN_83	BASIN-83	1.8	10	96.0	4.0	3.5	1,022
BASIN_84	BASIN-84	10.8	36	87.0	4.0	2.6	2,783
BASIN_85	BASIN-85	67.4	60	79.0	4.0	1.9	9,527
BASIN_86	BASIN-86	24.1	39	80.0	4.0	2.0	4,300



Client: City of Silverton  
 Project: Stormwater Master Plan  
 Project No.: 215004-025

**Subcatchment Parameters and 25-Year Storm Event Results**

					25-Year Storm Event		
Subbasin ID	Load Placement ID	Area (acres)	Time of Concentration (min)	NRCS Curve Number	Total Precipitation (in)	Total Runoff Depth (in)	Peak Runoff (gpm)
BASIN_87	BASIN-87	7.4	25	85.2	4.0	2.4	2,012
BASIN_88	BASIN-88	25.5	30	88.4	4.0	2.7	7,485
BASIN_89	STOR_12	11.4	10	94.0	4.0	3.3	6,125
BASIN_90	12-134	7.6	23	88.0	4.0	2.7	2,446
BASIN_90A	BASIN-90	1.4	5	88.0	4.0	2.7	744
BASIN_90B	16-111	3.4	23	88.0	4.0	2.7	1,084
BASIN_91	BASIN-91	2.3	10	97.0	4.0	3.6	1,320
BASIN_92	BASIN-92	31.5	32	84.0	4.0	2.3	7,449
BASIN_93	BASIN-93	18.9	36	89.8	4.0	2.8	5,470
BASIN_94	BASIN-94	13.9	27	87.0	4.0	2.6	4,008

Client: City of Silverton  
 Project: Stormwater Master Plan  
 Project No.: 215004-025

**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
11-34	226.42	213.37	3.35	9.71	0.000	0.00
11-35	226.00	212.50	2.90	10.60	0.000	0.00
11-40	226.00	212.34	2.89	10.77	0.000	0.00
11-41	226.90	212.04	3.53	11.34	0.000	0.00
11-5	223.39	216.60	3.16	3.63	0.000	0.00
11-6	226.00	215.34	3.01	7.65	0.000	0.00
11-88	210.57	194.58	15.99	0.00	0.000	0.00
11-89	209.76	194.12	15.64	0.00	0.000	0.00
11-90	209.30	193.89	14.03	1.38	0.000	0.00
11-91	208.05	193.34	11.70	3.00	0.000	0.00
11-96	214.00	211.00	3.57	-0.57	0.443	16.14
12-12	224.00	216.75	7.25	0.00	0.001	0.00
12-134	227.06	224.50	2.58	-0.02	0.013	0.62
12-135	229.17	226.34	2.58	0.25	0.000	0.00
12-16	224.00	218.00	6.00	0.00	0.001	0.01
12-17	227.94	220.23	5.82	1.89	0.000	0.00
12-18	224.54	220.54	4.30	-0.30	0.246	3.63
12-19	230.00	225.67	0.73	3.60	0.000	0.00
12-193	237.31	230.68	6.63	0.00	0.001	0.00
12-196	240.00	231.97	2.67	5.36	0.000	0.00
12-20	232.00	227.85	0.50	3.65	0.000	0.00
12-232	240.00	232.83	3.10	4.07	0.000	0.00
12-234	240.00	233.54	2.82	3.64	0.000	0.00
12-237	240.00	234.14	2.89	2.97	0.000	0.00
12-238	241.82	235.17	3.22	3.43	0.000	0.00
12-274	237.44	229.80	7.69	-0.05	0.041	0.91
12-279	236.93	229.56	7.29	0.07	0.000	0.00
12-282	236.60	229.42	7.18	0.00	0.000	0.00
12-288	234.40	228.34	6.06	0.00	0.000	0.00
12-294	232.91	226.66	6.25	0.00	0.000	0.00
12-295	232.00	226.39	5.61	0.00	0.000	0.00
12-328	240.00	232.40	2.95	4.65	0.000	0.00
12-71	232.44	228.70	0.75	2.99	0.000	0.00
12-72	230.80	226.30	0.65	3.85	0.000	0.00

Client: City of Silverton  
 Project: Stormwater Master Plan  
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**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
12-74	231.46	224.05	0.79	6.62	0.000	0.00
12-76	232.81	228.44	0.69	3.69	0.000	0.00
12-87	232.00	226.14	5.12	0.74	0.000	0.00
12-88	232.00	224.12	4.86	3.02	0.000	0.00
12-89	230.96	223.18	4.48	3.30	0.000	0.00
12-90	230.27	222.40	3.91	3.96	0.000	0.00
12-91	233.18	229.82	0.67	2.69	0.000	0.00
12-93	234.80	229.51	0.56	4.73	0.000	0.00
13-1	235.39	230.17	2.19	3.03	0.000	0.00
13-10	244.00	238.18	4.97	0.85	0.000	0.00
13-13	246.75	243.00	3.75	0.00	0.004	0.45
13-14	248.30	244.20	4.14	-0.04	0.027	1.77
13-16	251.20	247.70	4.00	-0.50	0.377	16.81
13-19	255.57	249.10	4.86	1.61	0.000	0.00
13-20	254.41	250.70	3.71	0.00	0.000	0.05
13-21	321.84	314.44	4.99	2.41	0.000	0.00
13-22	316.02	309.00	6.10	0.92	0.000	0.00
13-23	311.33	306.10	5.90	-0.67	0.500	7.32
13-24	310.48	308.00	0.82	1.66	0.000	0.00
13-25	311.00	309.37	0.69	1.11	0.000	0.00
13-5	239.99	233.69	6.30	0.00	0.000	0.02
13-6	243.50	237.40	6.10	0.00	0.000	0.00
13-7	249.00	243.20	5.80	0.00	0.000	0.00
13-8	251.80	247.50	4.30	0.00	0.000	0.00
14-14	395.25	385.30	7.21	2.74	0.000	0.00
14-15	352.81	346.37	0.67	5.77	0.000	0.00
14-15A	392.09	384.30	7.79	0.00	0.000	0.00
14-15A.1	368.60	361.33	6.28	0.99	0.000	0.00
14-15A.2	378.10	370.33	7.77	0.00	0.003	2.74
14-23	308.24	304.80	0.82	2.62	0.000	0.00
14-27	305.00	302.57	0.50	2.30	0.000	0.00
14-29	310.41	307.50	0.67	2.24	0.000	0.00
14-31	305.06	299.90	1.11	4.05	0.000	0.00
1465~COPY	235.74	226.89	4.40	4.45	0.000	0.00



Client: City of Silverton  
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**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
16-110	227.89	222.62	4.61	0.66	0.000	0.00
16-111	228.00	223.99	2.81	1.20	0.000	0.00
16-119	220.68	215.68	2.54	2.46	0.000	0.00
16-128	226.81	222.18	4.36	0.26	0.000	0.00
16-131	226.00	222.55	3.45	0.00	0.000	0.00
16-79	222.00	217.50	1.28	3.22	0.000	0.00
17-116	326.87	321.60	0.94	4.33	0.000	0.00
17-117	335.38	327.90	3.25	4.24	0.000	0.00
17-131	331.08	325.40	1.18	4.50	0.000	0.00
17-132	339.74	334.00	0.97	4.77	0.000	0.00
17-134	234.64	227.54	0.00	7.10	0.000	0.00
17-135	233.14	227.97	0.00	5.17	0.000	0.00
17-138	232.25	224.93	0.00	7.32	0.000	0.00
17-18	316.64	313.40	0.77	2.47	0.000	0.00
17-35	343.90	338.50	2.88	2.52	0.000	0.00
17-74	235.36	231.01	4.03	0.32	0.000	0.00
17-76	280.72	276.54	0.91	3.27	0.000	0.00
17-78	286.95	281.54	1.08	4.33	0.000	0.00
17-92	252.94	248.51	0.87	3.56	0.000	0.00
17-93	248.10	244.11	0.87	3.12	0.000	0.00
18-1	250.59	245.40	3.66	1.53	0.000	0.00
18-13	271.73	265.10	6.63	0.00	0.000	0.04
18-14	270.11	263.60	6.51	0.00	0.000	0.00
18-15	272.00	262.60	0.73	8.67	0.000	0.00
18-17	350.62	333.88	0.74	15.99	0.000	0.00
18-18	291.05	281.99	0.93	8.13	0.000	0.00
18-19	276.84	269.88	7.43	-0.47	0.354	6.70
18-2	250.22	244.50	4.05	1.67	0.000	0.00
18-20	275.25	267.33	7.95	-0.03	0.019	1.21
18-21	275.44	263.83	8.51	3.10	0.000	0.00
18-22	276.00	263.27	8.16	4.57	0.000	0.00
18-23	274.00	262.60	5.03	6.37	0.000	0.00
19-1	424.41	414.21	6.57	3.63	0.000	0.00
19-2	419.31	406.61	0.70	12.01	0.000	0.00

Client: City of Silverton  
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**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
19-4	382.71	371.81	1.07	9.84	0.000	0.00
19-5	366.87	359.99	0.79	6.09	0.000	0.00
2-1	226.00	219.28	1.16	5.56	0.000	0.00
2-11	238.34	219.92	1.30	17.12	0.000	0.00
2-12	221.43	216.22	1.21	4.01	0.000	0.00
2-13	225.70	219.28	0.36	6.06	0.000	0.00
2-14	227.30	219.51	1.06	6.73	0.000	0.00
2-15	232.37	224.15	1.01	7.21	0.000	0.00
2-16	237.63	229.08	1.03	7.51	0.000	0.00
2-17	239.30	235.08	0.96	3.26	0.000	0.00
2177	373.50	371.40	0.63	1.47	0.000	0.00
2180	360.97	356.80	0.44	3.73	0.000	0.00
2182	403.34	391.44	9.18	2.72	0.000	0.00
2186	294.14	292.20	0.85	1.09	0.000	0.00
2-2	226.00	219.04	1.34	5.62	0.000	0.00
2-20	243.06	237.46	1.33	4.26	0.000	0.00
22-1	302.07	298.10	0.92	3.05	0.000	0.00
22-2	298.44	294.10	0.72	3.62	0.000	0.00
23-21	278.00	266.69	7.20	4.11	0.000	0.00
23-24	278.90	269.30	7.67	1.93	0.000	0.00
23-25	279.29	269.45	7.80	2.04	0.000	0.00
23-31	282.00	270.29	9.12	2.59	0.000	0.00
23-32	281.29	270.19	8.95	2.15	0.000	0.00
23-40	286.00	279.57	2.07	4.36	0.000	0.00
23-41	285.31	278.75	1.60	4.96	0.000	0.00
23-42	284.38	277.31	0.92	6.15	0.000	0.00
23-48	290.07	282.68	1.40	5.99	0.000	0.00
2-38	242.23	235.08	2.23	4.92	0.000	0.00
2-39	243.18	234.89	2.40	5.89	0.000	0.00
24-16	291.14	287.50	1.33	2.31	0.000	0.00
24-17	290.00	284.61	0.84	4.55	0.000	0.00
24-19	290.93	287.40	2.47	1.06	0.000	0.00
24-34	297.46	290.11	1.19	6.16	0.000	0.00
24-36	296.69	289.75	1.53	5.41	0.000	0.00

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**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
24-41	300.10	295.30	0.96	3.84	0.000	0.00
24-50	309.84	298.24	1.02	10.58	0.000	0.00
24-51	310.89	303.01	0.76	7.12	0.000	0.00
24-52	311.35	303.80	1.04	6.51	0.000	0.00
24-56	312.48	305.64	0.95	5.88	0.000	0.00
24-58	314.69	305.97	1.08	7.64	0.000	0.00
25-110	338.37	332.10	3.99	2.27	0.000	0.00
25-111	338.41	331.76	2.61	4.04	0.000	0.00
25-122	350.00	344.95	3.15	1.90	0.000	0.00
25-123	346.05	339.35	4.04	2.66	0.000	0.00
25-124	345.27	338.57	2.60	4.10	0.000	0.00
25-13	380.82	373.54	0.73	6.55	0.000	0.00
25-131	350.00	343.41	2.81	3.78	0.000	0.00
25-135	358.64	348.66	1.58	8.40	0.000	0.00
25-15	375.02	368.51	0.72	5.80	0.000	0.00
25-17	366.00	358.68	1.34	5.98	0.000	0.00
25-180	360.94	356.91	1.57	2.46	0.000	0.00
25-19	362.00	357.24	1.48	3.28	0.000	0.00
25-2	432.73	427.13	0.21	5.39	0.000	0.00
2-52	224.30	221.80	1.33	1.17	0.000	0.00
25-20	360.94	356.82	1.65	2.47	0.000	0.00
25-26	377.43	374.41	1.08	1.94	0.000	0.00
25-27	378.71	373.48	1.09	4.14	0.000	0.00
25-3	427.25	421.50	0.22	5.53	0.000	0.00
2-53	224.50	221.53	1.02	1.95	0.000	0.00
25-32	376.66	372.84	0.68	3.14	0.000	0.00
25-35	369.12	365.09	0.55	3.48	0.000	0.00
25-4	400.66	396.54	0.24	3.88	0.000	0.00
25-42	364.23	354.47	3.87	5.89	0.000	0.00
25-45	359.33	355.58	2.87	0.88	0.000	0.00
25-47	359.13	354.33	0.98	3.81	0.000	0.00
25-54	354.00	348.27	1.94	3.79	0.000	0.00
25-57	353.32	347.38	2.07	3.87	0.000	0.00
25-60	351.24	346.18	2.22	2.83	0.000	0.00



