STORM DRAIN MASTER PLAN

(HAL Project No.: 160.11.100)

October 2012

DRAPER CITY
STORM DRAIN MASTER PLAN

(HAL Project No.: 160.11.100)

HANSEN ALLEN & LUCE INC
ENGINEERS

6771 South 900 East
Midvale, Utah 84047
(801) 566-5599

October 2012

ACKNOWLEDGMENTS

Successful completion of this study was made possible by the cooperation and assistance of many individuals, including the Mayor of Draper City, City Council Members, Planning Commission Members and City Staff personnel as shown below. We sincerely appreciate the cooperation and assistance provided by these individuals.

DRAPER CITY

Mayor
Darrell H. Smith

City Council
Bill Colbert
William Rappleye
Jeff Stenquist
Alan Summerhays
Troy Walker

City Staff
Troy Wolverton, City Engineer
Robert Markle, Storm Water Engineer
Karen Burnett, GIS
Douglas Ahlstrom, City Attorney

HAL PROJECT TEAM

Gregory J. Poole, Principal-In-Charge
Steven C. Jones, Project Manager
Gordon L. Jones, Project Engineer

TABLE OF CONTENTS

ACKNOWLEDGMENTS ii
HAL PROJECT TEAM ii
TABLE OF CONTENTS ii
LIST OF TABLES iii
LIST OF FIGURES iii
LIST OF APPENDIXES iv
GLOSSARY v
ABBREVIATIONS vii

CHAPTER I 1
INTRODUCTION 1
PURPOSE 1
BACKGROUND 1
AUTHORIZATION 2
STUDY AREA 2

CHAPTER II 1
EXISTING STORM DRAINAGE SYSTEM 1
NATURAL AND MAN-MADE DRAINAGES 1
Willow Creek 2
Corner Creek 2
IRRIGATION CANALS 2
Draper Canal 2
East Jordan Canal 3
Jordan and Salt Lake Canal 3
Galena Canal 3
EXISTING STORM DRAIN FACILITIES 3
Detention 3
Storm Drains and Ditches 4
Traverse Ridge Storm Drain and Natural Drainages 4

CHAPTER III 1
METHODOLOGY 1
HYDROLOGY 1
Drainage Design Frequency 1
Design Rainstorm 2
DRAINAGE BASIN CHARACTERISTICS 5
Subbasin Areas 5
Hydrologic Soil Type 5
Impervious Area 5
SCS Curve Number 6
Conveyance Characteristics 6
SCS Lag Time 6
DEVELOPMENT OF THE STORM DRAINAGE MODEL 7
Methodology 7
FUTURE LAND USE AND HYDROLOGIC CHARACTERISTICS 11

COMPUTATION OF RUNOFF HYDROGRAPHS 11

CHAPTER IV 1
STORM DRAINAGE ANALYSIS 1
EXISTING AND FUTURE STORM DRAIN CAPACITY AND DEFICIENCIES 1
10-YEAR VERSUS 100-YEAR ANALYSIS 1

CHAPTER V 1
CAPITAL FACILITIES PLAN 1
PREFERRED DRAINAGE PLAN DEVELOPMENT 1
PRECISION OF COST ESTIMATES 2
ESTIMATED CONSTRUCTION COSTS 3

REFERENCES 1

LIST OF TABLES

NO.	TITLE	PAGE
III-1	DESIGN RAINFALL DEPTHS FOR URBAN AREAS	III-3
III-2	DESIGN RAINFALL DEPTHS FOR MOUNTAIN AND TRAVERSE RIDGE AREAS	III-4
V-1	CAPITAL IMPROVEMENT PLAN AND IDENTIFIED DEFICIENCIES	V-2
V-2	CAPITAL IMPROVEMENT PLAN FOR REGIONAL PLANNED AREAS	V-12
V-3	CAPITAL IMPROVEMENT COST ALLOCATION FOR REGIONAL PLANNED AREAS	V-13

LIST OF FIGURES

NO.	TITLE	PAGE
I-1	SERVICE AREA AND DRAINAGE BASIN MAP	I-2
II-1	WILLOW CREEK EXISTING STORM DRAINAGE SYSTEM	II-1
II-2	CORNER CREEK EXISTING STORM DRAINAGE SYSTEM	II-1
II-3	SOUTH SIDE OF TRAVERSE MOUNTAIN EXISTING STORM DRAINAGE SYSTEM	II-1
III-1	URBAN STORM DRAINAGE CRITERIA	III-1
III-2	PRECIPITATION AREAS	III-3
III-3	WILLOW CREEK SUBBASINS	III-4
III-4	CORNER CREEK SUBBASINS	III-4
III-5	SOUTH SIDE OF TRAVERSE MOUNTAIN SUBBASINS	III-4
III-6	SUBBASINS DIALOGUE BOX	III-9
III-7	CONVEYANCE LINKS DIALOGUE BOX	III-10
III-8	JUNCTIONS DIALOGUE BOX	III-11

IV-1 WILLOW CREEK EXISTING STORM DRAINAGE SYSTEM DEFICIENCIES IV-1
IV-2 CORNER CREEK EXISTING STORM DRAINAGE SYSTEM DEFICIENCIES..... IV-1
IV-3 SOUTH SIDE OF TRAVERSE MOUNTAIN EXISTING STORM DRAINAGE SYSTEM DEFICIENCIES IV-1
V-1 WILLOW CREEK CAPITAL IMPROVEMENTS FACILITIES PROJECTS V-1
V-2 CORNER CREEK CAPITAL IMPROVEMENTS FACILITIES PROJECTS..... V-1
V-3 SOUTH SIDE OF TRAVERSE MOUNTAIN CAPITAL IMPROVEMENTS FACILITIES PROJECTS..... V-1

LIST OF APPENDIXES

APPENDIX A EXISTING STORM DRAIN PIPE CAPACITIES
APPENDIX B PRECIPITATION DEPTHS AND DISTRIBUTIONS
APPENDIX C COST ESTIMATES
APPENDIX D DRAINAGE DESIGN CRITERIA AND SITE DEVELOPEMNT SUBMITTAL REQUIREMENTS
APPENDIX E DETENTION BASIN SURVEY

GLOSSARY

10-year storm - The storm event that has a 10% (1 in 10) chance of being equaled or exceeded in any given year.

100-year storm - The storm event that has a 1% (1 in 100) chance of being equaled or exceeded in any given year.

Acre-feet (ac-ft) - Unit of measurement often used to quantify a volume of water, 1ac-ft equals 325,830 gallons

Cross drainage structures - Cross drainage structures convey storm drainage flows from one side of the street to the other and normally consist of storm drains or culverts.

Design Rainstorm - A rainfall event, defined by storm frequency and storm duration, that is used to design drainage structures or conveyance systems.

Detention Basin - An impoundment structure designed to reduce peak runoff flow rates by detaining a portion of the runoff during periods of peak flow and then releasing the runoff at lower flow rates.

HEC-1 – The Flood Hydrograph Package developed by the U.S. Army Corps of Engineers.

Initial storm drainage system - The drainage system which provides for conveyance of the storm runoff from minor storm events. The initial drainage system usually consists of curb and gutter, storm drains, and local detention facilities. The initial drainage system should be designed to reduce street maintenance, control nuisance flooding, help create an orderly urban system, and provide convenience to urban residents.

Major storm drainage system - The drainage system that provides protection from flooding of homes during a major storm event. The major storm drainage system may include streets (including overtopping the curb onto the lawn area), large conduits, open channels, and regional detention facilities.

Major storm event - Generally accepted as the 100-year storm. Typically homes should be protected from flooding in storm events up to a 100-year event.

Minor storm event - Storm event which is less than or equal to a 10-year storm.

Probable Maximum Flood - A flood event with a very low probability, usually less than 0.2%, of being exceeded in any given year. This flood event is used as a design storm when failure of the structure could cause loss of life.

Retention Basin - An impoundment structure designed to contain all of the runoff from a design storm event. Retention basins usually contain the runoff until it evaporates or infiltrates into the ground.

Storm Duration - The length of time that defines the rainfall depth or intensity for a given

frequency.

Storm Frequency - A measure of the relative risk that the precipitation depth for a particular design storm will be equaled or exceeded in any given year. This risk is usually expressed in years. For example, a storm with a 100-year frequency will have a 1% chance of being equaled or exceeded in a given year.

ABBREVIATIONS

ac-ft	acre-feet
cfs	cubic feet per second (ft^3/s)
CH_	Open channel conveyance
cmp	corrugated metal pipe
DET_	Detention
DWSP	Drinking Water Source Protection
E	East
ft	foot or feet
GIS	Geographic Information System
HAL	Hansen, Allen & Luce, Inc.
I_	Inlet
ID #	identification number
in	inches
irr	irrigation
M_	Manhole
N	North
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resource Conservation Service
PE	polyethylene pipe
Q10	peak storm water flow in a 10-year event
Q100	peak storm water flow in a 100-year event
RR	railroad
S	South
SB_	Subbasin
SCS	Soil Conservation Service
tot	total
TR-55	Technical Release-55
W	West
w/	with
w/o	without
Xing	crossing

CHAPTER I
INTRODUCTION

PURPOSE

This Storm Drain Master Plan presents activities and public policies to manage and regulate storm water runoff caused by development to help mitigate flooding and environmental impacts. This plan will be a means for educating developers, private property owners, City staff and elected officials regarding the capability and needs of Draper City's storm drainage system. The master plan examines the existing storm drainage system and future development impact on the system. Existing and future deficiencies are identified and the preferred solution alternatives are presented with cost estimates. An implementation plan is developed with master plan projects. The City's storm drainage facility design criteria were reviewed and storm water quality management recommendations are presented.

A computer model was developed as part of the Storm Drain Master Plan that simulates water runoff during a storm event in Draper City. The City selected the storm drainage and hydraulic model StormNet. StormNet was later purchased by AutoDesk and its name changed to Storm and Sanitary Analysis and operates as a stand-alone program. Not only was the model a vital tool in analyzing the existing and future storm drainage situation for the master plan, but it will allow Draper City to continue to update and analyze for potential drainage deficiencies and facilitate the analysis of conceptual design of alternative mitigation measures.

BACKGROUND

Draper City is nestled in the southeast corner of the Salt Lake Valley with Lone Peak towering on the east and Traverse Mountain on the south. All of Traverse Mountain, in fact, lies within the boundary of the City, creating a unique setting of natural and urban blend. Developers have discovered Draper City's uniqueness. Draper City is located conveniently between two major metropolitan cities and straddles both Salt Lake and Utah Counties. The population of Draper has experienced growth during the previous decade, increasing from about 25,000 in 2000 to over 40,000 in 2010 (www.draper.ut.us). Development alone can create challenges for constructing a well-planned city-wide storm drainage system.

Major topographic relief is from the mountains to the east and south toward the Jordan River in the west. Runoff from the south side of Traverse Mountain in Utah County flows south and then west toward the Jordan River. Corner Creek and Willow Creek are the two major natural drainage areas on the Salt Lake County side of Draper City. The south side of Traverse Mountain in Utah County is part of the Dry Creek natural drainage area in Utah County.

Storm water runoff is a difficult resource to manage. In a dry climate such as Utah's, existing drainage ways are often dry and to the inexperienced citizen may appear to be prime places to construct buildings. Unlike sanitary sewers and drinking water systems, there are no clearly defined minimum service requirements for storm water systems. Storm water flows are dependent on many complex time and spatially varied factors. Even a natural undeveloped drainage system is not static; streams can erode in one section while depositing in another. Stream courses can also change alignment and cross section dramatically with just one storm runoff event. Urbanization compounds the problem and creates a need for a drainage system

with the basic goals of managing nuisance water, protecting development from damage, and protecting downstream waters from adverse quality and quantity impacts.

AUTHORIZATION

Draper City selected Hansen, Allen & Luce, Inc. (HAL) to assist them in preparation of this comprehensive Storm Drain Master Plan. This study has been completed in accordance with an agreement between Draper City and HAL dated April 1, 2009. Development of the Storm Drainage Master Plan was completed under the direction of, and in cooperation with City staff. The study area and major storm drainage basin boundaries are shown on Figure I-1.

STUDY AREA

The study area includes all of the area within Draper City boundaries (including Traverse Mountain) and mountain drainages tributary to areas of the City. The northern boundary of the study area is generally the boundary between Draper City and Sandy City, except for portions of Sandy City tributary to Draper City.

CHAPTER II
EXISTING STORM DRAINAGE SYSTEM

Draper City is fortunate to have Willow Creek and Corner Creek run through the City and provide a convenient discharge location for the City's storm drainage facilities. These two natural drainage features are maintained by Salt Lake County and are planned to have 100-year storm capacities. Existing storm drainage facilities in the Salt Lake County portion of Draper City rely on these two creeks for conveyance of storm water runoff from the City to the Jordan River reducing the need for large main storm drain lines. Many areas of the City continue to rely on canals. This reliance may become problematic in the future should any of the existing canals be abandoned as happened with the Draper Canal and the Galena Canal. The East Jordan Canal and the Jordan and Salt Lake Canal continue to convey storm drainage under agreements between Salt Lake County and the canal companies.

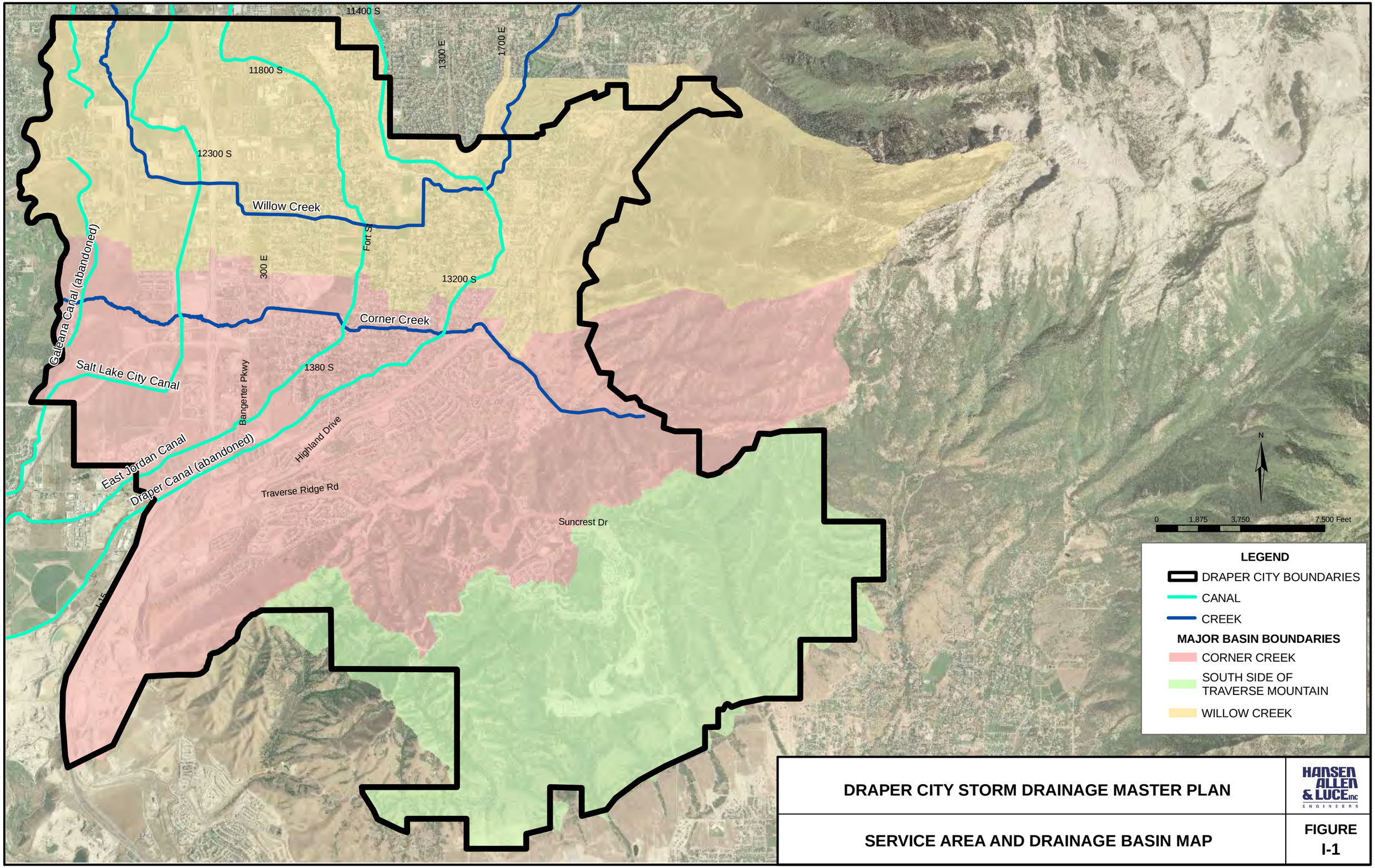
In the older developed areas of the City, storm drain facilities include, at most, road side swales and ditches conveying runoff to canals. The natural drainages were seldom used because in the past they were not well defined and had often been impacted by historic agricultural practices. Flooding had not been a problem in the past because Draper City consisted mostly of farms and open fields. That has rapidly changed over the past few decades. As farm land is developed, modern storm drain facilities are required.

The City has experienced rapid growth during the last two decades. These developed areas include roads with curb and gutter. Run-off is collected from the street with inlets and pipe which convey the water to a detention basin. The run-off is detained and released at a controlled rate directly into a creek, canal, or collector pipe that conveys the run-off from several detention outlets to a creek or canal.

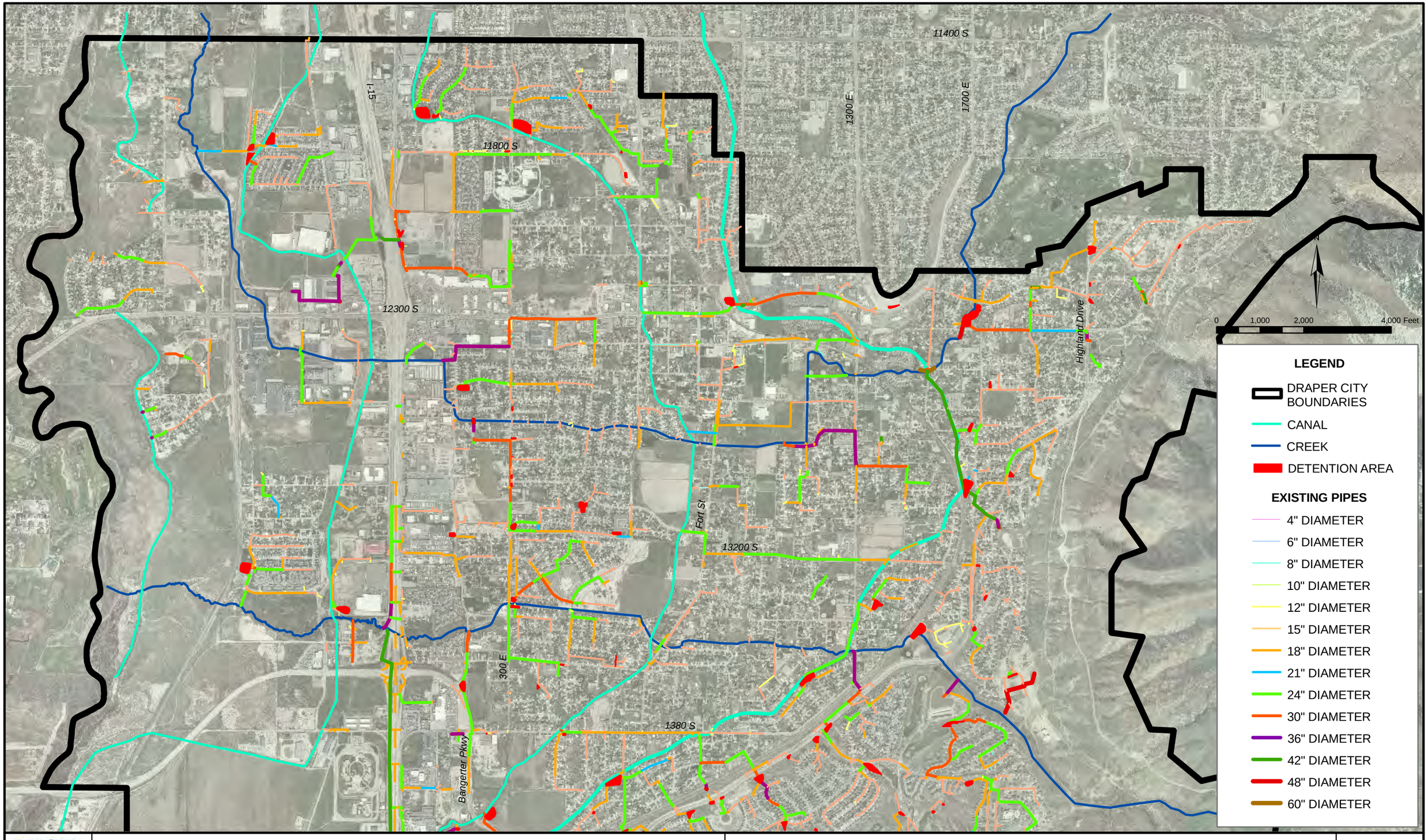
Each of these features that make up the storm drainage system facilities in Draper City is discussed in this section. Figures II-1, II-2 and II-3 show the existing storm drainage system, including the three major storm drainage basins or watersheds: Willow Creek, Corner Creek and the south side of Traverse Mountain. Detailed storm drainage existing facility maps are found in Appendix G.

NATURAL AND MAN-MADE DRAINAGES

The City's storm drain system in Salt Lake County relies heavily on Willow Creek and Corner Creek which provide the major storm drainage facilities for the City. Each stream system is under the responsibility of Salt Lake County Department of Public Works. Corner Creek had a master plan completed in 1993 by Hansen, Allen, and Luce, Inc. and Willow Creek had a master plan completed in 1996 by Montgomery Watson. The purpose of these master plans was to provide guidance for creek channel improvements and future watershed developments. The general plan for the creeks is for them to be able to convey the 100-year storm event under future development conditions.



DRAPER CITY STORM DRAINAGE MASTER PLAN	HANSEN ALLEN & LUCE INC ENGINEERS
SERVICE AREA AND DRAINAGE BASIN MAP	**FIGURE I-1**



HANSEN ALLEN & LUCE INC ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

WILLOW CREEK EXISTING STORM DRAINAGE SYSTEM

FIGURE II-1

13200 S
1380 S
300 E
Fort St
Bangerter Pkwy
I-15
Traverse Ridge Rd
Highland Drive
Suncrest Dr
N
0 1,000 2,000 4,000 Feet

LEGEND

- DRAPER CITY BOUNDARIES
- CANAL
- CREEK
- DETENTION AREA

EXISTING PIPES

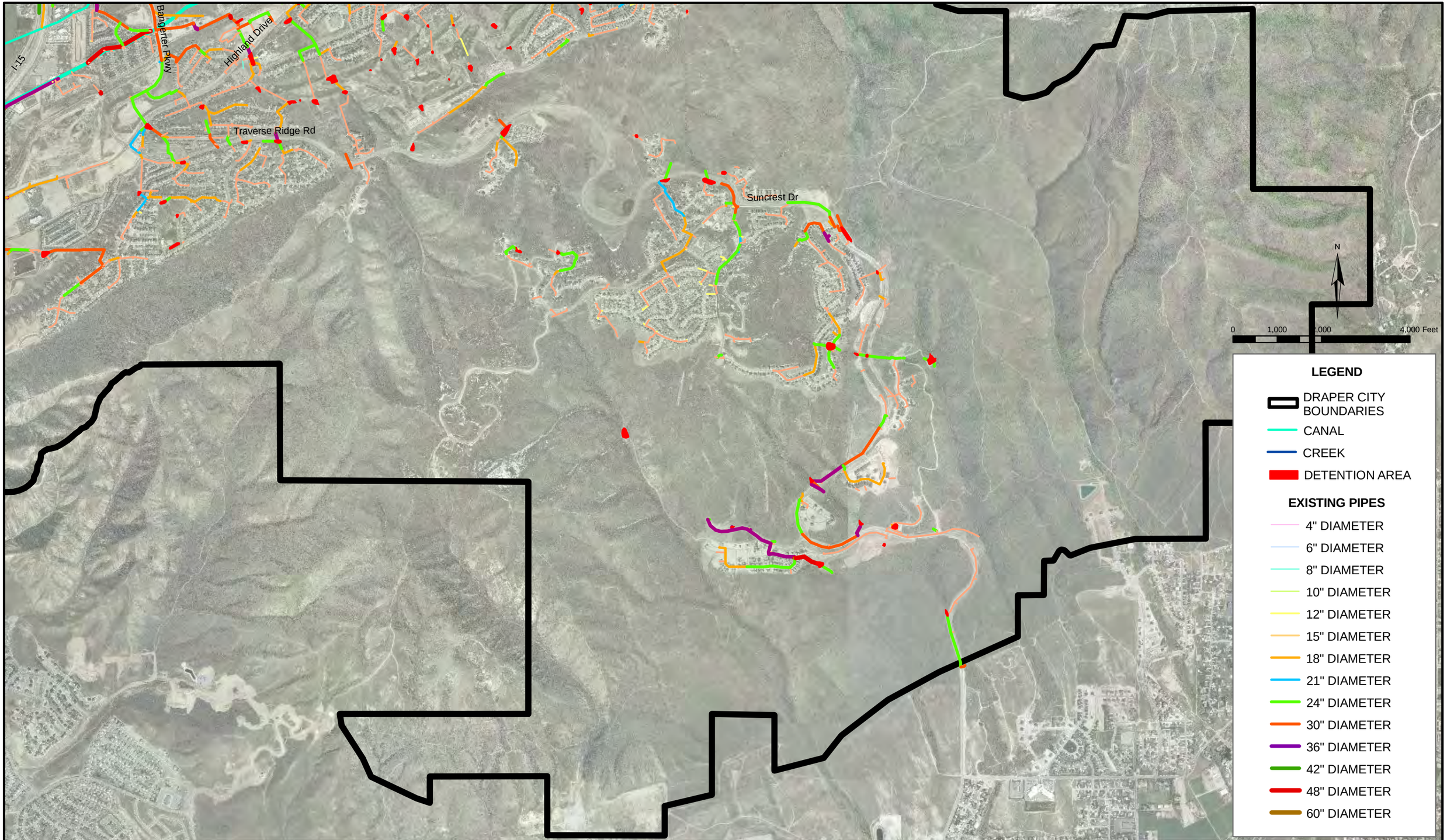
- 4" DIAMETER
- 6" DIAMETER
- 8" DIAMETER
- 10" DIAMETER
- 12" DIAMETER
- 15" DIAMETER
- 18" DIAMETER
- 21" DIAMETER
- 24" DIAMETER
- 30" DIAMETER
- 36" DIAMETER
- 42" DIAMETER
- 48" DIAMETER
- 60" DIAMETER

HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK EXISTING STORM DRAINAGE SYSTEM

FIGURE II-2



HANSEN ALLEN & LUCE INC ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

SOUTH SIDE OF TRAVERSE MOUNTAIN
EXISTING STORM DRAINAGE SYSTEM

FIGURE
II-3

Willow Creek

Willow Creek generally drains the northern portion of the City. It flows west, from the mountains on the east side of Draper City, to the Jordan River. In the past Willow Creek was diverted into the canals most of the year. Because of this, the creek channel had been greatly constricted, with some reaches disappearing completely. The 1996 master plan for Willow Creek prepared by Montgomery Watson outlined projects that would provide capacity in the Creek to convey a 100-year storm event. Several of the projects have been completed at this time. A sufficient number of improvements have been completed such that the channel has the capacity to convey a 10-year storm. Salt Lake County's goal is to provide capacity for the 100-year storm event.

Corner Creek

Corner Creek drains the southern portion of the City. It flows from the mountains, out of Corner Canyon, west to the Jordan River. Similar to Willow Creek, the Corner Creek channel has been disrupted by irrigation activities. Corner Creek was actually used to distribute water delivered through the South Field Ditch from the Draper Irrigation Canal. The Corner Creek drainage area has also had a history of sediment deposition from the mountains. The 1993 master plan prepared by Hansen, Allen and Luce, Inc. outlined projects to allow Corner Creek to convey a 100-year storm event. The projects included a debris and sediment basin at the mouth of Corner Canyon. A sufficient number of improvements have been completed such that the channel has the capacity to convey a 10-year storm. Salt Lake County's goal is to provide capacity for the 100-year storm event. The 100-year flow rates identified in the 1993 Corner Creek master plan do not exceed the capacity of the improvements presented in this Master Plan.

Tributaries to Dry Creek

The southern portion of the Traverse Mountain area contains several drainages, among them Hog Hollow, Maple Hollow, Mercer Hollow, Broadleaf Hollow and other minor drainages. All of these drainages are tributary to Dry Creek, which is located outside of the Draper City boundaries.

IRRIGATION CANALS

Four irrigation canals flow through Draper City perpendicular to Willow Creek and Corner Creek. Both the East Jordan Canal and the Jordan and Salt Lake Canal are still used to deliver irrigation water. The Galena and Draper Canals no longer carry irrigation water. All four canals, however, still receive storm drainage. Canals are usually not the best conveyances for storm water because they are designed to distribute water rather than collect it. Canal capacities decrease from upstream to downstream, while runoff flow rates increase from upstream to downstream. Water quality, debris and sediment, liability issues, and canal maintenance are problems associated with use of the canals to convey storm drainage.

Draper Canal

The Draper Canal runs from the south to the north and is the closest canal in Draper to the mountains on the east. The Draper Canal no longer conveys irrigation water and has been

purchased by Draper City. The canal has been impacted by debris and sediment. Currently the canal conveys storm water tributary to the canal to Corner Creek and Willow Creek via recently installed piping.

East Jordan Canal

The East Jordan Canal is the next canal located west of the Draper Canal. It too flows from the south to the north. The canal is owned by the East Jordan Canal Company. Salt Lake County Department of Public Works has an agreement with the East Jordan Canal Company for storm water conveyance in the East Jordan Canal. The East Jordan Canal Company currently does allow for new storm drainage connections that meet certain conditions as part of an agreement. New private connections are not allowed due to liability concerns. New Draper City connections are required to be in public roads in order to allow for maintenance and control of any future modifications that may be needed for water quality. Projects involving new connections will also be required to obtain a Salt Lake County flood control permit.

Jordan and Salt Lake Canal

The Jordan and Salt Lake Canal is the next canal located west of the East Jordan Canal. It flows from the south to the north. The canal is owned by Salt Lake City Corporation and is used to convey Utah Lake water to fulfill Salt Lake City exchange agreements. Salt Lake County has an agreement for conveyance of storm drainage. New storm drainage connections are not allowed currently.

Galena Canal

The Galena Canal is located between the Jordan and Salt Lake Canal and the Jordan River. Less than 80 cfs of storm water flows into the canal during a 10-year storm event under existing conditions. Some sections of the canal where development has occurred have been filled in. Any water in the canal before these sections is supposed to be conveyed to wetlands or the Jordan River.

EXISTING STORM DRAIN FACILITIES

From October 2008 to May 2009, Draper City conducted a city-wide inventory of their storm drain facilities, including inlets, manholes, storm drain pipes and detention facilities. The inventory was performed by City personnel using map-grade GPS equipment for location and surface elevations and manual measure-downs for pipe invert elevations.

Detention

Draper City has required recent developments to limit peak runoff flow rates from a 10-year storm event to 0.1 cfs per acre. Individual developments are required to construct facilities necessary to meet this requirement. Local drainage facilities constructed to meet the 0.1-cfs per acre runoff restriction usually consist of small on-site detention basins with outlets that limit the storm water discharge to the specified rate. Facilities intended for local runoff control are usually constructed and maintained by the property owner. Hundreds of private detentions are located throughout the City. Over 100 City owned detention basins are maintained by the City.

Stage capacity and discharge data are unavailable for most of the private detention facilities.

During 2009 and 2010, 86 City-owned detention basins were surveyed by HAL in order to determine stage-capacity and outlet characteristics. Each surveyed detention with its accompanying points was imported into AutoCad where a 3-D surface was made. From the surface, a "Stage-Storage" table was produced using an AutoCad function. Several detentions were included in the model that were not part of the survey. Where capacity problems were discovered downstream of a commercial area detention basin or where known commercial area detention basins were identified, the problems were discussed with City staff and, where appropriate, the detention basin was then modeled with 0.1 cfs per acre using a unit detention basin.

Storm Drains and Ditches

The 2008 inventory of the storm drainage piping system, including manholes and inlets, provided a fairly complete picture of the entire system. Some small areas remain unknown because of issues regarding access. Also, because of the use of the map-grade GPS during the inventory, some of the manhole surface elevations were inconsistent and caused problems in the model with reverse flow. To correct those anomalies, the City's 2-foot contours were used to adjust the manhole or inlet surface elevations. Ditch characteristics were not included in the inventory and were assumed based on 2-foot contour information. The level of detail in the inventory greatly surpassed that of the previous master plan. Pipe capacity was determined by the storm drain model. Capacities of existing storm drainage pipes can be found in Appendix A.

For the 100-year analysis, the capacity of the curb and gutter was estimated for a standard residential street with the water surface level with the crown of the road. Maximum flow capacities were calculated with Manning's equation for gutter slopes from 0.3 to 10 percent. Because gutters are often obstructed by parked cars or other obstacles, the maximum flow capacity was reduced to an allowable capacity according to a methodology outlined in the *Urban Storm Drainage Criteria Manual* (Denver Regional Council of Governments, 1990). This methodology applies a reduction factor to the maximum capacity to estimate the allowable capacity of the gutter. The reduction factor is a function of the gutter slope. Curb and gutter capacity varies from 4 to 8 cfs for the typical range of slopes allowed on residential streets. Gutter capacity was not considered unless the model indicated peak runoff was exceeding the capacity of a pipe and the pipe was installed in a street with gutters.

Most of the ditches in Draper are old irrigation ditches or roadside ditches along older roads. Open ditches require more maintenance to convey storm runoff. Many of these ditches are being replaced with piped storm drain systems during new development.

Traverse Ridge Storm Drain and Natural Drainages

The Traverse Ridge area contains multiple natural drainages that have been adversely affected by the existing storm drainage system. Constant and consistent flows were observed during multiple field visits to Coyote Hollow, Maple Hollow and Hog Hollow. These constant flows were not present prior to development and are assumed to be the result of runoff from irrigation. This constant flow during the summer months has caused significant erosion along large stretches of these drainage channels. While the existing storm drainage piping system is mostly adequate according to the model, maintenance issues with the detention basins as well as the erosion issues are significant problems that will need to be addressed in the future.

CHAPTER III
METHODOLOGY

This section describes the methodology and process followed in developing the Draper City Storm Drain Master Plan. Hydrology and basin characteristics are discussed followed by a description of the storm drainage modeling process.

HYDROLOGY

Drainage Design Frequency

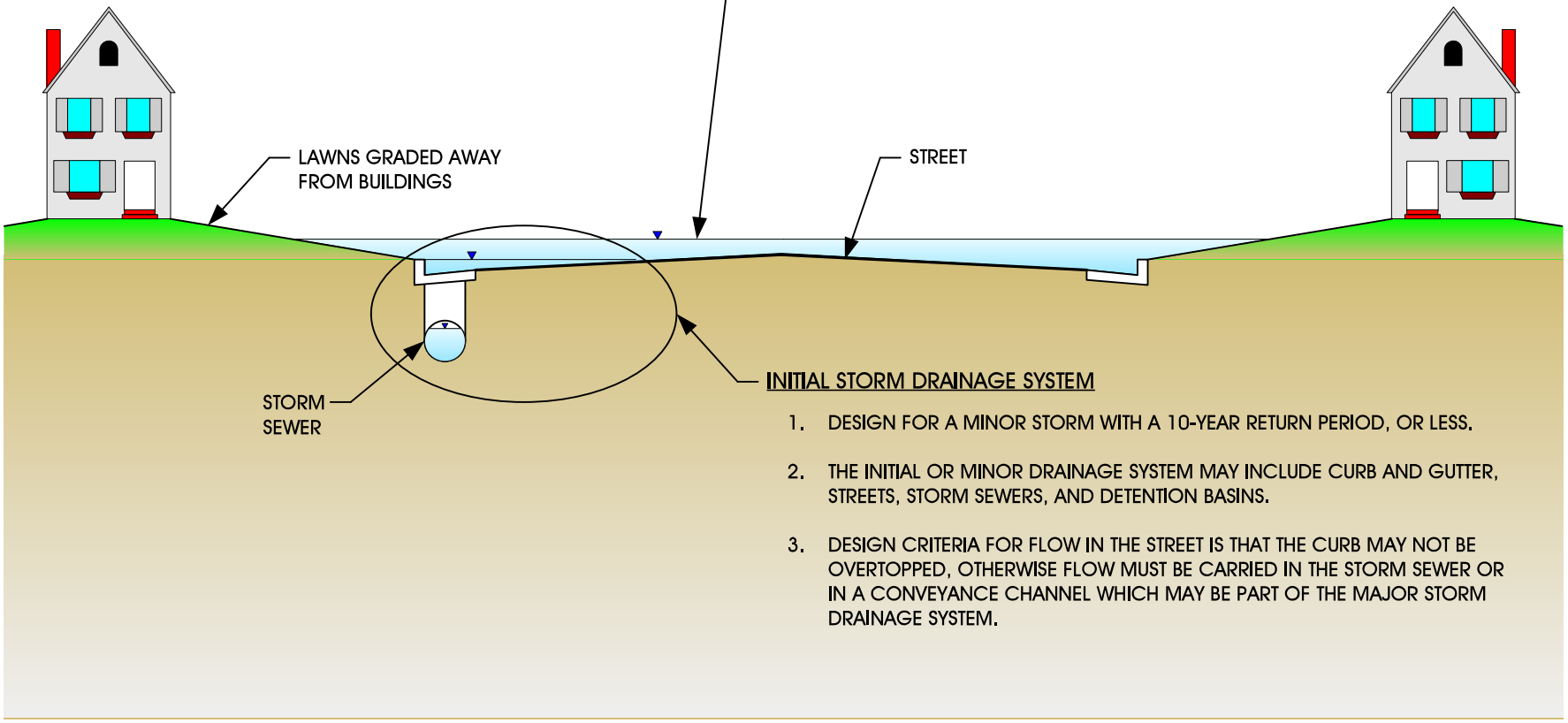
The approach selected by Draper City for determining the drainage design frequency is based upon methodology given in the *Urban Storm Drainage Criteria Manual* (Denver Regional Council of Governments, 2008). The *Urban Storm Drainage Criteria Manual* defines the urban drainage system as follows:

> "Every urban area has two separate and distinct drainage systems, whether or not they are actually planned for and designed. One is the initial system, and the other is the major system. To provide for an orderly urban growth, reduce costs to future generations, and obviate loss of life and major property damage, both systems must be planned and properly engineered." (Page DP-3)

The initial storm drainage system is sometimes referred to as the convenience system in that the initial system is designed to "reduce street maintenance costs, to provide protection against regularly recurring damage from storm runoff (of a 10-year recurrence interval or less), to help create an orderly urban system, and to provide convenience to the urban residents" (Denver Regional Council of Governments, 2008). Storm sewer systems are generally considered part of the initial storm drainage system. In conjunction with the initial storm drainage system, provisions shall be made to avoid major property damage or loss of life from a major storm event. Such provisions are considered to comprise the major storm drainage system.

The major storm drainage system in newly developing urban areas or business districts shall be designed for the 100-year event with the objective to eliminate major damage to edifices (homes, buildings, etc.) and to prevent loss of life. This does not mean that storm sewers, which are considered part of the initial storm drainage system, should be designed for the 100-year event. It means that the combination of storm sewers and channelized surface flow, which may include using part of the grassed frontage area of a home as part of a 100-year channel (see Figure III-1), shall be designed to accommodate the 100-year event thereby preventing damage to the edifice. There appears to be general agreement among most major flood control agencies that in the design of the major storm drainage system for urban areas the 1-percent storm (100-year return period) should be used, except in the design of water impoundment structures that exceed a specified capacity.

As water impoundment structures increase in volume and embankment height, the potential for property damage and loss of life increases if the impoundment fails. Selection of a design storm and other design criteria for large impoundment structures shall include an evaluation of the risks associated with failure of the impoundment. If failure of the impoundment could result in loss of life or major property damage, the spillway and outlet works for the impoundment shall be designed for the 500-year event or the Probable Maximum Flood. Design



HANSEN ALLEN & LUCE inc ENGINEERS	DRAPER CITY STORM DRAINAGE MASTER PLAN	URBAN STORM DRAINAGE CRITERIA	FIGURE III-1

requirements and other regulations for water impoundments are presented in *State of Utah Statutes and Administrative Rules for Dam Safety,* (Division of Water Rights, 1991). It is anticipated that all potential detention basins within Draper City will be classified as minor dams because they will have capacities less than 10 acre-feet and embankment heights less than 10 feet. Minor dams that do not pose a significant threat of property damage or loss of life are usually exempted from State regulations for dam safety.

Draper City has selected the 10-year storm event for the design of the initial storm drainage system and the 100-year storm event for design of the major storm drainage system. The 10-year storm event was selected by Draper City for the design of the initial storm drainage system because:

a. The 10-year storm event is the design frequency selected by most large municipalities along the Wasatch Front, and
b. The 10-year storm event provides a level of protection most likely experienced historically throughout much of Draper City.

Applying the storm drainage criteria for a 100-year storm event to the major storm drainage system in Draper City is a more complex issue because the major storm drainage system in Draper City is very difficult to define and analyze. The process for the evaluation of the 100-year storm event involves determining where surcharging or insufficient inlet capacity occurs and gutter capacity and surface flow patterns once road capacities are exceeded. The City requested that some sections of the City be analyzed for the 100-year storm event, including Draper Parkway, Highland Drive to Pioneer Road and Regionally Planned Area #6. While these 100-year storm analyses give an insightful determination of general flow paths and peak flows, limitations in the available topography make more accurate determinations infeasible mostly because of the difficulty in defining local storage.

In most of the newer developments, roadways are lower in elevation than adjacent lots which allow the roadways to carry the runoff that exceeds the capacity of the initial storm drainage system. However, the older sections of Draper City were developed around an existing open channel irrigation system where ditches along roadways deliver irrigation water to adjacent lots and agricultural land. The ditches along the roadways must be higher than the lots, so the roadways are higher in elevation than adjacent properties. Runoff that exceeds the capacity of the initial storm drainage system will collect in low areas between the homes and the roadways, and in some cases may flow through lots between homes. Draper City has chosen to apply the major drainage system design criteria (100-year storm event) to all new development.

Design Rainstorm

The storm distribution used in the Draper City storm drain model was developed using a 1-hour Farmer-Fletcher distribution modified by Salt Lake County for a 3-hour storm. Farmer and Fletcher (1971) examined rainfall gauge records and classified storms based on whether the heaviest rainfall of the storm fell in the first, second, third or fourth quarter of the storm period. Farmer and Fletcher found that "first and second quartile storms together comprise 76 percent of those storms containing a burst of 5-minute duration with a 2-year recurrence interval and 92 percent of storms containing a burst of 10-minute duration, with a 10-year recurrence interval." Farmer and Fletcher developed model storms for the first and second quartile storms.

The 3-hour storm distribution developed by Salt Lake County utilizes a 1-hour Farmer-Fletcher first quartile storm distribution for the central hour of the 3-hour distribution. The remaining two hours of the design storm distribution were distributed symmetrically around the central hour. The use of the 3-hour storm removes the need for a sensitivity analysis.

Precipitation depths were determined based on the NOAA Atlas 14 Point Precipitation Frequency Estimates data server. Precipitation depths increase with elevation and proximity to the mountains due to the orographic effect. Because of this, the City was divided into three areas for the purpose of developing design rainstorm depths, as shown on Figure III-2. In the NOAA Atlas 2, May through October rainfall depths were provided separate from the total depths which also included snowfall. The May through October period is generally when storm drainage capacities are tested due to rainstorms. However, NOAA no longer provides the May through October precipitation depths due to funding limitations. In order to be consistent with values used in the past and to more accurately account for only rainfall events, the rainfall depths from NOAA 14 were adjusted for this seasonal factor based on the adjustment from NOAA 2. The adjusted design rainfall amounts used in the storm drain model are shown in Table III-1.

TABLE III-1
DESIGN RAINFALL DEPTHS FOR URBAN AREA

Location	Return Period	3-Hour Rainfall Depths (inches)
Urban Area	10-Year	0.93
Urban Area	100-Year	1.79

Where Mountain Areas are the major contributor to a storm drainage system or conveyance, a 12-hour and 24-hour event was also analyzed. The Traverse Ridge Area also used longer duration events for analysis of specific conveyances. The 12-hour and 24-hour storm events were modeled using the GBEA storm distribution. Unlike the Urban Area, the Mountain and Traverse Ridge areas require a duration sensitivity analysis using the precipitation values in Table III-2. The duration producing the peak flow shall be used for the planning and design of the conveyance system whereas the duration producing the largest storage shall be used for the planning and design of detention facilities.

Willow Creek

Galeana Canal (abandoned)

Corner Creek

Salt Lake City Canal

East Jordan Canal

Draper Canal (abandoned)

N

0 1,875 3,750 7,500 Feet

LEGEND

DRAPER CITY BOUNDARIES

CANAL

CREEK

PRECIPITATION AREAS

MOUNTAIN AREA

TRAVERSE RIDGE AREA

URBAN AREA

DRAPER CITY STORM DRAINAGE MASTER PLAN

HANSEN ALLEN & LUCE Inc ENGINEERS

PRECIPITATION AREAS

FIGURE III-2

TABLE III-2
DESIGN RAINFALL DEPTHS FOR MOUNTAIN AND TRAVERSE RIDGE AREAS

Location	Return Period	3-Hour Rainfall Depths (inches)	6-Hour Rainfall Depths (inches)	12-Hour Rainfall Depths (inches)	24-Hour Rainfall Depths (inches)
Traverse Ridge Area	10-Year	1.03	1.28	1.62	1.80
Traverse Ridge Area	100-Year	1.87	2.06	2.52	2.62
Mountain Area	10-Year	1.17	1.50	1.96	2.30
Mountain Area	100-Year	2.10	2.39	3.03	3.35

Thirteen separate gauging stations in the Great Basin Experimental Area (GBEA) (ranging in elevation from 5,500 feet to over 10,000 feet) were maintained for varying periods of time from 1919 to 1965. Fifteen gauging stations were maintained in the Davis County Experimental Watershed (ranging in elevation from 4,350 feet to 9,000 feet) for varying periods of time between 1939 and 1968. After completing their analyses of the data, Farmer and Fletcher found that "more than 50 percent of the storm rainfall depth occurs in 25 percent of the storm periods;" and that "usually more than half of the total depth of rain is delivered as burst rainfall." Farmer and Fletcher developed design storm distributions which have become accepted by governmental entities including Salt Lake County and Davis County as the characteristic distributions for storms in Utah of short duration (generally less than six hours).

The work of Farmer and Fletcher was expanded in 1985 to develop a longer duration rainfall distribution from the GBEA data (VHA, 1985). For the derivation of the design 24-hour rainfall event, a storm was defined "as a period of continuous or intermittent precipitation delivering at least 0.1 inches of rainfall during which time dry periods without rainfall did not exceed four hours." Storm having durations ranging from 20 hours to 28 hours were accepted to be representative of a 24-hour storm duration. The 24-hour duration storms were then screened to include only storms which contained rainfall meeting the burst criteria of having over 50 percent of the precipitation occurring in less than 25 percent of the time. Storms meeting the burst criteria were further categorized in accordance with which quartile of the storm the burst had occurred (i.e. the first, second, third or fourth quarter of the storm period). Identified storms were used to develop a 24-hour design storm distribution for use in Utah. A sensitivity analysis for all storm distributions developed shows the 3rd quartile storm distribution to produce the higher runoff peaks. The GBEA 3rd Quartile storm distribution developed in 1985 includes a burst of rainfall with an approximate 10 percent of the 24-hour total rainfall falling within a half hour period. In a similar comparison, the SCS Type II distribution allows approximately 62 percent of the total precipitation to occur within the same period. Because the distribution was developed based on local data, the GBEA distribution is believed to be the best available storm distribution for Utah for storms lasting between 6 and 24 hours.

DRAINAGE BASIN CHARACTERISTICS

A drainage basin is an area where all rainfall or snowmelt runoff within it will collect to a common point. Drainage basins may also be referred to as watersheds or catchments. Drainage subbasin boundaries depend upon both the topography and the location of storm drainage facilities. The subbasin characteristics developed for the Storm Drain Master Plan are based on field observations and the GIS mapping supplied by Draper City. Important subbasin characteristics include: 1) Subbasin area, 2) Hydrologic soil type, 3) Percentage of impervious area, 4) SCS curve number, 5) Conveyance characteristics and 6) SCS Lag Time.

Subbasin Areas

Subbasins are smaller drainage basins located within a larger drainage basin. Drainage subbasins boundaries depend upon both the topography and the location of storm drainage facilities. The drainage subbasin boundaries are shown on Figures III-3, III-4 and III-5 for each of the respective major drainage basin areas. Subbasin boundaries were developed based on existing stream and waterway locations, existing and proposed storm drainage facility locations, and Draper City aerial photographs and 2-foot contours. Subbasins varied in size depending upon the level of development within the subbasin and the locations for which hydrographs were needed. Average subbasin size in developed areas was approximately 30 acres. Each mountain watershed directly tributary to Draper City was delineated as a single subbasin.

Hydrologic Soil Type

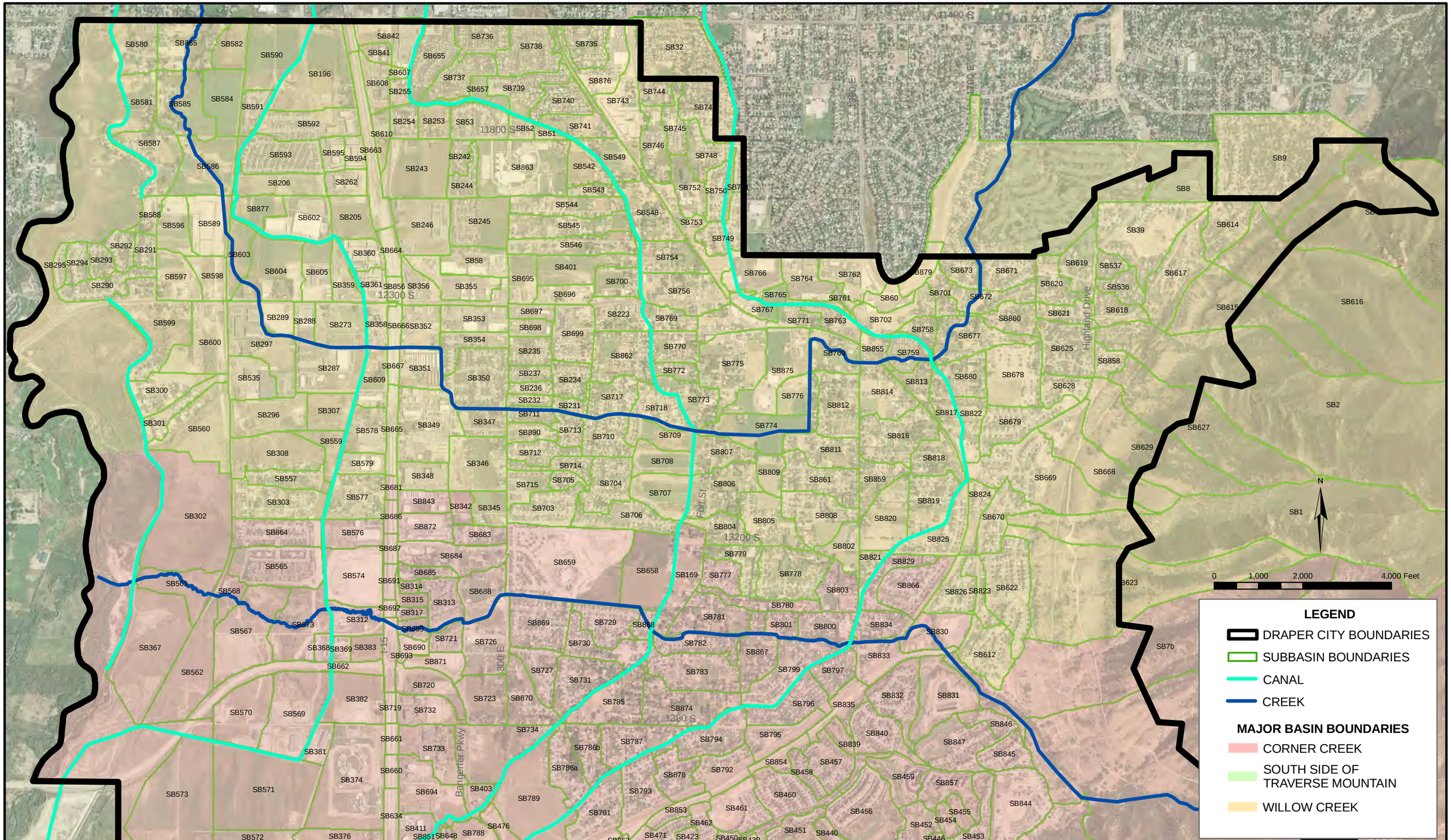
Hydrologic soil type is a general indication of the soil's infiltration capacity. Soils are assigned a hydrologic type of A, B, C, or D by the USDA Natural Resources Conservation Service (NRCS). Soils of hydrologic soil type A have the highest infiltration rate and therefore produce the least amount of runoff. Soils of hydrologic soil type D have the lowest infiltration rate and therefore produce the highest amount of runoff. While many native type D and type A soils are present in Draper City, urbanized areas most often have imported soils more conducive to landscaping and vegetation. Therefore, the majority of the soil conditions in Draper City's developed areas are either type B or type C.

Some changes to several soil hydrologic properties in the Traverse Mountain area were included in updates to the soil surveys by the Natural Resources Conservation Service (NRCS) and were later questioned by HAL in 2007. Correspondence with NRCS soil scientist Randy Lewis revealed that those changes were in error and that original soil properties from the 1972 Soil Survey of Utah County, Utah were correct. The following soils were changed to soil type D in the current NRCS study and are shown as such online but should be the soil type indicated below:

- Henefer Soil – Type C
- Parleys Soil – Type B

Impervious Area

Impervious areas within each subbasin were estimated using GIS and aerial photography. The impervious area was divided into two components: directly connected impervious areas and

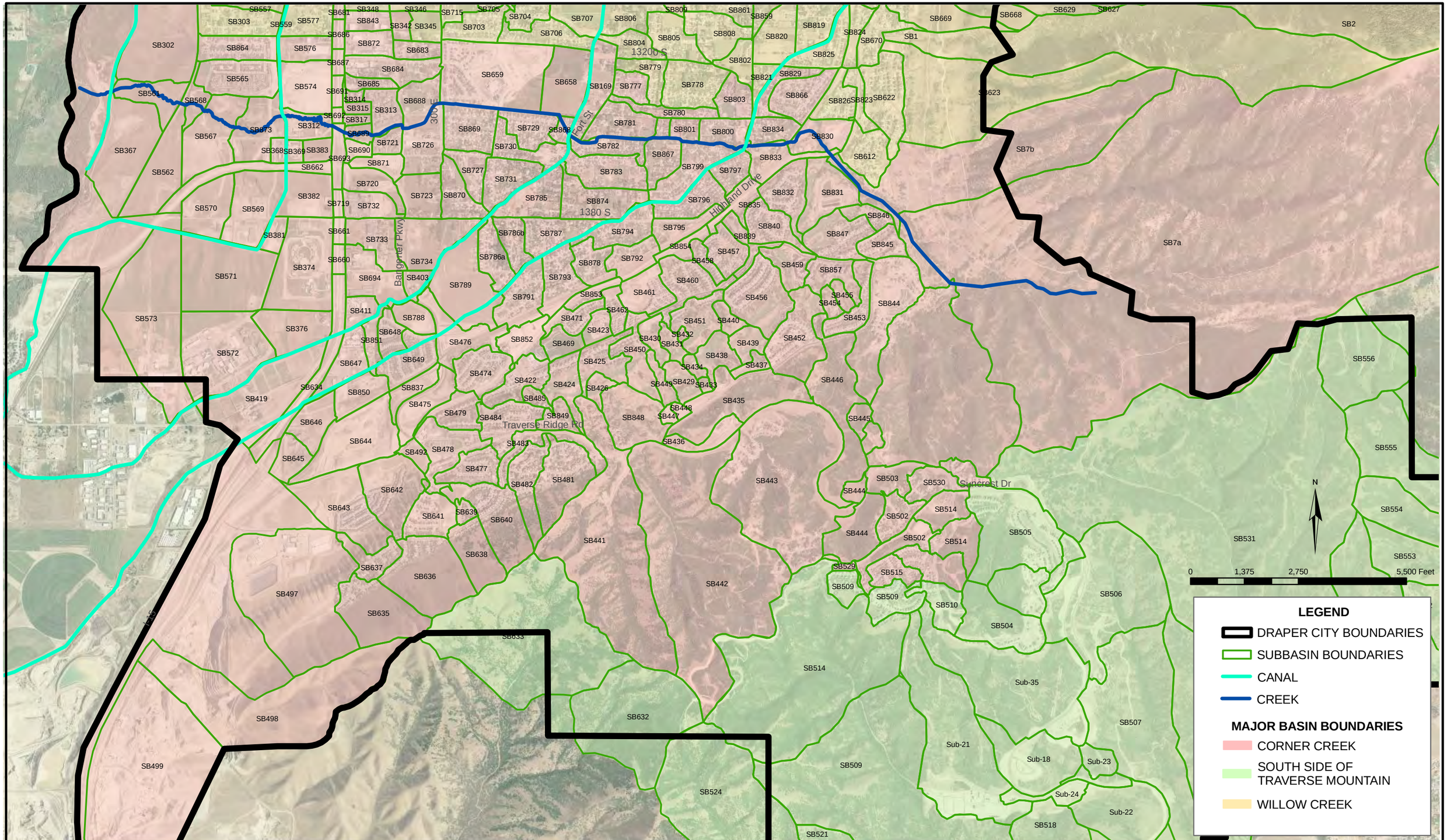


HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

WILLOW CREEK SUBBASINS

FIGURE III-3

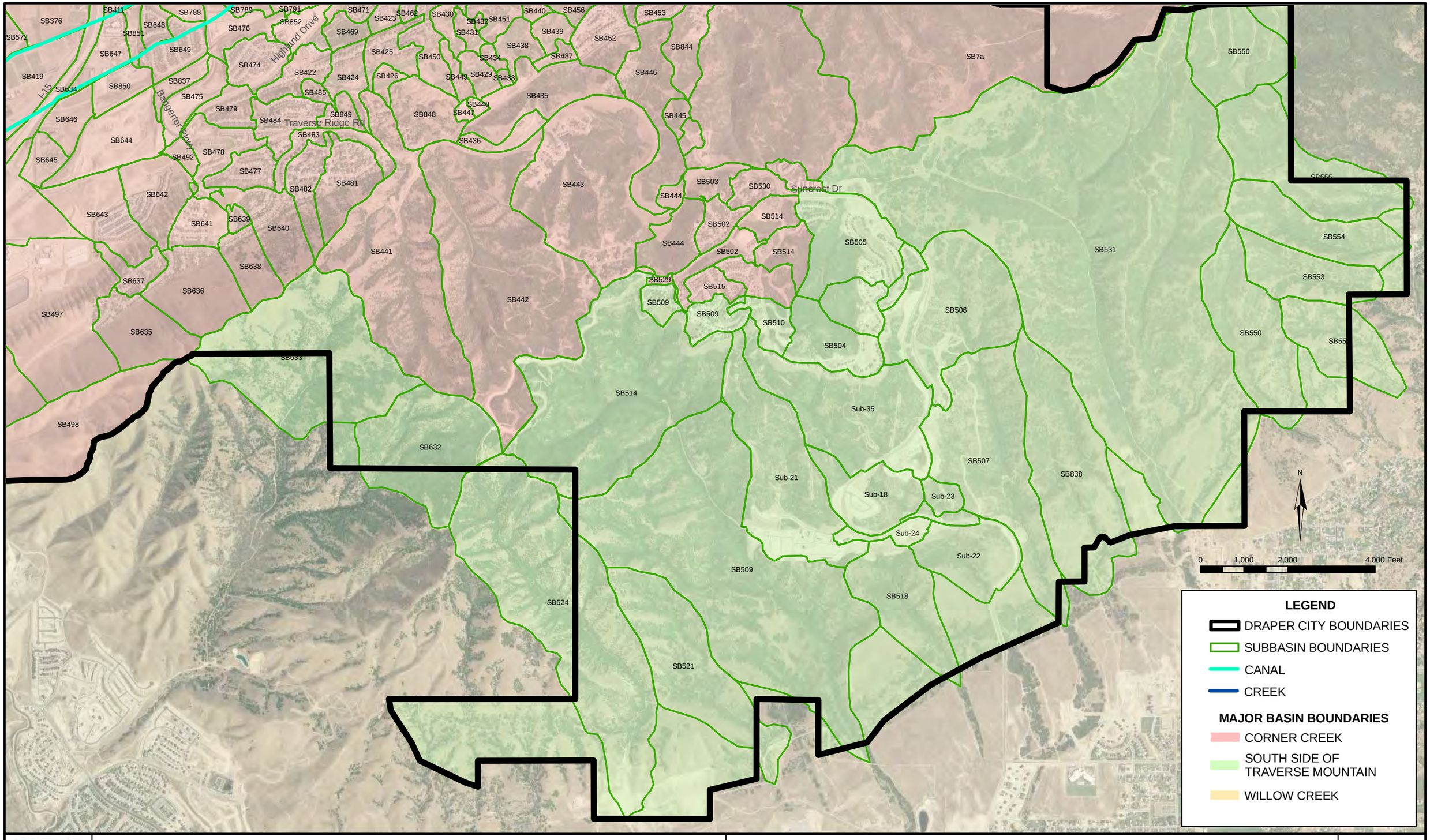


HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK SUBBASINS

FIGURE III-4



HANSEN ALLEN & LUCE INC ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

SOUTH SIDE OF TRAVERSE MOUNTAIN SUBBASINS

FIGURE III-5

unconnected impervious areas. Directly connected impervious areas provide a direct path for runoff to a conveyance such as a pipe, gutter or channel. Directly connected impervious areas include roadways, parking lots, driveways and sometimes the roofs of buildings. Runoff from unconnected impervious areas must cross a pervious area before reaching a conveyance. Examples of unconnected impervious areas include sidewalks that are not adjacent to the curb, patios, sheds and usually some portion of the roof of houses.

It is important to distinguish between directly connected and unconnected impervious areas because runoff from the directly connected impervious areas reaches the drainage conveyance system quickly and usually determines the magnitude of the peak flow rate upstream from detention. Impervious areas such as back yard patios which drain to grassed or landscaped areas have much less impact on storm runoff peak flows. Based upon field observations, the directly contributing impervious area for a typical residential lot in Draper City is assumed to include the driveway and 50% of the home and garage area. It is assumed that runoff from the remaining 50% of the home and garage area flows over grassed areas before reaching the street. For large commercial structures, it is assumed that 100% of the roof area is directly connected impervious area. The unconnected impervious area is included in the pervious area composite curve number based on an area weighted average while the directly connected impervious area is included as a percentage in the subbasin characteristics.

SCS Curve Number

The SCS curve number methodology is described in the NRCS publication TR-55 (NRCS, 1986). Each subbasin is assigned an SCS curve number based on hydrologic soil type and ground cover type. The curve number describes the relationship between precipitation and runoff for the pervious and unconnected impervious portions of the subbasin. Curve numbers range from 0 to 100. Areas with high runoff rates have high curve numbers. Areas that are more pervious have lower curve numbers. For example, parking lots and other impervious surfaces have curve numbers of about 98. Whereas, pervious areas such as fields, lawns, and gardens typically have curve numbers between 70 and 85.

Runoff curve numbers for the subbasins are selected based on land use type using Table 2.2 of Technical Release 55, Urban Hydrology for Small Watersheds.

Conveyance Characteristics

Storm drainage conveyance characteristics are based on information from the inventory, including pipe size, material and invert elevations. This information is used in the model to perform the hydraulic analysis.

SCS Lag Time

The SCS lag time represents the timing of runoff within a subbasin or more precisely, the time difference between the centroid of the excess rainfall and the peak of the direct runoff unit hydrograph. Lag times are computed based on TR-55 methodology, with sheet flow, shallow concentrated flow and channel flow (including pipes) components.

DEVELOPMENT OF THE STORM DRAINAGE MODEL

Methodology

A computer model was developed as part of the Storm Drain Master Plan that simulates water runoff during a storm event in Draper City. The City selected the hydrology and hydraulic model StormNet. StormNet was later purchased by AutoDesk and its name changed to Storm and Sanitary Analysis (SSA) and operates as a stand-alone program. SSA functions on an EPA SWMM platform with additional options for hydrology modeling.

HEC-1 was chosen as the hydrology model to use within SSA due to various factors, the foremost being the availability of the previous storm drain model in HEC-1. The HEC-1 unit hydrograph method chosen was the SCS Dimensionless method and the HEC-1 loss method chosen was the SCS Curve Number method. In a change from the previous master plan, the Kinematic Wave multi-plane method was abandoned for the SCS "lumped parameter" or SCS dimensionless hydrograph method that utilizes three main parameters: curve number, percent impervious and lag time.

The composite curve number used in the HEC-1 dimensionless hydrograph method is an area-weighted curve number based on all pervious and unconnected impervious areas. The method relies on the percent impervious input parameter to model the directly connected impervious area that was modeled previously as a separate plane using the Kinematic Wave method. The use of the percent impervious input in HEC-1 gives similar results when compared to the Kinematic Wave method.

Lag time is a calculation based on methodology for determining time of concentration as described in TR-55 Urban Hydrology Manual. Where undeveloped conditions exist, especially in mountain and canyon areas tributary to the City, the Simas and Hawkins method was used. This method uses a regression equation as follows:

$$T_{lag} = 0.0051 \times width^{0.594} \times slope^{-0.150} \times S_{nat}^{0.313}$$

where width (ft) is the watershed area divided by the watershed length, slope (ft/ft) is the ratio between the maximum difference in elevation and the longest flow-path length and S_{nat} is the storage coefficient (in) used in the Curve Number (CN) method.

The hydraulic modeling performed by the model is the same as EPA SWMM with a few added capabilities. The hydraulic modeling method chosen for the model was the Hydrodynamic routing method. The Hydrodynamic routing method solves the complete St. Venant equations for the entire network and includes modeling of backwater effects, flow reversal, surcharging and interconnected ponds. The model also includes the ability to model orifices and standpipes, weirs and detention basins. The individual elements of the storm water model are subbasins, conveyance lines and junctions.

Subbasins

The subbasins were delineated in GIS based on available contours and storm drain inventory data and imported into SSA using the GIS Import tool. Once imported, the subbasin characteristics were populated in the Subbasins Dialogue box shown in Figure III-6. The following parameters are defined in the Subbasins Dialogue for each subbasin:

- The curve number is a composite curve number for all area not considered directly connected impervious area. This calculation was done in a spreadsheet using GIS-determined area-types. Total impervious area for commercial and roadways was included with the directly connected impervious area. Residential areas (not including roads) were divided between pervious, directly connected impervious and unconnected impervious based on typical home determinations that were applied based on the number of individual homes in the subbasin. Those areas not included in the previous determinations were then included as pervious areas. The total percent impervious (directly connected impervious area) and composite curve number for the remaining percentage were calculated and entered into the SSA program.

- Initial abstraction is defined as the amount of rainfall (inches) that is lost before runoff begins and includes water retained in surface depressions, water absorbed by vegetation, evaporation and infiltration. Initial abstraction was not used in the master plan model and was set at zero for all subbasins.

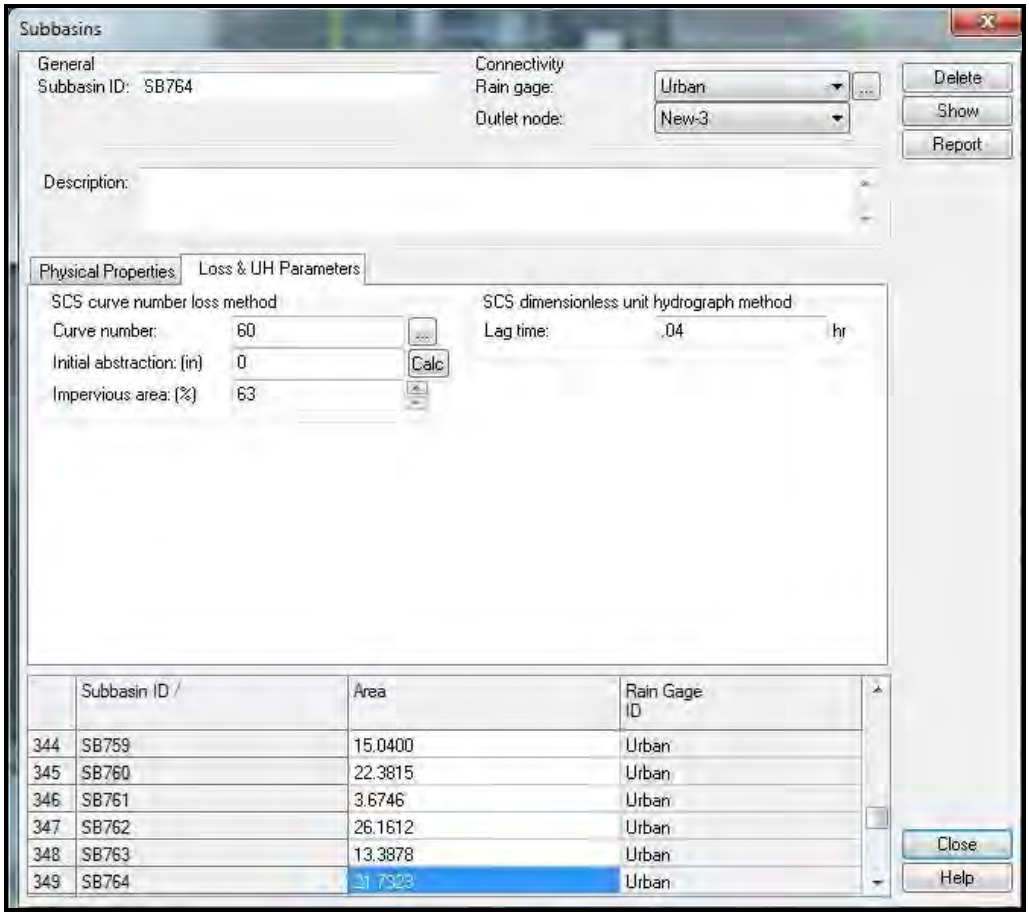
- The directly connected impervious area is entered as a percentage into the Impervious Area input line of the Subasins Dialogue box.

- The Lag Time input line is the subbasin lag time in hours as calculated using the TR-55 time of concentration methodology converted to lag time. Kinematic Wave characteristics used in the previous master plan were converted to a lag time by partitioning the pervious and unconnected impervious area plane into sheet flow, shallow concentrated flow and channel flow.

- The subbasin area is calculated automatically through the GIS Import Tool.

- Rain gauges need to be assigned for each subbasin and correspond with the general area within the City: Urban Area, Mountain Area, and Traverse Mountain Area.

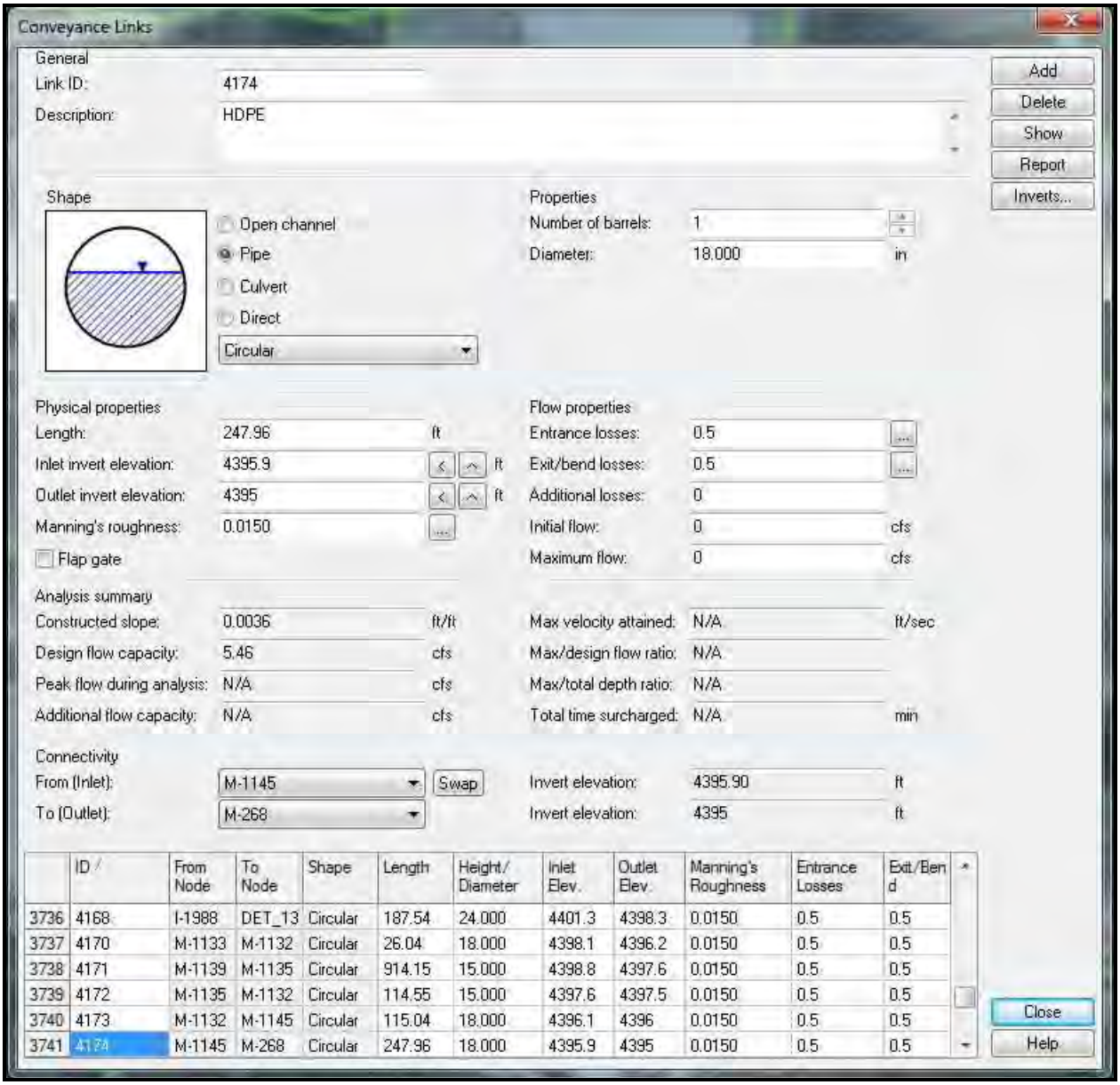
FIGURE III-6
SUBBASINS DIALOGUE BOX



Conveyances

The conveyances were created by the City in GIS with the inventory-created manhole and inlet information. Conveyance links in the Draper City model are most commonly representative of pipes, however open channels and culverts are also conveyance links represented in the model. Pipe sizes, inverts and connectivity are based on information gathered in the inventory process. Manual adjustments were made by HAL where rim elevations were incorrect and were altered according to 2-foot surface contours. All of the input (shown with white background) information in the dialogue shown in Figure III-7 was included in the GIS import and did not require manual entry in the SSA program.

FIGURE III-7
CONVEYANCE LINKS DIALOGUE BOX



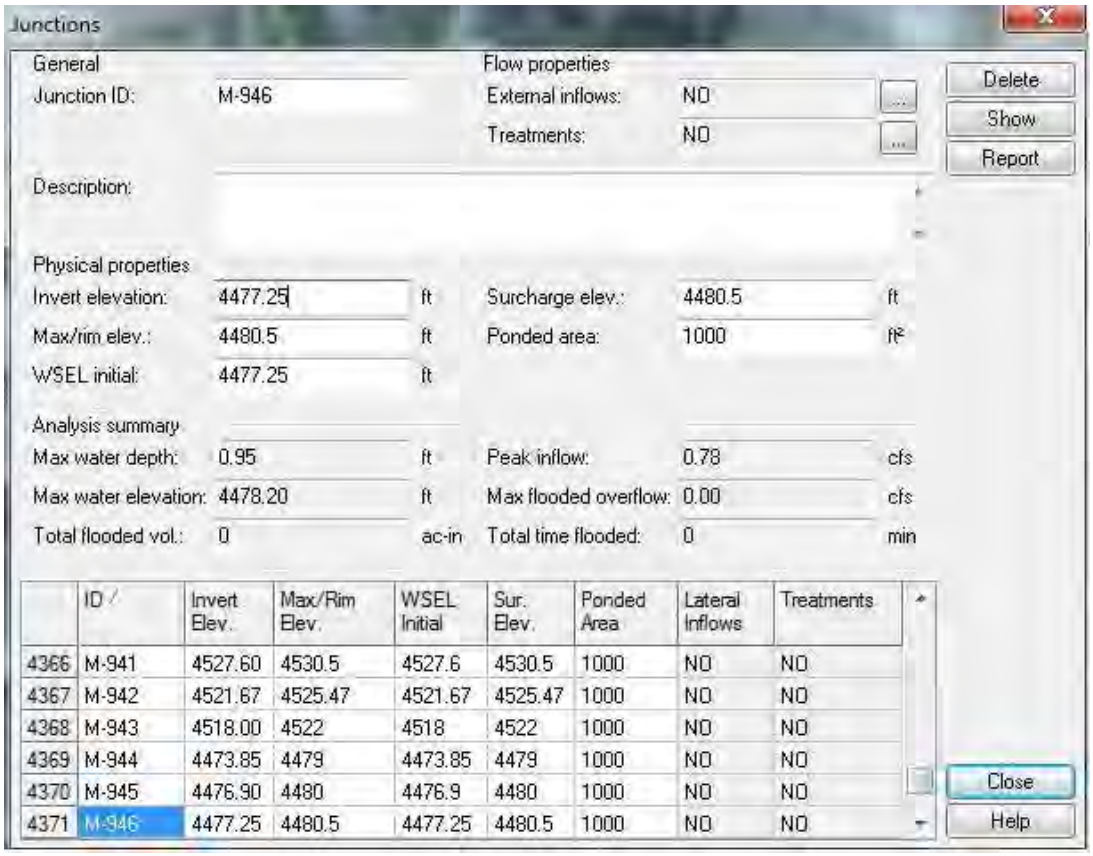
	ID	From Node	To Node	Shape	Length	Height/ Diameter	Inlet Elev.	Outlet Elev.	Manning's Roughness	Entrance Losses	Exit/Bend
3736	4168	I-1988	DET_13	Circular	187.54	24.000	4401.3	4398.3	0.0150	0.5	0.5
3737	4170	M-1133	M-1132	Circular	26.04	18.000	4398.1	4396.2	0.0150	0.5	0.5
3738	4171	M-1139	M-1135	Circular	914.15	15.000	4398.8	4397.6	0.0150	0.5	0.5
3739	4172	M-1135	M-1132	Circular	114.55	15.000	4397.6	4397.5	0.0150	0.5	0.5
3740	4173	M-1132	M-1145	Circular	115.04	18.000	4396.1	4396	0.0150	0.5	0.5
3741	4174	M-1145	M-268	Circular	247.96	18.000	4395.9	4395	0.0150	0.5	0.5

Junction

In the SSA model, junctions are defined most commonly as manholes but can also represent inlet boxes, confluence points in or to open channels and pipe connection fittings. Modeling inlets is an option in SSA but was not employed as part of this master plan analysis because of the level of detail required, therefore, inlets were included in the model as junctions equivalent to a manhole. The IDs used in the SSA model used a single letter followed by a numerical ID where the letter identified the type of junction: M for manhole, I for inlet and O for outlet. All of

the input (shown with white background) information in the dialogue shown in Figure III-8 was included in the GIS import and did not require manual entry in the SSA program.

FIGURE III-8
JUNCTIONS DIALOGUE BOX



	ID /	Invert Elev.	Max/Rim Elev.	WSEL Initial	Sur. Elev.	Ponded Area	Lateral Inflows	Treatments
4366	M-941	4527.60	4530.5	4527.6	4530.5	1000	NO	NO
4367	M-942	4521.67	4525.47	4521.67	4525.47	1000	NO	NO
4368	M-943	4518.00	4522	4518	4522	1000	NO	NO
4369	M-944	4473.85	4479	4473.85	4479	1000	NO	NO
4370	M-945	4476.90	4480	4476.9	4480	1000	NO	NO
4371	M-946	4477.25	4480.5	4477.25	4480.5	1000	NO	NO

FUTURE LAND USE AND HYDROLOGIC CHARACTERISTICS

Areas of Draper City have not been developed, most notably the areas west of I-15. Current zoning and land use maps were used to determine the future land use for full build-out. Subbasins where significant regional development is projected were detained using future regional detention facilities. Runoff was not limited by detention in subbasins currently close to full build-out that were not currently being detained. Future hydrologic characteristics were estimated for undeveloped subbasins. Future percentages of impervious area (directly connected) and curve numbers were estimated based on current zoning and land use in adjoining property that has already been developed or typical values for similar development in other parts of the City.

COMPUTATION OF RUNOFF HYDROGRAPHS

Hydrographs were computed for each subbasin, conveyance, junction, detention basin, inlet and other storm drain elements. The maximum value from each hydrograph is the peak runoff flow rate. Hydrographs were calculated for the Salt Lake County 3-hour storm for the majority

of the City's subbasins with the exception of the Traverse Mountain Area and selected Mountain Area subbasins. The peak flow rate identifies the critical flow rate to be used in design or evaluation of that element in the model.

CHAPTER IV
STORM DRAINAGE ANALYSIS

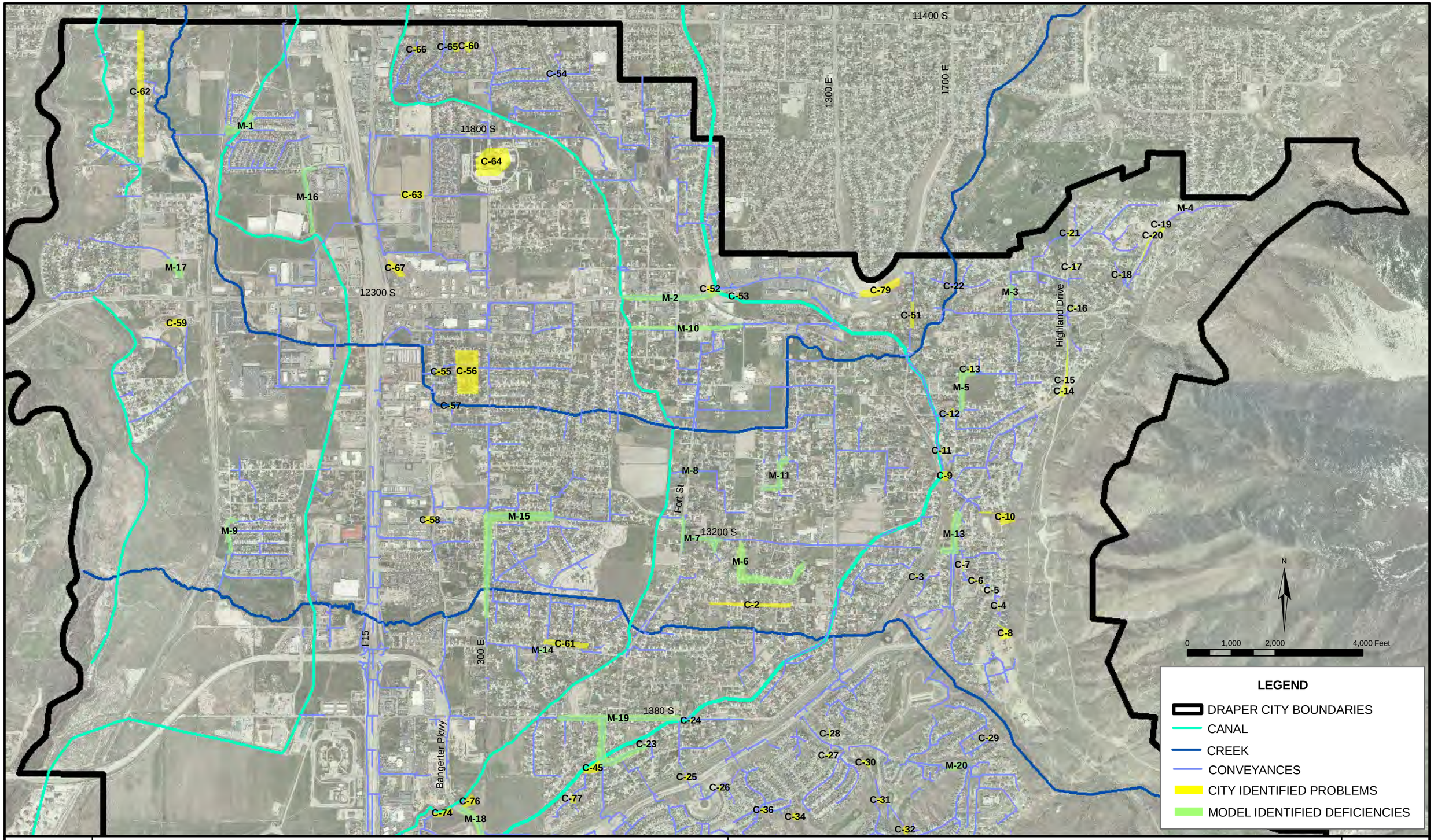
EXISTING AND FUTURE STORM DRAIN CAPACITY AND DEFICIENCIES

Storm drainage criteria established for this study provides that the initial storm drainage system be designed for the 10-year storm event and the major storm drainage system be designed for the 100-year storm event (see Figure III-1). The combination of storm drainage pipes and the curb and gutter should convey the runoff from the 10-year storm event without overtopping the curb or the crown of the road.

The existing system was evaluated using both existing and future conditions. The model indicates the capacity of the existing storm drain system. Locations where the model indicated flooding during the design storm where listed as model identified deficiencies. In addition to the model identified deficiencies, the City put together a comprehensive list of storm drain issues identified by City personnel. These two lists were compared against each other to eliminate duplicate deficiencies. Comparing the City identified issues against the model identified deficiencies also served as a validation or calibration of the model results. Duplicate storm drain issues on the two lists were merged into one deficiency. Identified deficiencies are listed in Table V-1 in the following Chapter with location and problem descriptions. Deficiencies with an ID number starting with “M” are model-identified deficiencies. Deficiencies with an identification number starting with “C” are City personnel-identified deficiencies. The model-identified deficiencies and City-identified problem areas are shown on Figures IV-1, IV-2 and IV-3.

10-YEAR VERSUS 100-YEAR ANALYSIS

The storm drain system has been designed to convey the 10-year storm. The initial analysis of the existing storm drain system under existing and future build-out conditions was with the 10-year storm. Analyzing the major storm drainage system in Draper City with the 100-year storm is a more complex issue because the major storm drainage system in Draper City is very difficult to define and analyze. The process for evaluation of the 100-year storm event involves using the model to identify surcharging or insufficient inlet capacity and then analyzing gutter capacity and then surface flow patterns once road capacities are exceeded. The City requested that some sections of the City be analyzed for the 100-year storm event, including Draper Parkway, Highland Drive to Pioneer Road and Regionally Planned Area #6. While these 100-year storm analyses give an insightful determination of general flow paths and peak flows, limitations in the available topography make more accurate determinations infeasible mostly because of the difficulty in defining local storage. The additional estimated cost for conveying and detaining the 100-year storm for these selected areas identified by the 100-year analysis are identified in Chapter V.

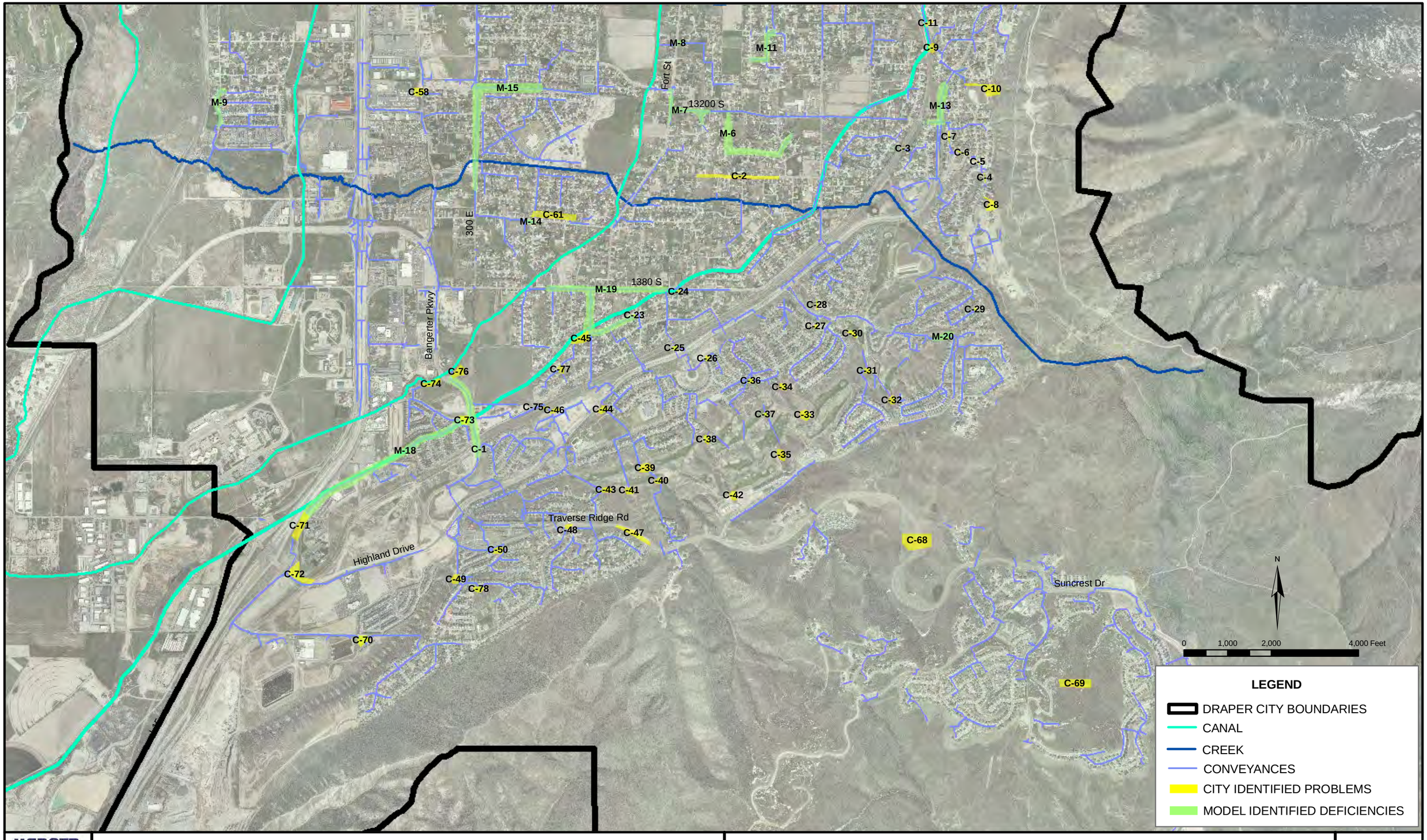


HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

WILLOW CREEK
EXISTING STORM DRAINAGE SYSTEM DEFICIENCIES

FIGURE
IV-1

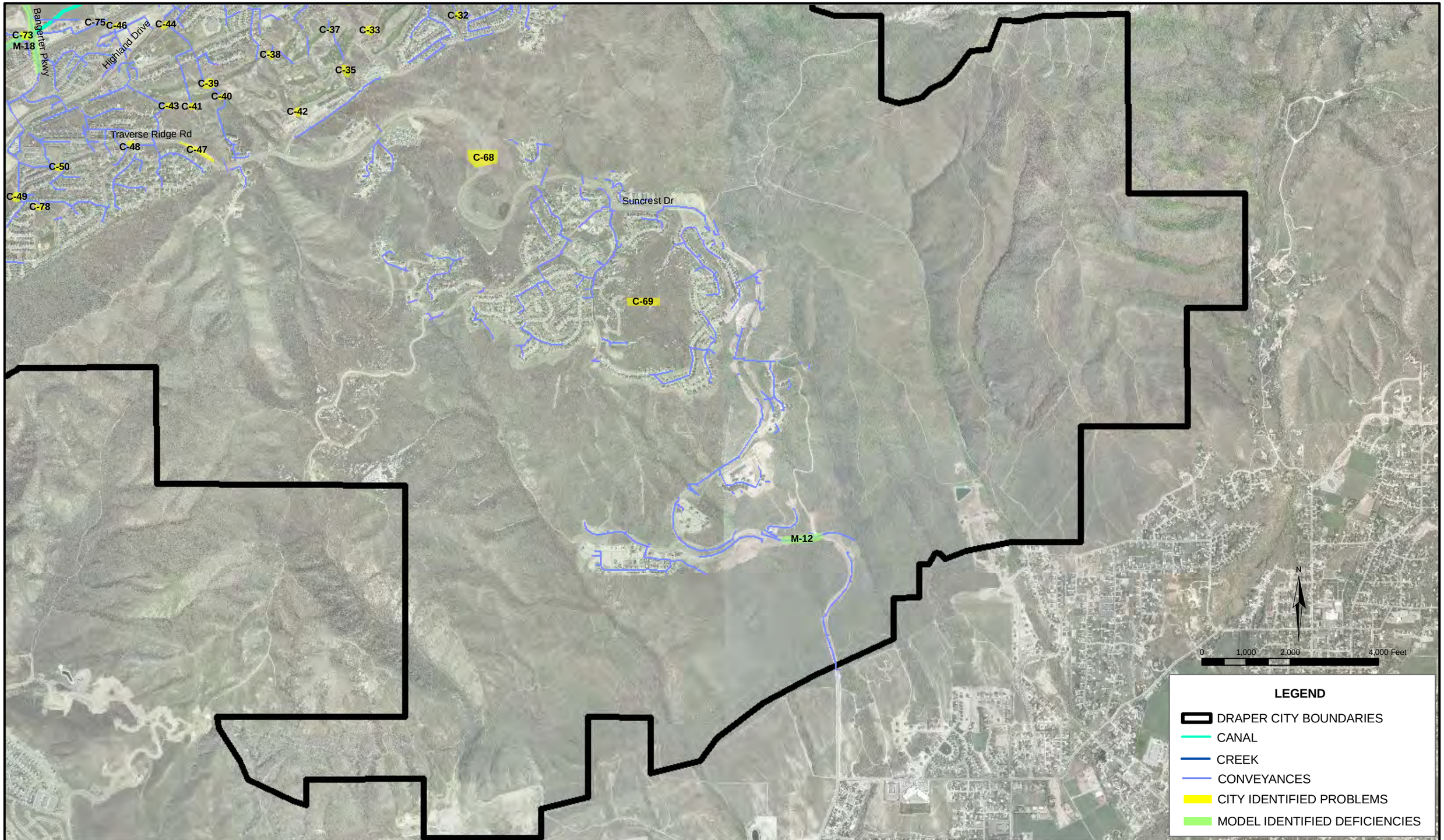


HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK
EXISTING STORM DRAINAGE SYSTEM DEFICIENCIES

FIGURE
IV-2



HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

SOUTH SIDE OF TRAVERSE MOUNTAIN
EXISTING STORM DRAINAGE SYSTEM DEFICIENCIES

FIGURE
IV-3

CHAPTER V
CAPITAL FACILITIES PLAN

The flows and pipe diameters provided in the capital improvement project descriptions are approximate and are for planning purposes only. A detailed hydrologic and hydraulic analysis shall be performed during the design process for the master plan improvement projects to identify final design pipe sizes.

PREFERRED DRAINAGE PLAN DEVELOPMENT

Meetings were held with Draper City personnel to identify and evaluate alternatives for storm drainage improvements. Selection of the preferred alternative for each problem was a process of evaluation and refinement, rather than a simple choice between alternatives. The process of selecting a preferred alternative included: reviewing the list of storm drainage inadequacies, brainstorming possible solutions to the problems, screening alternatives based on feasibility and public acceptance, development of alternatives, comparison based on cost and function, and selection of the preferred alternative. The preferred solution with 10-year cost estimates for each model-identified (M) and City personnel-identified (C) storm drain deficiency is presented in Table V-1. Deficiencies in areas analyzed for the 100-year storm also include costs for the 100-year solution. Capital improvements are shown on Figures V-1, V-2 and V-3.

Regional Planned Areas

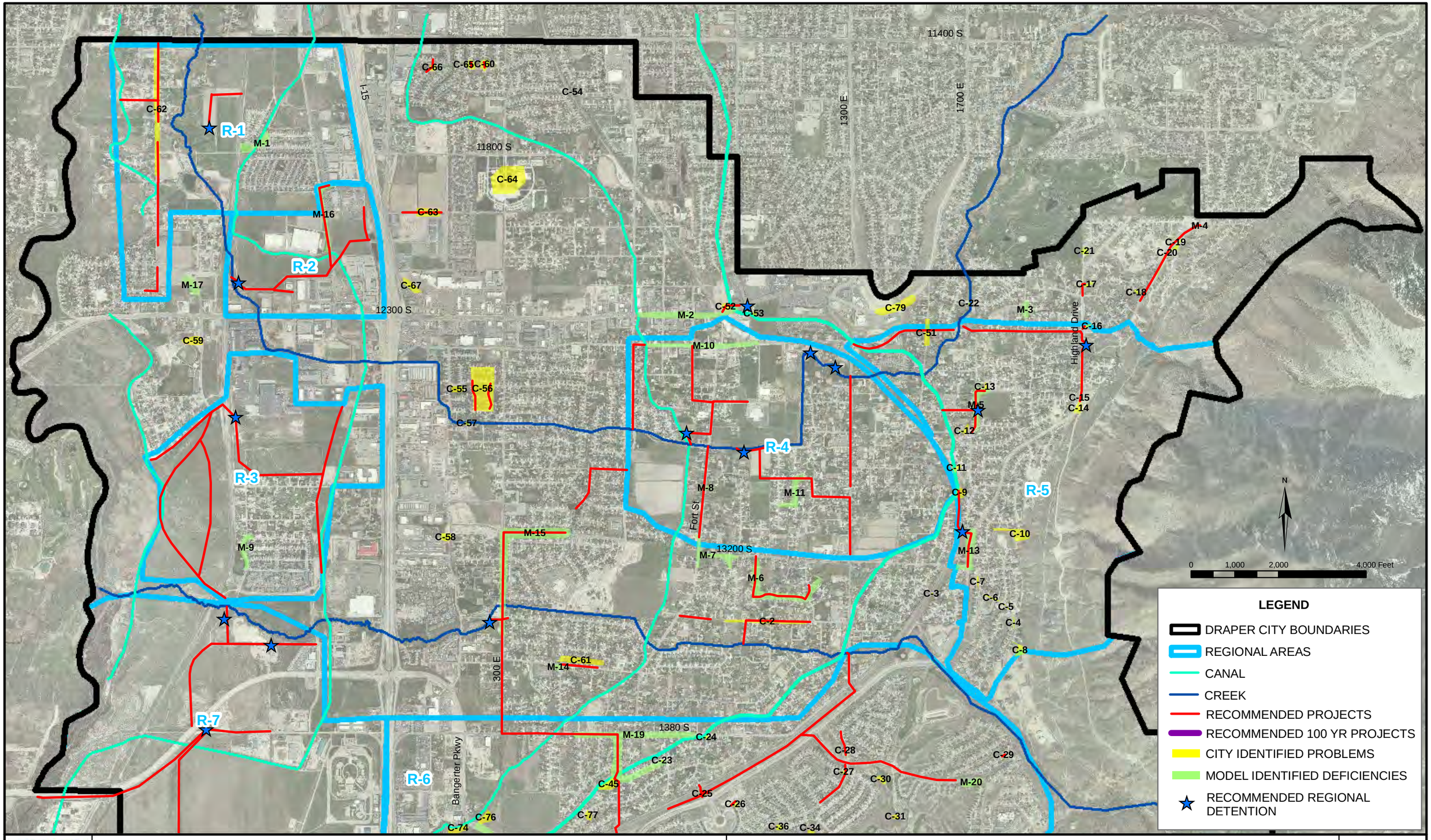
During the process of evaluating alternatives for the storm drain improvements, selection of the preferred alternative was to create Regional Planned Areas. These areas primarily included locations in the City with a large percentage of undeveloped land. The goal of the Regional Planned Areas is to provide regional detention and conveyance rather than requiring private detention for residential developments. Each of the Regional Planned Areas is described below and is listed in Table V-2 with cost estimates.

R-1 West Side 11400 South – Very little development has occurred in this area at this point making this a good candidate for regional planning. The regional detention in this area, because it is currently undeveloped, was sized for the 100-year storm event.