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**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
25-64	364.81	356.43	1.23	7.15	0.000	0.00
25-70	361.75	354.35	1.42	5.98	0.000	0.00
25-72	356.44	352.42	2.54	1.48	0.000	0.00
25-73	358.33	353.08	2.43	2.82	0.000	0.00
25-75	356.78	351.72	2.53	2.53	0.000	0.00
25-77	356.70	351.21	2.49	2.99	0.000	0.00
25-79	354.00	350.32	1.60	2.08	0.000	0.00
25-83	350.36	343.15	1.48	5.73	0.000	0.00
25-83_DUMMY	350.36	343.30	2.92	4.14	0.000	0.00
25-84	350.00	342.23	1.25	6.52	0.000	0.00
25-87	344.00	336.21	1.28	6.51	0.000	0.00
25-9	382.16	378.06	1.24	2.86	0.000	0.00
25-90	343.09	335.01	1.12	6.96	0.000	0.00
25-91	338.26	329.01	1.54	7.70	0.000	0.00
25-96	336.00	327.16	1.21	7.63	0.000	0.00
2-7	226.00	218.47	0.77	6.76	0.000	0.00
30-11	315.16	310.40	1.13	3.63	0.000	0.00
30-12	315.16	310.71	1.62	2.83	0.000	0.00
30-2	311.44	305.22	5.02	1.20	0.000	0.00
30-32	319.36	314.91	2.47	1.98	0.000	0.00
30-42	320.00	316.91	1.01	2.08	0.000	0.00
30-43	319.70	316.34	0.58	2.78	0.000	0.00
30-44	319.56	313.97	2.39	3.19	0.000	0.00
30-45	319.89	313.34	1.30	5.25	0.000	0.00
30-5	312.00	306.64	4.09	1.27	0.000	0.00
30-6	312.37	307.49	3.46	1.42	0.000	0.00
30-69	310.50	307.91	1.80	0.79	0.000	0.00
30-7	313.11	308.59	2.69	1.83	0.000	0.00
30-8	312.83	309.54	1.96	1.33	0.000	0.00
31-11	330.39	323.54	4.68	2.17	0.000	0.00
31-111	329.73	317.32	5.43	6.98	0.000	0.00
31-112	326.13	316.44	8.74	0.94	0.000	0.00
31-123	330.00	314.69	14.53	0.78	0.000	0.00
31-139	330.00	313.71	13.88	2.41	0.000	0.00

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**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
31-141	332.00	312.74	19.26	0.00	0.001	0.00
31-16	331.94	319.72	3.79	8.43	0.000	0.00
31-17	332.13	319.61	3.90	8.62	0.000	0.00
31-3	322.86	315.79	2.48	4.59	0.000	0.00
31-86	326.28	320.09	3.71	2.48	0.000	0.00
400-11	222.00	219.35	6.92	-2.12	1.594	16.08
400-18	225.55	222.38	1.31	1.86	0.000	0.00
400-19	228.00	222.08	0.43	5.49	0.000	0.00
400-20	218.00	214.03	3.23	0.77	0.000	0.00
400-21	218.93	213.93	1.39	3.61	0.000	0.00
400-24	215.01	212.50	2.13	0.38	0.000	0.00
400-25	214.86	212.30	2.32	0.24	0.000	0.00
400-26	214.88	212.38	2.59	-0.09	0.068	3.49
400-27	214.63	212.13	2.54	-0.04	0.570	8.50
400-28	221.79	217.70	0.95	3.13	0.000	0.00
400-30	221.78	217.50	1.03	3.25	0.000	0.00
400-31	221.73	217.30	0.57	3.86	0.000	0.00
400-33	221.96	217.78	2.94	1.24	0.000	0.00
400-34	225.28	220.63	4.65	0.00	0.000	0.00
400-35	224.69	220.43	2.42	1.84	0.000	0.00
400-38	221.59	215.59	1.12	4.88	0.000	0.00
400-39	220.00	215.38	0.55	4.07	0.000	0.00
400-40	220.40	215.40	2.82	2.18	0.000	0.00
400-41	222.61	216.61	0.28	5.72	0.000	0.00
400-42	226.00	221.95	4.05	0.00	0.000	0.00
400-43	226.34	221.04	5.08	0.22	0.000	0.00
400-46	279.68	275.58	0.93	3.17	0.000	0.00
400-56	225.83	220.25	5.13	0.45	0.000	0.00
400-57	226.36	220.72	5.40	0.24	0.000	0.00
400-59	220.00	217.30	2.37	0.33	0.000	0.00
400-60	220.00	217.20	0.37	2.43	0.000	0.00
400-61	220.72	216.90	3.36	0.46	0.000	0.00
400-62	219.00	215.90	2.84	0.26	0.000	0.00
400-8	217.00	215.00	1.95	0.05	0.000	0.00

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**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
400-9	217.00	214.90	1.21	0.89	0.000	0.00
44-30	305.63	300.20	1.26	4.17	0.000	0.00
500-1	216.00	213.50	1.91	0.59	0.000	0.00
500-11	248.10	244.10	2.83	1.17	0.000	0.00
500-12	241.01	236.51	3.33	1.17	0.000	0.00
500-14	240.51	236.34	3.50	0.67	0.000	0.00
500-18	228.08	224.33	1.12	2.62	0.000	0.00
500-19	220.00	215.60	1.18	3.22	0.000	0.00
500-2	217.00	214.00	2.88	0.12	0.000	0.00
500-7	214.20	211.70	2.92	-0.42	0.364	15.62
500-8	218.75	215.75	3.00	0.00	0.003	0.56
500-9	250.10	248.60	1.00	1.00	0.000	0.00
5-100	225.95	221.70	4.25	0.00	0.000	0.00
5-13	226.57	221.59	4.98	0.00	0.000	0.00
5-132	227.30	221.56	4.46	1.28	0.000	0.00
5-138	223.60	219.56	4.04	0.00	0.000	0.00
5-144	223.35	218.76	3.13	1.46	0.000	0.00
5-151	224.00	218.09	3.62	2.29	0.000	0.00
5-57	224.11	219.98	3.01	1.12	0.000	0.00
5-65	222.56	219.78	2.80	-0.02	0.013	0.64
6-100	220.55	216.40	3.54	0.61	0.000	0.00
6-101	220.51	216.80	3.71	-0.01	0.004	1.45
6-102	221.26	218.20	3.06	0.00	0.000	0.08
6-103	223.27	219.65	3.37	0.25	0.000	0.00
6-105	225.06	220.74	4.35	-0.03	0.024	3.62
6-113	218.50	216.50	1.17	0.83	0.000	0.00
6-136	216.78	214.28	1.74	0.76	0.000	0.00
6-137	215.00	213.00	1.27	0.73	0.000	0.00
6-2	226.53	220.98	0.88	4.67	0.000	0.00
6-37	228.00	222.72	4.03	1.25	0.000	0.00
6-4	228.00	221.27	6.25	0.48	0.000	0.00
6-44	230.00	223.93	5.02	1.05	0.000	0.00
6-86	232.00	225.48	6.42	0.10	0.000	0.00
7-13	234.70	231.17	1.78	1.75	0.000	0.00



Client: City of Silverton  
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**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
7-136	234.44	231.33	1.36	1.75	0.000	0.00
7-137	234.64	231.08	1.43	2.13	0.000	0.00
7-142	234.83	230.70	1.00	3.13	0.000	0.00
7-143	234.00	230.04	1.22	2.74	0.000	0.00
7-145	238.34	229.32	2.72	6.30	0.000	0.00
7-147	232.59	227.74	0.93	3.92	0.000	0.00
7-29	243.43	238.38	1.54	3.51	0.000	0.00
7-32	241.43	237.43	2.69	1.31	0.000	0.00
7-46	237.63	233.00	1.57	3.06	0.000	0.00
7-47	240.00	234.25	0.84	4.91	0.000	0.00
7-60	243.16	236.92	0.66	5.58	0.000	0.00
7-62	245.61	237.77	0.75	7.09	0.000	0.00
7-74	247.79	244.80	0.45	2.54	0.000	0.00
7-77	248.54	245.60	2.95	-0.01	0.008	0.77
8-172	256.89	253.56	2.47	0.86	0.000	0.00
8-176	256.34	252.34	1.46	2.54	0.000	0.00
8-177	258.00	252.00	1.95	4.05	0.000	0.00
8-178	253.70	251.24	2.46	0.00	0.000	0.05
8-27	257.39	253.56	3.33	0.50	0.000	0.00
8-28	256.05	253.00	3.09	-0.04	0.032	5.56
8-29	255.93	252.92	3.13	-0.12	0.087	9.56
8-33	256.61	252.60	3.40	0.61	0.000	0.00
8-34	257.45	252.57	3.39	1.53	0.000	0.00
8-37	258.00	251.78	2.80	3.42	0.000	0.00
8-43	260.65	253.01	1.82	5.82	0.000	0.00
8-51	256.00	250.23	3.45	2.32	0.000	0.00
8-55	254.90	249.35	3.03	2.51	0.000	0.00
8-56	254.00	249.28	2.83	1.89	0.000	0.00
8-57	254.00	249.04	3.10	1.86	0.000	0.00
8-59	251.48	248.98	2.95	-0.45	0.345	3.56
8-61	258.73	251.09	5.24	2.40	0.000	0.00
8-79	275.05	270.36	0.71	3.99	0.000	0.00
8-82	268.72	259.98	1.00	7.74	0.000	0.00
8-83	266.80	258.09	0.93	7.78	0.000	0.00

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**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
8-90	266.65	256.97	0.74	8.93	0.000	0.00
BASIN~02	222.00	219.00	1.54	1.46	0.000	0.00
BASIN~03	243.91	239.40	1.20	3.31	0.000	0.00
BASIN~05	243.87	235.34	2.11	6.42	0.000	0.00
BASIN~06	242.00	236.45	1.20	4.35	0.000	0.00
BASIN~07	243.08	236.68	1.15	5.25	0.000	0.00
BASIN~08	244.00	240.78	0.99	2.23	0.000	0.00
BASIN~09	248.00	242.37	0.74	4.89	0.000	0.00
BASIN~10	258.83	253.90	3.39	1.54	0.000	0.00
BASIN~11	257.38	250.98	3.38	3.03	0.000	0.00
BASIN~13	242.92	238.04	1.80	3.08	0.000	0.00
BASIN~14	241.19	237.19	2.90	1.10	0.000	0.00
BASIN~15	235.48	229.78	3.16	2.54	0.000	0.00
BASIN~16	228.00	221.76	6.36	-0.12	0.088	2.02
BASIN~17	237.00	234.49	0.75	1.76	0.000	0.00
BASIN~18	253.39	246.49	3.41	3.49	0.000	0.00
BASIN~19	301.83	298.83	0.95	2.05	0.000	0.00
BASIN~20	259.02	254.73	4.00	0.29	0.000	0.00
BASIN~21	264.76	251.44	4.97	8.35	0.000	0.00
BASIN~22	262.00	257.58	1.17	3.25	0.000	0.00
BASIN~24	304.92	300.90	1.42	3.87	0.000	0.00
BASIN~25	343.94	334.07	7.76	2.11	0.000	0.00
BASIN~26	392.28	386.10	6.38	-0.20	0.148	3.14
BASIN~27	240.00	235.57	4.54	-0.11	0.086	1.71
BASIN~28	235.47	230.41	5.06	0.00	0.000	0.00
BASIN~29	253.80	249.50	4.31	-0.01	0.004	0.34
BASIN~30.1	236.00	228.96	7.04	0.00	0.000	0.01
BASIN~30.2	238.96	230.80	8.20	-0.04	0.028	0.70
BASIN~31	226.00	221.44	4.85	-0.29	0.214	4.05
BASIN~32	218.90	215.58	2.39	0.93	0.000	0.00
BASIN~33	216.75	211.74	2.32	2.69	0.000	0.00
BASIN~34	231.67	224.42	7.25	0.00	0.000	0.00
BASIN~35	235.16	230.12	1.40	3.64	0.000	0.00
BASIN~36	234.96	231.74	1.48	1.74	0.000	0.00

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**Existing Junction Parameters and 25-Year Storm Event Results**

Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
BASIN~37	228.21	224.65	2.53	1.03	0.000	0.00
BASIN~38	237.43	232.76	4.82	-0.15	0.113	2.43
BASIN~39	225.76	221.90	3.86	0.00	0.000	0.02
BASIN~40	226.00	220.69	4.73	0.58	0.000	0.00
BASIN~41	225.85	222.05	3.80	0.00	0.000	0.03
BASIN~42	224.50	220.37	4.19	-0.06	0.043	1.18
BASIN~43	224.17	218.76	3.37	2.04	0.000	0.00
BASIN~44	226.00	214.33	3.86	7.81	0.000	0.00
BASIN~45	210.01	197.00	9.67	3.34	0.000	0.00
BASIN~46	210.00	195.45	14.55	0.00	0.002	0.01
BASIN~47	217.75	0.00	220.17	-2.41	1.805	17.62
BASIN~48	240.45	236.18	3.70	0.58	0.000	0.00
BASIN~49	249.77	0.00	252.52	-2.75	2.011	17.19
BASIN~50	244.45	241.53	2.93	-0.01	0.007	0.36
BASIN~51	246.65	242.95	3.71	-0.01	0.009	0.44
BASIN~52	251.23	247.20	4.22	-0.19	0.141	16.04
BASIN~53	256.39	252.10	5.38	-1.09	0.819	16.80
BASIN~54	274.10	266.50	7.60	0.00	0.000	0.00
BASIN~55	415.53	402.41	0.95	12.17	0.000	0.00
BASIN~57	440.10	433.46	6.77	-0.13	0.100	3.72
BASIN~58	463.03	450.04	13.00	-0.01	0.009	0.36
BASIN~59	288.25	275.34	6.82	6.09	0.000	0.00
BASIN~60	292.75	288.10	1.79	2.86	0.000	0.00
BASIN~61	298.00	290.58	1.15	6.27	0.000	0.00
BASIN~62	302.00	295.41	1.17	5.42	0.000	0.00
BASIN~63	314.00	309.89	1.80	2.31	0.000	0.00
BASIN~64	316.84	310.88	1.46	4.49	0.000	0.00
BASIN~65	323.95	318.84	2.00	3.11	0.000	0.00
BASIN~66	355.48	348.22	1.17	6.10	0.000	0.00
BASIN~68	377.08	374.67	1.13	1.28	0.000	0.00
BASIN~69	437.07	432.34	0.24	4.49	0.000	0.00
BASIN~70	389.29	383.95	0.54	4.80	0.000	0.00
BASIN~71	397.54	377.54	0.89	19.11	0.000	0.00
BASIN~72	360.76	352.88	0.95	6.93	0.000	0.00



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Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
BASIN~75	326.65	318.04	5.14	3.47	0.000	0.00
BASIN~76	305.00	0.00	305.58	-0.58	0.408	15.74
BASIN~77	321.95	317.68	0.78	3.49	0.000	0.00
BASIN~78	320.00	317.51	1.08	1.41	0.000	0.00
BASIN~79	212.00	0.00	214.27	-2.27	1.685	17.48
BASIN~80	232.00	224.24	1.32	6.44	0.000	0.00
BASIN~81	232.00	227.05	4.98	-0.03	0.020	0.66
BASIN~82	231.77	0.00	235.25	-3.48	2.603	19.67
BASIN~83	234.93	230.03	0.90	4.00	0.000	0.00
BASIN~84	230.00	227.54	0.96	1.50	0.000	0.00
BASIN~85	252.85	246.55	4.01	2.29	0.000	0.00
BASIN~86	344.50	340.70	1.03	2.77	0.000	0.00
BASIN~87	343.20	337.70	1.09	4.41	0.000	0.00
BASIN~88	287.74	283.16	1.34	3.24	0.000	0.00
BASIN~89	237.34	226.93	0.00	10.41	0.000	0.00
BASIN~90	229.16	226.41	2.79	-0.04	0.026	2.12
BASIN~91	228.14	0.00	228.42	-0.28	0.204	19.11
BASIN~92	236.29	232.34	1.31	2.64	0.000	0.00
BASIN~93	226.00	219.13	6.87	0.00	0.000	0.00
BASIN~94	213.95	211.45	3.19	-0.69	1.530	16.58
KJ-10	257.45	252.57	2.06	2.82	0.000	0.00
KJ-100	366.70	354.65	1.36	10.69	0.000	0.00
KJ-102	360.45	356.25	1.77	2.43	0.000	0.00
KJ-110	263.92	258.80	0.39	4.73	0.000	0.00
KJ-112	264.37	258.10	0.35	5.92	0.000	0.00
KJ-114	263.84	256.70	0.20	6.94	0.000	0.00
KJ-12	359.60	354.31	4.00	1.29	0.000	0.00
KJ-132	277.50	271.90	0.89	4.71	0.000	0.00
KJ-14	359.64	354.33	1.39	3.92	0.000	0.00
KJ-140	311.00	308.39	0.96	1.65	0.000	0.00
KJ-142	248.81	244.10	0.00	4.71	0.000	0.00
KJ-144	249.57	245.70	0.00	3.87	0.000	0.00
KJ-146	246.92	243.10	0.00	3.82	0.000	0.00
KJ-148	243.27	240.40	0.20	2.67	0.000	0.00

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Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
KJ-150	247.10	244.30	0.00	2.80	0.000	0.00
KJ-152	235.17	230.60	0.33	4.24	0.000	0.00
KJ-154	235.72	230.85	0.09	4.78	0.000	0.00
KJ-156	235.96	231.04	0.00	4.92	0.000	0.00
KJ-158	236.91	231.32	0.00	5.59	0.000	0.00
KJ-16	324.34	319.34	4.44	0.59	0.000	0.00
KJ-160	239.74	233.20	0.00	6.54	0.000	0.00
KJ-162	241.25	234.60	0.00	6.65	0.000	0.00
KJ-164	243.54	236.01	0.00	7.53	0.000	0.00
KJ-166	244.35	236.50	0.00	7.85	0.000	0.00
KJ-168	244.80	237.17	0.00	7.63	0.000	0.00
KJ-170	245.71	238.96	0.00	6.75	0.000	0.00
KJ-172	246.36	239.58	0.00	6.78	0.000	0.00
KJ-174	247.30	240.31	0.00	6.99	0.000	0.00
KJ-176	251.61	244.65	0.00	6.96	0.000	0.00
KJ-178	234.53	229.65	0.56	4.32	0.000	0.00
KJ-18	324.34	319.59	2.11	2.64	0.000	0.00
KJ-180	410.25	405.60	7.22	-2.57	1.926	17.23
KJ-184	402.15	398.25	2.07	1.83	0.000	0.00
KJ-186	389.73	384.64	5.09	0.00	0.000	0.00
KJ-188	351.44	342.29	9.18	1.32	0.000	0.00
KJ-188_DUMMY	351.44	342.29	9.17	-0.02	0.011	0.53
KJ-190	353.38	342.58	6.76	4.04	0.000	0.00
KJ-194	338.01	331.90	6.11	0.00	0.000	0.00
KJ-202	309.33	305.03	3.00	1.30	0.000	0.00
KJ-204	307.61	304.06	3.02	0.53	0.000	0.00
KJ-206	305.54	303.28	3.14	-0.88	0.659	17.96
KJ-208	306.00	303.02	0.90	2.08	0.000	0.00
KJ-222	363.69	344.37	7.13	12.19	0.000	0.00
KJ-224	403.88	392.61	8.03	3.24	0.000	0.00
KJ-226	364.39	360.06	4.34	-0.01	0.006	0.94
KJ-24	424.41	414.21	1.85	8.35	0.000	0.00
KJ-26	224.00	217.80	1.40	4.80	0.000	0.00
KJ-290	325.62	319.57	0.84	5.21	0.000	0.00

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Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
KJ-300	393.87	391.90	0.51	1.46	0.000	0.00
KJ-302	379.61	377.50	2.12	-0.01	0.004	0.57
KJ-303	370.22	368.40	0.51	1.31	0.000	0.00
KJ-306	345.67	342.40	0.84	2.43	0.000	0.00
KJ-307	301.00	298.40	0.83	1.77	0.000	0.00
KJ-308	300.00	296.87	0.72	2.41	0.000	0.00
KJ-309	300.00	293.83	2.94	3.23	0.000	0.00
KJ-310	290.00	286.58	0.64	2.78	0.000	0.00
KJ-311	286.00	283.21	0.87	1.92	0.000	0.00
KJ-312	285.00	282.49	1.01	1.50	0.000	0.00
KJ-313	284.00	278.12	3.59	2.29	0.000	0.00
KJ-32	343.22	338.14	0.84	4.24	0.000	0.00
KJ-320	224.53	218.90	3.26	2.37	0.000	0.00
KJ-322	224.60	218.81	3.39	2.40	0.000	0.00
KJ-324	311.44	305.32	4.99	1.13	0.000	0.00
KJ-326	311.44	305.22	5.02	1.20	0.000	0.00
KJ-328	311.44	305.32	0.00	6.12	0.000	0.00
KJ-330	417.91	408.10	9.95	-0.14	0.661	16.05
KJ-332	235.74	226.89	6.40	2.45	0.000	0.00
KJ-334	424.41	416.85	5.69	1.87	0.000	0.00
KJ-34	324.50	318.71	0.94	4.85	0.000	0.00
KJ-36	309.12	305.53	1.33	2.26	0.000	0.00
KJ-38	308.29	304.64	1.28	2.37	0.000	0.00
KJ-40	306.00	304.00	1.26	1.34	0.000	0.00
KJ-44	228.36	219.13	0.86	8.37	0.000	0.00
KJ-46	227.20	218.30	1.29	7.61	0.000	0.00
KJ-48	226.12	217.78	1.74	6.60	0.000	0.00
KJ-50	224.77	217.81	1.69	5.27	0.000	0.00
KJ-52	224.46	217.40	2.06	5.00	0.000	0.00
KJ-54	221.60	216.52	1.81	3.27	0.000	0.00
KJ-56	221.13	216.63	1.36	3.14	0.000	0.00
KJ-58	298.52	294.16	1.14	3.22	0.000	0.00
KJ-60	297.27	292.60	1.05	3.62	0.000	0.00
KJ-64	395.61	389.10	0.60	5.91	0.000	0.00



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Junction ID	Rim Elevation (ft)	Invert Elevation (ft)	25-Year Storm Event			
			Maximum Depth (ft)	Freeboard (ft)	Total Flood Volume (MG)	Total Flood Time (hrs)
KJ-66	384.39	377.60	0.67	6.12	0.000	0.00
KJ-68	377.00	370.20	0.80	6.00	0.000	0.00
KJ-70	373.20	366.00	0.67	6.53	0.000	0.00
KJ-72	372.32	364.70	1.02	6.60	0.000	0.00
KJ-74	370.67	362.60	0.90	7.17	0.000	0.00
KJ-76	367.89	358.90	1.02	7.97	0.000	0.00
KJ-80	378.25	371.35	0.86	6.04	0.000	0.00
KJ-82	378.05	371.00	0.57	6.48	0.000	0.00
KJ-84	370.64	364.20	0.42	6.02	0.000	0.00
KJ-86	368.13	355.45	0.58	12.10	0.000	0.00
KJ-88	367.04	356.59	2.88	7.57	0.000	0.00
KJ-90	366.02	355.02	2.76	8.24	0.000	0.00
KJ-92	360.55	354.15	3.58	2.82	0.000	0.00
KJ-94	358.99	353.74	3.81	1.44	0.000	0.00
KJ-96	359.37	353.42	2.59	3.36	0.000	0.00
KJ-98	358.93	353.78	2.23	2.92	0.000	0.00
NODE~1446	436.74	429.65	6.26	0.83	0.000	0.00
NODE~912	222.39	219.20	3.37	-0.18	0.136	2.68
NODE1415	210.00	0.00	0.00	210.00	0.000	0.00
NODE1419	440.12	421.75	18.39	-0.01	0.009	0.49
NODE1424	359.28	354.34	3.94	1.00	0.000	0.00
NODE1433	242.01	234.92	2.37	4.72	0.000	0.00
NODE1435	242.00	234.70	2.59	4.71	0.000	0.00
NODE1437	234.86	227.88	0.00	6.98	0.000	0.00
NODE1438	231.59	229.59	0.00	2.00	0.000	0.00
NODE1440	238.41	227.06	0.00	11.35	0.000	0.00
NODE1445	424.40	420.80	3.60	0.00	0.001	0.14
NODE1452	283.50	280.50	1.03	1.97	0.000	0.00
NODE1453	263.00	260.00	1.13	1.87	0.000	0.00
NODE1454	255.00	252.50	2.25	0.25	0.000	0.00
NODE1459	251.35	248.85	1.45	1.05	0.000	0.00
NODE1480	322.34	315.64	3.76	2.94	0.000	0.00
NODE1485	330.34	327.34	0.42	2.58	0.000	0.00
NODE1486	341.74	332.70	9.07	-0.03	0.012	0.20

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NODE1487	419.00	408.24	10.10	0.66	0.000	0.00
NODE1488	417.91	408.10	9.96	-0.15	0.106	4.55
NODE1489	405.49	401.88	5.48	-1.87	1.402	17.75
NODE1491	403.34	391.30	9.34	2.70	0.000	0.00
NODE1491_DUMMY	403.34	391.30	1.90	10.14	0.000	0.00
NODE1501	226.00	220.33	6.37	-0.70	0.546	8.95
NODE904	253.00	250.50	2.68	-0.18	0.139	2.83
NODE929	219.20	217.20	1.28	0.72	0.000	0.00

Client: City of Silverton  
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Existing Conduit Parameters and 25-Year Storm Event Results

Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
100-16	15	0.013	217.50	16-79	217.44	16-119	2.00	6,343	5,471	0.4	0.86	0.63
101-16	265	0.013	219.13	BASIN~93	217.60	16-79	1.50	3,580	5,470	0.6	1.53	0.94
10-12	124	0.013	216.75	12-12	215.34	12-11	2.00	10,827	15,011	1.1	1.39	1.00
10-13	149	0.013	242.95	BASIN~51	241.53	BASIN~50	1.50	4,604	6,963	1.0	1.51	1.00
10-14	191	0.013	346.37	14-15	334.29	BASIN~25	1.50	11,879	4,429	6.3	0.37	0.72
10-31	59	0.013	310.40	30-11	309.54	30-8	1.25	3,503	1,092	1.5	0.31	0.95
104-17	200	0.013	327.90	17-117	325.40	17-131	1.50	5,270	6,045	1.2	1.15	0.89
105-31	584	0.013	316.44	31-112	314.69	31-123	4.00	35,297	33,528	0.3	0.95	1.00
106-07	20	0.013	234.27	BASIN~17	233.34	7-46	2.50	44,154	7,981	5.8	0.18	0.40
106-17	200	0.013	334.00	17-132	328.20	17-117	1.50	8,039	6,045	2.9	0.75	0.82
106-31	227	0.013	314.69	31-123	313.77	31-139	4.00	41,051	38,604	0.4	0.94	1.00
107-07	344	0.013	233.00	7-46	231.17	7-13	2.50	13,425	9,619	0.5	0.72	0.64
107-17	115	0.013	227.88	NODE1437	227.74	17-134	4.00	22,519	0	0.1	0.00	0.00
107-31	241	0.013	313.71	31-139	313.42	31-141	4.00	22,343	46,594	0.1	2.09	1.00
108-16	15	0.013	222.18	16-128	222.03	400-57	1.50	4,736	7,450	1.0	1.57	1.00
108-25	42	0.013	354.33	KJ-14	354.34	25-47	2.00	1,567	4,728	0.0	3.02	0.64
108-31	216	0.013	312.74	31-141	312.04	31-145	4.00	36,691	66,612	0.3	1.82	1.00
109-17	68	0.013	226.93	BASIN~89	226.93	17-139	2.00	390	0	0.0	0.00	0.00
110-08	110	0.013	253.90	BASIN~10	253.68	8-27	1.50	2,108	3,107	0.2	1.47	1.00
111-08	209	0.013	253.56	8-27	253.07	8-28	1.50	2,285	2,899	0.2	1.27	1.00
111-25	104	0.013	355.58	25-45	355.17	25-42	2.00	6,367	5,903	0.4	0.93	1.00
11-13	25	0.013	243.00	13-13	242.95	BASIN~51	1.50	2,128	5,103	0.2	2.40	1.00
112-06	456	0.013	230.04	7-143	227.06	BASIN~34	2.21	19,622	13,218	0.7	0.67	0.78
112-08	56	0.013	253.00	8-28	252.99	8-29	1.50	630	2,084	0.0	3.31	1.00
112-25	161	0.013	354.47	25-42	354.34	NODE1424	3.00	8,519	8,751	0.1	1.03	1.00
1-13	247	0.013	230.41	BASIN~28	230.17	13-1	2.00	3,162	8,552	0.1	2.70	1.00
113-08	124	0.013	252.92	8-29	252.72	8-33	1.50	1,890	1,216	0.2	0.64	1.00
113-25	140	0.013	354.34	25-47	349.42	BASIN~66	3.00	56,168	12,787	3.5	0.23	0.32
114-08	210	0.013	254.73	BASIN~20	253.67	8-172	1.50	3,349	5,759	0.5	1.72	1.00
114-17	3	0.013	226.93	17-138	226.93	17-139	2.00	1,885	0	0.0	0.00	0.00
114-25	252	0.013	348.22	BASIN~66	344.15	25-83	4.00	81,914	15,162	1.6	0.19	0.29
117-08	59	0.013	252.00	8-177	251.24	8-178	1.75	8,081	2,979	1.3	0.37	1.00
117-25	249	0.013	344.32	25-83_DUMMY	343.41	25-131	3.00	18,104	296	0.4	0.02	0.79
1-18	40	0.013	245.40	18-1	244.60	18-2	2.00	14,411	9,530	2.0	0.66	1.00
118-08	32	0.013	252.34	8-176	252.00	8-177	1.75	7,386	2,671	1.1	0.36	0.91
118-25	85	0.013	343.15	25-83	342.23	25-84	3.00	31,115	15,182	1.1	0.49	0.46



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Existing Conduit Parameters and 25-Year Storm Event Results

Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
1-19	178	0.013	415.21	KJ-24	407.05	19-2	1.50	10,086	6,150	4.6	0.61	0.56
119-08	47	0.013	253.56	8-172	253.34	NODE1461	1.75	4,866	5,758	0.5	1.18	1.00
119-25	312	0.013	342.23	25-84	336.21	25-87	3.00	41,607	15,201	1.9	0.37	0.42
121-08	159	0.013	252.60	8-33	252.57	8-34	2.00	1,395	1,218	0.0	0.44	1.00
12-13	371	0.013	244.20	13-14	243.00	13-13	1.50	2,682	4,463	0.3	1.66	1.00
1-22	108	0.013	298.10	22-1	294.10	22-2	1.50	9,097	6,044	3.7	0.66	0.55
122-25	61	0.013	336.21	25-87	335.11	25-90	3.00	40,166	15,221	1.8	0.38	0.43
12-24	372	0.013	287.50	24-16	285.06	24-17	2.00	8,223	6,442	0.7	0.78	0.67
1-23	493	0.013	262.60	18-23	261.45	23-1	2.00	4,905	9,525	0.2	1.94	0.91
123-08	150	0.013	256.97	8-90	251.68	BASIN~21	2.00	19,063	5,621	3.5	0.29	0.69
123-25	204	0.013	335.01	25-90	329.01	25-91	3.00	51,296	15,241	2.9	0.30	0.44
124-08	72	0.013	258.09	8-83	256.97	8-90	2.00	12,701	5,621	1.6	0.44	0.42
124-25	88	0.013	332.10	25-110	331.76	25-111	4.00	40,024	29,134	0.4	0.73	0.83
1-25	354	0.013	348.66	25-135	348.44	25-54	3.16	14,559	3,982	0.1	0.27	0.53
125-08	150	0.013	259.98	8-82	258.12	8-83	2.00	11,299	5,621	1.2	0.50	0.50
125-25	243	0.013	329.11	25-91	327.36	25-96	4.00	54,706	15,261	0.7	0.28	0.36
126-08	237	0.013	270.36	8-79	260.17	8-82	2.00	21,064	5,621	4.3	0.27	0.38
126-25	252	0.013	327.16	25-96	323.59	31-11	4.00	76,765	15,281	1.4	0.20	0.65
127-08	403	0.013	250.23	8-51	249.28	8-56	2.50	8,941	11,847	0.2	1.33	1.00
128-08	333	0.013	250.23	8-51	249.35	8-55	2.50	9,459	11,725	0.3	1.24	1.00
129-08	78	0.013	249.35	8-55	249.04	8-57	2.50	11,636	11,733	0.4	1.01	1.00
130-08	71	0.013	249.04	8-57	248.98	8-59	2.50	5,339	11,738	0.1	2.20	1.00
131-08	70	0.013	249.28	8-56	248.98	8-59	2.50	12,090	11,847	0.4	0.98	1.00
13-13.1	415	0.013	247.20	BASIN~52	244.20	13-14	1.50	4,011	4,463	0.7	1.11	1.00
132-07	96	0.013	229.78	BASIN~15	229.36	7-145	2.00	6,716	9,997	0.4	1.49	1.00
132-08	222	0.013	253.01	8-43	251.79	8-37	3.00	22,197	13,313	0.5	0.60	0.77
133-07	270	0.013	229.32	7-145	227.74	7-147	2.00	7,765	9,996	0.6	1.29	0.73
133-08	100	0.013	257.58	BASIN~22	255.67	8-43	3.00	41,293	13,300	1.9	0.32	0.39
134-08	123	0.013	251.78	8-37	250.98	BASIN~11	3.00	24,099	14,282	0.6	0.59	0.97
135-08	110	0.013	250.98	BASIN~11	250.23	8-51	3.00	24,711	23,572	0.7	0.95	1.00
14-05	92	0.013	221.90	BASIN~39	221.59	5-13	1.50	2,744	2,355	0.3	0.86	1.00
14-12	44	0.013	218.00	12-16	216.75	12-12	2.00	17,137	13,542	2.8	0.79	1.00
141-25	14	0.013	356.91	25-180	356.91	25-20	2.50	2,712	5,938	0.0	2.19	0.62
14-18	134	0.013	266.50	BASIN~54	265.10	18-13	1.50	4,819	5,874	1.0	1.22	1.00
146-07	52	0.013	230.12	BASIN~35	230.04	7-143	2.21	9,489	13,219	0.2	1.39	0.59
15-05	280	0.013	221.59	5-13	220.69	BASIN~40	1.50	2,673	1,934	0.3	0.72	1.00

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Existing Conduit Parameters and 25-Year Storm Event Results

Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
15-12	116	0.013	220.23	12-17	218.10	12-16	2.00	13,744	10,812	1.8	0.79	1.00
15-13	253	0.013	249.10	13-19	247.70	13-16	1.50	3,509	3,883	0.6	1.11	1.00
15-18	286	0.013	265.10	18-13	263.60	18-14	1.50	3,414	5,773	0.5	1.69	1.00
157-12	44	0.013	230.68	12-193	230.34	12-192	2.50	16,193	18,020	0.8	1.11	1.00
160-12	173	0.013	231.97	12-196	230.68	12-193	2.50	15,899	13,537	0.7	0.85	1.00
16-06	42	0.013	211.74	BASIN~33	211.74	OFALL_10	2.50	898	15,127	0.0	16.84	0.86
16-12	115	0.013	220.54	12-18	220.23	12-17	2.00	5,273	6,757	0.3	1.28	1.00
16-13	134	0.013	251.00	13-20	249.10	13-19	1.50	5,615	3,884	1.4	0.69	1.00
16-14	219	0.013	304.80	14-23	302.57	14-27	1.50	4,756	2,587	1.0	0.54	0.44
16-18	219	0.013	263.60	18-14	262.60	18-15	1.50	3,188	5,773	0.5	1.81	0.74
17-06	102	0.013	214.28	6-136	213.00	6-137	2.00	11,388	11,928	1.3	1.05	0.72
17-13	397	0.013	334.07	BASIN~25	316.34	13-21	1.50	9,965	11,345	4.5	1.14	1.00
17-18.1	195	0.013	262.60	18-15	249.80	18-16	1.50	12,102	5,772	6.6	0.48	0.74
18-06	544	0.013	219.35	400-11	217.20	NODE929	2.00	6,383	11,390	0.4	1.78	0.82
18-13.1	355	0.013	314.44	13-21	309.00	13-22	2.00	12,569	11,382	1.5	0.91	1.00
18-18.1	99	0.013	359.99	19-5	333.91	18-17	1.50	24,663	13,111	27.4	0.53	0.52
19-13	143	0.013	309.00	13-22	305.80	13-23	2.00	14,448	15,983	2.0	1.11	1.00
19-14	28	0.013	300.90	BASIN~24	300.10	44-30	2.00	16,083	13,657	2.5	0.85	0.67
19-18	276	0.013	333.88	18-17	281.99	18-18	2.00	44,453	13,111	19.2	0.29	0.42
1929.1	68	0.013	219.92	2-11	217.80	KJ-26	3.00	52,987	41,042	3.1	0.39	0.45
1940.1	84	0.013	237.43	7-32	237.19	BASIN~14	3.91	36,622	32,684	0.3	0.45	0.71
1961.1	99	0.013	255.09	8-61	253.64	BASIN~11	2.00	12,276	8,627	1.5	0.70	0.62
198-12	140	0.013	232.40	12-328	231.97	12-196	2.50	10,218	13,654	0.3	1.34	1.00
201-12	109	0.013	232.83	12-232	232.42	12-328	2.50	11,315	13,641	0.4	1.21	1.00
20-14	115	0.013	307.50	14-29	304.80	14-23	1.50	7,232	2,947	2.4	0.41	0.50
20-14A	9	0.013	300.20	44-30	299.90	14-31	2.00	18,872	13,657	3.5	0.72	0.59
20-18	119	0.013	281.99	18-18	270.41	18-19	2.00	31,745	13,110	9.8	0.41	0.73
20-31	225	0.013	318.84	BASIN~65	316.79	31-3	3.00	28,597	22,461	0.9	0.79	0.67
203-12	75	0.013	233.54	12-234	232.83	12-232	2.50	17,913	13,633	0.9	0.76	1.00
204-12	121	0.013	234.14	12-237	233.54	12-234	2.50	12,985	13,629	0.5	1.05	1.00
2-06	344	0.013	221.27	6-4	220.98	6-2	1.50	1,370	5,566	0.1	4.06	0.79
207-12	218	0.013	235.17	12-238	234.14	12-237	2.50	12,667	13,863	0.5	1.09	1.00
2-11.1	20	0.013	216.59	4-1	216.60	11-5	1.50	1,054	4,441	0.1	4.21	1.00
211-12	294	0.013	236.18	BASIN~48	235.17	12-238	2.50	10,792	13,884	0.3	1.29	1.00
21-14	21	0.013	299.90	14-31	298.83	BASIN~19	2.00	22,986	13,656	5.1	0.59	0.51
21-18	396	0.013	269.88	18-19	267.33	18-20	2.00	8,147	8,300	0.6	1.02	1.00