R-2 12300 South Lone Peak Center – The existing storm drainage facilities are either at or over capacity. A new regional detention facility is needed to serve this area.

R-3 12800 South Lone Peak Industrial – New development in this area will need a regional storm drain system that can convey flow to the Jordan River and Galena Canal wetland areas.

R-4 City Center – Storm water in the City Center area is currently directed to the East Jordan Canal where the discharge is limited to the existing 24-inch outfall. It is very unlikely that the owners of the East Jordan Canal will permit an increase in the size of this outfall. Therefore, the existing problems identified in the model and by City personnel will need to be solved by conveying flow to Willow Creek.

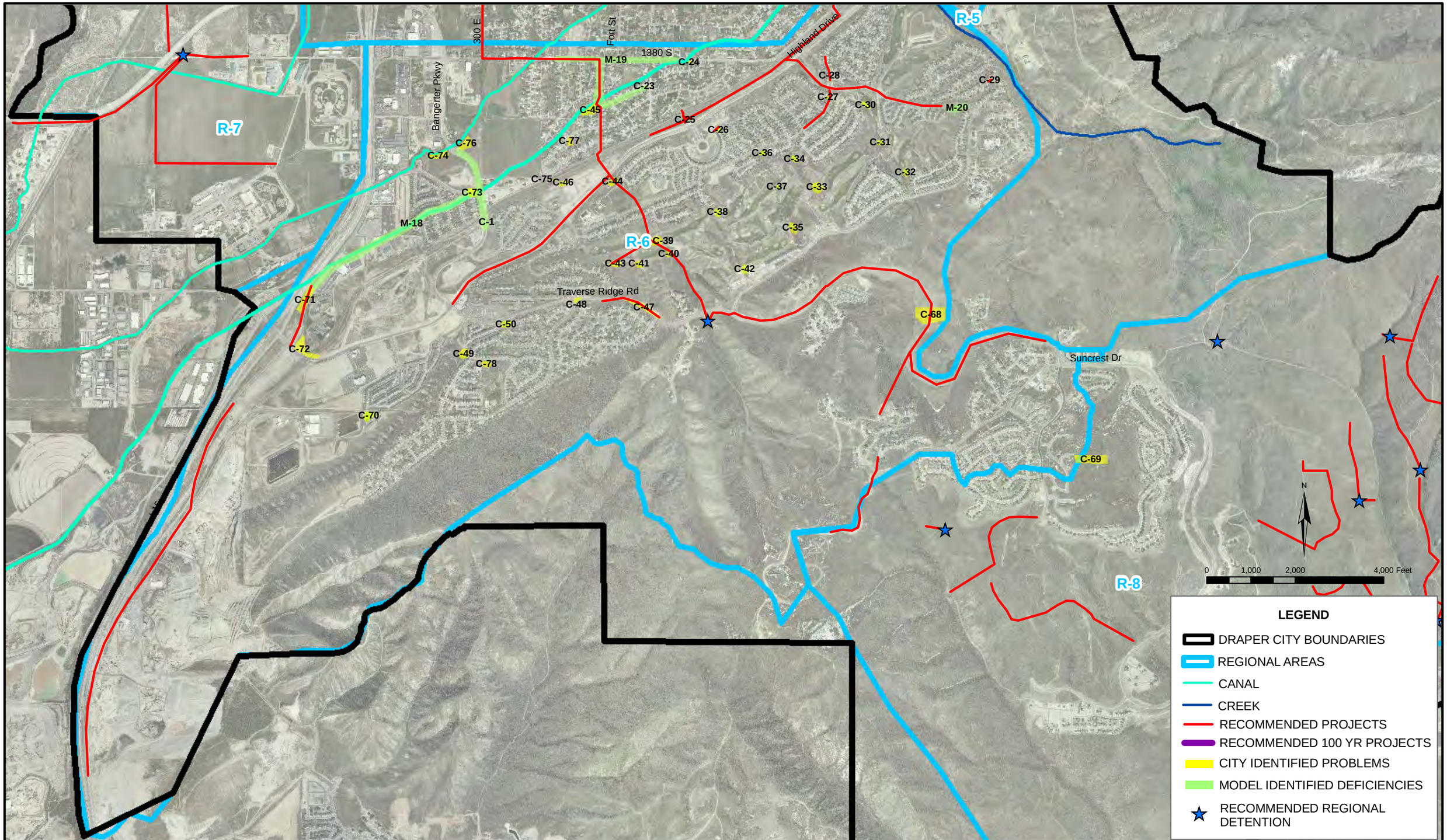


HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

WILLOW CREEK
CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
V-1

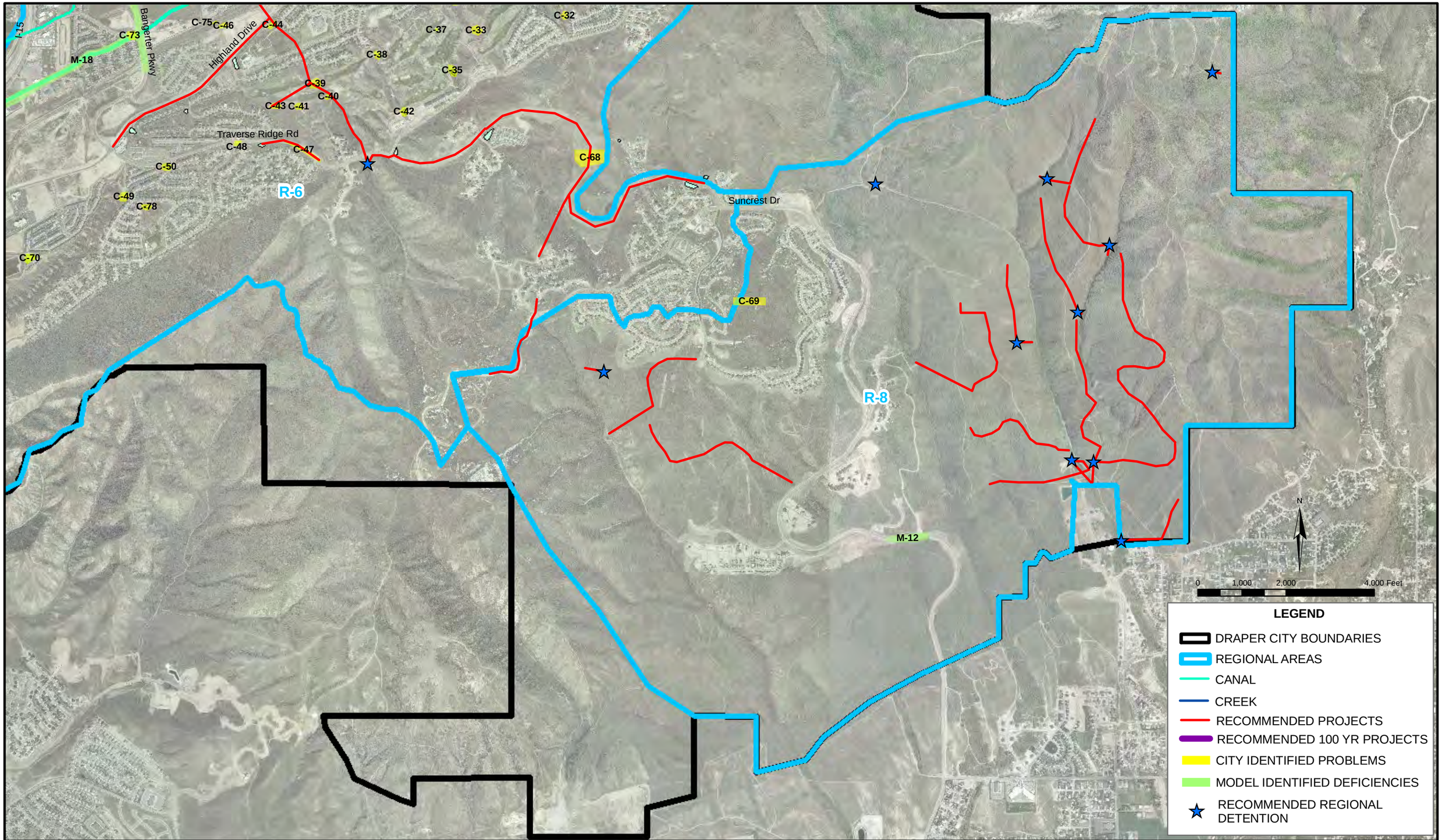


HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK
CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
V-2



HANSEN ALLEN & LUCE INC ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

SOUTH SIDE OF TRAVERSE MOUNTAIN
CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
V-3

R-5 Pioneer Road and Highland Drive – While this area is mostly built-out, improvement to the major outfalls can be accomplished with new regional detention facilities. These facilities will solve capacity problems in the outfalls along the old Draper Canal and Pioneer Road.

R-6 South Mountain – This area is the largest regional planned area. South Mountain was developed with a subdivision by subdivision approach to storm water. The result of this approach is a patchwork of conveyance systems and detention basins that direct storm water to various areas in an inefficient way. As development in the area increases, the reliance on this system becomes untenable if the City is to provide the level of service desired for the 10 and 100 year storm events. In order to provide solutions to existing problems and to create a long-term plan that does not rely on canals and ditches as well as reduce the number of detention facilities, a regional plan for this area was established in order to convey storm water flows to the natural drainage Corner Creek.

R-7 TOD and State Prison – While mostly undeveloped currently, this area will likely see growth in the near future as a commercial and high-density residential area. Regional storm drain facilities will convey storm water to a regional detention before discharge to the Jordan River.

R-8 Traverse Mountain – The Traverse Mountain area has unique challenges regarding storm water conveyance. The steep mountain terrain provides sufficient capacity for the majority of storm drainage pipes in the area but also creates problems regarding erosion and sediment transportation. Existing development in the area discharges storm water into drainage channels, including Coyote Hollow, Hog Hollow, and Maple Hollow. These channels have experienced significant erosion from this storm water discharge and they will require stabilization in order to prevent additional channel degradation. For the most part, stabilization will be achieved by diverting low flow storm water from the drainage channels. Because these are major drainages, the drainage channels and detention basins were analyzed using the 100-year storm. The detention basins were analyzed using the 2-year capture volume with 10-year and 100-year release rates. In the undeveloped areas of the Traverse Mountain area that have already been platted, zoned or otherwise approved for development, future regional backbone infrastructure was included in the plan.

PRECISION OF COST ESTIMATES

When considering cost estimates, there are several levels or degrees of precision, depending on the purpose of the estimate and the percentage of detailed design that has been completed. The following levels of precision are typical:

Type of Estimate	Precision
Master Planning	±50%
Preliminary Design	±30%
Final Design or Bid	±10%

For example, at the master planning level (or conceptual or feasibility design level), if a project is estimated to cost $1,000,000, then the precision or reliability of the cost estimate would typically be expected to range between approximately $500,000 and $1,500,000. While this may seem very imprecise, the purpose of master planning is to develop general sizing, location, cost, and scheduling information on a number of individual projects that may be designed and constructed over a period of many years. Master planning also typically includes the selection of common design criteria to help ensure uniformity and compatibility among future individual projects. Details such as the exact capacity of individual projects, the level of redundancy, the location of facilities, the alignment and depth of pipelines, the extent of utility conflicts, the cost of land and easements, the construction methodology, the types of equipment and material to be used, the time of construction, interest and inflation rates, permitting requirements, etc., are typically developed during the more detailed levels of design.

At the preliminary or 10% design level, some of the aforementioned information will have been developed. Major design decisions such as the size of facilities, selection of facility sites, pipeline alignments and depths, and the selection of the types of equipment and material to be used during construction will typically have been made. At this level of design the precision of the cost estimate for a $1,000,000 project would typically be expected to range between approximately $700,000 and $1,300,000.

After the project has been completely designed, and is ready to bid, all design plans and technical specifications will have been completed and nearly all of the significant details about the project should be known. At this level of design, the precision of the cost estimate for the same $1,000,000 project would typically be expected to range between approximately $900,000 and $1,100,000.

ESTIMATED CONSTRUCTION COSTS

Estimated construction costs for the storm drainage pipe lines include manholes, inlets and where applicable roadway repair, curb and gutter replacement, and utility relocation for larger storm drain diameters. It was assumed that curb and gutter would not be replaced for storm drain diameters smaller than 30-inches. It was also assumed that one existing utility would need to be relocated for storm drain diameters larger than 30-inches, and two existing utilities would need to be relocated for storm drain diameters larger than 48-inches. Estimated construction costs for detention facilities include excavation, grading, inlet and outlet structures, and general landscaping.

Unit costs for the construction cost estimates are based on conceptual level engineering. Unit construction costs were estimated based on construction cost indices, communication with material suppliers, and HAL experience with similar construction. Recent price and economic trends indicate that future costs are difficult to predict with certainty. Engineering cost estimates given in this study should be regarded as conceptual level as appropriate for use as a planning guide. Only during final design can a definitive and more accurate estimate be provided. A detailed cost estimate of each project along with unit pipe costs and detention basin project costs is provided in Appendix C.

TABLE V-1
CAPITAL IMPROVEMENT PLAN AND IDENTIFIED DEFICIENCIES

ID #	LOCATION	ELEMENT ID	PROBLEM DESCRIPTION	PREFERRED SOLUTION	PROJECT COST ($)
M-1	Intersection of Bubbling Brook Ln and Clintwood Drive	DET_136, DET_137	No orifices identified in these detentions, accompanying pipes flow full and experience backwater effects as a result	Add an orifice to each detention. 10" orifice for DET_136 6" orifice for DET_137	$3,000
M-2	900 East and 12300 South	O-9	20 cfs outlets to curb and gutter and does not reach detention. The detention basin is not detaining sufficiently and instead backs up and spills over weir in junction box just upstream. Downstream pipes are all over capacity with surcharge issues if that drainage makes it back into the system.	Improve junction box M-42 by raising weir height by an additional 2 feet. Improve DET_4 by lowering orifice location by 4 feet and expanding detention size by lowering the floor by 4 feet and widening at all levels accordingly. Also, 30" diameter pipe 867 should have its downstream invert elevation lowered by 4 feet. 100-year solution includes additional cost to construct diversion of excess flows to Willow Creek and upsizing some pipes in Draper Parkway.	$205,000
M-3	1840 East from 12280 South to 12230 South	160, 156	Storm drainage piping reduces from 30-inch to 24-inch at element 156. Pipes are overcapacity but not surcharging at manholes.	Monitor during future events to watch for potential problems. Consider connecting to the west if an improvement is warranted.	$0
M-4	Pioneer Road at Bear Hill Cir	M-157	Manhole is surcharging at this location.	Construct detention facility at this location.	$52,000
M-5	12600 South from 1700 East to 1730 East and 1700 East from 12600 South to Ellerbeck Ln	214, 215, 217, 218, 219, 220, 221, 222, 225, I-647	Pipes are overcapacity and surcharging at I-647.	Detention is needed at I-647. Construct new detention on school property as part of future development. Regionally planned area R-5.	See Regional Area CIP
M-6	Ranchero Drive and Bear Hollow Drive	I-494	Area has no storm drainage pipe system or inlets; SB803 enters storm drainage pipes that don t connect.	Install new storm drainage system in this area with inlets and piping.	Completed in 2011

TABLE V-1 (CONTINUED)

ID #	LOCATION	ELEMENT ID	PROBLEM DESCRIPTION	PREFERRED SOLUTION	PROJECT COST ($)
M-7	Golden Pheasant Drive from 980 East to Fort Street, Fort Street from Golden Pheasant Drive to 13200 South, 13200 South from Fort Street to 1040 East	770, 769, 765, 756, 755	Inlet I-192 surcharging and spilling 7.9 cfs. Pipes are over capacity or experiencing backwater effect.	Investigate inlet I-192 and the function of listed 2" orifice. Monitor during future events to identify potential problems.	$0
M-8	Fort Street and New Hope Drive	CH-4, I-301	Ditch is over capacity and inlet to CMP is surcharging.	Regionally planned area R-4.	See Regional Area CIP
M-9	Green Clover Road from park to 13055 S	4088, 4087, 4086, 4085, 4084, 4083, 4081	Pipes are over capacity but not surcharging at manholes.	Reconstruct the outlet for DET_150. Monitor the pipes in Galena Clover Road during future events to determine adequacy.	$39,000
M-10	Pioneer Road from 750 East to 1015 East	All downtown area elements	Systemic problem related to development. As development occurs, storm drainage will need to be installed.	Regionally planned area R-4.	See Regional Area CIP
M-11	Cabot Cove from 1150 East to 1140 East and 1140 East from Cabot Cove to 13015 South and 13015 South from 1140 East to 1120 East	491, 490, 489, 498, 503, 505, I-369, I-445, I-603	Pipe entering detention basin has no slope, which causes backwater issues upstream including surcharging manholes.	Regionally planned area R-4.	See Regional Area CIP
M-12	Suncrest Drive from Brookings Drive to the corner to the East	4562, 4561, 4594, 4593, I-2823, M-1687	Pipes are over capacity with surcharging at junctions.	Monitor this location during future storm events to determine potential problems.	$0

TABLE V-1 (CONTINUED)

ID #	LOCATION	ELEMENT ID	PROBLEM DESCRIPTION	PREFERRED SOLUTION	PROJECT COST ($)
M-13	Highland Drive and 13200 South intersection, up to about 13100 South	539, 628, 627, 536	Underground detention with assumed unit detention to 0.2 cfs/acre for SB622. 18-inch pipe with slopes of less than 0.5% are causing capacity problems with surcharging at several manholes.	Regionally planned area R-5.	See Regional Area CIP
M-14	Stokes Ave and 500 East	1070, DET_28, I-934	Detention is undersized for 10-year event.	Increase storage capacity in the detention and reconfigure outlet by dropping outlet pipe by 1 ft and adding about 0.1 ac-ft of additional storage capacity.	$52,000
M-15	300 East from 13460 South to Carlquist Drive, Carlquist Drive from 300 East to Crystal Spring Drive through DET_31 across Golden Pheasant Drive to Brookhaven Cove up to 12930 South, 12930 South from Brookhaven Dove to Future High School Site	1099, 1097, 1095, 1102, 1201, 1198, 1195, 1194, 1193, 1191, 1190, 946, 941, 940, 937, 935, 933, 932, 931, 981, 980, 979, 977, 975	Pipes are at capacity or surcharging under existing and future conditions.	Construct new 24-inch storm drain line from M-540 to the west to Corner Canyon Creek. Connect Lone Peak Meadows subdivision from I-924 to M-540 with 18-inch storm drain and abandon line running north through backyard. Add regional detention in-line with Corner Canyon Creek at this location. Upsize existing storm drain in 300 East to Carlquist Drive and east to Crystal Spring Drive. Increase detention capacity and improve outlet structure at DET_31 and continue storm drain to future high school location.	$1,865,000
M-16	Lone Peak Pkwy and Election Road to Lone Peak Pkwy and 12075 South	4567, 4568, 4572	No detention modeled from commercial area, causes surcharging downstream. This line ends with retention at the medical product building.	Include as part of the regionally planned area R-2.	See Regional Area CIP
M-17	550 West and 12250 South	3733, 3736, 3735, 3738, 3737	15" line is a little undersized and causes surcharging in one of the inlets.	Monitor this location during future storm events to determine potential problems.	$0

TABLE V-1 (CONTINUED)

ID #	LOCATION	ELEMENT ID	PROBLEM DESCRIPTION	PREFERRED SOLUTION	PROJECT COST ($)
M-18	Old Draper Canal	2339, 1605, 1604, 1597, 1596, CH-11, CH-10, 2336, 2334, 2333, 2331, 2330, 2329, 2327, 2326	System is very flat with ditch and large diameter pipe. With the constriction caused by the 15-inch pipe, the whole system acts as detention with flooding.	Include as part of regional solution R-6 by installing new storm drain down frontage road to 13800 South.	See Regional Area CIP
M-19	Area around Southridge Park	Numerous	System is over capacity both before detention and after. Many manholes are shown to be surcharging in 13800 South. Currently, the detention basin is too high and the runoff backs up in the pipes instead of in the detention.	Incorporate 13800 South improvements into regional improvement area. Improve DET_122 by lowering the detention by 2 feet. Install 10-inch orifice in DET_131.	$130,000
M-20	Rambling Road and 1650 East	1871, New-9	18" diameter storm drainage pipe 1871 is overcapacity and causes surcharging in upstream manholes.	Monitor this location in the future for potential problems. If problems arise, upsize pipe 1871 to a 24" diameter.	$0
M-21	Dearbourne Heights Condominiums	DET_59	Currently, outlet does not function properly.	Reconstruct outlet works and install orifice.	$39,000
C-1	14350 South Bangerter Parkway	M-746, 1484	Manhole lid blows off during minor rain events. Energy grade line is above ground level at this location in the model. 18-inch line downstream only has 8.1 cfs capacity.	Secure the manhole.	$0
C-2	1000 to 1200 East 13400 S	-	Identify need for storm drainage outfall.	Install storm drain pipe and inlets down to Cutler Cove and into Corner Creek.	$754,000
C-3	Behind 13270 South Akagi Lane	O-18	Currently drains to ditch.	Monitor this location for problems.	$0
C-4 - C-8	Aintree Ave	I-725, I-711, I-738, I-720	Open ditch flows jump inlet and flood into street. Open lots erode and flood through private lot.	Reconstruct inlets to culverts.	$16,000

TABLE V-1 (CONTINUED)

ID #	LOCATION	ELEMENT ID	PROBLEM DESCRIPTION	PREFERRED SOLUTION	PROJECT COST ($)
C-9	12900 Moose Hollow Drive	DET_50	Need a recommended headgate opening size for the detention basin.	Adjust headgate opening to about 0.6 square feet. This results in about 1.25 feet of depth in the detention basin.	$0
C-10	1819 East 13200 South	I-188	Cherry Creek, debris basin and 90 degree turns to pipe.	Construct concrete chute to convey debris flows past existing homes. Construct debris basin and obtain necessary rights-of-way.	$3,500,000
C-11	Short Court	855	Down sloping cul-de-sac outfalls past the homes with no conveyance.	Connect to existing 42-inch storm drain line.	$7,000
C-12	12742 Moose Hollow Drive	DET_12	Horses in difficult to access detention basin.	Construct regional detention at upstream school property (see M-5) and eliminate the need for this detention.	$0
C-13	12594 South 1745 East	DET_13	Detention on private property does not currently function.	Construct regional detention at school property (see M-5) and eliminate the need for this detention.	$0
C-14 - C-15	1991 East 12652 South (Highland Drive)	-	Upper Corner Canyon Road. Makeshift basin has no outfall. Highland Drive has no drainage.	Install 1,500 feet of 18-inch storm drain pipe with inlets.	$283,000
C-16	12312 South Graystone Court	I-403	Downsloping cul-de-sac with inaccessible detention basin.	Include in regional improvement area.	$0
C-17	2018 East Montane Court	I-268	Downsloping cul-de-sac with inaccessible detention basin.	Construct new storm drain south to existing storm drain in 12200 South. (See M-3 for additional solution)	$44,000
C-18	12197 South Montane Court	67	Reduction in pipe size in private driveway.	Monitor for issues in the future.	$0
C-19	12066 South Draper Farm Court	M-203	Question of whether this detention is needed.	Based on existing downstream capacity, this detention can be eliminated.	$0
C-20	12050 South Highland Drive	573, 52, 56, 57, 58, 59, 63	Existing line is not in the street and is difficult to access and maintain. Also, there are no inlets on Highland Drive.	Install new 18-inch storm drain pipe and inlets in Highland Drive.	$424,000
C-21	12087 South 2000 East	DET_49	Needs an evaluation of the outfall to determine appropriate headgate opening.	Headgate opening of 0.6 square feet for the 10-year event.	$0
C-22	1700 East Indian Wells Lane	O-131	Hole cut into box with 45 degree outlet to creek.	Reconstruct outlet to Willow Creek, possibly incorporate into solution to M-3.	$0
C-23	789 East Corner Ridge Drive	I-2198	Box bubbles up into down-sloping driveway.	Solution to M-19 will solve this problem.	$0

TABLE V-1 (CONTINUED)

ID #	LOCATION	ELEMENT ID	PROBLEM DESCRIPTION	PREFERRED SOLUTION	PROJECT COST ($)
C-24	13800 South Ranch Circle	M-1304, M-1305	Inlets clog easily creating flooding and ponding in 13800 South.	Replace with hooded inlets.	$7,000
C-25	Town Center Drive and Highland Drive	O-164, I-1556, O-165, I-1557	Erosion in the open channel portions.	Install new 18-inch storm drainage pipe to replace open channel conveyances.	$39,000
C-26	Candy Pull Drive and Pepi Band Road	I-1913	No outlet. System dead-ends into inlet box.	Install new 15-inch storm drain pipe to connect to system.	$44,000
C-27	Stone Canyon Drive and Vestry Road	-	Resident complains of drainage and ice issues.	Install new storm drain and inlets in Vestry Road.	$207,000
C-28	13852 South Vestry Road	-	Runoff from residents causes sidewalks and driveway to erode underneath and collapse.	Install new storm drain and inlets in Vestry Road.	$113,000
C-29	1810 East Richey Road	I-791	Curb and gutter runoff jumps driveway and floods into residential home.	Extend 15-inch storm drain line and install two new inlets.	$15,000
C-30	1420 East Rambling Road	CH-6	Golf course land drains have eroded 24" line causing erosion. The County has agreed that as owners of the Golf Course this is their issue to resolve.	Rip-rap the channel and add inlets for drainage.	$0
C-31 - C-44	South Mountain Golf Course	Numerous	No access. Outlet structure.	Monitor during storm events for potential problems. Relieve flow to some of the detentions with regional improvement area.	$0
C-45	13926 South Osborne Lane	DET_122	Check basin hydraulics.	Problems with DET_122 are addressed with the solution for M-19.	$0
C-46	571 East Highland Drive	O-176	Detention must be reconstructed.	Construct detention with outlet structure to properly detain this area.	$20,000
C-47	777 East Traverse Ridge Road	-	Need for storm drain system, causing erosion.	Install 1,300 feet of curb and gutter and 1500 feet of new 18 inch storm drain line to DET_79.	$313,000
C-48	Steep Mountain Drive and Traverse Ridge Road	-	Lack of drainage causes erosion to deposit in intersection.	Install 2,500 feet of curb and gutter along south side of Traverse Ridge Road.	$30,000
C-49	14900 South Manilla Drive	DET_74	This detention has no access. The detention has experienced flooding in the past.	Eliminate this detention and reroute flows to DET_77. Upsize DET_77 to replace DET_74.	$386,000

TABLE V-1 (CONTINUED)

ID #	LOCATION	ELEMENT ID	PROBLEM DESCRIPTION	PREFERRED SOLUTION	PROJECT COST ($)
C-50	14710 South Manilla Drive	DET_77	No access to this detention basin. Outlet structure should be looked at.	Problem resolved with resolution of city identified problem C-49.	$0
C-51	Relation Street	-	Lack of storm drain and curb and gutter.	Include as part of Regional area R-5. Install 2,300 feet of storm drain in Pioneer Road down to roundabout storm drain (cost for curb and gutter included with the Transportation Master Plan)	See Regional Area CIP
C-52	925 East 12300 South	DET_4	Analyze hydraulics and study control structure.	See problem M-2.	$0
C-53	1076 East Draper Parkway	-	Parking lot discharges straight to canal.	Monitor this location as potential water quality issue. Solution to this issue should be incorporated into future development.	$0
C-54	546 East Camden Park Lane	M-1442	New structure allows water to flow in two different directions.	Monitor this location in the future for potential problems. If necessary, may need to block connection to Cranberry Hill neighborhood.	$0
C-55	12617 South 150 East	DET_36	Review orifice.	Monitor this location for potential problems.	$0
C-56	244 East Stonebridge Drive	-	Street drainage needed; analyze for outfall.	Install approximately 1,500 feet of new 18 inch storm drain with inlets.	$283,000
C-57	221 East Hollybrook Cove	1012	Homeowner has cut storm drain and created water feature in yard out of it.	Any potential solution to future problems will be the responsibility of the homeowner.	$0
C-58	13145 South 150 East	DET_120	Functionality of basin is confusing. Cannot find outfall.	Reconstruct the outlet to the detention basin.	$20,000
C-59	12452 South Galena Park Boulevard	3746, 3745, 3744	System buried and inlets on street can't drain.	Incorporate redesign of outfall into park expansion.	$51,000
C-60	253 East Cranberry Hill Drive	2148, 2149	Pipes sloped wrong way and does not drain properly.	Relay 150 feet of 15 inch storm drain pipe when road surfacing is done.	$22,000
C-61	Between Corner Canyon Drive and Stoke Avenue	1065, 1066	Storm drain along property line of private property. Should be relocated to roadway. No access.	Install 840 feet of new 15 inch storm drain in Stokes Avenue.	$123,000
C-62	11400 to 18000 South and 700 West	-	Needs curb and gutter and storm drain with capacity for irrigation.	Included in regional solution R-1.	See Regional Area CIP
C-63	12101 South Factory Outlet Drive	CH-3	St. Marks detention to open ditch. There are maintenance issues with the ditch.	Install 960 feet of new storm drainage pipe.	$116,000

TABLE V-1 (CONTINUED)

ID #	LOCATION	ELEMENT ID	PROBLEM DESCRIPTION	PREFERRED SOLUTION	PROJECT COST ($)
C-64	400 East Kimballs Lane	-	Determine private detention.	Juan Diego detentions need orifices.	$0
C-65	219 East Cranberry Hill Drive	2143, 2144	Pipes do not drain properly.	Relay 150 feet of 15 inch storm drain pipe when road surfacing is done.	$22,000
C-66	11499 South Sweet Berry Drive	2158, 2160	Downstream pipe higher then upstream pipe.	Replace 380 feet of 18-inch storm drain pipe when road surfacing is done.	$50,000
C-67	12198 South Factory Outlet Drive	I-1797	Roadway flooded during last rain event.	Monitor during future storm events. Could have been a clogged inlet.	$0
C-68	1550 East Traverse Ridge Road	-	Erosion from lack of storm drain system in Traverse Ridge Road.	Included in regional solution R-8.	See Regional Area CIP
C-69	Suncrest	All Suncrest area Detention Basins	All basins in Suncrest must be sized properly, and outlet control structures redesigned and relocated to accessible locations.	Reconstruct detention outlet structures.	$520,000
C-70	145 East Steep Mountain Drive	DET_59	Maintenance issues at this detention.	Resolved by solution to existing model identified problem M-21.	$0
C-71	14800 South Minuteman Drive	DET_76	Detention basin has capacity and access deficiencies.	Detention basin is eliminated as part of regional solution R-6.	See Regional Area CIP
C-72	201 West Highland Drive	-	Erosion from lack of storm drain system and no curb and gutter on north side.	Install 3,800 feet of curb and gutter on the north side of Highland Drive.	$89,000
C-73	160 South Fork Drive	2341	Significant decrease in pipe size with 180 degree turn.	Included in regional solution R-6.	See Regional Area CIP
C-74	200 East Bangerter Highway	DET_54	Verify basin size and orifice. Redesign outlet structure.	Modeling predicts future condition to perform satisfactorily because of lower flows due to regional solution R-6. Monitor after R-6 solution is completed.	$0
C-75	571 East Highland Drive	CH-1	Erosion in open channel before culvert.	Included in regional solution R-6.	See Regional Area CIP
C-76	200 East Bangerter Highway	DET_55	Basin and outlet need redesign and reconstructed.	Included in regional solution R-6.	See Regional Area CIP
C-77	557 East Hollow Creek Road	DET_141	City would like to eliminate this detention on private property.	With improvements to DET_122 as part of the solution to problem M-19 this detention can be eliminated.	$0
C-78	Manti Drive at 375 East	DET_127	Basin and outlet needs redesign and reconstruction.	Resize detention to eliminate DET_125 and DET_126 and reconstruct the outlet.	$20,000

TABLE V-1 (CONTINUED)

ID #	LOCATION	ELEMENT ID	PROBLEM DESCRIPTION	PREFERRED SOLUTION	PROJECT COST ($)
C-79	Draper Parkway at 1350 East to 1500 East	-	Sag in Draper Parkway fills with water during large events.	Install inlets and piping to convey 100-year flows away from the sag.	$202,000
-	Located at various locations throughout the City	-	75 detentions have been identified that have functionality, capacity and maintenance deficiencies.	Reconstruct the outlets and other upgrades as needed to detention facilities.	$5,625,000
TOTAL					**$15,730,000**

TABLE V-2
CAPITAL IMPROVEMENT PLAN FOR REGIONAL PLANNED AREAS

ID #	NAME	REGIONAL PROJECT COST ($)
R-1	West Side 11400 South	$2,453,000
R-2	12300 South Lone Peak Center	$3,307,000
R-3	12800 South Lone Peak Industrial	$4,845,000
R-4	City Center	$5,970,000
R-5	Pioneer Road and Highland Drive	$4,207,000
R-6	South Mountain	$12,073,000
R-7	TOD and State Prison	$9,216,000
R-8	Traverse Mountain	$22,023,000
TOTAL		**$64,094,000**

COST ALLOCATION

A cost allocation breakdown was determined for each regional area and individual project. The allocation is based on directly connected impervious area within or tributary to each regional area or project. The allocation was divided into three time frames:

- **Development Prior to 1999** - The master plan completed in 2001 and revised in 2002 was based on aerial photography taken in 1999.
- **Development Between 1999 and 2009** - Aerial photographs from 2009 were the basis for the determination of subbasin characteristics for this Storm Drain Master Plan.
- **Future Development** – this includes future development based on current zoning and adjacent land use.

The capital improvement cost allocation for the regional planned areas are presented in Table V-3. The cost allocation for the individual projects listed in Table V-1 is located in Appendix C.

TABLE V-3
CAPITAL IMPROVEMENT COST ALLOCATION FOR REGIONAL PLANNED AREAS

ID #	NAME	DEVELOPMENT PRIOR TO 1999 (%)	DEVELOPMENT BETWEEN 1999 AND 2009 (%)	FUTURE DEVELOPMENT (%)
R-1	West Side 11400 South	30.2	30.1	39.7
R-2	12300 South Lone Peak Center	39.6	29.4	31.0
R-3	12800 South Lone Peak Industrial	17.4	43.5	39.0
R-4	City Center	31.8	26.7	41.5
R-5	Pioneer Road and Highland Dr.	30.2	60.8	9.1
R-6	South Mountain	29.1	29.4	46.5
R-7	TOD and State Prison	12.8	22.5	64.7
R-8	Traverse Mountain	0	16.9	83.1

REFERENCES

Denver Regional Council of Governments. June 2001 revised April 2008. *Urban Storm Drainage Criteria Manual*. Denver, CO.

Draper City. 1999. *Draper City Trailway Study for the Proposed Mehraban Trailway*. Draper City, UT.

Farmer, Eugene E. and Joel E. Fletcher. 1971. *Precipitation Characteristics of Summer Storms at High Elevations Stations in Utah*. USDA Forest Service, Research Paper INT-110. Ogden, UT.

Hansen, Allen & Luce Inc. 1993. *Corner Canyon Creek Master Plan*. Salt Lake County Department of Public Works. Midvale, Utah.

Hansen, Allen & Luce Inc. 2002. Draper City Storm Drainage Master Plan. Draper City. Midvale, Utah.

Horner, Richard R. J. J. Skupien, E.H. Livingston and H. E. Shaver, 1994. Fundamentals of Urban Runoff Management – Technical and Institutional Issues. Terren Institute in Cooperation with the United States Environmental Protection Agency. Washington D. C.

Horrocks Engineers. 1996. *City of Draper Master Storm Water Management Plan*. American Fork, UT.

National Oceanic and Atmospheric Administration (NOAA) website. 2006. http://dipper.nws.noaa.gov/hdsc/pfds/. Precipitation Frequency Data Server.

Natural Resource Conservation Service (NRCS). 1986. *Urban Hydrology for Small Watersheds*. Technical Release 55 (TR-55). United States Department of Agriculture (USDA). Washington, D.C.

Simas, M.J. and R.H. Hawkins. 1998. *Lag Time Characteristics for Small Watersheds in the U.S.* International Water Resources Engineering Conference Procedures, Vol. 2, pp. 1290-1296. ASCE. Reston, VA.

TRC North American Weather Consultants and Meteorological Solutions Incorporated. 1999. *Rainfall Intensity Duration Analysis, Salt Lake County, Utah*. Sandy, UT.

U.S. Army Corps of Engineers (USACE). 2008. *User's Manual - HEC-HMS Version 3.2*. Davis, California.

United States Environmental Protection Agency (USEPA). 1998. *NPDES Storm Water Phase II Fact Sheet*. January 1998.

U.S. Soil Conservation Service (SCS). 1972. *SCS National Engineering Handbook - Section 5 Hydrology*. United States Department of Agriculture, Washington, D.C.

U.S. Soil Conservation Service, 1968. *Soil Survey, Utah County, Utah*. United States Department of Agriculture, Washington, D. C.

Utah Administrative Code.

Utah Division of Water Rights. 1991 State of Utah Statutes and Administrative Rules for Dam Safety. Section 73-5a of the Utah Code Annotated 1953, as Amended.