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Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
2-13.1	287	0.013	232.76	BASIN~38	231.33	BASIN~28	1.50	3,327	5,923	0.5	1.78	1.00
2-16.1	164	0.013	223.99	16-111	222.55	16-131	1.50	4,423	4,926	0.9	1.11	1.00
2-18	178	0.013	244.50	18-2	236.00	18-25	1.50	10,306	9,528	4.8	0.92	1.00
2187.3	47	0.013	247.70	13-16	247.30	BASIN~52	1.00	1,479	3,749	0.9	0.84	1.00
2-19	47	0.013	406.61	19-2	402.52	BASIN~55	1.50	13,961	6,150	8.8	0.44	0.50
22-18	398	0.013	267.33	18-20	264.03	18-21	2.00	9,241	9,525	0.8	1.03	1.00
228-12	238	0.013	230.80	BASIN~30.2	229.80	12-274	2.00	6,586	8,113	0.4	1.23	1.00
2315.1	59	0.013	234.92	NODE1433	234.70	NODE1435	4.00	102,710	42,225	0.4	0.21	0.62
23-18	106	0.013	263.83	18-21	263.34	18-22	2.00	6,911	9,527	0.5	1.38	1.00
23-24.1	51	0.013	287.40	24-19	287.60	24-16	1.50	2,964	6,444	0.4	2.17	0.96
23-25.1	34	0.013	374.67	BASIN~68	374.61	25-26	1.50	1,994	2,952	0.2	1.48	0.71
236-12	238	0.013	229.80	12-274	229.56	12-279	2.00	3,223	8,355	0.1	2.59	1.00
237-12	59	0.013	229.56	12-279	229.42	12-282	2.00	4,938	8,356	0.2	1.69	1.00
2376.1	26	0.013	249.27	NODE1459	248.83	500-9	1.50	6,159	5,035	1.7	0.82	0.69
2376.2	25	0.013	248.85	NODE1459	248.60	500-9	1.50	4,706	7,702	1.0	1.64	0.81
2376.3	20	0.013	249.21	NODE1459	248.84	500-9	1.50	6,409	5,630	1.8	0.88	0.73
240-12	179	0.013	229.42	12-282	228.96	BASIN~30.1	2.00	5,140	8,355	0.3	1.63	1.00
24-13	43	0.013	308.00	13-24	307.50	14-29	1.50	5,078	2,937	1.2	0.58	0.50
24-18	399	0.013	263.27	18-22	262.64	18-23	2.00	4,032	9,525	0.2	2.36	1.00
24-24	234	0.013	288.10	BASIN~60	287.40	24-19	1.50	2,580	663	0.3	0.26	1.00
24-25	64	0.013	374.41	25-26	374.13	25-27	1.50	3,129	2,972	0.4	0.95	0.69
244-12	257	0.013	228.96	BASIN~30.1	228.34	12-288	2.00	4,988	11,235	0.2	2.25	1.00
248-12	241	0.013	228.34	12-288	226.66	12-294	2.25	11,615	11,218	0.7	0.97	1.00
25-13.1	241	0.013	233.69	13-5	230.90	BASIN~30.2	2.00	10,919	6,313	1.2	0.58	1.00
252-12	78	0.013	226.66	12-294	226.41	12-295	2.25	7,847	11,954	0.3	1.52	1.00
25-25.1	128	0.013	373.48	25-27	372.85	25-32	1.50	3,307	2,992	0.5	0.90	0.70
26-11	257	0.013	214.33	BASIN~44	213.47	11-34	2.00	5,869	7,693	0.3	1.31	1.00
27-11	231	0.013	213.37	11-34	212.60	11-35	2.00	5,867	7,693	0.3	1.31	1.00
27-23	225	0.013	275.34	BASIN~59	270.49	23-31	1.50	6,927	5,210	2.2	0.75	1.00
28-02	302	0.013	236.45	BASIN~06	235.59	BASIN~05	1.75	3,793	2,126	0.3	0.56	0.84
28-11	28	0.013	212.50	11-35	212.44	11-40	2.00	4,725	9,044	0.2	1.91	1.00
28-23	48	0.013	270.29	23-31	270.19	23-32	1.75	3,257	5,213	0.2	1.60	1.00
29-02	62	0.013	235.34	BASIN~05	235.14	2-38	2.00	5,789	4,874	0.3	0.84	1.00
29-03	56	0.013	240.78	BASIN~08	240.10	BASIN~03	1.75	7,860	4,837	1.2	0.62	0.57
29-11	61	0.013	212.34	11-40	212.14	11-41	2.00	5,831	8,200	0.3	1.41	1.00
29-23	347	0.013	270.19	23-32	269.45	23-25	1.75	3,285	5,211	0.2	1.59	1.00



Client: City of Silverton  
 Project: Stormwater Master Plan  
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Existing Conduit Parameters and 25-Year Storm Event Results

Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
300-1	26	0.013	215.00	400-8	214.90	400-9	2.00	6,240	14,838	0.4	2.38	0.78
300-13	37	0.013	219.00	BASIN~02	218.80	KJ-52	2.00	7,471	7,701	0.5	1.03	0.76
300-16A	21	0.013	214.03	400-20	213.93	400-21	4.00	43,999	51,121	0.5	1.16	0.58
300-17	56	0.013	222.38	400-18	222.08	400-19	1.50	3,458	5,260	0.5	1.52	0.57
300-2	78	0.013	220.33	NODE1501	220.15	400-11	4.00	8,269	21,854	0.2	2.64	1.00
30-02	351	0.013	237.46	2-20	235.28	2-17	2.00	8,005	6,274	0.6	0.78	0.67
300-26	478	0.013	252.74	BASIN~53	250.70	13-20	1.50	3,079	4,035	0.4	1.31	1.00
300-29	79	0.013	281.00	KJ-313	275.58	400-46	1.50	12,380	5,621	6.9	0.45	0.55
300-3	41	0.013	215.90	400-62	215.58	BASIN~32	1.25	2,554	4,586	0.8	1.80	1.00
30-03	178	0.013	239.40	BASIN~03	237.91	2-20	2.00	9,301	6,274	0.8	0.67	0.60
300-31	10	0.013	217.70	400-28	217.50	400-30	2.00	14,361	5,340	2.0	0.37	0.50
300-32	20	0.013	217.50	400-30	217.30	400-31	2.00	10,148	5,340	1.0	0.53	0.40
300-35	45	0.013	221.95	400-42	221.65	400-43	2.50	15,002	4,367	0.7	0.29	1.00
300-36	81	0.013	215.59	400-38	215.38	400-39	2.50	9,402	5,014	0.3	0.53	0.33
300-37	52	0.013	217.16	400-40	216.61	400-41	1.00	3,560	4,433	1.1	1.25	0.64
300-38	24	0.013	220.63	400-34	220.43	400-35	1.00	3,158	11,337	0.8	3.59	1.00
300-40	20	0.013	213.20	400-26	213.00	400-27	1.00	1,598	2,984	1.0	1.87	1.00
300-42	41	0.013	220.72	400-57	220.25	400-56	2.00	10,847	11,276	1.1	1.04	1.00
300-43	25	0.013	212.50	400-24	212.30	400-25	2.00	9,073	3,760	0.8	0.41	1.00
30-06	14	0.013	222.72	6-37	222.65	6-111	3.00	21,105	125	0.5	0.01	1.00
300-61	162	0.013	275.58	400-46	270.36	8-79	1.50	8,474	5,621	3.2	0.66	0.54
30-11.1	104	0.013	212.04	11-41	211.75	11-42	2.00	5,353	8,360	0.3	1.56	1.00
30-23	259	0.013	269.30	23-24	266.82	23-21	1.50	4,616	5,211	1.0	1.13	1.00
30-25	129	0.013	365.09	25-35	356.07	25-42	1.25	7,668	3,032	7.0	0.40	0.72
3-06	45	0.013	221.76	BASIN~16	221.45	6-4	1.50	3,913	5,568	0.7	1.42	1.00
31-02	205	0.013	235.08	2-38	234.89	2-39	2.50	5,611	4,863	0.1	0.87	0.92
3-11	226	0.013	216.60	11-5	215.34	11-6	1.50	3,519	4,437	0.6	1.26	1.00
31-23	75	0.013	266.69	23-21	265.93	KJ-132	1.50	12,477	5,211	7.0	0.42	0.80
3-13	316	0.013	235.57	BASIN~27	232.99	BASIN~38	1.50	4,262	4,254	0.8	1.00	1.00
3-19	214	0.013	402.41	BASIN~55	371.81	19-4	1.50	17,906	13,111	14.4	0.73	0.67
32-02	107	0.013	234.89	2-39	234.70	NODE1435	2.50	7,771	4,846	0.2	0.62	0.98
32-05	200	0.013	220.69	BASIN~40	220.03	5-57	1.50	2,705	5,387	0.3	1.99	1.00
33-02	22	0.013	219.28	2-1	219.20	2-2	2.50	11,198	4,659	0.4	0.42	0.47
33-30	320	0.013	310.88	BASIN~64	310.71	30-12	3.00	6,905	1,044	0.1	0.15	0.51
34-02	413	0.013	219.04	2-2	218.47	2-7	2.50	6,836	4,641	0.1	0.68	0.42
34-17	175	0.013	246.55	BASIN~85	245.40	18-1	2.00	8,241	9,530	0.7	1.16	1.00

Client: City of Silverton  
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Existing Conduit Parameters and 25-Year Storm Event Results

Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
35-02	17	0.013	218.47	2-7	218.05	KJ-26	2.50	28,615	4,634	2.4	0.16	0.37
36-02	442	0.013	224.15	2-15	219.76	2-14	2.50	18,350	6,272	1.0	0.34	0.40
36-06	99	0.013	224.65	BASIN~37	222.65	6-111	1.50	6,710	4,460	2.0	0.66	1.00
37-02	511	0.013	229.08	2-16	224.45	2-15	2.50	17,523	6,272	0.9	0.36	0.41
37-06	272	0.013	223.93	6-44	222.65	6-111	3.00	20,544	26,795	0.5	1.30	1.00
37-24	229	0.013	290.58	BASIN~61	290.12	24-34	2.00	4,549	2,860	0.2	0.63	0.58
38-02	334	0.013	235.08	2-17	231.08	2-16	2.50	20,139	6,273	1.2	0.31	0.38
38-06	254	0.013	224.42	BASIN~34	223.93	6-44	3.00	13,143	26,783	0.2	2.04	1.00
38-24	70	0.013	290.11	24-34	289.77	24-36	2.00	7,092	2,853	0.5	0.40	0.67
38-31	211	0.013	320.09	31-86	319.72	31-16	4.00	27,003	24,020	0.2	0.89	0.94
39-24	303	0.013	289.75	24-36	288.40	24-38	2.00	825	2,847	0.0	3.45	0.61
39-31	31	0.013	319.72	31-16	319.67	31-17	4.00	25,901	24,048	0.2	0.93	0.96
400-1	231	0.013	237.40	13-6	233.69	13-5	1.75	9,016	7,335	1.6	0.81	1.00
400-33.1	136	0.013	219.20	NODE~912	217.78	400-33	1.50	4,809	6,756	1.0	1.40	1.00
400-60A	52	0.013	217.30	400-59	217.20	400-60	1.08	864	3,062	0.2	3.54	0.67
400-60B	52	0.013	217.30	400-59	217.20	400-60	1.17	1,054	3,695	0.2	3.51	0.66
40-31	307	0.013	319.61	31-17	318.11	BASIN~75	4.00	45,057	23,485	0.5	0.52	0.99
41-02	58	0.013	219.57	2-14	219.28	2-13	4.00	45,573	6,272	0.5	0.14	0.17
41-06	125	0.013	221.44	BASIN~31	220.74	6-105	1.50	3,526	4,642	0.6	1.32	1.00
4-11	36	0.013	215.34	11-6	214.94	BASIN~44	1.50	4,967	4,438	1.1	0.89	1.00
41-23	192	0.013	277.31	23-42	273.21	23-43	2.00	14,838	6,417	2.1	0.43	0.46
41-24	112	0.013	295.41	BASIN~62	295.30	24-41	3.50	14,158	5,346	0.1	0.38	0.30
4-13	99	0.013	230.17	13-1	230.12	BASIN~35	2.00	2,284	8,552	0.1	3.74	0.85
41-31	164	0.013	318.04	BASIN~75	317.42	31-111	4.00	39,646	33,486	0.4	0.84	1.00
4-19	109	0.013	371.81	19-4	360.21	19-5	1.50	15,419	13,111	10.7	0.85	0.71
42-06	264	0.013	220.74	6-105	219.77	6-103	1.50	2,858	4,418	0.4	1.55	1.00
42-2	45	0.013	221.80	2-52	221.53	2-53	1.50	3,647	5,396	0.6	1.48	0.78
42-23	333	0.013	278.75	23-41	277.40	23-42	2.00	6,468	6,417	0.4	0.99	0.74
42-31	103	0.013	317.32	31-111	316.46	31-112	4.00	58,853	33,508	0.8	0.57	1.00
4-30	140	0.013	306.64	30-5	305.33	KJ-324	2.00	9,829	5,521	0.9	0.56	1.00
43-06	189	0.013	219.65	6-103	218.30	6-102	1.50	3,982	4,419	0.7	1.11	1.00
4-31	115	0.013	323.54	31-11	323.14	31-12	4.00	38,028	43,811	0.3	1.15	0.87
43-17	51	0.013	340.70	BASIN~86	338.50	17-35	1.50	9,770	4,299	4.3	0.44	0.84
43-23	312	0.013	279.57	23-40	278.85	23-41	2.00	4,879	6,425	0.2	1.32	0.88
44-06	86	0.013	218.20	6-102	217.50	6-101	1.50	4,256	4,475	0.8	1.05	1.00
44-23	524	0.013	282.68	23-48	279.66	23-40	2.00	7,705	6,439	0.6	0.84	0.84

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Existing Conduit Parameters and 25-Year Storm Event Results

Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
45-06	139	0.013	372.84	25-32	365.19	25-35	1.00	3,750	3,012	5.5	0.80	0.68
46-06	39	0.013	216.90	400-61	216.50	6-100	1.50	4,766	4,488	1.0	0.94	1.00
46-17	289	0.013	338.50	17-35	337.70	BASIN~87	1.50	2,480	4,299	0.3	1.73	0.86
47-11	105	0.013	197.00	BASIN~45	193.44	11-91	1.50	8,674	4,274	3.4	0.49	1.00
47-17	162	0.013	337.70	BASIN~87	334.20	17-132	1.50	6,926	6,045	2.2	0.87	0.72
48-11	47	0.013	195.45	BASIN~46	194.58	11-88	2.50	24,993	18,917	1.8	0.76	1.00
48-17	203	0.013	325.40	17-131	321.60	17-116	1.50	6,445	6,045	1.9	0.94	0.71
48-23	23	0.013	269.45	23-25	269.30	23-24	1.50	3,796	5,212	0.6	1.37	1.00
48-24	171	0.013	303.01	24-51	298.49	24-50	2.25	22,625	5,512	2.6	0.24	0.34
49-11	71	0.013	194.58	11-88	194.12	11-89	2.50	14,783	22,261	0.6	1.51	1.00
49-12	47	0.013	228.70	12-71	228.54	12-76	1.00	932	999	0.3	1.07	0.69
49-17	241	0.013	321.60	17-116	313.90	17-18	1.50	8,437	6,044	3.2	0.72	0.63
49-24	95	0.013	303.80	24-52	303.01	24-51	2.25	12,706	5,513	0.8	0.43	0.40
500-1.1	106	0.013	319.59	KJ-18	318.84	BASIN~65	3.00	25,202	21,236	0.7	0.84	0.69
500-2.1	80	0.013	339.35	25-123	338.57	25-124	4.00	63,651	29,123	1.0	0.46	0.83
500-3.1	25	0.013	294.10	22-2	292.20	22-3	1.50	13,073	6,045	7.7	0.46	0.48
500-4	36	0.013	216.80	6-101	217.30	400-61	1.50	5,565	4,488	1.4	0.81	1.00
500-5	422	0.013	251.44	BASIN~21	251.09	8-61	4.00	18,565	9,064	0.1	0.49	1.00
50-11	18	0.013	194.12	11-89	193.89	11-90	2.50	20,790	26,006	1.3	1.25	1.00
50-17	253	0.013	313.40	17-18	298.30	22-1	1.50	11,534	6,044	6.0	0.52	0.51
50-23	66	0.013	284.61	24-17	282.68	23-48	2.00	17,378	6,442	2.9	0.37	0.56
50-25	71	0.013	432.34	BASIN~69	427.48	25-2	1.50	12,389	698	6.9	0.06	0.16
51-11	139	0.013	193.89	11-90	193.34	11-91	2.50	11,579	24,609	0.4	2.13	1.00
51-25	43	0.013	427.13	25-2	421.60	25-3	1.50	17,058	718	13.1	0.04	0.14
5-13.1	476	0.013	243.20	13-7	237.40	13-6	1.50	5,205	6,121	1.2	1.18	1.00
5-16	30	0.013	222.64	16-110	222.35	16-128	1.50	4,599	7,448	1.0	1.62	1.00
52-11	87	0.013	193.34	11-91	192.50	11-92	2.50	18,082	24,573	1.0	1.36	1.00
52-25	232	0.013	421.50	25-3	396.89	25-4	1.50	15,397	738	10.7	0.05	0.15
5-30	73	0.013	307.49	30-6	306.64	30-5	2.00	10,938	5,523	1.2	0.50	1.00
53-05	280	0.013	221.56	5-132	220.41	BASIN~42	1.50	3,020	2,526	0.4	0.84	1.00
53-25	39	0.013	396.54	25-4	393.34	BASIN~71	1.50	13,543	758	8.3	0.06	0.16
54-05	253	0.013	220.37	BASIN~42	219.57	5-138	1.50	2,651	4,509	0.3	1.70	1.00
55-05	64	0.013	219.98	5-57	219.83	5-65	1.75	3,442	7,066	0.2	2.05	1.00
55-17	146	0.013	281.54	17-78	276.64	17-76	1.50	8,646	7,486	3.4	0.87	0.72
56-05	258	0.013	219.77	5-65	218.90	KJ-320	1.75	4,152	4,168	0.3	1.00	1.00
56-17	502	0.013	276.54	17-76	248.51	17-92	1.50	11,153	7,486	5.6	0.67	0.59



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Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
56-24	46	0.013	305.97	24-58	305.64	24-56	2.25	11,782	5,513	0.7	0.47	0.45
56-25	147	0.013	383.95	BASIN~70	378.09	25-9	2.00	20,265	3,238	4.0	0.16	0.44
57-05	216	0.013	219.56	5-138	218.99	BASIN~43	1.75	3,655	4,508	0.3	1.23	1.00
57-17	56	0.013	283.16	BASIN~88	281.84	17-78	1.50	7,237	7,486	2.4	1.03	0.92
57-24	162	0.013	305.64	24-56	303.81	24-52	2.25	14,791	5,513	1.1	0.37	0.44
58-05	194	0.013	218.76	5-144	218.19	5-151	2.00	5,505	8,287	0.3	1.51	1.00
58-24	286	0.013	307.91	30-69	305.97	24-58	2.50	15,172	5,514	0.7	0.36	0.58
58-25	202	0.013	378.06	25-9	377.74	BASIN~71	2.00	4,040	3,254	0.2	0.81	0.55
59-05	230	0.013	218.09	5-151	217.32	4-1	2.00	5,877	8,301	0.3	1.41	1.00
59-24	92	0.013	298.24	24-50	297.43	30-70	2.25	13,047	5,513	0.9	0.42	0.45
59-25	196	0.013	377.54	BASIN~71	373.64	25-13	2.00	14,314	5,838	2.0	0.41	0.44
61-05	52	0.013	221.70	5-100	221.56	5-132	1.50	2,453	2,527	0.3	1.03	1.00
61-12	249	0.013	230.03	BASIN~83	229.82	12-91	1.50	1,368	1,002	0.1	0.73	0.52
6-13	227	0.013	247.50	13-8	243.20	13-7	1.50	6,495	6,211	1.9	0.96	1.00
61-30	193	0.013	317.51	BASIN~78	316.91	30-42	1.50	2,628	2,313	0.3	0.88	0.70
6-14	252	0.013	361.33	14-15A.1	346.37	14-15	1.00	3,901	4,277	6.0	1.10	0.84
6-16	324	0.013	232.34	BASIN~92	222.62	16-110	1.50	8,168	7,447	3.0	0.91	0.94
62-07	115	0.013	231.74	BASIN~36	231.33	7-136	1.50	2,810	3,333	0.4	1.19	0.95
62-12	81	0.013	229.82	12-91	229.75	KJ-178	2.00	2,990	999	0.1	0.33	0.30
62-25	121	0.013	373.54	25-13	368.61	25-15	2.00	20,480	5,858	4.1	0.29	0.37
62-30	181	0.013	317.68	BASIN~77	316.91	30-42	1.50	3,079	1,633	0.4	0.53	0.57
6-30	105	0.013	309.89	BASIN~63	309.54	30-8	2.00	5,865	4,895	0.3	0.83	0.94
63-05	135	0.013	222.05	BASIN~41	221.70	5-100	1.50	2,398	2,678	0.3	1.12	1.00
63-07	46	0.013	231.33	7-136	231.08	7-137	1.50	3,460	3,332	0.5	0.96	0.93
63-12	23	0.013	229.65	KJ-178	229.61	12-93	2.00	4,265	999	0.2	0.23	0.27
63-25	219	0.013	368.51	25-15	358.76	25-17	2.00	21,412	5,878	4.4	0.27	0.49
63-30	161	0.013	316.91	30-42	316.34	30-43	2.00	6,041	3,491	0.4	0.58	0.40
64-07	85	0.013	231.08	7-137	230.94	7-142	1.50	1,911	3,332	0.2	1.74	0.83
64-12	188	0.013	229.51	12-93	228.90	12-71	2.00	5,781	1,000	0.3	0.17	0.28
64-30	9	0.013	316.34	30-43	316.04	30-44	2.00	18,777	3,493	3.4	0.19	0.29
65-07	315	0.013	234.25	7-47	233.20	7-46	1.50	2,724	1,652	0.3	0.61	0.74
65-12	103	0.013	229.80	12-71	227.20	12-72	1.00	2,540	0	2.5	0.00	0.00
66-07	345	0.013	236.92	7-60	234.25	7-47	1.50	4,150	1,652	0.8	0.40	0.50
66-25	249	0.013	358.68	25-17	357.32	25-19	2.00	7,501	5,898	0.5	0.79	0.69
67-05	35	0.013	218.76	BASIN~43	218.76	5-144	2.00	547	8,290	0.0	15.17	1.00
67-07	178	0.013	237.77	7-62	236.92	7-60	1.50	3,257	1,652	0.5	0.51	0.47

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 Project No.: 215004-025

Existing Conduit Parameters and 25-Year Storm Event Results

Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
67-12	91	0.013	226.30	12-72	224.24	BASIN~80	1.50	7,089	2,783	2.3	0.39	0.66
68-12	41	0.013	224.24	BASIN~80	224.05	12-74	2.00	6,893	5,969	0.5	0.87	0.49
68-25	103	0.013	357.24	25-19	356.91	25-180	2.00	5,717	5,917	0.3	1.04	0.75
69-07	228	0.013	244.80	7-74	237.77	7-62	1.50	8,275	1,652	3.1	0.20	0.40
69-12	177	0.013	227.54	BASIN~84	226.40	12-72	1.50	3,783	2,783	0.6	0.74	0.64
69-25	138	0.013	356.82	25-20	355.94	25-45	2.50	14,681	5,933	0.6	0.40	0.83
70-07	190	0.013	246.49	BASIN~18	245.60	7-77	1.50	3,225	2,211	0.5	0.69	1.00
70-07A	83	0.013	245.70	7-77	245.50	7-74	0.83	484	1,652	0.2	3.41	0.97
70-25	146	0.013	352.88	BASIN~72	350.64	25-135	1.50	5,833	4,238	1.5	0.73	0.63
71-07	244	0.013	236.68	BASIN~07	235.83	BASIN~05	1.50	2,785	2,089	0.3	0.75	0.88
7-13.1	228	0.013	249.50	BASIN~29	247.50	13-8	1.50	4,412	6,212	0.9	1.41	1.00
71-30	71	0.013	313.34	30-45	310.90	30-47	4.00	119,481	26,051	3.4	0.22	0.32
7-14	194	0.013	384.30	14-15A	370.33	14-15A.2	1.00	4,301	4,299	7.2	1.00	1.00
7-14.1	153	0.013	370.33	14-15A.2	361.33	14-15A.1	1.00	3,884	4,267	5.9	1.10	1.00
72-07	296	0.013	242.37	BASIN~09	239.23	7-29	1.50	4,856	2,363	1.1	0.49	0.49
72-30	263	0.013	313.97	30-44	313.34	30-45	4.00	31,553	27,170	0.2	0.86	0.46
7-30	112	0.013	308.59	30-7	307.49	30-6	2.00	10,062	5,521	1.0	0.55	1.00
73-07	58	0.013	238.38	7-29	238.04	BASIN~13	1.50	3,602	2,363	0.6	0.66	1.00
73-25	124	0.013	348.27	25-54	347.38	25-57	1.50	3,988	3,781	0.7	0.95	1.00
73-30	394	0.013	314.91	30-32	313.97	30-44	4.00	31,475	22,522	0.2	0.72	0.61
74-30	362	0.013	315.79	31-3	314.91	30-32	4.00	31,783	22,468	0.2	0.71	0.62
75-07	114	0.013	230.70	7-142	230.12	BASIN~35	2.00	7,256	3,331	0.5	0.46	0.60
78-11	216	0.013	224.50	12-134	223.99	16-111	1.50	2,292	3,930	0.2	1.71	1.00
79-12	49	0.013	227.05	BASIN~81	226.24	12-87	1.50	6,064	6,067	1.7	1.00	1.00
79-25	163	0.013	347.38	25-57	346.18	25-60	1.50	4,039	3,801	0.7	0.94	1.00
80-11	218	0.013	211.00	11-96	209.70	11-95	1.50	3,638	5,258	0.6	1.45	1.00
80-12	146	0.013	226.14	12-87	224.22	12-88	1.50	5,414	6,067	1.3	1.12	1.00
80-25	43	0.013	346.33	25-60	345.74	25-122	1.50	5,528	3,822	1.4	0.69	1.00
81-12	83	0.013	224.12	12-88	223.28	12-89	1.50	4,733	6,068	1.0	1.28	1.00
81-25	230	0.013	350.32	25-79	344.95	25-122	3.00	45,734	25,379	2.3	0.55	0.77
8-13	353	0.013	238.18	13-10	236.42	BASIN~48	2.00	7,172	9,116	0.5	1.27	1.00
8-14.1	142	0.013	386.10	BASIN~26	385.40	14-14	1.50	3,316	3,437	0.5	1.04	1.00
8-17	209	0.013	244.11	17-93	231.01	17-74	1.50	11,819	7,486	6.3	0.63	0.79
82-12	85	0.013	223.18	12-89	223.00	12-90	1.50	2,175	6,068	0.2	2.79	1.00
8-30	95	0.013	309.54	30-8	308.59	30-7	2.00	10,136	5,522	1.0	0.54	0.99
83-06	185	0.013	225.48	6-86	224.42	BASIN~34	2.50	13,919	11,997	0.6	0.86	1.00

Client: City of Silverton  
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Existing Conduit Parameters and 25-Year Storm Event Results

Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
83-12	318	0.013	222.40	12-90	221.39	12-18	2.00	5,725	7,228	0.3	1.26	1.00
84-06	145	0.013	226.39	12-295	225.48	6-86	2.50	14,585	12,007	0.6	0.82	1.00
84-12	90	0.013	225.67	12-19	225.00	12-90	1.00	1,380	1,018	0.7	0.74	0.87
84-25	120	0.013	351.21	25-77	350.42	25-79	3.00	24,319	25,359	0.7	1.04	0.82
85-12	106	0.013	231.01	17-74	227.05	BASIN-81	1.50	9,103	7,487	3.7	0.82	1.00
85-25	71	0.013	351.72	25-75	351.31	25-77	3.00	22,707	25,339	0.6	1.12	0.83
86-12	125	0.013	227.85	12-20	225.87	12-19	1.00	2,011	999	1.6	0.50	0.51
87-12	70	0.013	228.44	12-76	228.05	12-20	1.00	1,192	999	0.6	0.84	0.66
90-25	100	0.013	352.42	25-72	351.82	25-75	3.00	23,137	25,318	0.6	1.09	0.83
91-25	157	0.013	353.08	25-73	352.49	25-72	3.00	18,357	17,896	0.4	0.97	0.82
9-13	385	0.013	241.53	BASIN-50	238.18	13-10	2.00	9,475	9,116	0.9	0.96	1.00
9-14	70	0.013	385.30	14-14	384.70	14-15A	1.50	4,355	3,448	0.9	0.79	1.00
9-17	71	0.013	248.51	17-92	244.11	17-93	1.50	11,739	7,486	6.2	0.64	0.58
92-25	427	0.013	354.35	25-70	352.52	25-72	2.50	12,058	7,410	0.4	0.61	0.77
97-06	142	0.013	216.40	6-100	215.75	500-8	1.50	3,195	4,487	0.5	1.40	1.00
98-25	292	0.013	356.43	25-64	354.45	25-70	2.50	15,168	7,411	0.7	0.49	0.51
C-1	63	0.030	213.00	6-137	211.74	BASIN-33	1.50	25,973	11,761	2.0	0.45	0.92
C-10A	16	0.030	220.25	400-56	220.63	400-34	2.00	46,817	11,269	2.3	0.24	1.00
C-10B	160	0.030	220.43	400-35	219.20	NODE-912	2.00	26,948	11,400	0.8	0.42	1.00
C-11	266	0.030	217.78	400-33	217.30	400-59	1.00	7,064	6,758	0.2	0.96	1.00
C-12	444	0.030	217.20	400-60	213.00	500-7	1.00	35,645	6,754	0.9	0.19	0.69
C-13A	248	0.030	215.38	400-39	212.38	400-26	2.50	61,338	4,475	1.2	0.07	0.61
C-13B	50	0.030	212.13	400-27	211.45	BASIN-94	2.50	65,023	15,668	1.4	0.24	1.00
C-13B.1	351	0.030	211.45	BASIN-94	212.50	400-24	2.50	30,482	3,763	0.3	0.12	0.93
C-14	93	0.030	216.61	400-41	215.59	400-38	6.00	807,161	4,432	1.1	0.01	0.12
C-18A	55	0.030	251.20	8-178	250.50	NODE904	1.70	19,229	18,006	1.3	0.94	1.00
C-18B	512	0.030	250.50	NODE904	244.10	500-11	1.80	15,281	15,122	1.3	0.99	1.00
C-2	154	0.030	213.50	500-1	211.74	NODE927	2.00	12,582	10,878	1.1	0.86	0.91
C-20	396	0.030	248.60	500-9	244.10	500-11	2.00	54,362	17,727	1.1	0.33	0.75
C-21	446	0.030	244.10	500-11	237.43	7-32	4.00	88,336	32,634	1.5	0.37	0.69
C-22	409	0.030	237.19	BASIN-14	236.51	500-14	4.00	105,792	40,448	0.2	0.38	0.78
C-23	401	0.030	238.04	BASIN-13	236.51	500-12	3.00	107,709	2,836	0.4	0.03	0.80
C-24A	463	0.030	236.34	500-14	234.92	NODE1433	3.64	55,623	42,225	0.3	0.76	0.81
C-24B	20	0.030	234.70	NODE1435	234.59	BASIN-04	3.64	74,461	43,521	0.6	0.58	0.69
C-26	65	0.030	236.51	500-12	236.34	500-14	4.00	47,060	2,600	0.3	0.06	0.85
C-27	87	0.030	213.93	400-21	211.40	500-15	5.00	497,312	47,068	2.9	0.09	0.28

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							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
C-28	106	0.030	216.22	2-12	214.03	400-20	4.00	421,035	46,391	2.1	0.11	0.55
C-29B	47	0.030	219.28	2-13	216.22	2-12	4.00	520,597	6,272	6.5	0.01	0.18
C-30	63	0.030	222.08	400-19	219.28	2-1	3.00	202,178	4,828	4.5	0.02	0.27
C-31A	243	0.030	224.33	500-18	223.05	400-18	2.50	53,746	9,939	0.5	0.18	0.38
C-31B	140	0.030	223.05	400-18	221.80	2-52	2.50	70,004	5,420	0.9	0.08	0.39
C-34	70	0.030	217.30	400-31	215.60	500-19	2.00	47,872	5,340	2.4	0.11	0.44
C-35A	271	0.030	220.98	6-2	219.00	BASIN~02	3.00	41,747	5,565	0.7	0.13	0.40
C-36	122	0.030	215.60	500-19	213.60	500-20	2.00	39,312	15,452	1.6	0.39	0.59
C-37	490	0.030	221.53	2-53	217.70	400-28	2.00	20,019	5,344	0.8	0.27	0.49
C-38	614	0.030	227.74	7-147	224.33	500-18	3.00	85,606	9,978	0.6	0.12	0.34
C-39A	180	0.030	231.17	7-13	229.78	BASIN~15	3.00	91,086	8,811	0.8	0.10	0.80
C-3A	52	0.030	214.90	400-9	214.28	6-136	2.00	42,987	13,259	1.2	0.31	0.72
C-3B	185	0.030	216.50	6-113	215.00	400-8	2.00	35,322	11,390	0.8	0.32	0.78
C-4	121	0.030	217.20	NODE929	216.50	6-113	2.00	29,775	11,390	0.6	0.38	0.61
C-40	516	0.030	224.05	12-74	220.54	12-18	4.00	358,236	5,906	0.7	0.02	0.60
C-41	14	0.030	215.68	16-119	215.40	400-40	5.00	2,852,155	5,107	2.0	0.00	0.54
C-41A	102	0.030	309.37	13-25	308.39	KJ-140	1.80	22,450	2,917	1.0	0.13	0.46
C-41B	92	0.030	302.57	14-27	301.50	BASIN~24	2.80	71,973	2,597	1.2	0.04	0.23
C-43	81	0.030	308.94	30-2	307.91	30-69	2.00	13,960	5,521	1.3	0.40	0.78
C-44	297	0.030	331.76	25-111	323.54	31-11	4.71	242,162	29,150	2.8	0.12	0.77
C-45	228	0.030	338.57	25-124	332.10	25-110	5.00	231,122	29,142	2.8	0.13	0.66
C-46A	158	0.030	344.95	25-122	343.41	25-131	4.89	141,433	29,105	1.0	0.21	0.61
C-46B	217	0.030	343.41	25-131	339.35	25-123	4.89	196,192	29,141	1.9	0.15	0.70
C-47A	486	0.030	298.83	BASIN~19	280.50	NODE1452	3.00	127,966	15,957	3.8	0.12	0.33
C-47B	737	0.030	280.50	NODE1452	260.00	NODE1453	3.00	109,831	15,892	2.8	0.14	0.36
C-48	77	0.030	252.50	NODE1454	251.20	8-178	1.80	16,674	15,587	1.6	0.93	1.00
C-49	400	0.030	260.00	NODE1453	252.50	NODE1454	2.50	69,106	15,824	1.9	0.23	0.67
C-5	237	0.030	214.00	500-2	213.50	500-1	2.50	9,009	10,883	0.2	1.21	0.88
C-50A	131	0.030	212.30	400-25	211.70	500-7	2.50	34,446	3,771	0.5	0.11	0.96
C-50B	465	0.030	211.70	500-7	211.00	11-96	2.50	19,781	8,284	0.2	0.42	1.00
C-51	515	0.030	248.98	8-59	248.85	NODE1459	2.50	8,120	17,527	0.0	2.16	0.79
C-6A	109	0.030	215.75	500-8	215.90	400-62	2.40	13,214	4,586	0.1	0.35	1.00
C-6B	253	0.030	215.58	BASIN~32	214.00	500-2	3.00	20,064	10,955	0.6	0.55	0.88
C-7	361	0.030	222.65	6-111	220.33	NODE1501	3.00	130,244	28,449	0.6	0.22	1.00
C-9A	92	0.030	222.55	16-131	221.95	400-42	2.50	64,491	4,493	0.7	0.07	1.00
C-9B	10	0.030	221.04	400-43	220.72	400-57	2.50	142,753	4,357	3.2	0.03	1.00



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							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
LINK5	252	0.013	450.04	BASIN~58	427.49	NODE1419	1.00	4,794	4,823	9.0	1.01	1.00
LINK6	317	0.013	429.65	NODE~1446	420.80	NODE1445	1.00	2,672	3,168	2.8	1.19	1.00
LINK677	40	0.013	354.34	NODE1424	354.31	KJ-12	2.00	2,784	4,463	0.1	1.60	1.00
LINK685	93	0.013	227.97	17-135	227.88	NODE1437	3.00	9,329	0	0.1	0.00	0.00
LINK686	102	0.013	229.59	STOR_10	228.54	NODE1437	0.83	997	0	1.0	0.00	0.00
LINK687	49	0.013	229.59	STOR_10	226.93	17-138	0.83	2,292	0	5.4	0.00	0.00
LINK689	38	0.013	227.54	17-134	227.16	NODE1440	1.00	1,607	0	1.0	0.00	0.00
LINK690	7	0.013	227.06	NODE1440	227.03	BASIN~89	1.00	1,018	0	0.4	0.00	0.00
LINK695	109	0.013	226.89	1465~COPY	226.41	BASIN~90	1.00	1,060	2,145	0.4	2.02	1.00
LINK696	10	0.013	420.80	NODE1445	420.74	BASIN~56	1.00	1,239	7,414	0.6	5.99	1.00
LINK7	214	0.013	421.75	NODE1419	420.84	NODE1445	1.00	1,044	4,469	0.4	4.28	1.00
LINK704	120	0.013	433.46	BASIN~57	429.65	NODE~1446	1.00	2,850	3,168	3.2	1.11	1.00
LINK717	32	0.013	320.37	KJ-16	320.09	31-86	4.00	60,062	25,310	0.9	0.42	0.89
LINK718	39	0.013	226.41	BASIN~90	226.34	12-135	1.00	680	1,814	0.2	2.67	1.00
LINK719	227	0.013	226.34	12-135	225.10	12-134	1.00	1,182	1,814	0.5	1.54	1.00
LINK729	69	0.013	315.64	NODE1480	314.94	13-21	1.25	2,921	369	1.0	0.13	1.00
LINK732	219	0.013	334.07	NODE1486	328.34	NODE1484	1.00	2,588	3,811	2.6	1.47	1.00
LINK734	84	0.013	327.34	NODE1485	320.34	NODE1481	2.00	29,341	2,785	8.4	0.09	0.21
LINK736	353	0.013	408.24	NODE1487	408.10	KJ-330	3.00	5,964	9,381	0.0	1.57	1.00
LINK737	118	0.013	408.10	NODE1488	405.80	KJ-180	1.00	2,237	4,108	2.0	1.84	1.00
LINK738	221	0.013	401.88	NODE1489	394.01	KJ-224	1.00	3,020	3,012	3.6	1.00	1.00
SIPHON	98	0.013	251.09	8-61	250.98	BASIN~11	0.50	84	508	0.1	6.03	1.00
SW-101	57	0.013	258.80	KJ-110	258.40	KJ-112	1.25	2,422	500	0.7	0.21	0.31
SW-103	104	0.013	258.10	KJ-112	257.10	KJ-114	1.25	2,846	500	1.0	0.18	0.28
SW-105	125	0.013	256.70	KJ-114	244.23	OFALL_14	1.25	9,180	500	10.0	0.05	0.16
SW-11	10	0.013	252.57	KJ-10	252.46	8-37	1.00	1,702	784	1.1	0.46	1.00
SW-121	210	0.013	266.69	KJ-132	265.93	23-3	1.50	7,951	5,210	2.8	0.66	0.80
SW-123	35	0.030	308.39	KJ-140	308.00	13-24	2.00	13,076	2,927	1.1	0.22	0.44
SW-125	173	0.013	245.70	KJ-144	244.30	KJ-142	1.25	2,606	0	0.8	0.00	0.00
SW-127	267	0.013	244.10	KJ-142	242.37	BASIN~09	1.25	2,335	0	0.6	0.00	0.30
SW-129	457	0.013	243.10	KJ-146	240.40	KJ-148	1.25	2,230	0	0.6	0.00	0.08
SW-131	4	0.013	240.40	KJ-148	240.40	BASIN~03	2.00	1,589	42	0.0	0.03	0.10
SW-133	365	0.013	244.65	KJ-176	240.41	KJ-174	1.50	5,084	0	1.2	0.00	0.00
SW-135	86	0.013	240.31	KJ-174	239.68	KJ-172	1.50	4,025	0	0.7	0.00	0.00
SW-137	59	0.013	239.58	KJ-172	239.06	KJ-170	1.50	4,424	0	0.9	0.00	0.00
SW-139	220	0.013	238.96	KJ-170	237.27	KJ-168	1.50	4,131	0	0.8	0.00	0.00