APPENDIX A
Existing Storm Drain Pipe Capacities

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1	3	Pipe	RCP	I-76	M-49	29.41	4527.20	4527.00	0.6800	15	0.015	8.28	4.62	1.79	6.88	1.24	0.99	0.00	> CAPACITY
2	4	Pipe	RCP	M-65	M-49	157.34	4525.30	4523.70	1.0200	24	0.015	15.25	3.50	4.36	5.35	1.70	0.85	0.00	> CAPACITY
3	5	Pipe	RCP	M-65	I-104	42.15	4524.40	4524.00	0.9500	15	0.015	0.86	0.27	3.16	1.98	0.48	0.38	0.00	> CAPACITY
4	6	Pipe	RCP	M-65	M-288	193.79	4517.40	4513.70	1.9100	24	0.015	15.25	26.98	0.57	7.30	1.26	0.63	0.00	Calculated
5	8	Pipe	RCP	M-288	O-42	21.94	4513.60	4513.00	2.7300	24	0.015	15.25	35.76	0.43	8.29	1.13	0.57	0.00	Calculated
6	9	Pipe	RCP	M-49	M-52	223.22	4527.50	4525.30	0.9900	24	0.015	7.18	0.41	17.29	3.14	1.36	0.68	0.00	> CAPACITY
7	10	Pipe	RCP	M-52	M-51	224.79	4529.70	4527.60	0.9300	24	0.015	7.23	0.41	17.48	3.15	1.35	0.69	0.00	> CAPACITY
8	11	Pipe	RCP	I-78	M-51	7.50	4531.00	4530.70	4.0000	15	0.015	0.11	11.20	0.01	0.59	0.61	0.51	0.00	Calculated
9	12	Pipe	RCP	I-77	M-51	27.60	4530.80	4530.50	1.0900	15	0.015	0.09	5.84	0.01	0.42	0.81	0.67	0.00	Calculated
10	13	Pipe	RCP	M-50	M-51	159.94	4532.00	4529.80	1.3800	24	0.015	7.49	22.99	0.33	3.86	1.21	0.62	0.00	Calculated
11	14	Pipe	RCP	I-681	M-50	63.82	4535.20	4533.00	3.4500	18	0.015	0.00	16.90	0.00	0.00	0.00	0.00	0.00	Calculated
12	15	Pipe	RCP	I-680	I-681	30.26	4535.50	4535.30	0.6600	18	0.015	0.00	7.40	0.00	0.00	0.00	0.00	0.00	Calculated
13	16	Pipe	RCP	I-682	I-680	110.23	4535.60	4535.50	0.0900	18	0.015	0.00	2.74	0.00	0.00	0.00	0.00	0.00	Calculated
14	17	Pipe	RCP	M-399	I-683	8.76	4538.00	4537.90	1.1400	15	0.015	0.00	5.98	0.00	0.00	0.00	0.00	0.00	Calculated
15	18	Pipe	RCP	I-683	M-427	92.66	4537.50	4536.00	1.6200	18	0.015	0.00	11.58	0.00	0.00	0.00	0.00	0.00	Calculated
16	19	Pipe	RCP	M-427	M-50	95.66	4535.30	4532.00	3.4500	24	0.015	7.52	36.42	0.21	7.34	0.71	0.36	0.00	Calculated
17	20	Pipe	RCP	M-431	M-427	177.22	4545.40	4535.80	5.4200	18	0.015	2.77	21.19	0.13	8.10	0.37	0.25	0.00	Calculated
18	22	Pipe	RCP	M-430	M-431	111.72	4550.50	4545.50	4.4800	18	0.015	2.81	19.26	0.15	7.49	0.39	0.27	0.00	Calculated
19	23	Pipe	RCP	I-759	M-429	11.54	4559.30	4558.10	10.4000	15	0.015	0.00	18.05	0.00	0.00	0.03	0.02	0.00	Calculated
20	24	Pipe	RCP	I-758	M-429	56.61	4560.00	4558.20	3.1800	15	0.015	0.00	9.98	0.00	0.00	0.00	0.00	0.00	Calculated
21	25	Pipe	RCP	M-429	M-430	88.35	4557.80	4550.80	7.9200	18	0.015	2.83	25.63	0.11	9.17	0.34	0.23	0.00	Calculated
22	26	Pipe	RCP	M-429	M-428	359.44	4593.80	4558.00	9.9600	15	0.015	3.02	0.09	32.32	2.93	0.96	0.78	0.00	> CAPACITY
23	28	Pipe	HDPE	I-319	I-320	68.94	4629.50	4628.70	1.1600	15	0.015	0.00	6.03	0.00	0.00	0.00	0.00	0.00	Calculated
24	30	Pipe	HDPE	M-176	I-320	200.11	4628.50	4617.50	5.5000	15	0.015	0.00	0.13	0.00	0.00	0.00	0.00	0.00	Calculated
25	32	Pipe	HDPE	I-762	I-761	57.96	4634.70	4631.90	4.8300	15	0.015	3.75	12.31	0.30	8.07	0.50	0.40	0.00	Calculated
26	33	Pipe	RCP	I-763	I-766	96.47	4652.40	4651.70	0.7300	15	0.015	0.00	4.77	0.00	0.00	0.00	0.00	0.00	Calculated
27	34	Pipe	RCP	I-766	M-437	57.21	4651.40	4650.30	1.9200	15	0.015	0.00	7.76	0.00	0.00	0.29	0.24	0.00	Calculated
28	35	Pipe	HDPE	I-760	M-437	98.65	4652.20	4650.10	2.1300	15	0.015	0.00	8.17	0.00	0.00	0.39	0.32	0.00	Calculated
29	37	Pipe	HDPE	M-437	M-436	156.91	4649.90	4645.30	2.9300	15	0.015	8.17	9.59	0.85	8.23	0.92	0.75	0.00	Calculated
30	39	Pipe	HDPE	M-436	M-435	177.68	4645.10	4630.90	7.9900	15	0.015	8.17	15.83	0.52	11.69	0.67	0.56	0.00	Calculated
31	40	Pipe	HDPE	M-435	M-434	131.66	4630.80	4626.60	3.1900	18	0.015	8.16	16.26	0.50	8.62	0.77	0.53	0.00	Calculated
32	41	Pipe	HDPE	M-434	M-433	94.44	4626.50	4622.80	3.9200	18	0.015	8.16	18.02	0.45	9.13	0.74	0.50	0.00	Calculated
33	42	Pipe	HDPE	M-433	I-764	206.66	4622.70	4615.70	3.3900	18	0.015	8.16	16.75	0.49	8.96	1.10	0.75	0.00	Calculated
34	43	Pipe	HDPE	I-326	M-179	236.04	4983.30	4969.00	6.0600	15	0.015	0.00	13.78	0.00	0.00	0.00	0.00	0.00	Calculated
35	44	Pipe	HDPE	I-303	I-302	27.32	4968.30	4966.50	6.5900	15	0.015	0.00	14.37	0.00	0.00	0.00	0.00	0.00	Calculated
36	45	Pipe	HDPE	M-179	I-302	101.47	4968.90	4966.50	2.3700	15	0.015	0.00	8.65	0.00	0.00	0.00	0.00	0.00	Calculated
37	46	Pipe	DPE	I-302	M-159	266.30	4966.50	4959.70	2.5500	15	0.015	0.00	8.95	0.00	0.00	0.00	0.00	0.00	Calculated
38	47	Pipe	HDPE	M-159	M-160	226.54	4959.70	4933.60	11.5200	15	0.015	0.00	19.00	0.00	0.00	0.63	0.50	0.00	Calculated
39	48	Pipe	HDPE	M-160	I-305	142.31	4933.60	4927.70	4.1500	15	0.015	12.36	11.40	1.08	10.07	1.25	1.00	2.00	SURCHARGED
40	49	Pipe	HDPE	I-304	I-305	28.90	4929.00	4928.70	1.0400	15	0.015	0.00	5.70	0.00	0.00	0.00	0.00	0.00	Calculated
41	50	Pipe	HDPE	I-305	M-157	156.21	4927.90	4896.20	20.2900	15	0.015	12.33	25.22	0.49	12.55	0.93	0.75	0.00	Calculated
42	51	Pipe	HDPE	M-157	I-316	117.03	4896.10	4895.50	0.5100	15	0.015	5.95	4.11	1.45	5.14	1.12	0.89	0.00	> CAPACITY
43	52	Pipe	HDPE	M-220	I-367	245.47	4879.60	4864.30	6.2300	15	0.015	5.95	13.98	0.43	10.64	0.58	0.47	0.00	Calculated
44	53	Pipe	RCP	I-365	I-366	31.26	4871.40	4869.40	6.4000	15	0.015	0.00	14.16	0.00	0.00	0.00	0.00	0.00	Calculated
45	54	Pipe	RCP	I-366	M-203	23.15	4868.80	4868.50	1.3000	15	0.015	0.00	6.37	0.00	0.00	0.00	0.00	0.00	Calculated
46	55	Pipe	RCP	M-203	M-368	35.90	4868.30	4858.80	26.4600	15	0.015	0.00	28.80	0.00	0.00	0.00	0.00	0.00	Calculated
47	56	Pipe	HDPE	I-367	M-368	145.60	4864.00	4856.60	5.0800	15	0.015	5.95	12.62	0.47	9.66	0.68	0.55	0.00	Calculated
48	57	Pipe	HDPE	M-368	M-370	384.99	4856.50	4830.50	6.7500	15	0.015	11.47	14.55	0.79	12.38	0.88	0.71	0.00	Calculated
49	58	Pipe	PVC	M-370	M-369	335.36	4830.50	4812.40	5.4000	15	0.015	11.41	13.00	0.88	10.45	1.08	0.88	0.00	Calculated
50	59	Pipe	HDPE	M-369	M-342	503.66	4812.40	4793.00	3.8500	15	0.015	10.97	10.99	1.00	10.57	1.05	0.84	0.00	Calculated
51	60	Pipe	HDPE	I-272	I-285	54.57	4811.70	4808.90	5.1300	15	0.015	0.00	12.68	0.00	0.00	0.00	0.00	0.00	Calculated
52	61	Pipe	HDPE	I-285	M-342	109.02	4808.90	4793.00	14.5800	15	0.015	0.00	21.38	0.00	0.00	0.42	0.34	0.00	Calculated
53	63	Pipe	PVC	M-342	DET_7	311.96	4793.00	4772.00	6.7300	15	0.015	10.91	14.53	0.75	12.60	1.00	0.82	0.00	Calculated
54	66	Pipe	CMP	M-137	M-341	247.30	4765.00	4749.50	6.2700	42	0.015	7.81	7.84	1.00	2.75	1.17	0.34	0.00	Calculated
55	67	Pipe	RCP	M-137	M-136	79.43	4749.40	4744.70	5.9200	30	0.015	7.81	86.47	0.09	9.54	0.56	0.22	0.00	Calculated
56	68	Pipe	RCP	M-136	M-138	163.25	4744.60	4740.00	2.8200	24	0.015	7.81	32.91	0.24	5.31	0.95	0.48	0.00	Calculated
57	69	Pipe	HDPE	I-271	M-138	13.94	4743.10	4743.00	0.7200	18	0.015	0.00	10.34	0.00	0.00	0.00	0.00	0.00	Calculated
58	70	Pipe	RCP	I-267	I-266	37.03	4740.60	4739.60	2.7000	15	0.015	0.00	0.29	0.00	0.00	0.00	0.00	0.00	Calculated
59	71	Pipe	RCP	M-138	I-267	89.34	4739.90	4739.60	0.3400	24	0.015	7.81	11.36	0.69	4.11	1.16	0.58	0.00	Calculated
60	72	Pipe	HDPE	I-267	O-23	56.86	4739.50	4734.00	9.6700	24	0.015	7.81	60.98	0.13	11.73	0.53	0.26	0.00	Calculated
61	75	Pipe	RCP	I-403	I-405	55.42	4705.00	4703.00	3.6100	15	0.015	0.00	10.64	0.00	0.00	0.00	0.00	0.00	Calculated
62	76	Pipe	HDPE	I-297	I-405	30.42	4704.90	4703.10	5.9200	15	0.015	0.00	13.62	0.00	0.00	0.00	0.00	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
63	77	Pipe	RCP	I-405	I-406	42.56	4702.70	4700.70	4.7000	15	0.015	0.00	12.14	0.00	0.00	0.00	0.00	0.00	Calculated
64	79	Pipe	RCP	I-276	M-142	19.19	4728.00	4724.80	16.6800	15	0.015	3.48	22.86	0.15	11.35	0.37	0.30	0.00	Calculated
65	80	Pipe	RCP	M-142	M-221	316.23	4724.70	4692.00	10.3400	15	0.015	3.47	18.00	0.19	4.25	0.79	0.64	0.00	Calculated
66	81	Pipe	RCP	I-400	M-221	27.70	4694.30	4692.00	8.3000	15	0.015	0.00	16.13	0.00	0.00	0.60	0.49	0.00	Calculated
67	82	Pipe	RCP	M-221	I-404	70.39	4692.00	4691.90	0.1400	15	0.015	3.42	2.11	1.62	3.29	0.97	0.79	0.00	> CAPACITY
68	83	Pipe	RCP	M-222	I-404	91.07	4692.20	4691.90	0.3300	15	0.015	0.04	3.21	0.01	0.25	0.38	0.31	0.00	Calculated
69	84	Pipe	RCP	O-35	I-404	43.02	4694.00	4691.00	6.9700	15	0.015	0.00	12.52	0.00	0.00	0.29	0.24	0.00	Calculated
70	85	Pipe	RCP	I-404	M-223	28.49	4691.00	4690.70	1.0500	15	0.015	3.43	11.25	0.30	6.91	0.52	0.42	0.00	Calculated
71	86	Pipe	RCP	I-274	M-141	189.72	4648.70	4648.30	0.2100	12	0.015	0.00	0.45	0.00	0.00	0.00	0.00	0.00	Calculated
72	87	Pipe	RCP	I-274	I-275	34.44	4648.10	4647.80	0.8700	12	0.015	0.02	2.88	0.01	0.22	0.53	0.53	0.00	Calculated
73	88	Pipe	RCP	M-223	I-275	722.78	4690.70	4647.80	5.9400	15	0.015	3.42	13.64	0.25	6.62	0.55	0.44	0.00	Calculated
74	89	Pipe	RCP	I-275	M-140	119.57	4647.70	4643.60	3.4300	15	0.015	6.74	10.37	0.65	7.26	0.88	0.71	0.00	Calculated
75	90	Pipe	HDPE	M-140	I-273	9.06	4644.40	4643.50	9.9300	18	0.015	5.14	0.96	5.38	3.82	1.07	0.71	0.00	> CAPACITY
76	91	Pipe	RCP	M-140	M-139	236.87	4643.50	4638.90	1.9400	18	0.015	9.99	12.69	0.79	7.43	1.06	0.71	0.00	Calculated
77	92	Pipe	RCP	I-607	M-356	31.23	4817.80	4813.40	14.0900	15	0.015	0.00	21.01	0.00	0.00	0.00	0.00	0.00	Calculated
78	93	Pipe	RCP	M-356	I-608	54.76	4813.40	4811.30	3.8300	15	0.015	0.00	10.96	0.00	0.00	0.00	0.00	0.00	Calculated
79	94	Pipe	RCP	I-551	M-303	24.27	4770.10	4768.20	7.8300	15	0.015	0.00	15.66	0.00	0.00	0.00	0.00	0.00	Calculated
80	95	Pipe	RCP	I-612	M-303	37.23	4770.30	4768.20	5.6400	15	0.015	0.00	13.30	0.00	0.00	0.00	0.00	0.00	Calculated
81	96	Pipe	RCP	M-303	I-608	379.43	4811.20	4768.20	11.3300	15	0.015	0.00	0.29	0.00	0.00	0.00	0.00	0.00	Calculated
82	97	Pipe	RCP	M-303	I-550	30.87	4768.10	4767.80	0.9700	15	0.015	0.00	5.52	0.00	0.00	0.00	0.00	0.00	Calculated
83	98	Pipe	RCP	I-550	I-547	329.31	4767.90	4759.90	2.4300	15	0.015	0.00	8.70	0.00	0.00	0.00	0.00	0.00	Calculated
84	99	Pipe	RCP	I-549	I-548	21.79	4744.20	4743.50	3.2100	15	0.015	0.00	10.03	0.00	0.00	0.00	0.00	0.00	Calculated
85	100	Pipe	RCP	I-547	I-548	238.24	4760.00	4743.40	6.9700	15	0.015	0.00	14.78	0.00	0.00	0.00	0.00	0.00	Calculated
86	101	Pipe	RCP	M-300	I-548	332.07	4743.40	4722.50	6.2900	15	0.015	0.00	0.10	0.00	0.00	0.00	0.00	0.00	Calculated
87	102	Pipe	RCP	M-300	M-301	78.58	4722.40	4717.60	6.1100	15	0.015	0.00	13.84	0.00	0.00	0.00	0.00	0.00	Calculated
88	103	Pipe	RCP	M-301	I-536	58.08	4717.40	4715.90	2.5800	15	0.015	0.00	9.00	0.00	0.00	0.00	0.00	0.00	Calculated
89	104	Pipe	RCP	I-536	M-360	43.18	4715.90	4714.20	3.9400	15	0.015	0.00	11.11	0.00	0.00	0.00	0.00	0.00	Calculated
90	105	Pipe	RCP	I-615	I-616	23.15	4770.50	4768.80	7.3400	15	0.015	0.00	0.37	0.00	0.00	0.00	0.00	0.00	Calculated
91	106	Pipe	RCP	M-364	I-615	177.14	4769.00	4751.90	9.6500	15	0.015	0.00	1.73	0.00	0.00	0.00	0.00	0.00	Calculated
92	107	Pipe	RCP	M-364	M-363	131.62	4751.90	4737.90	10.6400	15	0.015	0.00	18.26	0.00	0.00	0.00	0.00	0.00	Calculated
93	108	Pipe	RCP	M-362	M-363	112.68	4737.90	4727.50	9.2300	15	0.015	0.00	0.17	0.00	0.00	0.00	0.00	0.00	Calculated
94	109	Pipe	RCP	I-614	M-362	91.11	4727.50	4722.00	6.0400	15	0.015	0.00	0.59	0.00	0.00	0.00	0.00	0.00	Calculated
95	110	Pipe	RCP	I-609	M-357	6.50	4722.70	4721.70	15.3800	15	0.015	0.00	21.96	0.00	0.00	0.00	0.00	0.00	Calculated
96	111	Pipe	RCP	I-614	M-357	47.77	4721.80	4721.70	0.2100	15	0.015	0.00	2.56	0.00	0.00	0.00	0.00	0.00	Calculated
97	112	Pipe	RCP	I-613	I-614	24.54	4724.50	4721.90	10.5900	15	0.015	0.00	18.22	0.00	0.00	0.00	0.00	0.00	Calculated
98	114	Pipe	RCP	M-367	I-620	32.23	4785.00	4781.40	11.1700	15	0.015	0.00	0.31	0.00	0.00	0.00	0.00	0.00	Calculated
99	115	Pipe	RCP	I-621	M-367	10.08	4782.80	4781.40	13.8900	15	0.015	0.00	20.86	0.00	0.00	0.00	0.00	0.00	Calculated
100	116	Pipe	RCP	M-367	M-365	134.35	4781.40	4770.90	7.8200	15	0.015	0.00	15.65	0.00	0.00	0.00	0.00	0.00	Calculated
101	117	Pipe	RCP	M-366	M-365	97.55	4770.90	4762.20	8.9200	15	0.015	0.00	0.18	0.00	0.00	0.00	0.00	0.00	Calculated
102	118	Pipe	RCP	I-617	M-366	184.73	4762.30	4742.70	10.6100	15	0.015	0.00	1.24	0.00	0.00	0.00	0.00	0.00	Calculated
103	119	Pipe	RCP	I-617	I-618	92.63	4742.80	4734.60	8.8500	15	0.015	0.00	16.66	0.00	0.00	0.00	0.00	0.00	Calculated
104	120	Pipe	RCP	I-619	I-618	86.80	4734.50	4728.80	6.5700	15	0.015	0.00	0.19	0.00	0.00	0.00	0.00	0.00	Calculated
105	121	Pipe	RCP	I-619	M-357	100.48	4728.70	4721.40	7.2700	15	0.015	0.00	15.09	0.00	0.00	0.00	0.00	0.00	Calculated
106	122	Pipe	RCP	M-357	M-358	96.72	4721.40	4717.00	4.5500	15	0.015	0.00	11.94	0.00	0.00	0.00	0.00	0.00	Calculated
107	123	Pipe	RCP	M-358	M-359	109.27	4716.90	4714.70	2.0100	15	0.015	0.00	7.94	0.00	0.00	0.00	0.00	0.00	Calculated
108	124	Pipe	RCP	M-359	M-360	73.76	4714.60	4714.20	0.5400	15	0.015	0.00	4.12	0.00	0.00	0.00	0.00	0.00	Calculated
109	125	Pipe	RCP	I-611	I-610	22.64	4714.60	4713.10	6.6300	15	0.015	0.00	14.41	0.00	0.00	0.00	0.00	0.00	Calculated
110	126	Pipe	RCP	M-360	I-610	104.09	4714.10	4712.50	1.5400	15	0.015	0.00	6.94	0.00	0.00	0.00	0.00	0.00	Calculated
111	127	Pipe	RCP	I-610	M-361	68.31	4712.50	4709.30	4.6800	15	0.015	0.00	12.12	0.00	0.00	0.00	0.00	0.00	Calculated
112	128	Pipe	RCP	M-361	O-60	80.58	4709.20	4704.00	6.4500	18	0.015	0.00	23.13	0.00	0.00	0.75	0.50	0.00	Calculated
113	129	Pipe	RCP	I-538	I-537	29.71	4697.60	4696.50	3.7000	18	0.015	0.00	17.52	0.00	0.00	0.00	0.00	0.00	Calculated
114	130	Pipe	RCP	I-537	I-539	56.89	4696.40	4696.20	0.3500	18	0.015	0.00	5.40	0.00	0.00	0.00	0.00	0.00	Calculated
115	131	Pipe	RCP	I-539	I-541	318.79	4696.00	4695.50	0.1600	18	0.015	0.00	3.61	0.00	0.00	0.00	0.00	0.00	Calculated
116	132	Pipe	RCP	I-541	I-540	66.49	4695.40	4694.50	1.3500	18	0.015	0.00	10.59	0.00	0.00	0.00	0.00	0.00	Calculated
117	133	Pipe	RCP	I-540	O-47	187.20	4694.30	4688.00	3.3700	18	0.015	0.00	16.70	0.00	0.00	0.28	0.19	0.00	Calculated
118	134	Pipe	RCP	I-545	I-546	38.56	4720.30	4719.40	2.3300	15	0.015	0.00	8.55	0.00	0.00	0.00	0.00	0.00	Calculated
119	135	Pipe	RCP	I-546	I-543	300.55	4719.40	4701.60	5.9200	15	0.015	0.00	13.62	0.00	0.00	0.63	0.50	0.00	Calculated
120	136	Pipe	RCP	I-535	I-534	41.05	4704.10	4703.80	0.7300	15	0.015	0.05	4.79	0.01	0.15	0.54	0.43	0.00	Calculated
121	137	Pipe	RCP	I-534	I-544	88.22	4703.80	4702.80	1.1300	15	0.015	0.41	5.96	0.07	0.43	0.97	0.77	0.00	Calculated
122	138	Pipe	RCP	I-544	I-543	245.77	4702.70	4701.60	0.4500	15	0.015	0.50	3.75	0.13	0.64	1.25	1.00	124.00	SURCHARGED
123	139	Pipe	RCP	I-543	I-542	33.21	4701.60	4701.20	1.2000	15	0.015	9.60	6.14	1.56	9.79	0.93	0.75	0.00	> CAPACITY
124	140	Pipe	RCP	I-542	O-48	133.58	4701.20	4684.50	12.5000	15	0.015	9.60	19.80	0.49	9.79	0.93	0.75	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
125	142	Pipe	RCP	M-302	M-225	404.55	4681.90	4661.80	4.9700	18	0.015	5.15	20.29	0.25	6.42	0.70	0.46	0.00	Calculated
126	143	Pipe	RCP	M-225	M-226	110.07	4661.80	4660.60	1.0900	18	0.015	5.15	9.51	0.54	5.12	0.83	0.55	0.00	Calculated
127	144	Pipe	HDPE	M-226	M-224	310.69	4660.50	4656.30	1.3500	18	0.015	5.15	10.58	0.49	5.09	0.84	0.56	0.00	Calculated
128	145	Pipe	HDPE	M-224	I-407	55.09	4656.30	4655.70	1.0900	18	0.015	5.15	9.50	0.54	4.93	0.86	0.57	0.00	Calculated
129	146	Pipe	PVC	I-408	M-226	53.52	4663.00	4660.60	4.4800	8	0.015	0.00	2.31	0.00	0.00	0.32	0.48	0.00	Calculated
130	147	Pipe	HDPE	I-407	I-273	516.76	4655.60	4644.50	2.1500	18	0.015	5.15	13.34	0.39	4.61	0.91	0.60	0.00	Calculated
131	148	Pipe	RCP	I-277	M-141	209.36	4657.10	4648.80	3.9600	12	0.015	0.00	6.15	0.00	0.00	0.00	0.00	0.00	Calculated
132	149	Pipe	RCP	I-287	M-146	146.93	4630.40	4626.00	2.9900	18	0.015	0.00	15.75	0.00	0.00	0.60	0.40	0.00	Calculated
133	150	Pipe	RCP	I-289	I-288	33.91	4627.90	4625.30	7.6700	15	0.015	0.00	15.50	0.00	0.00	0.63	0.50	0.00	Calculated
134	151	Pipe	RCP	I-288	M-150	28.07	4625.30	4623.20	7.4800	15	0.015	0.59	15.31	0.04	0.66	1.25	1.00	12.00	SURCHARGED
135	152	Pipe	HDPE	I-286	M-145	8.12	4625.90	4624.50	17.2400	15	0.015	0.22	23.25	0.01	0.33	1.18	0.94	0.00	Calculated
136	153	Pipe	HDPE	M-146	M-145	40.56	4625.80	4624.40	3.4500	24	0.015	9.83	36.43	0.27	6.42	1.70	0.85	0.00	Calculated
137	154	Pipe	HDPE	M-147	M-146	289.20	4633.00	4625.70	2.5200	24	0.015	9.98	31.15	0.32	7.67	1.13	0.57	0.00	Calculated
138	155	Pipe	HDPE	M-145	M-150	149.19	4624.40	4623.20	0.8000	30	0.015	9.85	31.88	0.31	2.77	2.50	1.00	7.00	SURCHARGED
139	156	Pipe	HDPE	M-150	M-148	114.50	4623.10	4623.00	0.0900	24	0.015	12.50	5.79	2.16	3.98	2.00	1.00	58.00	SURCHARGED
140	157	Pipe	PVC	I-292	M-150	27.31	4625.80	4623.20	9.5200	8	0.015	0.23	3.27	0.07	0.94	0.67	1.00	14.00	SURCHARGED
141	158	Pipe	HDPE	I-291	M-148	3.91	4625.00	4623.00	51.1500	15	0.015	0.14	40.54	0.00	0.21	1.16	0.93	0.00	Calculated
142	159	Pipe	HDPE	I-295	M-149	533.16	4649.30	4623.60	4.8200	15	0.015	0.00	12.29	0.00	0.00	0.63	0.50	0.00	Calculated
143	160	Pipe	HDPE	M-148	M-149	23.04	4622.90	4622.80	0.4300	24	0.015	12.52	12.92	0.97	3.98	2.00	1.00	61.00	SURCHARGED
144	161	Pipe	HDPE	I-264	I-265	26.78	4747.40	4744.80	9.7100	24	0.015	0.00	61.09	0.00	0.00	0.21	0.11	0.00	Calculated
145	162	Pipe	HDPE	I-132	I-265	56.97	4746.60	4745.10	2.6300	24	0.015	0.00	31.81	0.00	0.00	0.06	0.03	0.00	Calculated
146	163	Pipe	HDPE	I-265	I-114	120.18	4744.80	4735.20	7.9900	24	0.015	4.99	55.41	0.09	10.42	0.42	0.21	0.00	Calculated
147	164	Pipe	HDPE	I-114	O-28	206.02	4735.20	4719.10	7.8100	24	0.015	4.98	54.81	0.09	9.98	0.43	0.22	0.00	Calculated
148	166	Pipe	HDPE	M-343	I-597	162.63	4702.10	4695.50	4.0600	36	0.015	5.36	116.45	0.05	7.63	0.46	0.16	0.00	Calculated
149	167	Pipe	RCP	M-158	M-152	527.89	4680.80	4648.50	6.1200	21	0.015	11.59	33.97	0.34	12.56	0.70	0.41	0.00	Calculated
150	168	Pipe	RCP	M-152	I-296	372.33	4647.40	4632.20	4.0800	21	0.015	11.59	27.75	0.42	11.18	0.76	0.45	0.00	Calculated
151	169	Pipe	RCP	I-298	M-156	39.12	4623.40	4623.20	0.5100	15	0.015	0.05	4.00	0.01	0.21	0.92	0.74	0.00	Calculated
152	170	Pipe	RCP	I-299	M-156	8.00	4623.40	4623.20	2.5000	21	0.015	0.03	21.71	0.00	0.09	0.92	0.53	0.00	Calculated
153	171	Pipe	RCP	M-156	M-155	50.17	4623.20	4621.60	3.1900	21	0.015	10.55	24.52	0.43	6.46	1.23	0.71	0.00	Calculated
154	172	Pipe	RCP	I-296	M-438	175.59	4632.20	4622.50	5.5200	21	0.015	11.57	32.28	0.36	7.81	1.10	0.63	0.00	Calculated
155	173	Pipe	RCP	M-438	M-155	25.98	4622.50	4621.40	4.2300	30	0.015	23.70	73.15	0.32	8.00	1.58	0.65	0.00	Calculated
156	174	Pipe	RCP	M-155	M-389	25.33	4621.20	4620.00	4.7400	30	0.015	33.64	77.37	0.43	9.73	1.63	0.66	0.00	Calculated
157	175	Pipe	RCP	I-651	M-389	21.90	4625.20	4621.80	15.5300	15	0.015	0.00	22.06	0.00	0.00	0.00	0.00	0.00	Calculated
158	176	Pipe	HDPE	M-149	M-438	368.22	4622.70	4622.50	0.0500	24	0.015	12.50	4.57	2.74	4.36	1.77	0.89	0.00	> CAPACITY
159	177	Pipe	RCP	M-154	M-156	96.07	4624.00	4623.20	0.8300	15	0.015	0.15	5.11	0.03	0.28	0.63	0.50	0.00	Calculated
160	178	Pipe	RCP	M-153	M-154	89.59	4629.40	4623.80	6.2500	15	0.015	0.00	14.00	0.00	0.00	0.21	0.17	0.00	Calculated
161	179	Pipe	RCP	M-66	M-153	146.01	4637.00	4629.40	5.2100	15	0.015	0.00	12.86	0.00	0.00	0.00	0.00	0.00	Calculated
162	180	Pipe	RCP	I-108	M-66	180.39	4639.30	4637.00	1.2800	18	0.015	0.00	10.05	0.00	0.00	0.00	0.00	0.00	Calculated
163	181	Pipe	RCP	I-128	I-127	33.06	4639.80	4639.70	0.3000	15	0.015	0.00	3.77	0.00	0.00	0.00	0.00	0.00	Calculated
164	182	Pipe	RCP	I-127	I-108	105.06	4639.60	4639.30	0.2900	18	0.015	0.00	4.86	0.00	0.00	0.00	0.00	0.00	Calculated
165	183	Pipe	HDPE	I-129	I-127	383.63	4640.30	4639.60	0.1800	18	0.015	0.00	3.89	0.00	0.00	0.00	0.00	0.00	Calculated
166	184	Pipe	HDPE	I-130	I-129	55.83	4640.50	4640.40	0.1800	15	0.015	0.00	2.37	0.00	0.00	0.00	0.00	0.00	Calculated
167	185	Pipe	HDPE	I-131	I-130	22.62	4640.90	4640.60	1.3300	15	0.015	0.00	6.45	0.00	0.00	0.00	0.00	0.00	Calculated
168	187	Pipe	RCP	I-628	I-627	25.01	4697.60	4697.30	1.2000	15	0.015	0.00	6.13	0.00	0.00	0.00	0.00	0.00	Calculated
169	188	Pipe	RCP	I-627	M-380	321.22	4697.50	4660.00	11.6700	15	0.015	0.00	19.13	0.00	0.00	0.00	0.00	0.00	Calculated
170	189	Pipe	RCP	M-380	M-381	71.45	4660.10	4650.00	14.1400	15	0.015	0.00	21.05	0.00	0.00	0.00	0.00	0.00	Calculated
171	190	Pipe	RCP	M-381	M-382	97.10	4650.00	4643.80	6.3900	15	0.015	0.00	14.15	0.00	0.00	0.00	0.00	0.00	Calculated
172	191	Pipe	RCP	I-630	I-629	22.68	4639.20	4638.00	5.2900	15	0.015	0.00	12.88	0.00	0.00	0.00	0.00	0.00	Calculated
173	192	Pipe	RCP	M-382	I-629	36.82	4643.80	4637.80	16.3000	15	0.015	0.00	22.60	0.00	0.00	0.00	0.00	0.00	Calculated
174	193	Pipe	RCP	I-629	M-379	56.99	4637.80	4636.80	1.7500	15	0.015	0.00	7.42	0.00	0.00	0.00	0.00	0.00	Calculated
175	194	Pipe	RCP	I-626	I-625	20.32	4638.10	4637.00	5.4100	15	0.015	0.00	13.03	0.00	0.00	0.00	0.00	0.00	Calculated
176	195	Pipe	RCP	I-625	M-379	34.23	4637.00	4636.60	1.1700	15	0.015	0.00	6.05	0.00	0.00	0.00	0.00	0.00	Calculated
177	196	Pipe	RCP	M-379	I-624	248.33	4636.50	4632.50	1.6100	15	0.015	0.00	7.07	0.00	0.00	0.29	0.23	0.00	Calculated
178	197	Pipe	RCP	I-624	I-635	48.66	4632.60	4629.30	6.7800	15	0.015	4.62	14.58	0.32	7.64	0.62	0.49	0.00	Calculated
179	198	Pipe	RCP	I-636	I-637	22.63	4622.40	4622.30	0.4400	15	0.015	0.01	3.53	0.00	0.16	0.47	0.38	0.00	Calculated
180	199	Pipe	RCP	I-649	I-648	31.82	4611.60	4611.10	1.5700	15	0.015	0.00	7.02	0.00	0.00	0.00	0.00	0.00	Calculated
181	200	Pipe	RCP	I-648	M-383	29.80	4610.90	4609.50	4.7000	15	0.015	0.00	12.13	0.00	0.00	0.20	0.16	0.00	Calculated
182	201	Pipe	RCP	I-635	I-637	101.45	4629.50	4622.30	7.1000	15	0.015	4.62	14.90	0.31	9.79	0.51	0.41	0.00	Calculated
183	203	Pipe	RCP	I-637	M-383	194.67	4622.30	4610.10	6.2700	15	0.015	4.60	14.02	0.33	9.94	0.50	0.40	0.00	Calculated
184	204	Pipe	RCP	I-638	I-639	29.02	4610.50	4609.60	3.1000	15	0.015	0.00	9.86	0.00	0.00	0.15	0.12	0.00	Calculated
185	205	Pipe	RCP	I-639	M-383	65.28	4609.50	4609.40	0.1500	15	0.015	0.03	2.59	0.01	0.24	0.43	0.35	0.00	Calculated
186	206	Pipe	RCP	M-383	I-641	130.58	4609.40	4600.40	6.8900	15	0.015	4.59	14.70	0.31	10.15	0.49	0.40	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
187	207	Pipe	RCP	I-640	I-634	46.51	4593.40	4591.50	4.0900	15	0.015	0.01	11.32	0.00	0.01	0.63	0.51	0.00	Calculated
188	208	Pipe	RCP	I-634	I-633	23.62	4591.40	4590.30	4.6600	15	0.015	0.57	12.08	0.05	0.74	1.25	1.00	27.00	SURCHARGED
189	209	Pipe	RCP	I-631	I-632	22.58	4596.80	4596.30	2.2100	15	0.015	0.00	8.33	0.00	0.00	0.00	0.00	0.00	Calculated
190	210	Pipe	RCP	I-632	I-633	284.65	4596.10	4590.30	2.0400	15	0.015	0.00	7.99	0.00	0.00	0.63	0.50	0.00	Calculated
191	211	Pipe	RCP	I-633	I-643	67.35	4590.20	4590.00	0.3000	15	0.015	0.78	3.05	0.26	0.64	1.25	1.00	43.00	SURCHARGED
192	212	Pipe	RCP	I-641	I-643	363.74	4600.10	4590.10	2.7500	15	0.015	4.58	9.28	0.49	6.64	0.84	0.67	0.00	Calculated
193	213	Pipe	RCP	I-643	I-644	197.04	4590.00	4585.40	2.3300	15	0.015	8.64	8.55	1.01	7.04	1.25	1.00	48.00	SURCHARGED
194	214	Pipe	RCP	I-644	I-646	30.04	4585.40	4584.50	3.0000	18	0.015	8.65	15.76	0.55	6.75	1.50	1.00	85.00	SURCHARGED
195	215	Pipe	RCP	I-646	I-647	34.82	4584.40	4583.20	3.4500	18	0.015	8.64	16.90	0.51	4.89	1.50	1.00	93.00	SURCHARGED
196	216	Pipe	RCP	I-647	M-386	8.17	4583.20	4583.10	1.2200	15	0.015	6.07	6.19	0.98	4.94	1.25	1.00	97.00	SURCHARGED
197	217	Pipe	RCP	M-386	I-645	58.86	4583.00	4581.50	2.5500	15	0.015	6.06	8.94	0.68	4.94	1.25	1.00	99.00	SURCHARGED
198	218	Pipe	RCP	I-645	M-385	146.48	4581.20	4581.00	0.1400	15	0.015	6.06	2.07	2.93	4.94	1.25	1.00	106.00	SURCHARGED
199	219	Pipe	RCP	M-385	I-642	48.72	4580.90	4580.80	0.2100	15	0.015	6.06	2.54	2.39	5.03	1.25	1.00	92.00	SURCHARGED
200	220	Pipe	RCP	I-642	M-384	416.38	4580.60	4575.80	1.1500	15	0.015	5.43	6.01	0.90	4.74	1.25	1.00	94.00	SURCHARGED
201	221	Pipe	RCP	M-384	M-228	23.45	4575.70	4575.60	0.4300	15	0.015	5.39	3.66	1.47	4.56	1.25	1.00	101.00	SURCHARGED
202	222	Pipe	S	M-228	M-227	163.86	4575.50	4573.60	1.1600	15	0.015	5.39	6.03	0.89	4.39	1.25	1.00	103.00	SURCHARGED
203	223	Pipe	RCP	I-412	M-227	16.52	4574.30	4573.80	3.0300	15	0.015	0.34	9.74	0.04	0.32	1.25	1.00	108.00	SURCHARGED
204	224	Pipe	RCP	I-411	M-227	9.94	4574.80	4573.70	11.0700	15	0.015	0.92	18.62	0.05	0.81	1.25	1.00	98.00	SURCHARGED
205	225	Pipe	RCP	M-227	M-230	184.20	4573.50	4573.10	0.2200	15	0.015	5.43	2.61	2.08	4.42	1.25	1.00	110.00	SURCHARGED
206	226	Pipe	RCP	I-342	I-341	25.60	4574.70	4574.60	0.3900	15	0.015	0.00	3.50	0.00	0.00	0.00	0.00	0.00	Calculated
207	227	Pipe	RCP	I-341	M-230	35.55	4574.40	4574.20	0.5600	24	0.015	0.05	14.71	0.00	0.38	0.24	0.12	0.00	Calculated
208	228	Pipe	RCP	M-190	I-341	124.19	4583.50	4574.50	7.2500	15	0.015	0.00	15.07	0.00	0.00	0.02	0.02	0.00	Calculated
209	229	Pipe	RCP	I-339	I-340	20.53	4603.40	4603.10	1.4600	15	0.015	0.00	2.14	0.00	0.00	0.00	0.00	0.00	Calculated
210	230	Pipe	RCP	I-339	M-190	228.07	4603.00	4583.50	8.5500	15	0.015	0.00	16.37	0.00	0.00	0.00	0.00	0.00	Calculated
211	231	Pipe	RCP	I-413	M-230	152.49	4573.10	4570.60	1.6400	24	0.015	5.38	0.50	10.72	2.94	1.13	0.56	0.00	> CAPACITY
212	232	Pipe	RCP	I-414	I-413	25.40	4572.60	4570.80	7.0900	15	0.015	0.00	14.90	0.00	0.00	0.31	0.25	0.00	Calculated
213	233	Pipe	RCP	I-413	DET_52	177.59	4570.60	4560.00	5.9700	24	0.015	16.14	47.90	0.34	6.85	1.41	0.70	0.00	Calculated
214	234	Pipe	RCP	I-362	M-352	153.41	4560.30	4555.70	3.0000	15	0.015	0.00	9.69	0.00	0.00	0.63	0.50	0.00	Calculated
215	235	Pipe	RCP	M-229	I-413	84.81	4571.80	4570.80	1.1800	24	0.015	10.81	21.29	0.51	6.11	1.10	0.55	0.00	Calculated
216	236	Pipe	RCP	M-304	M-229	229.62	4574.70	4571.90	1.2200	24	0.015	10.86	21.65	0.50	6.30	1.08	0.54	0.00	Calculated
217	237	Pipe	RCP	I-345	I-346	23.56	4577.20	4576.00	5.0900	15	0.015	0.57	12.63	0.04	0.71	1.25	1.00	14.00	SURCHARGED
218	238	Pipe	RCP	I-346	M-304	51.91	4575.90	4575.00	1.7300	15	0.015	10.80	7.37	1.46	8.84	1.22	0.98	0.00	> CAPACITY
219	239	Pipe	RCP	M-198	I-346	67.51	4577.80	4576.00	2.6700	15	0.015	10.80	9.14	1.18	8.80	1.25	1.00	21.00	SURCHARGED
220	240	Pipe	RCP	M-232	M-231	29.18	4557.80	4555.80	6.8500	8	0.015	0.05	2.78	0.02	0.27	0.53	0.79	0.00	Calculated
221	241	Pipe	RCP	M-231	M-352	138.15	4555.70	4555.60	0.0700	24	0.015	11.97	5.27	2.27	3.85	1.95	0.98	0.00	> CAPACITY
222	242	Pipe	RCP	I-418	I-417	23.56	4668.50	4666.40	8.9100	15	0.015	0.00	16.71	0.00	0.00	0.00	0.00	0.00	Calculated
223	243	Pipe	RCP	I-417	M-233	223.77	4666.20	4651.80	6.4400	15	0.015	0.00	14.20	0.00	0.00	0.00	0.00	0.00	Calculated
224	244	Pipe	RCP	M-233	I-415	226.60	4651.80	4643.30	3.7500	15	0.015	0.00	10.84	0.00	0.00	0.00	0.00	0.00	Calculated
225	245	Pipe	RCP	I-416	I-415	22.24	4643.60	4643.30	1.3500	15	0.015	0.00	6.50	0.00	0.00	0.00	0.00	0.00	Calculated
226	246	Pipe	RCP	I-415	M-191	59.78	4643.20	4642.10	1.8400	15	0.015	0.00	7.59	0.00	0.00	0.00	0.00	0.00	Calculated
227	247	Pipe	RCP	I-427	I-426	22.45	4716.90	4715.60	5.7900	15	0.015	0.00	13.47	0.00	0.00	0.00	0.00	0.00	Calculated
228	248	Pipe	RCP	I-426	M-246	112.35	4715.40	4712.80	2.3100	15	0.015	0.00	8.52	0.00	0.00	0.00	0.00	0.00	Calculated
229	249	Pipe	RCP	M-246	M-245	276.03	4712.70	4709.10	1.3000	15	0.015	0.00	6.39	0.00	0.00	0.00	0.00	0.00	Calculated
230	250	Pipe	RCP	M-245	M-243	48.75	4709.00	4708.30	1.4400	15	0.015	0.00	6.71	0.00	0.00	0.00	0.00	0.00	Calculated
231	251	Pipe	RCP	M-243	M-244	60.54	4708.30	4708.00	0.5000	15	0.015	0.00	3.94	0.00	0.00	0.00	0.00	0.00	Calculated
232	252	Pipe	RCP	I-424	I-425	26.40	4710.80	4706.40	16.6700	15	0.015	0.00	22.96	0.00	0.00	0.00	0.00	0.00	Calculated
233	253	Pipe	RCP	M-244	I-425	36.65	4708.20	4706.40	4.9100	18	0.015	0.00	20.18	0.00	0.00	0.00	0.00	0.00	Calculated
234	254	Pipe	RCP	I-421	I-425	70.46	4706.50	4706.40	0.1400	15	0.015	0.00	2.11	0.00	0.00	0.00	0.00	0.00	Calculated
235	255	Pipe	RCP	I-425	M-236	206.70	4706.30	4686.50	9.5800	18	0.015	0.00	28.18	0.00	0.00	0.00	0.00	0.00	Calculated
236	256	Pipe	RCP	M-236	M-237	241.44	4686.40	4666.60	8.2000	18	0.015	0.00	26.07	0.00	0.00	0.00	0.00	0.00	Calculated
237	257	Pipe	RCP	M-237	I-556	149.07	4666.50	4660.00	4.3600	18	0.015	0.00	19.01	0.00	0.00	0.44	0.29	0.00	Calculated
238	258	Pipe	RCP	I-556	I-555	27.85	4659.70	4658.70	3.5900	18	0.015	10.12	17.25	0.59	8.38	0.97	0.65	0.00	Calculated
239	259	Pipe	RCP	M-305	I-555	145.85	4667.50	4658.90	5.9000	18	0.015	0.00	22.11	0.00	0.00	0.28	0.19	0.00	Calculated
240	260	Pipe	RCP	M-305	M-314	109.73	4670.70	4667.60	2.8300	18	0.015	0.00	0.27	0.00	0.00	0.00	0.00	0.00	Calculated
241	261	Pipe	RCP	M-314	M-313	105.85	4671.60	4670.80	0.7600	18	0.015	0.00	0.28	0.00	0.00	0.00	0.00	0.00	Calculated
242	262	Pipe	RCP	I-558	I-557	21.31	4674.10	4673.50	2.8200	15	0.015	0.00	9.39	0.00	0.00	0.00	0.00	0.00	Calculated
243	263	Pipe	RCP	I-557	M-313	96.40	4673.40	4671.70	1.7600	18	0.015	0.00	12.09	0.00	0.00	0.00	0.00	0.00	Calculated
244	264	Pipe	RCP	M-312	I-557	81.05	4673.70	4673.60	0.1200	18	0.015	0.00	3.20	0.00	0.00	0.00	0.00	0.00	Calculated
245	265	Pipe	RCP	M-311	M-312	82.86	4675.40	4673.80	1.9300	18	0.015	0.00	12.65	0.00	0.00	0.00	0.00	0.00	Calculated
246	266	Pipe	RCP	M-310	M-311	65.52	4678.70	4675.50	4.8800	18	0.015	0.00	20.12	0.00	0.00	0.00	0.00	0.00	Calculated
247	267	Pipe	RCP	M-309	M-310	61.76	4681.80	4678.80	4.8600	18	0.015	0.00	20.06	0.00	0.00	0.00	0.00	0.00	Calculated
248	268	Pipe	RCP	M-308	M-309	60.13	4688.00	4681.90	10.1400	18	0.015	0.00	29.00	0.00	0.00	0.00	0.00	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
249	269	Pipe	RCP	M-307	M-308	96.97	4692.50	4688.10	4.5400	18	0.015	0.00	19.39	0.00	0.00	0.00	0.00	0.00	Calculated
250	270	Pipe	RCP	M-306	M-307	47.09	4693.10	4692.60	1.0600	18	0.015	0.00	9.38	0.00	0.00	0.00	0.00	0.00	Calculated
251	271	Pipe	RCP	M-202	M-306	36.86	4694.20	4693.20	2.7100	18	0.015	0.00	15.37	0.00	0.00	0.00	0.00	0.00	Calculated
252	272	Pipe	RCP	M-201	M-202	72.60	4694.50	4694.30	0.2800	15	0.015	0.00	2.94	0.00	0.00	0.00	0.00	0.00	Calculated
253	273	Pipe	RCP	M-200	M-201	61.71	4694.70	4694.60	0.1600	18	0.015	0.00	3.66	0.00	0.00	0.00	0.00	0.00	Calculated
254	274	Pipe	RCP	M-199	M-200	111.79	4695.80	4694.80	0.8900	18	0.015	0.00	8.61	0.00	0.00	0.00	0.00	0.00	Calculated
255	275	Pipe	RCP	I-363	I-364	20.22	4696.80	4696.60	0.9900	18	0.015	0.00	9.05	0.00	0.00	0.00	0.00	0.00	Calculated
256	276	Pipe	RCP	I-364	M-199	162.37	4696.50	4695.90	0.3700	18	0.015	0.00	5.53	0.00	0.00	0.00	0.00	0.00	Calculated
257	277	Pipe	RCP	I-349	I-348	21.99	4634.90	4633.80	5.0000	15	0.015	0.00	12.52	0.00	0.00	0.00	0.00	0.00	Calculated
258	278	Pipe	RCP	I-348	I-347	137.78	4633.70	4630.80	2.1000	15	0.015	0.00	8.12	0.00	0.00	0.00	0.00	0.00	Calculated
259	279	Pipe	RCP	I-347	M-239	137.71	4630.70	4614.20	11.9800	15	0.015	0.00	19.40	0.00	0.00	0.13	0.11	0.00	Calculated
260	280	Pipe	RCP	M-239	DET_51	49.49	4614.10	4613.80	0.6100	15	0.015	0.08	4.36	0.02	0.39	0.50	0.42	0.00	Calculated
261	281	Pipe	RCP	M-191	M-192	114.62	4642.00	4637.60	3.8400	15	0.015	0.00	10.97	0.00	0.00	0.00	0.00	0.00	Calculated
262	282	Pipe	RCP	M-192	M-193	218.10	4637.60	4623.00	6.6900	15	0.015	0.00	14.49	0.00	0.00	0.00	0.00	0.00	Calculated
263	283	Pipe	RCP	M-193	M-195	95.31	4622.90	4618.40	4.7200	15	0.015	0.00	12.16	0.00	0.00	0.00	0.00	0.00	Calculated
264	284	Pipe	RCP	M-195	M-194	84.89	4618.50	4615.00	4.1200	15	0.015	0.00	11.37	0.00	0.00	0.00	0.00	0.00	Calculated
265	285	Pipe	RCP	M-196	M-194	82.51	4614.90	4610.10	5.8200	15	0.015	0.00	0.19	0.00	0.00	0.00	0.00	0.00	Calculated
266	286	Pipe	RCP	M-196	I-343	91.67	4610.00	4603.40	7.2000	15	0.015	0.00	15.02	0.00	0.00	0.00	0.00	0.00	Calculated
267	287	Pipe	RCP	I-344	I-343	24.78	4605.70	4603.60	8.4700	15	0.015	0.00	16.30	0.00	0.00	0.00	0.00	0.00	Calculated
268	288	Pipe	RCP	I-343	M-197	260.89	4603.30	4586.20	6.5500	15	0.015	0.00	14.33	0.00	0.00	0.63	0.50	0.00	Calculated
269	289	Pipe	RCP	M-197	M-198	147.26	4586.10	4577.90	5.5700	15	0.015	11.95	13.21	0.90	9.74	1.25	1.00	11.00	SURCHARGED
270	290	Pipe	RCP	I-428	I-429	323.06	4599.80	4581.70	5.6000	18	0.015	9.85	21.55	0.46	11.60	0.72	0.48	0.00	Calculated
271	291	Pipe	RCP	I-429	I-430	98.06	4581.70	4573.30	8.5700	18	0.015	9.85	26.64	0.37	11.66	0.72	0.48	0.00	Calculated
272	292	Pipe	RCP	I-430	I-431	114.40	4573.20	4569.00	3.6700	18	0.015	9.85	17.44	0.56	7.94	1.01	0.67	0.00	Calculated
273	293	Pipe	RCP	I-432	I-431	22.53	4569.60	4568.90	3.1100	15	0.015	0.04	9.87	0.00	0.14	0.89	0.72	0.00	Calculated
274	294	Pipe	RCP	I-431	I-313	87.74	4568.80	4567.50	1.4800	18	0.015	9.85	11.08	0.89	6.68	1.16	0.78	0.00	Calculated
275	295	Pipe	RCP	I-169	M-89	5.41	4530.80	4528.50	42.5100	12	0.015	0.00	20.13	0.00	0.00	0.00	0.00	0.00	Calculated
276	296	Pipe	RCP	M-89	M-249	32.96	4526.20	4524.30	5.7600	30	0.015	9.98	85.35	0.12	6.76	0.86	0.34	0.00	Calculated
277	297	Pipe	RCP	I-436	M-249	15.78	4529.80	4525.50	27.2500	15	0.015	0.00	29.22	0.00	0.00	0.00	0.00	0.00	Calculated
278	298	Pipe	RCP	I-170	M-249	23.21	4529.80	4525.50	18.5300	15	0.015	0.00	24.10	0.00	0.00	0.00	0.00	0.00	Calculated
279	299	Pipe	HDPE	I-598	M-344	496.30	4544.60	4534.40	2.0600	24	0.015	5.72	28.11	0.20	6.90	0.62	0.31	0.00	Calculated
280	300	Pipe	RCP	M-344	M-90	20.48	4533.60	4533.50	0.4900	24	0.015	5.72	13.70	0.42	3.81	0.96	0.48	0.00	Calculated
281	301	Pipe	RCP	I-172	I-171	44.62	4538.60	4538.50	0.2200	12	0.015	0.00	1.46	0.00	0.00	0.00	0.00	0.00	Calculated
282	302	Pipe	RCP	I-171	M-90	139.00	4532.20	4531.15	0.7600	18	0.015	4.78	7.91	0.60	4.41	0.88	0.59	0.00	Calculated
283	303	Pipe	RCP	M-90	M-89	366.38	4529.90	4528.50	0.3800	24	0.015	9.98	12.12	0.82	4.48	1.33	0.67	0.00	Calculated
284	304	Pipe	RCP	M-262	I-171	219.56	4533.90	4532.20	0.7700	18	0.015	4.79	8.01	0.60	4.30	0.90	0.60	0.00	Calculated
285	305	Pipe	RCP	M-249	M-421	260.31	4524.10	4522.90	0.4600	30	0.015	9.97	24.14	0.41	4.60	1.13	0.45	0.00	Calculated
286	306	Pipe	RCP	I-368	M-421	50.68	4527.60	4523.50	8.0900	15	0.015	0.00	15.92	0.00	0.00	0.10	0.08	0.00	Calculated
287	307	Pipe	RCP	M-421	M-184	364.01	4522.80	4518.60	1.1500	30	0.015	9.97	38.18	0.26	6.25	0.91	0.36	0.00	Calculated
288	309	Pipe	CMP	I-161	M-86	13.15	4523.20	4522.50	5.3200	18	0.015	0.00	21.15	0.00	0.00	0.00	0.00	0.00	Calculated
289	310	Pipe	CMP	I-435	M-248	8.93	4524.00	4523.10	10.0800	18	0.015	0.00	28.90	0.00	0.00	0.00	0.00	0.00	Calculated
290	311	Pipe	CMP	I-162	M-248	47.94	4523.70	4523.00	1.4600	18	0.015	0.00	11.00	0.00	0.00	0.00	0.00	0.00	Calculated
291	312	Pipe	RCP	M-248	M-247	312.65	4520.40	4519.70	0.2200	15	0.015	0.00	2.65	0.00	0.00	0.00	0.00	0.00	Calculated
292	313	Pipe	CMP	I-162	M-86	55.30	4523.80	4522.00	3.2500	18	0.015	0.00	16.42	0.00	0.00	0.00	0.00	0.00	Calculated
293	314	Pipe	RCP	M-86	M-248	65.82	4521.20	4520.40	1.2200	15	0.015	0.00	6.17	0.00	0.00	0.00	0.00	0.00	Calculated
294	315	Pipe	CMP	I-433	M-247	8.00	4523.90	4523.30	7.5000	15	0.015	0.00	15.33	0.00	0.00	0.00	0.00	0.00	Calculated
295	316	Pipe	RCP	I-434	M-247	17.43	4523.70	4522.90	4.5900	12	0.015	0.00	6.62	0.00	0.00	0.00	0.00	0.00	Calculated
296	317	Pipe	RCP	M-247	M-184	201.90	4519.50	4518.60	0.4500	18	0.015	0.00	6.08	0.00	0.01	0.46	0.31	0.00	Calculated
297	318	Pipe	RCP	M-184	M-185	57.05	4518.10	4517.30	1.4000	30	0.015	15.49	42.10	0.37	5.05	1.50	0.60	0.00	Calculated
298	319	Pipe	RCP	M-185	M-183	81.69	4517.20	4516.80	0.4900	30	0.015	15.48	24.87	0.62	5.01	1.50	0.60	0.00	Calculated
299	320	Pipe	RCP	I-329	M-183	10.88	4519.20	4518.50	6.4300	12	0.015	0.00	7.83	0.00	0.00	0.00	0.00	0.00	Calculated
300	321	Pipe	RCP	M-183	M-182	354.35	4516.40	4513.80	0.7300	30	0.015	15.46	30.45	0.51	5.96	1.30	0.52	0.00	Calculated
301	322	Pipe	RCP	I-110	I-109	47.51	4531.10	4529.20	4.0000	15	0.015	0.00	11.20	0.00	0.00	0.15	0.12	0.00	Calculated
302	323	Pipe	HDPE	I-113	I-112	94.71	4530.50	4529.50	1.0600	15	0.015	1.04	5.87	0.18	1.03	1.18	0.94	0.00	Calculated
303	324	Pipe	RCP	I-112	I-111	11.93	4529.40	4531.30	-15.9300	18	0.015	1.04	36.33	0.03	1.03	0.84	0.56	0.00	Calculated
304	325	Pipe	RCP	I-111	I-109	42.95	4529.20	4529.00	0.4700	18	0.015	1.04	6.21	0.17	2.07	0.49	0.33	0.00	Calculated
305	326	Pipe	RCP	I-109	O-14	12.95	4529.10	4529.00	0.7700	18	0.015	1.04	8.00	0.13	3.45	0.34	0.23	0.00	Calculated
306	327	Pipe	RCP	I-328	M-182	25.55	4518.10	4517.70	1.5700	12	0.015	0.00	7.23	0.00	0.00	0.00	0.00	0.00	Calculated
307	328	Pipe	RCP	I-330	M-182	20.51	4517.70	4517.50	0.9800	12	0.015	0.00	3.05	0.00	0.00	0.00	0.00	0.00	Calculated
308	329	Pipe	RCP	M-182	M-181	23.58	4513.70	4512.70	4.2400	30	0.015	15.45	73.21	0.21	6.21	1.80	0.72	0.00	Calculated
309	330	Pipe	RCP	M-181	M-87	166.33	4512.10	4511.90	0.1200	36	0.015	21.99	20.04	1.10	3.25	2.75	0.92	0.00	> CAPACITY
310	331	Pipe	RCP	I-163	M-87	31.35	4518.00	4513.70	13.7200	12	0.015	0.00	11.44	0.00	0.00	0.43	0.43	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
311	332	Pipe	DUCTILE IRON	I-437	M-250	7.20	4521.50	4519.10	33.3300	12	0.015	0.00	17.83	0.00	0.00	0.00	0.00	0.00	Calculated
312	333	Pipe	RCP	M-250	M-181	413.61	4517.30	4512.10	1.2600	18	0.015	4.27	10.24	0.42	3.11	1.09	0.73	0.00	Calculated
313	334	Pipe	RCP	I-438	M-251	9.55	4522.90	4520.00	30.3700	12	0.015	0.00	17.02	0.00	0.00	0.16	0.16	0.00	Calculated
314	335	Pipe	RCP	M-251	M-250	170.02	4519.60	4517.40	1.2900	18	0.015	4.27	10.36	0.41	5.34	0.69	0.46	0.00	Calculated
315	336	Pipe	RCP	M-256	M-251	246.65	4522.10	4519.90	0.8900	15	0.015	4.27	5.29	0.81	4.65	0.87	0.70	0.00	Calculated
316	337	Pipe	RCP	I-449	M-256	6.54	4524.70	4522.50	33.6400	12	0.015	0.00	17.91	0.00	0.00	0.26	0.26	0.00	Calculated
317	338	Pipe	RCP	I-450	M-256	27.00	4526.90	4522.50	16.3000	12	0.015	0.00	12.46	0.00	0.00	0.26	0.26	0.00	Calculated
318	339	Pipe	RCP	M-352	M-354	178.44	4555.50	4555.00	0.2800	24	0.015	11.92	10.38	1.15	4.40	1.82	0.91	0.00	> CAPACITY
319	340	Pipe	RCP	M-354	M-353	26.60	4552.30	4552.20	0.3800	42	0.015	42.03	53.46	0.79	4.37	3.50	1.00	33.00	SURCHARGED
320	341	Pipe	RCP	M-355	M-354	65.09	4552.50	4552.40	0.1500	42	0.015	30.75	34.18	0.90	3.20	3.50	1.00	38.00	SURCHARGED
321	342	Pipe	RCP	M-80	M-353	292.45	4552.10	4552.00	0.0300	42	0.015	42.03	1.61	26.07	4.42	3.38	0.97	0.00	> CAPACITY
322	344	Pipe	RCP	M-80	M-81	277.04	4551.90	4551.00	0.3200	42	0.015	43.64	49.70	0.88	4.55	3.44	0.98	0.00	Calculated
323	345	Pipe	RCP	I-152	M-81	7.18	4557.60	4556.60	13.9300	15	0.015	0.00	20.89	0.00	0.00	0.00	0.00	0.00	Calculated
324	348	Pipe	RCP	M-81	M-335	333.34	4550.90	4550.50	0.1200	42	0.015	43.65	30.20	1.45	4.91	3.05	0.87	0.00	> CAPACITY
325	349	Pipe	RCP	M-335	I-585	377.61	4550.40	4548.75	0.4400	42	0.015	47.28	57.64	0.82	6.97	2.33	0.66	0.00	Calculated
326	350	Pipe	RCP	I-585	M-332	113.93	4548.80	4546.40	2.1100	42	0.015	49.27	126.55	0.39	10.06	1.77	0.51	0.00	Calculated
327	351	Pipe	DUCTILE IRON	I-117	I-584	44.23	4559.10	4558.70	0.9000	10	0.015	0.00	1.79	0.00	0.00	0.00	0.00	0.00	Calculated
328	352	Pipe	RCP	I-584	O-52	41.01	4558.50	4558.00	1.2200	12	0.015	0.00	3.41	0.00	0.00	0.00	0.00	0.00	Calculated
329	353	Pipe	RCP	I-116	I-115	11.18	4559.00	4557.90	9.8400	60	0.015	37.99	708.01	0.05	7.27	1.56	0.31	0.00	Calculated
330	354	Pipe	RCP	I-115	M-333	144.30	4557.90	4554.90	2.0800	60	0.015	43.12	322.73	0.13	12.98	1.13	0.23	0.00	Calculated
331	355	Pipe	RCP	M-333	Willow-2	26.46	4554.90	4542.00	48.7500	60	0.015	43.12	1579.08	0.03	10.74	1.30	0.26	0.00	Calculated
332	356	Pipe	RCP	I-582	O-45	40.38	4556.90	4554.80	5.2000	15	0.015	6.15	8.36	0.74	7.87	0.76	0.61	0.00	Calculated
333	358	Pipe		M-334	Willow-2	191.00	4542.80	4542.00	0.4200	60	0.015	50.49	186.00	0.27	4.60	2.21	0.44	0.00	Calculated
334	359	Pipe	RCP	M-332	M-334	139.77	4546.30	4542.80	2.5000	42	0.015	49.27	137.98	0.36	8.18	2.10	0.60	0.00	Calculated
335	360	Pipe	RCP	I-283	I-282	39.79	4619.10	4618.90	0.5000	15	0.015	0.00	4.26	0.00	0.00	0.00	0.00	0.00	Calculated
336	361	Pipe	RCP	I-282	M-144	217.42	4618.80	4613.70	2.3500	18	0.015	0.00	13.94	0.00	0.00	0.00	0.00	0.00	Calculated
337	362	Pipe	RCP	I-281	M-143	30.25	4603.80	4603.00	2.6400	15	0.015	0.00	9.10	0.00	0.00	0.00	0.00	0.00	Calculated
338	363	Pipe	RCP	M-144	M-143	222.21	4613.80	4603.00	4.8600	18	0.015	0.00	20.07	0.00	0.00	0.00	0.00	0.00	Calculated
339	364	Pipe	RCP	I-422	I-556	65.49	4660.90	4659.80	1.6800	15	0.015	0.00	7.26	0.00	0.00	0.54	0.43	0.00	Calculated
340	365	Pipe	HDPE	I-61	I-57	250.75	4554.50	4551.40	1.2400	15	0.015	2.24	6.22	0.36	4.55	0.52	0.42	0.00	Calculated
341	366	Pipe	HDPE	I-57	I-56	272.13	4551.39	4539.90	4.2200	15	0.015	2.24	11.50	0.19	7.15	0.38	0.30	0.00	Calculated
342	367	Pipe	HDPE	I-55	I-56	23.49	4543.15	4542.30	3.6200	15	0.015	0.00	10.65	0.00	0.00	0.00	0.00	0.00	Calculated
343	368	Pipe	HDPE	I-56	I-58	553.12	4539.85	4497.25	7.7000	15	0.015	2.24	15.54	0.14	8.54	0.46	0.37	0.00	Calculated
344	369	Pipe	HDPE	I-59	I-58	72.50	4499.60	4497.00	3.5900	15	0.015	0.00	10.60	0.00	0.00	0.44	0.35	0.00	Calculated
345	370	Pipe	RCP	O-32	I-397	127.01	4491.80	4490.00	1.4200	15	0.015	0.00	0.16	0.00	0.00	0.00	0.00	0.00	Calculated
346	371	Pipe	RCP	I-397	I-396	28.73	4491.90	4491.90	0.0000	15	0.015	0.00	0.33	0.00	0.00	0.00	0.00	0.00	Calculated
347	373	Pipe	HDPE	I-58	I-399	130.95	4496.90	4492.70	3.2100	18	0.015	10.31	16.30	0.63	9.05	0.92	0.61	0.00	Calculated
348	374	Pipe	HDPE	I-399	M-219	17.03	4492.60	4490.60	11.7400	18	0.015	10.31	31.20	0.33	11.53	0.76	0.50	0.00	Calculated
349	375	Pipe	HDPE	M-219	O-33	8.65	4489.50	4488.00	17.3400	18	0.015	10.31	37.91	0.27	11.39	0.76	0.51	0.00	Calculated
350	376	Pipe	RCP	M-28	M-29	154.88	4513.50	4504.10	6.0700	15	0.015	0.00	0.14	0.00	0.00	0.00	0.00	0.00	Calculated
351	377	Pipe	RCP	M-28	M-27	171.77	4504.90	4496.70	4.7700	15	0.015	0.00	12.23	0.00	0.00	0.00	0.00	0.00	Calculated
352	378	Pipe	RCP	I-53	M-27	105.00	4496.20	4491.80	4.1900	15	0.015	0.00	0.17	0.00	0.00	0.00	0.00	0.00	Calculated
353	379	Pipe	RCP	I-398	I-53	36.44	4493.00	4490.80	6.0400	15	0.015	0.00	13.76	0.00	0.00	0.09	0.12	0.00	Calculated
354	380	Pipe	RCP	I-54	I-53	31.89	4492.70	4490.85	5.8000	15	0.015	0.00	13.48	0.00	0.00	0.07	0.10	0.00	Calculated
355	381	Pipe	RCP	I-52	I-51	21.02	4491.90	4491.35	2.6200	15	0.015	0.00	9.06	0.00	0.00	0.00	0.00	0.00	Calculated
356	382	Pipe	RCP	I-51	M-30	105.04	4491.20	4490.70	0.4800	15	0.015	0.00	3.86	0.00	0.00	0.15	0.16	0.00	Calculated
357	383	Pipe	RCP	M-30	M-31	103.89	4490.60	4488.70	1.8300	15	0.015	0.40	7.57	0.05	0.48	0.82	0.70	0.00	Calculated
358	384	Pipe	RCP	I-53	M-32	43.12	4490.70	4489.90	1.8600	15	0.015	0.28	7.63	0.04	0.47	0.68	0.63	0.00	Calculated
359	385	Pipe	RCP	M-32	M-33	35.74	4489.80	4489.70	0.2800	15	0.015	0.51	2.96	0.17	0.75	1.22	1.00	2.00	SURCHARGED
360	387	Pipe	RCP	M-33	M-31	61.75	4489.50	4489.30	0.3200	18	0.015	0.65	5.18	0.13	0.55	1.49	1.00	4.00	SURCHARGED
361	388	Pipe	RCP	M-31	O-31	212.07	4488.60	4488.00	0.2800	24	0.015	14.37	10.43	1.38	5.09	1.67	0.84	0.00	> CAPACITY
362	389	Pipe	HDPE	I-60	M-34	154.18	4504.70	4490.00	9.5300	15	0.015	0.00	17.29	0.00	0.00	0.00	0.00	0.00	Calculated
363	390	Pipe	HDPE	M-34	O-5	24.77	4490.00	4487.00	12.1100	12	0.015	0.00	1.39	0.00	0.00	0.00	0.00	0.00	Calculated
364	391	Pipe	RCP	M-87	I-599	321.29	4511.60	4511.30	0.0900	36	0.015	21.95	14.42	1.52	3.23	2.76	0.92	0.00	> CAPACITY
365	392	Pipe	RCP	I-599	M-83	317.30	4511.40	4511.20	0.0600	36	0.015	21.91	14.51	1.51	4.29	2.04	0.68	0.00	> CAPACITY
366	393	Pipe	RCP	I-157	M-83	87.40	4514.40	4513.20	1.3700	18	0.015	0.00	10.67	0.00	0.00	0.00	0.00	0.00	Calculated
367	394	Pipe	RCP	I-157	I-156	266.67	4516.00	4514.50	0.5600	15	0.015	0.00	0.11	0.00	0.00	0.00	0.00	0.00	Calculated
368	395	Pipe	RCP	I-155	M-82	42.55	4522.70	4521.80	2.1200	15	0.015	3.27	8.14	0.40	5.59	0.60	0.48	0.00	Calculated
369	396	Pipe	RCP	M-82	M-73	197.17	4521.30	4518.80	1.2700	15	0.015	3.27	6.30	0.52	5.01	0.66	0.53	0.00	Calculated
370	397	Pipe	RCP	M-73	M-75	406.83	4518.70	4512.50	1.5200	15	0.015	3.27	6.91	0.47	5.46	0.61	0.49	0.00	Calculated
371	398	Pipe	RCP	M-75	M-74	309.55	4512.40	4508.50	1.2600	15	0.015	3.27	6.28	0.52	5.05	0.65	0.52	0.00	Calculated
372	399	Pipe	RCP	M-74	New-6	755.02	4508.43	4496.00	1.6500	18	0.015	3.26	11.68	0.28	5.16	0.58	0.39	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
373	401	Pipe	CMP	New-6	M-79	266.17	4496.00	4493.20	1.0500	18	0.015	3.26	9.34	0.35	4.25	0.67	0.45	0.00	Calculated
374	402	Pipe	CMP	M-79	M-326	288.77	4493.30	4489.00	1.4900	18	0.015	3.97	11.11	0.36	5.12	0.68	0.45	0.00	Calculated
375	403	Pipe	CMP	M-326	M-346	######	4488.90	4482.80	0.5400	18	0.015	3.97	6.69	0.59	3.76	1.01	0.68	0.00	Calculated
376	404	Pipe	CMP	M-346	M-345	546.05	4482.70	4478.80	0.7100	18	0.015	7.37	7.69	0.96	4.43	1.42	0.95	0.00	Calculated
377	409	Pipe	RCP	M-63	M-64	136.87	4525.70	4524.50	0.8800	18	0.015	0.00	8.52	0.00	0.00	0.00	0.00	0.00	Calculated
378	410	Pipe	RCP	M-63	I-103	38.80	4525.70	4525.00	1.8000	18	0.015	0.00	12.23	0.00	0.00	0.00	0.00	0.00	Calculated
379	411	Pipe	RCP	I-103	I-102	479.01	4525.00	4521.10	0.8100	18	0.015	0.00	8.21	0.00	0.00	0.00	0.00	0.00	Calculated
380	412	Pipe	RCP	I-102	I-101	162.20	4524.40	4520.00	2.7100	18	0.015	0.00	2.26	0.00	0.00	0.00	0.00	0.00	Calculated
381	413	Pipe	RCP	I-101	M-62	44.07	4524.30	4519.00	12.0300	18	0.015	0.00	31.57	0.00	0.00	0.00	0.00	0.00	Calculated
382	415	Pipe	RCP	I-97	M-62	263.22	4518.90	4518.10	0.3000	18	0.015	0.00	0.56	0.00	0.00	0.00	0.00	0.00	Calculated
383	416	Pipe	RCP	I-98	I-97	83.12	4518.10	4515.80	2.7700	18	0.015	0.00	2.23	0.00	0.00	0.00	0.00	0.00	Calculated
384	417	Pipe	RCP	I-98	I-99	74.37	4515.70	4514.20	2.0200	18	0.015	0.00	12.93	0.00	0.00	0.00	0.00	0.00	Calculated
385	418	Pipe	RCP	I-99	O-12	103.02	4514.10	4512.70	1.3600	18	0.015	0.00	10.61	0.00	0.00	0.00	0.00	0.00	Calculated
386	419	Pipe	RCP	I-96	I-95	18.20	4509.80	4509.00	4.4000	15	0.015	0.00	6.56	0.00	0.00	0.00	0.00	0.00	Calculated
387	420	Pipe	RCP	I-95	I-92	156.22	4509.60	4501.80	4.9900	15	0.015	0.00	12.51	0.00	0.00	0.00	0.00	0.00	Calculated
388	421	Pipe	RCP	I-92	I-94	134.57	4501.10	4499.50	1.1900	12	0.015	0.00	3.37	0.00	0.00	0.00	0.00	0.00	Calculated
389	422	Pipe	PVC	I-93	M-60	26.88	4496.50	4495.00	5.5800	8	0.015	0.00	2.51	0.00	0.00	0.00	0.00	0.00	Calculated
390	424	Pipe	RCP	I-94	M-61	58.59	4499.50	4499.00	0.8500	12	0.015	0.00	2.85	0.00	0.00	0.00	0.00	0.00	Calculated
391	425	Pipe	RCP	M-60	M-61	41.42	4495.00	4494.80	0.4800	12	0.015	0.00	2.15	0.00	0.00	0.00	0.00	0.00	Calculated
392	426	Pipe	RCP	M-61	I-136	106.29	4494.60	4494.30	0.2800	12	0.015	0.00	1.34	0.00	0.00	0.00	0.00	0.00	Calculated
393	427	Pipe	RCP	I-136	I-137	88.42	4494.50	4494.20	0.3400	15	0.015	0.00	3.26	0.00	0.00	0.00	0.00	0.00	Calculated
394	428	Pipe	RCP	I-138	I-137	39.54	4496.00	4495.90	0.2500	12	0.015	0.00	1.55	0.00	0.00	0.00	0.00	0.00	Calculated
395	429	Pipe	RCP	I-137	I-139	65.91	4494.20	4494.00	0.3000	15	0.015	0.00	3.08	0.00	0.00	0.00	0.00	0.00	Calculated
396	430	Pipe	RCP	I-139	I-140	79.75	4493.90	4491.80	2.6300	15	0.015	0.00	9.08	0.00	0.00	0.00	0.00	0.00	Calculated
397	431	Pipe	RCP	I-454	I-140	233.60	4494.40	4492.40	0.8600	12	0.015	0.00	2.86	0.00	0.00	0.00	0.00	0.00	Calculated
398	432	Pipe	RCP	I-140	M-70	15.03	4491.70	4491.60	0.6700	18	0.015	0.00	8.47	0.00	0.00	0.00	0.00	0.00	Calculated
399	433	Pipe	RCP	I-455	I-454	64.46	4496.60	4494.50	3.2600	12	0.015	0.00	5.57	0.00	0.00	0.00	0.00	0.00	Calculated
400	435	Pipe	RCP	I-142	I-141	23.75	4491.90	4491.00	3.7900	15	0.015	0.00	10.90	0.00	0.00	0.00	0.00	0.00	Calculated
401	436	Pipe	RCP	I-141	M-70	209.44	4492.10	4491.00	0.5300	15	0.015	0.00	2.74	0.00	0.00	0.00	0.00	0.00	Calculated
402	437	Pipe	RCP	M-69	I-141	103.49	4490.90	4490.40	0.4800	15	0.015	0.00	0.17	0.00	0.00	0.00	0.00	0.00	Calculated
403	438	Pipe	RCP	M-68	I-133	29.50	4491.40	4491.30	0.3400	15	0.015	0.00	1.46	0.00	0.00	0.00	0.00	0.00	Calculated
404	440	Pipe	RCP	M-68	M-69	267.65	4491.20	4490.50	0.2600	15	0.015	0.00	2.94	0.00	0.00	0.00	0.00	0.00	Calculated
405	441	Pipe	RCP	M-69	M-125	351.96	4490.20	4485.90	1.2200	15	0.015	0.00	6.19	0.00	0.00	0.00	0.00	0.00	Calculated
406	444	Pipe	RCP	I-234	M-127	14.37	4486.50	4485.80	4.8700	12	0.015	0.00	6.81	0.00	0.00	0.01	0.04	0.00	Calculated
407	445	Pipe	RCP	M-126	M-127	88.71	4484.80	4484.60	0.2300	15	0.015	0.59	1.33	0.45	1.47	1.04	0.86	0.00	Calculated
408	446	Pipe	RCP	M-126	M-125	273.12	4484.50	4484.30	0.0700	15	0.015	1.05	1.51	0.69	1.39	1.25	1.00	4.00	SURCHARGED
409	447	Pipe	RCP	I-144	I-143	22.77	4488.30	4487.20	4.8300	15	0.015	0.00	12.31	0.00	0.00	0.00	0.00	0.00	Calculated
410	448	Pipe	RCP	I-143	M-125	59.79	4487.20	4484.10	5.1800	15	0.015	0.00	12.44	0.00	0.00	0.63	0.50	0.00	Calculated
411	450	Pipe	RCP	M-125	M-72	339.90	4484.50	4482.50	0.5900	15	0.015	1.64	4.29	0.38	1.73	1.25	1.00	4.00	SURCHARGED
412	451	Pipe	RCP	I-147	I-146	29.43	4483.60	4482.80	2.7200	15	0.015	2.13	9.23	0.23	1.74	1.25	1.00	20.00	SURCHARGED
413	452	Pipe	RCP	I-146	M-72	230.79	4482.60	4482.50	0.0400	15	0.015	3.15	1.17	2.70	2.69	1.25	1.00	25.00	SURCHARGED
414	453	Pipe	RCP	I-145	M-71	28.90	4483.30	4482.70	2.0800	15	0.015	1.78	8.07	0.22	1.66	1.25	1.00	21.00	SURCHARGED
415	456	Pipe	RCP	M-71	I-146	207.23	4482.70	4482.60	0.0500	15	0.015	2.07	1.23	1.69	1.93	1.25	1.00	24.00	SURCHARGED
416	459	Pipe	RCP	M-331	M-76	258.63	4516.00	4512.90	1.2000	24	0.015	0.00	21.53	0.00	0.00	0.00	0.00	0.00	Calculated
417	460	Pipe	RCP	M-76	M-77	261.06	4512.80	4509.00	1.4600	24	0.015	0.00	23.65	0.00	0.00	0.00	0.00	0.00	Calculated
418	461	Pipe	RCP	M-78	M-77	251.58	4508.90	4506.30	1.0300	24	0.015	0.00	0.39	0.00	0.00	0.00	0.00	0.00	Calculated
419	462	Pipe	RCP	M-78	O-15	19.45	4506.30	4503.80	12.8500	24	0.015	0.00	70.29	0.00	0.00	0.00	0.00	0.00	Calculated
420	463	Pipe	RCP	M-83	M-85	365.95	4511.15	4507.80	0.9200	36	0.015	21.90	55.31	0.40	7.02	1.36	0.45	0.00	Calculated
421	464	Pipe	RCP	I-159	M-85	11.98	4511.50	4509.00	20.8700	12	0.015	0.00	14.11	0.00	0.00	0.03	0.03	0.00	Calculated
422	465	Pipe	RCP	I-158	M-84	18.41	4506.60	4504.60	10.8600	12	0.015	0.00	10.18	0.00	0.00	0.00	0.00	0.00	Calculated
423	466	Pipe	RCP	M-85	M-84	351.32	4507.80	4503.10	1.3400	36	0.015	21.89	66.86	0.33	8.07	1.22	0.41	0.00	Calculated
424	467	Pipe	RCP	I-160	I-578	95.58	4505.50	4505.10	0.4200	18	0.015	0.03	5.96	0.00	0.14	0.41	0.28	0.00	Calculated
425	468	Pipe	RCP	I-578	M-329	68.03	4505.10	4502.60	3.6700	18	0.015	4.94	17.45	0.28	7.78	0.58	0.39	0.00	Calculated
426	469	Pipe	RCP	M-329	M-328	27.09	4502.20	4501.40	2.9500	18	0.015	4.94	15.64	0.32	6.37	0.87	0.58	0.00	Calculated
427	470	Pipe	RCP	M-84	M-328	166.64	4502.40	4500.80	0.9600	36	0.015	21.89	56.64	0.39	6.03	1.52	0.51	0.00	Calculated
428	471	Pipe	RCP	M-328	M-327	166.39	4500.60	4499.30	0.7800	36	0.015	26.71	51.09	0.52	6.67	1.65	0.55	0.00	Calculated
429	472	Pipe	RCP	I-523	I-521	26.44	4505.30	4505.00	1.1300	15	0.015	0.00	5.96	0.00	0.00	0.00	0.00	0.00	Calculated
430	473	Pipe	RCP	I-524	M-327	70.43	4497.30	4496.30	1.4200	36	0.015	26.71	2.18	12.26	4.96	2.13	0.71	0.00	> CAPACITY
431	474	Pipe	RCP	I-576	I-524	183.32	4496.20	4496.10	0.0500	36	0.015	26.70	13.50	1.98	4.81	2.19	0.73	0.00	> CAPACITY
432	475	Pipe	RCP	I-576	I-577	38.42	4501.80	4501.30	1.3000	18	0.015	0.00	6.57	0.00	0.00	0.00	0.00	0.00	Calculated
433	476	Pipe	RCP	I-522	I-521	21.80	4504.90	4497.50	33.9400	15	0.015	0.00	0.38	0.00	0.00	0.00	0.00	0.00	Calculated
434	477	Pipe	RCP	I-522	I-524	40.10	4502.80	4500.90	4.7400	15	0.015	0.00	12.19	0.00	0.00	0.00	0.00	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
435	481	Pipe	RCP	I-576	New-15	287.10	4495.70	4494.00	0.5900	36	0.015	33.59	44.48	0.76	6.95	1.94	0.65	0.00	Calculated
436	482	Pipe	RCP	New-15	M-88	221.03	4494.00	4489.10	2.2200	30	0.015	36.12	52.93	0.68	8.80	1.94	0.78	0.00	Calculated
437	483	Pipe	RCP	M-88	O-16	51.26	4489.10	4488.00	2.1500	30	0.015	36.12	52.07	0.69	9.23	1.85	0.74	0.00	Calculated
438	484	Pipe	RCP	M-348	I-576	471.08	4496.50	4496.10	0.0800	18	0.015	7.36	2.65	2.77	4.21	1.50	1.00	25.00	SURCHARGED
439	486	Pipe	HDPE	I-604	M-349	23.35	4500.70	4500.30	1.7100	12	0.015	0.69	4.04	0.17	0.92	1.00	1.00	46.00	SURCHARGED
440	487	Pipe	HDPE	I-605	M-349	17.80	4501.40	4500.10	7.3000	12	0.015	0.54	8.34	0.06	0.98	1.00	1.00	23.00	SURCHARGED
441	488	Pipe	HDPE	M-349	I-603	163.99	4500.10	4498.50	0.9800	12	0.015	0.84	3.05	0.28	1.48	1.00	1.00	54.00	SURCHARGED
442	489	Pipe	RCP	I-409	I-603	56.84	4497.90	4497.70	0.3500	24	0.015	4.09	11.63	0.35	2.26	2.00	1.00	68.00	SURCHARGED
443	490	Pipe	RCP	I-603	I-443	157.36	4497.30	4497.00	0.1900	24	0.015	4.57	8.56	0.53	1.46	2.00	1.00	74.00	SURCHARGED
444	491	Pipe	RCP	I-443	DET_New2	125.94	4497.20	4497.20	0.0000	24	0.015	12.14	0.55	21.98	3.87	2.00	1.00	74.00	SURCHARGED
445	492	Pipe	RCP	M-252	I-443	203.35	4506.00	4497.20	4.3300	15	0.015	0.00	11.65	0.00	0.00	0.63	0.50	0.00	Calculated
446	493	Pipe	RCP	I-441	M-252	79.62	4507.60	4506.10	1.8800	15	0.015	0.00	7.68	0.00	0.00	0.00	0.00	0.00	Calculated
447	494	Pipe	RCP	I-442	I-441	25.57	4508.30	4507.70	2.3500	12	0.015	0.00	4.73	0.00	0.00	0.00	0.00	0.00	Calculated
448	495	Pipe	RCP	I-439	I-441	324.72	4508.50	4507.80	0.2200	15	0.015	0.00	2.60	0.00	0.00	0.00	0.00	0.00	Calculated
449	496	Pipe	RCP	I-440	I-439	22.47	4508.80	4508.50	1.3400	12	0.015	0.00	3.57	0.00	0.00	0.00	0.00	0.00	Calculated
450	497	Pipe	RCP	I-410	I-409	24.42	4498.40	4498.20	0.8200	12	0.015	0.32	2.79	0.12	0.69	1.00	1.00	73.00	SURCHARGED
451	498	Pipe	RCP	M-253	I-409	527.72	4499.30	4498.10	0.2300	24	0.015	4.07	9.35	0.44	2.17	2.00	1.00	53.00	SURCHARGED
452	499	Pipe	RCP	I-447	M-253	22.90	4500.30	4499.50	3.4900	12	0.015	0.76	5.77	0.13	0.97	1.00	1.00	53.00	SURCHARGED
453	500	Pipe	RCP	M-254	M-253	153.95	4507.00	4499.40	4.9400	15	0.015	0.04	12.54	0.00	0.07	0.63	0.50	0.00	Calculated
454	501	Pipe	RCP	I-448	M-254	29.40	4507.20	4507.10	0.3400	15	0.015	0.00	2.92	0.00	0.00	0.00	0.00	0.00	Calculated
455	502	Pipe	RCP	M-255	I-448	301.69	4511.50	4507.30	1.3900	15	0.015	0.00	6.61	0.00	0.00	0.00	0.00	0.00	Calculated
456	503	Pipe	RCP	I-445	M-253	316.98	4500.00	4499.30	0.2200	18	0.015	3.75	4.28	0.88	2.20	1.50	1.00	50.00	SURCHARGED
457	504	Pipe	RCP	I-446	I-445	32.02	4500.70	4500.20	1.5600	12	0.015	1.26	3.86	0.33	1.61	1.00	1.00	47.00	SURCHARGED
458	505	Pipe	RCP	I-369	I-445	67.63	4500.90	4500.10	1.1800	12	0.015	2.24	3.36	0.67	2.86	1.00	1.00	44.00	SURCHARGED
459	507	Pipe	RCP	M-263	M-262	235.35	4534.90	4533.90	0.4200	15	0.015	4.79	3.65	1.31	4.30	1.07	0.85	0.00	> CAPACITY
460	510	Pipe	RCP	I-176	I-175	25.56	4542.40	4542.20	0.7800	12	0.015	0.00	2.86	0.00	0.00	0.00	0.00	0.00	Calculated
461	511	Pipe	RCP	I-175	O-17	28.60	4542.50	4542.00	1.7500	12	0.015	0.00	4.08	0.00	0.00	0.00	0.00	0.00	Calculated
462	512	Pipe	RCP	I-175	M-263	35.02	4542.20	4537.80	12.5600	12	0.015	0.00	10.94	0.00	0.00	0.00	0.00	0.00	Calculated
463	513	Pipe	RCP	I-730	I-731	35.58	4704.30	4700.50	10.6800	15	0.015	0.00	18.30	0.00	0.00	0.00	0.00	0.00	Calculated
464	514	Pipe	RCP	I-731	M-272	143.52	4700.50	4681.10	13.5200	15	0.015	0.00	20.58	0.00	0.00	0.00	0.00	0.00	Calculated
465	515	Pipe	RCP	M-272	M-273	134.50	4681.00	4665.10	11.8200	15	0.015	0.00	19.25	0.00	0.00	0.00	0.00	0.00	Calculated
466	516	Pipe	RCP	I-470	M-273	23.69	4667.40	4666.50	3.8000	15	0.015	0.00	10.91	0.00	0.00	0.00	0.00	0.00	Calculated
467	517	Pipe	RCP	M-273	M-269	52.24	4664.60	4658.80	11.1000	15	0.015	0.00	18.65	0.00	0.00	0.00	0.00	0.00	Calculated
468	518	Pipe	RCP	I-708	M-269	27.65	4660.40	4658.80	5.7900	15	0.015	0.00	13.47	0.00	0.00	0.00	0.00	0.00	Calculated
469	519	Pipe	RCP	I-707	I-708	29.02	4661.60	4660.50	3.7900	15	0.015	0.00	10.90	0.00	0.00	0.00	0.00	0.00	Calculated
470	520	Pipe	RCP	M-269	M-270	97.22	4658.80	4647.60	11.5200	15	0.015	0.00	19.00	0.00	0.00	0.00	0.00	0.00	Calculated
471	521	Pipe	RCP	M-270	M-271	61.25	4647.50	4640.70	11.1000	15	0.015	0.00	18.65	0.00	0.00	0.00	0.00	0.00	Calculated
472	522	Pipe	RCP	I-717	I-716	22.17	4630.70	4630.00	3.1600	15	0.015	0.00	9.95	0.00	0.00	0.00	0.00	0.00	Calculated
473	523	Pipe	RCP	M-271	I-716	128.34	4640.60	4630.10	8.1800	15	0.015	0.00	16.01	0.00	0.00	0.00	0.00	0.00	Calculated
474	524	Pipe	RCP	I-350	I-716	52.64	4634.10	4630.10	7.6000	15	0.015	0.00	15.43	0.00	0.00	0.00	0.00	0.00	Calculated
475	525	Pipe	RCP	I-716	M-417	31.05	4630.00	4626.40	11.5900	15	0.015	0.00	19.06	0.00	0.00	0.00	0.00	0.00	Calculated
476	526	Pipe	RCP	M-417	I-718	99.66	4626.30	4620.10	6.2200	15	0.015	0.00	13.96	0.00	0.00	0.00	0.00	0.00	Calculated
477	527	Pipe	RCP	I-718	I-719	120.22	4620.00	4614.70	4.4100	15	0.015	0.00	11.75	0.00	0.00	0.00	0.00	0.00	Calculated
478	528	Pipe	RCP	I-719	M-416	64.43	4614.80	4613.60	1.8600	15	0.015	0.00	7.64	0.00	0.00	0.00	0.00	0.00	Calculated
479	529	Pipe	RCP	M-416	I-721	156.93	4613.55	4596.43	10.9100	15	0.015	0.00	18.49	0.00	0.00	0.00	0.00	0.00	Calculated
480	530	Pipe	RCP	I-720	M-416	53.36	4617.80	4613.60	7.8700	15	0.015	0.00	15.71	0.00	0.00	0.00	0.00	0.00	Calculated
481	532	Pipe	RCP	I-721	M-418	35.84	4596.43	4595.00	3.9900	15	0.015	0.00	11.18	0.00	0.00	0.00	0.00	0.00	Calculated
482	533	Pipe	UNDERGROUND DETENTION W/ WEIR	M-418	M-419	64.68	4595.00	4590.10	7.5800	48	0.015	0.00	342.65	0.00	0.00	1.84	0.46	0.00	Calculated
483	535	Pipe	RCP	I-723	I-724	61.83	4588.40	4586.90	2.4300	15	0.015	0.66	8.72	0.08	0.90	1.25	1.00	12.00	SURCHARGED
484	536	Pipe	RCP	I-724	M-121	43.39	4586.80	4581.80	11.5200	18	0.015	9.63	30.90	0.31	6.47	1.50	1.00	33.00	SURCHARGED
485	537	Pipe	RCP	I-223	I-224	14.07	4594.40	4591.50	20.6100	15	0.015	0.00	25.42	0.00	0.00	0.49	0.39	0.00	Calculated
486	538	Pipe	RCP	I-378	I-733	83.99	4588.90	4584.10	5.7100	15	0.015	0.00	13.38	0.00	0.00	0.63	0.50	0.00	Calculated
487	539	Pipe	RCP	I-733	M-121	247.26	4584.00	4581.80	0.8900	18	0.015	9.51	8.59	1.11	5.38	1.50	1.00	94.00	SURCHARGED
488	540	Pipe	RCP	I-224	M-121	70.07	4591.40	4581.80	13.7000	15	0.015	10.37	20.72	0.50	8.69	1.17	0.93	0.00	Calculated
489	541	Pipe	RCP	I-229	M-123	9.23	4607.00	4606.50	5.4200	15	0.015	0.00	0.58	0.00	0.00	0.00	0.00	0.00	Calculated
490	542	Pipe	RCP	I-225	I-226	11.93	4612.20	4612.10	0.8400	15	0.015	0.02	5.13	0.00	0.07	0.72	0.58	0.00	Calculated
491	543	Pipe	RCP	I-377	M-189	60.48	4598.30	4597.40	1.4900	15	0.015	0.00	7.02	0.00	0.00	0.00	0.00	0.00	Calculated
492	544	Pipe	RCP	I-674	M-189	40.91	4602.70	4597.30	13.2000	15	0.015	0.00	20.38	0.00	0.00	0.00	0.00	0.00	Calculated
493	545	Pipe	RCP	I-337	M-189	61.90	4597.20	4597.10	0.1600	15	0.015	0.00	0.23	0.00	0.00	0.00	0.00	0.00	Calculated
494	546	Pipe	RCP	I-337	I-338	160.05	4597.10	4593.90	2.0000	15	0.015	0.00	7.92	0.00	0.00	0.00	0.00	0.00	Calculated
495	547	Pipe	RCP	I-336	I-338	150.25	4593.90	4585.90	5.3200	15	0.015	0.00	1.02	0.00	0.00	0.00	0.00	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
496	548	Pipe	RCP	M-188	I-336	79.10	4585.90	4584.10	2.2800	15	0.015	6.15	0.20	30.90	5.28	1.12	0.90	0.00	> CAPACITY
497	549	Pipe	RCP	M-188	O-18	122.49	4584.00	4582.80	0.9800	15	0.015	6.11	5.54	1.10	5.25	1.12	0.90	0.00	> CAPACITY
498	550	Pipe	RCP	I-473	I-336	166.91	4602.30	4585.90	9.8300	15	0.015	0.00	17.55	0.00	0.00	0.63	0.50	0.00	Calculated
499	551	Pipe	RCP	M-275	I-473	32.27	4603.00	4602.30	2.1700	15	0.015	0.00	8.30	0.00	0.00	0.00	0.00	0.00	Calculated
500	552	Pipe	RCP	I-472	M-274	22.74	4608.20	4608.10	0.4400	15	0.015	0.00	3.71	0.00	0.00	0.00	0.00	0.00	Calculated
501	553	Pipe	RCP	M-274	M-275	194.95	4608.00	4603.00	2.5600	15	0.015	0.00	8.96	0.00	0.00	0.00	0.00	0.00	Calculated
502	554	Pipe	RCP	I-228	M-122	11.53	4624.00	4623.30	6.0700	15	0.015	0.00	0.52	0.00	0.00	0.00	0.00	0.00	Calculated
503	555	Pipe	RCP	I-709	M-415	66.05	4694.80	4692.10	4.0900	15	0.015	0.00	11.32	0.00	0.00	0.00	0.00	0.00	Calculated
504	557	Pipe	RCP	M-415	O-64	40.09	4692.10	4692.00	0.2500	15	0.015	0.00	2.80	0.00	0.00	0.00	0.00	0.00	Calculated
505	558	Pipe	RCP	I-711	M-415	73.84	4701.30	4692.10	12.4600	15	0.015	0.00	19.76	0.00	0.00	0.00	0.00	0.00	Calculated
506	559	Pipe	RCP	I-729	I-712	57.11	4736.40	4727.50	15.5800	15	0.015	0.00	22.10	0.00	0.00	0.00	0.00	0.00	Calculated
507	562	Pipe	RCP	I-712	I-710	78.72	4727.50	4727.40	0.1300	15	0.015	0.00	2.00	0.00	0.00	0.00	0.00	0.00	Calculated
508	563	Pipe	RCP	I-725	I-727	79.38	4739.20	4730.80	10.5800	15	0.015	0.00	18.21	0.00	0.00	0.00	0.00	0.00	Calculated
509	564	Pipe	RCP	I-727	I-710	52.61	4730.70	4727.40	6.2700	15	0.015	0.00	14.02	0.00	0.00	0.00	0.00	0.00	Calculated
510	565	Pipe	RCP	I-710	O-63	79.64	4725.00	4727.40	-3.0100	15	0.015	0.00	0.89	0.00	0.00	0.00	0.00	0.00	Calculated
511	566	Pipe	RCP	I-713	I-738	37.92	4656.30	4656.20	0.2600	15	0.015	0.00	2.87	0.00	0.00	0.00	0.00	0.00	Calculated
512	567	Pipe	RCP	I-738	I-715	47.14	4656.10	4652.20	8.2700	15	0.015	0.00	16.10	0.00	0.00	0.00	0.00	0.00	Calculated
513	572	Pipe	HDPE	I-316	I-1215	25.46	4895.40	4894.00	5.5000	15	0.015	5.95	13.36	0.44	8.62	0.69	0.55	0.00	Calculated
514	573	Pipe	HDPE	I-1215	M-220	229.50	4894.00	4878.00	6.9700	15	0.015	5.95	14.78	0.40	6.28	0.90	0.72	0.00	Calculated
515	574	Pipe	RCP	M-389	M-390	491.87	4620.00	4606.60	2.7200	30	0.015	33.60	58.67	0.57	11.87	1.38	0.56	0.00	Calculated
516	575	Pipe	RCP	I-653	M-390	16.08	4608.70	4607.30	8.7100	18	0.015	0.00	26.86	0.00	0.00	0.28	0.19	0.00	Calculated
517	576	Pipe	RCP	I-652	M-390	14.69	4608.90	4607.20	11.5700	18	0.015	0.00	30.97	0.00	0.00	0.33	0.22	0.00	Calculated
518	577	Pipe	RCP	M-390	M-388	331.29	4606.60	4592.60	4.2300	30	0.015	33.60	73.08	0.46	13.49	1.25	0.51	0.00	Calculated
519	578	Pipe	RCP	I-654	M-388	94.62	4596.40	4592.00	4.6500	15	0.015	0.00	12.07	0.00	0.00	0.63	0.50	0.00	Calculated
520	579	Pipe	RCP	M-388	M-387	233.54	4592.50	4583.30	3.9400	30	0.015	33.58	70.56	0.48	13.21	1.27	0.51	0.00	Calculated
521	580	Pipe	RCP	I-650	M-387	18.86	4587.90	4584.70	16.9700	15	0.015	0.00	23.06	0.00	0.00	0.00	0.00	0.00	Calculated
522	581	Pipe	HDPE	I-622	M-387	35.20	4586.00	4584.40	4.5500	18	0.015	0.00	19.41	0.00	0.00	0.00	0.00	0.00	Calculated
523	582	Pipe	RCP	M-387	M-151	125.19	4581.10	4579.10	1.6000	30	0.015	33.58	44.59	0.75	8.52	1.92	0.77	0.00	Calculated
524	583	Pipe	RCP	M-151	I-293	205.63	4579.10	4574.90	2.0400	30	0.015	34.93	50.99	0.69	7.74	2.16	0.87	0.00	Calculated
525	584	Pipe	RCP	I-293	WillowCreekDET	140.98	4574.70	4574.40	0.2100	18	0.015	10.36	4.40	2.35	6.65	1.50	1.00	117.00	SURCHARGED
526	586	Pipe	RCP	I-294	I-600	49.10	4574.20	4574.00	0.4100	48	0.015	38.05	79.45	0.48	7.66	1.67	0.42	0.00	Calculated
527	587	Pipe	RCP	I-600	Willow-1	211.84	4574.00	4568.00	2.8300	48	0.015	38.06	209.51	0.18	11.22	1.26	0.31	0.00	Calculated
528	588	Pipe	HDPE	I-761	M-669	172.58	4631.70	4624.00	4.4600	15	0.015	3.74	11.83	0.32	8.27	0.49	0.40	0.00	Calculated
529	589	Pipe	RCP	M-669	I-1217	557.78	4622.40	4596.30	4.6800	15	0.015	3.70	12.11	0.31	8.58	0.48	0.38	0.00	Calculated
530	590	Pipe	RCP	I-1217	M-670	359.50	4596.20	4578.10	5.0300	15	0.015	5.39	12.39	0.43	5.61	0.91	0.73	0.00	Calculated
531	591	Pipe	RCP	I-1229	M-670	26.48	4579.70	4578.60	4.1500	12	0.015	0.37	6.29	0.06	0.71	0.84	0.86	0.00	Calculated
532	592	Pipe	RCP	M-670	I-1230	10.66	4578.60	4578.50	0.9400	12	0.015	5.38	2.99	1.80	7.60	0.84	0.85	0.00	> CAPACITY
533	593	Pipe	RCP to HDPE Somewhere	I-1230	I-582	836.04	4578.50	4556.90	2.5800	15	0.015	5.35	9.00	0.60	5.69	0.94	0.78	0.00	Calculated
534	594	Pipe	RCP	I-1223	I-1224	25.89	4646.70	4646.00	2.7000	15	0.015	0.00	9.21	0.00	0.00	0.00	0.00	0.00	Calculated
535	595	Pipe	RCP	I-1224	M-191	37.68	4646.10	4642.10	10.6200	15	0.015	0.00	18.24	0.00	0.00	0.00	0.00	0.00	Calculated
536	596	Pipe	RCP	I-555	M-234	138.53	4658.70	4650.00	6.2800	18	0.015	10.12	22.81	0.44	11.64	0.74	0.49	0.00	Calculated
537	597	Pipe	RCP	M-234	I-419	181.52	4650.00	4639.60	5.7300	18	0.015	10.11	21.79	0.46	7.35	1.08	0.73	0.00	Calculated
538	598	Pipe	RCP	I-419	I-420	29.63	4639.50	4639.40	0.3400	24	0.015	10.09	11.39	0.89	4.47	1.33	0.68	0.00	Calculated
539	599	Pipe	RCP	I-420	M-235	198.20	4639.20	4626.70	6.3100	24	0.015	10.10	49.24	0.21	10.53	0.68	0.34	0.00	Calculated
540	600	Pipe	RCP	M-235	M-240	256.01	4626.60	4620.90	2.2300	24	0.015	10.06	29.25	0.34	8.11	0.82	0.42	0.00	Calculated
541	601	Pipe	RCP	M-240	M-241	224.26	4620.80	4613.20	3.3900	24	0.015	10.05	36.09	0.28	6.72	0.97	0.50	0.00	Calculated
542	603	Pipe	RCP	I-423	M-241	25.57	4613.50	4613.30	0.7800	15	0.015	0.45	4.95	0.09	0.62	1.05	0.86	0.00	Calculated
543	604	Pipe	RCP	M-241	M-242	64.04	4613.20	4612.00	1.8700	18	0.015	9.86	12.46	0.79	6.86	1.12	0.76	0.00	Calculated
544	605	Pipe	RCP	I-173	I-1225	242.07	4618.40	4609.40	3.7200	15	0.015	0.00	10.79	0.00	0.00	0.00	0.00	0.00	Calculated
545	606	Pipe	RCP	I-1225	I-1226	36.54	4609.50	4609.30	0.5500	15	0.015	0.00	4.14	0.00	0.00	0.00	0.00	0.00	Calculated
546	607	Pipe		M-242	New-1	108.97	4611.90	4606.50	4.9600	18	0.015	9.86	20.27	0.49	11.02	0.75	0.50	0.00	Calculated
547	608	Pipe	RCP	I-1226	New-1	48.37	4609.20	4606.50	5.5800	15	0.015	0.00	13.23	0.00	0.00	0.33	0.27	0.00	Calculated
548	609	Pipe	RCP	New-1	I-428	41.36	4606.50	4600.20	15.2300	18	0.015	9.86	35.53	0.28	14.85	0.60	0.40	0.00	Calculated
549	610	Pipe	RCP	I-313	M-175	166.42	4567.60	4564.50	1.8600	24	0.015	9.85	26.76	0.37	5.98	1.04	0.52	0.00	Calculated
550	611	Pipe	RCP	M-175	DET_50	266.52	4564.50	4555.50	3.3800	42	0.015	42.51	160.23	0.27	6.14	2.36	0.68	0.00	Calculated
551	612	Pipe	RCP	M-175	I-314	131.88	4565.60	4564.60	0.7600	42	0.015	13.90	16.98	0.82	3.57	1.48	0.42	0.00	Calculated
552	613	Pipe	RCP	I-314	M-91	42.11	4566.00	4565.20	1.9000	42	0.015	13.91	4.25	3.27	3.38	1.55	0.44	0.00	> CAPACITY
553	614	Pipe	RCP	I-178	I-177	23.83	4569.40	4568.00	5.8700	15	0.015	0.00	13.57	0.00	0.00	0.22	0.17	0.00	Calculated
554	615	Pipe	RCP	I-177	M-91	63.34	4567.90	4567.00	1.4200	15	0.015	2.19	6.67	0.33	4.12	0.62	0.50	0.00	Calculated
555	618	Pipe	RCP	I-188	M-92	121.66	4611.60	4592.30	15.8600	36	0.015	0.00	230.24	0.00	0.00	0.00	0.00	0.00	Calculated
556	619	Pipe	RCP	M-92	I-180	30.01	4592.10	4590.80	4.3300	36	0.015	0.00	120.31	0.00	0.00	0.00	0.00	0.00	Calculated
557	620	Pipe	RCP	I-180	M-178	91.28	4590.70	4585.20	6.0300	36	0.015	0.00	141.89	0.00	0.00	0.00	0.00	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
558	621	Pipe	RCP	I-187	I-186	27.51	4589.20	4587.00	8.0000	15	0.015	0.00	15.83	0.00	0.00	0.00	0.00	0.00	Calculated
559	622	Pipe	RCP	I-186	M-178	41.93	4586.90	4586.80	0.2400	15	0.015	0.00	2.73	0.00	0.00	0.00	0.00	0.00	Calculated
560	623	Pipe	RCP	I-189	I-194	216.85	4588.40	4578.00	4.8000	15	0.015	0.00	12.28	0.00	0.00	0.02	0.01	0.00	Calculated
561	624	Pipe	RCP	I-194	I-193	45.87	4577.90	4576.60	2.8300	15	0.015	0.04	9.42	0.00	0.06	0.69	0.55	0.00	Calculated
562	625	Pipe	RCP	I-191	I-196	257.40	4595.90	4581.50	5.5900	15	0.015	0.00	13.24	0.00	0.00	0.51	0.44	0.00	Calculated
563	626	Pipe	RCP	I-196	I-195	46.80	4581.50	4580.20	2.7800	15	0.015	1.77	9.33	0.19	1.58	1.13	0.94	0.00	Calculated
564	627	Pipe	RCP	I-195	I-193	381.30	4580.10	4576.60	0.9200	15	0.015	5.91	5.36	1.10	4.85	1.25	1.00	110.00	SURCHARGED
565	628	Pipe	RCP	M-121	I-195	480.82	4581.70	4580.20	0.3100	18	0.015	10.28	5.08	2.02	5.81	1.50	1.00	106.00	SURCHARGED
566	629	Pipe	RCP	I-229	I-724	318.37	4606.40	4586.90	6.1200	15	0.015	0.00	13.86	0.00	0.00	0.63	0.50	0.00	Calculated
567	630	Pipe	RCP	I-226	I-224	401.45	4612.00	4591.50	5.1100	15	0.015	10.39	12.65	0.82	11.08	0.93	0.74	0.00	Calculated
568	631	Pipe	RCP	I-228	I-229	340.90	4623.20	4606.50	4.9000	15	0.015	0.00	12.39	0.00	0.00	0.00	0.00	0.00	Calculated
569	632	Pipe	RCP	I-227	I-226	399.53	4634.40	4612.10	5.5800	15	0.015	10.38	13.23	0.78	11.64	0.85	0.68	0.00	Calculated
570	633	Pipe	RCP	I-740	I-739	63.28	4668.60	4667.10	2.3700	15	0.015	6.02	8.73	0.69	6.86	0.84	0.67	0.00	Calculated
571	634	Pipe	RCP	I-740	I-741	99.34	4684.60	4668.70	16.0100	15	0.015	6.02	0.97	6.19	5.19	1.12	0.90	0.00	> CAPACITY
572	635	Pipe	RCP	I-657	M-186	55.33	4665.80	4664.30	2.7100	12	0.015	0.00	5.08	0.00	0.00	0.00	0.00	0.00	Calculated
573	636	Pipe	RCP	I-739	M-186	67.35	4667.00	4664.30	4.0100	15	0.015	6.02	11.23	0.54	8.42	0.70	0.57	0.00	Calculated
574	637	Pipe	RCP	I-334	M-186	170.30	4650.90	4649.00	1.1200	15	0.015	0.00	5.91	0.00	0.00	0.30	0.24	0.00	Calculated
575	638	Pipe	RCP	M-186	I-227	447.54	4648.90	4634.40	3.2400	15	0.015	6.02	10.08	0.60	7.80	0.78	0.63	0.00	Calculated
576	639	Pipe	RCP	I-335	I-334	23.09	4653.20	4650.90	9.9600	15	0.015	0.00	17.86	0.00	0.00	0.00	0.00	0.00	Calculated
577	640	Pipe	RCP	I-351	I-477	64.13	4748.20	4747.10	1.7200	15	0.015	0.00	7.33	0.00	0.00	0.00	0.00	0.00	Calculated
578	641	Pipe	RCP	I-477	M-276	53.72	4747.00	4745.10	3.5400	15	0.015	0.00	10.58	0.00	0.00	0.00	0.00	0.00	Calculated
579	642	Pipe	RCP	M-277	M-276	146.49	4745.00	4744.50	0.3400	15	0.015	0.00	0.93	0.00	0.00	0.00	0.00	0.00	Calculated
580	643	Pipe	RCP	I-479	I-478	24.99	4744.00	4743.50	2.0000	12	0.015	0.00	4.37	0.00	0.00	0.00	0.00	0.00	Calculated
581	644	Pipe	RCP	I-478	M-277	37.78	4744.40	4742.80	4.2400	15	0.015	0.00	1.82	0.00	0.00	0.00	0.00	0.00	Calculated
582	645	Pipe	RCP	M-278	I-478	41.30	4743.40	4743.10	0.7300	24	0.015	0.02	0.96	0.02	0.42	0.08	0.05	0.00	Calculated
583	646	Pipe	RCP	M-278	M-392	269.95	4743.00	4707.00	13.3400	24	0.015	9.90	71.60	0.14	6.60	0.96	0.49	0.00	Calculated
584	647	Pipe	RCP	M-392	M-393	165.05	4706.90	4706.00	0.5500	24	0.015	9.74	14.48	0.67	7.07	0.88	0.45	0.00	Calculated
585	649	Pipe	RCP	I-480	M-278	231.14	4745.90	4743.10	1.2100	18	0.015	0.00	10.02	0.00	0.00	0.20	0.13	0.00	Calculated
586	650	Pipe	RCP	M-279	I-480	114.13	4750.00	4746.00	3.5000	18	0.015	0.00	17.04	0.00	0.00	0.00	0.00	0.00	Calculated
587	652	Pipe	RCP	I-482	I-481	23.36	4754.90	4753.90	4.2800	15	0.015	0.00	11.58	0.00	0.00	0.00	0.00	0.00	Calculated
588	653	Pipe	RCP	I-481	M-280	69.04	4753.80	4752.20	2.3200	18	0.015	0.00	13.86	0.00	0.00	0.00	0.00	0.00	Calculated
589	654	Pipe	RCP	M-281	I-481	163.45	4756.70	4753.90	1.7100	15	0.015	0.00	7.33	0.00	0.00	0.00	0.00	0.00	Calculated
590	655	Pipe	RCP	M-282	M-281	73.34	4758.00	4756.80	1.6400	15	0.015	0.00	7.16	0.00	0.00	0.00	0.00	0.00	Calculated
591	656	Pipe	RCP	M-283	M-282	75.90	4759.60	4758.10	1.9800	15	0.015	0.00	7.87	0.00	0.00	0.00	0.00	0.00	Calculated
592	657	Pipe	RCP	M-284	M-283	74.11	4763.10	4759.70	4.5900	15	0.015	0.00	11.99	0.00	0.00	0.00	0.00	0.00	Calculated
593	658	Pipe	RCP	M-285	M-284	83.06	4767.10	4763.10	4.8200	15	0.015	0.00	12.29	0.00	0.00	0.00	0.00	0.00	Calculated
594	659	Pipe	RCP	I-655	M-285	22.27	4768.00	4767.20	3.5900	15	0.015	0.00	10.61	0.00	0.00	0.00	0.00	0.00	Calculated
595	660	Pipe	RCP	I-655	I-656	29.07	4770.00	4768.10	6.5400	15	0.015	0.00	0.33	0.00	0.00	0.00	0.00	0.00	Calculated
596	662	Pipe	RCP	I-686	I-687	9.48	4879.70	4878.70	10.5500	48	0.015	0.00	90.41	0.00	0.00	0.00	0.00	0.00	Calculated
597	663	Pipe	RCP	M-404	I-686	203.78	4878.60	4854.90	11.6300	48	0.015	0.00	2.76	0.00	0.00	0.00	0.00	0.00	Calculated
598	664	Pipe	RCP	M-403	M-404	188.39	4854.80	4839.70	8.0200	48	0.015	0.00	2.87	0.00	0.00	0.00	0.00	0.00	Calculated
599	665	Pipe	RCP	I-688	I-689	26.79	4845.80	4844.70	4.1100	15	0.015	0.00	11.34	0.00	0.00	0.00	0.00	0.00	Calculated
600	666	Pipe	RCP	I-694	I-689	282.17	4869.40	4844.70	8.7500	15	0.015	0.00	16.56	0.00	0.00	0.00	0.00	0.00	Calculated
601	667	Pipe	RCP	I-695	I-694	25.68	4870.80	4869.50	5.0600	15	0.015	0.00	12.60	0.00	0.00	0.00	0.00	0.00	Calculated
602	668	Pipe	RCP	M-403	M-408	40.70	4839.60	4837.90	4.1800	48	0.015	0.00	254.43	0.00	0.00	0.00	0.00	0.00	Calculated
603	669	Pipe	RCP	M-408	M-411	427.81	4838.00	4796.10	9.7900	48	0.015	0.00	389.60	0.00	0.00	0.00	0.00	0.00	Calculated
604	670	Pipe	RCP	M-412	M-411	256.30	4796.00	4795.50	0.2000	48	0.015	0.00	2.46	0.00	0.00	0.00	0.00	0.00	Calculated
605	671	Pipe	RCP	M-412	M-413	42.21	4795.50	4795.40	0.2400	48	0.015	0.01	60.59	0.00	0.12	0.42	0.11	0.00	Calculated
606	672	Pipe	RCP	I-701	I-1259	24.45	4833.70	4833.30	1.6400	15	0.015	0.00	7.16	0.00	0.00	0.00	0.00	0.00	Calculated
607	673	Pipe	RCP	I-1259	M-413	9.57	4833.20	4832.20	10.4500	15	0.015	0.00	18.10	0.00	0.00	0.00	0.00	0.00	Calculated
608	674	Pipe	RCP	M-413	O-62	222.14	4795.40	4791.90	1.5800	48	0.015	4.34	156.26	0.03	5.29	0.47	0.12	0.00	Calculated
609	675	Pipe	RCP	I-700	I-699	27.60	4840.40	4839.30	3.9900	15	0.015	0.00	0.34	0.00	0.00	0.00	0.00	0.00	Calculated
610	676	Pipe	RCP	I-700	M-413	156.25	4839.30	4832.20	4.5400	15	0.015	0.00	11.93	0.00	0.00	0.00	0.00	0.00	Calculated
611	677	Pipe	RCP	I-691	I-690	21.75	4830.80	4830.20	2.7600	15	0.015	0.00	9.30	0.00	0.00	0.00	0.00	0.00	Calculated
612	678	Pipe	RCP	M-407	I-690	81.89	4830.20	4824.10	7.4500	15	0.015	0.00	1.38	0.00	0.00	0.00	0.00	0.00	Calculated
613	679	Pipe	RCP	I-692	I-693	22.05	4819.70	4818.20	6.8000	15	0.015	0.00	14.60	0.00	0.00	0.00	0.00	0.00	Calculated
614	680	Pipe	RCP	M-407	I-693	113.91	4823.70	4818.20	4.8300	15	0.015	0.00	12.30	0.00	0.00	0.00	0.00	0.00	Calculated
615	681	Pipe	RCP	I-706	I-685	65.41	4814.60	4814.50	0.1500	15	0.015	0.00	2.19	0.00	0.00	0.00	0.00	0.00	Calculated
616	682	Pipe	RCP	I-704	I-705	26.99	4801.00	4800.50	1.8500	15	0.015	0.00	7.62	0.00	0.00	0.00	0.00	0.00	Calculated
617	683	Pipe	RCP	I-703	M-414	189.11	4800.10	4798.80	0.6900	15	0.015	0.00	0.71	0.00	0.00	0.00	0.00	0.00	Calculated
618	684	Pipe	RCP	I-705	M-414	32.92	4800.40	4800.20	0.6100	15	0.015	0.00	4.36	0.00	0.00	0.00	0.00	0.00	Calculated
619	685	Pipe	RCP	I-696	M-414	26.83	4801.30	4800.20	4.1000	15	0.015	0.00	11.34	0.00	0.00	0.00	0.00	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
620	686	Pipe	RCP	I-702	I-703	24.56	4815.90	4814.30	6.5100	15	0.015	0.00	14.29	0.00	0.00	0.00	0.00	0.00	Calculated
621	687	Pipe	RCP	M-411	I-703	109.41	4798.70	4797.50	1.1000	15	0.015	0.00	0.54	0.00	0.00	0.00	0.00	0.00	Calculated
622	688	Pipe	HDPE	I-659	M-394	112.64	4675.20	4669.20	5.3300	12	0.015	0.00	7.13	0.00	0.00	0.00	0.00	0.00	Calculated
623	689	Pipe	HDPE	M-394	I-658	187.93	4675.20	4669.20	3.1900	12	0.015	0.00	0.07	0.00	0.00	0.00	0.00	0.00	Calculated
624	690	Pipe	HDPE	M-394	I-662	96.80	4669.10	4663.50	5.7900	12	0.015	0.00	7.43	0.00	0.00	0.00	0.00	0.00	Calculated
625	691	Pipe	HDPE	I-662	I-663	110.25	4663.40	4657.10	5.7100	12	0.015	0.00	7.38	0.00	0.00	0.00	0.00	0.00	Calculated
626	692	Pipe	HDPE	I-663	I-471	169.75	4657.10	4644.10	7.6600	12	0.015	0.00	8.54	0.00	0.00	0.28	0.28	0.00	Calculated
627	693	Pipe		I-471	O-41	236.31	4644.00	4613.20	13.0300	15	0.015	10.26	20.21	0.51	16.02	0.64	0.52	0.00	Calculated
628	694	Pipe	RCP	I-1219	I-1218	27.71	4594.50	4593.00	5.4100	15	0.015	0.00	13.03	0.00	0.00	0.00	0.00	0.00	Calculated
629	695	Pipe	RCP	I-1218	M-671	53.47	4592.80	4591.70	2.0600	15	0.015	0.00	8.03	0.00	0.00	0.00	0.00	0.00	Calculated
630	696	Pipe	RCP	I-1221	I-1220	28.86	4587.50	4586.70	2.7700	15	0.015	0.00	9.32	0.00	0.00	0.00	0.00	0.00	Calculated
631	697	Pipe	RCP	M-671	I-1220	250.38	4591.60	4586.70	1.9600	15	0.015	0.00	7.83	0.00	0.00	0.00	0.00	0.00	Calculated
632	698	Pipe	RCP	I-190	M-347	227.21	4558.60	4555.40	1.4100	15	0.015	0.00	6.64	0.00	0.00	0.00	0.00	0.00	Calculated
633	699	Pipe	RCP	O-56	M-347	18.66	4555.40	4554.00	7.5000	15	0.015	0.00	11.00	0.00	0.00	0.00	0.00	0.00	Calculated
634	703	Pipe	RCP	I-205	M-108	27.12	4570.50	4568.80	6.2700	15	0.015	0.00	14.02	0.00	0.00	0.02	0.06	0.00	Calculated
635	704	Pipe	RCP	M-108	M-109	382.83	4567.10	4563.20	1.0200	15	0.015	5.83	5.65	1.03	4.96	1.25	1.00	0.00	> CAPACITY
636	707	Pipe	RCP	M-109	M-110	13.92	4563.10	4562.90	1.4400	15	0.015	5.83	6.71	0.87	5.19	1.07	0.86	0.00	Calculated
637	708	Pipe	RCP	M-110	M-111	450.55	4562.80	4557.20	1.2400	15	0.015	5.81	6.24	0.93	5.64	0.97	0.78	0.00	Calculated
638	709	Pipe	RCP	M-111	M-99	374.96	4557.10	4550.60	1.7300	15	0.015	5.81	7.37	0.79	5.37	1.04	0.83	0.00	Calculated
639	710	Pipe	RCP	I-197	M-99	50.03	4555.00	4554.30	1.4000	18	0.015	0.00	10.77	0.00	0.00	0.00	0.00	0.00	Calculated
640	711	Pipe	RCP	I-601	I-602	254.77	4557.50	4556.90	0.2400	18	0.015	0.00	0.18	0.00	0.00	0.00	0.00	0.00	Calculated
641	712	Pipe	RCP	I-601	O-38	154.07	4557.00	4556.00	0.6500	18	0.015	0.00	7.33	0.00	0.00	0.00	0.00	0.00	Calculated
642	713	Pipe	RCP	I-198	M-101	21.76	4557.00	4556.30	3.2200	18	0.015	0.00	16.33	0.00	0.00	0.00	0.00	0.00	Calculated
643	714	Pipe	RCP	M-101	M-100	61.47	4556.20	4555.30	1.4600	18	0.015	0.00	11.02	0.00	0.00	0.00	0.00	0.00	Calculated
644	715	Pipe	RCP	M-100	M-99	45.11	4551.40	4551.30	0.2200	18	0.015	0.07	4.29	0.02	0.55	0.65	0.45	0.00	Calculated
645	716	Pipe	RCP	M-99	M-102	33.02	4550.60	4550.00	1.8200	18	0.015	9.45	12.27	0.77	6.14	1.24	0.84	0.00	Calculated
646	717	Pipe	RCP	M-102	M-103	297.64	4549.90	4545.90	1.3400	18	0.015	9.43	10.55	0.89	6.47	1.14	0.77	0.00	Calculated
647	718	Pipe	RCP	M-103	M-104	338.53	4545.80	4538.90	2.0400	18	0.015	9.41	13.00	0.72	7.75	0.96	0.65	0.00	Calculated
648	719	Pipe	RCP	I-199	M-104	20.08	4543.30	4541.10	10.9600	15	0.015	0.00	18.53	0.00	0.00	0.00	0.00	0.00	Calculated
649	720	Pipe	RCP	I-200	M-104	49.18	4543.60	4542.70	1.8300	15	0.015	1.82	7.57	0.24	4.68	0.44	0.35	0.00	Calculated
650	721	Pipe	RCP	I-201	M-105	49.20	4536.00	4532.90	6.3000	15	0.015	0.00	14.05	0.00	0.00	0.00	0.00	0.00	Calculated
651	723	Pipe	RCP	M-104	M-105	456.05	4538.60	4526.00	2.7600	24	0.015	11.19	32.59	0.34	6.82	1.06	0.53	0.00	Calculated
652	724	Pipe	RCP	M-105	M-107	277.79	4525.90	4523.30	0.9400	24	0.015	14.35	18.97	0.76	6.30	1.36	0.68	0.00	Calculated
653	725	Pipe	RCP	M-107	M-106	167.42	4523.20	4519.90	1.9700	24	0.015	14.35	27.53	0.52	7.53	1.17	0.59	0.00	Calculated
654	726	Pipe	RCP	I-202	M-106	10.90	4522.30	4520.40	17.4300	15	0.015	0.00	23.37	0.00	0.00	0.36	0.28	0.00	Calculated
655	728	Pipe	RCP	M-106	M-98	194.07	4519.70	4517.70	1.0300	24	0.015	14.34	19.90	0.72	6.44	1.33	0.67	0.00	Calculated
656	729	Pipe	RCP	M-98	M-97	274.44	4517.60	4513.90	1.3500	24	0.015	14.33	22.77	0.63	7.28	1.20	0.60	0.00	Calculated
657	730	Pipe	RCP	M-97	M-299	326.43	4513.80	4508.50	1.6200	24	0.015	14.32	24.98	0.57	7.88	1.12	0.56	0.00	Calculated
658	731	Pipe	RCP	M-299	M-298	169.93	4508.40	4503.70	2.7700	24	0.015	14.32	32.61	0.44	8.68	1.04	0.52	0.00	Calculated
659	732	Pipe	HDPE	I-491	I-747	232.11	4534.00	4532.60	0.6000	24	0.015	0.00	0.41	0.00	0.00	0.00	0.00	0.00	Calculated
660	733	Pipe	HDPE	I-491	I-492	44.19	4532.50	4531.40	2.4900	24	0.015	5.63	30.93	0.18	4.50	0.86	0.43	0.00	Calculated
661	734	Pipe	HDPE	I-492	M-286	127.47	4531.30	4530.80	0.3900	24	0.015	5.59	12.28	0.45	2.74	1.25	0.63	0.00	Calculated
662	735	Pipe	HDPE	M-286	I-493	202.67	4530.70	4530.60	0.0500	24	0.015	5.57	4.36	1.28	2.63	1.28	0.64	0.00	> CAPACITY
663	736	Pipe	HDPE	I-493	I-494	26.62	4530.60	4530.50	0.3800	24	0.015	5.57	12.02	0.46	3.74	0.96	0.48	0.00	Calculated
664	737	Pipe	RCP	M-298	M-96	363.57	4503.60	4498.20	1.4900	24	0.015	14.35	23.89	0.60	7.54	1.17	0.60	0.00	Calculated
665	738	Pipe	RCP	I-317	I-184	62.83	4496.80	4495.80	1.5900	15	0.015	0.00	7.06	0.00	0.00	0.00	0.00	0.00	Calculated
666	739	Pipe	RCP	I-184	M-94	402.95	4495.50	4491.50	0.9900	15	0.015	0.00	5.58	0.00	0.00	0.00	0.00	0.00	Calculated
667	740	Pipe	RCP	I-185	M-94	37.72	4492.50	4491.60	2.3900	15	0.015	0.00	8.65	0.00	0.00	0.00	0.00	0.00	Calculated
668	741	Pipe	RCP	I-183	M-94	58.24	4491.60	4491.20	0.6900	15	0.015	0.00	2.32	0.00	0.00	0.00	0.00	0.00	Calculated
669	742	Pipe	RCP	I-183	I-182	22.72	4491.20	4491.00	0.8800	15	0.015	0.00	5.25	0.00	0.00	0.00	0.00	0.00	Calculated
670	743	Pipe	RCP	I-182	I-181	376.38	4491.10	4488.00	0.8200	15	0.015	0.00	5.08	0.00	0.00	0.00	0.00	0.00	Calculated
671	744	Pipe	RCP	I-181	M-93	62.64	4487.90	4486.30	2.5500	18	0.015	0.00	14.55	0.00	0.00	0.71	0.47	0.00	Calculated
672	745	Pipe	RCP	M-93	I-452	165.71	4486.40	4486.30	0.0600	18	0.015	3.63	2.24	1.62	2.84	1.02	0.68	0.00	> CAPACITY
673	746	Pipe	RCP	I-452	M-260	28.05	4486.20	4484.80	4.9900	12	0.015	3.63	6.90	0.53	5.46	0.80	0.80	0.00	Calculated
674	747	Pipe	RCP	M-260	M-261	416.24	4484.70	4482.30	0.5800	15	0.015	3.61	4.34	0.83	4.03	0.85	0.68	0.00	Calculated
675	748	Pipe	HDPE	I-453	M-261	28.06	4484.20	4482.70	5.3500	18	0.015	0.00	21.05	0.00	0.00	0.13	0.09	0.00	Calculated
676	749	Pipe	Combined with 750 (18" Ductile Iron) because of unknown junction. Assumed 18" for entire length. HDPE	M-261	O-26	522.95	4482.10	4480.00	0.4000	18	0.015	3.61	5.77	0.63	2.51	1.18	0.79	0.00	Calculated
677	751	Pipe	PVC	I-300	O-27	109.79	4479.50	4478.50	0.9100	18	0.015	1.77	8.69	0.20	4.36	0.43	0.29	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
678	752	Pipe	Combined with 753 and assumed to be 15" for entire length. Needs to be verified.	I-301	O-59	361.41	4476.00	4470.00	1.6600	15	0.015	5.17	7.21	0.72	6.24	0.80	0.64	0.00	Calculated
679	754	Pipe	RCP	M-96	M-95	432.08	4498.10	4491.30	1.5700	24	0.015	14.27	24.60	0.58	5.89	1.65	0.84	0.00	Calculated
680	755	Pipe	RCP	I-192	M-95	36.53	4492.80	4490.60	6.0200	18	0.015	11.87	22.34	0.53	6.72	1.50	1.00	56.00	SURCHARGED
681	756	Pipe	RCP	M-95	M-259	269.81	4490.50	4483.50	2.5900	18	0.015	11.43	14.66	0.78	6.47	1.50	1.00	69.00	SURCHARGED
682	757	Pipe	RCP	I-501	I-500	25.19	4491.50	4490.80	2.7800	15	0.015	0.92	9.33	0.10	0.93	1.20	0.97	0.00	Calculated
683	758	Pipe	RCP	I-500	DET_C10	100.98	4490.70	4485.80	4.8500	15	0.015	4.27	12.33	0.35	5.94	1.25	1.00	57.00	SURCHARGED
684	760	Pipe	RCP	I-499	I-500	110.67	4491.00	4490.80	0.1800	15	0.015	4.48	3.24	1.39	4.06	1.25	1.00	46.00	SURCHARGED
685	761	Pipe	RCP	I-498	I-499	70.52	4492.60	4491.20	1.9900	15	0.015	4.48	7.89	0.57	4.18	1.25	1.00	5.00	SURCHARGED
686	762	Pipe	RCP	I-498	I-497	64.66	4493.10	4492.60	0.7700	15	0.015	4.50	1.56	2.89	4.07	1.09	0.88	0.00	> CAPACITY
687	763	Pipe	RCP	I-503	I-502	25.63	4496.40	4496.10	1.1700	15	0.015	0.00	6.06	0.00	0.00	0.00	0.00	0.00	Calculated
688	764	Pipe	RCP	I-502	I-497	199.50	4496.00	4493.10	1.4500	15	0.015	0.00	6.75	0.00	0.00	0.63	0.50	0.00	Calculated
689	765	Pipe	RCP	M-259	M-258	614.45	4483.40	4476.80	1.0700	18	0.015	12.50	9.44	1.32	7.07	1.50	1.00	74.00	SURCHARGED
690	766	Pipe	RCP	M-553	M-552	22.46	4478.60	4477.40	5.3400	15	0.015	0.80	12.94	0.06	0.91	1.25	1.00	15.00	SURCHARGED
691	767	Pipe	RCP	M-552	M-258	215.52	4477.30	4476.60	0.3200	15	0.015	0.54	3.19	0.17	0.44	1.25	1.00	73.00	SURCHARGED
692	769	Pipe	RCP	M-258	M-257	463.64	4476.70	4475.65	0.2300	24	0.015	12.50	9.33	1.34	3.98	2.00	1.00	57.00	SURCHARGED
693	770	Pipe	RCP	M-257	I-745	72.09	4475.65	4475.50	0.2100	24	0.015	12.52	8.94	1.40	4.22	1.84	0.92	0.00	> CAPACITY
694	771	Pipe	RCP	M-180	M-257	77.47	4477.00	4476.80	0.2600	15	0.015	0.20	2.84	0.07	0.63	0.85	0.68	0.00	Calculated
695	772	Pipe	RCP	I-327	M-180	34.52	4477.60	4477.00	1.7400	12	0.015	0.04	4.14	0.01	0.17	0.44	0.45	0.00	Calculated
696	775	Pipe	RCP	I-744	I-745	35.53	4476.80	4475.60	3.3800	18	0.015	0.08	17.01	0.00	0.11	0.92	0.61	0.00	Calculated
697	776	Pipe	RCP	I-745	M-420	316.23	4475.50	4473.30	0.7000	24	0.015	14.75	16.35	0.90	5.72	1.53	0.77	0.00	Calculated
698	777	Pipe	RCP	I-746	M-420	34.60	4474.80	4473.40	4.0500	15	0.015	0.00	11.26	0.00	0.00	0.52	0.41	0.00	Calculated
699	778	Pipe	RCP	I-743	I-742	24.39	4473.40	4473.00	1.6400	15	0.015	0.19	7.17	0.03	0.49	1.14	0.92	0.00	Calculated
700	779	Pipe	RCP	I-742	M-420	32.71	4474.00	4473.80	0.6100	15	0.015	0.35	4.38	0.08	1.10	0.53	0.43	0.00	Calculated
701	780	Pipe	RCP	M-420	O-37	170.06	4473.30	4469.60	2.1800	24	0.015	14.75	28.92	0.51	8.60	1.07	0.54	0.00	Calculated
702	781	Pipe	RCP	I-496	I-495	25.61	4489.70	4488.70	3.9000	15	0.015	0.00	11.06	0.00	0.00	0.26	0.21	0.00	Calculated
703	782	Pipe	RCP	I-495	I-506	112.52	4488.80	4486.60	1.9600	15	0.015	1.93	7.83	0.25	4.15	0.50	0.40	0.00	Calculated
704	783	Pipe	RCP	I-506	M-287	251.47	4486.70	4483.30	1.3500	15	0.015	1.93	6.51	0.30	4.62	0.47	0.37	0.00	Calculated
705	784	Pipe	RCP	M-287	I-504	85.86	4483.40	4479.90	4.0800	15	0.015	1.93	11.30	0.17	2.74	0.80	0.64	0.00	Calculated
706	785	Pipe	RCP	I-505	I-504	26.08	4481.50	4480.00	5.7500	15	0.015	0.00	13.43	0.00	0.00	0.59	0.48	0.00	Calculated
707	786	Pipe	RCP	I-504	O-43	133.84	4479.90	4479.75	0.1100	15	0.015	2.02	1.87	1.08	1.71	1.18	1.00	5.00	SURCHARGED
708	787	Pipe	RCP	I-210	I-211	24.44	4578.50	4576.70	7.3600	12	0.015	0.00	8.47	0.00	0.00	0.00	0.00	0.00	Calculated
709	788	Pipe	RCP	I-213	I-211	265.82	4576.60	4576.40	0.0800	15	0.015	0.00	0.11	0.00	0.00	0.00	0.00	0.00	Calculated
710	789	Pipe	RCP	I-213	M-113	174.16	4576.40	4574.40	1.1500	15	0.015	0.00	6.00	0.00	0.00	0.00	0.00	0.00	Calculated
711	790	Pipe	RCP	M-113	M-114	77.15	4574.40	4573.10	1.6900	15	0.015	0.00	7.27	0.00	0.00	0.00	0.00	0.00	Calculated
712	791	Pipe	RCP	I-212	M-114	181.88	4573.00	4570.80	1.2100	15	0.015	0.00	0.13	0.00	0.00	0.00	0.00	0.00	Calculated
713	792	Pipe	RCP	I-206	I-212	84.34	4570.80	4569.80	1.1900	15	0.015	0.00	1.36	0.00	0.00	0.00	0.00	0.00	Calculated
714	793	Pipe	RCP	I-206	I-207	258.86	4569.80	4565.80	1.5500	18	0.015	0.00	11.32	0.00	0.00	0.00	0.00	0.00	Calculated
715	794	Pipe	RCP	I-207	M-112	169.00	4565.70	4563.70	1.1800	18	0.015	0.00	9.90	0.00	0.00	0.00	0.00	0.00	Calculated
716	795	Pipe	RCP	I-208	I-209	25.45	4564.50	4563.60	3.5400	18	0.015	0.00	17.12	0.00	0.00	0.00	0.00	0.00	Calculated
717	796	Pipe	RCP	M-112	I-209	92.19	4563.70	4563.60	0.1100	18	0.015	0.00	3.00	0.00	0.00	0.00	0.00	0.00	Calculated
718	797	Pipe	RCP	I-209	M-115	291.04	4563.60	4561.80	0.6200	24	0.015	0.00	15.42	0.00	0.00	0.81	0.41	0.00	Calculated
719	798	Pipe	RCP	I-214	I-322	89.45	4579.60	4577.00	2.9100	15	0.015	0.00	9.54	0.00	0.00	0.00	0.00	0.00	Calculated
720	799	Pipe	RCP	I-322	I-323	26.83	4576.90	4576.30	2.2400	15	0.015	0.00	8.37	0.00	0.00	0.00	0.00	0.00	Calculated
721	800	Pipe	RCP	M-177	I-323	277.17	4576.20	4568.90	2.6300	18	0.015	0.00	0.17	0.00	0.00	0.00	0.00	0.00	Calculated
722	801	Pipe	RCP	M-177	I-325	139.91	4568.90	4565.80	2.2200	15	0.015	0.00	8.33	0.00	0.00	0.00	0.00	0.00	Calculated
723	802	Pipe	RCP	I-325	I-324	22.75	4565.80	4565.30	2.2000	15	0.015	0.00	8.30	0.00	0.00	0.00	0.00	0.00	Calculated
724	803	Pipe	RCP	I-324	M-115	147.38	4565.60	4561.80	2.5800	15	0.015	0.00	8.99	0.00	0.00	0.63	0.50	0.00	Calculated
725	804	Pipe	RCP	M-115	M-116	125.18	4561.80	4561.70	0.0800	24	0.015	5.82	5.54	1.05	2.44	1.57	0.79	0.00	> CAPACITY
726	805	Pipe	RCP	M-116	I-215	110.41	4561.60	4561.50	0.0900	24	0.015	5.75	5.90	0.98	2.57	1.59	0.80	0.00	Calculated
727	806	Pipe	RCP	I-215	I-216	21.60	4561.40	4561.35	0.2300	24	0.015	5.70	9.43	0.60	2.69	1.64	0.83	0.00	Calculated
728	807	Pipe	RCP	I-216	DET_71	45.73	4561.30	4561.20	0.2200	30	0.015	5.71	16.62	0.34	2.33	1.69	0.68	0.00	Calculated
729	809	Pipe	RCP	I-221	I-220	25.29	4562.50	4560.60	7.5100	15	0.015	0.00	15.35	0.00	0.00	0.63	0.50	0.00	Calculated
730	810	Pipe	RCP	I-220	M-117	169.49	4560.60	4560.30	0.1800	18	0.015	5.61	3.83	1.46	3.52	1.32	0.89	0.00	> CAPACITY
731	811	Pipe	RCP	M-117	I-219	146.73	4560.30	4558.60	1.1600	18	0.015	5.65	9.80	0.58	3.54	1.32	0.89	0.00	Calculated
732	812	Pipe	RCP	I-218	I-219	23.88	4559.50	4558.60	3.7700	15	0.015	0.13	10.87	0.01	0.15	1.25	1.00	12.00	SURCHARGED
733	813	Pipe	RCP	I-219	M-118	28.23	4558.50	4558.40	0.3500	18	0.015	5.65	5.42	1.04	3.20	1.50	1.00	36.00	SURCHARGED
734	814	Pipe	RCP	M-118	M-119	72.36	4558.40	4558.30	0.1400	24	0.015	8.95	7.29	1.23	2.85	2.00	1.00	9.00	SURCHARGED
735	815	Pipe	RCP	M-119	M-120	286.78	4558.20	4558.10	0.0300	24	0.015	8.96	3.66	2.45	3.02	1.78	0.89	0.00	> CAPACITY
736	816	Pipe	RCP	I-222	M-120	18.32	4559.20	4558.10	6.0000	18	0.015	0.04	22.31	0.00	0.06	0.98	0.66	0.00	Calculated
737	817	Pipe	RCP	M-120	M-294	106.55	4558.00	4557.90	0.0900	24	0.015	8.88	6.01	1.48	3.87	1.36	0.69	0.00	> CAPACITY

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
738	818	Pipe	RCP	M-294	M-296	80.32	4557.70	4555.60	2.6100	24	0.015	11.43	32.00	0.36	4.83	1.42	0.71	0.00	Calculated
739	819	Pipe	N	I-231	I-230	35.16	4560.50	4558.60	5.4000	24	0.015	0.00	45.58	0.00	0.00	0.29	0.14	0.00	Calculated
740	820	Pipe	RCP	I-230	M-295	23.22	4558.60	4558.20	1.7200	24	0.015	2.84	25.73	0.11	3.37	0.63	0.32	0.00	Calculated
741	821	Pipe	RCP	M-295	M-294	95.45	4558.10	4557.80	0.3100	24	0.015	2.84	11.70	0.24	2.97	0.74	0.37	0.00	Calculated
742	822	Pipe	RCP	M-296	M-297	63.47	4555.50	4555.40	0.1600	24	0.015	11.43	7.78	1.47	3.66	1.98	1.00	0.00	> CAPACITY
743	823	Pipe	RCP	M-297	M-124	527.47	4555.40	4553.90	0.2800	24	0.015	11.11	10.46	1.06	4.15	1.57	0.80	0.00	> CAPACITY
744	824	Pipe	RCP	O-19	M-124	10.74	4552.90	4552.50	3.7200	24	0.015	11.11	1.89	5.87	4.52	1.45	0.73	0.00	> CAPACITY
745	825	Pipe	HDPE	I-944	I-945	33.93	4487.10	4486.30	2.3600	15	0.015	0.02	6.08	0.00	0.12	0.63	0.51	0.00	Calculated
746	826	Pipe	HDPE	I-945	O-81	264.77	4486.20	4483.00	1.2100	15	0.015	4.78	6.62	0.72	5.69	0.81	0.65	0.00	Calculated
747	827	Pipe	HDPE	I-946	I-947	27.49	4480.00	4479.40	2.1800	15	0.015	0.00	8.27	0.00	0.00	0.00	0.00	0.00	Calculated
748	828	Pipe	HDPE	I-947	O-82	97.30	4479.50	4479.00	0.5100	15	0.015	0.00	4.01	0.00	0.00	0.00	0.00	0.00	Calculated
749	831	Pipe	RCP-HDPE	I-954	I-953	337.86	4479.70	4479.60	0.0300	15	0.015	0.05	0.96	0.05	0.41	0.21	0.17	0.00	Calculated
750	832	Pipe	HDPE	I-953	I-951	97.86	4479.50	4479.10	0.4100	15	0.015	0.14	3.58	0.04	0.76	0.59	0.48	0.00	Calculated
751	834	Pipe	RCP	I-951	M-551	214.02	4479.00	4476.80	1.0300	15	0.015	0.29	5.73	0.05	0.78	1.05	0.84	0.00	Calculated
752	835	Pipe	RCP	M-551	I-950	200.13	4476.70	4475.90	0.4000	15	0.015	0.87	3.63	0.24	0.79	1.25	1.00	47.00	SURCHARGED
753	836	Pipe	RCP	I-950	M-550	150.73	4475.80	4475.30	0.3300	15	0.015	5.46	3.22	1.69	4.45	1.25	1.00	60.00	SURCHARGED
754	837	Pipe	RCP	M-550	O-83	300.46	4474.60	4474.00	0.2000	15	0.015	5.46	2.50	2.18	4.78	1.10	0.88	0.00	> CAPACITY
755	841	Pipe	HDPE	I-939	New-21	216.88	4477.45	4476.20	0.5800	15	0.015	0.00	4.25	0.00	0.00	0.18	0.14	0.00	Calculated
756	842	Pipe	RCP	New-21	M-549	81.78	4476.20	4475.30	1.1000	18	0.015	0.14	9.55	0.02	0.24	0.81	0.54	0.00	Calculated
757	843	Pipe	HDPE	I-938	I-937	68.34	4477.10	4477.00	0.1500	15	0.015	0.40	2.14	0.19	0.33	1.25	1.00	47.00	SURCHARGED
758	844	Pipe	HDPE	I-937	M-549	127.57	4476.90	4475.50	1.1000	15	0.015	7.85	5.86	1.34	6.55	1.18	0.94	0.00	> CAPACITY
759	845	Pipe	RCP	M-549	O-84	66.75	4475.30	4472.00	4.9400	18	0.015	15.03	20.24	0.74	10.71	1.11	0.74	0.00	Calculated
760	846	Pipe	HDPE	I-943	I-942	37.04	4486.00	4486.80	-2.1600	15	0.015	0.00	4.11	0.00	0.00	0.00	0.00	0.00	Calculated
761	847	Pipe	HDPE	I-942	I-940	436.69	4486.80	4478.50	1.9000	15	0.015	0.00	7.72	0.00	0.00	0.00	0.00	0.00	Calculated
762	848	Pipe	HDPE	I-939	I-940	103.63	4478.40	4478.60	-0.1900	15	0.015	0.00	2.46	0.00	0.00	0.00	0.00	0.00	Calculated
763	849	Pipe	HDPE	I-941	I-940	29.56	4479.00	4478.50	1.6900	15	0.015	0.00	7.28	0.00	0.00	0.00	0.00	0.00	Calculated
764	850	Pipe	RCP	I-1220	M-672	62.08	4586.60	4585.70	1.4500	21	0.015	0.00	16.53	0.00	0.00	0.00	0.00	0.00	Calculated
765	851	Pipe	RCP	M-672	M-705	22.00	4585.20	4585.10	0.4500	21	0.015	0.00	9.26	0.00	0.00	0.00	0.00	0.00	Calculated
766	852	Pipe	RCP	M-705	M-706	120.48	4584.90	4582.10	2.3200	15	0.015	0.00	8.61	0.00	0.00	0.00	0.00	0.00	Calculated
767	853	Pipe	RCP	M-706	M-707	96.60	4582.00	4579.50	2.5900	15	0.015	0.00	9.01	0.00	0.00	0.00	0.00	0.00	Calculated
768	854	Pipe	RCP	M-707	O-128	139.06	4579.50	4561.40	13.0200	21	0.015	0.00	49.54	0.00	0.00	0.08	0.05	0.00	Calculated
769	857	Pipe	RCP	O-129	M-402	759.66	4555.00	4554.30	0.0900	42	0.015	31.31	26.47	1.18	4.15	3.43	0.99	0.00	> CAPACITY
770	858	Pipe	HDPE	I-597	M-708	58.34	4695.50	4692.10	5.8300	24	0.015	5.36	47.33	0.11	7.75	0.55	0.28	0.00	Calculated
771	859	Pipe	HDPE	I-1216	M-708	12.79	4695.50	4694.80	5.4700	15	0.015	0.00	13.10	0.00	0.00	0.00	0.00	0.00	Calculated
772	860	Pipe	RCP	I-406	M-708	75.10	4700.70	4692.10	11.4500	15	0.015	0.00	18.95	0.00	0.00	0.31	0.25	0.00	Calculated
773	861	Pipe	RCP	M-708	M-158	190.49	4692.00	4680.90	5.8300	24	0.015	11.65	47.33	0.25	11.90	0.70	0.35	0.00	Calculated
774	862	Pipe	RCP	M-391	I-763	12.81	4652.50	4650.60	14.8300	18	0.015	0.00	8.04	0.00	0.00	0.00	0.00	0.00	Calculated
775	863	Pipe	RCP	I-957	I-956	341.56	4465.10	4462.90	0.6400	15	0.015	0.00	4.49	0.00	0.00	0.35	0.28	0.00	Calculated
776	864	Pipe	RCP	I-956	I-958	112.24	4462.80	4462.60	0.1800	15	0.015	1.60	2.36	0.68	2.19	0.72	0.58	0.00	Calculated
777	865	Pipe	RCP	I-958	O-85	142.25	4462.50	4462.30	0.1400	18	0.015	1.60	3.41	0.47	2.34	0.62	0.41	0.00	Calculated
778	867	Pipe	RCP	M-42	DET_4	254.70	4534.40	4529.13	2.0700	30	0.015	36.78	51.13	0.72	7.49	2.50	1.00	90.00	SURCHARGED
779	869	Pipe	RCP	I-149	I-148	37.53	4486.40	4486.30	0.2700	15	0.015	0.00	2.89	0.00	0.00	0.00	0.00	0.00	Calculated
780	870	Pipe	RCP	I-148	M-374	39.50	4486.20	4486.00	0.5100	15	0.015	0.00	3.98	0.00	0.00	0.00	0.00	0.00	Calculated
781	871	Pipe	RCP	M-72	M-376	272.67	4482.40	4481.50	0.3300	15	0.015	3.16	3.22	0.98	2.57	1.25	1.00	29.00	SURCHARGED
782	872	Pipe	RCP	M-374	M-375	35.22	4485.90	4485.50	1.1400	18	0.015	0.00	9.70	0.00	0.00	0.00	0.00	0.00	Calculated
783	873	Pipe	RCP	M-375	M-371	4.27	4486.20	4486.00	4.6800	18	0.015	0.00	19.70	0.00	0.00	0.00	0.00	0.00	Calculated
784	876	Pipe	RCP	I-1102	I-1104	69.19	4470.50	4465.00	7.9500	15	0.015	0.00	15.78	0.00	0.00	0.00	0.00	0.00	Calculated
785	877	Pipe	RCP	I-1104	O-96	33.64	4464.80	4464.00	2.3800	15	0.015	0.00	8.63	0.00	0.00	0.00	0.00	0.00	Calculated
786	878	Pipe	RCP	I-1106	I-1105	30.16	4468.60	4467.20	4.6400	15	0.015	0.00	12.06	0.00	0.00	0.00	0.00	0.00	Calculated
787	879	Pipe	RCP	I-1105	M-620	29.92	4467.10	4467.50	-1.3400	15	0.015	0.00	6.47	0.00	0.00	0.00	0.00	0.00	Calculated
788	880	Pipe	RCP	M-620	M-621	131.86	4467.40	4466.50	0.6800	15	0.015	0.00	4.63	0.00	0.00	0.00	0.00	0.00	Calculated
789	881	Pipe	RCP	M-621	M-622	55.25	4466.40	4466.00	0.7200	15	0.015	0.00	4.76	0.00	0.00	0.00	0.00	0.00	Calculated
790	882	Pipe	RCP	M-622	I-1107	80.21	4465.90	4465.80	0.1200	15	0.015	0.00	1.98	0.00	0.00	0.00	0.00	0.00	Calculated
791	883	Pipe	RCP	I-1107	M-623	34.39	4465.70	4465.60	0.2900	15	0.015	0.00	3.02	0.00	0.00	0.00	0.00	0.00	Calculated
792	884	Pipe	RCP	I-1109	I-1108	26.14	4467.70	4467.20	1.9100	15	0.015	0.00	7.74	0.00	0.00	0.00	0.00	0.00	Calculated
793	885	Pipe	RCP	I-1108	M-623	102.74	4467.10	4465.60	1.4600	15	0.015	0.00	6.76	0.00	0.00	0.00	0.00	0.00	Calculated
794	886	Pipe	RCP	M-623	M-624	128.10	4465.40	4464.90	0.3900	15	0.015	0.00	3.50	0.00	0.00	0.15	0.15	0.00	Calculated
795	887	Pipe	RCP	M-624	M-625	103.00	4464.80	4463.70	1.0700	15	0.015	0.39	5.79	0.07	0.55	0.83	0.69	0.00	Calculated
796	888	Pipe	RCP	I-1110	M-625	58.02	4464.50	4463.70	1.3800	15	0.015	0.26	6.61	0.04	0.41	0.97	0.81	0.00	Calculated
797	889	Pipe	RCP	M-625	I-1112	44.85	4463.60	4463.50	0.2200	15	0.015	0.68	2.64	0.26	0.75	1.25	1.00	10.00	SURCHARGED
798	890	Pipe	RCP	I-1111	I-1112	22.38	4463.60	4463.50	0.4500	15	0.015	0.21	3.74	0.06	0.56	1.25	1.00	10.00	SURCHARGED
799	891	Pipe	RCP	I-1112	M-626	203.65	4463.50	4462.90	0.2900	15	0.015	1.13	3.04	0.37	1.04	1.25	1.00	11.00	SURCHARGED