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							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
SW-141	84	0.013	237.17	KJ-168	236.65	KJ-166	1.50	3,700	0	0.6	0.00	0.00
SW-143	50	0.013	236.50	KJ-166	236.11	KJ-164	1.50	4,174	0	0.8	0.00	0.00
SW-145	132	0.013	236.01	KJ-164	234.70	KJ-162	1.50	4,700	0	1.0	0.00	0.00
SW-147	128	0.013	234.60	KJ-162	233.30	KJ-160	1.50	4,743	0	1.0	0.00	0.00
SW-149	239	0.013	233.20	KJ-160	231.32	KJ-158	1.50	4,184	0	0.8	0.00	0.00
SW-151	117	0.013	231.32	KJ-158	231.14	KJ-156	1.50	1,846	0	0.2	0.00	0.00
SW-153	61	0.013	231.04	KJ-156	230.95	KJ-154	1.50	1,815	0	0.1	0.00	0.00
SW-155	101	0.013	230.85	KJ-154	230.70	KJ-152	1.50	1,817	10	0.1	0.01	0.11
SW-157	45	0.013	230.60	KJ-152	230.53	BASIN-83	1.50	1,858	24	0.2	0.01	0.24
SW-159	149	0.013	405.60	KJ-180	402.08	NODE1489	0.83	1,514	1,886	2.4	1.25	1.00
SW-161	116	0.013	398.25	KJ-184	384.64	KJ-186	0.83	3,373	3,151	11.8	0.93	1.00
SW-163	261	0.013	384.64	KJ-186	360.24	KJ-226	0.83	3,013	3,064	9.4	1.02	1.00
SW-17	28	0.010	216.39	BASIN-56	415.32	19-1	0.50	717	1,364	4.8	1.90	1.00
SW-179	80	0.013	305.03	KJ-202	304.69	KJ-204	1.50	3,070	5,311	0.4	1.73	1.00
SW-181	99	0.013	304.06	KJ-204	303.70	KJ-206	1.50	2,836	5,311	0.4	1.87	1.00
SW-183	94	0.013	303.28	KJ-206	303.02	KJ-208	1.00	841	2,577	0.3	3.06	0.95
SW-185	365	0.030	303.02	KJ-208	298.40	KJ-307	2.00	31,841	5,622	1.3	0.18	0.43
SW-187	64	0.013	298.40	KJ-307	296.87	KJ-308	2.00	15,664	5,622	2.4	0.36	0.39
SW-189	106	0.030	296.87	KJ-308	293.83	KJ-309	2.00	47,907	5,621	2.9	0.12	0.68
SW-191	46	0.013	293.83	KJ-309	292.20	2186	1.50	8,877	5,634	3.5	0.63	0.78
SW-193	75	0.030	286.58	KJ-310	283.21	KJ-311	2.00	60,141	5,622	4.5	0.09	0.38
SW-195	23	0.013	283.21	KJ-311	282.49	KJ-312	1.67	11,049	5,621	3.1	0.51	0.56
SW-197	140	0.013	282.49	KJ-312	278.12	KJ-313	1.67	11,020	5,621	3.1	0.51	0.80
SW-199	252	0.013	345.37	KJ-222	343.29	KJ-188	4.50	80,164	2,517	0.8	0.03	1.00
SW-201	207	0.013	392.61	KJ-224	392.44	2182	4.00	18,460	3,027	0.1	0.16	1.00
SW-203	187	0.013	392.44	2182	392.30	NODE1491	4.00	17,651	924	0.1	0.05	1.00
SW-205	13	0.013	398.25	2182	397.90	KJ-184	0.83	85	2,180	0.0	25.74	1.00
SW-207	192	0.013	360.06	KJ-226	344.15	KJ-188	0.83	2,836	2,826	8.3	1.00	1.00
SW-209	271	0.013	343.29	KJ-188_DUMMY	342.63	KJ-190	1.25	1,431	4,129	0.2	2.89	1.00
SW-21	59	0.013	217.80	KJ-26	216.22	2-12	3.00	49,075	43,807	2.7	0.45	0.43
SW-211	399	0.013	342.58	KJ-190	331.90	KJ-194	1.25	4,745	5,415	2.7	1.14	1.00
SW-213	412	0.013	331.90	KJ-194	319.57	KJ-190	1.25	5,019	5,576	3.0	1.11	0.84
SW-215	275	0.013	319.57	KJ-290	305.03	KJ-292	1.25	6,673	5,310	5.3	0.80	0.84
SW-219	7	0.013	309.30	13-23	309.37	13-25	0.67	553	2,907	1.0	5.26	1.00
SW-221	124	0.013	392.38	NODE1491_DUMMY	392.00	KJ-300	1.00	887	939	0.3	1.06	0.72
SW-223	132	0.013	292.20	2186	286.58	KJ-310	1.50	9,714	5,623	4.2	0.58	0.50

Client: City of Silverton  
 Project: Stormwater Master Plan  
 Project No.: 215004-025

Existing Conduit Parameters and 25-Year Storm Event Results

Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
SW-225	179	0.013	391.90	KJ-300	377.50	KJ-302	1.00	4,540	2,342	8.1	0.52	0.75
SW-227	155	0.013	377.50	KJ-302	372.20	2177	0.83	1,821	2,029	3.4	1.11	1.00
SW-229	87	0.013	371.40	2177	368.60	KJ-303	1.00	2,865	2,051	3.2	0.72	0.63
SW-231	170	0.013	368.40	KJ-303	358.10	2180	1.00	3,941	2,054	6.1	0.52	0.51
SW-233	255	0.013	356.80	2180	342.40	KJ-306	1.50	11,214	2,059	5.7	0.18	0.42
SW-235	73	0.013	342.40	KJ-306	338.14	KJ-32	1.50	11,436	6,825	5.9	0.60	0.56
SW-237	8	0.013	218.90	KJ-320	218.81	KJ-322	1.75	7,404	4,170	1.1	0.56	1.00
SW-239	38	0.013	218.81	KJ-322	218.81	BASIN~43	1.75	366	4,167	0.0	11.38	1.00
SW-241	619	0.013	306.10	13-23	301.30	14-23	1.50	2,161	4,361	0.2	2.02	0.77
SW-249	13	0.013	305.33	KJ-324	305.22	30-2	2.00	9,316	5,523	0.8	0.59	1.00
SW-257	13	0.010	416.85	KJ-334	415.91	19-1	0.83	3,442	4,915	7.2	1.43	1.00
SW-27	330	0.013	338.14	KJ-32	318.91	KJ-34	1.50	11,387	6,822	5.8	0.60	0.56
SW-29	319	0.013	318.71	KJ-34	305.73	KJ-36	1.50	9,511	6,828	4.1	0.72	0.69
SW-307	82	0.013	228.84	STOR_12	226.90	KJ-332	1.50	7,235	4,244	2.4	0.59	1.00
SW-31	34	0.013	305.53	KJ-36	304.84	KJ-38	1.50	6,705	6,771	2.0	1.01	0.91
SW-33	79	0.013	304.64	KJ-38	304.00	KJ-40	2.00	9,156	6,779	0.8	0.74	0.64
SW-35	91	0.030	304.00	KJ-40	303.59	BASIN~24	2.60	25,436	6,779	0.5	0.27	0.37
SW-37	227	0.013	219.13	KJ-44	218.35	KJ-46	2.50	10,787	2,720	0.3	0.25	0.42
SW-371	326	0.013	303.60	14-23	300.90	BASIN~24	2.50	20,130	4,731	1.2	0.24	0.44
SW-39	196	0.013	218.30	KJ-46	217.95	KJ-48	2.50	7,773	2,736	0.2	0.35	0.57
SW-41	21	0.013	217.78	KJ-48	217.92	KJ-50	2.50	14,992	2,750	0.7	0.18	0.66
SW-43	194	0.013	217.81	KJ-50	217.47	KJ-52	2.50	7,714	2,763	0.2	0.36	0.73
SW-45	294	0.013	217.50	KJ-52	216.58	KJ-54	2.50	10,301	10,181	0.3	0.99	0.74
SW-47	59	0.013	216.52	KJ-54	216.63	KJ-56	2.50	7,948	10,181	0.2	1.28	0.64
SW-49	40	0.013	216.73	KJ-56	216.26	500-19	2.50	19,971	10,182	1.2	0.51	0.51
SW-51	74	0.013	295.30	24-41	294.26	KJ-58	2.00	12,072	5,509	1.4	0.46	0.50
SW-53	68	0.013	294.26	KJ-58	293.55	KJ-60	2.00	10,367	5,509	1.0	0.53	0.52
SW-55	60	0.013	292.60	KJ-60	292.01	OFALL_12	2.00	10,098	5,510	1.0	0.55	0.53
SW-57	126	0.013	389.10	KJ-64	377.70	KJ-66	2.00	30,611	6,062	9.1	0.20	0.30
SW-59	118	0.013	377.60	KJ-66	370.30	KJ-68	2.00	25,315	6,082	6.2	0.24	0.34
SW-61	121	0.013	370.20	KJ-68	366.40	KJ-70	2.00	18,014	6,102	3.1	0.34	0.40
SW-63	28	0.013	366.00	KJ-70	364.80	KJ-72	2.50	38,402	6,122	4.4	0.16	0.32
SW-65	221	0.013	364.70	KJ-72	362.70	KJ-74	2.50	17,506	6,142	0.9	0.35	0.41
SW-67	157	0.013	362.60	KJ-74	359.40	KJ-76	2.50	26,318	7,374	2.0	0.28	0.36
SW-69	243	0.013	358.90	KJ-76	356.53	25-64	3.00	29,556	7,391	1.0	0.25	0.36
SW-71	48	0.013	371.35	KJ-80	371.10	KJ-82	1.50	3,390	2,186	0.5	0.64	0.57

Client: City of Silverton  
 Project: Stormwater Master Plan  
 Project No.: 215004-025

Existing Conduit Parameters and 25-Year Storm Event Results

Conduit ID (Char)	LENGTH (ft)	Manning's N (Double)	Upstream Invert (ft)	Upstream Node ID	Downstream Invert (ft)	Downstream Node ID	25-Year Storm Event					
							Full Depth (ft)	Full Flow (gpm)	Maximum Flow (gpm)	Percent Slope (%)	Max.Flow/Full Flow	Max.Depth/Full Depth
SW-73	287	0.013	371.00	KJ-82	364.30	KJ-84	1.50	7,205	2,205	2.3	0.31	0.38
SW-75	101	0.013	364.20	KJ-84	356.45	KJ-86	1.50	13,092	2,225	7.7	0.17	0.28
SW-77	301	0.013	355.45	KJ-86	352.98	BASIN~72	3.00	27,111	2,241	0.8	0.08	0.24
SW-79	56	0.013	356.59	KJ-88	355.92	KJ-90	1.25	3,167	4,999	1.2	1.58	1.00
SW-81	257	0.013	355.02	KJ-90	354.25	KJ-92	3.00	16,396	5,006	0.3	0.31	0.96
SW-83	85	0.013	354.15	KJ-92	353.84	KJ-94	2.00	6,129	5,028	0.4	0.82	1.00
SW-85	50	0.013	353.74	KJ-94	353.53	KJ-96	1.25	1,882	5,046	0.4	2.68	1.00
SW-87	36	0.013	354.43	KJ-98	353.57	KJ-96	1.00	2,486	592	2.4	0.24	1.00
SW-89	194	0.013	354.65	KJ-98	353.78	KJ-100	2.00	231	578	0.0	2.51	0.68
SW-91	115	0.013	353.42	KJ-96	353.22	25-73	3.00	12,459	17,877	0.2	1.43	0.81
SW-93	156	0.013	356.25	KJ-102	353.62	KJ-96	2.00	13,199	12,615	1.7	0.96	0.94



**Client:** City of Silverton  
**Project:** Stormwater Master Plan  
**Project No.:** 215004-025

**Existing Storage Parameters and 25-Year Storm Event Results**

Storage ID (Char)	Invert Elevation (ft)	Full Depth	Initial Water Depth (ft)	25-Year Storm Event	
				Total Inflow Volume (MG)	Average Percent Full (%)
17-139	227	8.0	0.0	0.00	0
31-12	321	6.3	0.0	24.03	10
4-1	217	5.3	0.0	2.92	16
6-111	223	5.3	0.0	10.77	19
BASIN~04	234	3.0	0.0	28.70	15
BASIN~56	417	6.5	4.0	4.22	45
BASIN~67	354	5.0	2.0	6.32	65
NODE1461	253	3.0	0.0	1.39	26
NODE1481	317	5.5	3.0	0.06	39
NODE1484	325	5.5	3.0	0.10	64
STOR_10	230	4.0	0.0	0.00	0
STOR_12	227	4.0	0.0	1.02	61