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
800	892	Pipe	RCP	M-626	I-1113	110.42	4462.80	4461.80	0.9100	15	0.015	7.10	5.22	1.36	6.25	1.09	0.87	0.00	> CAPACITY
801	894	Pipe	RCP	I-1114	I-1113	34.08	4461.90	4461.50	1.1700	15	0.015	0.05	2.35	0.02	0.43	0.89	0.72	0.00	Calculated
802	895	Pipe	RCP	I-1113	O-97	68.63	4462.00	4457.50	6.5600	15	0.015	7.10	14.34	0.49	11.84	0.61	0.49	0.00	Calculated
803	896	Pipe	RCP	M-627	O-98	54.34	4460.20	4457.00	5.8900	15	0.015	4.96	13.59	0.37	9.22	0.56	0.45	0.00	Calculated
804	897	Pipe	RCP	I-1117	I-1116	34.97	4461.90	4461.40	1.4300	15	0.015	0.01	6.69	0.00	0.06	0.78	0.63	0.00	Calculated
805	898	Pipe	RCP	I-1116	M-627	217.87	4461.30	4460.30	0.4600	18	0.015	4.96	6.17	0.80	3.99	0.99	0.66	0.00	Calculated
806	899	Pipe	RCP	M-628	I-1116	87.15	4461.50	4461.40	0.1100	18	0.015	1.56	3.08	0.50	1.42	1.01	0.67	0.00	Calculated
807	900	Pipe	RCP	I-1118	M-628	110.22	4462.50	4461.60	0.8200	18	0.015	1.54	8.23	0.19	2.27	0.66	0.44	0.00	Calculated
808	901	Pipe	RCP	I-1081	I-1080	19.02	4461.50	4460.40	5.7800	15	0.015	0.00	13.46	0.00	0.00	0.00	0.00	0.00	Calculated
809	902	Pipe	RCP	I-1080	M-614	235.31	4460.50	4459.30	0.5100	15	0.015	0.00	4.00	0.00	0.00	0.00	0.00	0.00	Calculated
810	903	Pipe	RCP	M-614	O-100	60.09	4459.20	4459.00	0.3300	15	0.015	0.00	3.23	0.00	0.00	0.00	0.00	0.00	Calculated
811	904	Pipe	RCP	I-1120	I-1119	23.48	4460.90	4460.60	1.2800	15	0.015	0.00	6.64	0.00	0.00	0.00	0.00	0.00	Calculated
812	905	Pipe	RCP	I-1119	O-99	63.34	4460.70	4455.50	8.2100	15	0.015	0.00	16.04	0.00	0.00	0.00	0.00	0.00	Calculated
813	906	Pipe	RCP	I-1083	I-1082	20.82	4456.90	4456.40	2.4000	15	0.015	0.00	8.68	0.00	0.00	0.00	0.00	0.00	Calculated
814	907	Pipe	RCP	I-1082	O-102	69.92	4456.50	4455.30	1.7200	15	0.015	0.00	7.33	0.00	0.00	0.00	0.00	0.00	Calculated
815	908	Pipe	RCP	I-1123	I-1122	20.48	4459.00	4458.20	3.9100	15	0.015	0.00	11.06	0.00	0.00	0.00	0.00	0.00	Calculated
816	909	Pipe	RCP	I-1122	O-101	73.97	4458.00	4453.00	6.7600	15	0.015	0.00	14.56	0.00	0.00	0.00	0.00	0.00	Calculated
817	911	Pipe	HDPE	I-1078	I-1079	22.03	4455.70	4454.80	4.0900	15	0.015	0.00	11.32	0.00	0.00	0.00	0.00	0.00	Calculated
818	912	Pipe	HDPE	I-1079	I-1077	176.36	4454.70	4454.00	0.4000	15	0.015	0.00	3.53	0.00	0.00	0.00	0.00	0.00	Calculated
819	913	Pipe	HDEP	I-1077	O-103	75.42	4453.10	4453.00	0.1300	15	0.015	0.00	10.98	0.00	0.00	0.00	0.00	0.00	Calculated
820	914	Pipe	RCP	I-968	I-969	101.58	4459.70	4459.10	0.5900	15	0.015	0.01	4.30	0.00	0.06	0.64	0.51	0.00	Calculated
821	915	Pipe	RCP	I-969	I-971	290.20	4459.00	4458.30	0.2400	15	0.015	2.46	2.75	0.90	2.83	0.83	0.67	0.00	Calculated
822	916	Pipe	RCP	I-970	I-971	35.64	4459.70	4458.40	3.6500	15	0.015	0.00	10.69	0.00	0.00	0.27	0.21	0.00	Calculated
823	917	Pipe	RCP	I-971	M-556	150.38	4458.20	4456.10	1.4000	18	0.015	2.46	10.76	0.23	1.75	1.11	0.74	0.00	Calculated
824	918	Pipe	RCP	I-972	I-973	24.28	4460.50	4459.80	2.8800	15	0.015	0.00	9.51	0.00	0.00	0.00	0.00	0.00	Calculated
825	919	Pipe	RCP	I-973	M-556	374.50	4459.70	4456.20	0.9300	15	0.015	0.01	5.41	0.00	0.01	0.63	0.50	0.00	Calculated
826	920	Pipe	RCP	M-556	I-975	186.53	4456.00	4455.90	0.0500	18	0.015	2.46	2.11	1.17	1.39	1.50	1.00	136.00	SURCHARGED
827	921	Pipe	RCP	I-975	I-974	35.90	4457.80	4455.80	5.5700	18	0.015	2.46	4.80	0.51	2.86	0.75	0.50	0.00	Calculated
828	922	Pipe	RCP	I-974	M-557	154.43	4457.70	4455.50	1.4200	21	0.015	4.52	16.39	0.28	5.55	0.65	0.37	0.00	Calculated
829	923	Pipe	RCP	M-557	M-558	165.90	4455.40	4453.70	1.0200	21	0.015	4.52	13.90	0.32	4.06	0.83	0.48	0.00	Calculated
830	924	Pipe	RCP	M-558	I-981	12.63	4453.60	4453.50	0.7900	18	0.015	4.52	8.10	0.56	3.95	0.97	0.64	0.00	Calculated
831	925	Pipe	RCP	I-981	M-559	18.05	4453.50	4453.40	0.5500	18	0.015	3.08	6.78	0.45	3.42	0.76	0.51	0.00	Calculated
832	926	Pipe	RCP	I-981	M-560	89.49	4453.40	4452.80	0.6700	15	0.015	2.45	4.58	0.54	3.15	1.10	0.88	0.00	Calculated
833	927	Pipe	RCP	M-560	M-561	400.83	4453.00	4448.90	1.0200	15	0.015	2.68	5.66	0.47	2.79	1.25	1.00	19.00	SURCHARGED
834	928	Pipe	RCP	M-561	I-982	505.87	4448.80	4446.50	0.4500	15	0.015	5.32	3.77	1.41	4.33	1.25	1.00	100.00	SURCHARGED
835	929	Pipe	RCP	I-982	M-562	18.99	4446.40	4445.50	4.7400	18	0.015	5.32	19.82	0.27	5.03	1.50	1.00	102.00	SURCHARGED
836	930	Pipe	RCP	I-998	I-999	31.15	4447.60	4447.50	0.3200	15	0.015	0.37	3.17	0.12	0.30	1.25	1.00	97.00	SURCHARGED
837	931	Pipe	RCP	I-999	M-562	250.33	4447.40	4446.40	0.4000	15	0.015	4.72	3.54	1.34	4.19	1.25	1.00	87.00	SURCHARGED
838	932	Pipe	RCP	M-562	M-563	458.68	4445.40	4442.90	0.5500	18	0.015	7.54	6.72	1.12	4.27	1.50	1.00	116.00	SURCHARGED
839	933	Pipe	RCP	M-563	I-983	167.44	4442.80	4442.50	0.1800	18	0.015	7.54	3.85	1.96	4.27	1.50	1.00	120.00	SURCHARGED
840	934	Pipe	RCP	I-984	I-983	41.22	4443.00	4442.60	0.9700	15	0.015	0.40	5.52	0.07	0.34	1.25	1.00	105.00	SURCHARGED
841	935	Pipe	RCP	I-983	M-564	144.77	4442.40	4442.00	0.2800	18	0.015	7.54	4.79	1.58	4.28	1.50	1.00	55.00	SURCHARGED
842	936	Pipe	RCP	I-991	M-564	178.50	4442.60	4442.20	0.2200	21	0.015	2.13	6.50	0.33	1.74	1.56	0.90	0.00	Calculated
843	937	Pipe	RCP	M-564	I-985	76.67	4441.90	4441.80	0.1300	18	0.015	7.34	3.29	2.23	4.17	1.48	0.99	0.00	> CAPACITY
844	938	Pipe	RCP	I-985	I-986	76.75	4441.70	4441.60	0.1300	24	0.015	7.32	7.08	1.03	2.99	1.46	0.73	0.00	> CAPACITY
845	939	Pipe	RCP	I-987	I-986	43.09	4442.90	4442.10	1.8600	15	0.015	0.03	7.63	0.00	0.06	0.45	0.37	0.00	Calculated
846	940	Pipe	RCP	I-986	M-565	221.08	4441.50	4441.00	0.2300	24	0.015	7.25	9.32	0.78	3.39	1.41	0.71	0.00	Calculated
847	941	Pipe	RCP	M-565	I-888	204.15	4440.40	4440.00	0.2000	24	0.015	7.23	8.68	0.83	2.31	1.99	0.99	0.00	Calculated
848	942	Pipe	RCP	I-889	I-888	48.67	4440.90	4439.90	2.0500	15	0.015	0.09	7.61	0.01	0.09	1.19	0.95	0.00	Calculated
849	943	Pipe	RCP	I-887	M-517	34.48	4440.90	4440.50	1.1600	15	0.015	0.00	6.03	0.00	0.00	0.00	0.00	0.00	Calculated
850	944	Pipe	RCP	I-886	M-517	11.63	4441.80	4440.50	11.1800	15	0.015	0.00	18.79	0.00	0.00	0.00	0.00	0.00	Calculated
851	945	Pipe	RCP	M-517	M-519	62.32	4440.40	4440.30	0.1600	15	0.015	0.00	2.56	0.00	0.00	0.00	0.00	0.00	Calculated
852	947	Pipe	RCP	I-888	O-87	32.22	4440.00	4439.90	0.3100	24	0.015	7.23	10.92	0.66	2.30	2.00	1.00	22.00	SURCHARGED
853	950	Pipe	RCP	I-890	M-520	8.15	4441.50	4440.60	11.0400	15	0.015	0.00	18.60	0.00	0.00	0.19	0.15	0.00	Calculated
854	951	Pipe	RCP	M-520	M-521	21.75	4440.10	4440.00	0.4600	24	0.015	0.05	13.29	0.00	0.24	0.94	0.47	0.00	Calculated
855	952	Pipe	RCP	I-988	M-521	30.49	4440.10	4439.90	0.6600	24	0.015	3.52	15.88	0.22	2.19	1.03	0.52	0.00	Calculated
856	953	Pipe	RCP	I-894	I-893	47.85	4441.10	4438.00	6.4800	15	0.015	0.00	7.68	0.00	0.00	0.37	0.30	0.00	Calculated
857	954	Pipe	RCP	M-521	M-522	141.82	4439.90	4439.80	0.0700	24	0.015	3.51	5.21	0.67	2.67	0.96	0.48	0.00	Calculated
858	955	Pipe	RCP	I-891	M-522	7.96	4439.90	4439.80	1.2600	15	0.015	0.01	6.28	0.00	0.17	0.79	0.63	0.00	Calculated
859	957	Pipe	RCP	M-523	I-892	81.23	4440.50	4439.80	0.8600	15	0.015	1.37	5.20	0.26	2.07	0.67	0.53	0.00	Calculated
860	958	Pipe	RCP	I-892	M-522	37.99	4439.80	4439.70	0.2600	15	0.015	1.37	2.87	0.48	1.43	0.91	0.73	0.00	Calculated
861	959	Pipe	RCP	M-522	M-611	116.84	4439.70	4439.10	0.5100	24	0.015	4.87	14.05	0.35	2.68	1.13	0.56	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
862	960	Pipe	RCP	I-989	O-86	22.98	4440.60	4440.00	2.6100	24	0.015	10.51	34.22	0.31	3.62	1.74	0.87	0.00	Calculated
863	961	Pipe	RCP	I-990	I-989	78.00	4440.90	4440.70	0.2600	24	0.015	10.51	9.93	1.06	3.92	1.64	0.82	0.00	> CAPACITY
864	962	Pipe	RCP	I-991	I-990	421.48	4442.00	4441.00	0.2400	24	0.015	10.51	9.55	1.10	3.47	1.84	0.92	0.00	> CAPACITY
865	963	Pipe	RCP	I-992	I-991	81.71	4442.90	4442.10	0.9800	18	0.015	2.50	9.01	0.28	1.51	1.32	0.89	0.00	Calculated
866	964	Pipe	RCP	M-566	I-992	69.13	4443.10	4443.00	0.1400	15	0.015	2.48	2.13	1.17	2.48	1.09	0.89	0.00	> CAPACITY
867	965	Pipe	RCP	I-994	I-993	22.46	4443.70	4443.60	0.4500	15	0.015	0.03	3.74	0.01	0.15	0.96	0.80	0.00	Calculated
868	966	Pipe	RCP	I-993	M-566	186.31	4443.40	4443.10	0.1600	15	0.015	2.47	2.25	1.10	2.08	1.17	0.96	0.00	> CAPACITY
869	967	Pipe	RCP	M-567	I-993	50.61	4444.30	4443.60	1.3800	15	0.015	2.50	6.58	0.38	3.43	0.79	0.65	0.00	Calculated
870	968	Pipe	RCP	M-568	M-567	428.36	4445.80	4444.30	0.3500	15	0.015	2.49	3.31	0.75	3.13	0.77	0.62	0.00	Calculated
871	969	Pipe	RCP	I-1063	M-607	21.73	4448.60	4446.80	8.2800	12	0.015	0.00	8.89	0.00	0.00	0.44	0.44	0.00	Calculated
872	970	Pipe	RCP	I-1062	M-607	6.24	4447.90	4446.80	17.6300	12	0.015	0.00	12.96	0.00	0.00	0.44	0.44	0.00	Calculated
873	971	Pipe	RCP	M-607	M-568	201.82	4446.80	4446.00	0.4000	15	0.015	2.57	3.52	0.73	3.24	0.78	0.63	0.00	Calculated
874	972	Pipe	RCP	I-996	I-995	23.73	4449.60	4447.30	9.6900	15	0.015	0.00	17.43	0.00	0.00	0.00	0.00	0.00	Calculated
875	973	Pipe	RCP	I-995	M-568	59.79	4447.20	4445.90	2.1700	15	0.015	0.00	8.26	0.00	0.00	0.41	0.33	0.00	Calculated
876	976	Pipe	HDPE	I-1058	M-606	169.58	4453.40	4452.70	0.4100	15	0.015	0.42	3.60	0.12	0.61	1.04	0.83	0.00	Calculated
877	977	Pipe	HDPE	M-606	DET_31	104.71	4453.40	4450.53	2.7400	15	0.015	0.78	9.27	0.08	1.00	1.04	0.83	0.00	Calculated
878	978	Pipe	HDPE	I-1000	DET_31	128.03	4455.40	4448.80	5.1600	15	0.015	0.00	10.92	0.00	0.00	0.63	0.50	0.00	Calculated
879	980	Pipe	HDPE turns to RCP somewhere	M-570	I-997	188.69	4450.10	4449.20	0.4800	15	0.015	4.85	3.87	1.25	4.24	1.25	1.00	89.00	SURCHARGED
880	981	Pipe	RCP	I-997	I-999	188.53	4448.90	4447.40	0.8000	15	0.015	4.72	4.99	0.95	3.95	1.25	1.00	94.00	SURCHARGED
881	984	Pipe	RCP	I-1195	I-1196	56.36	4446.40	4442.90	6.2100	15	0.015	0.16	13.95	0.01	0.24	0.77	0.61	0.00	Calculated
882	985	Pipe	RCP	I-1066	I-1196	23.85	4446.90	4443.00	16.3500	15	0.015	0.00	22.64	0.00	0.00	0.63	0.50	0.00	Calculated
883	986	Pipe	RCP	I-1196	M-661	484.13	4442.90	4441.30	0.3300	15	0.015	2.95	3.22	0.92	2.71	1.25	1.00	127.00	SURCHARGED
884	987	Pipe	RCP	M-661	M-662	92.10	4441.20	4440.20	1.0900	15	0.015	2.95	5.83	0.51	2.40	1.25	1.00	136.00	SURCHARGED
885	988	Pipe	RCP	M-662	I-1197	79.49	4440.10	4440.00	0.1300	15	0.015	2.95	1.99	1.48	2.40	1.25	1.00	145.00	SURCHARGED
886	989	Pipe	RCP	I-1197	I-1198	23.90	4440.00	4439.90	0.4200	15	0.015	2.91	3.62	0.80	2.37	1.25	1.00	146.00	SURCHARGED
887	990	Pipe	RCP	I-1198	DET_47	34.96	4440.00	4439.90	0.2900	15	0.015	2.91	2.99	0.97	2.37	1.25	1.00	145.00	SURCHARGED
888	992	Pipe	RCP	M-611	I-1072	311.82	4439.00	4438.80	0.0600	24	0.015	4.87	4.97	0.98	2.69	1.13	0.56	0.00	Calculated
889	993	Pipe	RCP	I-1206	I-1072	39.18	4441.30	4439.90	3.5700	15	0.015	0.00	10.58	0.00	0.00	0.00	0.00	0.00	Calculated
890	994	Pipe	RCP	I-1072	M-663	804.08	4438.70	4435.80	0.3600	30	0.015	6.84	21.35	0.32	2.69	1.30	0.52	0.00	Calculated
891	995	Pipe	RCP	M-663	I-1201	57.35	4435.80	4435.70	0.1700	30	0.015	6.82	14.84	0.46	2.02	1.63	0.65	0.00	Calculated
892	996	Pipe	RCP	I-1201	I-1200	155.01	4435.70	4435.60	0.0600	30	0.015	6.81	9.03	0.75	2.08	1.59	0.64	0.00	Calculated
893	997	Pipe	RCP	I-1068	I-1067	23.20	4443.70	4443.40	1.2900	15	0.015	0.00	6.37	0.00	0.00	0.09	0.07	0.00	Calculated
894	998	Pipe	RCP	I-1067	M-608	211.23	4442.90	4440.30	1.2300	15	0.015	3.27	6.21	0.53	4.75	0.69	0.55	0.00	Calculated
895	999	Pipe	RCP	M-608	M-609	168.60	4440.20	4438.90	0.7700	15	0.015	3.26	4.92	0.66	4.14	0.76	0.61	0.00	Calculated
896	1000	Pipe	RCP	M-609	DET_33	82.80	4438.80	4436.00	3.3800	15	0.015	3.26	10.30	0.32	6.95	0.52	0.42	0.00	Calculated
897	1001	Pipe	RCP	DET_33	I-1070	26.67	4435.90	4435.80	0.3700	18	0.015	0.11	5.57	0.02	1.16	0.69	0.46	0.00	Calculated
898	1002	Pipe	RCP	I-1070	O-90	14.11	4435.70	4435.40	2.1300	18	0.015	0.10	13.27	0.01	0.43	0.99	0.67	0.00	Calculated
899	1003	Pipe	RCP	I-1200	New-20	358.63	4435.50	4435.30	0.0600	30	0.015	7.67	8.39	0.91	2.88	1.33	0.53	0.00	Calculated
900	1004	Pipe	RCP	DET_33	New-20	37.78	4435.75	4435.30	1.1900	15	0.015	3.00	6.11	0.49	3.39	0.89	0.71	0.00	Calculated
901	1005	Pipe	RCP	New-20	M-664	501.78	4435.30	4432.20	0.6200	30	0.015	9.75	27.94	0.35	4.63	1.18	0.47	0.00	Calculated
902	1006	Pipe	RCP	M-664	I-1073	317.62	4432.20	4430.80	0.4400	30	0.015	9.72	23.60	0.41	2.87	1.91	0.76	0.00	Calculated
903	1007	Pipe	RCP	I-1074	M-612	34.79	4435.20	4432.10	8.9100	24	0.015	3.44	58.53	0.06	5.30	0.77	0.38	0.00	Calculated
904	1008	Pipe	RCP	M-612	I-1073	25.43	4432.00	4431.80	0.7900	24	0.015	3.44	17.39	0.20	2.99	1.39	0.69	0.00	Calculated
905	1009	Pipe	RCP	I-1073	I-1207	22.23	4430.70	4430.50	0.9000	30	0.015	13.01	33.72	0.39	3.32	2.50	1.00	51.00	SURCHARGED
906	1010	Pipe	RCP	I-1207	O-123	14.92	4430.50	4430.00	3.3500	30	0.015	13.01	65.08	0.20	2.65	2.50	1.00	62.00	SURCHARGED
907	1011	Pipe	RCP	I-1087	O-92	190.79	4429.90	4428.00	1.0000	36	0.015	13.59	45.65	0.30	6.94	0.96	0.32	0.00	Calculated
908	1012	Pipe	RCP	O-92	O-93	63.83	4428.00	4425.00	4.7000	48	0.015	13.59	300.13	0.05	10.76	0.63	0.16	0.00	Calculated
909	1013	Pipe	RCP	I-1211	I-1084	35.69	4434.10	4434.00	0.2800	15	0.015	0.00	2.96	0.00	0.00	0.00	0.00	0.00	Calculated
910	1014	Pipe	RCP	M-665	I-1211	2.65	4434.00	4432.70	49.0600	15	0.015	0.00	7.69	0.00	0.00	0.00	0.00	0.00	Calculated
911	1015	Pipe	RCP	I-1209	I-1208	29.94	4435.00	4434.50	1.6700	15	0.015	0.00	7.23	0.00	0.00	0.00	0.00	0.00	Calculated
912	1016	Pipe	RCP	I-1208	I-1084	225.06	4434.50	4434.00	0.2200	15	0.015	0.00	2.64	0.00	0.00	0.00	0.00	0.00	Calculated
913	1017	Pipe	RCP	I-1210	I-1209	86.26	4436.10	4435.00	1.2800	15	0.015	0.00	6.49	0.00	0.00	0.00	0.00	0.00	Calculated
914	1018	Pipe	RCP	I-1085	M-615	36.80	4432.90	4430.80	5.7100	15	0.015	0.00	13.50	0.00	0.00	0.00	0.00	0.00	Calculated
915	1019	Pipe	RCP	M-615	M-667	140.13	4430.70	4430.00	0.5000	15	0.015	0.00	3.96	0.00	0.00	0.00	0.00	0.00	Calculated
916	1020	Pipe	RCP	M-667	M-666	39.16	4430.00	4429.20	2.0400	15	0.015	0.00	8.00	0.00	0.00	0.00	0.00	0.00	Calculated
917	1021	Pipe	RCP	I-1212	M-666	11.81	4433.20	4433.00	1.6900	15	0.015	0.00	7.29	0.00	0.00	0.00	0.00	0.00	Calculated
918	1022	Pipe	RCP	M-666	I-1086	26.68	4433.20	4433.00	0.7500	15	0.015	0.00	4.85	0.00	0.00	0.00	0.00	0.00	Calculated
919	1023	Pipe	CP	I-1086	O-91	22.02	4433.00	4432.00	4.5400	18	0.015	0.00	19.40	0.00	0.00	0.00	0.00	0.00	Calculated
920	1024	Pipe	HDPE	I-1088	I-1089	60.58	4428.40	4427.80	0.9900	15	0.015	0.00	5.57	0.00	0.00	0.00	0.00	0.00	Calculated
921	1025	Pipe	HDPE	I-1089	O-94	76.17	4427.60	4426.70	1.1800	15	0.015	0.00	6.09	0.00	0.00	0.00	0.00	0.00	Calculated
922	1027	Pipe	HDPE	I-1213	New-14	71.73	4423.80	4423.70	0.1400	15	0.015	4.79	2.09	2.29	4.50	1.02	0.82	0.00	> CAPACITY
923	1028	Pipe	HDPE	New-14	O-124	222.51	4423.70	4420.00	1.6600	15	0.015	4.79	7.22	0.66	6.06	0.77	0.61	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
924	1029	Pipe	HDPE	I-1091	I-1213	39.51	4424.10	4423.90	0.5100	15	0.015	4.79	3.98	1.20	3.90	1.25	1.00	71.00	SURCHARGED
925	1031	Pipe	HDPE	DET_36	I-1091	52.26	4425.00	4423.90	2.1000	15	0.015	9.55	8.12	1.18	7.78	1.25	1.00	59.00	SURCHARGED
926	1032	Pipe	RCP	M-617	DET_36	190.52	4427.50	4425.10	1.2600	24	0.015	18.41	22.01	0.84	6.26	2.00	1.00	18.00	SURCHARGED
927	1033	Pipe	HDPE	I-1092	M-617	33.67	4427.70	4427.60	0.3000	24	0.015	9.47	10.68	0.89	3.93	2.00	1.00	16.00	SURCHARGED
928	1034	Pipe	HDPE	I-1093	I-1092	36.63	4428.00	4427.80	0.5500	24	0.015	9.47	14.49	0.65	3.49	2.00	1.00	15.00	SURCHARGED
929	1035	Pipe	HDPE	I-1094	I-1095	30.96	4431.40	4430.50	2.9100	12	0.015	0.07	5.26	0.01	0.16	0.64	0.66	0.00	Calculated
930	1036	Pipe	HDPE	I-1095	I-1093	338.71	4430.30	4428.10	0.6500	24	0.015	9.45	15.87	0.60	4.14	1.68	0.85	0.00	Calculated
931	1037	Pipe	HDPE	I-1097	I-1096	21.65	4435.00	4434.20	3.7000	12	0.015	0.01	5.94	0.00	0.02	0.41	0.42	0.00	Calculated
932	1038	Pipe	HDPE	I-1096	I-1095	428.61	4434.00	4430.50	0.8200	24	0.015	8.83	17.72	0.50	5.43	1.09	0.56	0.00	Calculated
933	1039	Pipe	RCP	M-668	O-125	287.59	4421.30	4421.00	0.1000	36	0.015	54.81	18.67	2.94	8.18	2.70	0.90	0.00	> CAPACITY
934	1040	Pipe	RCP	I-1214	M-668	24.50	4430.00	4428.50	6.1200	15	0.015	0.00	13.85	0.00	0.00	0.00	0.00	0.00	Calculated
935	1041	Pipe	RCP	M-618	M-668	190.75	4421.90	4421.60	0.1600	36	0.015	51.85	22.92	2.26	7.34	3.00	1.00	61.00	SURCHARGED
936	1042	Pipe	RCP	I-1101	M-618	144.55	4428.00	4425.40	1.8000	15	0.015	1.65	7.51	0.22	1.61	1.25	1.00	2.00	SURCHARGED
937	1043	Pipe	RCP	I-1100	M-618	7.15	4426.00	4423.90	29.3700	15	0.015	0.92	30.34	0.03	0.84	1.25	1.00	21.00	SURCHARGED
938	1044	Pipe	RCP	I-959	I-960	24.05	4457.50	4457.00	2.0800	15	0.015	0.00	8.07	0.00	0.00	0.00	0.00	0.00	Calculated
939	1045	Pipe	RCP	I-960	I-961	55.99	4456.90	4456.80	0.1800	15	0.015	0.00	2.37	0.00	0.00	0.00	0.00	0.00	Calculated
940	1046	Pipe	RCP	I-961	M-554	266.04	4456.70	4452.90	1.4300	15	0.015	0.00	6.69	0.00	0.00	0.49	0.39	0.00	Calculated
941	1047	Pipe	RCP	I-963	I-962	23.42	4454.60	4453.00	6.8300	15	0.015	0.00	14.63	0.00	0.00	0.44	0.35	0.00	Calculated
942	1048	Pipe	RCP	I-962	M-554	66.28	4452.90	4452.70	0.3000	18	0.015	0.73	5.00	0.15	0.57	1.08	0.72	0.00	Calculated
943	1049	Pipe	RCP	I-966	I-965	179.97	4456.30	4453.40	1.6100	15	0.015	0.00	7.11	0.00	0.00	0.25	0.21	0.00	Calculated
944	1050	Pipe	RCP	I-965	I-962	450.86	4453.30	4453.10	0.0400	18	0.015	0.49	1.92	0.26	0.81	0.69	0.47	0.00	Calculated
945	1051	Pipe	RCP	M-554	M-555	256.33	4452.60	4451.70	0.3500	24	0.015	7.07	11.62	0.61	2.95	1.50	0.75	0.00	Calculated
946	1052	Pipe	RCP	I-964	M-555	30.15	4452.40	4452.30	0.3300	12	0.015	0.06	1.78	0.03	0.58	1.00	1.00	8.00	SURCHARGED
947	1053	Pipe	RCP	M-555	New-13	281.94	4451.60	4451.50	0.0400	24	0.015	6.97	3.69	1.89	2.59	1.63	0.82	0.00	> CAPACITY
948	1054	Pipe	RCP	I-967	New-13	60.67	4452.00	4451.50	0.8200	24	0.015	3.56	17.80	0.20	2.09	1.21	0.61	0.00	Calculated
949	1055	Pipe	RCP	New-13	I-929	125.41	4451.50	4450.80	0.5600	24	0.015	10.50	14.65	0.72	4.85	1.29	0.65	0.00	Calculated
950	1056	Pipe	RCP	I-929	O-80	69.24	4450.70	4448.00	3.9000	24	0.015	10.50	38.72	0.27	9.30	0.77	0.39	0.00	Calculated
951	1057	Pipe	RCP	I-928	I-929	48.44	4451.20	4450.90	0.6200	12	0.015	0.08	2.43	0.03	0.43	0.49	0.49	0.00	Calculated
952	1058	Pipe	RCP	I-904	I-905	28.57	4467.30	4466.80	1.7500	15	0.015	0.00	7.41	0.00	0.00	0.00	0.00	0.00	Calculated
953	1059	Pipe	RCP	I-903	I-905	106.70	4466.90	4466.80	0.0900	15	0.015	0.00	1.71	0.00	0.00	0.00	0.00	0.00	Calculated
954	1060	Pipe	RCP	I-905	O-74	156.90	4466.70	4464.50	1.4000	15	0.015	0.00	11.64	0.00	0.00	0.00	0.00	0.00	Calculated
955	1061	Pipe	RCP	I-906	M-529	183.60	4467.70	4463.00	2.5600	15	0.015	0.00	8.96	0.00	0.00	0.00	0.00	0.00	Calculated
956	1062	Pipe	RCP	I-907	M-529	8.78	4467.50	4462.90	52.3900	15	0.015	0.00	40.52	0.00	0.00	0.00	0.00	0.00	Calculated
957	1063	Pipe	RCP	I-908	M-529	13.63	4467.50	4465.90	11.7400	15	0.015	0.00	19.18	0.00	0.00	0.00	0.00	0.00	Calculated
958	1064	Pipe	RCP	M-529	I-910	269.58	4462.60	4462.50	0.0400	15	0.015	0.00	4.70	0.00	0.00	0.00	0.00	0.00	Calculated
959	1065	Pipe	RCP	I-910	M-530	145.52	4464.50	4462.70	1.2400	15	0.015	0.00	6.23	0.00	0.00	0.00	0.00	0.00	Calculated
960	1066	Pipe	RCP	M-530	M-544	804.99	4462.60	4454.10	1.0600	15	0.015	0.00	5.75	0.00	0.00	0.08	0.07	0.00	Calculated
961	1067	Pipe	RCP	I-932	M-544	112.62	4454.20	4454.00	0.1800	15	0.015	0.03	2.36	0.01	0.30	0.15	0.15	0.00	Calculated
962	1068	Pipe	RCP	M-544	I-931	163.67	4454.00	4452.20	1.1000	15	0.015	0.46	5.87	0.08	0.65	0.76	0.61	0.00	Calculated
963	1069	Pipe	HDPE	I-933	I-934	28.33	4454.80	4454.60	0.7100	15	0.015	0.23	4.70	0.05	0.32	1.25	1.00	157.00	SURCHARGED
964	1070	Pipe	HDPE	I-934	DET_28	118.40	4454.60	4453.00	1.3500	15	0.015	5.20	6.51	0.80	4.24	1.25	1.00	163.00	SURCHARGED
965	1072	Pipe	RCP	M-548	M-547	76.19	4454.40	4453.00	1.8400	24	0.015	0.00	26.58	0.00	0.00	0.00	0.00	0.00	Calculated
966	1073	Pipe	RCP	M-547	M-546	103.25	4453.00	4452.50	0.4800	24	0.015	0.00	13.64	0.00	0.00	0.00	0.00	0.00	Calculated
967	1074	Pipe	RCP	M-546	M-545	95.55	4452.40	4451.90	0.5200	24	0.015	0.00	14.18	0.00	0.00	0.21	0.10	0.00	Calculated
968	1075	Pipe	RCP	M-545	I-936	57.43	4451.80	4451.60	0.3500	24	0.015	1.35	11.57	0.12	2.10	0.52	0.26	0.00	Calculated
969	1077	Pipe	RCP	I-936	I-911	305.93	4451.50	4451.00	0.1600	24	0.015	1.35	7.93	0.17	2.09	0.52	0.26	0.00	Calculated
970	1079	Pipe	RCP	I-911	M-531	64.58	4450.80	4450.10	1.0800	24	0.015	1.35	20.41	0.07	3.47	0.36	0.18	0.00	Calculated
971	1080	Pipe	RCP	M-531	M-532	39.68	4450.00	4447.30	6.8000	24	0.015	1.35	51.14	0.03	4.01	0.58	0.29	0.00	Calculated
972	1081	Pipe	RCP	I-912	I-913	23.87	4448.30	4448.10	0.8400	15	0.015	0.00	5.12	0.00	0.00	0.00	0.00	0.00	Calculated
973	1082	Pipe	RCP	I-913	M-532	58.26	4448.20	4447.50	1.2000	15	0.015	0.01	6.14	0.00	0.04	0.39	0.31	0.00	Calculated
974	1083	Pipe	RCP	M-532	M-533	315.91	4447.30	4445.60	0.5400	24	0.015	6.48	14.38	0.45	3.89	1.06	0.53	0.00	Calculated
975	1084	Pipe	RCP	M-533	M-534	312.06	4445.50	4444.70	0.2600	24	0.015	6.40	9.93	0.64	3.65	1.08	0.55	0.00	Calculated
976	1085	Pipe	RCP	I-914	M-534	30.01	4445.40	4444.70	2.3300	15	0.015	0.00	8.73	0.00	0.00	0.32	0.27	0.00	Calculated
977	1086	Pipe	RCP	M-537	M-507	81.95	4441.60	4441.50	0.1200	24	0.015	6.09	6.85	0.89	1.95	2.00	1.00	21.00	SURCHARGED
978	1087	Pipe	RCP	M-534	M-507	60.76	4444.60	4441.50	5.1000	24	0.015	6.38	44.50	0.14	3.35	1.35	0.69	0.00	Calculated
979	1088	Pipe	RCP	M-507	M-536	159.02	4441.50	4440.90	0.3800	24	0.015	12.45	12.04	1.03	3.96	2.00	1.00	21.00	SURCHARGED
980	1089	Pipe	RCP	M-536	M-535	104.45	4440.80	4440.50	0.2900	24	0.015	12.45	10.51	1.18	4.25	2.00	1.00	24.00	SURCHARGED
981	1090	Pipe	RCP	I-916	M-535	15.95	4440.70	4440.60	0.6300	15	0.015	0.65	4.43	0.15	0.53	1.25	1.00	34.00	SURCHARGED
982	1091	Pipe	RCP	I-915	M-535	31.76	4442.20	4440.60	5.0400	15	0.015	2.30	12.57	0.18	2.57	1.25	1.00	10.00	SURCHARGED
983	1092	Pipe	RCP	M-535	M-538	351.82	4440.40	4438.80	0.4500	24	0.015	12.45	13.22	0.94	3.96	2.00	1.00	27.00	SURCHARGED
984	1093	Pipe	RCP	I-918	M-538	26.33	4438.80	4438.60	0.7600	15	0.015	2.50	4.88	0.51	2.03	1.25	1.00	92.00	SURCHARGED
985	1094	Pipe	RCP	I-917	M-538	20.08	4441.40	4438.60	13.9400	15	0.015	1.15	20.91	0.06	1.13	0.99	0.84	0.00	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
986	1095	Pipe	RCP	M-538	M-539	216.09	4438.70	4438.60	0.0500	24	0.015	10.48	4.22	2.48	3.33	2.00	1.00	39.00	SURCHARGED
987	1096	Pipe	RCP	I-919	M-539	35.40	4439.20	4438.50	1.9800	15	0.015	0.27	7.87	0.03	0.22	1.25	1.00	48.00	SURCHARGED
988	1097	Pipe	RCP	M-539	M-540	76.61	4438.50	4438.40	0.1300	24	0.015	10.48	7.08	1.48	3.34	2.00	1.00	37.00	SURCHARGED
989	1098	Pipe	RCP	I-920	M-540	30.52	4440.80	4438.40	7.8600	15	0.015	0.29	15.70	0.02	0.39	0.75	0.62	0.00	Calculated
990	1099	Pipe	RCP	M-540	M-541	206.39	4438.40	4438.20	0.1000	24	0.015	10.27	6.10	1.68	3.27	2.00	1.00	20.00	SURCHARGED
991	1100	Pipe	RCP	I-922	M-541	24.81	4441.40	4438.50	11.6900	15	0.015	0.00	19.14	0.00	0.00	0.63	0.50	0.00	Calculated
992	1101	Pipe	RCP	I-921	M-541	21.41	4441.20	4438.50	12.6100	15	0.015	0.00	19.88	0.00	0.00	0.63	0.50	0.00	Calculated
993	1102	Pipe	RCP	M-541	O-75	119.12	4438.20	4438.00	0.1700	24	0.015	10.02	8.03	1.25	5.67	1.10	0.55	0.00	> CAPACITY
994	1103	Pipe	RCP	I-877	I-876	26.56	4443.4	4443.1	1.13	15	0.015	0	5.95	0	0	0	0	0	Calculated
995	1104	Pipe	RCP	I-876	M-505	237.23	4443	4441.6	0.59	15	0.015	0.14	4.3	0.03	0.22	0.61	0.51	0	Calculated
996	1105	Pipe	RCP	M-505	I-875	196.94	4441.6	4439.8	0.91	15	0.015	1.16	5.28	0.22	1.43	1.23	1	3	SURCHARGED
997	1106	Pipe	RCP	I-875	M-543	35.3	4439.9	4439.7	0.57	15	0.015	1.16	4.21	0.28	0.95	1.25	1	23	SURCHARGED
998	1107	Pipe	RCP	I-878	I-879	28.99	4449.3	4449.2	0.34	15	0.015	0	3.29	0	0	0	0	0	Calculated
999	1108	Pipe	RCP	I-879	M-506	255.31	4449.1	4445.5	1.41	15	0.015	0	6.65	0	0	0	0	0	Calculated
1000	1109	Pipe	RCP	M-506	I-880	39.57	4445.4	4445	1.01	15	0.015	0	5.63	0	0	0	0	0	Calculated
1001	1110	Pipe	RCP	I-881	I-880	20.73	4447.6	4445	12.54	15	0.015	0	19.83	0	0	0	0	0	Calculated
1002	1111	Pipe	RCP	I-880	I-927	277.58	4445	4439.9	1.84	15	0.015	0	3.36	0	0	0	0	0	Calculated
1003	1112	Pipe	RCP	I-927	I-926	373.51	4444	4443.1	0.24	15	0.015	0	2.59	0	0	0	0	0	Calculated
1004	1113	Pipe	RCP	I-926	M-543	60.74	4443.2	4439.6	5.93	18	0.015	0.08	22.16	0	0.09	0.75	0.5	0	Calculated
1005	1114	Pipe	RCP	M-543	I-924	99.21	4439.5	4439.4	0.1	18	0.015	8.75	2.89	3.03	4.95	1.5	1	20	SURCHARGED
1006	1115	Pipe	RCP	I-924	I-925	28.22	4439.4	4438.8	2.13	24	0.015	8.79	28.59	0.31	3.85	2	1	15	SURCHARGED
1007	1116	Pipe	RCP	I-925	M-542	210.28	4438.7	4438.2	0.24	24	0.015	8.8	9.56	0.92	2.8	2	1	22	SURCHARGED
1008	1117	Pipe	RCP	M-542	O-79	49.51	4438.2	4438	0.4	12	0.015	5.71	1.96	2.91	7.33	0.97	0.97	0	> CAPACITY
1009	1118	Pipe	RCP	I-874	M-504	26.1	4457.2	4457	0.77	15	0.015	0	4.9	0	0	0	0	0	Calculated
1010	1120	Pipe	RCP	M-504	I-976	247.23	4456.1	4453.2	1.17	15	0.015	0	6.06	0	0	0	0	0	Calculated
1011	1121	Pipe	RCP	I-977	I-976	23.56	4453.5	4453.4	0.42	15	0.015	0	3.65	0	0	0	0	0	Calculated
1012	1122	Pipe	RCP	I-976	I-978	350.6	4453.2	4450.8	0.68	15	0.015	0	4.63	0	0	0	0	0	Calculated
1013	1123	Pipe	RCP	I-979	I-978	44.89	4451.1	4450.7	0.89	15	0.015	0	5.28	0	0	0	0	0	Calculated
1014	1124	Pipe	RCP	I-978	I-980	83.97	4450.6	4449.7	1.07	18	0.015	0	9.42	0	0	0	0	0	Calculated
1015	1125	Pipe	RCP	I-980	M-487	183.89	4449.6	4448.5	0.6	24	0.015	0	15.16	0	0	0	0	0	Calculated
1016	1126	Pipe	RCP	I-843	M-486	38.45	4449.9	4449.1	2.08	15	0.015	0	8.23	0	0	0	0	0	Calculated
1017	1127	Pipe	RCP	M-488	M-486	138.55	4449.1	4449	0.07	24	0.015	0	5.27	0	0	0	0	0	Calculated
1018	1128	Pipe	RCP	M-486	M-487	41.99	4448.9	4448.5	0.95	24	0.015	0	19.14	0	0	0	0	0	Calculated
1019	1129	Pipe	RCP	I-842	I-841	43.09	4450.5	4448.8	3.95	15	0.015	0	11.12	0	0	0	0	0	Calculated
1020	1130	Pipe	RCP	M-487	I-841	47.18	4448.4	4448.3	0.21	30	0.015	0	16.37	0	0	0	0	0	Calculated
1021	1131	Pipe	RCP	I-841	M-485	203.56	4448.4	4448.3	0.05	30	0.015	0	13.65	0	0	0	0	0	Calculated
1022	1132	Pipe	RCP	M-485	I-840	131.33	4448.7	4447.6	0.84	30	0.015	0	32.53	0	0	0	0	0	Calculated
1023	1133	Pipe	RCP	I-839	I-838	65.8	4448.5	4447.5	1.52	15	0.015	0	6.9	0	0	0	0	0	Calculated
1024	1134	Pipe	RCP	I-840	I-838	91.58	4447.4	4447.3	0.11	30	0.015	0	11.75	0	0	0	0	0	Calculated
1025	1135	Pipe	RCP	I-838	I-835	494.65	4447.3	4444.1	0.65	30	0.015	0	28.59	0	0	0.36	0.14	0	Calculated
1026	1136	Pipe	HDPE	M-484	M-483	245.68	0	4444.8	-1809.18	18	0.015	0	3.07	0	0.16	0.01	0.01	0	Calculated
1027	1137	Pipe	HDPE	I-837	M-483	33.32	4446.8	4444.3	7.5	18	0.015	0	25.09	0	0	0.26	0.17	0	Calculated
1028	1138	Pipe	RCP	M-483	I-836	20.91	4444.7	4444.6	0.48	30	0.015	0.04	24.58	0	0.51	0.17	0.07	0	Calculated
1029	1139	Pipe	RCP	I-836	I-835	38.19	4444.7	4444.1	1.57	30	0.015	0.05	44.56	0	0.1	0.42	0.17	0	Calculated
1030	1140	Pipe	RCP	I-835	I-899	248.42	4444.1	4444	0.04	24	0.015	0.33	3.93	0.09	0.83	0.77	0.38	0	Calculated
1031	1141	Pipe	RCP	I-834	I-833	22.54	4449.2	4446.5	11.98	15	0.015	0	19.38	0	0	0	0	0	Calculated
1032	1142	Pipe	RCP	I-833	M-482	52.94	4446.5	4445.6	1.7	15	0.015	0	7.3	0	0	0	0	0	Calculated
1033	1143	Pipe	RCP	M-482	I-835	199.23	4445.5	4444.1	0.7	18	0.015	0	7.63	0	0	0.36	0.24	0	Calculated
1034	1144	Pipe	RCP	M-481	M-482	172.37	4445.7	4445.6	0.06	18	0.015	0	3.1	0	0	0	0	0	Calculated
1035	1145	Pipe	RCP	I-899	I-900	29.22	4444.1	4443.8	1.03	30	0.015	0.46	36.02	0.01	0.94	0.87	0.35	0	Calculated
1036	1146	Pipe	RCP	I-900	M-527	225.82	4443.8	4443.7	0.04	30	0.015	0.8	7.48	0.11	1.03	1.07	0.43	0	Calculated
1037	1147	Pipe	RCP	M-527	I-896	158.44	4443.7	4443.5	0.13	30	0.015	1.28	12.63	0.1	1.19	1.22	0.49	0	Calculated
1038	1148	Pipe	RCP	I-896	I-895	27.02	4443.6	4443	2.22	30	0.015	1.55	52.97	0.03	0.83	1.52	0.61	0	Calculated
1039	1149	Pipe	RCP	I-895	O-78	89.52	4443	4440.3	3.02	30	0.015	21.59	61.74	0.35	4.79	2.16	0.86	0	Calculated
1040	1150	Pipe	RCP	I-923	O-77	24.95	4440	4439.8	0.8	15	0.015	6.33	5.01	1.26	5.42	1.13	0.91	0	> CAPACITY
1041	1151	Pipe	RCP	I-898	I-897	30.28	4447.1	4444.5	8.59	15	0.015	0	16.41	0	0	0.16	0.13	0	Calculated
1042	1152	Pipe	RCP	I-897	M-526	398.04	4444.5	4444.1	0.1	15	0.015	0.04	1.77	0.02	0.16	0.52	0.41	0	Calculated
1043	1153	Pipe	RCP	M-526	M-525	91.12	4444.2	4443.7	0.55	15	0.015	0.2	4.15	0.05	0.52	0.87	0.69	0	Calculated
1044	1154	Pipe	RCP	M-525	I-895	27.47	4443.6	4443	2.18	15	0.015	0.31	8.41	0.04	0.3	1.22	0.98	0	Calculated
1045	1155	Pipe	RCP	M-524	I-895	29.83	4443.5	4443	1.68	18	0.015	1.04	11.79	0.09	0.74	1.41	0.94	0	Calculated
1046	1156	Pipe	RCP	I-902	M-524	291.63	4443.7	4443.6	0.03	18	0.015	0.84	1.69	0.5	1.24	1.17	0.78	0	Calculated
1047	1157	Pipe	RCP	I-901	M-528	24.92	4444.5	4444.1	1.61	15	0.015	0.01	7.09	0	0.08	0.52	0.41	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1048	1158	Pipe	RCP	M-528	I-902	204.26	4443.8	4443.7	0.05	18	0.015	0.58	2.01	0.29	1.17	1.07	0.71	0	Calculated
1049	1159	Pipe	RCP	I-854	I-853	27.79	4446.9	4446.8	0.36	15	0.015	0	3.36	0	0	0	0	0	Calculated
1050	1160	Pipe	RCP	I-853	M-493	37.81	4446.8	4445.4	3.7	15	0.015	0	10.77	0	0	0	0	0	Calculated
1051	1161	Pipe	RCP	M-493	I-852	26.16	4445.5	4445.3	0.76	24	0.015	0	17.14	0	0	0	0	0	Calculated
1052	1162	Pipe	RCP	I-852	M-502	125.26	4445.3	4445.2	0.08	24	0.015	0	5.54	0	0	0	0	0	Calculated
1053	1165	Pipe	RCP	I-829	M-481	61.3	4446.7	4445.9	1.31	18	0.015	0	10.4	0	0	0	0	0	Calculated
1054	1166	Pipe	RCP	I-832	I-830	119.81	4447.8	4447.4	0.33	15	0.015	0	3.23	0	0	0	0	0	Calculated
1055	1167	Pipe	RCP	I-830	I-831	24.81	4447.3	4447	1.21	15	0.015	0	6.16	0	0	0	0	0	Calculated
1056	1168	Pipe	RCP	I-831	I-829	56.14	4446.9	4446.7	0.36	15	0.015	0	3.5	0	0	0	0	0	Calculated
1057	1169	Pipe	RCP	I-827	M-480	52	4447.3	4446.5	1.54	15	0.015	0	6.94	0	0	0	0	0	Calculated
1058	1170	Pipe	RCP	I-828	M-480	39.09	4448.5	4446.5	5.12	15	0.015	0	12.66	0	0	0	0	0	Calculated
1059	1171	Pipe	RCP	M-480	I-825	59.32	4446.4	4445.1	2.19	15	0.015	0	8.29	0	0	0	0	0	Calculated
1060	1172	Pipe	RCP	I-826	I-825	23.13	4447.3	4445.1	9.51	15	0.015	0	17.27	0	0	0	0	0	Calculated
1061	1173	Pipe	RCP	I-825	M-528	314.83	4445	4443.8	0.38	18	0.015	0	5.62	0	0	0.51	0.34	0	Calculated
1062	1174	Pipe	RCP	I-851	I-850	33.13	4446.3	4445.5	2.41	15	0.015	0	8.7	0	0	0	0	0	Calculated
1063	1175	Pipe	RCP	I-850	I-849	92.22	4445.4	4444.6	0.87	15	0.015	0	5.21	0	0	0	0	0	Calculated
1064	1176	Pipe	RCP	I-849	I-848	195.86	4444.5	4444.1	0.2	15	0.015	0	2.53	0	0	0	0	0	Calculated
1065	1177	Pipe	RCP	I-848	I-847	88.91	4444	4443.7	0.34	15	0.015	0	3.25	0	0	0	0	0	Calculated
1066	1178	Pipe	RCP	I-847	I-846	191.74	4443.6	4442.8	0.42	15	0.015	0	3.62	0	0	0	0	0	Calculated
1067	1179	Pipe	PVC	I-88	I-87	19	4492.3	4492.2	0.53	6	0.015	0	0.35	0	0	0	0	0	Calculated
1068	1180	Pipe	CMP	I-87	I-89	5.56	4491.9	4490.4	26.98	12	0.015	0	16.04	0	0	0	0	0	Calculated
1069	1189	Pipe	CMP	I-120	M-59	6.18	4488.2	4488.1	1.62	18	0.015	5.91	11.58	0.51	3.35	1.5	1	66	SURCHARGED
1070	1191	Pipe	RCP	M-513	M-511	200.02	4441.3	4441.2	0.05	18	0.015	0	2.04	0	0	0	0	0	Calculated
1071	1193	Pipe	RCP	M-511	M-512	231.68	4441.2	4441.1	0.04	18	0.015	0	1.89	0	0	0	0	0	Calculated
1072	1194	Pipe	RCP	M-512	I-885	16.38	4441	4440.9	0.61	15	0.015	0	4.37	0	0	0	0	0	Calculated
1073	1195	Pipe	RCP	M-510	M-509	221.35	4439.8	4439.7	0.05	18	0.015	0	1.94	0	0	0	0	0	Calculated
1074	1196	Pipe	RCP	I-885	M-509	27.31	4440.9	4440.6	1.1	15	0.015	0	5.87	0	0	0	0	0	Calculated
1075	1197	Pipe	RCP	I-884	M-509	21.08	4440.3	4439.9	1.9	15	0.015	0	7.71	0	0	0	0	0	Calculated
1076	1198	Pipe	RCP	M-509	M-508	425.24	4439.9	4439.2	0.16	18	0.015	0	3.69	0	0	0	0	0	Calculated
1077	1199	Pipe	RCP	I-882	M-508	20.62	4439.9	4439.2	3.39	15	0.015	0	10.32	0	0	0	0	0	Calculated
1078	1200	Pipe	RCP	I-883	M-508	23.87	4440.9	4439.2	7.12	15	0.015	0	14.94	0	0	0	0	0	Calculated
1079	1201	Pipe	RCP	M-508	O-76	244.1	4439.1	4439	0.04	18	0.015	0	2.47	0	0	0	0	0	Calculated
1080	1202	Pipe	RCP	M-492	M-493	149.51	4445.8	4445.5	0.2	24	0.015	0	8.78	0	0	0	0	0	Calculated
1081	1203	Pipe	RCP	I-855	M-492	153.25	4446.3	4445.9	0.26	24	0.015	0	10.02	0	0	0	0	0	Calculated
1082	1204	Pipe	RCP	I-856	I-855	26.37	4449.6	4447.1	9.48	15	0.015	0	17.24	0	0	0	0	0	Calculated
1083	1205	Pipe	RCP	I-857	M-494	56.88	4449.5	4447.1	4.22	15	0.015	0	11.5	0	0	0	0	0	Calculated
1084	1206	Pipe	RCP	M-494	I-855	47.84	4446.5	4446.4	0.21	24	0.015	0	8.96	0	0	0	0	0	Calculated
1085	1207	Pipe	RCP	M-495	M-494	65.41	4446.9	4446.4	0.76	24	0.015	0	17.14	0	0	0	0	0	Calculated
1086	1208	Pipe	RCP	M-496	M-495	170.67	4447.4	4447	0.23	24	0.015	0	9.49	0	0	0	0	0	Calculated
1087	1209	Pipe	RCP	I-858	M-496	24.71	4449.6	4447.9	6.88	15	0.015	0	14.68	0	0	0	0	0	Calculated
1088	1210	Pipe	RCP	M-497	M-496	43.57	4447.6	4447.5	0.23	24	0.015	0	9.39	0	0	0	0	0	Calculated
1089	1211	Pipe	RCP	I-859	M-497	259.27	4448	4447.7	0.12	24	0.015	0	6.67	0	0	0	0	0	Calculated
1090	1212	Pipe	RCP	I-860	I-859	24.19	4451.4	4448	14.06	15	0.015	0	21.08	0	0	0	0	0	Calculated
1091	1213	Pipe	RCP	M-498	I-859	36.52	4448.3	4448.1	0.55	18	0.015	0	6.74	0	0	0	0	0	Calculated
1092	1214	Pipe	RCP	I-861	M-498	52.85	4449	4448.4	1.14	18	0.015	0	9.7	0	0	0	0	0	Calculated
1093	1215	Pipe	RCP	I-862	I-861	22.49	4450.2	4449.1	4.89	15	0.015	0	12.6	0	0	0	0	0	Calculated
1094	1216	Pipe	RCP	M-501	I-861	297.27	4451.4	4449.1	0.77	15	0.015	0	4.94	0	0	0	0	0	Calculated
1095	1217	Pipe	RCP	I-866	M-501	20.29	4452.3	4451.6	3.45	15	0.015	0	10.4	0	0	0	0	0	Calculated
1096	1218	Pipe	RCP	I-867	M-501	48.88	4452.2	4451.5	1.43	15	0.015	0	6.7	0	0	0	0	0	Calculated
1097	1219	Pipe	RCP	M-499	M-498	87.12	4449.3	4448.4	1.03	18	0.015	0	9.25	0	0	0	0	0	Calculated
1098	1220	Pipe	RCP	M-500	M-499	48.54	4449.5	4449.4	0.21	18	0.015	0	4.13	0	0	0	0	0	Calculated
1099	1221	Pipe	RCP	I-863	M-500	486.2	4450.1	4449.6	0.1	18	0.015	0	2.92	0	0	0	0	0	Calculated
1100	1222	Pipe	RCP	I-865	I-864	25.67	4453.2	4451.5	6.62	15	0.015	0	14.41	0	0	0	0	0	Calculated
1101	1223	Pipe	RCP	I-864	I-863	49.18	4451.5	4450.4	2.24	15	0.015	0	8.37	0	0	0	0	0	Calculated
1102	1224	Pipe	RCP	I-869	I-868	29.93	4456.4	4452.9	11.69	15	0.015	0	19.14	0	0	0	0	0	Calculated
1103	1225	Pipe	RCP	I-868	M-491	419.52	4452.8	4451.1	0.41	15	0.015	0	3.56	0	0	0	0	0	Calculated
1104	1226	Pipe	RCP	M-491	M-490	271.72	4451.1	4450.6	0.18	24	0.015	0	8.41	0	0	0	0	0	Calculated
1105	1227	Pipe	RCP	M-490	M-489	214.28	4450.5	4449.3	0.56	24	0.015	0	14.67	0	0	0	0	0	Calculated
1106	1228	Pipe	RCP	M-489	M-488	209.07	4449.5	4449.1	0.19	24	0.015	0	8.58	0	0	0	0	0	Calculated
1107	1229	Pipe	RCP	I-845	M-491	67.85	4451.2	4451	0.29	24	0.015	0	10.64	0	0	0	0	0	Calculated
1108	1230	Pipe	RCP	I-844	I-845	35.54	4452	4451.3	1.97	15	0.015	0	7.86	0	0	0	0	0	Calculated
1109	1231	Pipe	RCP	I-870	I-845	87.37	4452.6	4451.3	1.49	24	0.015	0	23.92	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1110	1232	Pipe	RCP	I-871	I-870	23.61	4455.6	4453.5	8.89	15	0.015	0	16.7	0	0	0	0	0	Calculated
1111	1233	Pipe	RCP	M-503	I-870	35.37	4453.1	4452.6	1.41	24	0.015	0	23.31	0	0	0	0	0	Calculated
1112	1235	Pipe	RCP	I-872	M-503	52.6	4454.5	4452.6	3.61	15	0.015	0	10.64	0	0	0	0	0	Calculated
1113	1236	Pipe	RCP	I-873	I-872	24.65	4454.7	4454.6	0.41	15	0.015	0	3.57	0	0	0	0	0	Calculated
1114	1241	Pipe	HDPE	I-1205	I-1204	50.44	4441.9	4441.8	0.2	15	0.015	0	2.49	0	0	0	0	0	Calculated
1115	1242	Pipe	HDPE	I-1204	O-122	34.35	4441.8	4439.5	6.7	15	0.015	0	14.49	0	0	0	0	0	Calculated
1116	1246	Pipe	HDPE	I-1147	I-1148	23.74	4661.9	4661.8	0.42	15	0.015	4.12	3.63	1.13	3.89	1.25	1	17	SURCHARGED
1117	1247	Pipe	HDPE	I-1148	I-1166	56.03	4661.8	4659.8	3.57	15	0.015	3.99	10.58	0.38	4.13	1.25	1	17	SURCHARGED
1118	1248	Pipe	HDPE	I-1166	I-1167	23.26	4659.8	4659.7	0.43	15	0.015	3.99	3.67	1.09	3.25	1.25	1	61	SURCHARGED
1119	1249	Pipe	HDPE	M-650	I-1167	356.99	4675.7	4659.7	4.48	24	0.015	7.86	41.51	0.19	7.46	1.28	0.65	0	Calculated
1120	1250	Pipe	HDPE	M-649	M-650	349.15	4716	4675.8	11.51	18	0.015	7.87	30.89	0.25	14.34	0.52	0.35	0	Calculated
1121	1251	Pipe	HDPE	M-648	M-649	231.79	4739.1	4716.1	9.92	18	0.015	7.88	28.68	0.27	13.46	0.55	0.37	0	Calculated
1122	1252	Pipe	HDPE	I-1165	M-648	74	4744.8	4739.2	7.57	15	0.015	4.71	15.44	0.3	10.29	0.5	0.4	0	Calculated
1123	1253	Pipe	HDPE	I-1149	I-1165	34.97	4748.9	4744.9	11.44	15	0.015	0	18.93	0	0	0.23	0.18	0	Calculated
1124	1254	Pipe	HDPE	M-647	I-1165	70.24	4750.6	4744.9	8.12	15	0.015	4.71	15.99	0.29	10.53	0.49	0.39	0	Calculated
1125	1255	Pipe	RCP	M-637	M-647	173.72	4657.6	4751.1	-53.82	18	0.015	4.71	17.54	0.27	8.12	0.54	0.36	0	Calculated
1126	1256	Pipe	HDPE	M-646	O-111	89.05	4771.6	4766.2	6.06	15	0.015	5.48	13.79	0.4	9.89	0.84	0.68	0	Calculated
1127	1257	Pipe	HDPE	I-1150	I-1164	37.3	4800	4797.3	7.24	15	0.015	0	14.98	0	0	0.28	0.23	0	Calculated
1128	1258	Pipe	HDPE	I-1164	M-646	441.31	4797.3	4771.7	5.8	15	0.015	5.48	13.49	0.41	10.27	0.56	0.45	0	Calculated
1129	1259	Pipe	HDPE	I-660	I-331	92.19	4671.6	4668.3	3.58	12	0.015	0	5.84	0	0	0	0	0	Calculated
1130	1260	Pipe	HDPE	I-331	I-333	37.56	4668.2	4657.7	27.96	12	0.015	0	16.33	0	0	0	0	0	Calculated
1131	1261	Pipe	RCP	I-332	I-333	60.71	4658.9	4657.7	1.98	12	0.015	0	4.34	0	0	0	0	0	Calculated
1132	1262	Pipe	HDPE	I-333	M-187	61.85	4657.6	4654	5.82	12	0.015	0	7.48	0	0	0	0	0	Calculated
1133	1263	Pipe	HDPE	M-187	I-474	227.24	4654	4653.4	0.26	12	0.015	0	1.59	0	0	0	0	0	Calculated
1134	1264	Pipe	HDPE	I-474	I-476	178.37	4653.4	4651.3	1.18	12	0.015	0	3.35	0	0	0	0	0	Calculated
1135	1265	Pipe	RCP	I-475	I-476	84.27	4653.5	4651.4	2.49	15	0.015	0	8.84	0	0	0	0	0	Calculated
1136	1266	Pipe	HDPE	I-476	I-471	230.67	4651.3	4644	3.16	12	0.015	0	5.49	0	0	0.33	0.33	0	Calculated
1137	1268	Pipe	HDPE	I-1163	New-17	216.74	4842	4822.5	9	18	0.015	5.51	27.31	0.2	11.32	0.48	0.32	0	Calculated
1138	1269	Pipe	HDPE	New-17	I-1164	281.24	4822.5	4797.33	8.95	15	0.015	5.5	16.75	0.33	11.14	0.53	0.42	0	Calculated
1139	1270	Pipe	HDPE	I-1151	I-1163	34.99	4842.2	4842	0.57	15	0.015	0.02	4.23	0.01	0.22	0.37	0.29	0	Calculated
1140	1271	Pipe	RCP	I-1031	I-1151	58.52	4848.5	4842.2	10.77	15	0.015	0	18.37	0	0	0.13	0.11	0	Calculated
1141	1272	Pipe	RCP	I-1152	I-1032	57.42	4853.6	4850.3	5.75	15	0.015	0	13.42	0	0	0	0	0	Calculated
1142	1273	Pipe	RCP	I-1032	I-1031	32.65	4850.2	4848.6	4.9	15	0.015	0	12.55	0	0	0	0	0	Calculated
1143	1274	Pipe	RCP	M-591	I-1031	32.23	4849.8	4848.6	3.72	15	0.015	0	10.8	0	0	0	0	0	Calculated
1144	1275	Pipe	RCP	I-1033	M-591	109.03	4855.6	4849.8	5.32	15	0.015	0	12.91	0	0	0	0	0	Calculated
1145	1276	Pipe	RCP	I-1034	I-1033	21.48	4855.9	4855.7	0.93	15	0.015	0	5.4	0	0	0	0	0	Calculated
1146	1277	Pipe	RCP	I-1004	I-1003	21.51	4896.6	4896.1	2.32	15	0.015	0	8.7	0	0	0	0	0	Calculated
1147	1278	Pipe	RCP	I-1003	M-574	57.82	4896.1	4894.3	3.11	15	0.015	0	9.88	0	0	0	0	0	Calculated
1148	1279	Pipe	RCP	M-574	M-573	86.74	4894.3	4893.7	0.69	15	0.015	0	4.66	0	0	0	0	0	Calculated
1149	1280	Pipe	RCP	M-572	M-573	13.49	4898.4	4896.3	15.57	18	0.015	0	35.92	0	0	0	0	0	Calculated
1150	1281	Pipe	RCP	I-1002	M-572	14.07	4899.1	4898.6	3.55	15	0.015	0	10.55	0	0	0	0	0	Calculated
1151	1282	Pipe	RCP	I-1001	M-572	9.13	4901.1	4898.6	27.38	15	0.015	0	29.3	0	0	0	0	0	Calculated
1152	1283	Pipe	RCP	M-573	M-575	33.95	4893.5	4892.7	2.36	18	0.015	0	13.97	0	0	0	0	0	Calculated
1153	1284	Pipe	HDPE	M-575	M-645	59.02	4887.9	4886.8	1.86	18	0.015	0.18	12.43	0.01	0.24	1.29	0.87	0	Calculated
1154	1285	Pipe	HDPE	I-1153	I-1162	35.6	4890.8	4890.1	1.97	15	0.015	0.01	7.85	0	0.03	0.4	0.32	0	Calculated
1155	1286	Pipe	HDPE	I-1162	M-645	43.37	4890.1	4886.8	7.61	30	0.015	14.39	98.06	0.15	6.75	1.37	0.55	0	Calculated
1156	1287	Pipe	HDPE	M-644	I-1162	222.13	4912.6	4890	10.17	30	0.015	14.39	113.39	0.13	12.81	0.73	0.29	0	Calculated
1157	1288	Pipe	HDPE	I-1161	M-644	143.86	4927.6	4912.8	10.29	18	0.015	13.69	29.24	0.47	15.31	0.76	0.5	0	Calculated
1158	1291	Pipe	RCP	M-643	I-1161	49.75	4935.1	4927.7	14.87	18	0.015	13.69	35.23	0.39	15.26	0.76	0.51	0	Calculated
1159	1292	Pipe	RCP- eliptical	M-642	M-643	16.37	4936.7	4935.2	9.16	18	0.015	13.69	27.56	0.5	10.77	1.01	0.68	0	Calculated
1160	1298	Pipe	RCP	I-1037	M-592	138.92	4954.6	4947.2	5.33	15	0.015	0	12.92	0	0	0	0	0	Calculated
1161	1299	Pipe	RCP	I-1039	I-1037	163.89	0	4954.7	-3023.19	15	0.015	0	5.04	0	0	0	0	0	Calculated
1162	1301	Pipe	RCP	I-1040	M-593	120.55	4971.5	4960.2	9.37	15	0.015	0	17.14	0	0	0.49	0.39	0	Calculated
1163	1302	Pipe	RCP	M-593	M-641	94.1	0	4960.5	-5271.52	15	0.015	0.11	3.65	0.03	0.81	0.88	0.7	0	Calculated
1164	1304	Pipe	RCP	I-594	I-593	25.91	5153.6	5149.4	16.21	15	0.015	0	22.54	0	0	0	0	0	Calculated
1165	1305	Pipe	RCP	I-593	M-340	33.01	5149.3	5148.6	2.12	24	0.015	0	28.55	0	0	0	0	0	Calculated
1166	1307	Pipe	RFP	I-592	I-591	23.78	5153.7	5153.3	1.68	15	0.015	0	7.26	0	0	0	0	0	Calculated
1167	1308	Pipe	RCP	I-591	M-339	266.74	5153.2	5151.1	0.79	15	0.015	0	5	0	0	0	0	0	Calculated
1168	1310	Pipe	RCP	M-339	I-593	256.65	5151	5149.4	0.62	24	0.015	0	15.48	0	0	0	0	0	Calculated
1169	1311	Pipe	RCP	M-340	I-517	356.23	5148.5	5147.4	0.31	24	0.015	0	10.89	0	0	0	0	0	Calculated
1170	1312	Pipe	RCP	I-518	I-517	24.16	5149	5147.2	7.45	15	0.015	0	15.28	0	0	0	0	0	Calculated
1171	1313	Pipe	RCP	I-517	M-289	218.14	5147.1	5131	7.38	24	0.015	0	53.26	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1172	1314	Pipe	RCP	M-289	M-290	36.99	5130.9	5129.4	4.06	24	0.015	0	40	0	0	0	0	0	Calculated
1173	1315	Pipe	RCP	M-290	I-513	239.88	5129.4	5116.5	5.38	24	0.015	0	45.47	0	0	0	0	0	Calculated
1174	1316	Pipe	RCP	I-514	I-513	24.44	5118.5	5116.4	8.59	15	0.015	0	16.45	0	0	0	0	0	Calculated
1175	1317	Pipe	RCP	I-513	M-291	127.88	5116.4	5109.8	5.16	24	0.015	0	44.54	0	0	0	0	0	Calculated
1176	1318	Pipe	RCP	M-291	I-515	119.03	5109.7	5107.7	1.68	24	0.015	0	25.41	0	0	0.37	0.18	0	Calculated
1177	1319	Pipe	RCP	I-516	I-515	22.52	5108.7	5107.7	4.44	15	0.015	0	11.8	0	0	0.37	0.3	0	Calculated
1178	1320	Pipe	RCP	I-515	M-400	261.06	5107.6	5064.7	16.43	24	0.015	26.88	79.49	0.34	20.6	0.87	0.43	0	Calculated
1179	1321	Pipe	RCP	M-292	I-515	39.13	5107.9	5107.7	0.51	15	0.015	0.05	4	0.01	0.29	0.64	0.51	0	Calculated
1180	1322	Pipe	RCP	M-293	M-292	29.42	5109.5	5107.8	5.78	15	0.015	0	13.06	0	0	0.27	0.22	0	Calculated
1181	1323	Pipe	RCP	I-519	M-293	523.24	5137	5109.6	5.24	15	0.015	0	12.81	0	0	0	0	0	Calculated
1182	1324	Pipe	RCP	I-520	I-519	24.12	5137.5	5137.1	1.66	15	0.015	0	7.21	0	0	0	0	0	Calculated
1183	1326	Pipe	RCP	I-373	I-519	323.41	5168.1	5137.1	9.59	15	0.015	0	17.33	0	0	0	0	0	Calculated
1184	1327	Pipe	RCP	I-374	I-373	24.9	5167.8	5167.3	2.01	15	0.015	0	8.24	0	0	0	0	0	Calculated
1185	1331	Pipe	RCP	I-386	I-385	20.3	5148.1	5147.6	2.46	15	0.015	0	8.87	0	0	0	0	0	Calculated
1186	1332	Pipe	RCP	I-385	M-208	128.19	5147.5	5137.6	7.72	15	0.015	0	15.56	0	0	0	0	0	Calculated
1187	1333	Pipe	RCP	M-208	M-209	66.73	5137.5	5131.8	8.54	15	0.015	0	16.36	0	0	0	0	0	Calculated
1188	1334	Pipe	RCP	M-209	M-210	128.03	5131.7	5119.8	9.29	15	0.015	0	17.07	0	0	0	0	0	Calculated
1189	1335	Pipe	RCP	M-210	M-211	44.54	5119.7	5115.5	9.43	15	0.015	0	16.14	0	0	0	0	0	Calculated
1190	1336	Pipe	RCP	M-211	I-387	32.55	5115.5	5113.3	6.76	15	0.015	0	16.12	0	0	0	0	0	Calculated
1191	1337	Pipe	RCP	I-388	I-387	24.32	5114.2	5113.6	2.47	15	0.015	0	8.79	0	0	0	0	0	Calculated
1192	1338	Pipe	RCP	I-387	M-212	22.25	5113.2	5112.6	2.7	15	0.015	0	9.27	0	0	0	0	0	Calculated
1193	1339	Pipe	RCP	M-212	M-204	186.04	5112.5	5106.4	3.28	15	0.015	0	10.18	0	0	0	0	0	Calculated
1194	1340	Pipe	RCP	M-204	M-205	402.28	5106.3	5091.2	3.75	15	0.015	0	10.85	0	0	0	0	0	Calculated
1195	1341	Pipe	RCP	M-205	I-370	37.77	5091.1	5090.7	1.06	15	0.015	0	5.76	0	0	0	0	0	Calculated
1196	1342	Pipe	RCP	I-370	M-401	104.45	5087.1	5074.9	11.68	15	0.015	0	19.13	0	0	0	0	0	Calculated
1197	1343	Pipe	RCP	M-401	M-400	82.65	5074.8	5064.6	12.34	15	0.015	0	19.7	0	0	0.5	0.4	0	Calculated
1198	1345	Pipe	RCP	I-389	M-215	8.89	5054.5	5051.7	31.5	15	0.015	0	31.42	0	0	0	0	0	Calculated
1199	1346	Pipe	RCP	I-390	M-215	16.89	5053.1	5051.5	9.47	15	0.015	0	17.23	0	0	0	0	0	Calculated
1200	1347	Pipe	RCP	M-215	M-213	182.06	5051.4	5043.7	4.23	15	0.015	0	11.51	0	0	0	0	0	Calculated
1201	1348	Pipe	RCP	M-213	M-214	49.59	5043.6	5041.5	4.23	15	0.015	0	11.52	0	0	0	0	0	Calculated
1202	1349	Pipe	RCP	M-214	M-638	75.41	5041.4	5036.8	6.1	15	0.015	0	13.83	0	0	0.3	0.24	0	Calculated
1203	1350	Pipe	RCP	I-1157	M-638	53.16	5041.3	5036.8	8.47	15	0.015	0	16.29	0	0	0.3	0.24	0	Calculated
1204	1351	Pipe	RCP	M-638	M-639	70.2	5036.7	5036.5	0.28	18	0.015	0.15	4.86	0.03	0.39	0.8	0.53	0	Calculated
1205	1352	Pipe	RCP	M-639	I-1158	49.1	5036.4	5036.3	0.2	24	0.015	0.27	8.85	0.03	0.29	1.05	0.52	0	Calculated
1206	1353	Pipe	RCP	I-1158	M-640	127.41	5036.3	5026	8.08	24	0.015	26.85	55.75	0.48	15.19	1.13	0.57	0	Calculated
1207	1354	Pipe	RCP	M-640	I-1159	93.36	5025.9	5017.7	8.78	24	0.015	26.85	58.11	0.46	14.6	1.63	0.82	0	Calculated
1208	1355	Pipe	HDPE	I-1156	I-1159	35.2	5019.3	5017.6	4.83	12	0.015	1.24	6.79	0.18	1.86	1	1	21	SURCHARGED
1209	1356	Pipe	RCP	I-1168	I-1172	36.79	5053.2	5050.9	6.25	12	0.015	0	7.77	0	0	0.49	0.49	0	Calculated
1210	1361	Pipe	RCP	I-1169	I-1171	38.33	5104.4	5102.9	3.91	15	0.015	0	11.08	0	0	0	0	0	Calculated
1211	1362	Pipe	HDPE	M-653	I-1171	259.6	5123.3	5103	7.82	15	0.015	0	15.66	0	0	0	0	0	Calculated
1212	1363	Pipe	HDPE	M-652	M-653	40.94	5126.4	5123.4	7.33	15	0.015	0	15.16	0	0	0	0	0	Calculated
1213	1364	Pipe	RCP	I-1170	M-651	30.64	5133	5131.4	5.22	15	0.015	0	12.79	0	0	0	0	0	Calculated
1214	1365	Pipe	HDPE	M-651	M-652	68.31	5131.4	5126.4	7.32	15	0.015	0	15.15	0	0	0	0	0	Calculated
1215	1366	Pipe	HDPE	M-634	M-651	281.76	5150.1	5131.4	6.64	15	0.015	0	14.43	0	0	0	0	0	Calculated
1216	1367	Pipe	HDPE	I-1134	M-634	56.82	0	5150.2	-9064.06	15	0.015	0	14.03	0	0	0	0	0	Calculated
1217	1370	Pipe	RCP	M-603	I-1055	75.69	5055.4	5048.6	8.98	18	0.015	12.83	27.29	0.47	13.6	0.78	0.53	0	Calculated
1218	1371	Pipe	RCP	M-602	M-603	108.99	5064.2	5055.5	7.98	18	0.015	12.83	25.72	0.5	13.35	0.79	0.53	0	Calculated
1219	1372	Pipe	RCP	M-601	M-602	85.69	5072.5	5065.3	8.4	18	0.015	12.83	26.39	0.49	13.4	0.79	0.53	0	Calculated
1220	1373	Pipe	RCP	M-600	M-601	81.65	5079.1	5072.7	7.84	18	0.015	12.83	25.49	0.5	12.97	0.81	0.55	0	Calculated
1221	1374	Pipe	RCP	I-1053	M-600	234.78	5097.2	5079.1	7.71	18	0.015	12.83	25.28	0.51	12.76	0.82	0.55	0	Calculated
1222	1375	Pipe	RCP	I-1054	I-1053	19.52	5097.6	5097.3	1.54	15	0.015	0.03	6.94	0	0.22	0.51	0.42	0	Calculated
1223	1376	Pipe	RCP	I-1052	I-1051	23.34	5099	5098.9	0.43	15	0.015	0	3.66	0	0	0	0	0	Calculated
1224	1377	Pipe	RCP	I-1051	I-1053	27.03	5098.9	5097.3	5.92	15	0.015	0	13.62	0	0	0.33	0.27	0	Calculated
1225	1378	Pipe	RCP	I-1050	M-598	18.37	5113.2	5112	6.53	18	0.015	0	23.27	0	0	0.46	0.32	0	Calculated
1226	1379	Pipe	HDPE	I-1042	I-1043	57.15	4855.9	4849.2	11.72	15	0.015	0	19.17	0	0	0	0	0	Calculated
1227	1380	Pipe	HDPE	I-1044	I-1043	72	4851	4849.1	2.64	15	0.015	0	9.09	0	0	0	0	0	Calculated
1228	1381	Pipe	HDPE	I-1043	M-597	198.15	4849.1	4827	11.15	15	0.015	0	18.7	0	0	0	0	0	Calculated
1229	1382	Pipe	HDPE	I-822	I-821	18.75	4883.6	4882.3	6.93	15	0.015	0	14.91	0	0	0	0	0	Calculated
1230	1383	Pipe	HDPE	I-821	M-479	217.55	4882.2	4878.1	1.88	15	0.015	0	7.69	0	0	0	0	0	Calculated
1231	1384	Pipe	HDPE	M-479	I-823	195.85	4878	4870.4	3.88	15	0.015	0	11.03	0	0	0	0	0	Calculated
1232	1385	Pipe	HDPE	I-824	I-823	18.92	4872	4870.4	8.46	15	0.015	0	16.28	0	0	0	0	0	Calculated
1233	1386	Pipe	HDPE	I-823	M-475	176.75	4870.2	4863.2	3.96	15	0.015	0	11.14	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1234	1387	Pipe	HDPE	M-475	I-815	158.43	4863.1	4851.1	7.57	15	0.015	0	15.41	0	0	0	0	0	Calculated
1235	1389	Pipe	HDPE	I-815	M-476	62.8	4850.9	4844.7	9.87	15	0.015	0	17.59	0	0	0	0	0	Calculated
1236	1390	Pipe	HDPE	M-476	M-477	110.02	4844.6	4831.9	11.54	15	0.015	0	19.02	0	0	0	0	0	Calculated
1237	1391	Pipe	HDPE	M-477	I-817	128.92	4831.8	4815.5	12.64	15	0.015	0	19.91	0	0	0	0	0	Calculated
1238	1392	Pipe	HDPE	I-817	M-478	160.5	4815.2	4796.9	11.4	15	0.015	0	18.9	0	0	0	0	0	Calculated
1239	1393	Pipe	HDPE	I-1045	I-1046	48.97	4807	4803.2	7.76	15	0.015	0	15.6	0	0	0	0	0	Calculated
1240	1394	Pipe	HDPE	I-1046	M-478	65.37	4803.1	4796.9	9.48	15	0.015	0	17.24	0	0	0	0	0	Calculated
1241	1395	Pipe	HDPE	M-596	I-1045	146.47	4819.9	4807	8.81	15	0.015	0	16.61	0	0	0	0	0	Calculated
1242	1396	Pipe	HDPE	M-595	M-596	151.03	4831.9	4819.9	7.95	15	0.015	0	15.78	0	0	0	0	0	Calculated
1243	1397	Pipe	HDPE	M-594	M-595	102.04	4838.5	4831.9	6.47	15	0.015	0	14.24	0	0	0	0	0	Calculated
1244	1398	Pipe	HDPE	I-819	M-594	193.64	4843.1	4838.6	2.32	15	0.015	0	8.53	0	0	0	0	0	Calculated
1245	1399	Pipe	HDPE	I-820	I-819	22.09	4843.3	4843.2	0.45	12	0.015	0	2.08	0	0	0	0	0	Calculated
1246	1400	Pipe	HDPE	M-478	I-818	224.81	4796.8	4770	11.92	18	0.015	0	31.43	0	0	0.38	0.26	0	Calculated
1247	1401	Pipe	HDPE	I-1047	I-1048	24.55	4819.4	4818.5	3.67	15	0.015	0	10.72	0	0	0	0	0	Calculated
1248	1402	Pipe	HDPE	M-597	I-1048	86.43	4827	4818.5	9.83	15	0.015	0	17.56	0	0	0	0	0	Calculated
1249	1403	Pipe	HDPE	I-1048	I-1049	142.65	4818.5	4807.1	7.99	15	0.015	0	15.83	0	0	0	0	0	Calculated
1250	1404	Pipe	HDPE	I-1049	I-1027	179.51	4807	4803.7	1.84	15	0.015	0	7.59	0	0	0	0	0	Calculated
1251	1405	Pipe	HDPE	I-1028	I-1027	26.01	4804.9	4803.7	4.61	15	0.015	0	12.03	0	0	0	0	0	Calculated
1252	1406	Pipe	RCP	I-1027	M-587	349.51	4803.6	4802	0.46	15	0.015	0	3.79	0	0	0	0	0	Calculated
1253	1407	Pipe	RCP	M-587	M-588	206.68	4801.9	4799.7	1.06	15	0.015	0	5.78	0	0	0	0	0	Calculated
1254	1408	Pipe	HDPE	M-588	M-589	156.74	4799.6	4794.8	3.06	15	0.015	0	9.8	0	0	0	0	0	Calculated
1255	1409	Pipe	HDPE	M-589	M-590	136.8	4794.8	4781.9	9.43	15	0.015	0	17.19	0	0	0	0	0	Calculated
1256	1410	Pipe	HDPE	M-590	I-1030	114.91	4781.9	4770	10.36	15	0.015	0	18.02	0	0	0	0	0	Calculated
1257	1411	Pipe	HDPE	I-1029	I-1030	48.63	4774	4770	8.23	15	0.015	0	16.06	0	0	0	0	0	Calculated
1258	1412	Pipe	HDPE	I-1155	I-1160	34.53	4966.9	4965.8	3.19	18	0.015	13.69	16.25	0.84	8.54	1.28	0.85	0	Calculated
1259	1413	Pipe	HDPE	I-1160	M-641	54.3	4965.7	4960.6	9.39	18	0.015	13.69	27.9	0.49	13.47	0.84	0.56	0	Calculated
1260	1414	Pipe	RCP	M-641	M-642	260.75	4960.4	4936.7	9.09	18	0.015	13.69	27.46	0.5	10.77	1.01	0.68	0	Calculated
1261	1415	Pipe	HDPE	I-775	I-774	24.24	4675.9	4675.8	0.41	12	0.015	0	1.98	0	0	0	0	0	Calculated
1262	1416	Pipe	HDPE	I-774	M-444	229.09	4675.7	4668.8	3.01	12	0.015	0	5.36	0	0	0	0	0	Calculated
1263	1417	Pipe	HDPE	M-444	M-445	136.24	4664.7	4657.7	5.14	24	0.015	9.75	44.57	0.22	8.25	0.79	0.4	0	Calculated
1264	1418	Pipe	HDPE	I-812	M-473	46.21	4698.3	4697.3	2.16	15	0.015	0	8.36	0	0	0	0	0	Calculated
1265	1419	Pipe	HDPE	I-807	M-474	139.64	4740.4	4717	16.76	18	0.015	0	37.27	0	0	0	0	0	Calculated
1266	1420	Pipe	HDPE	M-474	I-812	83.09	4717	4698.3	22.51	15	0.015	0	26.54	0	0	0	0	0	Calculated
1267	1421	Pipe	RCP	I-1393	I-1392	37.04	4575.9	4574.9	2.7	15	0.015	0	9.2	0	0	0.43	0.35	0	Calculated
1268	1422	Pipe	RCP	M-178	M-779	197.22	4585.1	4572.6	6.34	42	0.015	0	219.52	0	0	0.29	0.08	0	Calculated
1269	1423	Pipe	RCP	I-193	I-1392	334.57	4576.5	4575.3	0.36	18	0.015	5.82	5.45	1.07	3.79	1.22	0.81	0	> CAPACITY
1270	1424	Pipe	RCP	I-179	I-1228	252.99	4596.4	4578.4	7.11	15	0.015	0	14.93	0	0	0	0	0	Calculated
1271	1425	Pipe	RCP	I-1228	I-1227	37.32	4578.3	4577.6	1.88	15	0.015	0	7.67	0	0	0	0	0	Calculated
1272	1426	Pipe	RCP	I-1227	M-779	51.07	4577.5	4574.5	5.87	15	0.015	0	13.57	0	0	0	0	0	Calculated
1273	1427	Pipe	RCP	I-1392	M-779	33.87	4574.8	4574.3	1.48	18	0.015	5.82	11.06	0.53	5.47	0.87	0.58	0	Calculated
1274	1428	Pipe	RCP	M-779	M-91	389.76	4572.4	4566	1.64	42	0.015	12.02	111.73	0.11	3.98	1.24	0.36	0	Calculated
1275	1429	Pipe	RCP	M-143	I-1391	182.84	4602.9	4595.4	4.1	18	0.015	0	18.31	0	0	0.32	0.22	0	Calculated
1276	1430	Pipe	RCP	I-270	I-269	28.17	4611.2	4610.8	1.42	15	0.015	0	6.67	0	0	0	0	0	Calculated
1277	1431	Pipe	RCP	I-269	I-278	140.31	4610.8	4606.3	3.21	15	0.015	0	10.03	0	0	0	0	0	Calculated
1278	1432	Pipe	RCP	I-278	I-279	27.64	4606.2	4605.7	1.81	15	0.015	0	7.53	0	0	0	0	0	Calculated
1279	1433	Pipe	RCP	I-279	I-280	173.12	4605.6	4599.5	3.52	15	0.015	0	10.51	0	0	0	0	0	Calculated
1280	1434	Pipe		I-280	New-2	229.47	4599.43	4595.4	1.76	18	0.015	0	12.06	0	0	0.37	0.25	0	Calculated
1281	1435	Pipe	RCP	I-1391	New-2	43.13	4595.5	4595.4	0.23	18	0.015	0.27	4.38	0.06	0.82	0.69	0.46	0	Calculated
1282	1436	Pipe	RCP	New-2	I-1390	41.37	4594.2	4594.1	0.24	18	0.015	6.74	4.48	1.51	3.81	1.5	1	6	SURCHARGED
1283	1437	Pipe	RCP	I-1390	I-1389	82.02	4594.1	4593.5	0.73	18	0.015	6.74	7.79	0.87	3.93	1.5	1	4	SURCHARGED
1284	1438	Pipe	RCP	I-1389	I-1388	38.64	4593.4	4592.8	1.55	18	0.015	10.46	11.34	0.92	6.72	1.24	0.82	0	Calculated
1285	1439	Pipe	RCP	I-1388	I-1387	38.02	4592.7	4590.6	5.52	18	0.015	10.46	21.9	0.48	10.11	0.85	0.57	0	Calculated
1286	1440	Pipe	RCP	I-1387	O-131	18.36	4590.5	4583	40.85	18	0.015	10.47	58.19	0.18	18.92	0.68	0.45	0	Calculated
1287	1441	Pipe	RCP	I-1386	I-1389	150.58	4595.3	4593.5	1.2	18	0.015	3.96	9.95	0.4	3.09	1.07	0.72	0	Calculated
1288	1442	Pipe	RCP	I-1384	I-1386	165.95	4600.9	4595.2	3.43	18	0.015	3.97	16.87	0.24	5.69	0.62	0.42	0	Calculated
1289	1443	Pipe	RCP	M-778	I-1384	27	4601.1	4601	0.37	18	0.015	3.97	6.56	0.61	3.7	0.87	0.58	0	Calculated
1290	1444	Pipe	RCP	I-1382	M-778	63.2	4603.8	4601.3	3.96	18	0.015	0	18.11	0	0	0.41	0.28	0	Calculated
1291	1445	Pipe	RCP	I-1383	I-1382	37.42	4601.1	4603.9	-7.48	15	0.015	0	4.09	0	0	0	0	0	Calculated
1292	1446	Pipe	RCP	I-1385	M-778	291.84	4607.8	4601.3	2.23	15	0.015	0	8.36	0	0	0.41	0.33	0	Calculated
1293	1447	Pipe	RCP	I-1381	I-1382	216.41	4607.7	4603.9	1.76	15	0.015	0	7.42	0	0	0	0	0	Calculated
1294	1448	Pipe	RCP	I-1380	I-1379	26.31	4590	4589	3.8	18	0.015	0	17.75	0	0	0	0	0	Calculated
1295	1449	Pipe	RCP	I-1379	O-24	159.88	4588.9	4578.2	6.69	18	0.015	0	23.55	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1296	1450	Pipe	HDPE	I-1271	M-719	23.4	4713	4711.5	6.41	15	0.015	0	14.17	0	0	0	0	0	Calculated
1297	1451	Pipe	HDPE	I-1272	M-719	17.76	4712.9	4711.5	7.88	15	0.015	0	15.72	0	0	0	0	0	Calculated
1298	1452	Pipe	HDPE	M-719	M-720	298.92	4711.4	4694.9	5.52	18	0.015	0	21.39	0	0	0	0	0	Calculated
1299	1453	Pipe	HDPE	M-720	M-721	113.62	4694.8	4688.3	5.72	18	0.015	0	21.77	0	0	0.44	0.3	0	Calculated
1300	1454	Pipe	HDPE	I-1274	M-721	19.45	4689.1	4688.3	4.11	15	0.015	0.06	11.42	0.01	0.44	0.47	0.39	0	Calculated
1301	1455	Pipe	HDPE	I-1273	M-721	21.55	4690.5	4688.3	10.21	15	0.015	0	18.01	0	0	0.44	0.36	0	Calculated
1302	1456	Pipe	HDPE	M-721	M-723	45.34	4688.2	4686	4.85	18	0.015	0.9	20.05	0.04	0.78	1.24	0.83	0	Calculated
1303	1457	Pipe	HDPE	I-1278	M-723	54.03	4687.2	4686	2.22	24	0.015	2.82	29.22	0.1	1.6	1.98	0.99	0	Calculated
1304	1458	Pipe	HDPE	I-1277	I-1278	127.65	4693.6	4687.2	5.01	18	0.015	0	20.42	0	0	0.75	0.5	0	Calculated
1305	1459	Pipe	HDPE	I-1275	I-1277	112.19	4697.9	4693.7	3.74	15	0.015	0	10.83	0	0	0	0	0	Calculated
1306	1460	Pipe	HDPE	I-1276	I-1275	22.84	4699.1	4698	4.82	15	0.015	0	12.29	0	0	0	0	0	Calculated
1307	1461	Pipe	HDPE	I-1283	I-1282	35.42	4716.4	4716	1.13	15	0.015	0	5.95	0	0	0	0	0	Calculated
1308	1462	Pipe	HDPE	I-1282	I-1281	354.84	4715.9	4688.4	7.75	15	0.015	0	15.59	0	0	0.39	0.33	0	Calculated
1309	1463	Pipe	HDPE	I-1281	I-1279	98.86	4688.3	4687.6	0.71	15	0.015	1.35	4.71	0.29	2.24	1.06	0.87	0	Calculated
1310	1464	Pipe	HDPE	I-1280	I-1279	37.58	4689.1	4687.6	3.99	15	0.015	0.08	11.19	0.01	0.33	0.66	0.54	0	Calculated
1311	1465	Pipe	HDPE	I-1279	M-723	54.76	4687.5	4686	2.74	15	0.015	2.18	9.27	0.23	2.19	1.25	1	6	SURCHARGED
1312	1466	Pipe	HDPE	M-723	I-1284	112.26	4685.9	4682.6	2.94	24	0.015	24.9	33.87	0.74	7.93	2	1	9	SURCHARGED
1313	1467	Pipe	HDPE	I-1285	I-1284	23.53	4683.7	4682.6	4.67	15	0.015	0.79	12.1	0.07	0.68	1.25	1	12	SURCHARGED
1314	1468	Pipe	HDPE	I-1284	M-724	53.03	4682.5	4682	0.94	24	0.015	24.9	19.04	1.31	7.93	2	1	11	SURCHARGED
1315	1469	Pipe	HDPE	I-1286	M-724	52.21	4682.6	4682	1.15	15	0.015	1.21	6	0.2	0.99	1.25	1	12	SURCHARGED
1316	1470	Pipe	HDPE	I-1288	I-1287	13.21	4695.6	4695	4.54	15	0.015	0	11.93	0	0	0	0	0	Calculated
1317	1471	Pipe	HDPE	I-1287	I-1286	314.14	4694.9	4682.7	3.88	15	0.015	0	11.03	0	0	0.63	0.5	0	Calculated
1318	1472	Pipe	HDPE	M-724	I-1322	103.26	4681.9	4681.6	0.29	30	0.015	24.89	19.16	1.3	5.56	2.14	0.87	0	> CAPACITY
1319	1473	Pipe	HDPE	I-1323	I-1322	28.94	4682.1	4681.6	1.73	15	0.015	0.28	7.36	0.04	0.34	1.25	1	4	SURCHARGED
1320	1474	Pipe	HDPE	I-1322	M-743	71.73	4681.5	4680.4	1.53	30	0.015	24.73	44.02	0.56	6.28	2.05	0.87	0	Calculated
1321	1475	Pipe	HDPE	M-743	M-744	162.97	4680.3	4679	0.8	30	0.015	24.45	31.75	0.77	5.68	2.4	1	0	Calculated
1322	1476	Pipe	HDPE	M-744	M-727	347.45	4678.9	4677.6	0.37	30	0.015	24.45	21.74	1.12	5.57	2.08	0.84	0	> CAPACITY
1323	1477	Pipe	HDPE	M-726	M-727	151.51	4692.2	4677.6	9.64	15	0.015	0	17.38	0	0	0.62	0.5	0	Calculated
1324	1478	Pipe	HDPE	I-1324	M-727	20.14	4679.3	4677.6	8.44	15	0.015	0	16.27	0	0	0.62	0.5	0	Calculated
1325	1479	Pipe	HDPE	M-727	I-1325	18.33	4677.5	4676	8.18	30	0.015	24.45	101.69	0.24	9.58	1.27	0.52	0	Calculated
1326	1480	Pipe	HDPE	I-1325	I-1326	95.27	4675.9	4673.1	2.94	30	0.015	24.45	60.94	0.4	7.9	1.48	0.6	0	Calculated
1327	1481	Pipe	HDPE	I-1326	I-1327	72.85	4673	4672.1	1.24	30	0.015	24.45	39.51	0.62	7.32	1.58	0.64	0	Calculated
1328	1482	Pipe	HDPE	I-1327	M-745	127.31	4672	4653.2	14.77	30	0.015	24.45	136.6	0.18	18.42	0.78	0.32	0	Calculated
1329	1483	Pipe	HDPE	M-745	M-746	185.1	4653.1	4620.9	17.4	18	0.015	24.45	37.97	0.64	15.97	1.2	0.81	0	Calculated
1330	1484	Pipe	HDPE	M-746	M-689	37.6	4620.8	4620.5	0.8	18	0.015	24.45	8.13	3.01	15.1	1.31	0.87	0	> CAPACITY
1331	1485	Pipe	RCP	M-688	M-689	118.21	4630.8	4620.5	8.71	24	0.015	26.52	57.87	0.46	16.04	1.08	0.54	0	Calculated
1332	1486	Pipe	RCP	I-1238	M-689	55.96	4624.6	4620.5	7.33	21	0.015	0	37.17	0	0	0.56	0.32	0	Calculated
1333	1487	Pipe	RCP	M-687	M-688	156.72	4642.8	4630.9	7.59	24	0.015	26.53	54.03	0.49	15.75	1.06	0.53	0	Calculated
1334	1488	Pipe	RCP	M-686	M-687	113.78	4655.4	4642.9	10.99	24	0.015	26.53	64.98	0.41	16.61	1.01	0.51	0	Calculated
1335	1489	Pipe	RCP	M-685	M-686	221.11	4670.4	4655.5	6.74	24	0.015	26.53	50.9	0.52	15.38	1.07	0.54	0	Calculated
1336	1490	Pipe	RCP	M-684	M-685	218.06	4686.1	4670.5	7.15	24	0.015	26.53	52.44	0.51	15.59	1.06	0.53	0	Calculated
1337	1491	Pipe	RCP	I-1239	M-684	44.36	4687.9	4686.9	2.25	15	0.015	0	8.41	0	0	0.15	0.12	0	Calculated
1338	1492	Pipe	RCP	I-1270	M-684	55.67	4689.2	4686.1	5.57	24	0.015	15.17	46.64	0.33	9.39	1.01	0.51	0	Calculated
1339	1493	Pipe	RCP	I-1269	I-1270	36.88	4690.7	4689.3	3.8	15	0.015	0	10.91	0	0	0.44	0.36	0	Calculated
1340	1494	Pipe	RCP	M-718	I-1270	91.93	4693.6	4689.3	4.68	24	0.015	15.17	42.4	0.36	10.66	0.92	0.46	0	Calculated
1341	1495	Pipe	RCP	M-717	M-718	105.59	4698.7	4693.7	4.74	24	0.015	15.17	42.88	0.35	11.09	0.89	0.45	0	Calculated
1342	1496	Pipe	RCP	M-716	M-717	116.64	4706.9	4698.8	6.94	24	0.015	15.17	51.67	0.29	11.98	0.84	0.42	0	Calculated
1343	1497	Pipe	RCP	I-1268	M-716	270.81	4723.6	4706.9	6.17	24	0.015	15.17	48.69	0.31	12.86	0.8	0.4	0	Calculated
1344	1498	Pipe	RCP	I-1267	I-1268	35.94	4724.7	4723.7	2.78	24	0.015	15.17	32.7	0.46	8.24	1.13	0.57	0	Calculated
1345	1499	Pipe	HDPE	I-1289	I-1290	36.76	4730.2	4728.7	4.08	15	0.015	0	11.38	0	0	0	0	0	Calculated
1346	1500	Pipe	HDPE	I-1290	M-725	103.22	4728.6	4724.7	3.78	15	0.015	0	10.88	0	0	0	0	0	Calculated
1347	1501	Pipe	HDPE	M-725	I-1291	228.86	4724.6	4700	10.75	15	0.015	0	17.98	0	0	0	0	0	Calculated
1348	1502	Pipe	HDPE	I-1292	I-1291	24.61	4703.9	4700	15.85	15	0.015	0	19.35	0	0	0	0	0	Calculated
1349	1503	Pipe	HDPE	I-1291	M-726	96.34	4701	4692.3	9.03	15	0.015	0	16.82	0	0	0	0	0	Calculated
1350	1504	Pipe	RCP	I-791	M-449	10.39	4988.6	4986.9	16.36	15	0.015	0	22.65	0	0	0	0	0	Calculated
1351	1505	Pipe	RCP	I-790	M-449	16.77	4988.5	4986.9	9.54	15	0.015	0	17.29	0	0	0	0	0	Calculated
1352	1506	Pipe	RCP	M-449	M-450	291.11	4986.9	4980.2	2.3	15	0.015	0	8.49	0	0	0	0	0	Calculated
1353	1508	Pipe	PVC	M-451	M-450	15.95	4981	4980.7	1.88	8	0.015	0	1.46	0	0	0	0	0	Calculated
1354	1509	Pipe	RCP	M-450	M-452	181.71	4980.1	4976.2	2.15	18	0.015	0	13.34	0	0	0	0	0	Calculated
1355	1511	Pipe	PVC	M-453	M-452	17.57	4977.2	4976.5	3.98	10	0.015	0	3.75	0	0	0	0	0	Calculated
1356	1512	Pipe	RCP	M-452	M-454	137.19	4981.5	4972.9	6.27	18	0.015	0	22.79	0	0	0	0	0	Calculated
1357	1513	Pipe	RCP	I-792	M-454	29.7	4975.4	4972.9	8.42	15	0.015	0	16.24	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1358	1514	Pipe	RCP	M-454	I-793	9.45	4972.9	4973.2	-3.17	18	0.015	0	16.22	0	0	0	0	0	Calculated
1359	1515	Pipe	HDPE	I-793	I-796	276.05	4973.1	4922.9	18.19	18	0.015	0	38.82	0	0	0	0	0	Calculated
1360	1516	Pipe	RCP	I-796	M-455	5.65	4922.9	4920.4	44.25	24	0.015	0	130.42	0	0	0.58	0.29	0	Calculated
1361	1517	Pipe	RCP	I-797	M-455	22.96	4925.4	4921.6	16.55	15	0.015	0	22.78	0	0	0	0	0	Calculated
1362	1518	Pipe	RCP	M-455	M-456	290.06	4920.3	4918.6	0.59	24	0.015	9.49	15.14	0.63	4.96	1.16	0.59	0	Calculated
1363	1520	Pipe	RCP	M-456	M-457	251.83	4918.5	4916.2	0.91	24	0.015	9.43	18.74	0.5	5.7	1.02	0.52	0	Calculated
1364	1522	Pipe	RCP	M-457	M-458	154.06	4916.1	4903.5	8.18	24	0.015	9.43	56.07	0.17	12.66	0.56	0.29	0	Calculated
1365	1523	Pipe	PVC	M-459	M-458	16.49	4905.6	4904.2	8.49	10	0.015	0	5.47	0	0	0	0	0	Calculated
1366	1524	Pipe	RCP	M-458	M-460	61.84	4903.4	4897.9	8.89	24	0.015	9.43	58.47	0.16	12.29	0.57	0.29	0	Calculated
1367	1525	Pipe	RCP	I-798	M-460	23.23	4901.8	4897.9	16.79	15	0.015	0	22.94	0	0	0.23	0.19	0	Calculated
1368	1526	Pipe	RCP	I-799	M-460	9.07	4900.9	4897.9	33.08	15	0.015	0	32.31	0	0	0.23	0.19	0	Calculated
1369	1527	Pipe	RCP	M-460	M-461	114.32	4897.8	4886.9	9.53	24	0.015	9.42	60.54	0.16	13.22	0.54	0.28	0	Calculated
1370	1528	Pipe	RCP	M-461	M-462	127.59	4886.8	4875.2	9.09	24	0.015	9.43	59.12	0.16	11.52	0.59	0.31	0	Calculated
1371	1530	Pipe	PVC	M-571	M-463	22.73	4875.1	4873	9.24	8	0.015	0	3.23	0	0	0.23	0.37	0	Calculated
1372	1531	Pipe	RCP	M-462	M-463	30.71	4875.1	4873.1	6.51	24	0.015	9.42	50.03	0.19	9.99	0.65	0.34	0	Calculated
1373	1532	Pipe	RCP	M-463	M-464	131.45	4872.9	4861.7	8.52	24	0.015	9.42	57.23	0.16	12.76	0.55	0.28	0	Calculated
1374	1533	Pipe	HDPE	I-801	M-464	14.21	4862.7	4861.7	7.04	15	0.015	0	14.85	0	0	0.21	0.18	0	Calculated
1375	1534	Pipe	HDPE	I-800	M-464	14.7	4863.3	4861.7	10.88	15	0.015	0	18.47	0	0	0.21	0.18	0	Calculated
1376	1535	Pipe	RCP	M-464	M-469	232	4861.6	4841.8	8.53	24	0.015	9.42	57.28	0.16	10.46	0.64	0.33	0	Calculated
1377	1536	Pipe	HDPE	I-804	M-469	23.11	4842.4	4841.8	2.6	15	0.015	0.03	9.02	0	0.1	0.46	0.38	0	Calculated
1378	1537	Pipe	HDPE	M-469	M-470	174.2	4841.8	4834.4	4.25	30	0.015	15.12	73.27	0.21	5.8	1.29	0.53	0	Calculated
1379	1538	Pipe	HDPE	I-805	I-806	26.59	4835.4	4834.2	4.51	15	0.015	0	11.89	0	0	0.46	0.37	0	Calculated
1380	1539	Pipe	HDPE	M-470	I-806	98.32	4834.3	4834.2	0.1	30	0.015	15.09	11.34	1.33	4.42	1.6	0.66	0	> CAPACITY
1381	1540	Pipe	HDPE	I-806	M-471	141.44	4834.6	4809.5	17.75	30	0.015	15.09	149.75	0.1	9.02	0.9	0.37	0	Calculated
1382	1541	Pipe	RCP	I-1241	I-1240	41.26	4709.2	4705.3	9.45	15	0.015	0	17.21	0	0	0	0	0	Calculated
1383	1542	Pipe	RCP	I-1242	I-1243	39.27	4708.1	4704.4	9.42	15	0.015	0	17.18	0	0	0	0	0	Calculated
1384	1543	Pipe	RCP	I-1243	M-682	9.15	4704.3	4703	14.21	18	0.015	0	34.97	0	0	0	0	0	Calculated
1385	1544	Pipe	RCP	I-1240	M-682	46.47	4705.2	4702.3	6.24	15	0.015	0	13.99	0	0	0	0	0	Calculated
1386	1545	Pipe	RCP	M-682	M-683	302.78	4698.7	4689.8	2.94	24	0.015	7.84	33.61	0.23	8.48	0.67	0.34	0	Calculated
1387	1546	Pipe	RCP	I-1244	M-683	8.4	4691.3	4689.8	17.86	15	0.015	0	23.66	0	0	0.31	0.25	0	Calculated
1388	1547	Pipe	RCP	M-683	M-684	74.27	4689.7	4686.8	3.9	24	0.015	7.84	38.88	0.2	8.79	0.65	0.33	0	Calculated
1389	1548	Pipe	RCP	M-689	I-1245	382.3	4620.5	4577.7	11.2	30	0.015	49.16	118.94	0.41	15.61	1.53	0.61	0	Calculated
1390	1549	Pipe	RCP	I-1235	I-1245	55.35	4585.7	4578.3	13.37	15	0.015	0	20.47	0	0	0.63	0.5	0	Calculated
1391	1550	Pipe	RCP	I-1245	M-690	213.24	4578	4567.2	5.06	30	0.015	49.1	80	0.61	15.61	1.52	0.61	0	Calculated
1392	1551	Pipe	RCP	I-1256	M-704	33.71	4562.9	4561.6	3.86	18	0.015	0	17.88	0	0	0.34	0.23	0	Calculated
1393	1552	Pipe	RCP	M-704	I-1257	147.45	4560.9	4560	0.61	30	0.015	13.07	27.77	0.47	5.53	1.34	0.54	0	Calculated
1394	1553	Pipe	PVC	I-1258	I-1257	24.78	4561.1	4560	4.44	12	0.015	0.08	6.51	0.01	0.17	0.61	0.61	0	Calculated
1395	1554	Pipe	RCP	M-703	M-704	232.25	4571.7	4561.1	4.56	30	0.015	13.04	75.94	0.17	7.97	0.94	0.38	0	Calculated
1396	1555	Pipe	RCP	I-1254	M-703	39.9	4573.7	4571.8	4.76	30	0.015	13.04	77.57	0.17	9.7	0.8	0.32	0	Calculated
1397	1556	Pipe	RCP	I-1255	I-1254	22.88	4574.5	4573.8	3.06	18	0.015	0.06	15.92	0	0.14	0.45	0.3	0	Calculated
1398	1557	Pipe	RCP	I-1252	M-697	97.16	4555.9	4549.6	6.48	18	0.015	0	23.18	0	0	0	0	0	Calculated
1399	1558	Pipe	RCP	M-702	I-1254	104.51	4578.3	4573.8	4.31	30	0.015	13.04	73.76	0.18	9.75	0.79	0.32	0	Calculated
1400	1559	Pipe	RCP	M-701	M-702	97.87	4583.7	4578.4	5.42	30	0.015	13.04	82.72	0.16	11.1	0.72	0.29	0	Calculated
1401	1560	Pipe	RCP	M-700	M-701	181.55	4588.6	4583.9	2.59	30	0.015	13.04	57.2	0.23	8.89	0.85	0.34	0	Calculated
1402	1561	Pipe	RCP	I-1251	M-695	21.91	4584.1	4584	0.46	15	0.015	0	3.78	0	0	0	0	0	Calculated
1403	1562	Pipe	RCP	I-1249	I-1250	791.71	4616	4615	0.13	30	0.015	13.04	12.63	1.03	4.64	1.53	0.61	0	> CAPACITY
1404	1563	Pipe	RCP	I-1250	M-693	33.09	4615	4608.1	20.85	36	0.015	13.04	263.96	0.05	16.46	0.51	0.17	0	Calculated
1405	1564	Pipe	RCP	M-693	M-694	32.16	4600.6	4599.8	2.49	36	0.015	13.04	92.86	0.14	8.14	0.83	0.28	0	Calculated
1406	1565	Pipe	RCP	M-694	New-12	118.12	4599.8	4592	6.6	36	0.015	13.04	148.54	0.09	11.51	0.65	0.22	0	Calculated
1407	1566	Pipe	Invert elevation adjusted	New-12	M-700	28.34	4592	4588.49	12.39	30	0.015	13.04	125.1	0.1	9.25	0.82	0.33	0	Calculated
1408	1567	Pipe	RCP	M-696	M-697	273.5	4576	4559.5	6.03	18	0.015	0	22.36	0	0	0	0	0	Calculated
1409	1568	Pipe	RCP	M-697	M-698	436.57	4559.5	4529.5	6.87	18	0.015	0	23.86	0	0	0	0	0	Calculated
1410	1569	Pipe	RCP	M-695	M-696	280.71	4584	4576	2.85	18	0.015	0	15.37	0	0	0	0	0	Calculated
1411	1570	Pipe	RCP	I-1253	M-698	63.88	4543	4532.4	16.59	15	0.015	0	22.81	0	0	0	0	0	Calculated
1412	1571	Pipe	RCP	M-690	M-691	92.92	4567.1	4558	9.79	30	0.015	49.12	111.25	0.44	16.41	1.7	0.76	0	Calculated
1413	1572	Pipe	RCP	I-1257	M-691	59.97	4560	4558.4	2.67	30	0.015	19.67	58.06	0.34	8.9	1.49	0.67	0	Calculated
1414	1573	Pipe	RCP	M-691	M-692	24.87	4557.9	4550.4	30.16	30	0.015	68.19	195.21	0.35	14.86	2.33	1	1	SURCHARGED
1415	1574	Pipe	RCP	M-692	M-681	73.19	4550.3	4547	4.51	30	0.015	68.2	75.48	0.9	14.2	2.5	1	4	SURCHARGED
1416	1575	Pipe	RCP	M-681	M-680	160.99	4546.9	4441.8	65.28	30	0.015	68.19	89.92	0.76	14.6	2.5	1	4	SURCHARGED
1417	1576	Pipe	RCP	M-698	M-699	171.1	4529	4525	2.34	18	0.015	0	14.73	0	0	0.75	0.5	0	Calculated
1418	1577	Pipe	RCP	I-1233	M-699	20.2	4530.2	4529.3	4.46	15	0.015	0	11.82	0	0	0	0	0	Calculated
1419	1578	Pipe	RCP	I-1246	M-699	38.68	4531.4	4529.3	5.43	15	0.015	0	13.04	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1420	1579	Pipe	RCP	M-680	M-699	200.93	4536.6	4528.9	3.83	30	0.015	68.19	69.59	0.98	14.64	2.24	0.9	0	Calculated
1421	1580	Pipe	RCP	M-699	M-679	128.04	4521.8	4517.5	3.36	30	0.015	68.02	65.14	1.04	13.9	2.5	1	5	SURCHARGED
1422	1581	Pipe	RCP	M-679	M-678	132.67	4511.4	4506.8	3.47	30	0.015	67.91	66.19	1.03	14.12	2.48	1	4	SURCHARGED
1423	1582	Pipe	RCP	M-678	M-677	130.34	4501.4	4498.3	2.38	30	0.015	67.1	54.82	1.22	13.67	2.5	1	9	SURCHARGED
1424	1583	Pipe	RCP	I-1232	M-677	25.33	4499.5	4498.5	3.95	15	0.015	0.67	11.12	0.06	1.29	1.25	1	5	SURCHARGED
1425	1584	Pipe	RCP	I-1247	M-677	34.28	4500.5	4498.3	6.42	15	0.015	1.7	14.18	0.12	2	1.25	1	3	SURCHARGED
1426	1585	Pipe	RCP	M-677	I-1248	259.15	4494.2	4484.9	3.59	30	0.015	66.8	67.34	0.99	13.61	2.5	1	14	SURCHARGED
1427	1586	Pipe	RCP	I-1231	I-1248	73.82	4490	4485.3	6.37	15	0.015	0.61	14.13	0.04	0.82	0.82	0.69	0	Calculated
1428	1588	Pipe	HDPE	I-675	I-677	111.04	4564.2	4562.3	1.71	15	0.015	0	7.32	0	0	0	0	0	Calculated
1429	1589	Pipe	HDPE	I-677	I-678	90.99	4562.3	4562	0.33	15	0.015	0	3.21	0	0	0	0	0	Calculated
1430	1590	Pipe	HDPE	I-679	I-678	21.09	4562.4	4562	1.9	15	0.015	0	7.71	0	0	0	0	0	Calculated
1431	1591	Pipe	HDPE	I-1293	I-1294	27.1	4565.8	4565.1	2.58	15	0.015	0	9	0	0	0	0	0	Calculated
1432	1592	Pipe	HDPE	I-678	M-168	66.97	4562	4561.9	0.15	15	0.015	0	2.16	0	0	0	0	0	Calculated
1433	1593	Pipe	HDPE	I-1294	M-168	42.12	4564.1	4561.9	5.22	15	0.015	0	15.31	0	0	0	0	0	Calculated
1434	1594	Pipe	HDPE	I-310	M-168	26.44	4564.1	4561.7	9.08	15	0.015	0	16.87	0	0	0.05	0.07	0	Calculated
1435	1595	Pipe	HDPE	M-168	M-170	172.39	4561.7	4560.6	0.64	15	0.015	0.42	4.47	0.09	0.63	0.54	0.54	0	Calculated
1436	1596	Pipe	RCP	M-398	M-169	365.48	4558.7	4558.6	0.03	48	0.015	16.5	20.59	0.8	2.19	4	1	127	SURCHARGED
1437	1597	Pipe	RCP	M-169	M-171	80.96	4558.6	4558.55	0.06	48	0.015	14.99	30.94	0.48	2.22	4	1	128	SURCHARGED
1438	1598	Pipe	HDPE	M-170	I-312	119.91	4560.5	4560.4	0.08	15	0.015	1.29	1.91	0.67	1.65	1.1	1	1	SURCHARGED
1439	1599	Pipe	HDPE	I-311	I-312	26.53	4563	4560.4	9.8	15	0.015	0	17.53	0	0	0.58	0.5	0	Calculated
1440	1600	Pipe	HDPE	I-312	M-166	60.78	4560.3	4560.1	0.33	15	0.015	1.68	3.21	0.52	1.54	1.25	1	3	SURCHARGED
1441	1601	Pipe	HDPE	I-1295	I-1296	27.46	4564.6	4563.8	2.91	15	0.015	0	9.56	0	0	0	0	0	Calculated
1442	1602	Pipe	HDPE	I-1296	M-166	48.45	4563.8	4560.1	7.64	15	0.015	0	15.47	0	0	0.63	0.5	0	Calculated
1443	1603	Pipe	HDPE	M-166	I-309	243.71	4560.1	4559.4	0.29	15	0.015	1.88	3	0.63	2.21	1.25	1	6	SURCHARGED
1444	1604	Pipe	RCP	M-171	M-167	317.77	4558.55	4558.3	0.08	48	0.015	13.61	34.92	0.39	2.13	4	1	128	SURCHARGED
1445	1605	Pipe	RCP	M-167	M-165	136.16	4558.3	4558.2	0.07	48	0.015	12.02	33.74	0.36	2.05	4	1	131	SURCHARGED
1446	1606	Pipe	HDPE	I-1297	I-1298	24.05	4564.2	4563.7	2.08	15	0.015	0	8.07	0	0	0	0	0	Calculated
1447	1607	Pipe	HDPE	I-1301	I-1302	335.98	4599.9	4570.3	8.81	15	0.015	0	16.62	0	0	0	0	0	Calculated
1448	1608	Pipe	HDPE	I-1302	M-162	180.29	4570.2	4563.8	3.55	15	0.015	0	10.55	0	0	0	0	0	Calculated
1449	1609	Pipe	HDPE	I-307	I-306	24.76	4564.2	4562.9	5.25	15	0.015	0	12.83	0	0	0	0	0	Calculated
1450	1610	Pipe	HDPE	M-162	I-306	162.73	4563.9	4562.5	0.86	15	0.015	0	5.19	0	0	0	0	0	Calculated
1451	1611	Pipe	HDPE	I-306	M-163	31.87	4562.6	4560.9	5.33	15	0.015	0	12.93	0	0	0.32	0.35	0	Calculated
1452	1612	Pipe	HDPE	I-1299	I-1300	24.56	4564.9	4564.7	0.81	15	0.015	0	5.05	0	0	0	0	0	Calculated
1453	1613	Pipe	RCP	I-930	I-1378	50.73	4453.9	4453.6	0.59	12	0.015	0.05	2.37	0.02	0.36	0.56	0.56	0	Calculated
1454	1614	Pipe	RCP	I-931	I-1378	189.42	4454	4453.1	0.48	18	0.015	0.49	6.28	0.08	0.57	0.73	0.49	0	Calculated
1455	1615	Pipe	RCP	I-1378	I-967	482.3	4453	4452.2	0.17	18	0.015	3.59	3.71	0.97	2.72	1.04	0.7	0	Calculated
1456	1616	Pipe	RCP	M-376	M-372	307.24	4481.4	4479.7	0.55	18	0.015	11.21	6.77	1.66	6.46	1.44	0.96	0	> CAPACITY
1457	1617	Pipe	HDPE	M-371	M-377	289.61	4483.3	4480.6	0.93	18	0.015	0	8.79	0	0	0	0	0	Calculated
1458	1618	Pipe	RCP	M-372	O-130	455.76	4479.7	4477	0.59	24	0.015	11.21	15.09	0.74	5.23	1.29	0.65	0	Calculated
1459	1619	Pipe	HDPE	I-154	M-377	370.79	4483	4480.5	0.67	15	0.015	0	4.62	0	0	0	0	0	Calculated
1460	1620	Pipe	DUCTILE IRON - CMP	M-345	M-373	183	4478.5	4478	0.27	18	0.015	7.37	4.76	1.55	4.6	1.28	0.85	0	> CAPACITY
1461	1621	Pipe	CMP	M-373	O-70	662.24	4477.9	4465	1.95	21	0.015	7.37	18.21	0.4	6.23	1.26	0.72	0	Calculated
1462	1623	Pipe	PVC	I-236	I-235	120.44	4484.1	4484	0.08	8	0.015	0	0.31	0	0	0	0	0	Calculated
1463	1624	Pipe	PVC	I-237	I-236	67.24	4485.2	4485	0.3	8	0.015	0	0.58	0	0	0	0	0	Calculated
1464	1625	Pipe	CMP	I-237	I-123	29.44	4484	4483.9	0.34	15	0.015	0	0.33	0	0	0	0	0	Calculated
1465	1626	Pipe	RCP-ELLIPTICAL	M-59	M-57	272.95	4487.4	4482.8	1.69	15	0.015	7.17	7.27	0.99	5.84	1.25	1	72	SURCHARGED
1466	1630	Pipe	RCP	I-371	M-206	23.2	5118.4	5115.5	12.5	15	0.015	0	19.79	0	0	0	0	0	Calculated
1467	1631	Pipe	RCP	M-206	M-207	54.26	5115.5	5112.5	5.53	15	0.015	0	13.16	0	0	0	0	0	Calculated
1468	1633	Pipe	RCP	I-1136	I-1133	34.2	5175.2	5173	6.43	12	0.015	0	7.83	0	0	0	0	0	Calculated
1469	1634	Pipe	HDPE	I-1133	M-633	288.1	5172.9	5167.1	2.01	15	0.015	0	7.96	0	0	0	0	0	Calculated
1470	1635	Pipe	HDPE	I-1132	I-1131	33.62	5160.4	5147.8	37.48	15	0.015	0	34.29	0	0	0	0	0	Calculated
1471	1639	Pipe	HDPE	I-1131	I-1137	33.72	5147.7	5147.5	0.59	18	0.015	0	7.01	0	0	0	0	0	Calculated
1472	1640	Pipe	RCP	I-1008	M-578	230.3	5167.9	5153.1	6.43	15	0.015	0	14.21	0	0	0	0	0	Calculated
1473	1641	Pipe	RCP	M-578	I-1009	243.17	5153	5136.8	6.66	15	0.015	0	14.45	0	0	0	0	0	Calculated
1474	1642	Pipe	RCP	I-1010	I-1009	21.1	5136.9	5136.8	0.47	15	0.015	0	3.85	0	0	0	0	0	Calculated
1475	1643	Pipe	RCP	I-1009	M-579	45.49	5136.7	5134	5.94	15	0.015	0	13.64	0	0	0	0	0	Calculated
1476	1644	Pipe	RCP	M-579	M-580	99.7	5133.9	5127.7	6.22	15	0.015	0	13.96	0	0	0	0	0	Calculated
1477	1645	Pipe	RCP	M-580	I-1011	108.92	5127.6	5121.3	5.78	15	0.015	0	13.46	0	0	0	0	0	Calculated
1478	1647	Pipe	RCP	I-1011	M-581	73.43	5121.3	5120.3	1.36	15	0.015	0	6.53	0	0	0	0	0	Calculated
1479	1648	Pipe	RCP	M-581	I-1015	245.93	5120.2	5119.8	0.16	15	0.015	0	2.37	0	0	0	0	0	Calculated
1480	1650	Pipe	RCP	I-1015	M-583	191.88	5119.9	5119.4	0.26	15	0.015	0	2.86	0	0	0	0	0	Calculated
1481	1651	Pipe	RCP	M-583	M-584	159.06	5119.4	5118.5	0.57	15	0.015	0	4.21	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1482	1652	Pipe	HDPE	I-1013	I-1014	104.9	5116.6	5115.5	1.05	15	0.015	0	5.73	0	0	0	0	0	Calculated
1483	1653	Pipe	HDPE	I-1014	M-582	18.86	5115.4	5110.6	25.45	15	0.015	0	28.24	0	0	0	0	0	Calculated
1484	1655	Pipe	RCP	I-1041	I-1037	110.47	4972.4	4959	12.13	15	0.015	0	19.5	0	0	0	0	0	Calculated
1485	1656	Pipe	RCP	I-1007	I-1006	23.08	5147.7	5147.4	1.3	15	0.015	0	6.49	0	0	0	0	0	Calculated
1486	1657	Pipe	RCP	I-1006	M-577	133.79	5147.3	5138.1	6.88	15	0.015	0	14.68	0	0	0	0	0	Calculated
1487	1658	Pipe	RCP	M-577	M-576	130.96	5138.2	5126.7	8.78	15	0.015	0	16.59	0	0	0	0	0	Calculated
1488	1660	Pipe	RCP	M-576	I-1057	137.21	5126.6	5117	7	15	0.015	0	14.82	0	0	0.35	0.3	0	Calculated
1489	1661	Pipe	RCP	I-1005	I-1057	21.58	0	5117	-23711.8	15	0.015	0	29.77	0	0	0.35	0.3	0	Calculated
1490	1662	Pipe	RCP	I-1057	M-605	28.77	5116.9	5116.7	0.7	15	0.015	0.2	4.67	0.04	0.52	0.91	0.76	0	Calculated
1491	1663	Pipe	RCP	I-1017	M-605	51.14	5117.6	5116.4	2.35	24	0.015	0.09	30.03	0	0.09	0.71	0.37	0	Calculated
1492	1664	Pipe	RCP	I-1018	I-1017	22.37	5117.9	5117.7	0.89	15	0.015	0	5.29	0	0	0	0.02	0	Calculated
1493	1665	Pipe	RCP	M-599	I-1053	130.97	5108.1	5097.3	8.25	18	0.015	12.83	26.14	0.49	13.75	0.77	0.52	0	Calculated
1494	1666	Pipe	RCP	M-598	M-599	42.48	5112	5108.2	8.95	18	0.015	12.83	27.23	0.47	12.62	0.82	0.56	0	Calculated
1495	1667	Pipe	RCP	M-604	M-598	177.37	5114.4	5112	1.35	24	0.015	12.83	22.81	0.56	7.42	1.05	0.54	0	Calculated
1496	1668	Pipe	RCP	I-1056	M-604	40.97	5115.3	5114.5	1.95	24	0.015	12.83	27.4	0.47	6.56	1.16	0.6	0	Calculated
1497	1669	Pipe	RCP	M-605	I-1056	98.74	5116.3	5115.4	0.91	24	0.015	12.83	18.72	0.69	5.78	1.3	0.67	0	Calculated
1498	1670	Pipe	RCP	M-584	I-1017	289.01	5118.4	5117.7	0.24	21	0.015	0	6.76	0	0	0	0.01	0	Calculated
1499	1671	Pipe	RCP	I-1139	I-1130	35.69	5131.2	5129.6	4.48	12	0.015	0	6.54	0	0	0	0	0	Calculated
1500	1672	Pipe	HDPE	I-1140	I-1129	36.45	5134.7	5132.9	4.94	18	0.015	0	20.23	0	0	0	0	0	Calculated
1501	1673	Pipe	RCP-HDPE	I-1130	M-632	231.82	5129.5	5128.6	0.39	24	0.015	0	12.35	0	0	0	0	0	Calculated
1502	1674	Pipe	HDPE-RCP	I-1129	I-1130	305.85	5132.8	5129.6	1.05	18	0.015	0	9.46	0	0	0	0	0	Calculated
1503	1677	Pipe	HDPE	I-1141	I-1026	34.94	5133.8	5133.4	1.14	12	0.015	0	3.3	0	0	0	0	0	Calculated
1504	1678	Pipe	HDPE	I-1026	M-586	124.19	5133.3	5132.4	0.72	24	0.015	0	16.69	0	0	0	0	0	Calculated
1505	1679	Pipe	HDPE	M-586	M-585	322.36	5132.4	5130.85	0.48	24	0.015	0	13.6	0	0	0	0	0	Calculated
1506	1680	Pipe	RCP	I-1025	M-585	10.91	5137	5134.6	22	15	0.015	0	26.31	0	0	0	0	0	Calculated
1507	1681	Pipe	HDPE	M-585	O-89	76.8	5130.85	5130.32	0.69	24	0.015	0	16.29	0	0	0	0	0	Calculated
1508	1682	Pipe	RCP	I-1023	I-1024	356.58	5137.7	5133	1.32	18	0.015	0	10.45	0	0	0	0	0	Calculated
1509	1683	Pipe	RCP	I-1142	I-1024	34.96	5136.4	5133	9.73	15	0.015	0	17.46	0	0	0	0	0	Calculated
1510	1684	Pipe	24 RCP	I-1024	O-88	50.05	5132.9	5130	5.79	18	0.015	0	21.91	0	0	0	0	0	Calculated
1511	1685	Pipe	RCP	I-1143	I-1022	34.34	5141.9	5140.8	3.2	15	0.015	0	10.02	0	0	0	0	0	Calculated
1512	1686	Pipe	RCP	I-1022	I-1023	215.8	5140.7	5137.7	1.39	18	0.015	0	10.73	0	0	0	0	0	Calculated
1513	1687	Pipe	RCP	I-1144	I-1021	37.62	5144.9	5143.9	2.66	15	0.015	0	9.13	0	0	0	0	0	Calculated
1514	1688	Pipe	RCP	I-1021	I-1022	404.51	5143.8	5140.8	0.74	18	0.015	0	7.84	0	0	0	0	0	Calculated
1515	1689	Pipe	RCP	I-1145	I-1020	37.88	5148.2	5146.8	3.7	15	0.015	0	10.76	0	0	0	0	0	Calculated
1516	1690	Pipe	RCP	I-1020	I-1021	406.92	5146.7	5143.9	0.69	15	0.015	0	4.64	0	0	0	0	0	Calculated
1517	1691	Pipe	RCP	I-1019	I-1020	401.01	5156.4	5146.8	2.39	15	0.015	0	8.66	0	0	0	0	0	Calculated
1518	1692	Pipe	RCP	I-1146	I-1019	37.84	5160.5	5156.4	10.84	15	0.015	0	18.47	0	0	0	0	0	Calculated
1519	1693	Pipe	RCP-ELLIPTICAL	M-57	I-124	356.47	4483.7	4481	0.76	15	0.015	5.75	4.87	1.18	4.73	1.25	1	75	SURCHARGED
1520	1694	Pipe	RCP-ELLIPTICAL	I-124	M-55	17.38	4481	4480.7	1.73	15	0.015	5.48	7.36	0.75	4.72	1.25	1	62	SURCHARGED
1521	1695	Pipe	RCP	M-55	I-84	55.41	4480.6	4479.9	1.26	15	0.015	5.47	6.29	0.87	5.08	1.25	1	65	SURCHARGED
1522	1696	Pipe	RCP	I-84	M-53	337.59	4479.7	4473.8	1.75	15	0.015	7.88	7.44	1.06	6.7	1.18	0.94	0	> CAPACITY
1523	1697	Pipe	RCP	M-53	O-10	14.02	4471.8	4468	27.1	15	0.015	7.88	29.15	0.27	14.9	0.56	0.45	0	Calculated
1524	1698	Pipe	PVC	M-56	M-54	470.6	4476.5	4470.3	1.32	8	0.015	0	1.22	0	0	0	0	0	Calculated
1525	1699	Pipe	PVC	M-54	O-11	178.57	4470.2	4469	0.67	8	0.015	0	0.88	0	0	0	0	0	Calculated
1526	1700	Pipe	RCP	I-80	I-81	40.48	4456.3	4453.6	6.67	15	0.015	0	14.46	0	0	0	0	0	Calculated
1527	1701	Pipe	HDPE	I-308	M-164	31.76	4557.8	4557.7	0.31	15	0.015	1.57	3.14	0.5	1.28	1.25	1	16	SURCHARGED
1528	1702	Pipe	HDPE	I-1298	M-164	38.85	4563.7	4557.8	15.19	15	0.015	0	21.82	0	0	0.63	0.5	0	Calculated
1529	1703	Pipe	HDPE	I-309	M-164	39.72	4559.4	4557.8	4.03	15	0.015	2.66	11.24	0.24	2.93	1.25	1	11	SURCHARGED
1530	1704	Pipe	HDPE	I-1300	M-163	41.1	4564.6	4560.9	9	15	0.015	0	16.8	0	0	0.32	0.35	0	Calculated
1531	1705	Pipe	HDPE	M-163	I-308	280.5	4560.8	4557.7	1.11	15	0.015	1.07	5.98	0.18	1.12	0.95	0.85	0	Calculated
1532	1706	Pipe	HDPE	I-1329	I-1330	61.62	5131.2	5128.6	4.22	15	0.015	0	11.5	0	0	0	0	0	Calculated
1533	1707	Pipe	HDPE	I-1330	I-1331	122.36	5128.5	5125.2	2.7	15	0.015	0	9.19	0	0	0	0	0	Calculated
1534	1708	Pipe	HDPE	I-1331	M-747	292.16	5125.1	5111.1	4.79	15	0.015	0	12.26	0	0	0.63	0.5	0	Calculated
1535	1709	Pipe	HDPE	I-1332	M-747	21.98	5113.3	5111.3	9.1	15	0.015	1.54	16.89	0.09	1.62	1.17	1	1	SURCHARGED
1536	1710	Pipe	HDPE	I-1394	M-747	13.34	5113.3	5111.3	14.99	15	0.015	1.52	21.68	0.07	1.98	1.18	1	0	SURCHARGED
1537	1711	Pipe	HDPE	I-1335	I-1334	26.55	5110.7	5110.4	1.13	15	0.015	1.94	5.95	0.33	1.65	1.25	1	14	SURCHARGED
1538	1712	Pipe	HDPE	I-1334	I-1333	153.11	5110.4	5109.8	0.39	15	0.015	2.38	3.5	0.68	1.94	1.25	1	15	SURCHARGED
1539	1713	Pipe	HDPE	I-1333	M-748	90.92	5109.7	5108.6	1.21	15	0.015	2.9	6.16	0.47	2.36	1.25	1	18	SURCHARGED
1540	1714	Pipe	HDPE	M-747	M-748	36.2	5110.2	5108.6	4.42	15	0.015	3.63	11.77	0.31	2.96	1.25	1	16	SURCHARGED
1541	1715	Pipe	HDPE	M-377	M-780	220.31	4480.3	4478.8	0.68	18	0.015	0	7.51	0	0	0	0	0	Calculated
1542	1716	Pipe	HDPE	I-1075	M-613	184.19	4453.6	4451.9	0.92	15	0.015	0	5.38	0	0	0.05	0.04	0	Calculated
1543	1717	Pipe	HDPE	M-613	I-1076	311.41	4451.8	4451.2	0.19	15	0.015	0.09	2.46	0.04	1	0.16	0.13	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1544	1718	Pipe	HDPE	I-1076	O-145	79.95	4451.2	4449.6	2	15	0.015	0.09	7.92	0.01	2.15	0.09	0.08	0	Calculated
1545	1722	Pipe	HDPE	I-1407	I-1406	26.97	4450.1	4447.5	9.64	12	0.015	0	9.49	0	0	0	0	0	Calculated
1546	1723	Pipe	HDPE	I-1406	I-1405	50.75	4447.6	4447.5	0.2	12	0.015	0	1.37	0	0	0	0	0	Calculated
1547	1724	Pipe	HDPE	I-1405	O-141	12.98	4447.5	4446	11.56	12	0.015	0	10.5	0	0	0	0	0	Calculated
1548	1725	Pipe	HDPE	I-1065	I-1064	30.81	4448.2	4447.4	2.6	15	0.015	0	9.24	0	0	0.27	0.22	0	Calculated
1549	1726	Pipe	HDPE	I-1064	O-139	106.98	4447.3	4445	2.15	15	0.015	3.7	8.21	0.45	6.15	0.62	0.49	0	Calculated
1550	1733	Pipe	RCP	I-1395	I-1396	17.88	4440.2	4439.3	5.03	15	0.015	0	12.56	0	0	0	0	0	Calculated
1551	1734	Pipe	RCP	I-1396	O-132	9.17	4439.3	4439.2	1.09	15	0.015	0	5.85	0	0	0	0	0	Calculated
1552	1735	Pipe	RCP	I-1398	I-1397	17.56	4439.8	4439.3	2.85	15	0.015	0	9.45	0	0	0	0	0	Calculated
1553	1736	Pipe	RCP	I-1397	O-133	9.23	4439.3	4438.9	4.33	15	0.015	0	11.65	0	0	0	0	0	Calculated
1554	1737	Pipe	RCP	I-1432	I-1433	27.63	4439.6	4439.5	0.36	15	0.015	0	3.37	0	0	0	0	0	Calculated
1555	1738	Pipe	RCP	I-1433	I-1434	33.19	4439.5	4438.5	3.01	15	0.015	0	9.72	0	0	0	0	0	Calculated
1556	1739	Pipe	HDPE	I-1434	O-146	9.75	4438.4	4437.5	9.23	18	0.015	0	27.66	0	0	0	0	0	Calculated
1557	1740	Pipe	HDPE	I-1353	I-1354	110.19	5139.7	5129.9	8.89	15	0.015	0	16.7	0	0	0	0	0	Calculated
1558	1741	Pipe	HDPE	I-1354	M-757	185.78	5127.6	5112.2	8.29	15	0.015	0	16.12	0	0	0.63	0.5	0	Calculated
1559	1742	Pipe	HDPE	M-757	M-748	87.81	5112	5108.6	3.87	15	0.015	3.53	11.02	0.32	3.28	1.25	1	9	SURCHARGED
1560	1743	Pipe	HDPE	M-748	I-1336	229.87	5108.5	5104.4	1.78	15	0.015	9.45	7.48	1.26	7.7	1.25	1	22	SURCHARGED
1561	1744	Pipe	HDPE	I-1336	M-749	112.39	5104.5	5102.7	1.6	15	0.015	9.47	7.09	1.34	7.8	1.2	0.97	0	> CAPACITY
1562	1745	Pipe	HDPE	I-1337	M-749	50.02	5103.7	5102.7	2	15	0.015	0.06	7.92	0.01	0.11	0.62	0.5	0	Calculated
1563	1746	Pipe	HDPE	M-749	M-750	253.13	5102.6	5101.1	0.59	24	0.015	9.07	15.09	0.6	4.87	1.15	0.57	0	Calculated
1564	1747	Pipe	HDPE	M-750	M-751	229.99	5101	5093.7	3.17	24	0.015	9.07	34.93	0.26	5.5	1.16	0.58	0	Calculated
1565	1748	Pipe	HDPE	I-1338	M-751	42.05	5101.9	5100	4.52	15	0.015	0	12.09	0	0	0	0	0	Calculated
1566	1749	Pipe	HDPE	I-1340	I-1339	25.91	5104.3	5103.9	1.54	15	0.015	0	6.96	0	0	0	0	0	Calculated
1567	1750	Pipe	HDPE	I-1339	I-1338	45.12	5103.9	5102	4.21	15	0.015	0	11.49	0	0	0	0	0	Calculated
1568	1751	Pipe	HDPE	I-1341	M-751	150.37	5096.4	5093.7	1.8	15	0.015	0	7.5	0	0	0.63	0.5	0	Calculated
1569	1752	Pipe	HDPE	M-751	M-752	213.59	5093.6	5092.1	0.7	30	0.015	20.33	29.79	0.68	5.97	1.63	0.65	0	Calculated
1570	1753	Pipe	HDPE	I-1342	M-752	22.02	5099	5096.9	9.54	15	0.015	0	17.29	0	0	0	0	0	Calculated
1571	1754	Pipe	HDPE	I-1343	M-752	18.3	5099	5096.9	11.48	15	0.015	0	18.97	0	0	0	0	0	Calculated
1572	1755	Pipe	HDPE	M-752	M-753	419.53	5092	5089.2	0.67	30	0.015	20.34	29.04	0.7	5.86	1.7	0.68	0	Calculated
1573	1756	Pipe	HDPE	I-1344	M-753	39.24	5099.1	5096.8	5.86	15	0.015	0	13.55	0	0	0	0	0	Calculated
1574	1757	Pipe	HDPE	M-753	M-758	150.3	5089.2	5086	2.13	30	0.015	30.91	51.87	0.6	6.94	2.13	0.85	0	Calculated
1575	1758	Pipe	HDPE	M-758	I-1355	73.04	5085.9	5085.8	0.14	30	0.015	30.91	13.15	2.35	6.76	2.2	0.88	0	> CAPACITY
1576	1759	Pipe	HDPE	I-1352	I-1351	29.31	5134.3	5134.2	0.34	15	0.015	0	3.27	0	0	0	0	0	Calculated
1577	1760	Pipe	HDPE	I-1351	M-756	120.79	5134.1	5130.2	3.23	15	0.015	0	10.06	0	0	0	0	0	Calculated
1578	1761	Pipe	HDPE	M-756	I-1350	117.51	5130.1	5127.5	2.21	15	0.015	0	8.33	0	0	0	0	0	Calculated
1579	1762	Pipe	HDPE	I-1350	I-1349	107.13	5127.4	5123.3	3.83	15	0.015	0	10.95	0	0	0	0	0	Calculated
1580	1763	Pipe	HDPE	I-1349	M-754	158.49	5122.6	5118.2	2.78	15	0.015	0	9.33	0	0	0	0	0	Calculated
1581	1764	Pipe	HDPE	M-754	M-755	280.35	5118.1	5096.6	7.67	15	0.015	0	15.5	0	0	0.63	0.5	0	Calculated
1582	1765	Pipe	HDPE	I-1347	M-755	52.42	5102.1	5096.8	10.11	15	0.015	2.21	17.89	0.12	2.3	1.25	1	10	SURCHARGED
1583	1766	Pipe	HDPE	I-1348	I-1347	40.72	5102.6	5102.2	0.98	15	0.015	1.61	5.55	0.29	1.35	1.25	1	8	SURCHARGED
1584	1767	Pipe	RCP	I-1615	M-891	55.9	4827	4826	1.79	21	0.015	19.44	18.37	1.06	8.23	1.67	0.95	0	> CAPACITY
1585	1768	Pipe	RCP	M-891	M-892	378.19	4820.5	4801.9	4.92	21	0.015	21.37	30.45	0.7	12.76	1.15	0.66	0	Calculated
1586	1769	Pipe	RCP	M-892	M-893	39.36	4801.8	4798.1	9.4	21	0.015	21.37	42.1	0.51	13.79	1.08	0.61	0	Calculated
1587	1770	Pipe	RCP	M-893	M-894	111.57	4791.5	4768.5	20.61	24	0.015	21.37	84.14	0.25	9.49	1.35	0.67	0	Calculated
1588	1771	Pipe	RCP	M-894	O-112	25.16	4778	4770.5	29.81	24	0.015	21.37	107.04	0.2	13.91	1.42	0.71	0	Calculated
1589	1772	Pipe	HDPE	I-1266	M-714	299.48	4779.8	4778.5	0.43	15	0.015	2.42	3.69	0.66	2.26	1.25	1	12	SURCHARGED
1590	1773	Pipe	HDPE	M-714	I-1264	289.49	4778.5	4776.9	0.55	15	0.015	2.71	4.16	0.65	2.26	1.25	1	22	SURCHARGED
1591	1774	Pipe	HDPE	I-1265	I-1264	26.89	4788.7	4786.7	7.44	15	0.015	0	15.27	0	0	0	0	0	Calculated
1592	1775	Pipe	HDPE	I-1264	M-713	111.22	4776.9	4771.6	4.77	15	0.015	15.18	12.22	1.24	12.37	1.25	1	24	SURCHARGED
1593	1776	Pipe	HDPE	I-1260	I-1261	40.44	4754.2	4751.7	6.18	15	0.015	0	13.92	0	0	0	0	0	Calculated
1594	1777	Pipe	HDPE	I-1261	I-1262	20.13	4751.7	4750.3	6.95	15	0.015	0	14.5	0	0	0	0	0	Calculated
1595	1778	Pipe	HDPE	I-1355	M-759	185.69	5085.7	5060	13.84	30	0.015	30.91	132.25	0.23	20.65	0.86	0.34	0	Calculated
1596	1779	Pipe	HDPE	M-759	M-760	34.32	5057.9	5054.2	10.78	30	0.015	30.91	116.72	0.26	15.05	1.09	0.44	0	Calculated
1597	1780	Pipe	HDPE	M-760	M-761	319.41	5051.6	4951.3	31.4	30	0.015	30.91	199.2	0.16	28.63	0.68	0.27	0	Calculated
1598	1781	Pipe	HDPE	M-761	M-762	114.83	4948.6	4901	41.45	30	0.015	30.91	228.87	0.14	30.26	0.65	0.26	0	Calculated
1599	1782	Pipe	HDPE	M-762	M-763	86.24	4897.8	4864.7	38.38	30	0.015	30.91	220.23	0.14	28.71	0.68	0.27	0	Calculated
1600	1783	Pipe	HDPE	M-763	M-764	123.76	4861.5	4840.8	16.73	30	0.015	30.91	145.38	0.21	21.57	0.83	0.33	0	Calculated
1601	1784	Pipe	HDPE	I-1262	M-709	29.63	4750.4	4748.6	6.07	15	0.015	0	13.8	0	0	0	0	0	Calculated
1602	1785	Pipe	HDPE	I-1263	M-709	11.68	4748.6	4748.5	0.86	15	0.015	0	5.18	0	0	0	0	0	Calculated
1603	1786	Pipe	RCP	M-709	M-710	237.32	4748.4	4744.1	1.81	15	0.015	0	7.54	0	0	0.3	0.24	0	Calculated
1604	1787	Pipe	15 to 18 HDPE	M-713	M-710	143.58	4771.5	4743.9	19.22	15	0.015	15.18	24.55	0.62	19.54	0.78	0.62	0	Calculated
1605	1788	Pipe	HDPE	M-710	M-711	85.29	4743.8	4735.4	9.85	18	0.015	15.17	28.57	0.53	10.83	1.2	0.8	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1606	1789	Pipe	HDPE	M-712	I-1264	278.54	4794.8	4786.7	2.91	15	0.015	8.64	9.55	0.9	8.46	0.97	0.78	0	Calculated
1607	1790	Pipe	HDPE	I-1616	I-1617	53.74	4743.7	4740.7	5.58	15	0.015	0	13.23	0	0	0	0	0	Calculated
1608	1791	Pipe	HDPE	I-1620	I-1619	48.44	4735.9	4731.4	9.29	15	0.015	0	17.06	0	0	0	0	0	Calculated
1609	1792	Pipe	HDPE	I-1619	I-1618	12.76	4731.2	4731.1	0.78	15	0.015	0	4.96	0	0	0	0	0	Calculated
1610	1793	Pipe	HDPE	I-1617	I-1622	394.93	4740.6	4729.4	2.84	15	0.015	0	9.43	0	0	0	0	0	Calculated
1611	1794	Pipe	HDPE	I-1618	I-1621	124.13	4731	4728.2	2.26	15	0.015	0	8.41	0	0	0	0	0	Calculated
1612	1795	Pipe	HDPE	I-1622	I-1621	48.8	4729.3	4728.1	2.46	15	0.015	0	8.96	0	0	0	0	0	Calculated
1613	1796	Pipe	HDPE	I-1621	M-722	90.81	4728	4727.6	0.44	15	0.015	0	3.72	0	0	0	0	0	Calculated
1614	1797	Pipe	HDPE	M-722	M-902	118.21	4727.5	4725	2.11	15	0.015	0	8.14	0	0	0	0	0	Calculated
1615	1798	Pipe	HDPE	M-902	M-719	264.11	4725.1	4711.5	5.15	15	0.015	0	12.7	0	0	0	0	0	Calculated
1616	1799	Pipe	HDPE	I-1624	I-1623	41.79	4731.8	4731.5	0.72	15	0.015	0	4.74	0	0	0	0	0	Calculated
1617	1800	Pipe	HDPE	I-1623	M-895	23.18	4731.4	4729.6	7.77	15	0.015	0	15.6	0	0	0	0	0	Calculated
1618	1802	Pipe	HDPE	I-1627	I-1628	21.76	4757.5	4756.8	3.22	15	0.015	0.71	10.11	0.07	0.6	1.25	1	5	SURCHARGED
1619	1803	Pipe	HDPE	I-1628	M-899	33.65	4756.8	4755.1	5.05	18	0.015	14.77	20.46	0.72	9.43	1.5	1	8	SURCHARGED
1620	1804	Pipe	HDPE	M-899	I-1626	112.67	4754.9	4751.2	3.28	18	0.015	14.77	16.5	0.9	8.36	1.5	1	10	SURCHARGED
1621	1805	Pipe	HDPE	I-1626	I-1625	62.13	4751.1	4749.6	2.41	18	0.015	14.78	14.15	1.04	8.46	1.45	0.97	0	> CAPACITY
1622	1806	Pipe	HDPE	I-1625	M-898	57.16	4749.5	4741.1	14.7	18	0.015	14.77	34.9	0.42	16.48	0.76	0.51	0	Calculated
1623	1807	Pipe	HDPE	M-898	O-173	98.68	4741	4714.2	27.16	18	0.015	14.76	47.44	0.31	22.09	0.73	0.49	0	Calculated
1624	1808	Pipe	HDPE	I-1629	I-1630	32.81	4760.1	4757.9	6.71	15	0.015	0	14.63	0	0	0	0	0	Calculated
1625	1809	Pipe	HDPE	I-1630	I-1632	138.57	4757.7	4756	1.23	15	0.015	0	6.2	0	0	0	0	0	Calculated
1626	1810	Pipe	HDPE	I-1631	I-1632	46.21	4757.5	4756.2	2.81	15	0.015	0	9.39	0	0	0	0	0	Calculated
1627	1811	Pipe	HDPE	I-1632	M-900	97.01	4756.1	4746.8	9.59	18	0.015	0	28.19	0	0	0	0	0	Calculated
1628	1812	Pipe	HDPE	M-900	M-897	109.82	4746.6	4722.5	21.95	18	0.015	0	42.61	0	0	0	0	0	Calculated
1629	1813	Pipe	HDPE	M-897	O-175	78.83	4722.5	4718	5.71	18	0.015	0	21.85	0	0	0	0	0	Calculated
1630	1816	Pipe	HDPE	I-1633	M-901	181.96	4703.1	4684	10.5	36	0.015	12	187.28	0.06	5.45	1.33	0.44	0	Calculated
1631	1817	Pipe	HDPE	M-901	M-903	32.45	4683.9	4683.7	0.62	24	0.015	11.99	15.39	0.78	3.82	2	1	17	SURCHARGED
1632	1818	Pipe	HDPE	I-1585	I-1586	40.6	4714.4	4712.1	5.67	15	0.015	0	13.33	0	0	0	0	0	Calculated
1633	1819	Pipe	HDPE	I-1586	I-1588	20.17	4712	4711.8	0.99	15	0.015	0	5.57	0	0	0	0	0	Calculated
1634	1820	Pipe	HDPE	I-1588	I-1587	37.99	4711.7	4709.9	4.74	15	0.015	0	12.19	0	0	0	0	0	Calculated
1635	1821	Pipe	HDPE	I-1587	M-903	94.68	4709.8	4701.5	8.77	15	0.015	0	16.58	0	0	0	0	0	Calculated
1636	1822	Pipe	RCP	M-903	I-1634	121.67	4683.5	4683.4	0.08	24	0.015	11.99	5.62	2.13	3.94	1.86	0.93	0	> CAPACITY
1637	1823	Pipe	RCP	I-1634	I-1635	67.78	4683.3	4683.1	0.3	24	0.015	11.99	10.65	1.13	4.65	1.53	0.76	0	> CAPACITY
1638	1824	Pipe	RCP	I-1635	I-1636	261.7	4683	4668.3	5.62	24	0.015	11.99	46.47	0.26	11.98	0.71	0.36	0	Calculated
1639	1825	Pipe	RCP	I-1604	I-1603	26.14	4701.6	4701.5	0.38	15	0.015	0	3.46	0	0	0	0	0	Calculated
1640	1826	Pipe	RCP	I-1603	M-904	66	4701.4	4679.5	33.18	15	0.015	0	32.25	0	0	0	0	0	Calculated
1641	1828	Pipe	RCP	I-1636	I-1637	93.23	4661.3	4658.7	2.79	30	0.015	33.57	59.36	0.57	10.62	1.53	0.61	0	Calculated
1642	1829	Pipe	RCP	I-1598	I-1636	308.75	4663.8	4661.2	0.84	30	0.015	0	32.62	0	0	0.91	0.36	0	Calculated
1643	1830	Pipe	RCP	M-881	I-1606	133.65	4703	4701.9	0.82	15	0.015	0	5.13	0	0	0	0	0	Calculated
1644	1831	Pipe	RCP	I-1606	I-1605	58.84	4702	4699.3	4.59	15	0.015	0	11.99	0	0	0	0	0	Calculated
1645	1832	Pipe	RCP	I-1605	M-880	12.71	4699.3	4696	25.96	15	0.015	0	28.53	0	0	0	0	0	Calculated
1646	1833	Pipe	RCP	M-880	M-879	101.77	4683.6	4680.6	2.95	15	0.015	0	9.61	0	0	0	0	0	Calculated
1647	1834	Pipe	RCP	M-879	M-878	62.04	4680.6	4676.6	6.45	15	0.015	0	14.22	0	0	0	0	0	Calculated
1648	1835	Pipe	RCP	M-878	I-1602	433.82	4676.6	4661.3	3.53	15	0.015	0	10.51	0	0	0	0	0	Calculated
1649	1836	Pipe	RCP	I-1601	I-1602	30.76	4661.6	4661.3	0.98	15	0.015	0	5.53	0	0	0	0	0	Calculated
1650	1838	Pipe	RCP	I-1600	I-1599	65.19	4681.4	4680.3	1.69	15	0.015	0	7.27	0	0	0	0	0	Calculated
1651	1839	Pipe	RCP	I-1599	I-1598	173.75	4680.2	4664	9.32	15	0.015	0	17.09	0	0	0	0	0	Calculated
1652	1840	Pipe	RCP	M-877	I-1598	37.14	4664.2	4663.9	0.81	24	0.015	0	17.62	0	0	0	0	0	Calculated
1653	1841	Pipe	RCP	I-1596	M-877	57.59	4664.8	4664.2	1.04	24	0.015	0	20.18	0	0	0	0	0	Calculated
1654	1842	Pipe	RCP	I-1597	I-1596	27.01	4665.2	4665	0.74	15	0.015	0	4.82	0	0	0	0	0	Calculated
1655	1843	Pipe	RCP	I-1595	I-1596	212.34	4666.3	4664.9	0.66	24	0.015	0	15.92	0	0	0	0	0	Calculated
1656	1844	Pipe	RCP	I-1593	I-1595	184.81	4667.9	4666.4	0.81	24	0.015	0	17.66	0	0	0	0	0	Calculated
1657	1845	Pipe	RCP	I-1594	I-1593	31.59	4668.7	4668.1	1.9	15	0.015	0	7.72	0	0	0	0	0	Calculated
1658	1846	Pipe	HDPE	I-1589	I-1590	40.28	4691.2	4690.1	2.73	15	0.015	0	9.25	0	0	0	0	0	Calculated
1659	1847	Pipe	HDPE	I-1590	I-1591	19.18	4690	4687	15.64	15	0.015	0	22.14	0	0	0	0	0	Calculated
1660	1848	Pipe	HDPE	I-1591	I-1592	34.36	4687	4686.1	2.62	15	0.015	0	9.06	0	0	0	0	0	Calculated
1661	1849	Pipe	HDPE	I-1592	M-876	30.11	4686	4685.1	2.99	15	0.015	0	9.68	0	0	0	0	0	Calculated
1662	1852	Pipe	RCP	I-1637	O-176	146.8	4658.6	4627.1	21.46	30	0.015	33.57	164.67	0.2	11.31	1.45	0.58	0	Calculated
1663	1853	Pipe	RCP	I-1638	O-177	46.7	4626	4620	12.85	48	0.015	33.5	446.23	0.08	14.32	0.95	0.24	0	Calculated
1664	1854	Pipe	HDPE	I-1614	I-1613	40.78	4668.7	4666.9	4.41	18	0.015	0.09	19.13	0	0.1	0.87	0.6	0	Calculated
1665	1855	Pipe	RCP	M-884	M-883	86.65	4666.8	4666.4	0.46	24	0.015	10.14	13.32	0.76	3.23	2	1	14	SURCHARGED
1666	1856	Pipe	HDPE	I-1613	M-883	10.44	4666.8	4665.9	8.62	18	0.015	0.19	17.82	0.01	0.11	1.5	1	20	SURCHARGED
1667	1857	Pipe	HDPE	M-883	I-1612	12.63	4666.4	4666.2	1.58	18	0.015	10.15	11.46	0.89	5.74	1.5	1	35	SURCHARGED

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1668	1858	Pipe	HDPE	I-1612	I-1611	32.77	4666.2	4666.1	0.31	18	0.015	10.14	5.03	2.02	6.01	1.36	0.91	0	> CAPACITY
1669	1859	Pipe	HDPE	I-1611	M-882	21.24	4666	4662.1	18.36	18	0.015	10.14	39.01	0.26	8.45	1.31	0.89	0	Calculated
1670	1860	Pipe	RCP	I-1609	I-1610	31.26	4661.2	4660.3	2.88	15	0.015	0.53	9.55	0.06	0.49	1.25	1	52	SURCHARGED
1671	1861	Pipe	RCP	M-885	I-1610	92.31	4660.8	4660.3	0.54	18	0.015	8.41	6.7	1.25	4.76	1.5	1	77	SURCHARGED
1672	1862	Pipe	RCP	M-882	M-885	87.75	4662.1	4660.8	1.48	18	0.015	10.14	11.08	0.91	5.74	1.5	1	54	SURCHARGED
1673	1865	Pipe	RCP	I-1610	New-7	152.49	4660.3	4660	0.2	18	0.015	8.41	4.04	2.08	4.76	1.5	1	60	SURCHARGED
1674	1866	Pipe	HDPE	M-400	I-1172	174.33	5064.5	5050.9	7.8	24	0.015	26.87	54.76	0.49	16.09	1.05	0.52	0	Calculated
1675	1867	Pipe	HDPE	I-1172	I-1158	183	5050.8	5036.3	7.92	24	0.015	26.87	55.21	0.49	15.44	1.08	0.54	0	Calculated
1676	1868	Pipe	RCP	I-1055	M-916	73.35	5045.4	5039.6	7.91	18	0.015	12.83	25.6	0.5	12.88	0.81	0.55	0	Calculated
1677	1869	Pipe	RCP	M-916	M-917	50.55	5039.5	5033.8	11.28	18	0.015	12.83	30.57	0.42	14.21	0.75	0.51	0	Calculated
1678	1870	Pipe	RCP	M-917	M-918	171.72	5033.7	5008.9	14.44	18	0.015	12.83	34.6	0.37	9.55	1.06	0.71	0	Calculated
1679	1871	Pipe	RCP	M-918	O-178	274.4	5008.8	4987.7	7.69	18	0.015	25.72	25.27	1.02	18.24	1.5	1	26	SURCHARGED
1680	1872	Pipe	HDPE	O-179	I-1155	148.46	4986	4967	12.8	15	0.015	13.69	20.03	0.68	12.96	1	0.8	0	Calculated
1681	1873	Pipe	HDPE	M-471	O-148	127.69	4809.4	4808.3	0.86	30	0.015	15.09	32.39	0.47	8.42	0.95	0.39	0	Calculated
1682	1874	Pipe	HDPE	M-468	I-802	261.61	4871.8	4869.7	0.8	24	0.015	0	17.57	0	0	0	0	0	Calculated
1683	1875	Pipe	HDPE	I-803	I-802	23.93	4870.3	4869.7	2.51	15	0.015	0	8.86	0	0	0	0	0	Calculated
1684	1876	Pipe	HDPE	I-802	M-467	85.28	4869.5	4868.5	1.17	24	0.015	0	21.76	0	0	0	0	0	Calculated
1685	1877	Pipe	HDPE	M-467	M-466	109.36	4868.5	4868.1	0.37	24	0.015	0	11.86	0	0	0.09	0.06	0	Calculated
1686	1878	Pipe	HDPE	M-466	M-465	92.36	4868	4867.4	0.65	24	0.015	0.14	15.8	0.01	0.31	0.58	0.32	0	Calculated
1687	1879	Pipe	HDPE	I-770	O-73	248.16	4828.6	4802.7	10.44	30	0.015	33.35	114.75	0.29	20.9	0.88	0.36	0	Calculated
1688	1880	Pipe	HDPE	I-769	I-770	111.88	4830.8	4828.8	1.79	30	0.015	33.34	47.53	0.7	9.12	1.69	0.7	0	Calculated
1689	1882	Pipe	HDPE	I-768	I-769	65.31	4834.8	4830.9	5.97	30	0.015	33.35	86.87	0.38	10.06	1.54	0.64	0	Calculated
1690	1883	Pipe	HDPE	M-439	I-768	129.79	4845.1	4834.9	7.86	30	0.015	33.35	99.65	0.33	14.6	1.14	0.47	0	Calculated
1691	1884	Pipe	HDPE	I-767	M-439	198.96	4863.4	4845.2	9.15	30	0.015	33.34	107.52	0.31	17.6	0.99	0.41	0	Calculated
1692	1885	Pipe	HDPE	M-632	I-1639	72.14	5128.5	5128.4	0.14	24	0.015	0	7.3	0	0	0	0	0	Calculated
1693	1886	Pipe	RCP	I-1639	M-905	100.03	5128.4	5117	11.4	15	0.015	0	18.9	0	0	0	0	0	Calculated
1694	1887	Pipe	RCP	M-905	I-1645	51.31	5116.9	5116.2	1.36	15	0.015	0	6.54	0	0	0	0	0	Calculated
1695	1888	Pipe	RCP	I-1645	M-907	122.17	5116.1	5111.8	3.52	15	0.015	0	10.5	0	0	0	0	0	Calculated
1696	1889	Pipe	RCP	M-907	I-1646	74.76	5111.7	5109.3	3.21	15	0.015	0	10.03	0	0	0	0	0	Calculated
1697	1890	Pipe	RCP	I-1646	M-908	49.57	5109.2	5104.6	9.28	15	0.015	0	17.05	0	0	0	0	0	Calculated
1698	1891	Pipe	RCP	M-908	M-909	124.85	5104.5	5097.5	5.61	15	0.015	0	13.26	0	0	0	0	0	Calculated
1699	1892	Pipe	RCP	M-909	M-910	71.14	5097.4	5092.9	6.33	15	0.015	0	14	0	0	0	0	0	Calculated
1700	1893	Pipe	RCP	M-910	M-911	86.48	5092.9	5085.3	8.79	15	0.015	0	16.65	0	0	0	0	0	Calculated
1701	1894	Pipe	RCP	M-911	M-912	351.48	5085.2	5066	5.46	15	0.015	0	13.08	0	0	0.63	0.5	0	Calculated
1702	1895	Pipe	RCP	I-1647	M-912	25.82	5074.1	5071.5	10.07	15	0.015	0	17.87	0	0	0	0	0	Calculated
1703	1896	Pipe	RCP	I-1644	M-905	32.78	0	5117	-15610.1	15	0.015	0	7.32	0	0	0	0	0	Calculated
1704	1897	Pipe	RCP	M-906	I-1644	78.03	5117.9	5117.7	0.26	15	0.015	0	2.83	0	0	0	0	0	Calculated
1705	1898	Pipe	RCP	I-1642	M-906	189.42	5120.9	5117.9	1.58	15	0.015	0	7.05	0	0	0	0	0	Calculated
1706	1899	Pipe	RCP	I-1643	I-1642	23.53	5121.3	5121	1.27	15	0.015	0	6.32	0	0	0	0	0	Calculated
1707	1900	Pipe	RCP	I-1641	I-1642	286.37	5122.7	5121.1	0.56	15	0.015	0	4.18	0	0	0	0	0	Calculated
1708	1901	Pipe	RCP	I-1640	I-1641	83.65	5123.6	5122.8	0.96	15	0.015	0	5.47	0	0	0	0	0	Calculated
1709	1902	Pipe	RCP	I-1648	I-1640	209.4	5125	5123.5	0.72	15	0.015	0	4.74	0	0	0	0	0	Calculated
1710	1903	Pipe	RCP	I-1649	I-1648	26.52	5125.4	5125.1	1.13	15	0.015	0	5.95	0	0	0	0	0	Calculated
1711	1904	Pipe	RCP	I-1650	M-913	33.33	5092.4	5091.5	2.7	15	0.015	0	9.2	0	0	0	0	0	Calculated
1712	1905	Pipe	RCP	I-1651	M-913	27.25	5092	5091.5	1.83	15	0.015	0	7.58	0	0	0	0	0	Calculated
1713	1906	Pipe	RCP	M-913	I-1652	59.69	5091.4	5091.3	0.17	15	0.015	0	2.29	0	0	0	0	0	Calculated
1714	1907	Pipe	RCP	I-1652	I-1653	25.53	5091.2	5090	4.7	15	0.015	0	12.14	0	0	0	0	0	Calculated
1715	1908	Pipe	RCP	I-1653	M-914	120.26	5089.9	5083.8	5.07	15	0.015	0	12.63	0	0	0	0	0	Calculated
1716	1909	Pipe	RCP	M-914	M-915	292.6	5083.7	5070.7	4.44	15	0.015	0	11.8	0	0	0	0	0	Calculated
1717	1910	Pipe	RCP	M-915	I-1654	118.31	5070.7	5069.1	1.35	15	0.015	0	6.51	0	0	0	0	0	Calculated
1718	1911	Pipe	RCP	I-1654	I-1655	24.61	5069.1	5068.7	1.63	15	0.015	0	7.14	0	0	0	0	0	Calculated
1719	1912	Pipe	RCP	I-1655	M-912	35.56	5068.7	5066	7.59	15	0.015	0.01	15.43	0	0.01	0.63	0.51	0	Calculated
1720	1913	Pipe	RCP	M-912	I-1127	132.61	5065.9	5052.2	10.33	18	0.015	23.12	29.29	0.79	13.24	1.5	1	6	SURCHARGED
1721	1914	Pipe	RCP	I-1127	I-1128	26.44	5052.2	5051.4	3.03	18	0.015	23.12	15.74	1.47	14.64	1.25	0.84	0	> CAPACITY
1722	1915	Pipe	RCP	I-1128	M-629	154.24	5051.4	5030.1	13.81	18	0.015	23.12	33.84	0.68	18.62	0.99	0.66	0	Calculated
1723	1916	Pipe	HDPE	I-1527	I-1526	34.35	4747	4745.4	4.66	15	0.015	0	12.08	0	0	0	0	0	Calculated
1724	1917	Pipe	HDPE	I-1526	M-648	81.03	4745.3	4739.2	7.53	15	0.015	0	15.39	0	0	0.23	0.18	0	Calculated
1725	1918	Pipe	HDPE	I-1529	I-1528	24.14	4696	4694.6	5.8	15	0.015	0	13.48	0	0	0	0	0	Calculated
1726	1919	Pipe	HDPE	I-1528	M-856	224.83	4694.5	4677.5	7.56	15	0.015	0	15.39	0	0	0	0	0	Calculated
1727	1920	Pipe	HDPE	I-1536	I-1530	260.01	4724.4	4679.6	17.23	15	0.015	0	23.24	0	0	0	0	0	Calculated
1728	1921	Pipe	HDPE	I-1537	I-1530	479.36	4746.4	4679.6	13.94	15	0.015	0	20.9	0	0	0	0	0	Calculated
1729	1922	Pipe	HDPE	I-1530	M-856	99.27	4680	4676.4	3.63	15	0.015	0	10.66	0	0	0.2	0.16	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1730	1923	Pipe	HDPE	I-1533	I-1532	16.77	4680	4679.3	4.17	15	0.015	0	11.44	0	0	0	0	0	Calculated
1731	1924	Pipe	HDPE	I-1532	M-856	133.09	4678.6	4676.7	1.43	15	0.015	0	6.69	0	0	0.05	0.04	0	Calculated
1732	1925	Pipe	HDPE	M-856	O-161	182.38	4676.2	4663	7.24	18	0.015	7.4	24.49	0.3	13.78	0.73	0.49	0	Calculated
1733	1926	Pipe	HDPE	I-1574	I-1575	51.29	4660	4659.4	1.17	15	0.015	0	6.06	0	0	0	0	0	Calculated
1734	1927	Pipe	HDPE	I-1575	I-1576	309.97	4659.3	4643.5	5.1	15	0.015	0	12.64	0	0	0.33	0.26	0	Calculated
1735	1928	Pipe	HDPE	I-1577	I-1576	117.78	4651.8	4643.4	7.13	30	0.015	10.23	95.22	0.11	9.89	0.66	0.26	0	Calculated
1736	1929	Pipe	HDPE	I-1576	M-874	385.35	4643.2	4630.3	3.35	24	0.015	10.23	36.15	0.28	9.65	0.74	0.37	0	Calculated
1737	1930	Pipe	HDPE	M-874	I-1578	338.94	4630.2	4610.2	5.9	24	0.015	10.22	47.63	0.21	11.28	0.67	0.33	0	Calculated
1738	1931	Pipe	HDPE	M-875	I-1580	20.58	4620	4612.8	34.99	18	0.015	8.18	53.85	0.15	7.74	0.95	0.64	0	Calculated
1739	1932	Pipe	HDPE	I-1580	I-1579	46.44	4612.7	4612.4	0.65	18	0.015	8.18	7.32	1.12	5.02	1.3	0.87	0	> CAPACITY
1740	1933	Pipe	HDPE	I-1579	I-1578	48.07	4612.3	4610.8	3.12	18	0.015	8.18	16.08	0.51	7.87	0.85	0.57	0	Calculated
1741	1934	Pipe	HDPE	I-1578	I-1512	301.56	4610.1	4597.2	4.28	30	0.015	14.59	73.64	0.2	11.28	0.76	0.31	0	Calculated
1742	1935	Pipe	HDPE	I-1583	I-1582	50.22	4600.1	4598.7	2.79	18	0.015	0	15.2	0	0	0	0	0	Calculated
1743	1936	Pipe	HDPE	I-1582	I-1581	7.28	4598.6	4598	8.24	15	0.015	0	16.47	0	0	0	0	0	Calculated
1744	1937	Pipe	HDPE	I-1581	I-1512	37.8	4597.9	4597.8	0.26	15	0.015	0.01	2.88	0	0.2	0.07	0.07	0	Calculated
1745	1938	Pipe	HDPE	I-1512	M-855	97.26	4597.1	4593.2	4.01	30	0.015	14.59	71.18	0.2	8.41	0.94	0.38	0	Calculated
1746	1939	Pipe	HDPE	M-855	M-852	224.46	4593.2	4590.7	1.11	36	0.015	14.55	61.01	0.24	6.68	1.02	0.35	0	Calculated
1747	1940	Pipe	HDPE	I-1520	M-855	266.43	4593.3	4593.2	0.04	15	0.015	0.21	1.08	0.19	0.34	1.01	0.83	0	Calculated
1748	1941	Pipe	HDPE	I-1522	I-1520	33.3	4595.4	4593.4	6.01	15	0.015	0	13.72	0	0	0.43	0.36	0	Calculated
1749	1942	Pipe	HDPE	I-1521	I-1522	8.41	4595.6	4595.5	1.19	15	0.015	0	6.1	0	0	0	0	0	Calculated
1750	1943	Pipe	HDPE	I-1523	I-1521	53.06	4596.1	4595.7	0.75	15	0.015	0	5.04	0	0	0	0	0	Calculated
1751	1944	Pipe	HDPE	I-1524	I-1523	21.43	4596.5	4596.2	1.4	15	0.015	0	6.84	0	0	0	0	0	Calculated
1752	1946	Pipe	HDPE	I-1513	I-1514	40.16	4593.5	4592.7	1.99	15	0.015	0	7.9	0	0	0	0	0	Calculated
1753	1947	Pipe	HDPE	I-1514	M-852	72.77	4592.6	4590.7	2.61	24	0.015	0	31.68	0	0	0.33	0.17	0	Calculated
1754	1948	Pipe	HDPE	M-852	M-853	362.89	4590.6	4577.1	3.72	36	0.015	14.53	111.49	0.13	10.59	0.74	0.25	0	Calculated
1755	1949	Pipe	HDPE	I-1515	M-853	21.16	4580.1	4577.1	14.18	15	0.015	0	21.08	0	0	0.32	0.25	0	Calculated
1756	1950	Pipe	HDPE	I-1516	M-853	32.44	4578.5	4577.2	4.01	15	0.015	0	11.21	0	0	0.27	0.21	0	Calculated
1757	1951	Pipe	HDPE	M-853	M-854	302.12	4576.9	4559.8	5.66	36	0.015	23.04	137.52	0.17	8.09	1.27	0.42	0	Calculated
1758	1952	Pipe	HDPE	I-1518	M-854	31.43	4562.5	4559.4	9.86	15	0.015	0	16.41	0	0	0.63	0.5	0	Calculated
1759	1953	Pipe	HDPE	M-854	I-1517	17.75	4559.8	4559.2	3.38	36	0.015	23.04	43.39	0.53	8.35	1.24	0.41	0	Calculated
1760	1954	Pipe	HDPE	I-1517	O-160	31.32	4559.7	4552	24.58	36	0.015	23.04	286.62	0.08	19.43	0.67	0.22	0	Calculated
1761	1955	Pipe	HDPE	M-473	I-811	147.85	4697.3	4686.7	7.17	15	0.015	0	14.99	0	0	0	0	0	Calculated
1762	1956	Pipe	HDPE	I-811	M-472	25.38	4686.7	4685.2	5.91	15	0.015	0	13.61	0	0	0.34	0.27	0	Calculated
1763	1957	Pipe	HDPE	I-808	I-809	25.69	4715.3	4715.2	0.39	15	0.015	0	3.49	0	0	0	0	0	Calculated
1764	1958	Pipe	HDPE	I-809	I-810	213.5	4715.1	4690.5	11.52	15	0.015	0	19	0	0	0	0	0	Calculated
1765	1959	Pipe	HDPE	I-810	M-472	34.6	4690.2	4685.2	14.45	15	0.015	0	21.28	0	0	0.34	0.27	0	Calculated
1766	1960	Pipe	HDPE	M-472	I-814	178.29	4685.2	4668.4	9.42	15	0.015	9.92	17.19	0.58	10.65	0.97	0.77	0	Calculated
1767	1961	Pipe	HDPE	I-813	I-814	23.76	4668.8	4668.4	1.68	15	0.015	0.44	7.26	0.06	0.39	1.25	1	1	SURCHARGED
1768	1962	Pipe	HDPE	I-773	I-772	24.4	4667.6	4665.4	9.02	15	0.015	0	16.81	0	0	0.63	0.5	0	Calculated
1769	1963	Pipe	HDPE	I-814	M-443	56.53	4668.4	4665.7	4.78	15	0.015	9.92	12.24	0.81	8.08	1.25	1	4	SURCHARGED
1770	1964	Pipe	HDPE	M-443	I-772	32.98	4665.6	4665.4	0.61	24	0.015	9.91	15.27	0.65	3.56	1.66	0.83	0	Calculated
1771	1965	Pipe	HDPE	I-772	M-444	211.56	4665.3	4664.8	0.24	24	0.015	9.75	9.53	1.02	4.08	1.41	0.71	0	> CAPACITY
1772	1966	Pipe	HDPE	I-779	I-778	23.11	4686.7	4686.3	1.73	15	0.015	0	7.37	0	0	0	0	0	Calculated
1773	1967	Pipe	HDPE	I-778	M-446	37.95	4686.2	4682.3	10.28	15	0.015	0	17.95	0	0	0	0	0	Calculated
1774	1968	Pipe	HDPE	M-446	M-447	103.68	4682.2	4670.4	11.38	15	0.015	0	18.89	0	0	0	0	0	Calculated
1775	1969	Pipe	HDPE	M-447	I-780	65.94	4670.4	4664.7	8.64	15	0.015	0	16.46	0	0	0	0	0	Calculated
1776	1970	Pipe	HDPE	I-781	I-780	23.28	4664.2	4663.1	4.73	15	0.015	0	12.17	0	0	0	0	0	Calculated
1777	1971	Pipe	HDPE	M-440	M-441	156.74	4656.8	4645.2	7.4	18	0.015	8.19	24.77	0.33	11.31	0.64	0.43	0	Calculated
1778	1972	Pipe	HDPE	I-771	M-448	49.04	4662.4	4657.7	9.58	15	0.015	0	17.33	0	0	0.33	0.27	0	Calculated
1779	1973	Pipe	HDPE	I-780	M-448	33.72	4663	4657.7	15.72	15	0.015	0	22.2	0	0	0.33	0.27	0	Calculated
1780	1974	Pipe	HDPE	I-788	M-448	53.29	4662.7	4657.7	9.38	15	0.015	0	17.15	0	0	0.33	0.27	0	Calculated
1781	1975	Pipe	HDPE	M-448	I-789	26.78	4657.7	4657	2.61	15	0.015	0.12	9.05	0.01	0.26	0.95	0.77	0	Calculated
1782	1976	Pipe	HDPE	I-789	M-440	61.91	4656.9	4656.8	0.16	24	0.015	8.19	7.88	1.04	3.97	1.23	0.62	0	> CAPACITY
1783	1977	Pipe	HDPE	I-1584	I-1583	154.52	4646.2	4600.2	29.77	15	0.015	0	30.55	0	0	0	0	0	Calculated
1784	1978	Pipe	HDPE	I-786	I-787	25.67	4668	4666.6	5.45	15	0.015	0	13.07	0	0	0	0	0	Calculated
1785	1979	Pipe	HDPE	I-787	I-785	60.1	4666.5	4657.5	14.98	15	0.015	0	21.66	0	0	0.42	0.36	0	Calculated
1786	1980	Pipe	HDPE	I-782	I-783	26.09	4661.7	4661.6	0.38	15	0.015	0	3.47	0	0	0	0	0	Calculated
1787	1981	Pipe	HDPE	I-784	I-785	211.74	4659.5	4657.5	0.94	18	0.015	0	8.85	0	0	0.42	0.3	0	Calculated
1788	1982	Pipe	HDPE	I-783	M-919	73.35	4661.6	4661	0.82	15	0.015	0	5.06	0	0	0	0	0	Calculated
1789	1983	Pipe	HDPE	I-777	I-776	24.69	4664	4663.3	2.84	15	0.015	0	9.43	0	0	0	0	0	Calculated
1790	1984	Pipe	HDPE	I-776	M-919	33.21	4663.2	4661	6.62	15	0.015	0	14.41	0	0	0	0	0	Calculated
1791	1985	Pipe	HDPE	M-919	I-784	29.66	4661	4659.6	4.72	18	0.015	0	19.78	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1792	1986	Pipe	HDPE	I-785	I-789	344.54	4657.4	4657	0.12	18	0.015	0.72	3.1	0.23	0.76	1.15	0.79	0	Calculated
1793	1987	Pipe	HDPE	M-441	M-875	325.2	4645.2	4620	7.75	15	0.015	8.18	15.58	0.53	12.56	0.65	0.52	0	Calculated
1794	1988	Pipe	HDPE	I-1190	M-658	4.74	4351.9	4351.2	14.77	15	0.015	0	21.51	0	0	0	0	0	Calculated
1795	1989	Pipe	HDPE	M-658	O-120	142.82	4349.2	4330	13.44	15	0.015	0	18.69	0	0	0	0	0	Calculated
1796	1990	Pipe	HDPE	I-1179	M-655	37.27	4354	4353.6	1.07	15	0.015	0	5.8	0	0	0	0	0	Calculated
1797	1991	Pipe	RCP	I-1182	I-1181	42.47	4354.2	4352.1	4.94	12	0.015	0	6.87	0	0	0	0	0	Calculated
1798	1992	Pipe	HDPE	M-655	I-1180	44.52	4353.5	4351.7	4.04	15	0.015	0	11.26	0	0	0	0	0	Calculated
1799	1993	Pipe	RCP	I-1181	I-1180	23.87	4352	4351.9	0.42	18	0.015	0	7.68	0	0	0	0	0	Calculated
1800	1994	Pipe	RCP	I-1180	M-656	200.8	4351.7	4342.9	4.38	18	0.015	0	19.06	0	0	0	0	0	Calculated
1801	1995	Pipe	RCP	M-656	O-116	230.45	4342.8	4334	3.82	18	0.015	0	17.23	0	0	0	0	0	Calculated
1802	1996	Pipe	RCP	I-1183	I-1184	28.74	4339.2	4338	4.18	15	0.015	0	9.63	0	0	0	0	0	Calculated
1803	1997	Pipe	RCP TO 18 HDPE	I-1184	O-117	210.48	4339.2	4330	4.37	15	0.015	0	10.76	0	0	0	0	0	Calculated
1804	1998	Pipe	RCP	I-1187	M-657	58.33	4341.4	4339.9	2.57	15	0.015	0	8.98	0	0	0	0	0	Calculated
1805	1999	Pipe	RCP	I-1185	M-657	29.87	4341.7	4339.9	6.03	15	0.015	0	13.78	0	0	0	0	0	Calculated
1806	2000	Pipe	RCP	M-657	I-1186	28.14	4339.8	4337.7	7.46	15	0.015	0	15.29	0	0	0	0	0	Calculated
1807	2001	Pipe	RCP	I-1186	O-118	224.14	4337.6	4330	3.39	15	0.015	0	7.51	0	0	0	0	0	Calculated
1808	2002	Pipe	RCP	I-1188	I-1189	25.34	4339.1	4338.9	0.79	15	0.015	0	4.97	0	0	0	0	0	Calculated
1809	2003	Pipe	RCP	I-1189	O-119	211.61	4338.8	4330	4.16	15	0.015	0	10.62	0	0	0	0	0	Calculated
1810	2004	Pipe	PVC	I-465	I-464	33.93	4401.7	4401.6	0.29	12	0.015	0	1.68	0	0	0	0	0	Calculated
1811	2005	Pipe	RCP	I-464	M-265	60.95	4401.3	4400	2.13	15	0.015	0	8.24	0	0	0.15	0.12	0	Calculated
1812	2006	Pipe	RCP	I-1177	I-1178	97.06	4374.4	4372.5	1.96	15	0.015	5.1	7.83	0.65	6.3	0.78	0.63	0	Calculated
1813	2008	Pipe	RCP	I-748	M-422	35.47	4476.1	4475.85	0.7	15	0.015	0	4.7	0	0	0	0	0	Calculated
1814	2009	Pipe	RCP	I-749	M-422	24.1	4476.5	4475.9	2.49	15	0.015	0	8.83	0	0	0	0	0	Calculated
1815	2010	Pipe	RCP	M-422	M-423	121.19	4475.8	4475	0.66	15	0.015	0	4.55	0	0	0.21	0.17	0	Calculated
1816	2011	Pipe	RCP	I-750	M-423	29.71	4475.5	4474.9	2.02	15	0.015	0	7.96	0	0	0.26	0.21	0	Calculated
1817	2012	Pipe	RCP	I-751	M-423	25.21	4475.6	4474.9	2.78	15	0.015	0	9.33	0	0	0.26	0.21	0	Calculated
1818	2013	Pipe	RCP	M-423	O-71	102.25	4474.8	4474	0.78	15	0.015	1.97	4.5	0.44	3.46	0.6	0.48	0	Calculated
1819	2014	Pipe	RCP	I-752	M-424	109.41	4473	4472.8	0.18	15	0.015	1.95	2.39	0.82	2.06	0.9	0.72	0	Calculated
1820	2015	Pipe	RCP	M-424	M-425	199.23	4472.8	4472.4	0.2	15	0.015	1.95	2.51	0.78	2.21	0.86	0.68	0	Calculated
1821	2016	Pipe	RCP	M-425	M-426	196.24	4472.3	4471.9	0.2	15	0.015	1.95	2.53	0.77	1.91	0.98	0.78	0	Calculated
1822	2017	Pipe	RCP	M-426	M-320	194.82	4471.8	4471.7	0.05	15	0.015	1.95	1.27	1.53	1.81	1.03	0.82	0	> CAPACITY
1823	2018	Pipe	RCP	I-567	M-320	23.23	4474.2	4473.6	2.58	15	0.015	0	9	0	0	0	0	0	Calculated
1824	2019	Pipe	RCP	I-568	M-320	25.16	4473	4472	3.97	15	0.015	0	11.16	0	0	0.31	0.25	0	Calculated
1825	2020	Pipe	RCP	M-320	M-321	353.09	4471.65	4471	0.18	15	0.015	1.94	2.4	0.81	2.47	0.76	0.61	0	Calculated
1826	2021	Pipe	RCP	M-321	M-322	320.89	4470.9	4469.5	0.44	15	0.015	1.94	3.7	0.52	2.9	0.78	0.63	0	Calculated
1827	2022	Pipe	PVC	M-322	M-323	12.48	4469.5	4468.8	5.61	8	0.015	1.93	2.51	0.77	5.48	0.67	1	46	SURCHARGED
1828	2023	Pipe	CMP	I-570	I-569	32.93	4471	4469.2	5.47	18	0.015	0	21.28	0	0	0.07	0.05	0	Calculated
1829	2024	Pipe	PVC	M-323	I-569	11.75	4468.8	4468.6	1.7	12	0.015	1.93	4.03	0.48	3.07	0.75	0.75	0	Calculated
1830	2025	Pipe	CMP	I-569	O-49	18.07	4469.1	4466	17.16	24	0.015	1.93	81.21	0.02	9.38	0.23	0.12	0	Calculated
1831	2029	Pipe	RCP	I-573	I-574	73.42	4463.2	4464.05	-1.16	18	0.015	0	9.8	0	0	0	0	0	Calculated
1832	2030	Pipe	RCP	I-574	M-324	143.03	4463.95	4463.3	0.45	18	0.015	0	6.14	0	0	0.27	0.18	0	Calculated
1833	2031	Pipe	RCP	M-324	M-325	310.32	4463.5	4459.65	1.24	24	0.015	1.26	21.84	0.06	3.73	0.33	0.16	0	Calculated
1834	2032	Pipe	RCP	I-575	M-325	46.27	4462.2	4459.95	4.86	12	0.015	0	6.81	0	0	0	0	0	Calculated
1835	2034	Pipe	RCP	M-325	M-319	366.71	4459.45	4455.7	1.02	24	0.015	1.26	19.83	0.06	3.05	0.39	0.19	0	Calculated
1836	2035	Pipe	RCP	M-319	M-318	288.25	4455.65	4454.7	0.33	24	0.015	1.24	11.26	0.11	2.49	0.43	0.22	0	Calculated
1837	2036	Pipe	RCP	M-318	I-564	415.05	4454.6	4448.2	1.54	24	0.015	2.05	24.35	0.08	4.66	0.39	0.2	0	Calculated
1838	2037	Pipe	RCP	I-361	I-360	27.73	4456.5	4456.2	1.08	12	0.015	0	3.21	0	0	0	0	0	Calculated
1839	2038	Pipe	RCP	I-360	I-566	122.77	4456.1	4456	0.08	12	0.015	0.01	0.88	0.01	0.2	0.16	0.16	0	Calculated
1840	2039	Pipe	RCP	I-672	M-318	77.84	4455.7	4455.5	0.26	15	0.015	0.86	2.84	0.3	2.26	0.44	0.35	0	Calculated
1841	2040	Pipe	RCP	M-396	I-672	5.13	4456	4456	0	15	0.015	0.86	0.78	1.1	2.32	0.43	0.34	0	> CAPACITY
1842	2041	Pipe	RCP	I-673	M-396	34.97	4456.6	4456	1.72	15	0.015	0.86	7.33	0.12	2.61	0.39	0.31	0	Calculated
1843	2042	Pipe	HDPE	I-566	I-672	29.56	4456	4455.9	0.34	10	0.015	0.02	1.09	0.02	0.29	0.26	0.31	0	Calculated
1844	2043	Pipe	RCP	M-397	M-396	284.3	4457.8	4456.75	0.37	15	0.015	0	3.4	0	0	0	0	0	Calculated
1845	2044	Pipe	RCP	I-667	M-397	159.19	4458.8	4457.85	0.6	15	0.015	0	4.32	0	0	0	0	0	Calculated
1846	2045	Pipe	RCP	I-565	I-357	24.39	4447.5	4446.55	3.9	12	0.015	0	6.09	0	0	0	0	0	Calculated
1847	2046	Pipe	RCP	I-359	I-358	28.56	4448.7	4448.5	0.7	12	0.015	0	2.58	0	0	0	0	0	Calculated
1848	2047	Pipe	RCP	I-358	I-357	33.45	4448.4	4446.1	6.88	12	0.015	0	8.1	0	0	0	0	0	Calculated
1849	2048	Pipe	RCP	I-564	M-316	795.29	4448.1	4442.8	0.67	24	0.015	2.02	16.01	0.13	3.46	0.48	0.24	0	Calculated
1850	2049	Pipe	RCP	M-316	I-392	59.24	4441.25	4438.4	4.81	18	0.015	2.02	19.97	0.1	4.14	0.48	0.32	0	Calculated
1851	2050	Pipe	RCP	I-357	I-356	326.23	4446	4444.05	0.6	12	0.015	0	2.39	0	0	0	0	0	Calculated
1852	2051	Pipe	RCP	I-563	I-356	28.81	4445.7	4444	5.9	12	0.015	0	7.5	0	0	0.02	0.02	0	Calculated
1853	2052	Pipe	RCP	I-356	I-560	97.94	4443.9	4443.6	0.31	12	0.015	0.01	1.71	0	0.08	0.3	0.3	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1854	2053	Pipe	RCP	I-355	I-356	37.19	4446.6	4444.1	6.72	12	0.015	0	8.01	0	0	0	0	0	Calculated
1855	2054	Pipe	RCP	I-354	I-560	34.67	4446.6	4443.65	8.51	12	0.015	0	9.01	0	0	0.2	0.2	0	Calculated
1856	2055	Pipe	RCP	I-560	I-561	137.97	4443.5	4443.3	0.14	12	0.015	0.05	1.18	0.04	0.18	0.65	0.65	0	Calculated
1857	2056	Pipe	RCP	I-562	M-317	5.8	4443.65	4443.55	1.72	12	0.015	0	4.05	0	0	0	0	0	Calculated
1858	2057	Pipe	RCP	I-353	I-352	29.46	4445.6	4445.2	1.36	12	0.015	0	3.6	0	0	0	0	0	Calculated
1859	2058	Pipe	RCP	I-352	I-561	35.42	4445.1	4442.1	8.47	12	0.015	0	6.96	0	0	0.37	0.37	0	Calculated
1860	2059	Pipe	RCP	I-561	M-317	18.14	4443.3	4442.65	3.58	12	0.015	3.38	5.84	0.58	6.29	0.65	0.65	0	Calculated
1861	2060	Pipe	RCP	M-317	M-315	175.58	4442.35	4440.35	1.14	15	0.015	3.38	5.98	0.57	4.82	0.7	0.56	0	Calculated
1862	2061	Pipe	RCP	M-315	I-559	7.34	4439.9	4438.6	17.71	15	0.015	3.38	23.56	0.14	4.47	0.74	0.59	0	Calculated
1863	2062	Pipe	RCP	I-559	I-392	72.98	4438.5	4438.25	0.34	15	0.015	3.38	3.28	1.03	3.5	0.92	0.74	0	> CAPACITY
1864	2063	Pipe	RCP	I-525	I-392	73.1	4438.6	4438.3	0.41	18	0.015	3.76	5.83	0.64	3.6	0.86	0.57	0	Calculated
1865	2064	Pipe	RCP	M-316	O-44	103.03	4442.7	4441.7	0.97	18	0.015	0	8.97	0	0	0	0	0	Calculated
1866	2065	Pipe	RCP	I-392	M-218	326.11	4438.2	4433	1.59	18	0.015	7.12	11.5	0.62	6.22	1.06	0.71	0	Calculated
1867	2066	Pipe	RCP	I-526	I-525	52.04	4439.6	4438.7	1.73	18	0.015	0	11.97	0	0	0.44	0.29	0	Calculated
1868	2067	Pipe	RCP	M-218	M-217	446.4	4432.9	4429.25	0.82	18	0.015	6.88	8.23	0.84	4.23	1.44	0.96	0	Calculated
1869	2068	Pipe	RCP	I-395	M-217	24.72	4429.5	4429.2	1.21	18	0.015	2.78	10.03	0.28	1.73	1.5	1	117	SURCHARGED
1870	2069	Pipe	RCP	M-217	M-216	71.68	4429.05	4428.9	0.21	18	0.015	6.92	4.16	1.66	3.91	1.5	1	137	SURCHARGED
1871	2070	Pipe	RCP	M-216	I-393	378.58	4428.8	4427.5	0.34	18	0.015	6.23	5.33	1.17	3.59	1.5	1	140	SURCHARGED
1872	2071	Pipe	RCP	I-394	I-393	36.35	4428.1	4427.6	1.38	15	0.015	0.39	6.57	0.06	0.35	1.25	1	134	SURCHARGED
1873	2072	Pipe	RCP	I-530	I-529	249.05	4442.8	4441.2	0.64	15	0.015	0	4.49	0	0	0	0	0	Calculated
1874	2073	Pipe	HDPE	I-257	I-258	18.01	4478.1	4477.8	1.67	15	0.015	0	7.23	0	0	0	0	0	Calculated
1875	2074	Pipe	HDPE	I-258	I-260	283.98	4477.7	4477	0.25	15	0.015	0	2.78	0	0	0.08	0.06	0	Calculated
1876	2075	Pipe	HDPE	I-259	I-260	17.8	4477.3	4476.9	2.25	15	0.015	0	8.39	0	0	0.13	0.1	0	Calculated
1877	2076	Pipe	RCP	I-260	M-26	177.16	4476.85	4475.2	0.93	15	0.015	0.28	5.4	0.05	0.41	0.78	0.62	0	Calculated
1878	2077	Pipe	RCP	I-48	M-26	24.79	4476.6	4475.3	5.24	15	0.015	0.14	12.82	0.01	0.21	0.9	0.72	0	Calculated
1879	2078	Pipe	RCP	M-26	I-50	213.07	4475.1	4474.5	0.28	18	0.015	6.02	4.83	1.25	3.7	1.5	1	7	SURCHARGED
1880	2079	Pipe	RCP	I-49	I-50	21.51	4476.6	4474.8	8.37	15	0.015	0	16.2	0	0	0.63	0.5	0	Calculated
1881	2080	Pipe	RCP	I-50	M-24	179.17	4474.3	4473.4	0.5	18	0.015	6	6.45	0.93	3.48	1.5	1	12	SURCHARGED
1882	2081	Pipe	RCP	M-24	M-25	62.81	4473.2	4473	0.32	18	0.015	6	5.14	1.17	3.39	1.5	1	15	SURCHARGED
1883	2082	Pipe	RCP	M-25	I-43	135.76	4472.95	4472.7	0.18	18	0.015	6	3.91	1.53	3.89	1.22	0.82	0	> CAPACITY
1884	2083	Pipe	RCP	I-43	M-135	190.91	4472.5	4470.9	0.84	18	0.015	6	8.33	0.72	4.4	1.1	0.74	0	Calculated
1885	2084	Pipe	RCP	I-261	M-135	57.19	4472.8	4470.95	3.23	15	0.015	0	10.07	0	0	0.6	0.48	0	Calculated
1886	2085	Pipe	RCP	M-135	I-262	152.11	4470.7	4470.1	0.39	18	0.015	5.98	5.72	1.05	4	1.45	0.97	0	> CAPACITY
1887	2088	Pipe	HDPE	I-670	I-671	64.65	4472.8	4470	4.33	15	0.015	0	11.65	0	0	0.63	0.5	0	Calculated
1888	2089	Pipe	RCP	I-668	I-671	44.16	4470.4	4470	0.91	24	0.015	23.33	18.66	1.25	7.67	1.86	0.93	0	> CAPACITY
1889	2090	Pipe	RCP	I-669	I-668	33.14	4471.2	4470.8	1.21	15	0.015	0.09	6.15	0.01	0.24	1.25	1	25	SURCHARGED
1890	2091	Pipe	RCP	I-41	I-668	185.12	4471.9	4470.5	0.76	24	0.015	13.8	17.05	0.81	4.39	2	1	12	SURCHARGED
1891	2092	Pipe	RCP	I-42	I-41	161.08	4473	4472	0.62	15	0.015	0.5	4.41	0.11	0.41	1.25	1	7	SURCHARGED
1892	2093	Pipe	HDPE	M-21	I-41	216.49	4472.05	4472	0.02	24	0.015	13.8	2.98	4.63	4.43	2	1	9	SURCHARGED
1893	2094	Pipe	HDPE	I-37	M-21	151.5	4473.8	4472.4	0.92	18	0.015	4.14	8.75	0.47	2.63	1.5	1	10	SURCHARGED
1894	2095	Pipe	HDPE	M-19	I-37	338.28	4476.9	4473.85	0.9	18	0.015	3.66	8.64	0.42	4.26	1.09	0.73	0	Calculated
1895	2097	Pipe	HDPE	M-14	M-21	151.82	4476.2	4472.5	2.44	18	0.015	10.95	14.21	0.77	6.54	1.5	1	6	SURCHARGED
1896	2098	Pipe	HDPE	M-18	M-19	388.08	4480.7	4476.95	0.97	18	0.015	3.66	8.95	0.41	4.72	0.68	0.45	0	Calculated
1897	2099	Pipe	HDPE	I-36	M-18	405.42	4484.7	4480.75	0.97	21	0.015	3.68	13.55	0.27	4.67	0.64	0.36	0	Calculated
1898	2100	Pipe	HDPE	I-35	I-36	25.72	4485.5	4484.8	2.72	15	0.015	0	9.24	0	0	0.27	0.22	0	Calculated
1899	2101	Pipe	HDPE	I-32	I-36	80.51	4485.1	4484.8	0.37	15	0.015	3.68	3.42	1.08	3.61	0.97	0.77	0	> CAPACITY
1900	2102	Pipe	RCP	M-13	I-32	69.55	4485.5	4485.2	0.43	24	0.015	3.68	12.88	0.29	2.53	0.99	0.5	0	Calculated
1901	2103	Pipe	HDPE	I-20	I-18	256.45	4490.7	4486.2	1.75	15	0.015	0	7.42	0	0	0	0	0	Calculated
1902	2104	Pipe	HDPE	I-19	I-18	17.67	4486.6	4486.2	2.26	15	0.015	0	8.42	0	0	0	0	0	Calculated
1903	2105	Pipe	HDPE	I-18	I-21	160.62	4486.1	4484	1.31	15	0.015	0	6.4	0	0	0	0	0	Calculated
1904	2106	Pipe	HDPE	I-21	I-22	151.65	4483.9	4482	1.25	15	0.015	0	6.27	0	0	0	0	0	Calculated
1905	2107	Pipe	HDPE	I-22	I-31	183.13	4481.9	4480.2	0.93	18	0.015	0	8.77	0	0	0	0	0	Calculated
1906	2108	Pipe	HDPE	I-31	I-33	89.21	4480.1	4478.7	1.57	15	0.015	0	7.01	0	0	0.56	0.5	0	Calculated
1907	2109	Pipe	HDPE	I-29	I-30	34.87	4481.4	4481.2	0.57	15	0.015	0	4.24	0	0	0	0	0	Calculated
1908	2110	Pipe	HDPE	I-30	I-33	62.87	4481.1	4478.7	3.82	15	0.015	0	10.94	0	0	0.56	0.5	0	Calculated
1909	2111	Pipe	HDPE	I-33	M-14	105.75	4478.5	4476.05	2.32	18	0.015	11.11	14.27	0.78	7.17	1.33	0.95	0	Calculated
1910	2112	Pipe	RCP	I-384	I-382	130.26	4472	4471.75	0.19	15	0.015	0.07	2.45	0.03	0.47	0.25	0.21	0	Calculated
1911	2113	Pipe	RCP	I-383	I-382	21.36	4472.2	4471.85	1.64	15	0.015	0	7.17	0	0	0.13	0.11	0	Calculated
1912	2114	Pipe	RCP	I-382	I-381	149.09	4471.65	4471	0.44	15	0.015	0.31	3.7	0.08	0.64	0.79	0.65	0	Calculated
1913	2115	Pipe	RCP	I-381	I-380	173.16	4470.9	4470.6	0.17	15	0.015	1.04	2.33	0.45	1.26	1.23	0.99	0	Calculated
1914	2117	Pipe	HDPE	I-39	I-379	25.36	4468.6	4468.6	0	24	0.015	14.75	1.23	11.98	5.2	1.69	0.85	0	> CAPACITY
1915	2118	Pipe	HDPE	I-38	I-39	20.65	4469.4	4468.7	3.39	24	0.015	14.74	36.1	0.41	4.84	1.86	0.93	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1916	2119	Pipe	HDPE	M-20	I-38	114.58	4470	4469.4	0.52	24	0.015	14.76	14.19	1.04	4.84	1.86	0.93	0	> CAPACITY
1917	2120	Pipe	RCP	I-380	M-20	73.98	4470.5	4470.2	0.41	15	0.015	1.49	3.57	0.42	1.28	1.25	1	17	SURCHARGED
1918	2121	Pipe	RCP	I-40	M-20	66.03	4470.8	4470.1	1.06	15	0.015	0.33	5.76	0.06	0.31	1.25	1	7	SURCHARGED
1919	2122	Pipe	HDPE	I-34	M-20	212.63	4471.4	4470.1	0.61	24	0.015	15.15	15.33	0.99	5.14	2	1	3	SURCHARGED
1920	2123	Pipe	HDPE	M-17	I-34	178.51	4471.8	4471.3	0.28	24	0.015	15.16	10.38	1.46	4.82	2	1	11	SURCHARGED
1921	2124	Pipe	HDPE	M-16	M-17	300.26	4472.2	4471.6	0.2	24	0.015	15.16	8.76	1.73	4.83	2	1	23	SURCHARGED
1922	2125	Pipe	HDPE	M-15	M-16	121.24	4472.9	4472.3	0.49	24	0.015	15.16	13.79	1.1	4.82	2	1	25	SURCHARGED
1923	2126	Pipe	HDPE	I-26	M-12	4.85	4478	4477.2	16.49	15	0.015	0.09	22.74	0	0.22	0.51	0.51	0	Calculated
1924	2127	Pipe	HDPE	I-25	M-12	21.15	4478	4476.8	5.67	15	0.015	0.13	13.34	0.01	0.2	0.68	0.59	0	Calculated
1925	2128	Pipe	HDPE	M-12	M-15	39.03	4474.4	4473.7	1.79	15	0.015	3.63	7.5	0.48	3.26	1.25	1	20	SURCHARGED
1926	2129	Pipe	HDPE	I-24	M-920	48.5	4479.4	4479	0.82	15	0.015	0	5.08	0	0	0	0	0	Calculated
1927	2130	Pipe	HDPE	I-23	M-920	10.23	4479.3	4479	2.93	12	0.015	0	5.29	0	0	0	0	0	Calculated
1928	2131	Pipe	HDPE	M-920	M-12	194.97	4478.8	4476.8	1.03	15	0.015	0	5.67	0	0	0.63	0.5	0	Calculated
1929	2132	Pipe	HDPE	I-233	I-232	29.69	4480.9	4479.9	3.37	15	0.015	0	10.27	0	0	0	0	0	Calculated
1930	2133	Pipe	HDPE	I-232	I-24	146.67	4479.8	4479.5	0.2	15	0.015	0	2.53	0	0	0	0	0	Calculated
1931	2134	Pipe	HDPE	I-243	I-242	21.41	4482.7	4482.3	1.87	15	0.015	0	7.65	0	0	0	0	0	Calculated
1932	2135	Pipe	HDPE	I-242	I-232	329.21	4482.1	4479.9	0.67	15	0.015	0	4.58	0	0	0	0	0	Calculated
1933	2136	Pipe	HDPE	M-134	M-15	205.74	4473.2	4473.1	0.05	24	0.015	7.35	4.32	1.7	2.34	2	1	24	SURCHARGED
1934	2137	Pipe	HDPE	M-133	M-134	151.42	4473.25	4473.2	0.03	24	0.015	7.84	3.56	2.2	2.51	2	1	25	SURCHARGED
1935	2138	Pipe	HDPE	M-1	M-133	62	4474.15	4473.3	1.37	15	0.015	7.87	6.56	1.2	6.41	1.25	1	32	SURCHARGED
1936	2139	Pipe	HDPE	I-3	M-1	61.65	4477.3	4474.4	4.7	15	0.015	2.88	12.14	0.24	2.34	1.25	1	15	SURCHARGED
1937	2140	Pipe	HDPE	I-8	M-1	32.19	4474.7	4474.35	1.09	15	0.015	2.98	5.84	0.51	2.43	1.25	1	27	SURCHARGED
1938	2141	Pipe	HDPE	M-3	I-8	115.37	4477.96	4475.4	2.22	15	0.015	2.98	8.34	0.36	2.71	1.25	1	11	SURCHARGED
1939	2142	Pipe	HDPE	M-2	M-3	119.98	4477.7	4477.97	-0.23	15	0.015	2.47	2.66	0.93	2.54	1.25	1	11	SURCHARGED
1940	2143	Pipe	HDPE	I-7	I-6	22.47	4480.2	4479.6	2.67	15	0.015	0	9.15	0	0	0.12	0.11	0	Calculated
1941	2144	Pipe	HDPE	I-6	M-2	123.85	4479.4	4477.5	1.53	15	0.015	0.83	6.93	0.12	1.29	0.85	0.69	0	Calculated
1942	2145	Pipe	HDPE	M-5	M-2	37.3	4482	4477.5	12.06	15	0.015	0.44	19.45	0.02	0.63	0.63	0.55	0	Calculated
1943	2146	Pipe	HDPE	I-11	M-5	21.06	4479.1	4478.3	3.8	15	0.015	0	10.91	0	0	0	0	0	Calculated
1944	2147	Pipe	HDPE	M-4	M-5	270.1	4480	4478.4	0.59	15	0.015	0	4.31	0	0	0	0	0	Calculated
1945	2148	Pipe	HDPE	I-10	I-9	20.26	4484	4483.7	1.48	15	0.015	0	6.81	0	0	0	0	0	Calculated
1946	2149	Pipe	HDPE	I-9	M-4	120.14	4482	4481.5	0.42	15	0.015	0	3.61	0	0	0	0	0	Calculated
1947	2150	Pipe	HDPE	I-12	M-4	39.12	4480.4	4480.1	0.77	15	0.015	0	4.9	0	0	0	0	0	Calculated
1948	2151	Pipe	HDPE	I-28	I-27	195.9	4489.85	4488.16	0.86	15	0.015	0	5.2	0	0	0	0	0	Calculated
1949	2152	Pipe	HDPE	I-5	I-28	99.56	4490.3	4489.9	0.4	15	0.015	0	3.55	0	0	0	0	0	Calculated
1950	2153	Pipe	HDPE	I-2	I-1	20.82	4477.1	4476.5	2.88	15	0.015	2.54	9.5	0.27	2.39	1.25	1	16	SURCHARGED
1951	2154	Pipe	HDPE	I-1	M-1	398.76	4476.4	4474.3	0.53	15	0.015	2.79	4.06	0.69	2.71	1.25	1	18	SURCHARGED
1952	2155	Pipe	HDPE	I-256	I-248	58.62	4470.6	4470.1	0.85	15	0.015	0.09	5.17	0.02	0.29	0.53	0.44	0	Calculated
1953	2156	Pipe	HDPE	I-249	I-248	29.11	4471.4	4470.3	3.78	15	0.015	0	10.88	0	0	0.29	0.24	0	Calculated
1954	2157	Pipe	HDPE	I-248	M-130	114.47	4470.05	4469.3	0.66	18	0.015	0.38	7.37	0.05	0.61	1.17	0.78	0	Calculated
1955	2158	Pipe	RCP	M-130	I-250	289.66	4470.3	4470.3	0	18	0.015	0.58	0.17	3.43	1.23	0.57	0.38	0	> CAPACITY
1956	2159	Pipe	RCP	I-251	I-250	19.95	4471.2	4470.3	4.51	15	0.015	0	11.89	0	0	0.31	0.25	0	Calculated
1957	2160	Pipe	RCP	I-250	I-252	82.36	4470.2	4470.4	-0.24	18	0.015	0.8	4.49	0.18	1.82	0.64	0.43	0	Calculated
1958	2161	Pipe	RCP	I-252	M-131	147	4470.6	4470	0.41	24	0.015	0.85	12.53	0.07	0.92	0.66	0.34	0	Calculated
1959	2162	Pipe	RCP	M-131	I-253	203.85	4469.89	4469.3	0.29	24	0.015	1.05	10.55	0.1	0.57	1.42	0.72	0	Calculated
1960	2163	Pipe	RCP	I-254	I-253	24.58	4471	4469.7	5.29	15	0.015	0.01	12.88	0	0.01	0.64	0.51	0	Calculated
1961	2164	Pipe	RCP	I-253	I-246	232.02	4469.3	4469.2	0.04	24	0.015	1.45	4.07	0.36	0.76	1.78	0.89	0	Calculated
1962	2165	Pipe	HDPE	I-255	M-132	12.58	4470.6	4469.1	11.92	15	0.015	0.04	19.33	0	0.06	0.84	0.67	0	Calculated
1963	2166	Pipe	RCP	M-132	I-246	33.32	4469.5	4469.3	0.6	18	0.015	0.84	7.05	0.12	0.55	1.5	1	5	SURCHARGED
1964	2167	Pipe	RCP	I-245	I-244	20.26	4471.2	4471	0.99	15	0.015	0	5.56	0	0	0.03	0.02	0	Calculated
1965	2168	Pipe	RCP	I-244	M-129	237.35	4470.9	4470.15	0.32	15	0.015	0.1	3.15	0.03	0.25	0.52	0.42	0	Calculated
1966	2169	Pipe	RCP	M-129	M-132	186.96	4470.05	4469.7	0.19	18	0.015	0.55	3.94	0.14	0.78	1.16	0.78	0	Calculated
1967	2170	Pipe	RCP	I-246	M-128	170.17	4469.1	4468.7	0.24	24	0.015	11.26	9.51	1.18	4.04	1.67	0.84	0	> CAPACITY
1968	2171	Pipe	HDPE	M-128	DET_112	84.38	4468.6	4468.3	0.36	24	0.015	11.22	11.69	0.96	6.05	1.38	0.69	0	Calculated
1969	2173	Pipe	RCP	M-673	M-674	121.11	4478.5	4478.2	0.25	24	0.015	4.01	9.76	0.41	1.48	1.71	0.85	0	Calculated
1970	2174	Pipe	RCP	M-674	M-675	234.73	4478.2	4478	0.09	24	0.015	8.47	5.72	1.48	3.43	1.47	0.73	0	> CAPACITY
1971	2175	Pipe	RCP	M-675	M-676	87.78	4477.9	4477.3	0.68	24	0.015	8.47	16.21	0.52	4.72	1.11	0.56	0	Calculated
1972	2176	Pipe	RCP	M-676	O-4	354.07	4475.3	4474	0.37	24	0.015	8.45	11.88	0.71	4.27	1.2	0.6	0	Calculated
1973	2177	Pipe	RCP	I-606	M-351	46.33	4472	4471.5	1.08	24	0.015	0.54	20.37	0.03	0.71	0.58	0.29	0	Calculated
1974	2178	Pipe	RCP	M-351	M-350	366.05	4471.5	4471.2	0.08	24	0.015	0.56	5.61	0.1	0.36	1.01	0.51	0	Calculated
1975	2179	Pipe	RCP	I-527	I-526	115.01	4439.9	4439.7	0.17	15	0.015	0	2.33	0	0	0	0	0	Calculated
1976	2180	Pipe	RCP	I-529	I-527	239.04	4441.1	4440.1	0.42	15	0.015	0	3.62	0	0	0	0	0	Calculated
1977	2181	Pipe	RCP	I-528	I-529	22.55	4441.6	4441.2	1.77	15	0.015	0	7.46	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
1978	2182	Pipe	RCP	I-531	I-532	416.24	4443.1	4442	0.26	15	0.015	0	2.88	0	0	0.01	0.01	0	Calculated
1979	2183	Pipe	HDPE	I-533	I-532	24.21	4442.2	4441.8	1.65	18	0.015	1.05	11.7	0.09	3.7	0.33	0.22	0	Calculated
1980	2184	Pipe	RCP	I-532	O-46	112.85	4441.7	4440	1.51	24	0.015	1.05	24.06	0.04	4.78	0.25	0.12	0	Calculated
1981	2185	Pipe	HDPE	I-1437	I-1096	295.05	4436.1	4434.1	0.68	24	0.015	8.8	16.14	0.55	5.03	1.09	0.54	0	Calculated
1982	2187	Pipe	HDPE	I-73	I-72	68.27	4515	4514.8	0.29	15	0.015	8.56	3.03	2.82	6.98	1.25	1	17	SURCHARGED
1983	2188	Pipe	HDPE	I-72	M-45	222.58	4513	4505.9	3.19	24	0.015	32.52	35.02	0.93	11.39	2	1	41	SURCHARGED
1984	2189	Pipe	HDPE	M-45	M-46	241.69	4505.6	4495.1	4.34	24	0.015	32.52	40.87	0.8	10.35	2	1	53	SURCHARGED
1985	2191	Pipe	HDPE	M-46	M-47	165.28	4495.2	4492.5	1.63	24	0.015	27.68	25.06	1.1	8.81	2	1	63	SURCHARGED
1986	2192	Pipe	RCP	M-47	M-37	83.01	4492.5	4490.6	2.29	21	0.015	26.26	20.78	1.26	10.92	1.75	1	60	SURCHARGED
1987	2194	Pipe	HDPE	I-68	M-37	38.49	4494.1	4493.4	1.82	15	0.015	0.04	7.55	0	0.98	0.39	0.32	0	Calculated
1988	2195	Pipe	RCP	M-37	M-38	28.74	4490.6	4489.1	5.22	24	0.015	25.09	44.79	0.56	8.23	2	1	59	SURCHARGED
1989	2197	Pipe	RCP	M-38	M-39	272.26	4489.2	4485.7	1.29	24	0.015	24.46	22.23	1.1	7.94	2	1	54	SURCHARGED
1990	2198	Pipe	RCP	I-69	M-39	65.46	4486.2	4485.6	0.92	12	0.015	1.15	2.96	0.39	1.47	1	1	59	SURCHARGED
1991	2200	Pipe	RCP	M-39	M-40	320.46	4485.5	4478.8	2.09	24	0.015	23.39	28.35	0.83	7.92	2	1	57	SURCHARGED
1992	2203	Pipe	RCP	I-71	I-70	120.64	4490	4486.7	2.74	15	0.015	0	9.26	0	0	0.63	0.5	0	Calculated
1993	2204	Pipe	RCP	I-70	I-69	119.47	4486.4	4486.3	0.08	12	0.015	1.15	0.89	1.29	1.47	1	1	58	SURCHARGED
1994	2205	Pipe	RCP	I-83	M-40	91.65	4481	4480.5	0.55	15	0.015	2.2	4.14	0.53	1.8	1.25	1	60	SURCHARGED
1995	2207	Pipe	RCP	M-40	M-35	44.48	4478.8	4478.5	0.67	24	0.015	22.7	16.1	1.41	7.22	2	1	64	SURCHARGED
1996	2208	Pipe	RCP	M-35	M-36	307.58	4478.6	4473.4	1.69	24	0.015	22.24	25.49	0.87	7.13	2	1	63	SURCHARGED
1997	2209	Pipe	RCP	I-65	M-36	63.81	4473.4	4473.3	0.16	15	0.015	3.13	2.22	1.41	2.55	1.25	1	93	SURCHARGED
1998	2211	Pipe	RCP	M-36	I-64	250.65	4473.3	4470.5	1.12	24	0.015	24.42	20.72	1.18	7.99	1.87	0.94	0	> CAPACITY
1999	2212	Pipe	RCP	I-64	O-7	16.14	4470.4	4467.7	16.73	24	0.015	24.42	80.19	0.3	14.51	1.06	0.53	0	Calculated
2000	2213	Pipe	RCP	M-781	I-1412	37.72	4457	4456.9	0.27	12	0.015	0	1.59	0	0	0	0	0	Calculated
2001	2214	Pipe	RCP	I-1412	M-782	48.92	4456.4	4456.2	0.41	15	0.015	0	3.58	0	0	0	0	0	Calculated
2002	2215	Pipe	RCP	M-782	M-795	361.65	4454.2	4448.7	1.52	15	0.015	0	6.9	0	0	0	0	0	Calculated
2003	2216	Pipe	RCP	M-795	M-794	342.21	4448.6	4447.1	0.44	15	0.015	0	3.77	0	0	0	0	0	Calculated
2004	2217	Pipe	RCP	M-794	M-792	84.2	4447	4445.4	1.9	15	0.015	0	7.72	0	0	0.18	0.15	0	Calculated
2005	2218	Pipe	RCP	I-1424	M-792	8.25	4445.9	4445.1	9.7	15	0.015	0	17.43	0	0	0.33	0.27	0	Calculated
2006	2219	Pipe	RCP	M-792	I-1425	21.25	4445.1	4444.2	4.24	15	0.015	3.8	11.52	0.33	3.76	0.96	0.77	0	Calculated
2007	2220	Pipe	RCP	I-1425	M-793	64.32	4444.2	4444.1	0.16	15	0.015	3.8	2.21	1.72	3.55	1.02	0.82	0	> CAPACITY
2008	2221	Pipe	RCP	I-1426	I-1427	41.22	4445.4	4445.1	0.73	15	0.015	0	4.78	0	0	0	0	0	Calculated
2009	2222	Pipe	RCP	I-1427	M-793	52.29	4445.1	4444.2	1.72	15	0.015	0	7.34	0	0	0.31	0.25	0	Calculated
2010	2223	Pipe	RCP	I-1422	I-1423	34.36	4447.8	4446.5	3.78	15	0.015	0	10.89	0	0	0	0	0	Calculated
2011	2224	Pipe	RCP	I-1423	M-793	176.63	4446.5	4444.1	1.36	18	0.015	0	10.61	0	0	0.36	0.24	0	Calculated
2012	2225	Pipe	RCP	M-793	I-1428	502.81	4444.1	4440.1	0.8	18	0.015	3.78	8.12	0.47	3.32	0.92	0.61	0	Calculated
2013	2226	Pipe	RCP	I-1429	I-1428	28.11	4441.7	4440.2	5.34	15	0.015	0	12.93	0	0	0.51	0.41	0	Calculated
2014	2227	Pipe	RCP	I-1428	I-1430	409.08	4440.1	4437.7	0.59	18	0.015	5.73	6.97	0.82	4.46	1.02	0.68	0	Calculated
2015	2228	Pipe	RCP Combined with 2230 (listed as 24") and assumed to be 18" the entire length. RCP	I-1431	I-1430	27.78	4438.3	4437.7	2.16	15	0.015	0.02	8.23	0	0.08	0.53	0.43	0	Calculated
2016	2229	Pipe		I-1430	I-1437	111.67	4437.69	4436.1	1.42	18	0.015	5.74	10.86	0.53	4.82	0.97	0.65	0	Calculated
2017	2231	Pipe	RCP	O-147	I-1435	34.5	4437.3	4436.5	2.32	15	0.015	0.03	0.3	0.09	0.57	0.27	0.21	0	Calculated
2018	2232	Pipe	HDPE	I-1435	I-1436	53.15	4437.4	4437.3	0.19	15	0.015	0.03	2.43	0.01	0.42	0.22	0.17	0	Calculated
2019	2233	Pipe	RCP 6 ORIFICE PLATE Combined with 2235 (listed as 18") and assumed to be 15".	I-1436	M-799	39.13	4437.3	4436.7	1.53	15	0.015	0.64	6.93	0.09	3.12	0.39	0.31	0	Calculated
2020	2234	Pipe	Needs to be field verified.	M-799	I-1437	366.34	4436.45	4436.1	0.1	15	0.015	0.66	1.73	0.38	0.99	0.96	0.77	0	Calculated
2021	2236	Pipe	RCP	I-1421	M-789	10.58	4454.7	4454	6.62	15	0.015	0.01	14.4	0	0.02	0.92	0.74	0	Calculated
2022	2237	Pipe	RCP	I-1413	M-789	14.23	4455.2	4454.1	7.73	15	0.015	0.01	15.57	0	0.02	0.65	0.52	0	Calculated
2023	2238	Pipe	RCP	M-789	M-788	360.48	4454.2	4453.4	0.22	18	0.015	3.25	4.29	0.76	2.96	0.89	0.6	0	Calculated
2024	2239	Pipe	RCP	I-1420	M-788	8.72	4455.5	4453.9	18.35	15	0.015	0	23.98	0	0	0.09	0.08	0	Calculated
2025	2240	Pipe	RCP	I-1414	M-788	16.59	4454.7	4453.9	4.82	15	0.015	0	12.29	0	0	0.09	0.08	0	Calculated
2026	2241	Pipe	RCP	M-788	M-787	202.08	4453.3	4452.2	0.54	18	0.015	3.24	6.72	0.48	3.75	0.74	0.49	0	Calculated
2027	2242	Pipe	RCP	I-81	M-787	39.1	4453.3	4453.1	0.51	18	0.015	0	6.51	0	0	0	0	0	Calculated
2028	2243	Pipe	RCP	M-787	M-786	112.3	4452.1	4451.4	0.62	24	0.015	3.24	16.02	0.2	2.68	0.96	0.48	0	Calculated
2029	2244	Pipe	RCP	I-1419	M-786	7.62	4454.6	4453.5	14.44	15	0.015	0	21.27	0	0	0	0	0	Calculated
2030	2245	Pipe	RCP	I-1415	M-786	14.68	4454.4	4453.4	6.81	15	0.015	0	14.61	0	0	0	0	0	Calculated
2031	2246	Pipe	RCP	M-786	M-785	102.19	4451.3	4451.1	0.2	24	0.015	3.27	8.67	0.38	1.7	1.48	0.74	0	Calculated
2032	2247	Pipe	RCP	I-1416	M-785	17.67	4452.7	4452.1	3.4	18	0.015	0	16.78	0	0	0.28	0.19	0	Calculated
2033	2249	Pipe	RCP	M-785	M-784	271.69	4451.1	4450.5	0.22	24	0.015	8.12	9.21	0.88	3.66	1.33	0.66	0	Calculated
2034	2250	Pipe	HDPE	I-1418	M-784	14.01	4455	4454.4	4.28	18	0.015	0	18.84	0	0	0	0	0	Calculated
2035	2251	Pipe	HDPE	I-1417	M-784	30.06	4451.5	4450.9	2	18	0.015	0.01	12.86	0	0.05	0.39	0.26	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2036	2252	Pipe	RCP	M-784	M-783	38.9	4450.4	4450.1	0.77	24	0.015	8.11	17.22	0.47	4.68	1.08	0.54	0	Calculated
2037	2253	Pipe	RCP	M-402	M-355	539.56	4554.2	4552.5	0.32	42	0.015	30.74	48.94	0.63	3.82	3.48	1	2	SURCHARGED
2038	2254	Pipe	RCP	I-1356	M-765	395.33	4811.4	4787.4	6.07	15	0.015	0	13.79	0	0	0	0	0	Calculated
2039	2255	Pipe	RCP	M-765	I-1357	406.52	4787.3	4762.2	6.17	15	0.015	0	13.91	0	0	0.48	0.38	0	Calculated
2040	2256	Pipe	RCP	I-1368	I-1367	66.86	4753.9	4751.3	3.89	15	0.015	0	11.04	0	0	0.52	0.42	0	Calculated
2041	2258	Pipe	RCP	I-1367	M-771	41.79	4752.1	4751.6	1.2	15	0.015	0.23	6.12	0.04	0.6	0.49	0.4	0	Calculated
2042	2259	Pipe	RCP	I-1357	M-771	193.99	4762.3	4751.6	5.52	15	0.015	9.56	13.15	0.73	11.15	0.82	0.66	0	Calculated
2043	2260	Pipe	RCP	M-771	M-770	204.11	4751.5	4740.2	5.54	15	0.015	9.52	13.17	0.72	11.18	0.81	0.65	0	Calculated
2044	2262	Pipe	RCP	M-770	I-1366	400.02	4740	4720.2	4.95	18	0.015	9.5	20.25	0.47	11.03	0.72	0.49	0	Calculated
2045	2263	Pipe	RCP	I-1366	M-769	246.27	4720.1	4708.6	4.67	18	0.015	9.51	19.67	0.48	10.53	0.74	0.52	0	Calculated
2046	2265	Pipe	RCP	M-769	M-768	194.56	4708.4	4700.3	4.16	18	0.015	9.48	18.58	0.51	6.08	1.22	0.83	0	Calculated
2047	2266	Pipe	RCP	I-1365	I-1364	33.22	4704	4702.1	5.72	12	0.015	2.27	7.38	0.31	3.48	1	1	53	SURCHARGED
2048	2267	Pipe	RCP	I-1364	M-768	50.76	4701.9	4700.3	3.15	15	0.015	2.25	9.94	0.23	1.83	1.25	1	57	SURCHARGED
2049	2268	Pipe	RCP	M-768	I-1363	53.03	4700.2	4697.5	5.09	18	0.015	21.02	20.54	1.02	11.89	1.5	1	59	SURCHARGED
2050	2269	Pipe	RCP	I-1363	M-767	301.16	4697.4	4684.3	4.35	18	0.015	19.58	19.02	1.03	11.69	1.5	1	54	SURCHARGED
2051	2270	Pipe	RCP	M-766	M-767	8.39	4685.4	4684.2	14.3	36	0.015	0	218.61	0	0	0.51	0.17	0	Calculated
2052	2271	Pipe	RCP	M-767	I-1358	279.43	4684.1	4664.4	7.05	18	0.015	19.58	24.17	0.81	14.53	1.07	0.71	0	Calculated
2053	2273	Pipe	RCP	I-1358	I-1362	255.55	4664.2	4648	6.34	18	0.015	19.58	22.92	0.85	13.81	1.12	0.75	0	Calculated
2054	2274	Pipe	RCP	I-1362	I-1359	224.44	4647.9	4628.4	8.69	18	0.015	19.78	26.83	0.74	14.51	1.28	0.85	0	Calculated
2055	2275	Pipe	RCP	I-1359	I-1360	247.77	4628.3	4615.3	5.25	18	0.015	19.79	20.85	0.95	12.51	1.5	1	57	SURCHARGED
2056	2276	Pipe	RCP	I-1361	I-1360	87.75	4619	4615.1	4.44	12	0.015	0.15	6.51	0.02	0.34	1	1	45	SURCHARGED
2057	2277	Pipe	RCP	I-1360	M-815	227.31	4614.9	4611.7	1.41	24	0.015	23.91	23.37	1.02	7.61	2	1	76	SURCHARGED
2058	2278	Pipe	RCP	M-815	M-816	253.79	4611	4609.8	0.47	24	0.015	23.91	13.48	1.77	7.84	1.87	0.93	0	> CAPACITY
2059	2279	Pipe	RCP	M-816	M-817	151.02	4607.9	4599.9	5.3	24	0.015	23.92	45.13	0.53	13.34	1.11	0.56	0	Calculated
2060	2280	Pipe	RCP	M-817	M-818	123.73	4599.5	4594.2	4.28	24	0.015	23.92	40.58	0.59	12.04	1.21	0.6	0	Calculated
2061	2281	Pipe	RCP	M-818	O-150	194.95	4591.5	4584	3.85	24	0.015	23.92	38.46	0.62	14.03	1.08	0.54	0	Calculated
2062	2282	Pipe	RCP	M-814	I-1360	275.88	4618.3	4615.5	1.01	24	0.015	9.06	19.75	0.46	5.65	2	1	45	SURCHARGED
2063	2283	Pipe	RCP	M-813	M-814	604.63	4644.5	4618.4	4.32	24	0.015	7.56	40.73	0.19	8.08	1.28	0.64	0	Calculated
2064	2284	Pipe	RCP	M-812	M-813	244.45	4649.3	4644.6	1.92	24	0.015	7.56	27.19	0.28	7.13	0.74	0.37	0	Calculated
2065	2285	Pipe	RCP	M-811	M-812	237.13	4653.7	4649.4	1.81	24	0.015	7.56	26.4	0.29	6.97	0.75	0.38	0	Calculated
2066	2286	Pipe	RCP	M-810	M-811	130.79	4656.5	4653.8	2.06	24	0.015	7.56	28.17	0.27	7.12	0.74	0.37	0	Calculated
2067	2287	Pipe	RCP	M-809	M-810	192.84	4660	4656.6	1.76	24	0.015	7.56	26.03	0.29	6.85	0.76	0.38	0	Calculated
2068	2289	Pipe	RCP	I-1448	M-808	9.06	4663	4661.6	15.45	15	0.015	0	22.01	0	0	0	0	0	Calculated
2069	2290	Pipe	RCP	M-808	M-809	37.08	4660.5	4660.1	1.08	24	0.015	7.56	20.36	0.37	5.2	0.94	0.47	0	Calculated
2070	2292	Pipe	RCP	I-1449	M-808	32.14	4662	4661.1	2.8	15	0.015	0	9.37	0	0	0.22	0.18	0	Calculated
2071	2293	Pipe	RCP	M-807	M-808	162.13	4663	4660.6	1.48	24	0.015	7.56	23.85	0.32	5.66	0.88	0.44	0	Calculated
2072	2294	Pipe	RCP	M-806	M-807	228.18	4669.1	4663.1	2.63	24	0.015	7.56	31.79	0.24	7.61	0.71	0.35	0	Calculated
2073	2295	Pipe	RCP	I-1446	M-806	6.19	4674.5	4673.5	16.16	15	0.015	0	22.5	0	0	0	0	0	Calculated
2074	2296	Pipe	RCP	I-1447	M-806	28.96	4675	4672.8	7.6	15	0.015	0	15.43	0	0	0	0	0	Calculated
2075	2297	Pipe	RCP	M-803	M-806	119.74	4672.9	4669.2	3.09	24	0.015	7.56	34.46	0.22	8.24	0.67	0.33	0	Calculated
2076	2299	Pipe	RCP	M-804	M-803	102.46	4677.9	4673	4.78	24	0.015	7.56	42.88	0.18	9.34	0.61	0.3	0	Calculated
2077	2300	Pipe	RCP	I-1445	M-804	29.93	4688.3	4688.1	0.67	15	0.015	0	4.58	0	0	0	0	0	Calculated
2078	2301	Pipe	RCP	I-1444	M-804	12.39	4688.7	4688.1	4.84	15	0.015	0	12.32	0	0	0	0	0	Calculated
2079	2302	Pipe	RCP	I-1443	M-804	290.37	4686.7	4678.1	2.96	24	0.015	7.56	33.74	0.22	8.41	0.66	0.33	0	Calculated
2080	2303	Pipe	PVC	M-805	M-804	400.58	4714.4	4685.7	7.16	8	0.015	0	2.84	0	0	0	0	0	Calculated
2081	2306	Pipe	RCP	M-802	O-149	209.18	4732.1	4727	2.44	36	0.015	10.77	90.26	0.12	8.2	0.72	0.24	0	Calculated
2082	2308	Pipe	RCP	M-801	M-802	219.16	0	4732.2	-2159.24	36	0.015	10.77	56.58	0.19	5.85	0.92	0.31	0	Calculated
2083	2309	Pipe	RCP	I-1374	M-777	30.6	4750.6	4748.4	7.19	15	0.015	0	15.01	0	0	0	0	0	Calculated
2084	2310	Pipe	RCP	M-777	I-1375	18.16	4746.4	4746.3	0.55	30	0.015	0.08	27.67	0	0.88	0.69	0.27	0	Calculated
2085	2311	Pipe	RCP	M-776	M-777	439.56	4756.1	4746.5	2.18	30	0.015	10.77	52.53	0.2	8.21	0.78	0.31	0	Calculated
2086	2312	Pipe	RCP	M-775	M-776	364.65	4764.1	4756.2	2.17	30	0.015	10.77	52.32	0.21	8.15	0.79	0.31	0	Calculated
2087	2313	Pipe	RCP	I-1373	M-775	26.22	2770	4768.1	-7620.52	15	0.015	0	15.19	0	0	0	0	0	Calculated
2088	2314	Pipe	RCP	I-1372	I-1371	75	4767.3	4766.5	1.07	24	0.015	0	20.25	0	0	0	0	0	Calculated
2089	2315	Pipe	RCP	I-1371	M-775	9.21	4766.4	4764.1	24.97	24	0.015	0	97.98	0	0	0.4	0.2	0	Calculated
2090	2317	Pipe	RCP	M-774	M-775	396.56	4777.5	4764.1	3.38	24	0.015	10.77	36.04	0.3	9.42	0.78	0.39	0	Calculated
2091	2319	Pipe	RCP	M-773	M-774	209.83	4781.4	4777.7	1.76	15	0.015	10.77	7.43	1.45	8.82	1.22	0.98	0	> CAPACITY
2092	2320	Pipe	RCP	I-1370	M-773	41.67	4785.4	4781.5	9.36	15	0.015	0.16	17.13	0.01	0.24	1.25	1	81	SURCHARGED
2093	2321	Pipe	RCP	I-1369	M-773	29.54	4783.1	4781.5	5.42	15	0.015	10.77	13.23	0.81	8.78	1.25	1	119	SURCHARGED
2094	2322	Pipe	HDPE	I-1499	M-849	62.13	4546.6	4544.3	3.7	18	0.015	0	17.52	0	0	0	0	0	Calculated
2095	2323	Pipe		M-849	O-156	78.19	4544.1	4540	5.24	18	0.015	0	21.35	0	0	0	0	0	Calculated
2096	2325	Pipe	CMP	I-1451	M-819	73.57	4568	4566.5	2.04	24	0.015	25.6	28	0.91	8.78	1.75	0.88	0	Calculated
2097	2326	Pipe	BOX CULVERT	M-819	M-823	572.83	4560.7	4560.6	0.02	60	0.015	25.64	29.82	0.86	1.93	5	1	88	SURCHARGED

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2098	2327	Pipe	RCP	M-823	M-822	12.58	4560.7	4560.1	4.77	36	0.015	25.64	126.24	0.2	3.63	3	1	134	SURCHARGED
2099	2329	Pipe	RCP	M-822	M-821	65.56	4560	4559.6	0.61	36	0.015	32.65	45.15	0.72	4.62	3	1	156	SURCHARGED
2100	2330	Pipe	RCP	M-821	M-820	395.84	4559.5	4559.4	0.03	36	0.015	29.55	9.19	3.22	4.18	3	1	155	SURCHARGED
2101	2331	Pipe	RCP	M-820	M-824	237.89	4559.4	4559.3	0.04	36	0.015	29.55	11.85	2.49	4.18	3	1	153	SURCHARGED
2102	2333	Pipe	RCP	M-824	M-825	165.51	4559.3	4559.2	0.06	36	0.015	29.56	14.21	2.08	4.18	3	1	151	SURCHARGED
2103	2334	Pipe	RCP	M-825	M-826	397.24	4559.2	4559.1	0.03	36	0.015	29.55	9.17	3.22	4.18	3	1	143	SURCHARGED
2104	2336	Pipe	RCP	M-826	O-152	78.47	4559.1	4559	0.13	36	0.015	32.51	20.64	1.58	4.69	3	1	136	SURCHARGED
2105	2337	Pipe	RCP	I-488	M-826	60.31	4561.3	4559.1	3.65	15	0.015	0.62	10.69	0.06	0.5	1.25	1	136	SURCHARGED
2106	2338	Pipe	RCP	I-487	I-488	52.09	4561.4	4561.3	0.19	15	0.015	0.62	2.45	0.25	0.54	1.25	1	134	SURCHARGED
2107	2339	Pipe	RCP	M-165	M-173	644.03	4558.1	4558	0.02	48	0.015	9.95	15.51	0.64	1.61	4	1	133	SURCHARGED
2108	2341	Pipe	RCP	M-173	M-174	75.13	4558.5	4558.4	0.13	15	0.015	9.96	2.04	4.87	8.18	1.21	0.97	0	> CAPACITY
2109	2342	Pipe	RCP	M-174	M-736	212.86	4558.1	4546.2	5.59	24	0.015	9.88	46.36	0.21	11.29	0.64	0.32	0	Calculated
2110	2343	Pipe	RCP	I-1316	M-736	23.2	4547.7	4546.2	6.47	12	0.015	0	7.85	0	0	0.26	0.26	0	Calculated
2111	2344	Pipe	RCP	I-1317	M-736	14.19	4546.7	4546.2	3.52	12	0.015	0.01	5.8	0	0.07	0.26	0.27	0	Calculated
2112	2345	Pipe	RCP	M-736	M-737	129.74	4546.1	4536.7	7.25	24	0.015	9.88	52.77	0.19	11.44	0.63	0.32	0	Calculated
2113	2346	Pipe	RCP	M-737	M-738	117.59	4536.7	4529	6.55	24	0.015	9.84	50.17	0.2	11.63	0.62	0.31	0	Calculated
2114	2347	Pipe	RCP	M-738	I-1318	205.81	4528.9	4515.6	6.46	30	0.015	9.85	90.37	0.11	11.6	0.58	0.24	0	Calculated
2115	2348	Pipe	RCP	I-1318	M-172	72.16	4515.5	4509.8	7.9	30	0.015	13.41	99.91	0.13	12.59	0.67	0.27	0	Calculated
2116	2349	Pipe	RCP	M-172	M-739	347.36	4509.7	4489.3	5.87	30	0.015	13.39	86.23	0.16	12.43	0.68	0.27	0	Calculated
2117	2350	Pipe	HDPE	I-1304	I-1318	53.72	4515.6	4515.5	0.19	24	0.015	13.41	8.46	1.58	4.81	1.65	0.83	0	> CAPACITY
2118	2351	Pipe	RCP	I-1305	I-1304	34.37	4516.4	4515.7	2.04	15	0.015	0.13	7.99	0.02	0.22	1.22	0.99	0	Calculated
2119	2352	Pipe	HDPE	M-729	I-1304	117.89	4523.5	4515.7	6.62	24	0.015	13.42	50.43	0.27	6.17	1.3	0.66	0	Calculated
2120	2353	Pipe	HDPE	M-728	M-729	103.62	4533.3	4523.6	9.36	24	0.015	13.42	59.99	0.22	14.22	0.67	0.34	0	Calculated
2121	2354	Pipe	HDPE	I-1303	M-728	293.59	4555.9	4533.4	7.66	24	0.015	13.43	54.28	0.25	13.88	0.69	0.35	0	Calculated
2122	2355	Pipe	RCP	I-1307	M-730	23.58	4524.4	4524.3	0.42	12	0.015	0	2.29	0	0	0	0	0	Calculated
2123	2356	Pipe	RCP	I-1306	M-730	8.66	4526.2	4524.3	21.94	12	0.015	0	14.46	0	0	0	0	0	Calculated
2124	2357	Pipe	RCP	M-730	M-731	213.48	4524.2	4508.4	7.4	15	0.015	0	15.23	0	0	0	0	0	Calculated
2125	2358	Pipe	RCP	I-1309	M-731	20.37	4509.2	4508.4	3.93	12	0.015	0	6.12	0	0	0	0	0	Calculated
2126	2359	Pipe	RCP	M-731	I-1310	72.62	4508.4	4503.1	7.3	15	0.015	0	15.12	0	0	0	0	0	Calculated
2127	2360	Pipe	RCP	I-1310	M-732	230.12	4503	4488.9	6.13	15	0.015	0	13.86	0	0	0	0	0	Calculated
2128	2361	Pipe	RCP	I-1311	M-732	28.84	4491.5	4488.9	9.02	15	0.015	0	16.81	0	0	0	0	0	Calculated
2129	2362	Pipe	RCP	I-1308	I-1312	78.77	4512	4510.6	1.78	15	0.015	0	7.46	0	0	0	0	0	Calculated
2130	2363	Pipe	RCP	I-1312	M-733	16.04	4510.5	4510.3	1.25	15	0.015	0	6.25	0	0	0	0	0	Calculated
2131	2364	Pipe	RCP	M-733	M-734	238.59	4510.2	4491.5	7.84	15	0.015	0	15.67	0	0	0	0	0	Calculated
2132	2365	Pipe	RCP	M-734	I-1313	59.5	4491.4	4490	2.35	15	0.015	0	8.89	0	0	0	0	0	Calculated
2133	2366	Pipe	RCP	I-1313	M-732	36.17	4489	4488.9	0.28	15	0.015	0	2.94	0	0	0	0	0	Calculated
2134	2367	Pipe	RCP	M-732	I-1314	131.95	4488.8	4483.2	4.24	15	0.015	0	11.53	0	0	0.1	0.09	0	Calculated
2135	2368	Pipe	RCP	I-1315	I-1314	25.99	4483.7	4483.2	1.92	15	0.015	0	7.77	0	0	0.1	0.09	0	Calculated
2136	2369	Pipe	RCP	I-1314	M-735	47	4483	4482.3	1.49	15	0.015	0.16	6.83	0.02	0.27	0.75	0.62	0	Calculated
2137	2370	Pipe	RCP	I-1319	M-740	17.1	4484.5	4481.8	15.79	12	0.015	0	12.27	0	0	0.5	0.5	0	Calculated
2138	2371	Pipe	RCP	M-735	M-740	95.72	4482.2	4481.8	0.42	15	0.015	0.28	3.62	0.08	0.43	1.22	0.99	0	Calculated
2139	2372	Pipe	RCP	M-739	M-740	183.36	4489.2	4481.8	4.04	30	0.015	13.39	71.41	0.19	8.51	1.16	0.47	0	Calculated
2140	2373	Pipe	RCP	I-1320	M-741	5.77	4483.7	4480.8	50.26	12	0.015	0	21.89	0	0	0.5	0.5	0	Calculated
2141	2374	Pipe	RCP	M-740	M-741	49.71	4481.7	4480.8	1.81	36	0.015	26.28	77.78	0.34	6.18	1.72	0.58	0	Calculated
2142	2375	Pipe	RCP	M-741	M-742	171.55	4480.7	4479.6	0.64	36	0.015	26.26	46.29	0.57	6.14	1.71	0.58	0	Calculated
2143	2376	Pipe	RCP	I-1321	M-742	52.73	4482.7	4480.2	4.74	12	0.015	0	6.72	0	0	0.48	0.5	0	Calculated
2144	2377	Pipe	RCP	M-742	DET_54	251.59	4479.5	4475.4	1.63	36	0.015	26.21	50.76	0.52	6.91	2.02	0.67	0	Calculated
2145	2383	Pipe	RCP	M-829	I-1459	25.55	4458.8	4449.4	36.79	24	0.015	0.22	30.04	0.01	0.23	0.79	0.43	0	Calculated
2146	2385	Pipe	HDPE	I-1459	I-1460	202.55	4458.2	4452.8	2.67	24	0.015	14.92	32.01	0.47	7.87	1.54	0.79	0	Calculated
2147	2386	Pipe	HDPE	I-1460	M-830	61.43	4452.7	4451.5	1.95	24	0.015	14.92	27.97	0.53	7.11	2	1	9	SURCHARGED
2148	2388	Pipe	RCP	I-1498	M-848	21.09	4455	4452.4	12.33	15	0.015	0	19.66	0	0	0	0	0	Calculated
2149	2389	Pipe	RCP	M-848	M-847	58.12	4452.4	4450.5	3.27	15	0.015	0	10.12	0	0	0	0	0	Calculated
2150	2390	Pipe	HDPE	I-1656	O-180	143.26	4507.5	4505	1.75	15	0.015	0	7.4	0	0	0	0	0	Calculated
2151	2391	Pipe		M-886	New-7	42.9	4660	4652.6	17.25	18	0.015	8.41	0.44	19.13	5.13	1.31	0.87	0	> CAPACITY
2152	2392	Pipe	HDPE	M-886	M-887	33.94	4651.7	4648.5	9.43	18	0.015	8.41	28.08	0.3	10.15	0.71	0.48	0	Calculated
2153	2393	Pipe	HDPE	M-887	M-888	43.86	4648.5	4646.4	4.79	24	0.015	8.4	42.9	0.2	9.12	0.67	0.33	0	Calculated
2154	2394	Pipe	HDPE	M-888	M-889	127.07	4646.3	4640	4.96	24	0.015	8.41	43.66	0.19	9.21	0.66	0.33	0	Calculated
2155	2395	Pipe	HDPE	M-889	New-8	122.38	4640	4636	3.27	24	0.015	8.42	35.45	0.24	7.71	0.76	0.38	0	Calculated
2156	2396	Pipe	RCP	New-8	M-890	116.61	4636	4633.4	2.23	24	0.015	8.41	29.28	0.29	7.47	0.78	0.39	0	Calculated
2157	2397	Pipe	HDPE	I-1541	I-1542	40.51	4657.2	4654.7	6.17	15	0.015	0	13.91	0	0	0	0	0	Calculated
2158	2398	Pipe	HDPE	I-1542	I-1543	19.27	4654.6	4654.5	0.52	15	0.015	0	4.03	0	0	0	0	0	Calculated
2159	2399	Pipe	HDPE	I-1543	I-1544	39.2	4654.4	4652.9	3.83	15	0.015	0	10.95	0	0	0.11	0.08	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2160	2400	Pipe	HDPE	I-1544	M-862	66.84	4652.8	4643	14.66	15	0.015	2.58	21.44	0.12	11.24	0.3	0.24	0	Calculated
2161	2401	Pipe	HDPE	M-862	M-861	153.69	4641.2	4636	3.38	24	0.015	6.69	36.06	0.19	8.36	0.6	0.3	0	Calculated
2162	2402	Pipe	HDPE	I-1550	I-1551	69.15	4697.4	4696.8	0.87	24	0.015	0	18.26	0	0	0	0	0	Calculated
2163	2403	Pipe	HDPE	I-1551	M-865	34.43	4696.7	4694.8	5.52	24	0.015	0	46.06	0	0	0.29	0.14	0	Calculated
2164	2404	Pipe	HDPE	I-1562	I-1561	34.29	4708.1	4706.3	5.25	15	0.015	0	12.83	0	0	0	0	0	Calculated
2165	2405	Pipe	HDPE	I-1561	I-1553	235.02	4706.2	4700.1	2.6	15	0.015	0	9.02	0	0	0	0	0	Calculated
2166	2406	Pipe	HDPE	I-1554	I-1553	26.5	4700.4	4700.1	1.13	15	0.015	0	5.96	0	0	0	0	0	Calculated
2167	2407	Pipe	HDPE	I-1552	M-866	15.25	4702.7	4699.3	22.3	15	0.015	0	26.43	0	0	0	0	0	Calculated
2168	2408	Pipe	HDPE	I-1553	M-866	44.05	4700	4699.3	1.59	15	0.015	0	7.06	0	0	0	0	0	Calculated
2169	2409	Pipe	HDPE	M-866	M-865	87.69	4700.5	4696.1	5.02	18	0.015	0	20.39	0	0	0	0	0	Calculated
2170	2410	Pipe	HDPE	M-865	M-867	213.38	4694.7	4682	5.95	24	0.015	9.1	47.89	0.19	12.36	0.57	0.28	0	Calculated
2171	2411	Pipe	HDPE	M-867	M-864	54.64	4682	4675.4	12.08	24	0.015	9.09	68.14	0.13	6.98	1.15	0.57	0	Calculated
2172	2412	Pipe	HDPE	M-864	M-863	23.26	4675.2	4675.1	0.43	24	0.015	9.08	12.86	0.71	4.37	2	1	99	SURCHARGED
2173	2413	Pipe	HDPE	M-863	O-162	35.54	4675	4674	2.81	24	0.015	9.02	32.89	0.27	5.53	2	1	116	SURCHARGED
2174	2414	Pipe	HDPE	I-1555	O-164	177.72	4667.3	4655.98	6.37	18	0.015	1.61	22.98	0.07	8	0.26	0.17	0	Calculated
2175	2416	Pipe	HDPE	I-1549	I-1548	43.11	4673.2	4672.9	0.7	15	0.015	1.89	4.67	0.4	3.31	0.59	0.47	0	Calculated
2176	2417	Pipe	HDPE	I-1548	I-1547	46.86	4672.9	4671.3	3.41	15	0.015	1.89	10.34	0.18	4.78	0.54	0.43	0	Calculated
2177	2418	Pipe	HDPE	I-1547	I-1546	10.9	4671.3	4670.9	3.67	15	0.015	1.89	10.72	0.18	3.59	0.92	0.74	0	Calculated
2178	2419	Pipe	HDPE	I-1546	I-1545	33.14	4670.9	4670.6	0.91	15	0.015	1.89	5.33	0.35	3.56	1.18	0.95	0	Calculated
2179	2420	Pipe	HDPE	I-1545	O-163	39.76	4670.6	4670	1.51	15	0.015	1.88	6.88	0.27	4.93	1.25	1	46	SURCHARGED
2180	2421	Pipe	HDPE	I-1559	I-1560	59.49	4663.5	4662.6	1.51	15	0.015	0	6.92	0	0	0	0	0	Calculated
2181	2422	Pipe	HDPE	I-1560	O-167	71.7	4662.5	4651.5	15.34	15	0.015	0	21.93	0	0	0	0	0	Calculated
2182	2423	Pipe	RCP	I-1556	O-165	26.93	4642	4639	11.14	48	0.015	1.61	415.51	0	9.88	0.16	0.04	0	Calculated
2183	2424	Pipe	RCP	I-1557	O-166	27.89	4635	4634	3.59	36	0.015	1.61	109.46	0.01	6.79	0.22	0.07	0	Calculated
2184	2425	Pipe	HDPE	I-1563	I-1564	44.47	4663.4	4659.7	8.32	15	0.015	0	16.15	0	0	0	0	0	Calculated
2185	2426	Pipe	HDPE	I-1564	I-1565	18.43	4659.6	4659.5	0.54	15	0.015	0	4.12	0	0	0	0	0	Calculated
2186	2427	Pipe	HDPE	I-1565	I-1566	33.9	4659.4	4659.2	0.59	15	0.015	0	4.3	0	0	0	0	0	Calculated
2187	2428	Pipe	HDPE	I-1566	M-871	197.37	4659.1	4650	4.61	15	0.015	0	12.05	0	0	0.2	0.16	0	Calculated
2188	2429	Pipe	RCP	I-1568	New-18	195.8	4660.05	4655.5	2.32	30	0.015	11.29	54.19	0.21	9.64	0.72	0.29	0	Calculated
2189	2430	Pipe	HDPE	New-18	M-870	90.95	4655.5	4638.02	19.22	18	0.015	11.29	39.91	0.28	15.25	0.67	0.44	0	Calculated
2190	2431	Pipe	HDPE	M-871	M-870	69.84	4650	4638.9	15.89	18	0.015	4.75	36.29	0.13	13.39	0.38	0.25	0	Calculated
2191	2432	Pipe	HDPE	M-870	I-1567	170.6	4638	4629	5.28	24	0.015	13.57	45.08	0.3	11.86	0.78	0.39	0	Calculated
2192	2433	Pipe	HDPE	I-1572	M-871	363.25	4650.7	4650	0.19	18	0.015	4.82	4.38	1.1	4.56	0.95	0.63	0	> CAPACITY
2193	2434	Pipe	HDPE	I-1569	I-1570	43.86	4655.2	4653.6	3.65	15	0.015	0	10.69	0	0	0	0	0	Calculated
2194	2435	Pipe	HDPE	I-1570	I-1571	18.08	4653.5	4653.3	1.11	18	0.015	0	9.57	0	0.01	0.11	0.07	0	Calculated
2195	2436	Pipe	HDPE	I-1571	I-1572	38.31	4653.2	4650.8	6.26	18	0.015	2.05	22.6	0.09	2.43	0.9	0.6	0	Calculated
2196	2437	Pipe	RCP	M-873	I-1571	242	4654	4653.5	0.21	15	0.015	2.05	2.54	0.81	2.64	0.76	0.6	0	Calculated
2197	2438	Pipe	HDPE	I-1573	M-872	99.58	4659.3	4654.9	4.42	15	0.015	2.06	11.75	0.17	4.04	0.54	0.43	0	Calculated
2198	2439	Pipe	RCP	M-872	M-873	234.92	4654.9	4654.1	0.34	15	0.015	2.06	3.29	0.63	2.56	0.78	0.63	0	Calculated
2199	2440	Pipe	HDPE	I-1535	I-1534	26.58	4695.9	4695.5	1.5	15	0.015	0	6.87	0	0	0.15	0.12	0	Calculated
2200	2441	Pipe	HDPE	I-1534	O-171	221	4695.4	4666	13.3	15	0.015	3.35	20.42	0.16	16.71	0.27	0.22	0	Calculated
2201	2442	Pipe	RCP	I-1538	M-857	89.69	4788.6	4788.1	0.56	15	0.015	0	4.18	0	0	0.23	0.19	0	Calculated
2202	2443	Pipe	RCP	M-857	I-1540	56.98	4788	4787	1.76	15	0.015	0.04	7.42	0	0.06	0.91	0.73	0	Calculated
2203	2445	Pipe	HDPE	I-1540	M-858	222.68	4786.9	4784.9	0.9	15	0.015	4.97	5.31	0.94	4.05	1.25	1	59	SURCHARGED
2204	2446	Pipe	HDPE	M-860	M-858	125.25	4799.6	4786.3	10.62	15	0.015	0	18.24	0	0	0.13	0.1	0	Calculated
2205	2447	Pipe	HDPE	M-858	M-859	111.16	4784.7	4784.4	0.27	15	0.015	4.97	2.91	1.71	4.42	1.08	0.86	0	> CAPACITY
2206	2448	Pipe	RCP	I-1490	M-843	17.83	4465.4	4463.1	12.9	15	0.015	0	20.11	0	0	0.2	0.16	0	Calculated
2207	2449	Pipe	RCP	I-1491	M-843	42.05	4463.5	4463.1	0.95	15	0.015	0	5.46	0	0	0.2	0.16	0	Calculated
2208	2450	Pipe	RCP	I-1492	I-1493	89.92	4460.6	4460.2	0.44	15	0.015	0	10.89	0	0	0	0	0	Calculated
2209	2451	Pipe	RCP	M-843	M-842	437	4463	4459.9	0.71	18	0.015	1.51	7.72	0.2	3.35	0.45	0.3	0	Calculated
2210	2452	Pipe	RCP	I-1493	M-842	43.42	4460.2	4460	0.46	15	0.015	0	16.99	0	0	0.16	0.13	0	Calculated
2211	2453	Pipe	RCP	I-1488	M-842	19.03	4461.2	4460	6.31	15	0.015	0	14.06	0	0	0.16	0.13	0	Calculated
2212	2454	Pipe	RCP	M-842	M-841	408.13	4459.9	4456.2	0.91	18	0.015	1.51	8.67	0.17	2.18	0.66	0.44	0	Calculated
2213	2455	Pipe	RCP	I-1486	M-841	18.21	4456.9	4456.2	3.84	15	0.015	0.01	10.98	0	0.02	0.58	0.47	0	Calculated
2214	2456	Pipe	RCP	I-1487	M-841	44.08	4458.9	4456.2	6.13	15	0.015	0	13.86	0	0	0.47	0.37	0	Calculated
2215	2457	Pipe	RCP	M-841	M-840	73.47	4456.4	4455.2	1.63	24	0.015	5.63	25.06	0.22	4.83	0.8	0.4	0	Calculated
2216	2458	Pipe	DUCTILE IRON	I-1485	M-840	49.78	4457.3	4455.8	3.01	18	0.015	0	15.8	0	0	0.13	0.09	0	Calculated
2217	2459	Pipe	RCP	M-840	M-839	309.58	4455.1	4453.6	0.48	24	0.015	5.63	13.69	0.41	4.14	0.89	0.45	0	Calculated
2218	2460	Pipe	RCP	M-839	I-1484	113.25	4453.5	4452.3	1.06	24	0.015	5.63	20.18	0.28	5.14	0.76	0.38	0	Calculated
2219	2461	Pipe	RCP	I-1484	M-844	52.32	4451.8	4450.6	2.29	24	0.015	5.63	30.3	0.19	6.56	0.63	0.32	0	Calculated
2220	2462	Pipe	RCP	I-1494	M-844	19.48	4454.2	4451.6	13.35	15	0.015	0	20.45	0	0	0	0	0	Calculated
2221	2463	Pipe	HDPE	I-1503	I-1502	39.65	4422.7	4422.3	1.01	18	0.015	2.05	9.14	0.22	1.22	1.5	1	148	SURCHARGED

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2222	2464	Pipe	HDPE	I-1502	I-1504	286.94	4422.2	4020.9	139.86	18	0.015	7.64	6.36	1.2	4.33	1.5	1	151	SURCHARGED
2223	2465	Pipe	HDPE	I-1505	I-1504	40.15	4421.8	4421	1.99	18	0.015	1.49	12.85	0.12	1.04	1.5	1	143	SURCHARGED
2224	2466	Pipe	HDPE	I-1504	I-1506	124.9	4420.8	4420.2	0.48	18	0.015	7.64	6.31	1.21	4.33	1.5	1	149	SURCHARGED
2225	2467	Pipe	HDPE	I-1507	I-1506	39.86	4420.7	4420.3	1	18	0.015	0.58	9.12	0.06	0.34	1.5	1	144	SURCHARGED
2226	2468	Pipe	RCP	I-1506	O-157	153.76	4420.2	4417.4	1.82	15	0.015	9.74	7.55	1.29	7.97	1.25	1	131	SURCHARGED
2227	2469	Pipe	HDPE	M-926	I-1669	233.16	4560.2	4559.9	0.13	15	0.015	0	2.01	0	0	0	0	0	Calculated
2228	2470	Pipe	HDPE	I-1668	I-1669	24.61	4562.9	4562.1	3.25	15	0.015	0	10.09	0	0	0	0	0	Calculated
2229	2471	Pipe	HDPE	I-1669	M-925	92.2	4559.8	4558.9	0.98	15	0.015	0	5.53	0	0	0	0	0	Calculated
2230	2472	Pipe	HDPE	M-925	M-923	142.67	4558.8	4556.1	1.89	15	0.015	0	7.7	0	0	0	0	0	Calculated
2231	2473	Pipe	HDPE	I-1658	I-1657	27.6	4524.2	4523.5	2.54	15	0.015	5.75	8.92	0.64	6.44	0.85	0.68	0	Calculated
2232	2474	Pipe	HDEP	I-1657	M-921	161.14	4523	4490.6	20.11	15	0.015	5.75	25.1	0.23	6.66	0.83	0.66	0	Calculated
2233	2475	Pipe	DUCTILE IRON	M-921	O-181	116.23	4490.5	4488	2.15	24	0.015	13.26	27.22	0.49	5.27	1.49	0.75	0	Calculated
2234	2476	Pipe	HDPE	I-1659	I-1658	104.04	4524.4	4524.3	0.1	15	0.015	5.75	1.74	3.31	4.99	1.11	0.89	0	> CAPACITY
2235	2477	Pipe	HDPE	I-1660	I-1659	98.46	4525.7	4524.5	1.22	15	0.015	0.32	6.18	0.05	0.45	1.15	0.94	0	Calculated
2236	2478	Pipe	HDPE	M-924	M-923	111.71	4558.7	4556	2.42	15	0.015	0	8.7	0	0	0	0	0	Calculated
2237	2479	Pipe	HDPE	M-923	I-1667	298.69	4555.9	4537.6	6.13	15	0.015	0	13.86	0	0	0.33	0.27	0	Calculated
2238	2480	Pipe	HDPE	I-1666	I-1667	26.01	4538.8	4537.6	4.61	15	0.015	0	12.03	0	0	0.33	0.27	0	Calculated
2239	2481	Pipe	HDPE	I-1667	M-922	158.48	4537.5	4527	6.63	15	0.015	9.41	14.41	0.65	8.88	1.01	0.81	0	Calculated
2240	2482	Pipe	HDPE	M-922	I-1664	69.44	4527	4526.5	0.72	15	0.015	7.65	4.75	1.61	6.39	1.17	0.94	0	> CAPACITY
2241	2483	Pipe	HDPE	I-1664	New-22	148.03	4526.45	4510	11.11	15	0.015	7.65	18.66	0.41	8.05	0.9	0.72	0	Calculated
2242	2484	Pipe	HDPE	I-1665	New-22	179.81	4520.5	4510	5.84	15	0.015	0	13.53	0	0	0.63	0.5	0	Calculated
2243	2485	Pipe	HDPE	I-1662	I-1663	21.24	4525.5	4525.1	1.88	15	0.015	0	7.68	0	0	0	0	0	Calculated
2244	2486	Pipe	HDPE	I-1661	I-1662	126.62	4526.8	4525.6	0.95	15	0.015	0	5.45	0	0	0	0	0	Calculated
2245	2487	Pipe	HDPE	I-1663	Jun-2344	186.68	4524.9	4507	9.59	15	0.015	0	17.34	0	0	0.5	0.4	0	Calculated
2246	2488	Pipe	HDPE	New-22	Jun-2344	279.88	4510	4507	1.07	15	0.015	7.64	5.8	1.32	6.86	1.13	0.9	0	> CAPACITY
2247	2489	Pipe	HDPE	I-1672	I-1671	322.98	5126.4	5115.7	3.31	15	0.015	0	10.19	0	0	0	0	0	Calculated
2248	2490	Pipe	HDPE	I-1670	I-1671	38.67	5115.9	5115.7	0.52	15	0.015	0	4.03	0	0	0	0	0	Calculated
2249	2491	Pipe	HDPE	I-1677	I-1676	37.38	5123.9	5125	-2.94	15	0.015	0	9.6	0	0	0	0	0	Calculated
2250	2492	Pipe	HDPE	I-1676	I-1678	333.87	5125	5105.7	5.78	15	0.015	0	13.46	0	0	0	0	0	Calculated
2251	2493	Pipe	RCP	I-1680	I-1679	57.69	5106	5105.6	0.69	15	0.015	0	4.66	0	0	0	0	0	Calculated
2252	2494	Pipe	RCP	I-1679	I-1678	49.46	5105.5	5104.9	1.21	15	0.015	0	6.22	0	0	0	0	0	Calculated
2253	2495	Pipe	HDPE	I-1678	I-1681	82.4	5104.5	5102.4	2.55	15	0.015	0	9.02	0	0	0	0	0	Calculated
2254	2496	Pipe	HDPE	I-1681	M-927	67.01	5102.3	5101.3	1.49	15	0.015	0	6.84	0	0	0	0	0	Calculated
2255	2497	Pipe	HDPE	M-927	I-1682	69.87	5101.2	5101.1	0.14	15	0.015	0	2.12	0	0	0	0	0	Calculated
2256	2498	Pipe	HDPE	I-1682	I-1683	82.51	5101	5099.3	2.06	18	0.015	0	13.07	0	0	0	0	0	Calculated
2257	2499	Pipe	HDPE	I-1683	I-1684	68.04	5099.2	5097	3.23	18	0.015	0	16.37	0	0	0	0	0	Calculated
2258	2500	Pipe	HDPE	I-1684	I-1685	131.53	5097	5088.2	6.69	18	0.015	0	23.55	0	0	0	0	0	Calculated
2259	2501	Pipe	HDPE	I-1685	I-1686	156.77	5088.1	5077.3	6.89	18	0.015	0	23.89	0	0	0	0	0	Calculated
2260	2502	Pipe	HDPE	I-1686	I-1687	194.51	5077.2	5072.2	2.57	18	0.015	0	14.6	0	0	0	0	0	Calculated
2261	2503	Pipe	HDPE	I-1690	M-928	255.81	5103.9	5069.4	13.49	15	0.015	0	20.56	0	0	0.63	0.5	0	Calculated
2262	2504	Pipe	HDPE	I-1687	M-928	29.61	5072.2	5069.4	9.46	18	0.015	0	28	0	0	0.75	0.5	0	Calculated
2263	2505	Pipe	HDPE	I-1689	I-1688	29.66	5070.2	5069	4.05	18	0.015	0	17.53	0	0	0.43	0.29	0	Calculated
2264	2506	Pipe	HDPE	M-928	I-1688	35.02	5069.2	5069	0.57	18	0.015	13.82	4.86	2.84	9.25	1.18	0.79	0	> CAPACITY
2265	2507	Pipe	HDPE	I-1694	I-1693	70.4	5100.3	5093	10.37	15	0.015	0	17.9	0	0	0	0	0	Calculated
2266	2508	Pipe	HDPE	I-1693	I-1695	26.76	5093.1	5091.8	4.86	15	0.015	0	10.98	0	0	0	0	0	Calculated
2267	2510	Pipe	HDPE	Jun-2344	M-921	710.72	4507	4491	2.25	15	0.015	7.65	8.4	0.91	6.57	1.13	0.9	0	Calculated
2268	2511	Pipe	HDPE	I-1707	I-1708	111.39	4955.1	4951.7	3.05	15	0.015	5.49	9.8	0.56	7.69	0.71	0.56	0	Calculated
2269	2512	Pipe	HDPE	I-1708	I-1709	135.42	4951.6	4944	5.61	18	0.015	5.49	21.57	0.25	9.75	0.53	0.36	0	Calculated
2270	2513	Pipe	HDPE	I-1709	I-1711	120.62	4943.9	4930.9	10.78	18	0.015	5.49	29.89	0.18	12.36	0.45	0.3	0	Calculated
2271	2514	Pipe	HDPE	I-1710	I-1711	26.06	4931.6	4930.9	2.69	15	0.015	0	9.18	0	0	0.19	0.15	0	Calculated
2272	2515	Pipe	HDPE	I-1711	I-1712	137.04	4930.8	4918.7	8.83	18	0.015	5.49	27.05	0.2	11.54	0.47	0.31	0	Calculated
2273	2516	Pipe	HDPE	I-1713	I-1712	23.95	4918.8	4918.7	0.42	15	0.015	0.15	3.62	0.04	0.87	0.43	0.35	0	Calculated
2274	2517	Pipe	HDPE	I-1714	I-1715	24	4892.5	4891.8	2.92	15	0.015	0	9.21	0	0	0	0	0	Calculated
2275	2518	Pipe	HDPE	I-1715	I-1716	278.71	4891.9	4887.3	1.65	18	0.015	0	11.7	0	0	0	0	0	Calculated
2276	2519	Pipe	HDPE	I-1716	I-1718	419.58	4887.2	4848.3	9.27	18	0.015	0	27.72	0	0	0	0	0	Calculated
2277	2520	Pipe	HDPE	I-1717	I-1718	25.01	4849.1	4848.4	2.8	15	0.015	0	9.43	0	0	0	0	0	Calculated
2278	2521	Pipe	HDPE	I-1718	M-934	91.79	4848.3	4840	9.04	18	0.015	0	27.46	0	0	0	0	0	Calculated
2279	2522	Pipe	HDPE	M-934	M-935	137.03	4839.9	4825.9	10.22	18	0.015	0	29.1	0	0	0.39	0.26	0	Calculated
2280	2523	Pipe	HDPE	M-935	M-936	128.43	4825.8	4813.1	9.89	18	0.015	17.93	28.63	0.63	12.71	1.19	0.8	0	Calculated
2281	2524	Pipe	HDPE	I-1719	M-936	17.57	4813.3	4813.1	1.14	15	0.015	0.18	6.68	0.03	0.15	1.25	1	3	SURCHARGED
2282	2525	Pipe	HDPE	I-1721	I-1722	24.32	4787.3	4786.9	1.64	15	0.015	0	7.18	0	0	0	0	0	Calculated
2283	2526	Pipe	HDPE	I-1722	I-1723	255.39	4786.8	4781.4	2.11	15	0.015	0	8.14	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2284	2527	Pipe	HDPE	I-1724	I-1723	25.47	4781.9	4781.4	1.96	15	0.015	0	7.84	0	0	0	0	0	Calculated
2285	2528	Pipe	HDPE	I-1723	M-937	299.15	4781.3	4779.6	0.57	15	0.015	0	4.22	0	0	0	0	0	Calculated
2286	2529	Pipe	HDPE	I-1725	I-1726	35.8	4781.4	4780.8	1.68	15	0.015	0	7.25	0	0	0	0	0	Calculated
2287	2530	Pipe	HDPE	I-1726	M-937	54.13	4780.7	4779.5	2.22	15	0.015	0	8.16	0	0	0	0	0	Calculated
2288	2531	Pipe	HDPE	M-937	M-938	201.83	4779.6	4775.5	2.03	15	0.015	0	7.98	0	0	0	0	0	Calculated
2289	2532	Pipe	HDPE	M-938	M-939	94.09	4775.4	4770.1	5.63	15	0.015	0	13.29	0	0	0	0	0	Calculated
2290	2533	Pipe	HDPE	M-939	M-940	85.05	4770	4765.3	5.53	15	0.015	0	13.16	0	0	0.23	0.18	0	Calculated
2291	2534	Pipe	HDPE	M-940	I-1628	130.45	4765.2	4756.9	6.36	18	0.015	6.61	22.96	0.29	9.2	1	0.67	0	Calculated
2292	2535	Pipe	HDPE	I-1876	M-940	228.81	4785.48	4765.2	8.86	15	0.015	6.61	16.67	0.4	12.4	0.56	0.45	0	Calculated
2293	2536	Pipe	HDPE	I-1706	M-933	25.34	4953.6	4950.3	13.02	15	0.015	0	20.2	0	0	0	0	0	Calculated
2294	2537	Pipe	HDPE	I-1705	M-933	31.19	4952.2	4949.1	9.94	15	0.015	0	17.65	0	0	0	0	0	Calculated
2295	2538	Pipe	HDPE	M-933	I-1441	68.59	4949	4945.4	5.25	15	0.015	0	12.83	0	0	0	0	0	Calculated
2296	2539	Pipe	HDPE	I-1441	I-1440	28.1	4945.3	4945.2	0.36	15	0.015	0	3.34	0	0	0	0	0	Calculated
2297	2540	Pipe	HDPE	I-1671	I-1347	285.92	5115.6	5102.3	4.65	15	0.015	0	12.07	0	0	0.63	0.5	0	Calculated
2298	2541	Pipe	HDPE	M-755	I-1346	229.56	5096.6	5096.5	0.04	18	0.015	11.06	1.9	5.82	6.26	1.5	1	16	SURCHARGED
2299	2542	Pipe	HDPE	I-1345	I-1346	38.47	5097.4	5096.5	2.34	15	0.015	1.78	8.56	0.21	1.69	1.25	1	15	SURCHARGED
2300	2543	Pipe	HDPE	I-1346	M-753	165.92	5096.5	5091.8	2.83	15	0.015	10.66	9.42	1.13	8.73	1.22	0.98	0	> CAPACITY
2301	2544	Pipe	HDPE	I-1698	I-1700	64.57	4889.3	4888.7	0.93	15	0.015	0	5.4	0	0	0	0	0	Calculated
2302	2545	Pipe	HDPE	I-1699	I-1700	29.58	4890	4888.7	4.39	15	0.015	0	11.74	0	0	0	0	0	Calculated
2303	2547	Pipe	HDPE	I-1701	I-1702	25.96	4891.9	4891.8	0.39	15	0.015	0.02	3.47	0.01	0.14	0.65	0.52	0	Calculated
2304	2548	Pipe	HDPE	M-929	I-1702	98.28	4896.8	4888.5	8.45	15	0.015	5.68	12.63	0.45	8.98	0.66	0.53	0	Calculated
2305	2549	Pipe	HDPE	M-930	M-929	291.29	4906.1	4896.8	3.19	15	0.015	5.68	10	0.57	8.18	0.69	0.55	0	Calculated
2306	2550	Pipe	HDPE	I-1696	I-1697	26.58	4913	4912.9	0.38	15	0.015	0	3.43	0	0	0	0	0	Calculated
2307	2551	Pipe	HDPE	I-1697	M-931	32.06	4912.8	4910.3	7.8	15	0.015	0	15.63	0	0	0.29	0.24	0	Calculated
2308	2552	Pipe	HDPE	M-931	M-930	95.94	4910.2	4906.2	4.17	15	0.015	5.69	11.43	0.5	8.66	0.65	0.53	0	Calculated
2309	2553	Pipe	HDPE	I-1440	M-932	221.44	4943.7	4923.5	9.12	15	0.015	0	16.91	0	0	0.21	0.17	0	Calculated
2310	2554	Pipe	HDPE	M-932	I-1704	105.26	4923.4	4913.4	9.5	15	0.015	5.69	17.26	0.33	11.5	0.52	0.42	0	Calculated
2311	2555	Pipe	HDPE	I-1703	M-931	25.03	4912.6	4910.4	8.79	15	0.015	0	16.6	0	0	0.24	0.2	0	Calculated
2312	2556	Pipe	HDPE	I-1704	M-931	30.99	4913.3	4910.5	9.04	15	0.015	5.69	16.83	0.34	10.51	0.56	0.45	0	Calculated
2313	2558	Pipe	HDPE	I-1712	O-202	303.07	4918.6	4900.6	5.94	18	0.015	6.94	22.19	0.31	10.79	0.66	0.44	0	Calculated
2314	2559	Pipe	HDPE	I-1919	O-208	750.43	4900	4803.52	12.86	15	0.015	6.29	20.07	0.31	19.42	0.39	0.31	0	Calculated
2315	2560	Pipe	HDPE	I-1869	M-1034	752.49	4875.8	4804.2	9.52	15	0.015	0	17.27	0	0	0	0	0	Calculated
2316	2561	Pipe	HDPE	M-1034	I-1877	151.9	4804.2	4780	15.93	15	0.015	0	22.35	0	0	0.23	0.18	0	Calculated
2317	2562	Pipe	HDPE	I-1877	I-1878	26.76	4779.8	4779.1	2.62	18	0.015	3.82	14.72	0.26	5.94	0.59	0.39	0	Calculated
2318	2563	Pipe	HDPE	I-1878	I-1855	174.07	4779	4771.2	4.48	24	0.015	3.81	40.42	0.09	3.94	0.69	0.35	0	Calculated
2319	2564	Pipe	HDPE	I-1855	I-1854	41.77	4771.6	4771.4	0.48	24	0.015	3.79	13.57	0.28	2.4	1	0.5	0	Calculated
2320	2565	Pipe	HDPE	I-1854	I-1850	405.78	4771.9	4765.5	1.58	24	0.015	3.75	24.62	0.15	5.57	0.53	0.27	0	Calculated
2321	2566	Pipe	RCP	M-350	M-976	146.61	4471.2	4470.6	0.41	24	0.015	6.39	12.54	0.51	3.02	1.28	0.64	0	Calculated
2322	2567	Pipe	DUCTILE IRON	M-974	M-975	43.85	4487.5	4485.7	4.1	10	0.015	0	3.81	0	0	0.28	0.34	0	Calculated
2323	2568	Pipe	PVC	M-975	M-976	313.52	4485.6	4480.2	1.72	12	0.015	2.95	4.05	0.73	5.51	0.64	0.64	0	Calculated
2324	2569	Pipe	RCP	M-976	M-977	118.84	4470.5	4470.1	0.34	24	0.015	9.26	11.37	0.81	4.31	1.29	0.65	0	Calculated
2325	2570	Pipe	RCP	M-977	M-973	260.79	4470	4468.2	0.69	24	0.015	9.26	16.29	0.57	3.82	1.46	0.73	0	Calculated
2326	2571	Pipe	RCP	M-973	M-972	401.26	4468.1	4467.5	0.15	24	0.015	9.22	7.58	1.22	3.6	1.51	0.76	0	> CAPACITY
2327	2572	Pipe	DUCTILE IRON	M-972	O-187	24.2	4467.4	4467	1.65	24	0.015	9.22	25.21	0.37	6.06	0.97	0.49	0	Calculated
2328	2573	Pipe	RCP	I-1777	I-1776	26.19	4469.2	4468.5	2.67	15	0.015	0	9.15	0	0	0	0	0	Calculated
2329	2574	Pipe	RCP	I-1776	O-189	16.35	4468.4	4467	8.56	15	0.015	0	16.38	0	0	0	0	0	Calculated
2330	2575	Pipe	RCP	I-1805	I-1806	148.93	4460.6	4459.6	0.67	15	0.015	7.63	4.59	1.66	6.38	1.17	0.94	0	> CAPACITY
2331	2576	Pipe	RCP	I-1806	O-191	39.95	4459.5	4458	3.75	15	0.015	7.63	10.85	0.7	6.45	1.15	0.92	0	Calculated
2332	2577	Pipe	RCP	I-1812	M-998	99.32	4474.2	4471.8	2.42	15	0.015	4.87	8.7	0.56	5.08	0.91	0.73	0	Calculated
2333	2580	Pipe	RCP	M-998	I-1811	19.76	4471.7	4471.6	0.51	24	0.015	4.86	13.95	0.35	2.45	1.21	0.6	0	Calculated
2334	2581	Pipe	RCP	I-1811	I-1807	113.29	4471.5	4471.4	0.09	24	0.015	4.86	5.82	0.83	2.45	1.21	0.6	0	Calculated
2335	2582	Pipe	RCP	I-1807	I-1808	52.04	4471.4	4471.35	0.1	24	0.015	4.86	6.08	0.8	3.32	0.95	0.47	0	Calculated
2336	2583	Pipe	RCP	M-999	I-1808	121.21	4471.1	4471	0.08	24	0.015	0.03	3.98	0.01	0.19	0.43	0.21	0	Calculated
2337	2584	Pipe	RCP	I-1808	O-192	34.88	4471.3	4467.5	10.89	30	0.015	4.86	117.33	0.04	10.54	0.37	0.15	0	Calculated
2338	2585	Pipe	RCP	I-1810	I-1809	87.99	4469.9	4469.8	0.11	18	0.015	0	3.07	0	0	0	0	0	Calculated
2339	2586	Pipe	RCP	I-1809	O-193	14.79	4469.8	4469.5	2.03	18	0.015	0	12.97	0	0	0	0	0	Calculated
2340	2587	Pipe	RCP	I-1827	I-1825	51.68	4434.65	4434.5	0.29	15	0.015	0.19	3.02	0.06	0.86	0.63	0.51	0	Calculated
2341	2588	Pipe	HDPE	I-1825	I-1826	13.59	4434.45	4434.1	2.58	15	0.015	0.21	8.98	0.02	0.34	0.93	0.74	0	Calculated
2342	2589	Pipe	RCP	I-1824	I-1823	7.99	4434	4434.05	-0.63	15	0.015	0.04	4.43	0.01	0.57	1.25	1	49	SURCHARGED
2343	2590	Pipe	RCP	I-1823	M-1004	93.49	4434	4433.4	0.64	15	0.015	4.71	4.49	1.05	3.84	1.25	1	51	SURCHARGED
2344	2591	Pipe	RCP	I-1826	M-1004	381.34	4434.05	4433.1	0.25	15	0.015	1.45	2.79	0.52	2.1	1.2	0.96	0	Calculated
2345	2592	Pipe	RCP	M-1004	M-1003	62.05	4432.8	4432.35	0.73	24	0.015	10.95	16.7	0.66	3.49	2	1	44	SURCHARGED

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2346	2593	Pipe	RCP	I-1813	I-1814	28.84	4436.8	4436.6	0.69	15	0.015	0	4.66	0	0	0	0	0	Calculated
2347	2594	Pipe	RCP	I-1814	M-1000	6.97	4436.55	4434.85	24.39	15	0.015	0	27.65	0	0	0.42	0.33	0	Calculated
2348	2595	Pipe	RCP	I-1815	I-1816	107.86	4436.8	4436.05	0.7	18	0.015	0.03	7.59	0	0.09	0.51	0.34	0	Calculated
2349	2596	Pipe	RCP	M-1000	M-1001	382.54	4434.8	4433.6	0.31	24	0.015	3.38	10.98	0.31	1.91	1.42	0.71	0	Calculated
2350	2597	Pipe	RCP	M-1001	I-1819	256.37	4433.5	4433.4	0.04	24	0.015	3.19	3.87	0.82	1.3	2	1	15	SURCHARGED
2351	2598	Pipe	Combined with 2599 (listed as 24") and assumed 18" for entire length. RCP	I-1816	I-1818	243.75	4436	4434.9	0.45	18	0.015	3.86	6.12	0.63	4.89	0.68	0.46	0	Calculated
2352	2600	Pipe	HDPE	I-1817	I-1818	38.56	4436	4435	2.59	18	0.015	0	14.66	0	0	0.24	0.16	0	Calculated
2353	2601	Pipe	HDPE	I-1820	M-1002	35.74	4434	4434.2	-0.56	24	0.015	0.14	14.67	0.01	1.15	1.37	0.69	0	Calculated
2354	2603	Pipe	RCP	M-1002	I-1819	29.72	4434.1	4434	0.34	15	0.015	0.18	3.25	0.06	0.74	1.25	1	24	SURCHARGED
2355	2604	Pipe	RCP	I-1818	I-1819	40.66	4434.9	4433.5	3.44	24	0.015	3.86	36.38	0.11	3.71	1.27	0.64	0	Calculated
2356	2605	Pipe	RCP	I-1819	M-1004	406.24	4433.1	4432.9	0.05	24	0.015	6.15	4.35	1.41	2.25	2	1	35	SURCHARGED
2357	2606	Pipe	RCP	I-1821	M-1003	21.82	4434.3	4433.4	4.12	15	0.015	0.03	11.37	0	0.05	0.84	0.67	0	Calculated
2358	2607	Pipe	RCP	I-1822	M-1003	27.09	4434.3	4433.3	3.69	15	0.015	0.03	10.76	0	0.05	0.84	0.67	0	Calculated
2359	2608	Pipe	RCP	M-1003	M-1005	348.93	4432.3	4431.9	0.11	24	0.015	10.95	6.64	1.65	4.08	1.59	0.8	0	> CAPACITY
2360	2610	Pipe	RCP	M-1005	M-1006	21.23	4431.5	4431.2	1.41	24	0.015	10.95	23.31	0.47	5.03	1.31	0.65	0	Calculated
2361	2611	Pipe	RCP	M-1006	I-1828	73.75	4431.15	4430.4	1.02	24	0.015	10.95	19.77	0.55	6.49	1.06	0.53	0	Calculated
2362	2612	Pipe	RCP	I-1779	I-1828	36.03	4431.05	4430.45	1.67	18	0.015	0.02	11.75	0	0.06	0.52	0.35	0	Calculated
2363	2613	Pipe	RCP	I-1828	I-1780	93.55	4430.4	4428.1	2.46	24	0.015	10.95	30.74	0.36	5.27	1.26	0.63	0	Calculated
2364	2614	Pipe	RCP	I-1780	M-978	55.32	4428	4427.7	0.54	24	0.015	10.95	14.44	0.76	3.9	1.67	0.84	0	Calculated
2365	2615	Pipe	RCP	M-978	I-1781	61.48	4427.6	4427.3	0.49	24	0.015	10.95	13.7	0.8	4.08	1.6	0.8	0	Calculated
2366	2616	Pipe	RCP	I-1781	I-1783	104.2	4427.25	4426.2	1.01	24	0.015	10.94	15.49	0.71	4.23	1.56	0.78	0	Calculated
2367	2617	Pipe	RCP	I-1782	I-1783	36.57	4428.1	4426.15	5.33	18	0.015	0.01	18.44	0	0.01	0.79	0.53	0	Calculated
2368	2618	Pipe	RCP	I-1783	I-1786	246.75	4426.1	4425.45	0.26	24	0.015	10.93	13.38	0.82	3.91	1.78	0.89	0	Calculated
2369	2619	Pipe	RCP	I-1784	I-1786	116.54	4428	4425.45	2.19	18	0.015	0	13.47	0	0	0.75	0.5	0	Calculated
2370	2620	Pipe	RCP	I-1785	I-1786	35.97	4426.4	4425.45	2.64	18	0.015	0.05	14.79	0	0.09	1.27	0.85	0	Calculated
2371	2621	Pipe	RCP	I-1786	I-1787	91.15	4425.4	4424.95	0.49	24	0.015	10.89	13.78	0.79	3.58	2	1	12	SURCHARGED
2372	2622	Pipe	RCP	I-1787	I-1788	139.87	4424.9	4424.9	0	30	0.015	10.88	0.95	11.45	3.12	2.04	0.82	0	> CAPACITY
2373	2623	Pipe	RCP	I-1788	I-1790	64.32	4424.85	4424.5	0.54	30	0.015	10.92	26.22	0.42	3.55	2.1	0.84	0	Calculated
2374	2626	Pipe	RCP	I-1790	I-1791	71.05	4424.4	4423.95	0.63	30	0.015	15.21	28.29	0.54	5.05	2.41	0.96	0	Calculated
2375	2628	Pipe	RCP	I-1791	M-979	89.37	4423.9	4422.8	1.23	30	0.015	15.27	39.44	0.39	3.91	2.5	1	21	SURCHARGED
2376	2629	Pipe	RCP	M-979	M-981	227.52	4422.7	4422.5	0.09	30	0.015	15.89	10.54	1.51	3.66	2.5	1	63	SURCHARGED
2377	2631	Pipe	RCP	M-981	I-1796	88.04	4422.4	4421.9	0.57	30	0.015	15.9	26.79	0.59	4.06	2.5	1	69	SURCHARGED
2378	2632	Pipe	RCP	I-1795	I-1796	38.14	4422.7	4421.85	2.23	15	0.015	0.09	8.36	0.01	0.07	1.25	1	100	SURCHARGED
2379	2633	Pipe	RCP	I-1792	I-1793	38.55	4425.2	4424.6	1.56	12	0.015	0.77	3.85	0.2	1.08	1	1	33	SURCHARGED
2380	2634	Pipe	RCP	I-1793	M-980	125.32	4424.5	4424.35	0.12	15	0.015	0.95	1.94	0.49	0.77	1.25	1	75	SURCHARGED
2381	2636	Pipe	RCP	M-980	M-979	296.17	4424.3	4422.75	0.52	15	0.015	3.53	4.05	0.87	2.9	1.25	1	121	SURCHARGED
2382	2637	Pipe	RCP	I-1796	M-982	699.83	4421.8	4420.3	0.21	30	0.015	15.88	16.46	0.96	3.36	2.5	1	88	SURCHARGED
2383	2639	Pipe	RCP	I-1797	M-983	47.88	4420	4420	0	30	0.015	9.94	1.62	6.12	2.03	2.5	1	120	SURCHARGED
2384	2640	Pipe	RCP	M-982	M-983	77.75	4420.25	4420	0.32	30	0.015	15.91	20.16	0.79	3.24	2.5	1	115	SURCHARGED
2385	2641	Pipe	RCP	M-983	I-1798	13.05	4420	4420	0	30	0.015	24.28	3.11	7.8	4.95	2.5	1	104	SURCHARGED
2386	2642	Pipe	RCP	I-1798	M-984	82.32	4419.9	4418.5	1.7	30	0.015	24.29	46.36	0.52	5.38	2.5	1	112	SURCHARGED
2387	2643	Pipe	PVC	I-1799	M-984	43.32	4420	4418.5	3.46	12	0.015	3.13	5.75	0.54	3.98	1	1	140	SURCHARGED
2388	2644	Pipe	RCP	M-984	M-985	267.24	4418.4	4416.4	0.75	30	0.015	21.21	30.75	0.69	4.32	2.5	1	141	SURCHARGED
2389	2645	Pipe	RCP	I-1800	M-985	19.79	4420	4418.9	5.56	15	0.015	0.7	13.2	0.05	0.57	1.25	1	100	SURCHARGED
2390	2648	Pipe	RCP	M-985	M-986	75.31	4416.4	4416.15	0.33	30	0.015	21.23	20.48	1.04	4.32	2.5	1	169	SURCHARGED
2391	2649	Pipe	RCP	M-986	M-988	103.88	4416.1	4414.5	1.54	30	0.015	21.23	44.12	0.48	4.32	2.5	1	171	SURCHARGED
2392	2651	Pipe	RCP	M-987	O-190	17.6	4417	4414.9	11.93	18	0.015	3.36	31.45	0.11	4.08	1.5	1	171	SURCHARGED
2393	2652	Pipe	RCP	M-987	M-990	89.35	4414.6	4413.45	1.29	30	0.015	3.44	40.33	0.09	0.7	2.5	1	178	SURCHARGED
2394	2654	Pipe	RCP	M-990	M-989	6	4413.4	4413.4	0	36	0.015	27.05	7.46	3.62	3.83	3	1	183	SURCHARGED
2395	2655	Pipe	CMP	I-1762	I-1763	139.98	4423.1	4422.8	0.21	15	0.015	5.46	2.59	2.11	4.78	1.1	0.88	0	> CAPACITY
2396	2656	Pipe	HDPE	I-1804	M-996	3.16	4421.85	4421.75	3.16	12	0.015	0.02	5.49	0	0.18	1	1	128	SURCHARGED
2397	2657	Pipe	RCP	M-996	M-995	35.1	4421.7	4420.9	2.28	30	0.015	13.87	53.67	0.26	6.08	2.25	0.9	0	Calculated
2398	2658	Pipe	RCP	I-1767	M-996	265.46	4422	4421.75	0.09	30	0.015	13.91	10.91	1.27	3.93	2.11	0.85	0	> CAPACITY
2399	2659	Pipe	HDPE	I-1763	M-995	54.7	4422.7	4421	3.11	15	0.015	5.47	9.87	0.55	5.98	1.14	0.92	0	Calculated
2400	2660	Pipe	HDPE	M-994	M-995	13.51	4420.9	4421	-0.74	30	0.015	3.38	30.58	0.11	2.67	2.5	1	24	SURCHARGED
2401	2661	Pipe	HDPE	M-995	M-997	38.25	4420.9	4419.2	4.44	30	0.015	20.52	74.94	0.27	5.09	2.5	1	36	SURCHARGED
2402	2662	Pipe	HDPE	M-997	M-993	195.93	4419.1	4418.7	0.2	30	0.015	20.51	16.06	1.28	4.18	2.5	1	133	SURCHARGED
2403	2663	Pipe	HDPE	I-1803	M-993	63.7	4420.9	4419.4	2.35	12	0.015	0.07	4.74	0.01	0.16	1	1	104	SURCHARGED
2404	2664	Pipe	HDPE	M-993	M-992	149.16	4418.6	4418.4	0.13	30	0.015	20.52	13.02	1.58	4.18	2.5	1	120	SURCHARGED
2405	2665	Pipe	HDPE	I-1802	M-992	23.12	4421.4	4419.12	9.86	12	0.015	0.01	9.7	0	0.02	0.63	0.63	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2406	2666	Pipe	RCP	M-988	M-989	143.83	4414.45	4413.7	0.52	36	0.015	21.23	41.74	0.51	3	3	1	176	SURCHARGED
2407	2667	Pipe	RCP	DET_133	M-990	134.05	4414.5	4413.5	0.75	30	0.015	17.69	30.7	0.58	3.6	2.5	1	179	SURCHARGED
2408	2668	Pipe	RCP	I-1775	I-1774	28.2	4472.4	4468.8	12.77	15	0.015	0	20	0	0	0	0	0	Calculated
2409	2669	Pipe	RCP	I-1774	O-188	98.73	4468.7	4467	1.72	15	0.015	0	6.09	0	0	0	0	0	Calculated
2410	2670	Pipe	RCP	I-1778	I-1776	96.49	4466.6	4468.5	-1.97	15	0.015	0	7.86	0	0	0	0	0	Calculated
2411	2671	Pipe	HDPE	M-992	DET_133	142.38	4418.3	4413.55	3.34	30	0.015	20.51	58.07	0.35	4.18	2.5	1	126	SURCHARGED
2412	2672	Pipe	RCP	I-1801	DET_133	27.17	4417.2	4414	11.78	18	0.015	9.37	28.7	0.33	6.25	1.5	1	153	SURCHARGED
2413	2673	Pipe	RCP	I-393	M-969	72.41	4427.4	4426.85	0.76	18	0.015	5.95	7.93	0.75	3.37	1.5	1	152	SURCHARGED
2414	2674	Pipe	RCP	M-969	O-186	63.91	4426.8	4426	1.25	18	0.015	14.55	10.19	1.43	8.54	1.38	0.92	0	> CAPACITY
2415	2675	Pipe	RCP	I-1770	M-970	30.12	4428.45	4428.15	1	15	0.015	2.01	5.59	0.36	3.43	1.25	1	130	SURCHARGED
2416	2676	Pipe	HDPE	I-1769	M-970	11.08	4428.55	4428.15	3.61	15	0.015	0.16	10.64	0.02	0.2	1.25	1	122	SURCHARGED
2417	2677	Pipe	RCP	M-970	M-969	37.61	4428.1	4426.9	3.19	18	0.015	8.87	16.26	0.55	5.02	1.5	1	131	SURCHARGED
2418	2678	Pipe	RCP	M-971	M-970	585.59	4430.4	4428.2	0.38	18	0.015	6.8	5.58	1.22	3.85	1.5	1	124	SURCHARGED
2419	2680	Pipe	RCP	I-1772	M-971	40.62	4431.55	4430.5	2.58	24	0.015	7.67	31.52	0.24	4.2	2	1	69	SURCHARGED
2420	2682	Pipe	RCP	I-1773	I-1772	674.16	4435.54	4431.6	0.58	24	0.015	4.6	14.99	0.31	4.1	1.37	0.68	0	Calculated
2421	2683	Pipe	RCP	I-1743	M-953	64.88	4538.1	4535	4.78	15	0.015	0	12.24	0	0	0	0	0	Calculated
2422	2684	Pipe	RCP	M-953	M-952	270.48	4535	4519.3	5.8	15	0.015	0	13.49	0	0	0	0	0	Calculated
2423	2685	Pipe	RCP	I-1741	M-952	9.64	4520.2	4519.4	8.3	15	0.015	0	16.13	0	0	0	0	0	Calculated
2424	2686	Pipe	RCP	I-1742	M-952	19.03	4520.8	4519.4	7.36	15	0.015	0	15.19	0	0	0	0	0	Calculated
2425	2687	Pipe	RCP	M-952	M-951	230.98	4519.4	4508.6	4.68	15	0.015	0	12.11	0	0	0	0	0	Calculated
2426	2688	Pipe	RCP	M-951	M-950	81.13	4508.6	4505.2	4.19	15	0.015	0	11.46	0	0	0	0	0	Calculated
2427	2689	Pipe	RCP	I-1740	M-950	24.21	4506.5	4505.2	5.37	15	0.015	0	12.97	0	0	0	0	0	Calculated
2428	2690	Pipe	RCP	M-950	M-949	257.54	4505.1	4495.1	3.88	15	0.015	0	11.02	0	0	0	0	0	Calculated
2429	2691	Pipe	RCP	M-949	M-948	251.92	4495.1	4488.5	2.62	18	0.015	0	14.77	0	0	0	0	0	Calculated
2430	2692	Pipe	RCP	M-948	I-1920	365.15	4488.4	4477.9	2.88	18	0.015	0	15.44	0	0	0.75	0.5	0	Calculated
2431	2693	Pipe	RCP	I-1739	I-1920	20.57	4478.7	4478	3.4	18	0.015	0.14	16.79	0.01	0.25	1.18	0.8	0	Calculated
2432	2694	Pipe	RCP	I-1920	M-947	41.96	4477.9	4477.8	0.24	18	0.015	1.06	4.44	0.24	1.46	1.5	1	5	SURCHARGED
2433	2695	Pipe	RCP	M-947	M-946	48.57	4477.9	4477.3	1.24	18	0.015	1.27	10.12	0.13	0.93	1.5	1	5	SURCHARGED
2434	2696	Pipe	RCP	M-946	M-945	122.06	4477.3	4477	0.25	18	0.015	1.26	4.51	0.28	0.73	1.5	1	15	SURCHARGED
2435	2697	Pipe	RCP	M-945	I-1735	147.79	4476.9	4476.5	0.27	18	0.015	7.99	4.74	1.69	4.52	1.5	1	10	SURCHARGED
2436	2698	Pipe	RCP	I-1735	I-1736	31.01	4476.4	4476.3	0.32	18	0.015	7.99	6.12	1.31	4.87	1.34	0.9	0	> CAPACITY
2437	2699	Pipe	RCP	I-1736	DET_135	46.11	4476.3	4475	2.82	18	0.015	7.94	15.29	0.52	4.83	1.34	0.9	0	Calculated
2438	2700	Pipe	RCP	DET_135	I-1738	32.58	4475	4474.9	0.31	18	0.015	7.11	5.04	1.41	4.02	1.5	1	16	SURCHARGED
2439	2701	Pipe	RCP	I-1738	M-944	8.91	4474.8	4474.5	3.37	15	0.015	7.11	11.86	0.6	5.79	1.25	1	25	SURCHARGED
2440	2702	Pipe	RCP	M-944	O-184	65.74	4473.85	4473	1.29	30	0.015	29.84	40.42	0.74	7.69	1.84	0.74	0	Calculated
2441	2703	Pipe	RCP	M-1028	O-204	149.64	0	4897.9	-3273.12	15	0.015	10.12	30.84	0.33	24.99	0.45	0.36	0	Calculated
2442	2704	Pipe	HDPE	I-1870	New-35	289.94	4874.1	4849	8.66	18	0.015	3.38	26.79	0.13	11.58	0.33	0.22	0	Calculated
2443	2706	Pipe	HDPE	I-1868	M-1036	575.66	4846	4779.8	11.5	15	0.015	1.41	18.99	0.07	9.03	0.32	0.26	0	Calculated
2444	2707	Pipe	HDPE	I-1881	I-1921	21.83	4826.5	4825.9	2.75	15	0.015	0	9.36	0	0	0	0	0	Calculated
2445	2708	Pipe	HDPE	I-1921	M-1038	73.09	4825.8	4817.7	11.08	15	0.015	0	18.64	0	0	0	0	0	Calculated
2446	2709	Pipe	HDPE	M-1038	M-1037	121.99	4817.8	4803.3	11.89	15	0.015	0	19.3	0	0	0	0	0	Calculated
2447	2710	Pipe	HDEP	I-1880	I-1923	26.78	4786.4	4784.6	6.72	15	0.015	0	14.51	0	0	0	0	0	Calculated
2448	2711	Pipe	HDPE	M-1037	I-1922	165.05	4803.4	4786.1	10.48	15	0.015	0	18.13	0	0	0	0	0	Calculated
2449	2712	Pipe	HDPE	I-1879	I-1922	23.44	4785.8	4786	-0.85	15	0.015	0	5.17	0	0	0	0	0	Calculated
2450	2713	Pipe	HDPE	I-1922	M-1035	45.46	4786	4782.5	7.7	15	0.015	0	15.53	0	0	0	0	0	Calculated
2451	2714	Pipe	HDPE	I-1923	M-1035	60.5	4784.5	4782.6	3.14	15	0.015	0	9.92	0	0	0	0	0	Calculated
2452	2715	Pipe	HDPE	M-1035	M-1036	219.32	4782.6	4779.8	1.28	18	0.015	0	10.29	0	0	0.26	0.17	0	Calculated
2453	2716	Pipe	HDPE	M-1036	I-1851	198.32	4779.7	4767.8	6	24	0.015	9.36	48.03	0.19	10.69	0.64	0.32	0	Calculated
2454	2717	Pipe	HDPE	I-1851	I-1850	41.57	4767.7	4765.5	5.29	24	0.015	9.34	45.1	0.21	9.61	0.69	0.35	0	Calculated
2455	2718	Pipe	HDPE	M-764	M-1008	423.98	4837.8	4800	8.92	30	0.015	30.91	106.14	0.29	18.17	0.94	0.38	0	Calculated
2456	2719	Pipe	HDPE	M-1008	M-772	122.05	4797	4796.8	0.16	30	0.015	30.9	14.39	2.15	6.76	2.19	0.88	0	> CAPACITY
2457	2720	Pipe	HDPE	M-772	DET_59	143.2	4794.3	4785.4	6.22	30	0.015	30.83	88.72	0.35	7.78	1.89	0.76	0	Calculated
2458	2723	Pipe	HDPE	I-1730	I-1729	28.49	4537.5	4537.2	1.05	15	0.015	0	5.74	0	0	0	0	0	Calculated
2459	2724	Pipe	HDPE	I-1729	O-183	192.45	4537.1	4534	1.61	15	0.015	0	7.11	0	0	0	0	0	Calculated
2460	2725	Pipe	HDPE	I-1731	I-1732	26.61	4536.7	4536.2	1.88	15	0.015	0	7.98	0	0	0	0	0	Calculated
2461	2726	Pipe	HDPE	I-1732	M-941	282.2	4536.1	4527.6	3.01	15	0.015	0	9.72	0	0	0	0	0	Calculated
2462	2727	Pipe	HDPE	I-1733	I-1734	27.47	4528	4526.9	4	15	0.015	0	11.2	0	0	0	0	0	Calculated
2463	2730	Pipe	RCP	I-1734	M-942	176.74	4525.2	4521.8	1.92	15	0.015	0	7.77	0	0	0	0	0	Calculated
2464	2731	Pipe	HDPE	M-942	M-943	179.32	4521.7	4518	2.06	15	0.015	0	8.04	0	0	0	0	0	Calculated
2465	2732	Pipe	HDPE	M-943	O-214	375.79	4519	4517	0.53	15	0.015	0	4.08	0	0	0	0	0	Calculated
2466	2733	Pipe	HDPE	I-1915	M-1065	23.62	4732.7	4730.4	9.74	15	0.015	0	17.47	0	0	0	0	0	Calculated
2467	2734	Pipe	HDPE	I-1916	M-1065	6.26	4732.6	4730.3	36.74	15	0.015	0	33.86	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2468	2735	Pipe	HDPE	M-1065	M-1066	36.98	4730.4	4728.4	5.41	15	0.015	0	13.02	0	0	0	0	0	Calculated
2469	2736	Pipe	HDPE	I-1914	M-1064	98.87	4732.7	4727	5.77	15	0.015	0	13.49	0	0	0	0	0	Calculated
2470	2737	Pipe	HDPE	M-1066	M-1064	138.03	4728.3	4727	0.94	15	0.015	0	5.64	0	0	0	0	0	Calculated
2471	2738	Pipe	HDPE	I-1909	I-1908	26.14	4722.7	4720.9	6.89	15	0.015	0	14.69	0	0	0	0	0	Calculated
2472	2739	Pipe	HDPE	M-1064	M-1062	347.57	4726.9	4708	5.44	15	0.015	0	13.06	0	0	0	0	0	Calculated
2473	2740	Pipe	HDPE	M-1062	M-1063	118.1	4710.1	4709.8	0.25	15	0.015	0	2.82	0	0	0	0	0	Calculated
2474	2741	Pipe	HDPE	I-1910	M-1063	8.18	4710.4	4710	4.89	15	0.015	0	12.38	0	0	0	0	0	Calculated
2475	2742	Pipe	HDPE	M-1063	I-1911	24.37	4710.2	4710.1	0.41	18	0.015	0	15.43	0	0	0	0	0	Calculated
2476	2743	Pipe	HDPE	I-1911	I-1912	39.31	4710	4709.9	0.25	15	0.015	0	8.93	0	0	0	0	0	Calculated
2477	2744	Pipe	HDPE	I-1912	I-1913	28.19	4709.8	4709.5	1.06	15	0.015	0	5.78	0	0	0	0	0	Calculated
2478	2745	Pipe	HDPE	I-1702	M-1009	261.52	4891.8	4831.8	22.94	18	0.015	17.94	43.61	0.41	22.74	0.69	0.46	0	Calculated
2479	2746	Pipe	HDPE	M-1009	M-935	45.21	4831	4825.9	11.28	18	0.015	17.94	30.58	0.59	14.68	0.98	0.65	0	Calculated
2480	2748	Pipe	HDPE	I-1829	M-712	64.03	4801.9	4797.8	6.4	15	0.015	8.64	14.34	0.6	10.87	0.77	0.62	0	Calculated
2481	2749	Pipe	HDPE	I-1720	M-936	8.02	4813.4	4813.1	3.74	15	0.015	0.48	11.53	0.04	0.39	1.25	1	3	SURCHARGED
2482	2750	Pipe	HDPE	M-936	O-194	50.28	4813	4809.8	6.36	18	0.015	17.93	23.07	0.78	11.61	1.24	0.83	0	Calculated
2483	2751	Pipe	HDPE	I-1850	M-1024	175.56	4765.4	4743.4	12.53	24	0.015	12.44	69.4	0.18	14.98	0.6	0.31	0	Calculated
2484	2752	Pipe	HDPE	M-1024	O-196	595.32	4743.3	4702	6.94	24	0.015	12.39	51.63	0.24	16.64	0.55	0.29	0	Calculated
2485	2754	Pipe	HDPE	I-1853	M-1025	124.53	4694.1	4676	14.53	18	0.015	4.78	34.71	0.14	8.8	0.53	0.35	0	Calculated
2486	2755	Pipe	HDPE	M-1025	M-1069	347.62	4675.9	4671	1.41	18	0.015	4.78	10.81	0.44	7.24	0.61	0.41	0	Calculated
2487	2756	Pipe	HDPE	M-1022	M-1069	45.69	4671.7	4671	1.53	30	0.015	6.35	44	0.14	6.36	0.64	0.26	0	Calculated
2488	2757	Pipe	HDPE	M-1021	M-1022	159.23	4683.3	4671.8	7.22	24	0.015	6.35	52.69	0.12	8.59	0.57	0.29	0	Calculated
2489	2758	Pipe	HDPE	I-1845	I-1844	23.2	4716.5	4715.4	4.74	15	0.015	0	12.19	0	0	0	0	0	Calculated
2490	2759	Pipe	HDPE	I-1844	I-1846	270.11	4715.3	4698.3	6.29	15	0.015	0	14.05	0	0	0	0	0	Calculated
2491	2760	Pipe	HDPE	I-1847	I-1846	17.33	4698.6	4698.3	1.73	15	0.015	0	7.37	0	0	0	0	0	Calculated
2492	2761	Pipe	HDPE	I-1846	M-1021	219.17	4698.1	4683.5	6.66	15	0.015	0	14.45	0	0	0.13	0.11	0	Calculated
2493	2762	Pipe	HDPE	I-1849	I-1848	22.98	4686.1	4685.7	1.74	15	0.015	0	7.39	0	0	0	0	0	Calculated
2494	2763	Pipe	HDPE	I-1848	M-1023	161.21	4685.6	4683.8	1.12	18	0.015	0	9.62	0	0	0	0	0	Calculated
2495	2764	Pipe	HDPE	M-1023	M-1021	218.18	4683.7	4683.5	0.09	18	0.015	0.02	2.76	0.01	0.22	0.17	0.11	0	Calculated
2496	2765	Pipe	RCP	M-1069	M-884	77.36	4671	4666.9	5.3	48	0.015	10.3	286.6	0.04	4.09	1.47	0.38	0	Calculated
2497	2766	Pipe	HDPE	I-1841	I-1840	25.28	4755.8	4755.2	2.37	15	0.015	0	8.62	0	0	0	0	0	Calculated
2498	2767	Pipe	HDPE	I-1840	I-1837	172.8	4755.1	4738.6	9.55	15	0.015	0	17.3	0	0	0	0	0	Calculated
2499	2768	Pipe	HDPE	I-1843	I-1842	79.76	4741.5	4741.1	0.5	15	0.015	0	3.96	0	0	0	0	0	Calculated
2500	2769	Pipe	HDPE	I-1842	I-1838	248.2	4740.8	4739.5	0.52	15	0.015	0	4.05	0	0	0	0	0	Calculated
2501	2770	Pipe	HDPE	I-1839	I-1838	39.68	4739.6	4739.4	0.5	15	0.015	0	3.97	0	0	0	0	0	Calculated
2502	2771	Pipe	HDPE	I-1838	I-1837	36.37	4739.3	4738.6	1.92	15	0.015	0	7.77	0	0	0	0	0	Calculated
2503	2772	Pipe	HDPE	I-1837	M-1020	199.9	4738.5	4720.3	9.1	18	0.015	0	27.47	0	0	0.18	0.12	0	Calculated
2504	2774	Pipe	HDPE	M-1020	M-1019	133.54	4720	4708	8.99	18	0.015	9.74	27.29	0.36	13.38	0.64	0.43	0	Calculated
2505	2777	Pipe	HDPE	M-1019	M-1018	132.61	4707.8	4695.6	9.2	18	0.015	14.98	27.61	0.54	12.18	1.05	0.76	0	Calculated
2506	2778	Pipe	HDPE	M-1018	I-1833	77.71	4695.5	4692.2	4.25	18	0.015	14.71	18.76	0.78	8.4	1.45	1	2	SURCHARGED
2507	2779	Pipe	HDPE	I-1833	M-1017	39.39	4692	4691.9	0.25	24	0.015	14.71	9.88	1.49	5.19	1.69	0.85	0	> CAPACITY
2508	2780	Pipe	HDPE	I-1834	I-1833	22.12	4693.8	4692.2	7.23	15	0.015	0.21	15.06	0.01	0.28	0.77	0.62	0	Calculated
2509	2781	Pipe	HDPE	M-1016	M-1017	60.9	4694.7	4691.9	4.6	24	0.015	6.99	42.04	0.17	8.51	0.69	0.35	0	Calculated
2510	2783	Pipe	HDPE	M-1017	O-195	65.26	4691.8	4684.8	10.73	24	0.015	19.43	64.07	0.3	16.68	0.77	0.4	0	Calculated
2511	2784	Pipe	HDPE	M-1015	M-1016	119.73	4704.9	4694.7	8.52	24	0.015	6.99	57.23	0.12	10.12	0.54	0.27	0	Calculated
2512	2785	Pipe	HDPE	M-1014	M-1015	135.35	4708.5	4705	2.59	24	0.015	6.99	31.53	0.22	7.61	0.66	0.33	0	Calculated
2513	2786	Pipe	HDPE	I-1830	I-1831	26.55	4710.6	4709.7	3.39	15	0.015	0	10.31	0	0	0.36	0.29	0	Calculated
2514	2787	Pipe	HDPE	I-1831	M-1014	50.15	4709.6	4708.6	1.99	24	0.015	7	27.69	0.25	6.43	0.75	0.38	0	Calculated
2515	2788	Pipe	HDPE	M-1013	I-1831	160.81	4720.9	4709.7	6.96	18	0.015	7	24.03	0.29	9.73	0.63	0.43	0	Calculated
2516	2789	Pipe	HDPE	M-1012	M-1013	112.46	4728.7	4721	6.85	18	0.015	7	23.82	0.29	11.05	0.57	0.39	0	Calculated
2517	2790	Pipe	HDPE	I-1866	O-201	147.6	4859.8	4838.7	14.3	18	0.015	3.93	34.42	0.11	14.21	0.32	0.21	0	Calculated
2518	2791	Pipe	HDPE	I-1888	O-210	249.64	4794.84	4774	8.35	24	0.015	3.93	56.65	0.07	12.52	0.31	0.16	0	Calculated
2519	2792	Pipe	HDPE	I-1889	O-209	486.73	4784.1	4776.99	1.46	15	0.015	0	6.77	0	0	0	0	0	Calculated
2520	2793	Pipe	HDPE	I-1867	M-1039	364.85	4869.3	4817.7	14.14	15	0.015	0	21.05	0	0	0	0	0	Calculated
2521	2794	Pipe	HDPE	M-1039	M-1040	159.96	4817.7	4806.1	7.25	15	0.015	0	15.04	0	0	0	0	0	Calculated
2522	2795	Pipe	HDPE	M-1040	I-1882	87	4806.1	4797.9	9.43	15	0.015	0	17.24	0	0	0	0	0	Calculated
2523	2796	Pipe	HDPE	I-1883	M-1041	33.2	4794.4	4793.4	3.01	15	0.015	0	9.86	0	0	0	0	0	Calculated
2524	2797	Pipe	HDPE	I-1882	M-1042	55.27	4797.5	4792.2	9.59	15	0.015	0	17.34	0	0	0.15	0.12	0	Calculated
2525	2798	Pipe	HDPE	M-1041	M-1042	21.54	4793.5	4792.2	6.04	15	0.015	0	13.75	0	0	0.15	0.12	0	Calculated
2526	2799	Pipe	HDPE	M-1042	I-1885	136.84	4792.1	4779.1	9.5	15	0.015	3.8	17.26	0.22	9.82	0.44	0.35	0	Calculated
2527	2800	Pipe	HDPE	I-1884	I-1885	27.6	4780	4779.1	3.26	15	0.015	0	10.11	0	0	0.24	0.19	0	Calculated
2528	2802	Pipe	HDPE	I-1887	M-1011	250.62	4767.4	4754.4	5.19	15	0.015	4.69	12.75	0.37	9.36	0.53	0.43	0	Calculated
2529	2803	Pipe	HDPE	M-1011	M-1010	145.49	4754.2	4750.2	2.75	15	0.015	4.69	9.28	0.51	6.78	0.91	0.73	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2530	2804	Pipe	HDPE	I-1885	M-1043	105.81	4779	4775.7	3.12	15	0.015	3.79	9.89	0.38	7.12	0.56	0.45	0	Calculated
2531	2805	Pipe	HDPE	I-1886	M-1043	38.52	4776.6	4775.7	2.34	15	0.015	0	8.56	0	0	0.17	0.14	0	Calculated
2532	2806	Pipe	HDPE	M-1043	M-1010	314.71	4775.6	4750.1	8.1	15	0.015	3.78	15.95	0.24	5.84	0.82	0.66	0	Calculated
2533	2807	Pipe	HDPE	M-1010	I-1917	122.54	4750	4747.8	1.8	15	0.015	7.02	7.5	0.94	7.5	0.92	0.74	0	Calculated
2534	2808	Pipe	HDPE	I-1918	I-1917	23.95	4747.9	4747.8	0.42	15	0.015	0.02	3.62	0.01	0.08	0.53	0.44	0	Calculated
2535	2809	Pipe	HDPE	I-1832	M-1070	231.3	4678.2	4658	8.73	18	0.015	5.17	26.92	0.19	10.65	0.48	0.32	0	Calculated
2536	2810	Pipe	HDPE	M-1070	M-862	182.17	4658	4643	8.23	15	0.015	5.17	16.06	0.32	11.31	0.5	0.4	0	Calculated
2537	2811	Pipe	HDPE	I-1860	New-31	426.85	4912.2	4865	11.06	15	0.015	0.03	18.62	0	4.21	0.03	0.02	0	Calculated
2538	2812	Pipe	HDPE	I-1861	New-32	477.53	4927.5	4876	10.78	15	0.015	0.08	18.39	0	5.38	0.05	0.04	0	Calculated
2539	2813	Pipe	HDPE	I-1864	New-44	144.58	4851.9	4833	13.07	15	0.015	0.07	20.24	0	5.54	0.04	0.03	0	Calculated
2540	2814	Pipe	HDPE	I-1865	M-1045	113.34	4824	4804.5	17.2	15	0.015	0.07	23.22	0	4.28	0.05	0.04	0	Calculated
2541	2815	Pipe	HDPE	M-1045	M-1044	34.04	4802	4801.5	1.47	15	0.015	0.07	6.79	0.01	1.79	0.09	0.07	0	Calculated
2542	2816	Pipe	HDPE	M-1044	M-1046	224.89	4801.4	4798.9	1.11	15	0.015	0.07	5.95	0.01	1.66	0.1	0.08	0	Calculated
2543	2817	Pipe	HDPE	I-1893	I-1892	13.73	4788.2	4787.9	2.18	15	0.015	0	8.28	0	0	0	0	0	Calculated
2544	2818	Pipe	HDPE	I-1892	I-1890	102.88	4787.8	4787.4	0.39	15	0.015	0.02	3.49	0	0.11	0.26	0.21	0	Calculated
2545	2819	Pipe	HDPE	M-1046	M-1071	196.07	4798.8	4789	5	15	0.015	0.07	12.52	0.01	2.54	0.07	0.06	0	Calculated
2546	2820	Pipe	HDPE	M-1071	I-1890	55.99	4789	4787.4	2.86	15	0.015	0.07	9.46	0.01	1.49	0.24	0.19	0	Calculated
2547	2821	Pipe	HDPE	I-1890	M-1048	180.2	4787.3	4765.2	12.26	15	0.015	8.17	19.61	0.42	12.47	0.66	0.53	0	Calculated
2548	2822	Pipe	HDPE	M-1048	O-211	101.78	4765.3	4754.8	10.32	15	0.015	8.17	17.98	0.45	13.38	0.62	0.5	0	Calculated
2549	2823	Pipe	HDPE	M-859	O-212	232.33	4784.3	4754.7	12.74	15	0.015	4.97	19.98	0.25	14.71	0.4	0.32	0	Calculated
2550	2824	Pipe	HDPE	I-1894	I-1895	46.81	4769.7	4766.7	6.41	15	0.015	0	14.17	0	0	0	0	0	Calculated
2551	2825	Pipe	HDPE	I-1895	M-1047	222.71	4766.6	4762.8	1.71	15	0.015	0	7.31	0	0	0	0	0	Calculated
2552	2826	Pipe	HDPE	M-1047	M-1049	486.68	4762.7	4753.7	1.85	15	0.015	0	7.61	0	0	0	0	0	Calculated
2553	2827	Pipe	HDPE	M-1049	I-1896	5.7	4753.6	4752.8	14.04	15	0.015	0	21.62	0	0	0	0	0	Calculated
2554	2828	Pipe	HDPE	I-1896	I-1897	34.86	4752.7	4752.2	1.43	15	0.015	0	6.7	0	0	0	0	0	Calculated
2555	2829	Pipe	HDPE TO RCP	I-1558	M-1296	224.07	4628.9	4609.3	8.75	24	0.015	1.61	57.99	0.03	7.98	0.23	0.12	0	Calculated
2556	2830	Pipe	RCP	M-1296	M-1298	273.33	4609.2	4593	5.93	24	0.015	1.61	47.73	0.03	2.68	0.78	0.39	0	Calculated
2557	2831	Pipe	RCP	M-1298	M-1299	36.91	4592.8	4592.1	1.9	24	0.015	17.16	27	0.64	7.47	1.37	0.69	0	Calculated
2558	2832	Pipe	RCP	M-1299	M-1303	396.11	4592	4568.1	6.03	24	0.015	17.17	48.16	0.36	13.62	0.84	0.42	0	Calculated
2559	2833	Pipe	RCP	M-1301	M-1297	527.18	4594.8	4594	0.15	30	0.015	13.44	13.85	0.97	3.88	1.66	0.67	0	Calculated
2560	2834	Pipe	RCP	M-1297	M-1298	56.7	4593.9	4592.9	1.76	30	0.015	13.44	47.21	0.28	5.34	1.32	0.53	0	Calculated
2561	2835	Pipe	RCP	I-1567	M-1302	234.87	4628.9	4611.6	7.37	24	0.015	13.57	53.21	0.26	13.1	0.72	0.36	0	Calculated
2562	2836	Pipe	RCP	M-1302	M-1301	473.81	4611.5	4594.9	3.5	24	0.015	13.56	36.7	0.37	5.94	1.41	0.71	0	Calculated
2563	2837	Pipe	RCP	M-1303	M-1260	226.58	4568	4559	3.97	24	0.015	17.16	39.08	0.44	7.54	1.46	0.73	0	Calculated
2564	2838	Pipe	RCP	M-1260	M-1261	42.76	4559	4557.5	3.51	18	0.015	13.14	17.05	0.77	8.1	1.5	1	138	SURCHARGED
2565	2839	Pipe	RCP	I-2215	M-1309	41.3	4554.5	4553.3	2.91	18	0.015	1.62	15.52	0.1	1.37	1.43	0.96	0	Calculated
2566	2840	Pipe	HDPE	I-1688	M-1325	165.98	5069.1	5056.5	7.59	18	0.015	13.76	25.08	0.55	13.7	0.82	0.55	0	Calculated
2567	2841	Pipe	HDPE	M-1325	M-1324	226.69	5056.4	5033	10.32	18	0.015	13.75	29.25	0.47	15.66	0.73	0.5	0	Calculated
2568	2842	Pipe	HDPE	M-1324	M-1323	143.79	5032.8	5024	6.12	18	0.015	13.74	22.52	0.61	9.97	1.17	0.79	0	Calculated
2569	2843	Pipe	HDPE	I-2229	M-1323	14.03	5025	5023.9	7.84	15	0.015	0.22	15.82	0.01	0.24	1.04	0.89	0	Calculated
2570	2844	Pipe	HDPE	M-1323	I-2228	13.54	5023.5	5023.4	0.74	18	0.015	13.74	7.82	1.76	8.06	1.36	0.92	0	> CAPACITY
2571	2845	Pipe	HDPE	I-2228	O-237	121.76	5023.4	5021.6	1.48	24	0.015	13.78	23.84	0.58	6.45	1.57	0.79	0	Calculated
2572	2846	Pipe	Moved from O-20 in order to input into Corner Creek, same elevation as O-19	M-1250	O-19	15.7	4553.6	4552.5	7.01	24	0.015	3.59	51.9	0.07	7.66	0.41	0.21	0	Calculated
2573	2847	Pipe	RCP	M-1249	M-1250	20.96	4553.8	4553.7	0.48	24	0.015	3.59	19.15	0.19	4.04	0.65	0.33	0	Calculated
2574	2848	Pipe	RCP	I-2143	M-1249	18.45	4557.2	4554	17.34	15	0.015	0	23.32	0	0	0.31	0.25	0	Calculated
2575	2849	Pipe	RCP	M-1248	M-1249	91.99	4555.5	4553.9	1.74	24	0.015	3.59	25.86	0.14	4.29	0.62	0.31	0	Calculated
2576	2850	Pipe	RCP	M-1247	M-1248	529.78	4556.7	4555.6	0.21	24	0.015	3.59	8.93	0.4	2.92	0.83	0.41	0	Calculated
2577	2851	Pipe	RCP	M-1245	M-1247	417.22	4557.5	4556.8	0.17	24	0.015	3.59	8.03	0.45	2.62	0.94	0.47	0	Calculated
2578	2852	Pipe	RCP	I-2140	M-1245	9.18	4560.5	4557.9	28.32	15	0.015	0	29.79	0	0	0.3	0.24	0	Calculated
2579	2853	Pipe	RCP	M-1246	M-1245	59.54	4557.7	4557.6	0.17	24	0.015	3.59	8.04	0.45	2.48	0.95	0.48	0	Calculated
2580	2855	Pipe	HDPE	I-2139	I-2141	258.58	4563.6	4562.5	0.43	15	0.015	5.22	3.73	1.4	4.25	1.25	1	150	SURCHARGED
2581	2856	Pipe	HDPE	I-2137	I-2139	375.21	4566	4563.7	0.61	18	0.015	2.14	7.13	0.3	1.42	1.5	1	53	SURCHARGED
2582	2857	Pipe	HDPE	I-2138	I-2137	23.57	4567.7	4566	7.21	15	0.015	1.52	15.04	0.1	2.17	1.25	1	10	SURCHARGED
2583	2858	Pipe	HDPE	I-2142	I-2141	287	4562.5	4562.4	0.03	18	0.015	6.82	1.32	5.18	3.86	1.5	1	157	SURCHARGED
2584	2859	Pipe	HDPE	I-2144	I-2142	232.57	4565.4	4562.6	1.2	24	0.015	6.82	21.51	0.32	2.17	2	1	29	SURCHARGED
2585	2860	Pipe	HDPE	I-2145	I-2144	21.71	4567.6	4565.5	9.67	15	0.015	1.63	17.41	0.09	2.37	1.25	1	6	SURCHARGED
2586	2861	Pipe	HDPE	I-2147	I-2144	569.84	4568.5	4565.5	0.53	18	0.015	0.67	6.61	0.1	0.61	0.97	0.66	0	Calculated
2587	2862	Pipe	HDPE	I-2146	I-2147	23.39	4569.6	4568.6	4.28	15	0.015	0	11.58	0	0	0.17	0.15	0	Calculated
2588	2863	Pipe	RCP	M-1255	M-1256	14.34	4590	4587.7	16.04	15	0.015	0	22.42	0	0	0	0	0	Calculated
2589	2864	Pipe	RCP	M-1256	M-1254	310.8	4586.6	4582.7	1.25	15	0.015	4.24	6.27	0.68	5.62	0.74	0.59	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2590	2865	Pipe	RCP	I-2148	M-1254	29.5	4584.5	4583.4	3.73	12	0.015	0	5.96	0	0	0	0	0	Calculated
2591	2866	Pipe	RCP	M-1253	M-1254	17.97	4583.1	4582.8	1.67	12	0.015	0.01	4.06	0	0.13	0.42	0.42	0	Calculated
2592	2867	Pipe	RCP	M-1254	M-1252	70.77	4582.7	4580.8	2.68	15	0.015	4.23	9.17	0.46	6.72	0.63	0.51	0	Calculated
2593	2868	Pipe	RCP	M-1251	M-1252	18.49	4582.5	4581.7	4.33	15	0.015	0	11.65	0	0	0	0	0	Calculated
2594	2869	Pipe	RCP	M-1252	M-1259	812.43	4580.7	4560.3	2.51	15	0.015	4.22	8.87	0.48	6.16	0.93	0.74	0	Calculated
2595	2870	Pipe	RCP	I-2150	I-2149	80.58	4560.5	4560.1	0.5	12	0.015	0.69	2.18	0.32	1.29	1	1	15	SURCHARGED
2596	2871	Pipe	RCP	M-1305	M-1304	32.75	4563.8	4562.9	2.75	12	0.015	0	5.12	0	0	0	0.01	0	Calculated
2597	2872	Pipe	RCP	M-1304	M-1259	43.34	4563	4560.7	5.31	12	0.015	0.12	7.11	0.02	0.27	0.52	0.54	0	Calculated
2598	2873	Pipe	RCP	I-2149	M-1258	33	4560	4559.3	2.12	15	0.015	1.45	8.15	0.18	1.54	1.25	1	25	SURCHARGED
2599	2874	Pipe	RCP	M-1259	M-1258	42.95	4560.2	4559.6	1.4	15	0.015	4.23	6.62	0.64	4.55	1.25	1	24	SURCHARGED
2600	2875	Pipe	RCP	M-1258	M-1257	63.74	4559.2	4558.9	0.47	15	0.015	3.92	3.84	1.02	3.23	1.25	1	115	SURCHARGED
2601	2876	Pipe	RCP	M-1257	M-1261	180.72	4558	4557.5	0.28	15	0.015	3.92	2.94	1.33	3.19	1.25	1	136	SURCHARGED
2602	2877	Pipe	RCP	M-1261	M-1309	144.3	4557.5	4552.8	3.26	18	0.015	16.92	16.43	1.03	9.68	1.5	1	137	SURCHARGED
2603	2878	Pipe	RCP	M-1309	I-2214	754.73	4552.7	4532	2.74	18	0.015	15.04	15.09	1	9.12	1.5	1	144	SURCHARGED
2604	2879	Pipe	RCP	I-2213	I-2212	49.35	4524.4	4524.3	0.2	12	0.015	1.64	1.39	1.18	2.35	1	1	161	SURCHARGED
2605	2880	Pipe	RCP	I-2214	I-2212	399.66	4532	4524.26	1.94	18	0.015	14.19	12.67	1.12	8.13	1.5	1	160	SURCHARGED
2606	2881	Pipe	RCP	I-2212	M-1308	386.26	4520.86	4513.6	1.88	18	0.015	12.27	12.48	0.98	7.33	1.5	1	163	SURCHARGED
2607	2882	Pipe	RCP	I-2211	M-1308	7.17	4517.3	4515	32.08	12	0.015	1.09	17.49	0.06	1.5	1	1	162	SURCHARGED
2608	2883	Pipe	RCP	M-1308	M-1307	37.5	4512.5	4512	1.33	18	0.015	10.47	18.21	0.58	7.26	1.5	1	165	SURCHARGED
2609	2884	Pipe	combined with 2885	M-861	M-1293	545.67	4629.4	4595.2	6.27	18	0.015	6.69	22.79	0.29	5.41	1.03	0.69	0	Calculated
2610	2886	Pipe	HDPE	M-1293	M-1291	138.53	4595.2	4594.6	0.43	18	0.015	6.69	5.99	1.12	4.17	1.28	0.85	0	> CAPACITY
2611	2887	Pipe	RCP	M-1291	I-2201	4.1	4594.5	4594.2	7.32	15	0.015	6.68	15.14	0.44	6.48	0.98	0.78	0	Calculated
2612	2888	Pipe	RCP	I-2201	I-2202	23.44	4594.1	4592.9	5.12	15	0.015	6.68	12.67	0.53	7.32	0.87	0.7	0	Calculated
2613	2889	Pipe	RCP	I-2202	M-1292	74.29	4592.8	4590.8	2.69	15	0.015	6.68	9.19	0.73	7.36	0.87	0.69	0	Calculated
2614	2890	Pipe	RCP	M-1292	I-2197	382.74	4590.7	4565.3	6.64	15	0.015	6.68	14.42	0.46	8.88	0.92	0.74	0	Calculated
2615	2891	Pipe	RCP	I-2196	I-2197	25.29	4569.5	4567.7	7.12	15	0.015	1.92	15.14	0.13	2.83	1.25	1	49	SURCHARGED
2616	2892	Pipe	RCP	I-2197	M-1285	295.6	4564.2	4561.8	0.81	24	0.015	9.22	17.67	0.52	3.27	2	1	166	SURCHARGED
2617	2893	Pipe	RCP	M-1285	M-962	113.54	4561.7	4561.3	0.35	24	0.015	9.22	12.21	0.76	2.93	2	1	174	SURCHARGED
2618	2894	Pipe	RCP	M-962	M-964	18.41	4561.3	4561.2	0.54	24	0.015	9.22	14.45	0.64	2.93	2	1	177	SURCHARGED
2619	2896	Pipe	RCP	I-1765	M-968	98.13	4446.4	4443.7	2.75	12	0.015	5.48	5.12	1.07	7.05	0.97	0.97	0	> CAPACITY
2620	2897	Pipe	RCP	M-968	I-1766	4.38	4443.65	4441.05	59.36	12	0.015	5.48	23.79	0.23	10.92	0.61	0.61	0	Calculated
2621	2899	Pipe	HDPE	I-1766	I-1764	525.39	4441	4431.7	1.77	18	0.015	5.46	12.11	0.45	6.57	0.71	0.48	0	Calculated
2622	2900	Pipe	CMP	I-1764	I-1762	603.58	4431.6	4423.15	1.4	18	0.015	5.46	10.77	0.51	3.83	1.13	0.75	0	Calculated
2623	2901	Pipe	HDPE	I-1761	I-1762	20.66	4428.3	4423.2	24.69	15	0.015	0	27.82	0	0	0.63	0.5	0	Calculated
2624	2902	Pipe	RCP	I-2102	I-2103	23.31	6115.1	6107.3	33.46	15	0.015	0	32.41	0	0	0	0	0	Calculated
2625	2903	Pipe	RCP	I-2103	M-1224	73.96	6107.2	6095.8	15.41	15	0.015	0	21.98	0	0	0	0	0	Calculated
2626	2904	Pipe	RCP	I-2101	I-2100	22.53	6105	6104.9	0.44	15	0.015	0	3.73	0	0	0	0	0	Calculated
2627	2905	Pipe	RCP	I-2100	M-1224	60.25	6104.8	6095.7	15.1	15	0.015	0	21.76	0	0	0	0	0	Calculated
2628	2906	Pipe	RCP	M-1224	M-1223	186.33	6095.5	6080	8.32	15	0.015	0	16.15	0	0	0	0	0	Calculated
2629	2907	Pipe	RCP	M-1223	I-2099	189.49	6079.9	6059.8	10.61	15	0.015	0	18.24	0	0	0	0	0	Calculated
2630	2908	Pipe	RCP	I-2099	M-1222	57.76	6059.2	6057.5	2.94	15	0.015	0	9.6	0	0	0	0	0	Calculated
2631	2909	Pipe	RCP	I-2097	I-2098	24.67	6057.9	6057.8	0.41	15	0.015	0	3.56	0	0	0	0	0	Calculated
2632	2910	Pipe	RCP	M-1222	I-2098	69.78	6057.3	6057.2	0.14	15	0.015	0	2.12	0	0	0	0	0	Calculated
2633	2913	Pipe	RCP	M-1219	M-1221	200.08	6055.5	6028.2	13.64	24	0.015	0	72.37	0	0	0	0	0	Calculated
2634	2914	Pipe	RCP	M-1221	M-1220	57.3	6028.2	6016.7	20.07	24	0.015	0	87.99	0	0	0	0	0	Calculated
2635	2915	Pipe	RCP	M-1220	O-226	37.55	6011.6	6011	1.6	24	0.015	0	24.99	0	0	0	0	0	Calculated
2636	2917	Pipe	RCP	I-2117	I-2116	25.04	6166.6	6159.5	28.35	15	0.015	0	29.9	0	0	0	0	0	Calculated
2637	2918	Pipe	RCP	I-2116	O-230	189.53	6159.2	6145.1	7.44	15	0.015	0	15.28	0	0	0	0	0	Calculated
2638	2921	Pipe	RCP	M-1233	M-1232	78.5	6210	6196.6	17.07	15	0.015	0	23.13	0	0	0	0	0	Calculated
2639	2922	Pipe	RCP	M-1232	I-2114	54.91	6196.3	6185.9	18.94	15	0.015	0	24.41	0	0	0	0	0	Calculated
2640	2923	Pipe	RCP	I-2114	M-1231	138.06	6185.6	6175.1	7.61	15	0.015	0	15.44	0	0	0	0	0	Calculated
2641	2924	Pipe	RCP	M-1231	M-1230	76.47	6175.1	6167.6	9.81	18	0.015	0	28.51	0	0	0	0	0	Calculated
2642	2925	Pipe	RCP	M-1230	I-2112	80.33	6167.3	6158.3	11.2	18	0.015	0	30.49	0	0	0	0	0	Calculated
2643	2926	Pipe	RCP	I-2113	I-2112	34.18	6161.7	6158.1	10.53	15	0.015	0	18.19	0	0	0	0	0	Calculated
2644	2927	Pipe	RCP	I-2112	I-2111	248.32	6157.9	6155	1.17	24	0.015	0	21.19	0	0	0	0	0	Calculated
2645	2928	Pipe	RCP	I-2111	M-1229	89.97	6154.3	6147.7	7.34	24	0.015	0	53.1	0	0	0	0	0	Calculated
2646	2929	Pipe	RCP	M-1229	M-1228	116.15	6147.3	6146.4	0.77	24	0.015	0	17.26	0	0	0	0	0	Calculated
2647	2930	Pipe	RCP	M-1228	I-2109	76.24	6146	6145.5	0.66	24	0.015	0	15.88	0	0	0	0	0	Calculated
2648	2931	Pipe	RCP	I-2109	I-2110	24.59	6145	6143.5	6.1	24	0.015	0	48.42	0	0	0	0	0	Calculated
2649	2932	Pipe	RCP	I-2110	M-1226	34.35	6143.2	6138.4	13.97	24	0.015	0	73.44	0	0	0	0	0	Calculated
2650	2933	Pipe	RCP	I-2108	M-1227	43.52	6139.7	6139	1.61	15	0.015	0	7.4	0	0	0	0	0	Calculated
2651	2934	Pipe	RCP	M-1227	M-1226	205.12	6138.9	6138.4	0.24	15	0.015	0	2.76	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2652	2935	Pipe	RCP	M-1226	M-1225	124.39	3137.9	6135.3	-2409.68	24	0.015	0	28.45	0	0	0	0	0	Calculated
2653	2936	Pipe	RCP	M-1225	I-2107	239.34	6134.9	6129.6	2.21	24	0.015	0	29.18	0	0	0	0	0	Calculated
2654	2937	Pipe	RCP	I-2107	I-2106	22.07	6129.4	6129.3	0.45	24	0.015	0	13.2	0	0	0	0	0	Calculated
2655	2938	Pipe	RCP	I-2106	O-229	34.73	6129	6127	5.76	24	0.015	0	46.58	0	0	0	0	0	Calculated
2656	2939	Pipe	RCP	I-2105	I-2104	15.37	6116.4	6116.3	0.65	15	0.015	0	4.95	0	0	0	0	0	Calculated
2657	2940	Pipe	RCP	I-2104	O-228	185.8	6115.7	6063.2	28.26	15	0.015	0	29.75	0	0	0	0	0	Calculated
2658	2941	Pipe	RCP	I-2118	I-2119	34.78	6152.1	6148.2	11.21	15	0.015	0	18.75	0	0	0	0	0	Calculated
2659	2942	Pipe	RCP	I-2119	M-1235	167.82	6147.8	6126	12.99	15	0.015	0	20.18	0	0	0	0	0	Calculated
2660	2943	Pipe	RCP	I-2121	I-2120	43.03	6147	6146.7	0.7	15	0.015	0	4.9	0	0	0	0	0	Calculated
2661	2944	Pipe	RCP	I-2120	M-1235	258.93	6146.6	6126	7.96	15	0.015	0	15.8	0	0	0	0	0	Calculated
2662	2945	Pipe	RCP	M-1235	O-231	104.89	6125.9	6124.2	1.62	15	0.015	0	7.21	0	0	0	0	0	Calculated
2663	2946	Pipe	RCP	I-2124	I-2123	43.2	6207.5	6203.2	9.95	15	0.015	0	17.85	0	0	0.46	0.37	0	Calculated
2664	2947	Pipe	RCP	I-2123	I-2122	71.59	6203.3	6203.2	0.14	15	0.015	1.77	2.09	0.84	2.63	0.67	0.54	0	Calculated
2665	2948	Pipe	RCP	I-2122	O-232	107.62	6203.1	6202.3	0.74	15	0.015	1.77	4.83	0.37	3.46	0.54	0.43	0	Calculated
2666	2949	Pipe	RCP	I-2063	I-2062	27.52	6191.3	6184.8	23.62	15	0.015	0	27.31	0	0	0	0	0	Calculated
2667	2950	Pipe	RCP	I-2062	M-1198	77.94	6184.7	6183	2.18	15	0.015	0	8.22	0	0	0	0	0	Calculated
2668	2951	Pipe	RCP	M-1198	M-1192	111.7	6183	6182.8	0.18	15	0.015	0	2.48	0	0	0	0	0	Calculated
2669	2952	Pipe	RCP	I-2060	M-1192	44.41	6193.6	6186	17.11	12	0.015	0	12.77	0	0	0	0	0	Calculated
2670	2953	Pipe	RCP	M-1192	M-1193	138.66	6182.7	6182.4	0.22	15	0.015	0	2.6	0	0	0	0	0	Calculated
2671	2954	Pipe	RCP	I-2061	M-1193	51.28	6184.4	6182.5	3.71	12	0.015	0	5.94	0	0	0	0	0	Calculated
2672	2955	Pipe	RCP	M-1193	M-1194	166.57	6181.8	6178.9	1.74	15	0.015	0	7.39	0	0	0.12	0.1	0	Calculated
2673	2956	Pipe	RCP	M-1194	M-1195	198.61	6178.8	6140.5	19.28	15	0.015	3.93	24.58	0.16	14.4	0.34	0.27	0	Calculated
2674	2957	Pipe	RCP	M-1195	M-1196	79.89	6139.8	6117.4	28.04	15	0.015	3.93	29.64	0.13	16.09	0.32	0.25	0	Calculated
2675	2958	Pipe	RCP	M-1196	M-1197	108.08	6117.1	6098.7	17.02	15	0.015	3.93	23.11	0.17	13.54	0.36	0.29	0	Calculated
2676	2959	Pipe	RCP	M-1197	O-224	143.14	6098.6	6054.7	30.67	15	0.015	3.93	31	0.13	16.92	0.3	0.24	0	Calculated
2677	2960	Pipe	RCP	I-2065	I-2064	22.77	6266.3	6266.2	0.44	12	0.015	0	2.05	0	0	0	0	0	Calculated
2678	2961	Pipe	RCP	I-2136	M-1244	65.47	6259.8	6259.4	0.61	12	0.015	0	2.41	0	0	0	0	0	Calculated
2679	2962	Pipe	RCP	I-2064	M-1244	149.4	6266.1	6259.3	4.55	15	0.015	0	11.99	0	0	0	0	0	Calculated
2680	2963	Pipe	RCP	M-1244	M-1243	179.67	6259.2	6259.1	0.06	15	0.015	0	1.51	0	0	0	0	0	Calculated
2681	2964	Pipe	RCP	I-2133	I-2134	27.31	6260	6258.8	4.39	12	0.015	0	6.47	0	0	0	0.14	0	Calculated
2682	2965	Pipe	RCP	M-1243	M-1236	101.4	6259	6257	1.97	15	0.015	0.13	7.86	0.02	0.21	0.63	0.52	0	Calculated
2683	2966	Pipe	RCP	I-2134	M-1236	18.62	6258.7	6257	9.13	12	0.015	0.46	9.33	0.05	0.98	0.5	0.69	0	Calculated
2684	2967	Pipe	RCP	I-2127	I-2128	28.72	6273.1	6272.2	3.13	12	0.015	0	5.53	0	0	0	0	0	Calculated
2685	2968	Pipe	RCP	I-2128	I-2129	142.19	6271.9	6270.3	1.13	15	0.015	0	5.98	0	0	0	0	0	Calculated
2686	2969	Pipe	RCP	I-2129	I-2130	141.51	6270.2	6261	6.5	15	0.015	0	14.27	0	0	0	0	0	Calculated
2687	2970	Pipe	RCP	I-2130	I-2131	217.43	6260.9	6260	0.41	15	0.015	0	3.6	0	0	0	0	0	Calculated
2688	2971	Pipe	RCP	I-2131	I-2132	134.45	6259.9	6259.4	0.37	15	0.015	0	3.58	0	0	0	0	0	Calculated
2689	2972	Pipe	RCP	I-2132	M-1236	110	6259.3	6257	2.09	15	0.015	0.09	8.17	0.01	0.15	0.63	0.5	0	Calculated
2690	2973	Pipe	RCP	M-1236	M-1237	112.16	6257	6244.2	11.41	15	0.015	12.48	18.91	0.66	10.22	1.25	1	2	SURCHARGED
2691	2974	Pipe	RCP	M-1237	M-1238	49.84	6251.3	6228.8	45.14	15	0.015	12.48	37.62	0.33	24.63	0.53	0.43	0	Calculated
2692	2975	Pipe	RCP	M-1238	M-1239	127.23	6225.6	6192.2	26.25	15	0.015	12.48	28.67	0.44	12.99	0.91	0.73	0	Calculated
2693	2976	Pipe	RCP	M-1239	M-1240	79.96	6197.3	6171	32.89	15	0.015	12.48	32.11	0.39	22.69	0.57	0.46	0	Calculated
2694	2977	Pipe	RCP	M-1240	O-233	122.86	6165.4	6146.3	15.55	18	0.015	12.48	35.93	0.35	17.41	0.63	0.43	0	Calculated
2695	2978	Pipe	RCP	I-2135	M-1242	55.31	6223	6222.2	1.45	15	0.015	0	6.78	0	0	0	0	0	Calculated
2696	2979	Pipe	RCP	M-1242	M-1241	94.51	6221.2	6210.1	11.74	15	0.015	0	19.19	0	0	0	0	0	Calculated
2697	2980	Pipe	RCP	M-1241	M-1240	108.22	6204.6	6176.5	25.97	15	0.015	0	28.54	0	0	0	0	0	Calculated
2698	2981	Pipe	RCP	I-2125	M-1329	186.7	6297.7	6273.2	13.12	12	0.015	0	11.19	0	0	0	0	0	Calculated
2699	2982	Pipe	RCP	M-1329	I-2236	21.71	6271.9	6271	4.15	12	0.015	0	6.43	0	0	0	0	0	Calculated
2700	2983	Pipe	RCP	I-2236	I-2235	35.66	6274.8	6266.1	24.4	15	0.015	0	27.65	0	0	0	0	0	Calculated
2701	2984	Pipe	RCP	I-2235	M-1330	64.77	6266.7	6261.8	7.57	15	0.015	0	15.4	0	0	0	0	0	Calculated
2702	2985	Pipe	RCP	M-1330	M-1331	95.71	6261.5	6246.3	15.88	15	0.015	0	22.31	0	0	0	0	0	Calculated
2703	2986	Pipe	RCP	I-2237	M-1331	7.86	6246.6	6246.2	5.09	15	0.015	0	12.63	0	0	0	0	0	Calculated
2704	2987	Pipe	RCP	I-2238	M-1333	65.72	6246	6236.1	15.06	15	0.015	0	21.73	0	0	0	0	0	Calculated
2705	2988	Pipe	RCP	M-1331	M-1333	52.3	6245.9	6236	18.93	15	0.015	0	24.36	0	0	0	0	0	Calculated
2706	2989	Pipe	PVC	I-2239	M-1332	98.78	6279.5	6248.1	31.79	12	0.015	0	16.88	0	0	0	0	0	Calculated
2707	2990	Pipe	RCP	M-1332	I-2238	12.43	6250	6247.5	20.11	15	0.015	0	25.11	0	0	0	0	0	Calculated
2708	2991	Pipe	RCP	I-2190	I-2189	26.79	4583	4581.8	4.48	15	0.015	0	11.85	0	0	0	0	0	Calculated
2709	2992	Pipe	RCP	I-2189	M-1282	38.03	4581.7	4581.1	1.58	15	0.015	0	7.03	0	0	0	0	0	Calculated
2710	2994	Pipe	RCP	M-1282	M-1281	116.32	4581	4578.2	2.41	15	0.015	0	8.75	0	0	0	0	0	Calculated
2711	2995	Pipe	RCP	M-1281	M-1280	72.99	4578.1	4577.7	0.55	15	0.015	0	4.14	0	0	0	0	0	Calculated
2712	2996	Pipe	RCP	M-1280	M-1279	194.85	4577.6	4577.5	0.05	15	0.015	0	1.27	0	0	0	0	0	Calculated
2713	2997	Pipe	RCP	M-1279	M-1277	155.63	4577.4	4577.3	0.06	15	0.015	0.01	1.42	0.01	0.29	0.01	0.08	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2714	2998	Pipe	RCP	I-2192	I-2191	22.21	4602.3	4601.3	4.5	15	0.015	0	11.88	0	0	0	0	0	Calculated
2715	2999	Pipe	RCP	I-2191	M-1278	272.61	4601.2	4578	8.51	15	0.015	0	16.33	0	0	0	0	0	Calculated
2716	3000	Pipe	RCP	M-1278	M-1277	67.01	4578	4577.3	1.04	15	0.015	0	5.72	0	0	0	0.08	0	Calculated
2717	3001	Pipe	RCP	M-1277	I-2188	53.3	4577.2	4576.8	0.75	15	0.015	0.27	4.85	0.06	0.84	0.27	0.38	0	Calculated
2718	3002	Pipe	RCP	I-2188	I-2187	31.4	4576.7	4575.5	3.82	15	0.015	0.58	10.94	0.05	0.74	0.93	0.81	0	Calculated
2719	3003	Pipe	RCP	I-2187	M-1276	210.69	4575.4	4574.6	0.38	18	0.015	1.49	5.61	0.27	1.08	1.5	1	7	SURCHARGED
2720	3004	Pipe	RCP	M-1276	M-1275	172.21	4574.5	4573.5	0.58	18	0.015	1.95	7.04	0.28	1.11	1.5	1	15	SURCHARGED
2721	3005	Pipe	RCP	I-2186	M-1275	19.09	4583	4579.6	17.81	15	0.015	0	23.63	0	0	0	0	0	Calculated
2722	3006	Pipe	RCP	M-1275	I-2185	171.98	4573.4	4573	0.23	18	0.015	11.12	4.39	2.53	6.52	1.38	0.92	0	> CAPACITY
2723	3007	Pipe	RCP	I-2185	M-1284	194.02	4572.8	4563.3	4.9	18	0.015	11.12	20.14	0.55	7.47	1.17	0.79	0	Calculated
2724	3008	Pipe	RCP	M-1284	DET_122	338.15	4563.2	4562.4	0.24	18	0.015	8.02	4.43	1.81	4.54	1.5	1	166	SURCHARGED
2725	3009	Pipe	Includes 3010 (listed as 18-inch) Unsure if that is discrepency or if there is a manhole that is missing from inventory.	M-964	I-1751	49.83	4561.2	4561	0.4	24	0.015	21.39	12.42	1.72	6.81	2	1	178	SURCHARGED
2726	3011	Pipe	RCP	I-1751	DET_122	46.67	4561	4560.3	1.5	18	0.015	21.39	11.15	1.92	12.1	1.5	1	187	SURCHARGED
2727	3013	Pipe	RCP	New-9	M-961	26.04	4563	4558	19.2	15	0.015	12.25	24.53	0.5	11.02	1.18	0.94	0	Calculated
2728	3015	Pipe	RCP	M-961	New-10	78.29	4556.7	4556	0.89	18	0.015	12.25	8.61	1.42	6.93	1.5	1	172	SURCHARGED
2729	3016	Pipe		New-10	M-960	66	4558	4552.7	8.03	18	0.015	12.25	25.8	0.48	12.51	1.33	0.88	0	Calculated
2730	3017	Pipe	RCP	M-960	M-959	352.81	4552.4	4535.1	4.9	15	0.015	12.25	12.4	0.99	10.67	1.25	1	111	SURCHARGED
2731	3018	Pipe	RCP	I-1749	I-1748	28.27	4529.5	4528.6	3.18	15	0.015	0	9.99	0	0	0	0	0	Calculated
2732	3019	Pipe	RCP	M-959	M-957	356.97	4535.1	4518.2	4.73	15	0.015	11.17	12.18	0.92	9.85	1.25	1	133	SURCHARGED
2733	3020	Pipe	RCP	I-1748	M-958	186.8	4528.5	4521.3	3.85	15	0.015	0	11.01	0	0	0.63	0.5	0	Calculated
2734	3021	Pipe	RCP	M-958	I-1747	7.74	4521.3	4520.3	12.92	15	0.015	0.77	20.12	0.04	1.07	1.25	1	155	SURCHARGED
2735	3022	Pipe	RCP	I-1747	M-957	10.12	4519.7	4519.4	2.96	15	0.015	1.03	9.64	0.11	1.11	1.25	1	160	SURCHARGED
2736	3023	Pipe	RCP	I-1746	M-957	29.54	4520.6	4519.3	4.4	15	0.015	1.15	11.74	0.1	1.3	1.25	1	158	SURCHARGED
2737	3024	Pipe	RCP - Combined with 3025 (notes say 12" on this one, no evidence of manhole in aerial, location unknown)	M-957	M-1307	145.87	4518.1	4512.1	4.11	15	0.015	9.38	11.35	0.83	7.64	1.25	1	162	SURCHARGED
2738	3026	Pipe	RCP	M-1286	I-2197	217.86	4564.5	4564.4	0.05	21	0.015	5.34	4.16	1.28	2.22	1.75	1	166	SURCHARGED
2739	3027	Pipe	RCP	M-1287	M-1286	308.46	4567.3	4564.6	0.88	21	0.015	5.34	12.85	0.42	3.11	1.75	1	83	SURCHARGED
2740	3028	Pipe	RCP	I-2199	M-1287	145.98	4568.7	4567.4	0.89	21	0.015	7.9	12.96	0.61	3.66	1.75	1	54	SURCHARGED
2741	3029	Pipe	RCP	I-2198	I-2199	28.51	4569.5	4568.9	2.1	12	0.015	1.52	4.48	0.34	2.2	1	1	54	SURCHARGED
2742	3030	Pipe	RCP	M-1288	I-2199	68.54	4568.9	4568.8	0.15	18	0.015	6.8	3.48	1.96	3.87	1.5	1	55	SURCHARGED
2743	3031	Pipe	RCP	M-1289	M-1288	45.24	4571.8	4569	6.19	15	0.015	0.99	13.93	0.07	1.52	0.72	0.62	0	Calculated
2744	3032	Pipe	RCP	M-1290	M-1289	158.51	4578	4572	3.79	15	0.015	0	10.89	0	0	0	0.04	0	Calculated
2745	3033	Pipe	RCP	I-2200	M-1290	64.2	4582.5	4578.2	6.7	15	0.015	0	14.49	0	0	0	0	0	Calculated
2746	3034	Pipe	RCP	M-1294	I-2200	52.94	4583.3	4582.6	1.32	15	0.015	0	6.44	0	0	0	0	0	Calculated
2747	3035	Pipe	RCP	I-2204	M-1294	31.83	4584.6	4583.5	3.46	15	0.015	0	10.41	0	0	0	0	0	Calculated
2748	3036	Pipe	RCP	I-2203	M-1294	69.79	4587	4583.5	5.02	15	0.015	0	12.54	0	0	0	0	0	Calculated
2749	3037	Pipe	RCP	M-890	M-1283	84.6	4633.3	4626.8	7.68	24	0.015	8.41	54.35	0.15	11.62	0.56	0.28	0	Calculated
2750	3038	Pipe	RCP	M-1283	I-2193	137.62	4626.7	4619.3	5.38	24	0.015	8.41	45.46	0.18	10.47	0.61	0.3	0	Calculated
2751	3039	Pipe	RCP	I-2194	I-2193	40.57	4621.2	4619.9	3.2	15	0.015	0	10.02	0	0	0	0	0	Calculated
2752	3040	Pipe	RCP	I-2193	I-2195	296.89	4619.2	4600.5	6.3	24	0.015	8.4	49.21	0.17	11.4	0.57	0.28	0	Calculated
2753	3041	Pipe	RCP	I-2195	M-964	522.99	4600.4	4564.6	6.85	24	0.015	8.4	51.3	0.16	7.59	1.27	0.64	0	Calculated
2754	3042	Pipe	RCP	I-2209	M-1306	6.38	4512.3	4510.2	32.92	12	0.015	0.39	17.72	0.02	0.97	1	1	60	SURCHARGED
2755	3043	Pipe	RCP	I-2210	M-1306	10.66	4511.9	4509.9	18.76	12	0.015	0.72	13.37	0.05	1.35	1	1	104	SURCHARGED
2756	3044	Pipe	RCP	M-1307	M-1306	137.52	4511.9	4509.2	1.96	18	0.015	16.53	12.76	1.3	9.38	1.5	1	163	SURCHARGED
2757	3045	Pipe	RCP	M-1306	M-956	309.73	4509.1	4500.2	2.87	18	0.015	15.65	15.43	1.01	8.86	1.5	1	163	SURCHARGED
2758	3046	Pipe	RCP	I-1745	M-954	24.61	4505.4	4503.7	6.91	15	0.015	0.64	14.71	0.04	1.03	0.63	0.52	0	Calculated
2759	3047	Pipe	RCP	M-954	M-955	132.8	4503.9	4502.9	0.75	15	0.015	2.15	4.86	0.44	2.06	1.17	1	0	SURCHARGED
2760	3048	Pipe	RCP	M-955	M-956	13.18	4502.9	4502.4	3.79	15	0.015	3.86	10.9	0.35	3.31	1.25	1	58	SURCHARGED
2761	3052	Pipe	Combined with 3055, both are RCP 18" pipes, manhole data was missing	M-956	I-2208	537.37	4500.2	4483.7	3.07	18	0.015	17.04	15.95	1.07	9.91	1.49	1	8	SURCHARGED
2762	3053	Pipe	RCP	I-2206	I-2207	227.97	4489.5	4484.4	2.24	15	0.015	0	8.37	0	0	0	0	0	Calculated
2763	3054	Pipe	RCP	I-2207	I-2208	33.51	4484.3	4482	6.86	15	0.015	0	14.67	0	0	0.63	0.5	0	Calculated
2764	3056	Pipe	RCP	I-2208	M-944	401.67	4481.8	4473.9	1.97	24	0.015	23.7	27.5	0.86	8.16	1.73	0.87	0	Calculated
2765	3058	Pipe	HDPE	M-1051	M-1052	119.97	4776.7	4765.6	9.25	24	0.015	0	59.64	0	0	0	0	0	Calculated
2766	3059	Pipe	HDPE	M-1052	I-1899	250.86	4765.5	4753.1	4.94	24	0.015	0	43.59	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2767	3060	Pipe	HDPE	I-1898	I-1899	33.34	4754.7	4753.2	4.5	15	0.015	0	11.88	0	0	0	0	0	Calculated
2768	3061	Pipe	RCP	I-1891	M-1050	118.4	4745.6	4745.5	0.08	24	0.015	12.69	5.7	2.23	4.6	1.64	0.82	0	> CAPACITY
2769	3062	Pipe	HDPE	I-1899	M-1050	43.75	4753	4749.5	8	15	0.015	0	15.83	0	0	0	0	0	Calculated
2770	3063	Pipe	HDPE	I-1897	M-1050	97.55	4752.1	4749.8	2.36	15	0.015	0	8.6	0	0	0	0	0	Calculated
2771	3064	Pipe	HDPE	M-1050	M-1061	125.51	4745.4	4733.4	9.56	24	0.015	12.69	60.62	0.21	14.33	0.65	0.33	0	Calculated
2772	3065	Pipe	HDPE	M-1061	M-1060	104.41	4729.4	4722.4	6.7	24	0.015	12.69	50.77	0.25	12.37	0.72	0.36	0	Calculated
2773	3066	Pipe	HDPE	M-1060	M-1059	95.31	4720.5	4713.8	7.03	24	0.015	12.69	51.98	0.24	12.5	0.72	0.36	0	Calculated
2774	3067	Pipe	HDPE	M-1059	I-1906	101.67	4713.5	4706.2	7.18	30	0.015	12.69	95.25	0.13	12.47	0.65	0.26	0	Calculated
2775	3068	Pipe	HDPE	I-1907	I-1906	21.94	4707.3	4706.8	2.28	15	0.015	0	8.45	0	0	0	0	0	Calculated
2776	3069	Pipe	HDPE	I-1906	M-1058	93.37	4704	4696.9	7.6	30	0.015	27.76	98.03	0.28	15.1	0.99	0.4	0	Calculated
2777	3070	Pipe	HDPE	M-1058	M-1057	91.1	4696.6	4689.8	7.46	30	0.015	27.76	97.12	0.29	13.2	1.09	0.44	0	Calculated
2778	3071	Pipe	HDPE	M-1057	M-1056	78.45	4689.5	4687.7	2.29	36	0.015	27.76	87.56	0.32	9.33	1.29	0.44	0	Calculated
2779	3072	Pipe	HDPE	M-1056	I-1904	69.22	4687.5	4684.3	4.62	36	0.015	27.76	124.29	0.22	9.22	1.3	0.44	0	Calculated
2780	3073	Pipe	HDPE	I-1905	I-1904	20.36	4688	4685.3	13.26	15	0.015	0	20.39	0	0	0.23	0.19	0	Calculated
2781	3074	Pipe	HDPE	I-1904	M-1055	117.19	4684.2	4682.4	1.54	36	0.015	27.76	72.24	0.38	8.43	1.4	0.47	0	Calculated
2782	3075	Pipe	HDPE	M-1055	O-169	174.76	4682.1	4668.2	7.95	36	0.015	27.77	162.97	0.17	18.81	0.78	0.26	0	Calculated
2783	3076	Pipe	HDPE	I-1908	O-170	326.76	4720.8	4666.8	16.53	18	0.015	0	37.01	0	0	0.47	0.31	0	Calculated
2784	3077	Pipe	HDPE	I-1900	I-1901	23.57	4719.2	4717.3	8.06	18	0.015	0	25.85	0	0	0	0	0	Calculated
2785	3078	Pipe	HDPE	I-1901	M-1053	53.26	4717.2	4710.1	13.33	15	0.015	0	20.44	0	0	0	0	0	Calculated
2786	3079	Pipe	HDPE	I-1902	I-1903	22.32	4718.8	4716	12.54	15	0.015	0	19.83	0	0	0	0	0	Calculated
2787	3080	Pipe	HDPE	I-1903	M-1053	37.25	4716.5	4711.5	13.42	15	0.015	0	20.51	0	0	0	0	0	Calculated
2788	3081	Pipe	HDPE	M-1053	M-1054	181.39	4710	4692.4	9.7	15	0.015	0	17.44	0	0	0	0	0	Calculated
2789	3082	Pipe	HDPE	M-1054	M-1055	56.77	4692.2	4686.1	10.75	15	0.015	0	18.35	0	0	0	0	0	Calculated
2790	3084	Pipe	HDPE	M-1371	M-1372	274.93	4797	4790.6	2.33	24	0.015	28.86	29.91	0.96	10.03	1.79	0.9	0	Calculated
2791	3085	Pipe	HDPE	M-1372	M-1031	426.19	4790.5	4772.8	4.15	24	0.015	28.86	39.96	0.72	10.31	1.71	0.86	0	Calculated
2792	3086	Pipe	HDPE	M-1031	M-1373	266.9	4772.7	4765	2.88	18	0.015	19.36	15.46	1.25	10.96	1.5	1	91	SURCHARGED
2793	3087	Pipe	HDPE	M-1373	M-1374	266.33	4764.9	4752	4.84	18	0.015	19.35	20.04	0.97	12.19	1.33	0.89	0	Calculated
2794	3090	Pipe	HDPE	I-1874	M-1033	55.36	4977.3	4962.9	26.01	15	0.015	0.41	28.55	0.01	4.51	0.16	0.13	0	Calculated
2795	3091	Pipe	HDPE	I-1873	M-1032	104.8	4976	4962.5	12.88	15	0.015	4.76	20.09	0.24	12.82	0.43	0.34	0	Calculated
2796	3092	Pipe	HDPE	M-1033	M-1032	278.27	4962.9	4959.7	1.15	15	0.015	0.4	6	0.07	2.73	0.21	0.18	0	Calculated
2797	3093	Pipe	HDPE	M-645	M-1385	84.21	4886.8	4886.1	0.83	30	0.015	23.81	32.41	0.73	5.38	2.1	0.85	0	Calculated
2798	3094	Pipe	HDPE	M-1385	M-1386	69.24	4886	4885.5	0.72	30	0.015	23.78	30.21	0.79	5.92	1.88	0.76	0	Calculated
2799	3095	Pipe	HDPE	I-2317	I-2316	27.28	4885.5	4884.3	4.4	15	0.015	0.08	11.74	0.01	0.12	0.78	0.64	0	Calculated
2800	3096	Pipe	HDPE	M-1386	I-2316	73.46	4885.4	4884.3	1.5	30	0.015	23.77	43.5	0.55	7.07	1.59	0.65	0	Calculated
2801	3097	Pipe	HDPE	I-2316	M-1387	195.22	4884.2	4882	1.13	30	0.015	23.72	37.74	0.63	7.48	1.5	0.62	0	Calculated
2802	3098	Pipe	HDPE	M-1387	M-1388	129.59	4881.9	4877.1	3.7	30	0.015	23.71	68.42	0.35	11.44	1.07	0.44	0	Calculated
2803	3099	Pipe	HDPE	M-1388	I-2318	112.51	4877	4867.6	8.35	30	0.015	23.72	102.75	0.23	9.86	1.19	0.49	0	Calculated
2804	3100	Pipe	HDPE	I-2319	I-2318	30.17	4869.1	4867.7	4.64	15	0.015	0.03	12.06	0	0.05	0.66	0.56	0	Calculated
2805	3101	Pipe	HDPE	M-465	M-1389	73.36	4867.3	4867	0.41	24	0.015	0.33	12.54	0.03	0.34	1.12	0.59	0	Calculated
2806	3102	Pipe	HDPE	I-2320	M-1389	22.19	4867.4	4867	1.8	15	0.015	0.05	7.52	0.01	0.16	1.06	0.87	0	Calculated
2807	3103	Pipe	HDPE	I-2318	M-1389	18.59	4867.5	4867	2.69	30	0.015	23.71	58.3	0.41	7.79	1.48	0.61	0	Calculated
2808	3104	Pipe	HDPE	M-1389	I-767	41.75	4866.9	4863.5	8.14	30	0.015	33.34	101.44	0.33	14.19	1.17	0.48	0	Calculated
2809	3105	Pipe		M-629	M-630	165	5030.1	5005.7	14.79	18	0.015	23.12	35.01	0.66	19.23	0.96	0.64	0	Calculated
2810	3106	Pipe		M-630	M-631	250.91	5005.7	4961.9	17.46	18	0.015	23.12	38.02	0.61	23.62	0.81	0.54	0	Calculated
2811	3107	Pipe		M-631	O-207	144.94	4961.9	4887.5	51.33	18	0.015	23.12	65.24	0.35	32.67	0.63	0.42	0	Calculated
2812	3108	Pipe	HDPE	DET_101	O-105	489.82	4886	4827.35	11.97	15	0.015	18.11	19.37	0.93	19.77	0.96	0.77	0	Calculated
2813	3110	Pipe	HDPE	DET_129	New-39	662.51	5011.7	4911	15.2	15	0.015	6.57	22.92	0.29	20.75	0.38	0.3	0	Calculated
2814	3111	Pipe	RCP	M-1394	I-913	514.41	4453	4447.9	0.99	15	0.015	0	5.57	0	0	0.04	0.03	0	Calculated
2815	3112	Pipe	RCP	I-2323	I-2324	64.85	4459.3	4458.6	1.08	15	0.015	0	5.82	0	0	0	0	0	Calculated
2816	3113	Pipe	RCP	I-2324	M-1393	232.43	4458.4	4454.6	1.63	15	0.015	0	7.16	0	0	0	0	0	Calculated
2817	3114	Pipe	RCP	I-2325	M-1393	30.72	4456.3	4454.7	5.21	15	0.015	0	12.78	0	0	0	0	0	Calculated
2818	3115	Pipe	RCP	M-1393	I-2326	161.66	4454.7	4453.1	0.99	15	0.015	0	5.57	0	0	0	0	0	Calculated
2819	3116	Pipe	RCP	I-2326	I-2327	24.36	4453	4452.4	2.46	15	0.015	0	7.17	0	0	0	0	0	Calculated
2820	3117	Pipe	RCP	I-2327	M-1394	33.99	4452.9	4452.2	2.06	15	0.015	0	8.03	0	0	0	0	0	Calculated
2821	3118	Pipe	HDPE	I-1856	O-197	74.27	5001.58	4994.24	9.88	15	0.015	9.32	17.6	0.53	15.28	0.62	0.5	0	Calculated
2822	3119	Pipe	HDPE	I-1857	M-1026	398.17	4972	4949.2	5.73	12	0.015	7.7	7.39	1.04	10	1	1	113	SURCHARGED
2823	3120	Pipe	HDPE	M-1026	M-1027	52.44	4949.4	4946.3	5.91	12	0.015	6.36	7.51	0.85	9.4	0.84	0.85	0	Calculated
2824	3121	Pipe	HDPE	M-1027	O-198	205.72	4946.2	4891	26.83	15	0.015	6.35	29	0.22	18.52	0.4	0.32	0	Calculated
2825	3122	Pipe	HDPE	I-1862	O-199	210.43	4882.25	4849.29	15.66	18	0.015	6.13	36.03	0.17	16.29	0.4	0.27	0	Calculated
2826	3123	Pipe	RCP	M-1077	M-1028	187.12	4987.4	4939.5	25.6	15	0.015	10.13	27.17	0.37	19.3	0.55	0.44	0	Calculated
2827	3124	Pipe	RCP	M-1078	M-1077	533.26	5083.1	4987.5	17.93	15	0.015	0	23.7	0	0	0.22	0.18	0	Calculated
2828	3125	Pipe	RCP	M-1079	M-1078	139.69	5095	5083.2	8.45	15	0.015	0	16.27	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2829	3126	Pipe	RCP	I-1927	M-1079	22.22	5096.9	5095.9	4.5	15	0.015	0	11.88	0	0	0	0	0	Calculated
2830	3127	Pipe	RCP	I-1929	M-1079	70.92	5099.1	5095.1	5.64	15	0.015	0	13.3	0	0	0	0	0	Calculated
2831	3128	Pipe	RCP	I-1928	I-1929	17.34	5099.2	5099.1	0.58	15	0.015	0	4.25	0	0	0	0	0	Calculated
2832	3129	Pipe	RCP	M-1080	I-1929	146.88	5106.5	5099.1	5.04	15	0.015	0	12.57	0	0	0	0	0	Calculated
2833	3130	Pipe	RCP	I-1930	M-1080	95.16	5107.7	5106.5	1.26	15	0.015	0	6.29	0	0	0	0	0	Calculated
2834	3134	Pipe	RCP	I-1932	M-1082	121.48	5118.1	5117.6	0.41	15	0.015	0	3.59	0	0	0	0	0	Calculated
2835	3135	Pipe	RCP	M-1083	M-1082	74.42	5118.2	5117.6	0.81	15	0.015	0	5.03	0	0	0	0	0	Calculated
2836	3136	Pipe	RCP	I-1933	M-1083	87.74	5123.3	5118.2	5.81	15	0.015	0	13.5	0	0	0	0	0	Calculated
2837	3137	Pipe	RCP	I-1934	M-1085	97.09	5122	5120.1	1.96	15	0.015	0	7.83	0	0	0	0	0	Calculated
2838	3138	Pipe	RCP	M-1085	M-1084	101.64	5120	5119	0.98	15	0.015	0	5.55	0	0	0	0	0	Calculated
2839	3139	Pipe	RCP	M-1084	M-1083	168.62	5118.9	5118.2	0.42	15	0.015	0	3.61	0	0	0	0	0	Calculated
2840	3140	Pipe	RCP	I-1959	I-1960	25.18	5181.5	5180.4	4.37	15	0.015	0	11.7	0	0	0	0	0	Calculated
2841	3141	Pipe	RCP	I-1960	M-1111	56.27	5180.3	5174.9	9.6	15	0.015	0	17.34	0	0	0	0	0	Calculated
2842	3142	Pipe	RCP	M-1111	M-1112	93.84	5175.7	5165.2	11.19	15	0.015	0	18.73	0	0	0	0	0	Calculated
2843	3143	Pipe	RCP	M-1112	M-1113	94.84	5165.2	5155.5	10.23	15	0.015	0	17.9	0	0	0	0	0	Calculated
2844	3144	Pipe	RCP	M-1113	M-1114	127.17	5155.5	5142.5	10.22	15	0.015	0	17.9	0	0	0	0	0	Calculated
2845	3145	Pipe	RCP	I-1961	M-1115	17.43	0	5134.7	-29459	15	0.015	0	39.23	0	0	0	0	0	Calculated
2846	3146	Pipe	RCP	M-1115	I-1962	10.68	5134.6	5134.5	0.94	15	0.015	0	5.42	0	0	0	0	0	Calculated
2847	3147	Pipe	RCP	I-1962	O-215	212.22	5134.5	5129	2.59	15	0.015	0	9.01	0	0	0	0	0	Calculated
2848	3149	Pipe	RCP	I-1951	I-1952	34.32	5121.8	5121.2	1.75	15	0.015	0	7.4	0	0	0	0	0	Calculated
2849	3150	Pipe	RCP	I-1952	M-1105	40.82	5121.3	5117.6	9.06	15	0.015	0	16.86	0	0	0	0	0	Calculated
2850	3151	Pipe	RCP	M-1105	M-1104	363.37	5117.5	5102	4.27	15	0.015	0	11.56	0	0	0	0	0	Calculated
2851	3152	Pipe	RCP	M-1104	M-1103	171.74	5101.9	5089.4	7.28	15	0.015	0	15.1	0	0	0	0	0	Calculated
2852	3153	Pipe	RCP	M-1103	M-1102	163.17	5089.3	5079.3	6.13	15	0.015	0	13.86	0	0	0	0	0	Calculated
2853	3154	Pipe	RCP	I-1947	I-1948	25.7	5079.3	5079.2	0.39	15	0.015	0	3.49	0	0	0	0	0	Calculated
2854	3155	Pipe	RCP	I-1948	I-1950	40.56	5079.1	5078.6	1.23	15	0.015	0	6.22	0	0	0	0	0	Calculated
2855	3156	Pipe	RCP	I-1949	I-1950	25.51	5079.2	5078.6	2.35	15	0.015	0	8.59	0	0	0	0	0	Calculated
2856	3157	Pipe	RCP	M-1102	I-1950	44.97	5079.2	5078.6	1.33	15	0.015	0	6.47	0	0	0	0	0	Calculated
2857	3158	Pipe	RCP	I-1950	M-1101	143.19	5078.6	5076.7	1.33	15	0.015	0	6.45	0	0	0	0	0	Calculated
2858	3159	Pipe	RCP	M-1101	M-1100	196.38	5076.7	5073.4	1.68	18	0.015	0	11.8	0	0	0.25	0.17	0	Calculated
2859	3160	Pipe	RCP	I-1945	M-1100	12.81	5074.2	5073.4	6.25	15	0.015	0	13.99	0	0	0.25	0.2	0	Calculated
2860	3161	Pipe	RCP	I-1953	I-1954	33.87	5122.4	5121.9	1.48	15	0.015	0	6.8	0	0	0	0	0	Calculated
2861	3162	Pipe	RCP	I-1954	M-1097	334.88	5121.8	5100.8	6.27	15	0.015	0	14.02	0	0	0	0	0	Calculated
2862	3163	Pipe	RCP	M-1097	M-1096	43.75	5100.8	5098.9	4.34	15	0.015	0	11.67	0	0	0	0	0	Calculated
2863	3164	Pipe	RCP	M-1096	M-1098	155.4	5098.8	5087.9	7.01	15	0.015	0	14.83	0	0	0	0	0	Calculated
2864	3165	Pipe	RCP	M-1098	M-1099	61.6	5087.8	5081.9	9.58	15	0.015	0	17.33	0	0	0	0	0	Calculated
2865	3166	Pipe	RCP	M-1099	I-1944	93.9	5081.8	5074.7	7.56	15	0.015	0	15.42	0	0	0	0	0	Calculated
2866	3167	Pipe	RCP	I-1944	I-1943	24.19	5074.6	5074.5	0.41	15	0.015	0	3.6	0	0	0	0	0	Calculated
2867	3168	Pipe	RCP	I-1943	I-1945	45.6	5074.5	5074.3	0.44	15	0.015	0	3.71	0	0	0	0	0	Calculated
2868	3169	Pipe	RCP	I-1946	M-1100	22.47	5074.4	5073.4	4.45	15	0.015	0	11.81	0	0	0.25	0.2	0	Calculated
2869	3170	Pipe	RCP	M-1114	M-1115	137.71	5142.5	5134.7	5.66	15	0.015	0	13.32	0	0	0	0	0	Calculated
2870	3171	Pipe	RCP Combined with 3173, no manhole present in inventory, because they are the same size they were	M-1100	New-11	114.55	5073.35	5046	23.88	18	0.015	10.38	44.48	0.23	21.23	0.48	0.32	0	Calculated
2871	3172	Pipe	combined	New-11	M-1369	104.88	5046	5011.2	33.18	24	0.015	10.38	112.94	0.09	14.84	0.54	0.27	0	Calculated
2872	3173	Pipe	RCP	M-1369	M-1368	24.91	5011.2	5007.8	13.65	24	0.015	10.37	72.43	0.14	13.08	0.59	0.3	0	Calculated
2873	3174	Pipe	RCP	M-1368	M-1367	25.95	5001.3	4994	28.13	24	0.015	10.37	103.99	0.1	17.58	0.48	0.24	0	Calculated
2874	3175	Pipe	RCP	M-1367	DET_79	59.29	4989	4988.6	0.67	24	0.015	15.54	16.1	0.97	5.82	2	1	138	SURCHARGED
2875	3177	Pipe	HDPE	I-2277	M-1366	173.83	4979.7	4963.3	9.43	36	0.015	5.49	177.55	0.03	11.08	0.37	0.12	0	Calculated
2876	3178	Pipe	HDPE	M-1366	I-1707	135.81	4960.9	4955.1	4.27	15	0.015	5.49	11.56	0.48	9.43	0.69	0.55	0	Calculated
2877	3179	Pipe	RCP	M-1370	DET_79	340.86	4994.22	4988.1	1.8	24	0.015	10.03	25.18	0.4	4.15	1.43	0.72	0	Calculated
2878	3180	Pipe	RCP	I-1958	M-1095	250.51	5080.7	5036.8	17.52	15	0.015	0	23.44	0	0	0	0	0	Calculated
2879	3181	Pipe	RCP	M-1095	I-1942	165.99	5036	5018.6	10.48	15	0.015	0	18.13	0	0	0	0	0	Calculated
2880	3182	Pipe	RCP	I-1942	I-1941	26.91	5019.4	5018.3	4.09	15	0.015	0	11.32	0	0	0	0	0	Calculated
2881	3183	Pipe	RCP	I-1941	M-1093	49.05	5018.2	5014	8.56	15	0.015	0	16.38	0	0	0.6	0.5	0	Calculated
2882	3184	Pipe	RCP	I-1965	I-1964	123.46	5121.2	5113.4	6.32	15	0.015	0	14.07	0	0	0	0	0	Calculated
2883	3185	Pipe	RCP	I-1964	M-1116	45.86	5113.4	5111.1	5.02	15	0.015	0	12.54	0	0	0	0	0	Calculated
2884	3186	Pipe	RCP	M-1116	M-1117	85.44	5111.1	5108.5	3.04	15	0.015	0	9.77	0	0	0	0	0	Calculated
2885	3187	Pipe	RCP	M-1117	M-1118	189.48	5108.5	5102.1	3.38	15	0.015	0	10.29	0	0	0	0	0	Calculated
2886	3188	Pipe	RCP	M-1118	M-1119	90.88	5102.1	5096.9	5.72	15	0.015	0	13.39	0	0	0	0	0	Calculated
2887	3189	Pipe	RCP	M-1119	I-1966	104.97	5096.9	5087.9	8.57	15	0.015	0	16.39	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2888	3190	Pipe	RCP	I-1955	M-1106	40.79	5135.3	5134	3.19	15	0.015	0	9.99	0	0	0	0	0	Calculated
2889	3191	Pipe	RCP	M-1106	M-1107	82.48	5133.9	5130.9	3.64	15	0.015	0	10.68	0	0	0	0	0	Calculated
2890	3192	Pipe	RCP	M-1107	M-1108	67.54	5130.8	5130.6	0.3	15	0.015	0	3.05	0	0	0	0	0	Calculated
2891	3193	Pipe	RCP	I-1956	M-1108	18.52	5130.7	5130.6	0.54	15	0.015	0	4.11	0	0	0	0	0	Calculated
2892	3194	Pipe	RCP	M-1108	M-1109	231.37	5130.6	5119.8	4.67	15	0.015	0	12.1	0	0	0	0	0	Calculated
2893	3195	Pipe	RCP	M-1109	I-1957	84.42	5119.8	5111.8	9.48	15	0.015	0	17.23	0	0	0	0	0	Calculated
2894	3196	Pipe	RCP	I-1957	M-1110	208.45	5111.7	5089.2	10.79	15	0.015	0	18.39	0	0	0	0	0	Calculated
2895	3197	Pipe	RCP	M-1110	I-1967	83.43	5089.1	5084.3	5.75	15	0.015	0	13.43	0	0	0	0	0	Calculated
2896	3198	Pipe	RCP	I-1968	I-1967	25.06	5084.7	5084.3	1.6	15	0.015	0	7.07	0	0	0	0	0	Calculated
2897	3199	Pipe	RCP	I-1966	I-1967	43.09	5087.9	5084.3	8.35	15	0.015	0	16.18	0	0	0	0	0	Calculated
2898	3200	Pipe	RCP	I-1938	M-1087	12.96	5084.3	5083.1	9.26	15	0.015	0	17.04	0	0	0	0	0	Calculated
2899	3201	Pipe	RCP	I-1967	M-1087	46.32	5084.4	5083.1	2.81	15	0.015	0	9.38	0	0	0	0	0	Calculated
2900	3202	Pipe	RCP	M-1087	M-1088	129.58	5083	5068.6	11.11	15	0.015	0	18.7	0	0	0	0	0	Calculated
2901	3203	Pipe	RCP	M-1088	M-1089	108.3	5068.5	5060.4	7.48	15	0.015	0	15.31	0	0	0	0	0	Calculated
2902	3204	Pipe	RCP	M-1089	M-1090	289.2	5060.4	5041	6.71	18	0.015	0	23.58	0	0	0	0	0	Calculated
2903	3205	Pipe	RCP	M-1090	M-1091	149.38	5041.1	5023.6	11.72	18	0.015	0	31.16	0	0	0.29	0.19	0	Calculated
2904	3206	Pipe	RCP	M-1091	M-1092	66.08	5023.5	5016.6	10.44	18	0.015	10.22	29.42	0.35	11.9	0.73	0.49	0	Calculated
2905	3207	Pipe	RCP	I-1939	M-1092	12.74	5018.3	5016.5	14.13	15	0.015	0	21.04	0	0	0.44	0.36	0	Calculated
2906	3208	Pipe	RCP	M-1092	M-1093	52.23	5016.4	5014	4.6	18	0.015	10.21	19.76	0.52	7.57	1.07	0.72	0	Calculated
2907	3209	Pipe	RCP	M-1093	I-1940	112.16	5013.9	5012.2	1.52	18	0.015	10.08	11.21	0.9	6.53	1.2	0.82	0	Calculated
2908	3210	Pipe	HDPE	I-2176	I-2175	72.55	5007.4	5003.9	4.82	15	0.015	0	12.3	0	0	0	0	0	Calculated
2909	3211	Pipe	HDPE	I-2175	M-1270	213.69	5003.8	4985.6	8.52	15	0.015	0	16.34	0	0	0.29	0.23	0	Calculated
2910	3212	Pipe	RCP	I-2179	M-1270	49.39	4992.8	4987.3	11.14	15	0.015	0	18.68	0	0	0	0	0	Calculated
2911	3213	Pipe	HDPE	M-1270	M-1271	194.82	4985.6	4966.8	9.65	15	0.015	7.7	17.39	0.44	8.83	0.92	0.73	0	Calculated
2912	3214	Pipe	HDPE	M-1271	I-2181	137.54	4966.7	4964.5	1.6	15	0.015	7.78	7.08	1.1	6.49	1.17	0.94	0	> CAPACITY
2913	3216	Pipe	HDPE	I-2181	I-2180	42.12	4964.4	4963.4	2.37	18	0.015	7.71	14.03	0.55	6.95	0.9	0.6	0	Calculated
2914	3217	Pipe	HDPE	I-2180	O-234	41.01	4963.2	4960	7.8	18	0.015	7.72	25.43	0.3	12.58	0.56	0.38	0	Calculated
2915	3219	Pipe	HDPE	I-2182	M-1274	192.16	4956	4934.2	11.34	15	0.015	5.69	14.05	0.4	11	0.54	0.44	0	Calculated
2916	3220	Pipe	HDPE	M-1274	M-932	193.18	4943.9	4923.5	10.56	15	0.015	5.69	18.19	0.31	12.73	0.49	0.39	0	Calculated
2917	3221	Pipe	RCP	I-2177	I-2178	27.05	4981.5	4979.7	6.65	15	0.015	0	14.44	0	0	0	0	0	Calculated
2918	3222	Pipe	HDPE	I-2178	M-1433	160.18	4979.6	4956	14.73	15	0.015	0	21.49	0	0	0	0	0	Calculated
2919	3223	Pipe	RCP	M-1433	M-1272	136.24	4956	4937.5	13.58	24	0.015	0	72.25	0	0	0	0	0	Calculated
2920	3224	Pipe	RCP	M-1272	M-1273	85.02	4933.6	4930.6	3.53	24	0.015	0	36.83	0	0	0	0	0	Calculated
2921	3225	Pipe	HDPE	M-1273	M-930	233.78	4930.3	4906.3	10.27	15	0.015	0	17.94	0	0	0.25	0.2	0	Calculated
2922	3226	Pipe	PVC	I-2406	I-2405	6.7	6102	6097.1	73.13	12	0.015	0	26.41	0	0	0	0	0	Calculated
2923	3227	Pipe	RCP	I-2405	I-2407	269.85	6097	6073.4	8.75	15	0.015	0	16.57	0	0	0	0	0	Calculated
2924	3228	Pipe	RCP	I-2407	M-1421	71.15	6073.2	6069.1	5.76	15	0.015	0	13.44	0	0	0	0	0	Calculated
2925	3229	Pipe	RCP	I-2408	M-1421	25.33	6070.9	6069	7.5	15	0.015	0	15.33	0	0	0	0	0	Calculated
2926	3230	Pipe	RCP	M-1421	M-1422	113.44	6068.9	6060.5	7.4	15	0.015	0	15.23	0	0	0	0	0	Calculated
2927	3231	Pipe	RCP	M-1422	M-1423	103.34	6060.4	6057.9	2.42	15	0.015	0	8.71	0	0	0	0	0	Calculated
2928	3232	Pipe	RCP	M-1423	I-2409	105.9	6057.8	6050.9	6.52	15	0.015	0	14.25	0	0	0	0	0	Calculated
2929	3233	Pipe	RCP	I-2409	I-2410	58.19	6058.2	6049.9	14.26	18	0.015	0	34.38	0	0	0.31	0.22	0	Calculated
2930	3234	Pipe	RCP	I-2410	M-1424	169.55	6049.4	6049.3	0.06	24	0.015	0.37	4.76	0.08	0.56	1.18	0.6	0	Calculated
2931	3235	Pipe	RCP	I-2404	I-2393	215.15	6122.9	6080.5	19.71	18	0.015	9.61	40.41	0.24	18.23	0.51	0.34	0	Calculated
2932	3237	Pipe	RCP	M-1420	I-2404	307.51	6140.3	6123	5.63	18	0.015	9.61	21.59	0.45	11.53	0.71	0.48	0	Calculated
2933	3238	Pipe	RCP	M-1333	I-2240	206.98	6235.5	6213	10.87	24	0.015	0	64.64	0	0	0.04	0.02	0	Calculated
2934	3239	Pipe	RCP	I-2068	M-1202	38.04	6258.5	6255.9	6.83	12	0.015	0	8.15	0	0	0	0	0	Calculated
2935	3240	Pipe	RCP	I-2069	M-1202	48.68	6257.8	6252.9	10.07	12	0.015	0	9.84	0	0	0	0	0	Calculated
2936	3241	Pipe	RCP	M-1202	M-1201	208.68	6252.6	6226.4	12.56	15	0.015	0	19.85	0	0	0	0	0	Calculated
2937	3242	Pipe	RCP	I-2075	M-1199	226.25	6232.8	6225.6	3.18	12	0.015	0	5.52	0	0	0	0	0	Calculated
2938	3243	Pipe	RCP	M-1199	I-2067	21.44	6225.5	6221.5	18.66	15	0.015	0	24.24	0	0	0	0	0	Calculated
2939	3244	Pipe	RCP	M-1201	I-2067	62.97	6226.3	6221.9	6.99	15	0.015	0	14.8	0	0	0	0	0	Calculated
2940	3245	Pipe	RCP	I-2067	M-1200	142.95	6221.4	6217.9	2.45	15	0.015	0	8.79	0	0	0	0	0	Calculated
2941	3246	Pipe	RCP	M-1200	I-2241	58.51	6217.8	6213	8.2	15	0.015	0	16.07	0	0	0.04	0.03	0	Calculated
2942	3247	Pipe	RCP	I-2241	I-2240	35.26	6212.9	6212.5	1.13	15	0.015	0.03	5.96	0.01	0.16	0.37	0.3	0	Calculated
2943	3248	Pipe	RCP	I-2240	M-1334	151.14	0	6198.3	-4101.03	24	0.015	12.67	59.88	0.21	14.34	0.65	0.32	0	Calculated
2944	3249	Pipe	RCP	M-1334	I-2242	252.7	6196.9	6156.9	15.83	24	0.015	12.66	78.04	0.16	17.77	0.55	0.28	0	Calculated
2945	3253	Pipe	HDPE	M-1336	M-1335	53.78	6173.5	6171	4.65	12	0.015	0	6.66	0	0	0	0	0	Calculated
2946	3255	Pipe	HDPE	M-1335	I-2243	17.62	6171	6170.4	3.41	12	0.015	0	5.7	0	0	0	0	0	Calculated
2947	3256	Pipe	RCP	I-2243	I-2242	32.91	6166.9	6156.8	30.69	15	0.015	0	31.01	0	0	0.21	0.18	0	Calculated
2948	3257	Pipe	RCP	I-2242	I-2244	302.07	6156.6	6127.4	9.67	24	0.015	12.64	60.96	0.21	14.9	0.61	0.32	0	Calculated
2949	3259	Pipe	HDPE	I-2244	M-1337	60.73	6127.3	6116.6	17.62	24	0.015	12.64	82.33	0.15	9.29	0.88	0.45	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
2950	3260	Pipe	RCP	I-2245	M-1337	27.22	6123.8	6116.9	25.35	15	0.015	0	28.19	0	0	0.47	0.39	0	Calculated
2951	3261	Pipe	RCO	M-1337	M-1338	28.36	6116.4	6115.9	1.76	24	0.015	14.44	26.55	0.54	7.01	1.23	0.62	0	Calculated
2952	3262	Pipe	RCP	I-2246	M-1338	19.35	6127.4	6117.6	50.65	15	0.015	0	39.88	0	0	0	0	0	Calculated
2953	3263	Pipe	RCP	M-1338	I-2247	114.18	6115.5	6107.5	7.01	24	0.015	14.44	51.9	0.28	13.05	0.76	0.38	0	Calculated
2954	3264	Pipe	RCP	I-2247	M-1339	173.12	6107.1	6087.5	11.32	21	0.015	14.44	46.21	0.31	15.88	0.7	0.4	0	Calculated
2955	3265	Pipe	RCP	I-2248	M-1339	38.73	6093.9	6088.2	14.72	15	0.015	0	21.48	0	0	0	0	0	Calculated
2956	3267	Pipe	RCP	I-2249	M-1339	34.64	6092.5	6087.7	13.86	15	0.015	0	20.84	0	0	0.24	0.2	0	Calculated
2957	3268	Pipe	RCP	M-1339	M-1340	115.24	6087.3	6080.3	6.07	24	0.015	14.44	48.42	0.3	12.83	0.77	0.39	0	Calculated
2958	3269	Pipe	RCP	M-1340	M-1341	119.56	6080.3	6067.5	10.71	24	0.015	14.44	64.18	0.23	14.52	0.7	0.35	0	Calculated
2959	3270	Pipe	RCP	M-1341	M-1342	162.48	6067.3	6061.1	3.82	24	0.015	14.44	38.45	0.38	8.57	1.06	0.54	0	Calculated
2960	3271	Pipe	RCP	I-2251	M-1342	38.23	6063.9	6061.2	7.06	15	0.015	0	14.88	0	0	0.58	0.48	0	Calculated
2961	3272	Pipe	RCP	I-2250	M-1342	59.65	6071	6052.9	30.34	15	0.015	0	23.07	0	0	0.63	0.5	0	Calculated
2962	3273	Pipe	RCP	M-1342	M-1343	146.22	6060.9	6056.8	2.8	24	0.015	24.24	32.83	0.74	9.37	1.51	0.77	0	Calculated
2963	3274	Pipe	RCP	I-2414	I-2411	28.95	6057.7	6056.5	4.15	15	0.015	0	11.4	0	0	0	0	0	Calculated
2964	3275	Pipe	RCP	I-2411	M-1428	35.58	6056.2	6054.8	3.93	30	0.015	0	70.51	0	0	0.44	0.18	0	Calculated
2965	3276	Pipe	RCP	M-1343	M-1428	140.87	6056.8	6054.7	1.49	30	0.015	24.23	43.4	0.56	8.18	1.43	0.58	0	Calculated
2966	3277	Pipe	RCP	I-2413	I-2412	27.21	6060.1	6059.5	2.21	6	0.015	0	0.72	0	0	0	0	0	Calculated
2967	3279	Pipe	RCP	I-2412	M-1428	24.44	6059.2	6054.8	18	15	0.015	0	23.75	0	0	0.44	0.36	0	Calculated
2968	3280	Pipe	RCP	M-1428	M-1424	102.15	6054.6	6049.3	5.19	30	0.015	24.24	81.28	0.3	11.08	1.14	0.46	0	Calculated
2969	3281	Pipe	RCP	M-1424	M-1425	133.97	6049.1	6046.4	2.02	30	0.015	24.15	50.56	0.48	9.14	1.31	0.53	0	Calculated
2970	3282	Pipe	RCP	M-1425	M-1426	122.46	6046.3	6027.9	15.03	30	0.015	24.15	137.79	0.18	19.5	0.74	0.3	0	Calculated
2971	3283	Pipe	RCP	M-1426	M-1427	172.29	6027.6	6009.5	10.51	30	0.015	24.15	115.22	0.21	17.45	0.81	0.33	0	Calculated
2972	3284	Pipe	RCP	M-1427	O-247	153.61	6001.7	5975.8	16.86	30	0.015	24.15	145.97	0.17	20.68	0.71	0.29	0	Calculated
2973	3285	Pipe	RCP	I-2403	I-2402	21.7	6020	6020.1	-0.46	12	0.015	0	2.1	0	0	0	0	0	Calculated
2974	3286	Pipe	RCP	I-2402	I-2401	75.28	6017.2	6011.6	7.44	15	0.015	0	15.2	0	0	0	0	0	Calculated
2975	3287	Pipe	RCP	I-2401	I-2397	84.27	6011.5	6008.8	3.2	15	0.015	0	10.3	0	0	0.14	0.12	0	Calculated
2976	3288	Pipe	RCP	I-2397	I-2398	38.26	6008.7	6006.6	5.49	15	0.015	2.17	13.12	0.17	7.21	0.37	0.29	0	Calculated
2977	3289	Pipe	RCP	I-2398	O-246	259.85	6006.5	5962.8	16.82	15	0.015	2.16	22.96	0.09	15.2	0.22	0.17	0	Calculated
2978	3290	Pipe	RCP	I-2392	I-2393	34.42	6083.6	6082.3	3.78	15	0.015	0	10.88	0	0	0	0	0	Calculated
2979	3291	Pipe	RCP	I-2393	M-1418	152.79	6077.2	6062.9	9.36	18	0.015	9.61	27.85	0.35	13.63	0.63	0.42	0	Calculated
2980	3292	Pipe	RCP	M-1418	I-2394	200.38	6061	6042	9.48	18	0.015	9.61	28.14	0.34	12.95	0.65	0.44	0	Calculated
2981	3294	Pipe	RCP	M-1419	I-2395	42.78	6036.9	6036.2	1.64	18	0.015	0	11.65	0	0	0	0	0	Calculated
2982	3295	Pipe	RCP	I-2394	I-2395	79.13	6042	6036.2	7.33	21	0.015	9.61	37.18	0.26	11.83	0.65	0.37	0	Calculated
2983	3296	Pipe	RCP	I-2395	I-2396	326.08	6035.3	6011.4	7.33	21	0.015	9.61	37.17	0.26	10.41	0.73	0.42	0	Calculated
2984	3297	Pipe	RCP	I-2396	M-1216	322.21	6011.6	5959.3	16.23	21	0.015	16.67	55.33	0.3	19.6	0.67	0.38	0	Calculated
2985	3298	Pipe	RCP	I-2094	M-1211	194.21	6105.5	6102.8	1.39	15	0.015	0	6.64	0	0	0	0	0	Calculated
2986	3299	Pipe	RCP	M-1211	M-1212	356.92	6102.7	6099.4	0.92	15	0.015	0	5.41	0	0	0	0	0	Calculated
2987	3300	Pipe	RCP	M-1212	M-1213	108.04	6099.3	6098.3	0.93	15	0.015	0	5.39	0	0	0	0	0	Calculated
2988	3303	Pipe	RCP	M-1213	M-1214	255.88	6098.2	6058	15.71	15	0.015	0	22.19	0	0	0	0	0	Calculated
2989	3304	Pipe	RCP	I-2433	M-1214	21	6070	6066.2	18.1	15	0.015	0	23.82	0	0	0	0	0	Calculated
2990	3305	Pipe	RCP	M-1214	M-1215	132.64	6057.8	6027.4	22.92	15	0.015	0	26.82	0	0	0	0	0	Calculated
2991	3306	Pipe	HDPE	M-1215	M-1216	303.37	6027.4	5959.3	22.45	15	0.015	0	26.53	0	0	0	0	0	Calculated
2992	3307	Pipe	RCP	M-1216	M-1217	63.22	5955.2	5950.1	8.07	21	0.015	16.67	39	0.43	13.43	0.89	0.51	0	Calculated
2993	3308	Pipe	RCP	M-1217	M-1218	208.67	5946.1	5896.9	23.58	21	0.015	16.67	66.68	0.25	22.22	0.61	0.35	0	Calculated
2994	3309	Pipe	RCP	M-1218	O-225	52.53	5896.5	5888.9	14.47	21	0.015	16.67	52.16	0.32	18.24	0.7	0.41	0	Calculated
2995	3310	Pipe	RCP	I-2070	M-1203	43.37	6273.9	6269.6	9.91	12	0.015	0	9.71	0	0	0	0	0	Calculated
2996	3311	Pipe	RCP	M-1203	I-2072	247.41	6269.6	6251.2	7.44	15	0.015	0	15.27	0	0	0.25	0.21	0	Calculated
2997	3312	Pipe	RCP	I-2071	I-2072	27.67	6253.1	6251.5	5.78	15	0.015	0	13.46	0	0	0.1	0.09	0	Calculated
2998	3313	Pipe	RCP	I-2072	I-2073	56.33	6251.1	6250.5	1.07	15	0.015	0.21	5.78	0.04	0.31	0.9	0.74	0	Calculated
2999	3314	Pipe	RCP	I-2073	I-2074	18.22	6250.4	6250	2.2	15	0.015	5.91	8.4	0.7	4.89	1.19	0.96	0	Calculated
3000	3315	Pipe	RCP	I-2074	New-16	119.25	6250	6248	1.68	15	0.015	5.91	7.25	0.82	7.87	0.74	0.6	0	Calculated
3001	3316	Pipe	RCP	New-16	M-1204	84.12	6248	6216.3	37.68	18	0.015	5.91	55.89	0.11	19.67	0.34	0.23	0	Calculated
3002	3317	Pipe	RCP	M-1204	I-2088	141.9	6211.7	6177.5	24.1	18	0.015	5.91	44.72	0.13	17.03	0.37	0.25	0	Calculated
3003	3318	Pipe	RCP	I-2088	M-1210	443.34	6177.3	6155.6	4.89	18	0.015	5.91	20.14	0.29	6.41	0.79	0.53	0	Calculated
3004	3319	Pipe	RCP	M-1210	I-2089	147.93	6155.5	6154.5	0.68	18	0.015	5.88	7.49	0.79	4.54	1.03	0.69	0	Calculated
3005	3320	Pipe	RCP	I-2089	M-1420	67.41	6154.3	6140.4	20.62	18	0.015	5.88	41.34	0.14	11.53	0.5	0.34	0	Calculated
3006	3321	Pipe	RCP	I-2090	I-2091	24.69	6149.7	6147	10.94	12	0.015	0	10.21	0	0	0	0	0	Calculated
3007	3322	Pipe	RCP	I-2091	M-1420	42.51	6146.8	6140.4	15.06	15	0.015	0	21.72	0	0	0.31	0.25	0	Calculated
3008	3323	Pipe	RCP	I-2084	M-1209	56.97	6275.4	6273.7	2.98	15	0.015	0	9.76	0	0	0	0	0	Calculated
3009	3324	Pipe	RCP	M-1209	I-2078	211.46	6273.6	6262.4	5.3	15	0.015	0	12.91	0	0	0	0	0	Calculated
3010	3325	Pipe	RCP	I-2077	I-2078	35.33	6263.4	6262.3	3.11	12	0.015	0	5.5	0	0	0	0	0	Calculated
3011	3326	Pipe	RCP	I-2078	M-1205	43.24	6262.2	6258.9	7.63	15	0.015	0	15.47	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3012	3327	Pipe	RCP	M-1205	I-2076	70.87	6252.4	6252.2	0.28	15	0.015	5.96	3.33	1.79	4.85	1.25	1	5	SURCHARGED
3013	3328	Pipe	RCP	I-2076	I-2073	139.31	6252.1	6250.6	1.08	15	0.015	5.96	5.81	1.03	5	1.18	0.95	0	> CAPACITY
3014	3329	Pipe	RCP	I-2079	M-1205	35.79	6253.5	6252.6	2.51	15	0.015	0.36	8.93	0.04	0.34	1.2	0.98	0	Calculated
3015	3330	Pipe	RCP	M-1206	I-2079	220.12	6255	6253.6	0.64	15	0.015	0	4.46	0	0	0.53	0.44	0	Calculated
3016	3331	Pipe	RCP	I-2080	M-1206	229.45	6255.3	6255.1	0.09	15	0.015	0	1.65	0	0	0	0	0	Calculated
3017	3332	Pipe	RCP	M-1207	I-2080	52.01	6255.5	6255.4	0.19	15	0.015	0	2.9	0	0	0	0	0	Calculated
3018	3333	Pipe	RCP	I-2081	M-1207	39.73	6259.5	6258	3.78	12	0.015	0	6	0	0	0	0	0	Calculated
3019	3334	Pipe	RCP	I-2082	M-1208	12.75	6267.5	6263.6	30.59	12	0.015	0	17.12	0	0	0	0	0	Calculated
3020	3335	Pipe	RCP	M-1208	M-1207	252.87	6263.6	6256	3.01	15	0.015	0	9.71	0	0	0	0	0	Calculated
3021	3336	Pipe	RCP	I-2085	I-2086	23.93	6267.3	6265.8	6.27	12	0.015	0	7.73	0	0	0	0	0	Calculated
3022	3337	Pipe	RCP	I-2086	I-2083	157.84	6265.7	6264.1	1.01	12	0.015	0	3.11	0	0	0	0	0	Calculated
3023	3338	Pipe	RCP	I-2083	M-1208	83.8	6264	6263.7	0.36	15	0.015	0	3.35	0	0	0	0	0	Calculated
3024	3339	Pipe	RCP	I-2434	I-2216	29.36	5063	5061.3	5.79	15	0.015	0	13.47	0	0	0	0	0	Calculated
3025	3340	Pipe	RCP	I-2216	I-2217	60.81	5061.2	5058.3	4.77	15	0.015	0	12.23	0	0	0	0	0	Calculated
3026	3341	Pipe	RCP	I-2217	M-1310	264.11	5058.2	5036.6	8.18	15	0.015	0	16.01	0	0	0	0	0	Calculated
3027	3342	Pipe	RCP	I-2218	I-2219	29.25	5038.7	5038.2	1.71	15	0.015	0	7.32	0	0	0	0	0	Calculated
3028	3343	Pipe	RCP	I-2219	M-1310	37.59	5038	5036.7	3.46	15	0.015	0	10.41	0	0	0	0	0	Calculated
3029	3344	Pipe	RCP	M-1310	M-1311	150.2	5036.5	5028.5	5.33	15	0.015	0	12.92	0	0	0	0	0	Calculated
3030	3345	Pipe	RCP	M-1312	M-1311	29.19	5030.5	5029	5.14	15	0.015	0	12.69	0	0	0	0	0	Calculated
3031	3346	Pipe	RCP	M-1311	M-1313	134.41	5028.4	5017.4	8.18	15	0.015	0	16.02	0	0	0.49	0.4	0	Calculated
3032	3347	Pipe	RCP	I-2220	M-1313	20.11	5018.2	5017.5	3.48	15	0.015	0.03	10.45	0	0.07	0.53	0.45	0	Calculated
3033	3348	Pipe	RCP	I-2222	I-2221	24.07	5018.8	5018.5	1.25	15	0.015	0	6.25	0	0	0	0	0	Calculated
3034	3349	Pipe	RCP	I-2221	M-1313	35.22	5018.4	5017.5	2.56	15	0.015	0.01	8.95	0	0.03	0.44	0.37	0	Calculated
3035	3350	Pipe	RCP	M-1313	M-1314	167.71	5017	5009.5	4.47	18	0.015	17.78	19.25	0.92	11.31	1.26	0.85	0	Calculated
3036	3352	Pipe	RCP	M-1315	M-1314	19.9	5011.7	5010	8.54	15	0.015	0	16.41	0	0	0.24	0.19	0	Calculated
3037	3353	Pipe	RCP	M-1314	M-1316	123.12	5009.4	5003	5.2	21	0.015	17.79	31.31	0.57	12	1.04	0.6	0	Calculated
3038	3354	Pipe	RCP	I-2223	I-2224	26.42	5005	5004.5	1.89	15	0.015	0	7.7	0	0	0	0	0	Calculated
3039	3355	Pipe	RCP	I-2224	M-1316	38.57	5004.4	5003	3.63	15	0.015	0	10.67	0	0	0.5	0.41	0	Calculated
3040	3356	Pipe	RCP	M-1316	M-1317	212.56	5002.8	4996.3	3.06	21	0.015	17.77	24.01	0.74	8.16	1.48	0.85	0	Calculated
3041	3357	Pipe	RCP	M-1318	M-1317	39.62	5003.5	4996.5	17.67	15	0.015	0	23.53	0	0	0.63	0.5	0	Calculated
3042	3358	Pipe	RCP	M-1317	I-2225	19.2	4995.8	4995.7	0.52	21	0.015	17.77	9.91	1.79	7.58	1.64	0.94	0	> CAPACITY
3043	3359	Pipe	RCP	I-2225	DET_74	195.27	4995.6	4957	19.77	21	0.015	17.77	61.06	0.29	17.91	1.18	0.68	0	Calculated
3044	3361	Pipe	RCP	M-1321	M-1321	19.3	4954.4	4954.1	1.55	15	0.015	10.29	6.98	1.47	8.44	1.22	0.97	0	> CAPACITY
3045	3362	Pipe	HDPE	I-2151	M-1321	245.56	4985.3	4953	13.15	15	0.015	9.21	20.3	0.45	9.51	0.92	0.74	0	Calculated
3046	3363	Pipe	RCP	M-1321	I-2302	738.33	4954.3	4851	13.99	15	0.015	19.44	20.94	0.93	18.15	1.02	0.82	0	Calculated
3047	3365	Pipe	RCP	I-2226	M-1322	20.41	5015	5010.4	22.54	15	0.015	9.21	26.58	0.35	11.59	1	0.8	0	Calculated
3048	3367	Pipe	RCP	M-1322	M-1326	190.82	5006.6	4992.7	7.28	18	0.015	9.21	18.99	0.48	5.21	1.5	1	188	SURCHARGED
3049	3368	Pipe	RCP	M-1326	I-2230	50.34	5010.3	4995.5	29.4	18	0.015	9.21	49.36	0.19	8.05	0.97	0.65	0	Calculated
3050	3370	Pipe	RCP	I-2232	I-2231	40.19	4999.1	4999	0.25	18	0.015	0	4.54	0	0	0	0	0	Calculated
3051	3371	Pipe	RCP	I-2231	I-2230	25	4998.8	4995.5	13.2	18	0.015	0	33.08	0	0	0.75	0.5	0	Calculated
3052	3372	Pipe	RCP	I-2230	M-1262	56.49	4997	4995.4	2.83	18	0.015	9.21	15.32	0.6	7.88	0.94	0.63	0	Calculated
3053	3373	Pipe	RCP	M-1262	I-2151	80.54	4993	4970.4	28.06	18	0.015	9.21	48.22	0.19	10.1	1.02	0.68	0	Calculated
3054	3374	Pipe	RCP	I-2152	I-2151	29.07	4987	4970.5	56.76	15	0.015	0	42.18	0	0	0.63	0.5	0	Calculated
3055	3376	Pipe	RCP	I-2154	I-2153	20.41	4976.7	4976.2	2.45	15	0.015	0	8.76	0	0	0	0	0	Calculated
3056	3377	Pipe	RCP	I-2153	M-1263	30.27	4975.9	4975	2.97	15	0.015	0	9.65	0	0	0	0	0	Calculated
3057	3378	Pipe	RCP	I-2159	I-2158	21.14	5012.5	5009.6	13.72	15	0.015	0	20.74	0	0	0	0	0	Calculated
3058	3379	Pipe	RCP	I-2158	M-1264	179.85	5008.5	4989.8	10.4	15	0.015	0	18.05	0	0	0	0	0	Calculated
3059	3380	Pipe	RCP	M-1264	I-2157	97.92	4989.7	4982.1	7.76	15	0.015	0	15.6	0	0	0	0	0	Calculated
3060	3381	Pipe	RCP	I-2157	I-2155	88.3	4982	4977	5.66	15	0.015	0	13.32	0	0	0	0	0	Calculated
3061	3382	Pipe	RCP	I-2156	I-2155	21.27	4978	4977	4.7	15	0.015	0	12.14	0	0	0	0	0	Calculated
3062	3383	Pipe	RCP	I-2155	M-1263	27.64	4977	4975	7.24	15	0.015	0	15.06	0	0	0	0	0	Calculated
3063	3384	Pipe	RCP	M-1263	I-2162	244.31	4974.5	4956.1	7.53	15	0.015	0	15.36	0	0	0	0	0	Calculated
3064	3385	Pipe	RCP	I-2160	I-2161	228.93	4992.2	4969	10.13	15	0.015	0	17.82	0	0	0	0	0	Calculated
3065	3386	Pipe	RCP	I-2161	M-1265	127.9	4968.9	4957.6	8.84	15	0.015	0	16.64	0	0	0	0	0	Calculated
3066	3387	Pipe	RCP	M-1265	I-2163	77.31	4957.5	4952.7	6.21	15	0.015	0	13.95	0	0	0	0	0	Calculated
3067	3388	Pipe	RCP	I-2164	I-2163	21.68	4954.9	4952.6	10.61	15	0.015	0	18.23	0	0	0	0	0	Calculated
3068	3389	Pipe	RCP	I-2162	M-1266	56.79	4956	4951.7	7.57	15	0.015	0	15.41	0	0	0.19	0.15	0	Calculated
3069	3390	Pipe	RCP	I-2163	M-1266	32.15	4952.3	4951.9	1.24	15	0.015	0	6.24	0	0	0.09	0.07	0	Calculated
3070	3391	Pipe	RCP	M-1266	M-1267	83.85	4951.3	4944	8.71	18	0.015	11.4	26.86	0.42	13.25	0.73	0.49	0	Calculated
3071	3392	Pipe	RCP	M-1267	I-2165	73.52	4943.8	4933.6	13.87	18	0.015	11.39	33.91	0.34	11.84	1.05	0.7	0	Calculated
3072	3393	Pipe	RCP	I-2167	I-2166	34.63	4937	4935.8	3.47	15	0.015	0	10.42	0	0	0	0	0	Calculated
3073	3394	Pipe	RCP	I-2166	I-2165	35.3	4935.7	4934.4	3.68	15	0.015	0	10.74	0	0	0.4	0.34	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3074	3395	Pipe	RCP	I-2165	I-2168	21.89	4933	4932.9	0.46	18	0.015	11.33	6.15	1.84	6.62	1.39	0.93	0	> CAPACITY
3075	3396	Pipe	RCP	I-2168	DET_77	99.11	4932.8	4928.5	4.34	18	0.015	11.26	15.84	0.71	6.61	1.35	0.93	0	Calculated
3076	3398	Pipe	RCP	I-2169	M-1269	168.55	4924.5	4906.2	10.86	18	0.015	1.21	30	0.04	8.19	0.21	0.14	0	Calculated
3077	3401	Pipe	RCP	I-2173	I-2172	33.18	4928.9	4927.6	3.92	15	0.015	0	11.08	0	0	0	0	0	Calculated
3078	3402	Pipe	RCP	I-2172	M-1269	280.13	4927.5	4910.8	5.96	15	0.015	0	13.67	0	0	0	0	0	Calculated
3079	3403	Pipe	RCP	M-1269	I-2294	67.31	4905.8	4898.7	10.55	24	0.015	1.21	63.68	0.02	3.45	0.34	0.17	0	Calculated
3080	3404	Pipe	RCP	I-2294	M-1377	106.86	4899	4885.8	12.35	24	0.015	1.21	68.91	0.02	7.34	0.2	0.1	0	Calculated
3081	3405	Pipe	RCP	M-1377	I-2293	79.05	4885.8	4881	6.07	24	0.015	1.21	48.31	0.02	6.12	0.44	0.22	0	Calculated
3082	3406	Pipe	RCP	I-2293	I-2292	103.98	4880.9	4877.4	3.37	24	0.015	10.27	35.97	0.29	7.3	0.91	0.46	0	Calculated
3083	3407	Pipe	RCP	I-2292	I-2290	68.96	4877.4	4876.1	1.89	24	0.015	10.27	26.92	0.38	5.44	1.15	0.58	0	Calculated
3084	3408	Pipe	RCP	I-2290	I-2291	25.77	4876.1	4875.8	1.16	24	0.015	10.26	21.15	0.48	5.62	1.12	0.56	0	Calculated
3085	3409	Pipe	RCP	I-2291	M-1376	89.89	4874.4	4867.7	7.45	24	0.015	10.26	53.53	0.19	12.11	0.62	0.31	0	Calculated
3086	3410	Pipe	RCP	M-1376	M-1375	137.78	4845.5	4817.6	20.25	24	0.015	10.25	88.23	0.12	17.98	0.47	0.24	0	Calculated
3087	3411	Pipe	RCP	I-2282	I-2283	125.98	4924.9	4915.3	7.62	15	0.015	0	15.45	0	0	0	0	0	Calculated
3088	3412	Pipe	RCP	I-2283	I-2285	169.6	4915.2	4902.4	7.55	15	0.015	0	15.38	0	0	0	0	0	Calculated
3089	3413	Pipe	CMP	I-2183	I-2284	238.72	4947	4905	17.59	30	0.015	0	149.11	0	0	0	0	0	Calculated
3090	3414	Pipe	CMP	I-2284	I-2285	50.47	4905	4902.4	5.15	30	0.015	0	80.68	0	0	0	0	0	Calculated
3091	3415	Pipe	CMP	I-2285	O-239	70.69	4902.3	4893	13.16	30	0.015	0	128.94	0	0	0	0	0	Calculated
3092	3417	Pipe	RCP	I-2287	I-2288	278.65	4898.5	4884.7	4.95	15	0.015	0	12.46	0	0	0	0	0	Calculated
3093	3418	Pipe	RCP	I-2288	I-2289	323.12	4884.6	4865.5	5.91	15	0.015	0	13.61	0	0	0	0	0	Calculated
3094	3419	Pipe	RCP	I-2289	M-1375	141.23	4864.7	4817.6	33.35	18	0.015	0	52.57	0	0	0.18	0.12	0	Calculated
3095	3420	Pipe	RCP	M-1375	O-114	285.11	4817.5	4773.8	15.33	30	0.015	10.23	139.17	0.07	16.23	0.55	0.23	0	Calculated
3096	3423	Pipe	RCP	I-2171	I-2170	51.69	4909.8	4906.1	7.16	15	0.015	0	14.98	0	0	0	0	0	Calculated
3097	3424	Pipe	RCP	I-2170	M-1382	246.66	4906	4888	7.3	15	0.015	0	15.12	0	0	0	0	0	Calculated
3098	3425	Pipe	RCP	I-2300	M-1382	25.75	4890	4888	7.77	15	0.015	0	17.27	0	0	0	0	0	Calculated
3099	3426	Pipe	RCP	M-1382	I-2301	47.62	4888	4884.4	7.56	15	0.015	0	14.51	0	0	0	0	0	Calculated
3100	3427	Pipe	RCP	I-2301	I-2302	386.72	4884.3	4851	8.61	15	0.015	0	16.55	0	0	0.54	0.44	0	Calculated
3101	3428	Pipe	RCP	I-2302	M-1381	128.7	4851	4841.2	7.61	18	0.015	19.44	25.12	0.77	12.33	1.25	0.84	0	Calculated
3102	3429	Pipe	RCP	I-2299	M-1381	5.28	4842.1	4841.2	17.05	15	0.015	0.07	23.11	0	0.16	0.88	0.71	0	Calculated
3103	3430	Pipe	RCP	I-2298	I-2295	32.24	4841.7	4840.1	4.96	15	0.015	0	12.47	0	0	0	0	0	Calculated
3104	3431	Pipe	RCP	M-1381	I-1615	227.89	4841.7	4826.1	6.85	21	0.015	19.44	35.93	0.54	9.88	1.33	0.76	0	Calculated
3105	3432	Pipe	RCP	I-2295	I-2296	74.37	4840.1	4839.3	1.08	15	0.015	0	5.81	0	0	0	0	0	Calculated
3106	3433	Pipe	RCP	I-2296	M-1378	72.55	4839.2	4838	1.65	15	0.015	0	7.2	0	0	0	0	0	Calculated
3107	3434	Pipe	RCP	I-2297	M-1378	23.16	4841.6	4838	15.54	18	0.015	0	35.89	0	0	0	0	0	Calculated
3108	3436	Pipe	RCP	M-1378	M-1380	248.15	4838	4811.2	10.8	18	0.015	0	29.92	0	0	0	0	0	Calculated
3109	3437	Pipe	RCP	M-1380	M-1379	54.26	4810	4802	14.74	21	0.015	0	52.73	0	0	0	0	0	Calculated
3110	3438	Pipe	RCP	M-1379	O-113	136.11	4801.9	4777.7	17.78	21	0.015	0	57.87	0	0	0	0	0	Calculated
3111	3439	Pipe	HDPE	I-1175	I-1176	30.72	4770.9	4766.1	15.62	12	0.015	0	12.21	0	0	0	0	0	Calculated
3112	3440	Pipe	RCP	I-1176	M-1434	472.59	4757.4	4723	7.28	24	0.015	7.86	54.34	0.14	12.85	0.5	0.25	0	Calculated
3113	3441	Pipe	RCP	M-1434	M-682	205.35	4723	4698.8	11.78	24	0.015	7.85	67.31	0.12	12.04	0.52	0.26	0	Calculated
3114	3444	Pipe	RCP	M-711	M-715	151.68	4735.3	4731	2.83	18	0.015	15.17	15.33	0.99	10.2	1.18	0.78	0	Calculated
3115	3445	Pipe	RCP	M-715	I-1267	143.8	4731	4724.6	4.45	24	0.015	15.17	41.36	0.37	8.25	1.13	0.57	0	Calculated
3116	3446	Pipe	RCP	I-2321	I-2322	105.79	4454.5	4454	0.47	15	0.015	0	3.85	0	0	0	0	0	Calculated
3117	3447	Pipe	RCP	I-2322	M-1390	17.39	4454.1	4452	12.08	15	0.015	0	19.45	0	0	0	0	0	Calculated
3118	3449	Pipe	RCP	M-1391	M-1392	25.07	4450.4	4445	21.54	12	0.015	0	14.33	0	0	0	0	0	Calculated
3119	3450	Pipe	RCP	M-1392	M-1384	72.05	4448.2	4448	0.28	15	0.015	0	2.95	0	0	0	0	0	Calculated
3120	3451	Pipe	HDPE	I-1755	I-1756	39.24	4433.1	4431.6	3.82	18	0.015	3.15	17.5	0.18	2.97	1.5	1	95	SURCHARGED
3121	3452	Pipe	HDPE	I-1756	I-1758	264.37	4431.7	4430.6	0.42	18	0.015	3.51	5.87	0.6	2.33	1.5	1	98	SURCHARGED
3122	3453	Pipe	HDPE	I-1758	M-965	118.18	4430.2	4430.1	0.08	18	0.015	8.53	2.65	3.22	4.83	1.5	1	118	SURCHARGED
3123	3454	Pipe	HDPE	M-965	I-1757	81.55	4430	4429.6	0.49	18	0.015	6.93	6.38	1.09	3.92	1.5	1	121	SURCHARGED
3124	3455	Pipe	HDPE	I-1757	I-2311	50.07	4429.5	4429.2	0.6	18	0.015	6.94	7.05	0.98	3.93	1.5	1	126	SURCHARGED
3125	3456	Pipe	HDPE	I-2311	I-2312	111.1	4429.3	4429.1	0.18	18	0.015	6.93	3.86	1.79	3.92	1.5	1	126	SURCHARGED
3126	3457	Pipe	HDPE	I-2312	I-2313	148.16	4429.2	4429.1	0.07	18	0.015	6.93	2.37	2.93	3.92	1.5	1	118	SURCHARGED
3127	3459	Pipe	RCP	I-2313	I-2314	44.07	4429	4428.7	0.68	15	0.015	6.93	5.33	1.3	5.65	1.25	1	123	SURCHARGED
3128	3460	Pipe	RCP	I-2314	I-2315	264.9	4428.8	4427.9	0.34	18	0.015	6.93	5.31	1.31	3.92	1.5	1	117	SURCHARGED
3129	3461	Pipe	HDPE	I-2372	I-2373	27.53	4409.3	4407.7	5.81	15	0.015	0	13.5	0	0	0	0	0	Calculated
3130	3462	Pipe	HDPE	I-2373	M-1410	107.81	4407.6	4406.6	0.93	15	0.015	0	5.39	0	0	0	0	0	Calculated
3131	3463	Pipe	HDPE	I-2371	M-1410	26.06	4408.2	4406.6	6.14	15	0.015	0	13.96	0	0	0	0	0	Calculated
3132	3464	Pipe	HDPE	M-1410	M-1409	115.78	4406.5	4405.8	0.6	15	0.015	0	4.35	0	0	0	0	0	Calculated
3133	3465	Pipe	HDPE	M-1409	I-2375	314.84	4405.7	4404	0.54	15	0.015	0	4.11	0	0	0.25	0.2	0	Calculated
3134	3466	Pipe	HDPE	I-2374	I-2375	22.55	4407.9	4403.9	17.74	15	0.015	0	23.58	0	0	0.3	0.24	0	Calculated
3135	3467	Pipe	HDPE	I-2375	M-1411	307.68	4403.8	4402	0.59	15	0.015	2.4	4.28	0.56	3.63	0.66	0.53	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3136	3468	Pipe	HDPE	M-1411	M-1412	284.91	4401.9	4399.8	0.74	15	0.015	2.39	4.81	0.5	3.83	0.63	0.51	0	Calculated
3137	3469	Pipe	HDPE	M-1412	I-2377	228.2	4399.7	4387.9	5.17	15	0.015	2.39	12.73	0.19	7.81	0.37	0.3	0	Calculated
3138	3470	Pipe	HDPE	I-2376	I-2377	24.35	4389.4	4387.9	6.16	15	0.015	0	13.9	0	0	0	0	0	Calculated
3139	3471	Pipe	HDPE	I-2377	M-1413	61.79	4387.3	4386.1	1.94	24	0.015	2.39	27.32	0.09	4.99	0.42	0.21	0	Calculated
3140	3472	Pipe	HDPE	I-2378	I-2379	29.8	4387.8	4386.6	4.03	15	0.015	0	10.76	0	0	0	0	0	Calculated
3141	3473	Pipe	HDPE	I-2379	M-1413	18.11	4386.7	4386	3.87	15	0.015	0	11.01	0	0	0.09	0.07	0	Calculated
3142	3474	Pipe	HDPE	M-1413	M-1414	291.96	4385.9	4352	11.61	24	0.015	2.39	66.83	0.04	8.64	0.29	0.14	0	Calculated
3143	3475	Pipe	HDPE	M-1414	O-243	9.46	4352	4351	10.57	36	0.015	2.39	187.94	0.01	7.31	0.28	0.09	0	Calculated
3144	3476	Pipe	HDPE	I-2380	I-2381	23.84	4370.7	4370.6	0.42	15	0.015	0	3.63	0	0	0	0	0	Calculated
3145	3477	Pipe	RCP	I-2381	M-1415	56.81	4370.5	4370.1	0.7	18	0.015	0	7.64	0	0	0	0	0	Calculated
3146	3478	Pipe	HDPE	I-2382	M-1415	54.86	4372.6	4369.5	5.65	12	0.015	0	7.33	0	0	0.18	0.18	0	Calculated
3147	3479	Pipe	HDPE	M-1415	M-1416	287.93	4369.5	4351.9	6.11	24	0.015	3.21	48.49	0.07	8.58	0.35	0.18	0	Calculated
3148	3480	Pipe	HDPE	M-1416	O-244	15.58	4349.5	4350	-3.21	36	0.015	3.21	103.55	0.03	2.15	0.79	0.26	0	Calculated
3149	3481	Pipe	RCP	I-2384	I-2383	27.08	4385.6	4383.9	6.28	15	0.015	0	14.03	0	0	0	0	0	Calculated
3150	3482	Pipe	RCP	I-2383	M-1417	53.16	4383.6	4381	4.89	15	0.015	0	12.38	0	0	0	0	0	Calculated
3151	3483	Pipe	RCP	M-1417	O-245	266.11	4380.2	4355	9.47	18	0.015	0	28.03	0	0	0	0	0	Calculated
3152	3484	Pipe	RCP	M-844	M-1468	92.01	4446.6	4445.4	1.3	24	0.015	5.63	22.39	0.25	4.57	0.83	0.41	0	Calculated
3153	3485	Pipe	RCP	I-2494	M-1468	49.1	4449.4	4447.4	4.07	18	0.015	0	18.37	0	0	0	0	0	Calculated
3154	3486	Pipe	RCP	M-1468	I-2495	26.77	4445.2	4445.1	0.37	24	0.015	5.63	11.98	0.47	3.75	0.96	0.48	0	Calculated
3155	3487	Pipe	RCP	I-2495	I-2496	266.34	4445	4441	1.5	24	0.015	5.63	24.03	0.23	6.05	0.67	0.34	0	Calculated
3156	3488	Pipe	RCP	I-2496	I-2497	241.21	4437.2	4436	0.5	24	0.015	5.61	13.83	0.41	2.25	1.98	0.99	0	Calculated
3157	3490	Pipe	RCP	I-2487	I-2488	136.68	4457.7	4457.1	0.44	15	0.015	0	3.95	0	0	0	0	0	Calculated
3158	3491	Pipe	RCP	I-2489	I-2490	58.52	4459	4457.8	2.05	15	0.015	0	8.02	0	0	0	0	0	Calculated
3159	3492	Pipe	RCP	I-2488	I-2493	124.4	4457	4456.9	0.08	15	0.015	0	1.59	0	0	0	0	0	Calculated
3160	3493	Pipe	RCP	I-2493	M-1466	67.75	4456.8	4454.7	3.1	15	0.015	0	10.09	0	0	0	0	0	Calculated
3161	3494	Pipe	RCP	M-1466	M-1467	123.06	4454.6	4454.1	0.41	15	0.015	0	3.57	0	0	0	0	0	Calculated
3162	3495	Pipe	RCP	M-1467	I-2494	114.94	4454	4450.7	2.87	18	0.015	0	15.43	0	0	0	0	0	Calculated
3163	3496	Pipe	RCP	I-2490	I-2491	50.88	4457.7	4457.3	0.79	12	0.015	0	2.41	0	0	0	0	0	Calculated
3164	3497	Pipe	RCP	I-2491	O-256	22.02	4457.4	4457	1.82	12	0.015	0	3.84	0	0	0	0	0	Calculated
3165	3498	Pipe	RCP	I-2492	I-2493	25.81	4459	4455	15.5	15	0.015	0	15.97	0	0	0	0	0	Calculated
3166	3500	Pipe	HDPE	M-1470	I-2537	269.56	4433.2	4433.16	0.01	24	0.015	9.99	2.39	4.18	3.25	1.89	0.95	0	> CAPACITY
3167	3501	Pipe	HDPE	I-2538	I-2537	39.76	4435.5	4435.3	0.5	18	0.015	0	6.46	0	0	0	0	0	Calculated
3168	3502	Pipe	HDPE	I-2537	I-2539	169.93	4433.1	4432.9	0.12	24	0.015	9.53	6.73	1.42	3.75	1.57	0.79	0	> CAPACITY
3169	3504	Pipe	HDPE	I-2539	I-2540	299.56	4432.8	4431.2	0.53	24	0.015	9.29	14.33	0.65	3.39	1.71	0.86	0	Calculated
3170	3505	Pipe	RCP	I-2541	I-2540	27.36	4433.9	4432.5	5.12	15	0.015	0	12.66	0	0	0.55	0.45	0	Calculated
3171	3506	Pipe	HDPE	I-2540	I-2542	176.26	4431.1	4431	0.06	30	0.015	15	8.47	1.77	3.15	2.33	0.93	0	> CAPACITY
3172	3507	Pipe	RCP	I-2543	I-2544	33.75	4433.2	4431.6	4.74	15	0.015	0	12.19	0	0	0	0	0	Calculated
3173	3508	Pipe	RCP	I-2544	M-1492	171.22	4431.5	4430	0.88	30	0.015	0	33.27	0	0	0	0	0	Calculated
3174	3509	Pipe	RCP	M-1492	O-268	22.04	4429.9	4429	4.08	12	0.015	0	2.08	0	0	0	0	0	Calculated
3175	3510	Pipe	HDPE	I-2542	O-267	277.51	4430.8	4430.7	0.04	30	0.015	14.99	7.98	1.88	3.93	1.81	0.73	0	> CAPACITY
3176	3511	Pipe	RCP	I-1935	M-1086	90.29	5459.8	5457.7	2.33	15	0.015	0	8.54	0	0	0	0	0	Calculated
3177	3512	Pipe	RCP	M-1086	I-1936	49.69	5457.7	5455.1	5.23	15	0.015	0	12.81	0	0	0	0	0	Calculated
3178	3513	Pipe	RCP	I-1936	I-1937	54.2	5455	5453.1	3.51	15	0.015	0	10.51	0	0	0	0	0	Calculated
3179	3514	Pipe	RCP	I-1937	M-1072	127.12	5453	5437.9	11.88	15	0.015	0	19.3	0	0	0	0	0	Calculated
3180	3515	Pipe	RCP	M-1072	M-1073	76.33	5437.9	5437	1.18	15	0.015	0	6.01	0	0	0	0	0	Calculated
3181	3516	Pipe	RCP	M-1073	M-1074	104.55	5437	5423	13.39	15	0.015	0	20.51	0	0	0	0	0	Calculated
3182	3517	Pipe	RCP	M-1074	I-1924	59.83	5423	5420.2	4.68	15	0.015	0	12.11	0	0	0	0	0	Calculated
3183	3518	Pipe	RCP	I-1924	I-1925	13.72	5420.1	5418.7	10.2	15	0.015	0	18.07	0	0	0	0	0	Calculated
3184	3519	Pipe	RCP	I-1925	M-1075	27.7	5418.6	5418.4	0.72	15	0.015	0	4.76	0	0	0	0	0	Calculated
3185	3520	Pipe	RCP	M-1075	I-1926	140.18	5418.3	5411.9	4.57	15	0.015	0	11.96	0	0	0	0	0	Calculated
3186	3521	Pipe	RCP	I-2303	I-2304	25.27	5409.3	5406.2	12.27	15	0.015	0	19.61	0	0	0	0	0	Calculated
3187	3522	Pipe	HDPE	I-2304	M-1383	185.61	5387.8	5406.1	-9.86	18	0.015	0	0.21	0	0	0	0	0	Calculated
3188	3523	Pipe	HDPE	M-1383	I-2306	140.39	5387.7	5374.6	9.33	18	0.015	0	27.81	0	0	0	0	0	Calculated
3189	3524	Pipe	RCP	I-2305	I-2306	26.76	5380.6	5374.9	21.3	15	0.015	0	25.93	0	0	0	0	0	Calculated
3190	3525	Pipe	HDPE	I-2306	I-2307	243.35	5374.5	5350.4	9.9	18	0.015	0	28.67	0	0	0	0	0	Calculated
3191	3526	Pipe	HDPE	I-2307	I-2309	208.68	5349.9	5343.3	3.16	18	0.015	0	16.19	0	0	0	0	0	Calculated
3192	3527	Pipe	RCP	I-2308	I-2309	25.41	5344.2	5343.4	3.15	24	0.015	0	34.79	0	0	0	0	0	Calculated
3193	3530	Pipe	HDPE	I-2309	O-240	104.99	5343.3	5327	15.53	24	0.015	0	77.25	0	0	0	0	0	Calculated
3194	3531	Pipe	RCP	I-2328	M-1395	64.15	4420.5	4420	0.78	15	0.015	0.05	3.13	0.02	0.13	1.25	1	15	SURCHARGED
3195	3534	Pipe	RCP	M-1395	M-1396	171.41	4420.3	4420.1	0.12	18	0.015	5.02	3.11	1.61	3.37	1.18	0.79	0	> CAPACITY
3196	3538	Pipe	RCP	M-1397	I-2333	18.42	4427	4426.9	0.54	15	0.015	0.05	4.13	0.01	0.27	0.7	0.57	0	Calculated
3197	3539	Pipe	HDPE	I-2333	I-2332	43.43	4426.8	4426.7	0.23	18	0.015	2.38	4.37	0.55	2.51	0.79	0.53	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3198	3540	Pipe	HDPE	I-2335	I-2334	198.74	4429.5	4427.6	0.96	15	0.015	2.41	5.47	0.44	4.03	0.61	0.49	0	Calculated
3199	3541	Pipe	HDPE	I-2334	I-2333	96.18	4427.5	4426.9	0.62	15	0.015	2.4	4.42	0.54	3.17	0.74	0.59	0	Calculated
3200	3544	Pipe	RCP	I-2336	I-2565	16.07	4426.3	4421.5	29.87	24	0.015	0	107.15	0	0	1	0.5	0	Calculated
3201	3545	Pipe	RCP	I-2565	I-2566	81.86	4421.5	4421.3	0.24	24	0.015	8.4	9.69	0.87	2.67	2	1	35	SURCHARGED
3202	3546	Pipe	RCP	I-2566	I-2567	9.65	4421.3	4421.2	1.04	24	0.015	8.4	19.96	0.42	2.67	2	1	43	SURCHARGED
3203	3547	Pipe	RCP	I-2567	I-2568	82.87	4421.4	4421.2	0.24	24	0.015	8.4	9.63	0.87	3.17	2	1	36	SURCHARGED
3204	3548	Pipe	RCP	I-2568	M-1479	18.08	4421	4420.9	0.55	24	0.015	8.4	14.58	0.58	3.33	2	1	57	SURCHARGED
3205	3549	Pipe	HDPE	I-2523	M-1479	4.07	4428	4424	98.28	12	0.015	0	30.61	0	0	0.38	0.38	0	Calculated
3206	3550	Pipe	HDPE	I-2524	M-1480	4.33	4428	4425.5	57.74	18	0.015	0	69.17	0	0	0.75	0.5	0	Calculated
3207	3551	Pipe	RCP	I-2559	M-1496	33.17	6080.3	6080.2	0.3	15	0.015	0	3.07	0	0	0	0	0	Calculated
3208	3552	Pipe	RCP	I-2558	M-1496	28.33	6085.4	6080.2	18.36	15	0.015	0	23.99	0	0	0	0	0	Calculated
3209	3553	Pipe	RCP	I-2560	M-1496	19.38	6082.8	6080.2	13.42	15	0.015	0	20.51	0	0	0	0	0	Calculated
3210	3554	Pipe	RCP	M-1496	M-1497	207.63	6080.3	6078.5	0.87	15	0.015	0	5.14	0	0	0	0	0	Calculated
3211	3555	Pipe	RCP	M-1497	M-1498	39.03	6078.6	6078.5	0.26	15	0.015	0	2.83	0	0	0	0	0	Calculated
3212	3556	Pipe	RCP	M-1498	M-1499	181.98	6078.4	6077.2	0.66	15	0.015	0	4.55	0	0	0	0	0	Calculated
3213	3557	Pipe	RCP	M-1499	I-2561	19.48	6077.2	6077.1	0.51	15	0.015	0	4.01	0	0	0	0	0	Calculated
3214	3558	Pipe	RCP	I-2561	I-2562	22.56	6077	6076.5	2.22	15	0.015	0	8.33	0	0	0	0	0	Calculated
3215	3559	Pipe	RCP	I-2562	I-2563	83.6	6076.4	6076	0.48	15	0.015	0	3.97	0	0	0	0	0	Calculated
3216	3560	Pipe	RCP	I-2563	M-1500	125.86	6075.9	6074.5	1.11	15	0.015	0	5.9	0	0	0	0	0	Calculated
3217	3561	Pipe	RCP	M-1500	M-1501	80.71	6074.4	6072.8	1.98	15	0.015	0	7.88	0	0	0	0	0	Calculated
3218	3562	Pipe	RCP	M-1501	M-1502	148.62	6072.5	6068.4	2.76	15	0.015	0	9.3	0	0	0	0	0	Calculated
3219	3563	Pipe	RCP	I-2564	M-1502	30.98	6073.2	6068.4	15.49	15	0.015	0	22.04	0	0	0	0	0	Calculated
3220	3564	Pipe	RCP	M-1502	I-2551	126.83	6068.2	6049.3	14.9	15	0.015	0	21.61	0	0	0.16	0.12	0	Calculated
3221	3566	Pipe	RCP	I-2551	M-1494	31.62	6049.1	6044	16.13	15	0.015	5.49	22.48	0.24	13.14	0.47	0.37	0	Calculated
3222	3567	Pipe	RCP	M-1494	M-1493	118.79	6043.7	6036.1	6.4	15	0.015	5.48	14.16	0.39	10.26	0.56	0.45	0	Calculated
3223	3568	Pipe	RCP	M-1493	I-2549	163.52	6036	6023.3	7.77	15	0.015	5.49	15.61	0.35	10.45	0.54	0.44	0	Calculated
3224	3569	Pipe	RCP	I-2550	I-2549	48.86	6024.5	6023.4	2.25	15	0.015	0	8.4	0	0	0.23	0.2	0	Calculated
3225	3570	Pipe	RCP	I-2549	I-2552	60.34	6023.1	6021.2	3.15	15	0.015	5.46	9.96	0.55	7.45	0.7	0.58	0	Calculated
3226	3571	Pipe	RCP	I-2552	M-1495	103.4	6021.1	6016.8	4.16	15	0.015	5.45	11.46	0.48	8.64	0.62	0.51	0	Calculated
3227	3572	Pipe	RCP	M-1495	I-2557	84.77	6016.4	6012.7	4.36	15	0.015	5.45	11.7	0.47	8.67	0.61	0.51	0	Calculated
3228	3573	Pipe	RCP	I-2557	O-274	71.93	6012.4	5975.8	50.88	15	0.015	5.45	19.93	0.27	16.41	0.38	0.32	0	Calculated
3229	3574	Pipe	RCP	I-2553	I-2554	36.55	6004.4	5998	17.51	15	0.015	0	23.43	0	0	0	0	0	Calculated
3230	3575	Pipe	RCP	I-2554	O-271	56.7	5988.7	5988.4	0.53	15	0.015	0	4.07	0	0	0	0	0	Calculated
3231	3577	Pipe	RCP	I-2556	O-272	83.68	5971.1	5967.6	4.18	15	0.015	0.57	11.45	0.05	4.76	0.19	0.15	0	Calculated
3232	3578	Pipe	RCP	I-2400	I-2399	28.64	5949.5	5948.9	2.09	12	0.015	6.79	4.47	1.52	8.64	1	1	62	SURCHARGED
3233	3579	Pipe	RCP	I-2399	O-273	189.54	5948.8	5914.1	18.31	24	0.015	6.79	83.89	0.08	15.67	0.39	0.2	0	Calculated
3234	3580	Pipe	RCP	I-2001	I-1192	46.32	4413.6	4408	12.09	15	0.015	2.44	21.31	0.11	3.5	1.25	1	78	SURCHARGED
3235	3581	Pipe	RCP	I-1192	M-659	130.28	4403.3	4401.7	1.23	15	0.015	10.25	6.2	1.65	8.35	1.25	1	124	SURCHARGED
3236	3582	Pipe	RCP	M-659	I-1191	359.77	4401.4	4398.6	0.78	15	0.015	10.25	4.94	2.08	8.41	1.22	0.97	0	> CAPACITY
3237	3584	Pipe	HDPE	M-1150	I-2002	8.04	4402.2	4401.8	4.98	18	0.015	0	20.31	0	0	0	0	0	Calculated
3238	3585	Pipe	HDPE	I-552	I-554	19.62	4402.7	4402.5	1.02	18	0.015	0	9.19	0	0	0	0	0	Calculated
3239	3586	Pipe	HDPE	I-554	M-1150	44.74	4402.5	4402.3	0.45	18	0.015	0	6.09	0	0	0	0	0	Calculated
3240	3588	Pipe	RCP	M-660	I-2000	25.94	4421	4420.7	1.16	15	0.015	0	6.02	0	0	0	0	0	Calculated
3241	3590	Pipe	RCP	I-1194	I-1193	95.96	4423	4419.6	3.54	15	0.015	0	10.54	0	0	0	0	0	Calculated
3242	3591	Pipe	RCP	I-2000	I-1193	49.15	4420.6	4418.9	3.46	15	0.015	0	10.41	0	0	0	0	0	Calculated
3243	3592	Pipe	RCP	I-1193	I-1192	460.22	4418.9	4403.5	3.35	15	0.015	0	10.24	0	0	0.63	0.5	0	Calculated
3244	3593	Pipe	RCP	M-1183	M-1182	149.66	4453	4453.6	-0.4	24	0.015	0	12.41	0	0	0	0	0	Calculated
3245	3594	Pipe	RCP	M-1182	M-1181	107.04	4453.5	4450	3.27	24	0.015	0	35.45	0	0	0	0	0	Calculated
3246	3595	Pipe	RCP	M-1181	M-1179	248.01	4449.9	4447.7	0.89	24	0.015	0	18.47	0	0	0	0	0	Calculated
3247	3596	Pipe	RCP	M-1179	M-1180	349.77	4447.6	4447.2	0.11	24	0.015	0	6.63	0	0	0	0	0	Calculated
3248	3597	Pipe	RCP	M-1180	M-1164	357.18	4447.1	4445.9	0.34	24	0.015	0	11.36	0	0	0	0	0	Calculated
3249	3598	Pipe	HDPE	I-2040	I-2041	89.7	4451.3	4450.9	0.45	15	0.015	0	3.74	0	0	0	0	0	Calculated
3250	3600	Pipe	HDPE	I-2041	M-1165	241.27	4450.8	4443	3.23	15	0.015	0	10.07	0	0	0	0	0	Calculated
3251	3601	Pipe	HDPE	I-2054	I-2053	19.6	4445.8	4445.3	2.55	15	0.015	0	8.94	0	0	0	0	0	Calculated
3252	3602	Pipe	HDPE	I-2053	M-1165	144.9	4445.2	4443	1.52	15	0.015	0	6.9	0	0	0	0	0	Calculated
3253	3603	Pipe	HDPE	M-1165	M-1166	137.06	4442.9	4442.7	0.15	15	0.015	0	2.14	0	0	0	0	0	Calculated
3254	3604	Pipe	RCP	I-2043	I-2042	13.15	4444.7	4444.2	3.8	15	0.015	0	9.76	0	0	0	0	0	Calculated
3255	3605	Pipe	HDPE	I-2042	M-1167	81.06	4444.3	4443.9	0.49	15	0.015	0	3.93	0	0	0	0	0	Calculated
3256	3606	Pipe	HDPE	M-1167	M-1166	87.44	4443.8	4442.7	1.26	15	0.015	0	6.28	0	0	0	0	0	Calculated
3257	3607	Pipe	HDPE	M-1166	M-1168	115.11	4442.6	4438.5	3.56	15	0.015	0	10.57	0	0	0	0	0	Calculated
3258	3608	Pipe	HDPE	I-2052	I-2051	23.65	4439.9	4439.2	2.96	15	0.015	0	9.63	0	0	0	0	0	Calculated
3259	3609	Pipe	HDPE	I-2051	M-1178	109.7	4439.1	4439.1	0	15	0.015	0	0.17	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3260	3610	Pipe	HDPE	M-1178	M-1168	102.79	4439	4438.5	0.49	15	0.015	0	3.9	0	0	0	0	0	Calculated
3261	3611	Pipe	HDPE	M-1168	I-463	227.8	4438.5	4430.8	3.38	15	0.015	0	10.29	0	0	0	0	0	Calculated
3262	3612	Pipe	HDPE	I-2044	I-463	24.05	4431.5	4431	2.08	15	0.015	0	8.07	0	0	0	0	0	Calculated
3263	3613	Pipe	HDPE	I-463	M-1169	299.64	4430.7	4421.8	2.97	15	0.015	0	9.65	0	0	0.47	0.4	0	Calculated
3264	3614	Pipe	HDPE	I-460	I-2055	82.7	4445	4442.6	2.9	15	0.015	0	9.54	0	0	0	0	0	Calculated
3265	3615	Pipe	HDPE	I-2055	I-2056	24.07	4442.6	4441.9	2.91	15	0.015	0	9.55	0	0	0	0	0	Calculated
3266	3616	Pipe	HDPE	I-2056	M-1177	238.37	4441.8	4435.1	2.81	15	0.015	0	9.39	0	0	0	0	0	Calculated
3267	3617	Pipe	HDPE	M-1177	I-2050	241.72	4435.1	4427.5	3.14	15	0.015	0	9.93	0	0	0	0	0	Calculated
3268	3618	Pipe	HDPE	I-2049	I-2050	65.83	4428.6	4427.5	1.67	15	0.015	0	7.24	0	0	0	0	0	Calculated
3269	3619	Pipe	HDPE	I-2050	I-2047	156.13	4427.3	4423.1	2.69	15	0.015	0	9.22	0	0	0	0	0	Calculated
3270	3620	Pipe	RCP	I-2048	I-2047	20.89	4423.6	4423.1	2.39	12	0.015	0	4.78	0	0	0	0	0	Calculated
3271	3621	Pipe	RCP	I-2047	M-1176	52.77	4423	4421.8	2.27	15	0.015	0	8.44	0	0	0.45	0.4	0	Calculated
3272	3622	Pipe	RCP	M-1176	M-1175	111.15	4421.7	4420.4	1.17	15	0.015	0.4	6.05	0.07	0.44	1.12	0.94	0	Calculated
3273	3623	Pipe	RCP	M-1169	M-1170	230.63	4421.7	4421.4	0.13	24	0.015	1.79	7.07	0.25	1.34	1.18	0.62	0	Calculated
3274	3624	Pipe	RCP	M-1170	I-2045	247.99	4421.3	4420.1	0.48	24	0.015	2.8	13.64	0.21	1.04	1.71	0.87	0	Calculated
3275	3625	Pipe	RCP	M-1175	I-2045	134.82	4420.3	4420	0.22	15	0.015	0.65	2.64	0.25	0.64	1.25	1	23	SURCHARGED
3276	3626	Pipe	RCP	I-2045	I-2046	22.4	4419.9	4419.8	0.45	24	0.015	23.05	13.1	1.76	7.59	1.85	0.93	0	> CAPACITY
3277	3627	Pipe	HDPE	I-2046	M-1171	117.57	4419.7	4418.1	1.36	30	0.015	23.06	41.47	0.56	6.53	1.7	0.69	0	Calculated
3278	3628	Pipe	HDPE	M-1171	M-1172	56.2	4418	4416.2	3.2	30	0.015	23.03	63.62	0.36	6.71	2.19	0.88	0	Calculated
3279	3629	Pipe	HDPE	M-1172	M-1173	20.16	4416	4414.9	5.46	30	0.015	23.03	83.04	0.28	4.69	2.5	1	42	SURCHARGED
3280	3630	Pipe	RCP	M-1173	DET_3	178.78	4414.9	4414.68	0.12	15	0.015	6.61	1.96	3.37	6.7	0.97	0.77	0	> CAPACITY
3281	3631	Pipe	RCP	DET_3	O-40	28.62	4414.68	4410	16.35	12	0.015	6.61	12.49	0.53	13.47	0.6	0.6	0	Calculated
3282	3634	Pipe	RCP	M-1149	I-1999	18.01	4431.7	4431.6	0.56	18	0.015	0	6.78	0	0	0	0	0	Calculated
3283	3635	Pipe	RCP	I-1999	I-553	50.29	4431.6	4431.5	0.2	18	0.015	0	2.87	0	0	0	0	0	Calculated
3284	3636	Pipe	RCP	I-553	M-267	134.5	4431.5	4429	1.86	18	0.015	0	12.54	0	0	0	0	0	Calculated
3285	3637	Pipe	RCP	I-2005	I-2006	36.22	6223.5	6223.4	0.28	15	0.015	0	3.09	0	0	0	0	0	Calculated
3286	3638	Pipe	RCP	I-2006	M-1151	146.42	6223.4	6218	3.69	15	0.015	0	10.75	0	0	0	0	0	Calculated
3287	3639	Pipe	RCP	I-2004	I-2003	44.57	6220.3	6218.3	4.49	24	0.015	0	41.53	0	0	0	0	0	Calculated
3288	3640	Pipe	RCP	I-2003	M-1151	66.7	6218.2	6218	0.3	24	0.015	0	11.51	0	0	0	0	0	Calculated
3289	3641	Pipe	RCP	M-1151	O-220	55.21	6218	6119.4	178.59	15	0.015	0	32.47	0	0	0.28	0.22	0	Calculated
3290	3642	Pipe	RCP	I-2271	I-2270	462.86	6181.4	6169.2	2.64	15	0.015	0	9.09	0	0	0	0	0	Calculated
3291	3643	Pipe	RCP	I-2007	I-2008	22.57	6173	6172.4	2.66	15	0.015	0	9.13	0	0	0	0	0	Calculated
3292	3644	Pipe	RCP	I-2008	I-2270	104.09	6172.3	6169.2	2.98	15	0.015	0	9.77	0	0	0	0	0	Calculated
3293	3645	Pipe	RCP	I-2270	M-1359	288.2	6168.8	6155.2	4.72	15	0.015	0	12.18	0	0	0	0	0	Calculated
3294	3646	Pipe	RCP	M-1359	I-2269	101.05	6155	6149.7	5.24	15	0.015	0	12.82	0	0	0	0	0	Calculated
3295	3647	Pipe	RCP	I-2269	I-2267	300.25	6149.4	6136.3	4.36	15	0.015	0	11.69	0	0	0	0	0	Calculated
3296	3648	Pipe	RCP	I-2268	I-2267	25.46	6136.5	3136.4	11783.58	15	0.015	0	9.22	0	0	0	0	0	Calculated
3297	3649	Pipe	RCP	I-2267	M-1358	221.69	6135.8	6129.7	2.75	18	0.015	0	15.11	0	0	0	0	0	Calculated
3298	3650	Pipe	RCP	M-1358	I-2266	104.43	6129.5	6121.9	7.28	18	0.015	0	24.56	0	0	0	0	0	Calculated
3299	3651	Pipe	RCP	I-2266	M-1357	280.65	6121.3	6108.5	4.56	18	0.015	0	19.47	0	0	0	0	0	Calculated
3300	3652	Pipe	RCP	M-1357	M-1356	211.73	6108.1	6092.9	7.18	18	0.015	0	24.39	0	0	0	0	0	Calculated
3301	3653	Pipe	RCP	M-1356	I-2264	33.26	6092.8	6088.5	12.93	18	0.015	0	32.81	0	0	0	0	0	Calculated
3302	3654	Pipe	RCP	I-2263	I-2264	31.36	6092	6088.9	9.89	24	0.015	0	61.64	0	0	0	0	0	Calculated
3303	3655	Pipe	RCP	I-2264	I-2265	25.33	6088.5	6088	1.97	24	0.015	0	28.09	0	0	0	0	0	Calculated
3304	3656	Pipe	RCP	I-2265	M-1355	113.78	6087.9	6087	0.79	24	0.015	0	17.44	0	0	0	0	0	Calculated
3305	3658	Pipe	RCP	M-1355	M-1348	98.32	6087	6048.9	38.75	24	0.015	0	122.05	0	0	0	0	0	Calculated
3306	3659	Pipe	RCP	M-1348	M-1349	125.74	6048.8	6040.9	6.28	24	0.015	0	49.17	0	0	0.33	0.17	0	Calculated
3307	3660	Pipe	RCP	M-1349	DET_86	48.32	6040.8	6040.1	1.45	24	0.015	5.29	23.43	0.23	5.97	0.66	0.33	0	Calculated
3308	3661	Pipe	RCP	I-2257	DET_86	124.09	6051.2	6040.1	8.95	24	0.015	2.43	58.61	0.04	5.74	0.38	0.19	0	Calculated
3309	3662	Pipe	RCP	DET_86	M-1346	49.61	6040.1	6037	6.25	24	0.015	6.28	49.09	0.13	9.6	0.51	0.26	0	Calculated
3310	3663	Pipe	RCP	M-1346	M-1347	136.6	6036.9	6011.9	18.3	24	0.015	6.28	83.91	0.07	9.95	0.5	0.25	0	Calculated
3311	3664	Pipe	RCP	M-1347	O-238	7.82	6011.8	6011	10.23	24	0.015	6.28	64.64	0.1	8.72	0.55	0.28	0	Calculated
3312	3665	Pipe	HDPE	I-2262	M-1354	109.36	6061.4	6054.4	6.4	15	0.015	0	14.16	0	0	0	0	0	Calculated
3313	3666	Pipe	RCP	M-1354	I-2260	61.7	6054.1	6053.6	0.81	15	0.015	0	5.04	0	0	0	0	0	Calculated
3314	3667	Pipe	RCP	I-2261	I-2260	22.42	6054.3	6053.6	3.12	15	0.015	0	10.03	0	0	0	0	0	Calculated
3315	3668	Pipe	RCP	I-2260	M-1353	66.06	6053	6051.7	1.97	15	0.015	0	7.85	0	0	0	0	0	Calculated
3316	3669	Pipe	RCP	M-1353	I-2259	103.88	6051.4	6048.6	2.7	15	0.015	0	9.19	0	0	0	0	0	Calculated
3317	3670	Pipe	RCP	I-2258	I-2259	26.33	6049.1	6048.6	1.9	15	0.015	0	7.71	0	0	0	0	0	Calculated
3318	3671	Pipe	RCP	I-2259	M-1352	221.75	6048.5	6045.5	1.35	24	0.015	0	22.88	0	0	0	0	0	Calculated
3319	3672	Pipe	RCP	M-1352	M-1350	125.15	6045.4	6041.4	3.2	24	0.015	0	35.05	0	0	0.08	0.04	0	Calculated
3320	3673	Pipe	RCP	M-1350	M-1349	151.66	6041.3	6040.9	0.26	24	0.015	0.11	10.07	0.01	0.26	0.47	0.23	0	Calculated
3321	3675	Pipe	RCP	I-2461	M-1454	92.51	4449.8	4447.2	2.81	18	0.015	0	15.26	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3322	3677	Pipe	RCP	I-2460	M-1454	19.02	4449.8	4447.2	13.67	15	0.015	0	20.7	0	0	0	0	0	Calculated
3323	3679	Pipe	RCP	M-1454	I-2479	159.35	4446.8	4446	0.5	15	0.015	0	3.97	0	0	0	0	0	Calculated
3324	3680	Pipe	RCP	I-2462	I-2479	38.5	4447.2	4446	3.12	15	0.015	0	9.88	0	0	0	0	0	Calculated
3325	3681	Pipe	RCP	I-2479	M-1464	180.03	4446	4444.8	0.67	15	0.015	0	4.57	0	0	0.21	0.19	0	Calculated
3326	3682	Pipe	RCP	M-1464	I-2478	220.93	4444.6	4444.3	0.14	15	0.015	0.73	2.06	0.35	1.2	0.75	0.63	0	Calculated
3327	3683	Pipe	RCP	I-2478	I-2477	59.81	4444.4	4444.3	0.17	15	0.015	1.04	2.29	0.45	1.81	0.82	0.68	0	Calculated
3328	3684	Pipe	RCP	I-1969	I-1970	37.93	4384	4382.6	3.69	15	0.015	0	10.76	0	0	0	0	0	Calculated
3329	3685	Pipe	RCP	I-1970	M-1121	296.78	4380.7	4349.9	10.38	15	0.015	2.37	18.04	0.13	10.06	0.31	0.25	0	Calculated
3330	3686	Pipe	RCP	M-1121	O-218	280.15	4349.8	4330	7.07	15	0.015	2.36	12.83	0.18	7.86	0.36	0.29	0	Calculated
3331	3688	Pipe	RCP	M-1408	M-1407	366.07	4396.7	4389.5	1.97	18	0.015	0	12.77	0	0	0	0	0	Calculated
3332	3689	Pipe	RCP	M-1407	I-2369	109.53	4389.5	4388.2	1.19	18	0.015	0	9.92	0	0	0	0	0	Calculated
3333	3690	Pipe	RCP	I-2368	I-2369	24.65	4388.2	4388.1	0.41	15	0.015	0	3.57	0	0	0	0	0	Calculated
3334	3691	Pipe	RCP	I-2369	I-2366	202.79	4388	4381.6	3.16	18	0.015	0	16.17	0	0	0	0	0	Calculated
3335	3692	Pipe	RCP	I-2367	I-2366	24.59	4382.6	4381.5	4.47	15	0.015	0	11.84	0	0	0	0	0	Calculated
3336	3693	Pipe	RCP	I-2366	I-2365	91.7	4381.4	4377	4.8	18	0.015	0	20.17	0	0	0.26	0.17	0	Calculated
3337	3694	Pipe	RCP	I-2364	I-2365	22.91	4378.8	4377.5	5.67	15	0.015	0	13.34	0	0	0.01	0.01	0	Calculated
3338	3695	Pipe	RCP	I-2365	M-1406	154.7	4377	4361.9	9.76	24	0.015	9.15	61.25	0.15	9.1	0.71	0.36	0	Calculated
3339	3696	Pipe	RCP	M-1406	I-2362	282.67	4361.8	4359.1	0.96	24	0.015	9.13	19.16	0.48	5.08	1.09	0.56	0	Calculated
3340	3697	Pipe	RCP	I-2363	I-2362	24.78	4360.9	4359.1	7.26	15	0.015	0	15.09	0	0	0.59	0.5	0	Calculated
3341	3698	Pipe	RCP	I-2362	I-2361	98.67	4359	4358.5	0.51	24	0.015	8.97	13.96	0.64	4.54	1.16	0.6	0	Calculated
3342	3699	Pipe	RCP	I-2361	I-2360	273.37	4358.4	4347.5	3.99	24	0.015	8.98	39.15	0.23	9.52	0.64	0.34	0	Calculated
3343	3700	Pipe	RCP	I-2360	I-2359	89.61	4347.4	4344.6	3.12	24	0.015	8.96	34.66	0.26	8.44	0.71	0.37	0	Calculated
3344	3701	Pipe	RCP	I-2359	M-1430	181.56	4344.5	4337.4	3.91	24	0.015	8.95	38.77	0.23	4.77	1.12	0.58	0	Calculated
3345	3702	Pipe	RCP	I-2417	M-1430	28.16	4337.5	4337.4	0.36	15	0.015	0.08	3.34	0.02	0.36	1.25	1	12	SURCHARGED
3346	3703	Pipe	RCP	M-1430	M-1429	38.59	4337.3	4336.9	1.04	24	0.015	8.9	1	8.92	3.26	1.57	0.81	0	> CAPACITY
3347	3704	Pipe	RCP	M-1429	I-2416	36.14	4337.3	4337.2	0.28	24	0.015	8.9	10.31	0.86	4.24	1.23	0.63	0	Calculated
3348	3705	Pipe	RCP	I-2416	O-249	27.44	4337.1	4334	11.3	24	0.015	8.9	46.45	0.19	9.18	0.67	0.35	0	Calculated
3349	3706	Pipe	RCP	I-2415	I-2416	23.21	4338	4337.2	3.45	15	0.015	0	10.39	0	0	0.34	0.28	0	Calculated
3350	3707	Pipe	RCP	I-2418	I-2419	29.01	4334.2	4332.4	6.2	15	0.015	0	13.95	0	0	0.1	0.08	0	Calculated
3351	3708	Pipe	RCP	I-2419	O-250	43.27	4332.3	4329	7.63	15	0.015	1.63	15.46	0.11	7.66	0.29	0.23	0	Calculated
3352	3709	Pipe	RCP	I-2420	I-2421	64.54	4336.7	4335.9	1.24	15	0.015	0	6.23	0	0	0.28	0.23	0	Calculated
3353	3710	Pipe	RCP	I-2422	I-2421	43.22	4336	4335.9	0.23	15	0.015	0.04	2.69	0.01	0.28	0.52	0.42	0	Calculated
3354	3711	Pipe	RCP	I-2421	O-251	191.84	4335.8	4333	1.46	18	0.015	4.11	11	0.37	5.56	0.65	0.44	0	Calculated
3355	3712	Pipe	RCP	I-2425	I-2424	21.44	4339.1	4338.5	2.8	15	0.015	2.68	9.37	0.29	5.04	0.56	0.45	0	Calculated
3356	3713	Pipe	RCP	I-2426	I-2425	91.69	4340.6	4339.1	1.64	15	0.015	0	7.16	0	0	0.29	0.23	0	Calculated
3357	3714	Pipe	RCP	I-2424	O-252	161.52	4338.5	4332	4.02	15	0.015	2.67	7.63	0.35	5.47	0.52	0.42	0	Calculated
3358	3715	Pipe	RCP	I-2423	O-297	113.5	4347.5	4333	12.78	18	0.015	11.14	32.54	0.34	15.64	0.63	0.42	0	Calculated
3359	3716	Pipe	RCP	I-2427	I-2423	141.02	4350	4347.7	1.63	24	0.015	11.14	26.67	0.42	7.52	0.94	0.48	0	Calculated
3360	3717	Pipe	RCP	I-2428	I-2427	28.32	4351.7	4350.4	4.59	15	0.015	0	11.99	0	0	0.45	0.37	0	Calculated
3361	3718	Pipe	RCP	M-1431	I-2427	130.55	4353.4	4350	2.6	24	0.015	9.83	30.16	0.33	7.1	0.91	0.46	0	Calculated
3362	3719	Pipe	RCP	I-2430	I-2429	28.55	4361.1	4357.6	12.26	15	0.015	0	19.6	0	0	0.33	0.27	0	Calculated
3363	3720	Pipe	RCP	I-2429	M-1431	105.33	4357.5	4353.5	3.8	24	0.015	9.83	38.21	0.26	9.01	0.76	0.38	0	Calculated
3364	3721	Pipe	RCP	M-1432	I-2429	144.3	4368.4	4357.6	7.48	24	0.015	9.83	53.64	0.18	11.45	0.64	0.32	0	Calculated
3365	3722	Pipe	RCP	I-2431	M-1432	107.26	4377	4368.5	7.92	24	0.015	9.83	55.19	0.18	12.4	0.6	0.3	0	Calculated
3366	3723	Pipe	RCP	I-2432	I-2431	20.94	4378.8	4377.1	8.12	15	0.015	0	15.95	0	0	0.26	0.21	0	Calculated
3367	3724	Pipe	RCP	M-1122	I-2431	128.9	4387.3	4377.1	7.91	18	0.015	9.42	25.61	0.37	12.62	0.66	0.44	0	Calculated
3368	3725	Pipe	RCP	M-1129	M-1122	380.34	4403.4	4387.4	4.21	18	0.015	9.42	18.67	0.5	10.33	0.77	0.51	0	Calculated
3369	3726	Pipe	RCP	I-1981	M-1129	22.74	4403.8	4403.5	1.32	12	0.015	0.02	3.55	0.01	0.17	0.53	0.53	0	Calculated
3370	3727	Pipe	RCP	I-1982	M-1129	13.39	4405.1	4404.8	2.24	12	0.015	0	4.62	0	0	0	0	0	Calculated
3371	3728	Pipe	RCP	M-1128	M-1129	219.36	4403.5	4403.4	0.05	15	0.015	4.61	1.2	3.86	4.77	1.02	0.81	0	> CAPACITY
3372	3729	Pipe	RCP	M-1127	M-1128	201.31	4404.5	4403.6	0.45	15	0.015	4.61	3.74	1.23	3.76	1.25	1	95	SURCHARGED
3373	3730	Pipe	RCP	I-1979	M-1127	26.91	4407.1	4404.7	8.92	12	0.015	0.59	9.22	0.06	1.18	0.85	0.86	0	Calculated
3374	3731	Pipe	RCP	I-1980	M-1127	8.17	4407.4	4405.9	18.36	12	0.015	0.26	13.23	0.02	0.55	0.7	0.71	0	Calculated
3375	3732	Pipe	RCP	M-1126	M-1127	298.39	4404.6	4404.5	0.03	15	0.015	4.87	1.02	4.76	3.97	1.25	1	95	SURCHARGED
3376	3733	Pipe	RCP	M-1125	M-1126	301.63	4406.5	4404.7	0.6	15	0.015	2.02	4.32	0.47	1.65	1.25	1	83	SURCHARGED
3377	3734	Pipe	RCP	I-1978	M-1125	6.55	4407.8	4407.3	7.63	12	0.015	0.75	8.53	0.09	0.96	1	1	69	SURCHARGED
3378	3735	Pipe	PVC	M-1124	I-1977	6.57	4407.4	4407.3	1.52	12	0.015	2.04	3.81	0.54	2.6	1	1	72	SURCHARGED
3379	3736	Pipe	RCP	I-1977	M-1125	31.37	4407.2	4406.6	1.91	12	0.015	2.02	4.27	0.47	2.58	1	1	76	SURCHARGED
3380	3737	Pipe	PVC	I-1976	M-1123	32.93	4407.8	4407.5	0.91	12	0.015	1.86	2.95	0.63	2.47	1	1	68	SURCHARGED
3381	3738	Pipe	PVC	M-1123	M-1124	121.98	4407.5	4407.4	0.08	12	0.015	2.06	0.88	2.33	2.79	1	1	71	SURCHARGED
3382	3739	Pipe	RCP	I-2385	I-2386	99.83	4408.1	4407	1.1	15	0.015	0	5.88	0	0	0	0	0	Calculated
3383	3740	Pipe	RCP	I-2386	I-2387	223.34	4406.9	4406.8	0.04	15	0.015	0	1.45	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3384	3741	Pipe	RCP	I-2387	I-2389	96.81	4406.7	4406.5	0.21	15	0.015	0	2.35	0	0	0	0	0	Calculated
3385	3742	Pipe	RCP	I-2388	I-2389	58.82	4407.4	4406.5	1.53	15	0.015	0	6.81	0	0	0	0	0	Calculated
3386	3747	Pipe	RCP	I-2447	I-2448	87.23	4407.4	4407.3	0.11	12	0.015	0	1.05	0	0	0	0	0	Calculated
3387	3748	Pipe	RCP	I-2448	I-2449	103.95	4407.5	4406.2	1.25	12	0.015	0	3.45	0	0	0.42	0.47	0	Calculated
3388	3749	Pipe	RCP	I-2449	I-2450	96.94	4406.1	4405	1.13	12	0.015	0.51	3.29	0.16	0.89	0.97	1	1	SURCHARGED
3389	3750	Pipe	RCP	I-2450	I-2451	113.16	4404.9	4404.1	0.71	15	0.015	0.8	4.71	0.17	0.87	1.25	1	53	SURCHARGED
3390	3751	Pipe	RCP	I-2451	I-2452	63.55	4404	4403.6	0.63	15	0.015	0.76	4.55	0.17	0.64	1.25	1	67	SURCHARGED
3391	3752	Pipe	RCP	I-2452	I-2453	52.82	4403.6	4402.3	2.46	15	0.015	0.76	8.78	0.09	0.62	1.25	1	74	SURCHARGED
3392	3753	Pipe	RCP	I-2453	I-2454	284.69	4402.3	4402.1	0.07	15	0.015	6.24	1.48	4.21	5.35	1.13	0.9	0	> CAPACITY
3393	3754	Pipe	RCP	I-2454	I-2455	191.85	4402	4401.1	0.47	24	0.015	6.25	13.43	0.47	3.89	1.02	0.51	0	Calculated
3394	3756	Pipe	RCP	I-2455	I-2456	52.4	4401.5	4399.5	3.82	30	0.015	6.24	69.45	0.09	7.85	0.55	0.22	0	Calculated
3395	3757	Pipe	RCP	I-2456	I-2457	108.91	4399.5	4393	5.97	30	0.015	6.24	86.84	0.07	9.75	0.47	0.19	0	Calculated
3396	3758	Pipe	RCP	I-2457	O-254	231.66	4392.9	4366	11.61	30	0.015	6.24	101.43	0.06	11.17	0.43	0.17	0	Calculated
3397	3759	Pipe	RCP	I-2715	M-1578	45.31	4413.8	4412.4	3.09	18	0.015	0	16	0	0	0	0	0	Calculated
3398	3761	Pipe	RCP	I-2716	M-1578	28.9	4414.1	4412.3	6.23	15	0.015	0	13.97	0	0	0	0	0	Calculated
3399	3762	Pipe	RCP	M-1578	M-1579	273.13	4412.2	4411	0.44	21	0.015	0	9.1	0	0	0	0	0	Calculated
3400	3763	Pipe	RCP	M-1579	I-2717	36.72	4410.9	4410.8	0.27	21	0.015	0	7.17	0	0	0	0	0	Calculated
3401	3764	Pipe	RCP	I-1174	I-1173	41.12	5873.4	5873.3	0.24	24	0.015	19.85	10.14	1.96	8.92	1.33	0.67	0	> CAPACITY
3402	3765	Pipe	RCP	I-2633	I-2632	33.35	5845.5	5843.3	6.6	15	0.015	0	14.44	0	0	0	0	0	Calculated
3403	3766	Pipe	RCP	I-2632	M-1549	123.72	5843.3	5843.2	0.08	15	0.015	0	1.59	0	0	0	0	0	Calculated
3404	3767	Pipe	RCP	M-1549	M-1548	75.41	5842.6	5840.8	2.39	15	0.015	0	9.73	0	0	0	0	0	Calculated
3405	3768	Pipe	RCP	M-1548	M-1547	151.64	5840.2	5826.9	8.77	15	0.015	0	16.62	0	0	0	0	0	Calculated
3406	3769	Pipe	RCP	M-1547	M-1544	191.6	5826.7	5806.8	10.39	15	0.015	0	18.11	0	0	0	0	0	Calculated
3407	3770	Pipe	RCP	M-1544	I-2653	67.22	5806.8	5803.3	5.21	15	0.015	0	12.42	0	0	0	0	0	Calculated
3408	3771	Pipe	RCP	I-2653	M-1545	92.93	5803.2	5790.5	13.67	15	0.015	0	20.93	0	0	0	0	0	Calculated
3409	3772	Pipe	RCP	M-1545	M-1546	190.23	5790.3	5758.2	16.87	15	0.015	0	23	0	0	0	0	0	Calculated
3410	3773	Pipe	RCP	M-1546	O-288	72.4	5757.8	5757	1.1	15	0.015	0	5.89	0	0	0	0	0	Calculated
3411	3776	Pipe	RCP	I-2743	I-2744	35.42	5679.2	5679.1	0.28	24	0.015	0	10.42	0	0	0	0	0	Calculated
3412	3777	Pipe	RCP	I-2744	M-1598	149.71	5679	5667	8.02	36	0.015	0	163.66	0	0	0	0	0	Calculated
3413	3778	Pipe	RCP	M-1598	M-1599	159.43	5666.9	5655.1	7.4	36	0.015	0	157.26	0	0	0	0	0	Calculated
3414	3779	Pipe	RCP	M-1599	M-1600	124.27	5655	5647	6.44	36	0.015	0	146.67	0	0	0	0	0	Calculated
3415	3780	Pipe	RCP	I-2746	I-2745	33.77	5638.2	5635.9	6.81	15	0.015	0	14.67	0	0	0	0	0	Calculated
3416	3781	Pipe	RCP	M-1600	I-2745	130.61	5646.9	5635.9	8.42	36	0.015	0	167.76	0	0	0	0	0	Calculated
3417	3782	Pipe	RCP	I-2745	M-1601	126.27	5635.8	5625.9	7.84	36	0.015	0	161.86	0	0	0	0	0	Calculated
3418	3783	Pipe	RCP	I-2747	M-1601	69.55	5621.5	5621.3	0.29	36	0.015	0	31	0	0	0	0	0	Calculated
3419	3784	Pipe	RCP	M-1601	M-1602	225.55	5621.1	5608	5.81	36	0.015	0	139.31	0	0	0	0	0	Calculated
3420	3785	Pipe	RCP	M-1602	M-1603	119.94	5607.9	5597.6	8.59	36	0.015	0	167.74	0	0	0	0	0	Calculated
3421	3786	Pipe	? BURIED	I-2748	I-2771	46.45	5600	5596	8.61	15	0.015	0	16.43	0	0	0	0	0	Calculated
3422	3787	Pipe	RCP	M-1603	I-2749	68.1	5597.8	5592.7	7.49	36	0.015	0	158.19	0	0	0	0	0	Calculated
3423	3788	Pipe	? BURIED	I-2771	I-2749	36.82	5595.9	5594.7	3.26	36	0.015	0	104.36	0	0	0	0	0	Calculated
3424	3789	Pipe	RCP	I-2749	M-1618	184.01	5592.5	5581.8	5.81	36	0.015	0	139.39	0	0	0	0	0	Calculated
3425	3790	Pipe	RCP	M-1618	M-1619	151.7	5581.7	5577	3.1	36	0.015	0	102.18	0	0	0	0	0	Calculated
3426	3791	Pipe	RCP	M-1619	I-2772	182.23	5576.9	5570.7	3.4	36	0.015	0	106.62	0	0	0	0	0	Calculated
3427	3792	Pipe	RCP	I-2772	M-1620	41.1	5570.6	5570.2	0.97	36	0.015	0	58.43	0	0	0	0	0	Calculated
3428	3793	Pipe	RCP	I-2774	I-2773	66.69	5577	5572.8	6.3	24	0.015	0	59.78	0	0	0	0	0	Calculated
3429	3794	Pipe	RCP	I-2773	M-1620	44.21	5572.6	5570.9	3.85	24	0.015	0	38.45	0	0	0	0	0	Calculated
3430	3795	Pipe	RCP	I-2775	M-1620	75.27	5573.6	5571.5	2.79	15	0.015	0	9.35	0	0	0	0	0	Calculated
3431	3796	Pipe	RCP	M-1620	I-2770	211.29	5569.5	5555.6	6.58	36	0.015	0	148.26	0	0	0	0	0	Calculated
3432	3797	Pipe	RCP	I-2769	I-2770	58.64	5557.4	5555	4.09	15	0.015	0	11.33	0	0	0	0	0	Calculated
3433	3798	Pipe	RCP	I-2770	M-1617	45.45	5556.5	5553.7	6.16	36	0.015	0	143.48	0	0	0	0	0	Calculated
3434	3799	Pipe	RCP	M-1617	M-1616	97.11	5553.4	5550.7	2.78	36	0.015	0	96.39	0	0	0	0	0	Calculated
3435	3800	Pipe	RCP	M-1616	M-1615	99.98	5550.5	5550	0.5	36	0.015	0	40.88	0	0	0	0	0	Calculated
3436	3801	Pipe	RCP	M-1615	I-2768	192.88	5550	5540	5.18	36	0.015	0	131.62	0	0	0	0	0	Calculated
3437	3802	Pipe	RCP	I-2768	I-2766	171.62	5539.7	5531.3	4.89	36	0.015	0	127.12	0	0	0	0	0	Calculated
3438	3803	Pipe	RCP	I-2767	I-2766	23.54	5533.4	5531.5	8.07	15	0.015	0	15.91	0	0	0	0	0	Calculated
3439	3804	Pipe	RCP	I-2766	M-1614	27.23	5531.4	5528.5	10.65	36	0.015	0	188.64	0	0	0	0	0	Calculated
3440	3805	Pipe	RCP	M-1614	I-2764	33.99	5528.5	5525.2	9.71	36	0.015	0	180.11	0	0	0	0	0	Calculated
3441	3806	Pipe	RCP	I-2764	I-2765	25.01	5524.2	5523.5	2.8	48	0.015	11.49	208.27	0.06	6.76	0.77	0.19	0	Calculated
3442	3807	Pipe	RCP	I-2751	I-2750	23.64	5552.6	5549.1	14.81	15	0.015	0	21.54	0	0	0	0	0	Calculated
3443	3808	Pipe	RCP	I-2750	M-1604	139.68	5548.9	5547.9	0.72	18	0.015	0	7.7	0	0	0	0	0	Calculated
3444	3809	Pipe	RCP	M-1604	M-1605	102.43	5547.5	5547.4	0.1	18	0.015	0	2.84	0	0	0	0	0	Calculated
3445	3810	Pipe	RCP	I-2752	M-1605	200.54	0	0	0	15	0.015	0	6.73	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3446	3811	Pipe	RCP	M-1605	I-2753	200.08	5543.7	5542.7	0.5	18	0.015	0	6.44	0	0	0	0	0	Calculated
3447	3813	Pipe	HDPE	I-2722	I-2723	39.64	4417.7	4417.1	1.51	15	0.015	0.59	6.89	0.09	0.56	1.25	1	27	SURCHARGED
3448	3814	Pipe	HDPE	I-2723	O-290	203.06	4417	4413	1.97	15	0.015	8.21	7.86	1.05	6.69	1.25	1	39	SURCHARGED
3449	3815	Pipe	RCP	I-2741	I-2740	41.41	4415.4	4414.6	1.93	15	0.015	0	7.78	0	0	0	0	0	Calculated
3450	3816	Pipe	RCP	I-2740	M-1596	148.16	4414.5	4412	1.69	15	0.015	0	7.27	0	0	0	0	0	Calculated
3451	3818	Pipe	RCP	M-1596	O-294	142.2	4411.9	4410.4	1.05	15	0.015	0	5.75	0	0	0	0	0	Calculated
3452	3819	Pipe	RCP	I-2737	I-2736	53.99	4416.1	4415.7	0.74	12	0.015	0.86	2.66	0.32	1.17	0.96	1	0	SURCHARGED
3453	3820	Pipe	RCP	I-2736	M-1593	205.73	4415	4414.7	0.15	15	0.015	4.24	2.14	1.98	3.61	1.25	1	14	SURCHARGED
3454	3821	Pipe	RCP	M-1593	M-1594	205.98	4414.7	4413.6	0.53	15	0.015	4.06	4.09	0.99	3.58	1.25	1	14	SURCHARGED
3455	3822	Pipe	RCP	M-1594	M-1595	79.61	4413.5	4413.1	0.5	15	0.015	3.91	3.97	0.99	3.29	1.25	1	27	SURCHARGED
3456	3823	Pipe	RCP	M-1595	I-2738	186.1	4412.6	4412.3	0.16	15	0.015	3.91	3.43	1.14	3.54	1.25	1	33	SURCHARGED
3457	3824	Pipe	RCP	I-2739	I-2738	35.27	4415	4412.3	7.66	15	0.015	0	15.49	0	0	0.63	0.5	0	Calculated
3458	3825	Pipe	RCP	I-2738	O-293	251.02	4412.2	4410.4	0.72	15	0.015	3.95	4.87	0.81	4.35	1.25	1	41	SURCHARGED
3459	3827	Pipe	HDPE	I-2727	I-2726	51.58	4414.6	4414.2	0.78	15	0.015	0	4.93	0	0	0	0	0	Calculated
3460	3828	Pipe	HDPE	M-1597	I-2726	217.54	4414.5	4414.2	0.14	15	0.015	0	2.11	0	0	0	0	0	Calculated
3461	3830	Pipe	RCP	I-2726	M-1586	72.58	4414	4413.1	1.24	15	0.015	0	6.23	0	0	0	0	0	Calculated
3462	3831	Pipe	HDPE	I-2729	I-2728	39.38	4415.2	4414.7	1.27	15	0.015	0	6.31	0	0	0	0	0	Calculated
3463	3832	Pipe	HDPE	I-2728	M-1586	69.85	4414.6	4413.1	2.15	15	0.015	0	8.2	0	0	0	0	0	Calculated
3464	3833	Pipe	HDPE	M-1586	M-1587	267.52	4413	4411.9	0.41	18	0.015	0	5.84	0	0	0	0	0	Calculated
3465	3834	Pipe	HDPE	M-1587	M-1585	398.71	4411.8	4410.1	0.43	18	0.015	0	5.94	0	0	0.73	0.5	0	Calculated
3466	3836	Pipe	HDPE	M-1584	M-1585	39.01	4410.3	4410.2	0.26	18	0.015	0.26	4.61	0.06	0.79	1.31	0.96	0	Calculated
3467	3837	Pipe	HDPE	M-1585	I-2725	374.93	4410	4408.8	0.32	18	0.015	2.81	5.15	0.54	1.79	1.5	1	35	SURCHARGED
3468	3838	Pipe	HDPE	I-2724	I-2725	37.51	4409.3	4408.8	1.33	15	0.015	0.41	6.46	0.06	0.35	1.25	1	57	SURCHARGED
3469	3840	Pipe	HDPE	I-2725	M-1588	69.53	4408.7	4407.4	1.87	18	0.015	2.81	12.3	0.23	1.59	1.5	1	62	SURCHARGED
3470	3841	Pipe	HDPE	I-2730	I-2731	45.15	4410	4409.6	0.89	15	0.015	0.37	5.27	0.07	0.58	1.25	1	47	SURCHARGED
3471	3842	Pipe	HDPE	I-2731	M-1588	80.45	4409.5	4408	1.86	15	0.015	0.63	7.64	0.08	0.54	1.25	1	54	SURCHARGED
3472	3843	Pipe	HDPE	M-1588	M-1589	383.89	4407.4	4407.3	0.03	24	0.015	13.33	3.61	3.69	4.24	2	1	48	SURCHARGED
3473	3844	Pipe	HDPE	M-1589	M-1590	348.99	4407.2	4406	0.34	24	0.015	13.33	11.5	1.16	4.35	1.93	0.96	0	> CAPACITY
3474	3845	Pipe	HDPE	M-1590	I-2732	369.39	4405.9	4404.3	0.43	24	0.015	13.16	12.9	1.02	4.32	1.88	0.94	0	> CAPACITY
3475	3847	Pipe	HDPE	I-2732	I-2733	34.42	4404.2	4404.1	0.29	24	0.015	13.16	10.57	1.25	4.88	1.6	0.8	0	> CAPACITY
3476	3848	Pipe	HDPE	I-2733	O-291	56.11	4404	4396	14.26	24	0.015	13.16	74.03	0.18	10.1	1.29	0.65	0	Calculated
3477	3849	Pipe	HDPE	M-1592	M-1591	201.89	4409	4408.9	0.05	18	0.015	8.74	2.03	4.31	4.94	1.5	1	20	SURCHARGED
3478	3851	Pipe	HDPE	M-1591	I-2735	206.61	4408.8	4408	0.39	18	0.015	8.74	5.66	1.54	4.94	1.5	1	13	SURCHARGED
3479	3852	Pipe	HDPE	I-2735	I-2734	33.97	4407.9	4407.7	0.59	18	0.015	8.74	6.99	1.25	5.3	1.32	0.88	0	> CAPACITY
3480	3853	Pipe	HDPE	I-2734	O-292	48.34	4407.6	4399.4	16.96	24	0.015	8.74	80.75	0.11	14.22	0.5	0.25	0	Calculated
3481	3854	Pipe	HDPE	M-265	M-1120	332.28	4399.8	4375	7.46	15	0.015	5.1	15.29	0.33	5.57	0.87	0.7	0	Calculated
3482	3855	Pipe	HDPE	M-1120	I-1177	122.68	4375	4374.6	0.33	15	0.015	5.1	3.2	1.59	4.51	1.08	0.87	0	> CAPACITY
3483	3856	Pipe	HDPE	I-1178	O-217	163.39	4371.5	4356.4	9.24	15	0.015	5.09	17.02	0.3	11.72	0.58	0.46	0	Calculated
3484	3858	Pipe	RCP	I-1511	M-851	73.26	4418.6	4418.5	0.14	15	0.015	0	2.07	0	0	0	0	0	Calculated
3485	3859	Pipe	RCP	I-1510	M-851	5.5	4418.7	4417.7	18.18	15	0.015	0	11.94	0	0	0	0	0	Calculated
3486	3863	Pipe	HDPE	I-2515	M-1474	8.93	4421	4420.1	10.08	15	0.015	0	17.77	0	0	0	0	0	Calculated
3487	3866	Pipe	HDPE	I-2516	M-1474	38.67	4422	4420.4	4.14	15	0.015	0	11.39	0	0	0	0	0	Calculated
3488	3867	Pipe	HDPE	M-1474	M-1475	67.75	4420.2	4420	0.3	15	0.015	0	3.04	0	0	0	0	0	Calculated
3489	3868	Pipe	HDPE	I-2519	I-2518	39.58	4421	4420	2.53	15	0.015	0	8.9	0	0	0	0	0	Calculated
3490	3873	Pipe	HDPE	I-2518	M-1475	297.67	4416	4415	0.34	30	0.015	2.57	20.6	0.12	2.52	0.71	0.29	0	Calculated
3491	3874	Pipe	HDPE	I-2520	M-1476	42.31	4424.6	4424	1.42	15	0.015	0.02	6.67	0	0.06	0.51	0.41	0	Calculated
3492	3875	Pipe	HDPE	I-2521	M-1476	6.69	4424.2	4424	2.99	15	0.015	0.01	9.68	0	0.05	0.71	0.57	0	Calculated
3493	3876	Pipe	HDPE	M-1476	M-1475	298.09	4424	4420.1	1.31	18	0.015	5.47	10.41	0.53	5.79	0.79	0.53	0	Calculated
3494	3877	Pipe	HDPE	M-1475	I-2517	302.66	4414.9	4413.4	0.5	30	0.015	7.25	25.03	0.29	4.32	0.94	0.37	0	Calculated
3495	3880	Pipe	HDPE	I-2517	O-260	205.72	4413.3	4400	6.47	30	0.015	10.14	90.39	0.11	6.28	1.53	0.61	0	Calculated
3496	3881	Pipe	HDPE	I-2315	I-2661	259.45	4428	4426.1	0.73	18	0.015	6.93	7.79	0.89	3.92	1.5	1	124	SURCHARGED
3497	3882	Pipe	HDPE	I-2662	I-2661	38.35	4426.5	4426.1	1.04	15	0.015	0.99	5.72	0.17	0.8	1.25	1	139	SURCHARGED
3498	3883	Pipe	HDPE	I-2661	I-2663	276.78	4426	4425.9	0.04	18	0.015	4.3	1.73	2.48	2.43	1.5	1	140	SURCHARGED
3499	3884	Pipe	HDPE	I-2664	I-2663	48.19	4429	4425.9	6.43	15	0.015	0.21	14.2	0.01	0.31	0.68	0.56	0	Calculated
3500	3885	Pipe	HDPE	I-2663	I-2337	113.74	4425.8	4425.7	0.09	18	0.015	4.3	2.7	1.59	2.43	1.5	1	141	SURCHARGED
3501	3887	Pipe	RCP	I-2337	I-2338	60.73	4425.8	4425.6	0.33	15	0.015	4.3	3.21	1.34	3.5	1.25	1	146	SURCHARGED
3502	3888	Pipe	RCP	I-2338	I-2784	23.43	4425.5	4425.4	0.43	15	0.015	4.3	0.37	11.75	3.5	1.25	1	150	SURCHARGED
3503	3889	Pipe	RCP	I-2655	I-2654	68.49	4436.8	4436.6	0.29	15	0.015	0.25	3.03	0.08	0.76	0.87	0.76	0	Calculated
3504	3890	Pipe	RCP	I-2656	I-2654	24.03	4437.1	4436.6	2.08	15	0.015	0.13	8.08	0.02	0.38	0.72	0.64	0	Calculated
3505	3891	Pipe	RCP	I-2654	M-1550	234.43	4436.5	4436	0.21	15	0.015	1.05	2.59	0.4	0.94	1.16	0.96	0	Calculated
3506	3892	Pipe	RCP	M-1550	M-1551	232.36	4436.1	4434.7	0.6	15	0.015	1.27	4.35	0.29	1.43	1.25	1	28	SURCHARGED
3507	3893	Pipe	RCP	I-2657	M-1551	16.56	4435.7	4434.7	6.04	15	0.015	2.63	13.76	0.19	3.29	1.25	1	39	SURCHARGED

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3508	3894	Pipe	RCP	M-1551	I-2658	92.54	4434.6	4434.5	0.11	15	0.015	3.41	1.93	1.77	3.34	1.25	1	81	SURCHARGED
3509	3895	Pipe	RCP TO HDPE	I-2658	M-965	230.22	4434.3	4430.8	1.52	18	0.015	3.64	11.22	0.32	2.55	1.5	1	83	SURCHARGED
3510	3897	Pipe	RCP	I-2659	I-2660	25.01	4436.6	4436.3	1.2	18	0.015	0	9.97	0	0	0	0	0	Calculated
3511	3898	Pipe	18 RCP TO 15 HDPE	I-2660	I-1759	248.6	4436.2	4431.4	1.93	18	0.015	0	12.65	0	0	0	0	0	Calculated
3512	3899	Pipe	RCP	I-893	I-2678	86.7	4440.2	4440.1	0.12	15	0.015	0.03	1.9	0.02	0.26	0.79	0.63	0	Calculated
3513	3900	Pipe	RCP	I-2678	M-523	31.85	4440.5	4440.3	0.63	15	0.015	0.06	4.44	0.01	0.45	0.54	0.43	0	Calculated
3514	3901	Pipe	RCP	I-2676	I-2675	47.79	4442.7	4441.2	3.14	15	0.015	0	9.92	0	0	0.05	0.04	0	Calculated
3515	3902	Pipe	RCP	I-2675	I-2674	43.4	4441	4440.7	0.69	15	0.015	0.01	4.65	0	0.1	0.46	0.37	0	Calculated
3516	3903	Pipe	RCP	I-2674	I-2677	87.78	4440.6	4440.5	0.11	18	0.015	0.13	3.07	0.04	0.24	0.76	0.51	0	Calculated
3517	3904	Pipe	RCP	I-2677	M-523	232.23	4440.4	4440.3	0.04	15	0.015	1.37	1.16	1.18	1.72	0.77	0.62	0	> CAPACITY
3518	3905	Pipe	RCP	M-1559	I-2674	189.22	4440.8	4440.7	0.05	15	0.015	0.08	1.29	0.06	0.38	0.56	0.45	0	Calculated
3519	3906	Pipe	RCP	I-2673	M-1559	148.33	4440.8	4440.7	0.07	15	0.015	0.04	0.15	0.27	0.41	0.51	0.41	0	Calculated
3520	3907	Pipe	RCP	I-2672	I-2671	21.69	4441.6	4441.4	0.92	15	0.015	0	18.07	0	0	0	0	0	Calculated
3521	3908	Pipe	RCP	I-2671	I-2673	45.87	4441.3	4441	0.65	15	0.015	0	4.53	0	0.01	0.16	0.13	0	Calculated
3522	3909	Pipe	RCP	I-2670	I-2669	35.33	4438.3	4437.3	2.83	15	0.015	0	9.42	0	0	0	0	0	Calculated
3523	3910	Pipe	RCP	I-2669	M-1558	123.77	4436.9	4436.4	0.4	15	0.015	0	3.56	0	0	0	0	0	Calculated
3524	3911	Pipe	RCP	M-1558	M-1557	200.97	4436.3	4434	1.14	15	0.015	0	5.99	0	0	0	0	0	Calculated
3525	3912	Pipe	RCP	I-2667	I-2668	38.57	4437.1	4436.1	2.59	15	0.015	0	9.01	0	0	0	0	0	Calculated
3526	3913	Pipe	RCP	I-2668	M-1556	329.96	4436	4435.3	0.21	15	0.015	0	2.58	0	0	0	0	0	Calculated
3527	3915	Pipe	RCP	M-1556	M-1557	151.85	4435.2	4433.5	1.12	15	0.015	0	5.92	0	0	0	0	0	Calculated
3528	3916	Pipe	RCP	M-1557	M-967	133.7	4433.4	4432.8	0.45	15	0.015	0	3.75	0	0	0	0	0	Calculated
3529	3917	Pipe	RCP	I-1760	M-967	36.26	4434.3	4432.8	4.14	15	0.015	0	11.39	0	0	0	0	0	Calculated
3530	3919	Pipe	RCP	M-1555	M-1554	116.72	4430.5	4430.4	0.09	15	0.015	0.54	1.64	0.33	0.44	1.25	1	97	SURCHARGED
3531	3921	Pipe	RCP	M-1554	M-1553	27.42	4430.3	4430.2	0.36	15	0.015	0.66	3.38	0.19	0.54	1.25	1	101	SURCHARGED
3532	3922	Pipe	HDPE	M-1478	O-261	70.19	4407.8	4406	2.56	36	0.015	33.12	92.57	0.36	9.95	1.43	0.48	0	Calculated
3533	3923	Pipe	HDPE	M-1477	M-1478	226.3	4415.4	4407.8	3.36	36	0.015	33.12	105.93	0.31	10.09	1.41	0.47	0	Calculated
3534	3924	Pipe	HDPE	I-2332	I-2781	11.78	4426.7	4426.6	0.85	21	0.015	2.38	12.65	0.19	2.66	0.72	0.41	0	Calculated
3535	3925	Pipe	RCP	M-1398	I-2569	64.87	4426.6	4426	0.92	24	0.015	11.79	18.86	0.63	3.83	2	1	62	SURCHARGED
3536	3926	Pipe	RCP	M-1399	M-1398	120.2	4428.2	4426.7	1.25	18	0.015	11.78	10.17	1.16	6.67	1.5	1	62	SURCHARGED
3537	3927	Pipe	RCP	I-2339	M-1399	18.48	4431.6	4431.5	0.54	15	0.015	0.31	4.12	0.08	1.19	1.21	0.98	0	Calculated
3538	3929	Pipe	HDPE	I-2785	I-2341	65.36	4428	4426.8	1.84	15	0.015	0	7.59	0	0	0	0	0	Calculated
3539	3930	Pipe	HDPE	I-2343	I-2341	29.44	4428	4426.8	4.08	15	0.015	0	11.3	0	0	0	0	0	Calculated
3540	3937	Pipe	HDPE	M-1401	I-2345	35.84	4428.7	4428.5	0.56	18	0.015	3.69	6.8	0.54	2.31	1.5	1	13	SURCHARGED
3541	3938	Pipe	RCP	M-1553	I-2665	66.68	4430	4429.9	0.15	15	0.015	0.65	2.17	0.3	0.53	1.25	1	110	SURCHARGED
3542	3940	Pipe	RCP	I-2666	I-2665	26.97	4431.2	4430	4.45	15	0.015	0.86	11.81	0.07	0.86	1.25	1	89	SURCHARGED
3543	3942	Pipe	RCP	I-2665	M-1552	397.83	4429.8	4429.4	0.1	15	0.015	3.69	1.78	2.08	3.01	1.25	1	95	SURCHARGED
3544	3943	Pipe	RCP	M-1552	M-1401	275.31	4429.3	4428.7	0.22	15	0.015	3.69	2.61	1.41	3.01	1.25	1	36	SURCHARGED
3545	3944	Pipe	HDPE	I-2345	M-1625	68.37	4428.5	4428.3	0.29	15	0.015	3.69	3.03	1.22	3.11	1.25	1	34	SURCHARGED
3546	3945	Pipe	HDPE	M-1625	I-2346	73.94	4428.3	4427.9	0.54	15	0.015	3.69	4.12	0.9	3.7	1.25	1	32	SURCHARGED
3547	3946	Pipe	HDPE	I-2346	I-2578	16.33	4427.9	4427.6	1.84	15	0.015	3.72	7.59	0.49	4.78	1.25	1	33	SURCHARGED
3548	3947	Pipe	RCP	I-2720	I-2721	30.8	4420	4419.6	1.3	12	0.015	0.02	3.52	0.01	0.14	0.91	0.91	0	Calculated
3549	3948	Pipe	RCP	I-2721	M-1583	168.32	4419.5	4419.3	0.12	18	0.015	3.95	3.14	1.26	3.02	1.04	0.69	0	> CAPACITY
3550	3949	Pipe	RCP	M-1583	O-298	355.77	4419.4	4415	1.24	18	0.015	3.93	10.12	0.39	5.25	0.84	0.56	0	Calculated
3551	3951	Pipe	HDPE	M-1581	I-2719	12.82	4419.5	4419	3.9	12	0.015	1.53	6.1	0.25	2.01	1	1	30	SURCHARGED
3552	3952	Pipe	HDPE	I-2719	M-1580	4.32	4418.9	4418.5	9.26	10	0.015	1.45	5.72	0.25	2.68	0.83	1	36	SURCHARGED
3553	3953	Pipe	RCP	I-2718	M-1580	22.67	4419	4418.5	2.21	15	0.015	0.83	8.31	0.1	0.73	1.25	1	31	SURCHARGED
3554	3954	Pipe	RCP	M-1580	M-1582	197.42	4418.4	4416.7	0.86	15	0.015	6.71	5.2	1.29	5.7	1.15	0.92	0	> CAPACITY
3555	3955	Pipe	RCP	M-1582	O-289	87.96	4416.6	4411	6.37	15	0.015	6.74	10.63	0.63	10.32	0.82	0.66	0	Calculated
3556	3958	Pipe	RCP	M-1403	M-1404	70.28	4424.7	4419.7	7.11	18	0.015	0	24.28	0	0	0	0	0	Calculated
3557	3959	Pipe	RCP	M-1404	I-2350	46.66	4423.7	4423.2	1.07	24	0.015	0	20.3	0	0	0	0	0	Calculated
3558	3960	Pipe	RCP	I-2352	I-2351	49.5	4425.5	4424.6	1.82	18	0.015	0	12.28	0	0	0	0	0	Calculated
3559	3961	Pipe	RCP	I-2351	I-2350	100.34	4424.5	4423.1	1.4	18	0.015	0	10.79	0	0	0	0	0	Calculated
3560	3962	Pipe	PVC	I-2353	I-2356	130.74	4426.3	4426	0.23	6	0.015	0	0.23	0	0	0	0	0	Calculated
3561	3963	Pipe	RCP	I-2356	I-2357	157.64	4425.2	4423.7	0.95	15	0.015	0	5.46	0	0	0	0	0	Calculated
3562	3964	Pipe	CMP	I-2354	I-2355	8.99	4423.1	4423	1.11	18	0.015	0	9.6	0	0	0	0	0	Calculated
3563	3965	Pipe	RCP	I-2355	I-2604	97.25	4422.9	4421.5	1.44	24	0.015	0	23.52	0	0	0	0	0	Calculated
3564	3967	Pipe	RCP	M-1405	I-2358	132.62	4420	4419.5	0.38	24	0.015	10.11	12.04	0.84	3.65	1.66	0.83	0	Calculated
3565	3968	Pipe	RCP	M-1462	M-1405	250.89	4420.9	4420.1	0.32	24	0.015	10.11	11.07	0.91	3.22	2	1	29	SURCHARGED
3566	3969	Pipe	RCP	I-2469	M-1462	32.73	4423.1	4421.4	5.19	15	0.015	0.07	12.76	0.01	0.12	0.74	0.6	0	Calculated
3567	3970	Pipe	RCP	M-1461	M-1462	113.81	4421.1	4421	0.09	24	0.015	10.11	8.22	1.23	3.22	2	1	25	SURCHARGED
3568	3971	Pipe	RCP	I-2468	M-1461	20.02	4423	4421.4	7.99	15	0.015	0.18	15.83	0.01	0.21	1.02	0.83	0	Calculated
3569	3972	Pipe	RCP	M-1446	M-1461	176.16	4421.3	4421.2	0.06	24	0.015	0.46	4.67	0.1	0.22	2	1	27	SURCHARGED

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3570	3973	Pipe	RCP	I-2471	I-2470	130.82	4425.2	4424.4	0.61	12	0.015	0	2.41	0	0	0	0	0	Calculated
3571	3974	Pipe	RCP	I-2470	M-1460	17.49	4424.3	4423.2	6.29	15	0.015	0	14.04	0	0	0.3	0.25	0	Calculated
3572	3975	Pipe	RCP	I-2467	M-1460	23.44	4424.5	4423.2	5.55	15	0.015	0	13.18	0	0	0.3	0.25	0	Calculated
3573	3976	Pipe	RCP	M-1460	M-1446	154.03	4422.9	4421.6	0.84	15	0.015	0.35	5.14	0.07	0.38	1.07	0.87	0	Calculated
3574	3980	Pipe	HDPE TO RCP	M-1457	M-1459	33.01	4424.1	4423.9	0.61	15	0.015	0.68	4.36	0.16	1.07	1.25	1	66	SURCHARGED
3575	3981	Pipe	RCP	I-2466	M-1458	10.06	4428.3	4424.5	37.77	15	0.015	2.24	34.54	0.06	2.14	1.25	1	14	SURCHARGED
3576	3982	Pipe	RCP	M-1458	M-1459	39.5	4422.4	4422.2	0.51	36	0.015	27.35	41.13	0.66	3.87	3	1	67	SURCHARGED
3577	3983	Pipe	RCP	I-2472	M-1458	26.77	4428.3	4424.5	14.19	15	0.015	2.73	21.09	0.13	2.24	1.25	1	14	SURCHARGED
3578	3984	Pipe	RCP	M-1459	M-618	126.09	4422.2	4422.1	0.08	36	0.015	52.48	16.28	3.22	7.42	3	1	63	SURCHARGED
3579	3985	Pipe	RCP	M-1456	M-1458	643.46	4425.9	4422.5	0.53	36	0.015	27.31	42.02	0.65	4.18	3	1	40	SURCHARGED
3580	3986	Pipe	RCP	I-2465	M-1456	16.27	4432	4427.9	25.2	15	0.015	1.33	28.1	0.05	2.05	0.76	0.62	0	Calculated
3581	3987	Pipe	RCP	I-2473	M-1456	23.74	4432	4428.2	16.01	15	0.015	0.95	22.55	0.04	1.48	0.74	0.6	0	Calculated
3582	3988	Pipe	RCP	M-1463	M-1456	239.64	4428.1	4426	0.88	36	0.015	30.63	54.11	0.57	6.71	3	1	19	SURCHARGED
3583	3989	Pipe	RCP	I-2474	M-1463	38.54	4433.1	4432	2.85	15	0.015	0	9.46	0	0	0.38	0.31	0	Calculated
3584	3990	Pipe	RCP	I-2525	M-1481	3.25	4428	4426.3	52.31	12	0.015	1.61	22.33	0.07	2.06	1	1	29	SURCHARGED
3585	3991	Pipe	RCP	I-2578	M-1481	187.63	4427.6	4426.5	0.59	24	0.015	3.89	15.01	0.26	3.5	2	1	14	SURCHARGED
3586	3993	Pipe	RCP	I-2786	M-1480	17.77	4432	4426.7	29.83	18	0.015	0	49.72	0	0	0.15	0.11	0	Calculated
3587	3994	Pipe	RCP	M-1480	New-28	176.06	4422.6	4421.7	0.51	24	0.015	18.49	14.02	1.32	6.41	2	1	43	SURCHARGED
3588	3995	Pipe	RCP	New-28	M-1479	171.01	4421.7	4418.8	1.7	30	0.015	16.95	46.29	0.37	4.14	2.5	1	26	SURCHARGED
3589	3997	Pipe	RCP	M-1479	New-27	337.43	4418.8	4418.6	0.06	30	0.015	25.03	8.65	2.89	5.1	2.5	1	85	SURCHARGED
3590	3998	Pipe	RCP	New-27	New-26	359.94	4418.6	4418.5	0.03	30	0.015	25.03	5.93	4.22	5.52	2.18	0.87	0	> CAPACITY
3591	3999	Pipe	RCP	New-26	M-1477	348.81	4418.5	4415.4	0.89	36	0.015	31.92	54.49	0.59	8.79	1.53	0.51	0	Calculated
3592	4002	Pipe	RCP	I-2792	M-1477	124.9	4427.5	4423.7	3.04	24	0.015	0.58	34.2	0.02	4.01	0.18	0.09	0	Calculated
3593	4003	Pipe	RCP	I-2526	I-2527	98.8	4426.8	4425.1	1.72	15	0.015	0	7.34	0	0	0	0	0	Calculated
3594	4004	Pipe	RCP	I-2527	O-263	30.32	4425	4424.8	0.66	15	0.015	0	18.1	0	0	0	0	0	Calculated
3595	4005	Pipe	RCP	I-2528	I-2529	23.33	4427	4423.8	13.72	15	0.015	2.92	20.73	0.14	4.92	0.64	0.51	0	Calculated
3596	4006	Pipe	RCP	I-2529	M-1482	10.98	4423.7	4423.6	0.91	12	0.015	2.92	2.95	0.99	4.04	0.87	0.87	0	Calculated
3597	4007	Pipe	RCP	I-2530	M-1482	59.11	4425	4423.6	2.37	12	0.015	0	4.75	0	0	0.31	0.31	0	Calculated
3598	4008	Pipe	RCP	M-1482	M-1483	500.31	4423.5	4420.1	0.68	15	0.015	2.92	4.62	0.63	2.81	0.99	0.79	0	Calculated
3599	4009	Pipe	RCP	M-1483	I-2531	153.48	4420.2	4420.1	0.07	15	0.015	2.92	1.43	2.05	2.86	1.25	1	40	SURCHARGED
3600	4010	Pipe	RCP	I-2533	I-2531	67.2	4420.9	4420	1.34	12	0.015	0.03	3.57	0.01	0.08	0.84	0.84	0	Calculated
3601	4011	Pipe	RCP	I-2531	M-1484	50.21	4420.1	4419	2.19	18	0.015	2.92	13.47	0.22	3.7	1.49	1	0	Calculated
3602	4013	Pipe	RCP	M-1484	I-2532	28.21	4419	4418.9	0.35	18	0.015	2.9	5.42	0.53	3.25	1.5	1	94	SURCHARGED
3603	4014	Pipe	RCP	I-2532	M-1485	270.26	4418.8	4417.7	0.41	18	0.015	2.87	5.81	0.49	2.91	1.5	1	95	SURCHARGED
3604	4015	Pipe	PVC	I-2534	M-1485	11.05	4420.3	4417.7	23.53	12	0.015	0.02	14.98	0	0.04	0.92	0.93	0	Calculated
3605	4016	Pipe	RCP	I-2535	M-1485	75.96	4418.1	4417.7	0.53	12	0.015	0.08	2.24	0.04	0.16	1	1	110	SURCHARGED
3606	4017	Pipe	RCP	M-1485	M-1486	141.54	4417.6	4417.3	0.21	18	0.015	2.85	4.19	0.68	2.84	1.5	1	110	SURCHARGED
3607	4018	Pipe	RCP	M-1486	M-1487	343.64	4417.2	4415.9	0.38	18	0.015	2.85	5.6	0.51	2.25	1.5	1	113	SURCHARGED
3608	4019	Pipe	RCP	M-1487	M-1488	355.1	4415.9	4415.5	0.11	18	0.015	2.86	3.06	0.93	1.83	1.5	1	131	SURCHARGED
3609	4020	Pipe	RCP	M-1488	O-265	127.43	4415.9	4415.2	0.55	18	0.015	1.8	6.75	0.27	1.02	1.5	1	128	SURCHARGED
3610	4023	Pipe	RCP	M-1488	DET_149	151.42	4414.7	4411.93	1.83	15	0.015	1.06	8.6	0.12	0.94	1.25	1	138	SURCHARGED
3611	4027	Pipe	PVC	M-1490	O-264	62.33	4411.5	4409	4.01	10	0.015	4.28	3.76	1.14	12.36	0.51	0.61	0	> CAPACITY
3612	4028	Pipe	RCP	I-2502	I-2501	131.98	4418.8	4419.5	-0.53	12	0.015	0	0.08	0	0	0	0	0	Calculated
3613	4029	Pipe	RCP	I-2500	I-2501	39.26	4419.6	4418.8	2.04	12	0.015	0	4.41	0	0	0	0	0	Calculated
3614	4031	Pipe	RCP	I-2503	I-2504	17.36	4418	4417	5.76	12	0.015	0	4.38	0	0	0	0	0	Calculated
3615	4032	Pipe	RCP	I-2504	I-2505	41.69	4417.7	4417.6	0.24	15	0.015	0	2.74	0	0	0	0	0	Calculated
3616	4033	Pipe	RCP	I-2505	M-1472	3.61	4417.5	4416.9	16.62	18	0.015	0	37.11	0	0	0	0	0	Calculated
3617	4034	Pipe	RCP	I-2501	M-1471	78.04	4418.7	4418.3	0.51	15	0.015	0	4.01	0	0	0	0	0	Calculated
3618	4035	Pipe	RCP	M-1471	M-1472	189.83	4418.2	4416.9	0.68	15	0.015	0	4.63	0	0	0	0	0	Calculated
3619	4036	Pipe	RCP	M-1472	I-2506	461.29	4416.9	4415.6	0.28	18	0.015	0	4.83	0	0	0	0	0	Calculated
3620	4037	Pipe	RCP	I-2507	I-2506	44.88	4416.1	4415.8	0.67	12	0.015	0	2.52	0	0	0	0	0	Calculated
3621	4038	Pipe	RCP	I-2506	I-2508	561.5	4415.5	4410.4	0.91	18	0.015	0	8.68	0	0	0	0	0	Calculated
3622	4039	Pipe	RCP	I-2509	I-2508	46.67	4412.6	4410.5	4.5	12	0.015	0	6.55	0	0	0	0	0	Calculated
3623	4040	Pipe	RCP	I-2508	M-1473	154.72	4410.3	4407.2	2	18	0.015	0	12.93	0	0	0	0	0	Calculated
3624	4041	Pipe	RCP	M-1473	I-2510	185.67	4407.1	4402.7	2.37	18	0.015	0	14.01	0	0	0.05	0.03	0	Calculated
3625	4042	Pipe	RCP	I-2511	I-2510	50.67	4406.7	4402.7	7.89	15	0.015	0	15.73	0	0	0.05	0.04	0	Calculated
3626	4043	Pipe	RCP	I-2510	O-259	379.76	4402.6	4384	4.9	24	0.015	0.83	43.39	0.02	5.3	0.19	0.1	0	Calculated
3627	4044	Pipe	RCP	M-1564	I-2513	253.29	4406	4405.9	0.04	24	0.015	0.83	3.9	0.21	1.47	0.47	0.23	0	Calculated
3628	4045	Pipe	RCP	I-2512	I-2513	28.01	4406.5	4405.9	2.14	15	0.015	0	8.19	0	0	0.07	0.06	0	Calculated
3629	4046	Pipe	RCP	I-2513	I-2510	92.8	4405.8	4402.7	3.34	15	0.015	0.83	10.23	0.08	4.88	0.24	0.2	0	Calculated
3630	4047	Pipe	RCP	I-2680	I-2679	24.16	4416	4414.3	7.04	15	0.015	0	14.85	0	0	0	0	0	Calculated
3631	4048	Pipe	RCP	I-2679	I-2681	255.81	4414.2	4412.6	0.63	15	0.015	0	4.43	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3632	4049	Pipe	RCP	I-2682	I-2681	25.07	4414.7	4412.6	8.38	15	0.015	0	16.2	0	0	0	0	0	Calculated
3633	4050	Pipe	RCP	I-2681	I-2683	405.82	4412.5	4411.2	0.32	15	0.015	0	3.18	0	0	0.23	0.18	0	Calculated
3634	4051	Pipe	RCP	I-2685	I-2684	47.52	4412.5	4411.4	2.31	15	0.015	0	8.52	0	0	0.13	0.1	0	Calculated
3635	4052	Pipe	RCP	I-2684	I-2683	58.8	4411.3	4411.1	0.34	18	0.015	0.01	5.04	0	0.15	0.44	0.29	0	Calculated
3636	4053	Pipe	RCP	M-1565	I-2684	205.39	4412	4411.4	0.29	18	0.015	0	4.92	0	0	0.13	0.08	0	Calculated
3637	4054	Pipe	RCP	I-2683	I-2686	347.02	4411.2	4410.3	0.26	24	0.015	0.11	9.98	0.01	0.14	0.9	0.45	0	Calculated
3638	4055	Pipe	RCP	I-2687	I-2686	24.1	4411	4410.3	2.9	15	0.015	1.68	9.54	0.18	2.02	0.8	0.64	0	Calculated
3639	4056	Pipe	RCP	I-2686	I-2688	179.42	4410.3	4410.2	0.06	24	0.015	1.69	4.63	0.37	0.72	1.41	0.71	0	Calculated
3640	4057	Pipe	RCP	I-2688	I-2689	107.2	4410.2	4409.7	0.47	24	0.015	1.7	13.39	0.13	0.59	1.74	0.87	0	Calculated
3641	4058	Pipe	RCP	M-1560	I-2689	25.23	4410	4409.7	1.19	24	0.015	0.04	21.38	0	0.25	1.84	0.92	0	Calculated
3642	4060	Pipe	RCP	I-2690	I-2689	23.87	4415	4413.6	5.87	15	0.015	0	14.72	0	0	0	0	0	Calculated
3643	4061	Pipe	RCP	I-2689	I-2691	61.64	4409.6	4408.6	1.62	30	0.015	1.7	45.28	0.04	0.36	2.3	0.92	0	Calculated
3644	4062	Pipe	RCP	I-2691	M-1561	65.35	4408.6	4408.07	0.81	30	0.015	21.63	32.01	0.68	6.55	2.5	1	121	SURCHARGED
3645	4063	Pipe	HDPE	M-1561	M-1562	118.15	4410.6	4409.9	0.59	4	0.015	0	0.13	0.01	0.02	0.33	1	116	SURCHARGED
3646	4064	Pipe	RCP	M-1563	M-1564	81.98	4406.12	4405.7	0.51	24	0.015	0.83	14.03	0.06	0.81	0.72	0.36	0	Calculated
3647	4065	Pipe		I-2697	I-2696	28.77	4413.7	4413.4	1.04	15	0.015	0	7	0	0	0	0	0	Calculated
3648	4066	Pipe	RCP	I-2696	M-1565	32.59	4413.3	4412.3	3.07	15	0.015	0	9.95	0	0	0	0	0	Calculated
3649	4067	Pipe	RCP	I-2695	I-2694	23.09	4414	4413.1	3.9	15	0.015	0	10.87	0	0	0	0	0	Calculated
3650	4068	Pipe	RCP	I-2694	M-1565	80.71	4413.1	4412.3	0.99	15	0.015	0	5.68	0	0	0	0	0	Calculated
3651	4069	Pipe	RCP	I-2692	I-2693	24.91	4416.1	4415.5	2.41	15	0.015	0	8.76	0	0	0	0	0	Calculated
3652	4070	Pipe	RCP	I-2693	I-2694	321.85	4415.4	4413.1	0.71	15	0.015	0	4.7	0	0	0	0	0	Calculated
3653	4071	Pipe	RCP	I-2698	I-2699	24.45	4415.1	4412.9	9	15	0.015	0	16.79	0	0	0	0	0	Calculated
3654	4072	Pipe	RCP	I-2699	I-2700	59.89	4412.8	4409.2	6.01	15	0.015	0	13.73	0	0	0.63	0.5	0	Calculated
3655	4073	Pipe	RCP	I-2710	I-2709	32.83	4416.3	4413.4	8.83	12	0.015	0.53	7.64	0.07	1.29	0.51	0.58	0	Calculated
3656	4074	Pipe	RCP	I-2709	M-1570	386.11	4413.3	4412.8	0.13	15	0.015	1.08	3.49	0.31	0.98	1.25	1	12	SURCHARGED
3657	4075	Pipe	RCP	I-2708	M-1570	76.62	4416	4413.8	2.87	15	0.015	0.04	11.06	0	0.07	0.63	0.5	0	Calculated
3658	4076	Pipe	RCP	M-1570	I-2706	300.6	4412.5	4412	0.17	15	0.015	1.77	1.65	1.08	1.51	1.25	1	55	SURCHARGED
3659	4077	Pipe	RCP	I-2707	I-2706	27.7	4413.3	4412.5	2.89	15	0.015	0.4	9.51	0.04	0.42	1.25	1	44	SURCHARGED
3660	4078	Pipe	RCP	I-2706	M-1569	372.14	4412.4	4411.5	0.24	15	0.015	1.99	2.75	0.72	1.7	1.25	1	61	SURCHARGED
3661	4079	Pipe	RCP	M-1569	M-1568	161.58	4411.5	4411	0.31	15	0.015	1.99	3.11	0.64	1.62	1.25	1	84	SURCHARGED
3662	4080	Pipe	RCP	I-2705	M-1568	32.73	4411.9	4411	2.75	15	0.015	0.52	9.28	0.06	0.43	1.25	1	75	SURCHARGED
3663	4081	Pipe	RCP	M-1568	I-2703	62.51	4411	4410.9	0.16	18	0.015	7.27	3.64	2	4.11	1.5	1	90	SURCHARGED
3664	4082	Pipe	RCP	I-2704	I-2703	25.06	4412.3	4410.9	5.59	15	0.015	0.42	13.23	0.03	0.51	1.25	1	59	SURCHARGED
3665	4083	Pipe	RCP	I-2703	I-2702	41.91	4410.8	4410.6	0.48	18	0.015	7.28	6.29	1.16	4.12	1.5	1	93	SURCHARGED
3666	4084	Pipe	RCP	I-2702	I-2701	74.06	4410.5	4410.3	0.27	18	0.015	7.26	4.73	1.53	4.11	1.5	1	105	SURCHARGED
3667	4085	Pipe	RCP	I-2701	M-1567	93.8	4410.2	4409.5	0.75	18	0.015	7.26	7.86	0.92	4.11	1.5	1	130	SURCHARGED
3668	4086	Pipe	RCP	M-1567	I-2700	76.25	4409.4	4409.2	0.26	18	0.015	7.26	4.66	1.56	4.11	1.5	1	160	SURCHARGED
3669	4087	Pipe	RCP	I-2700	M-1566	78.83	4409.1	4409	0.13	18	0.015	7.26	3.24	2.24	4.11	1.5	1	159	SURCHARGED
3670	4088	Pipe	RCP	M-1566	I-2691	102.27	4408.9	4408.6	0.29	18	0.015	7.26	4.93	1.47	4.11	1.5	1	158	SURCHARGED
3671	4089	Pipe	RCP	I-2712	I-2711	26.24	4415.1	4414.7	1.52	12	0.015	0.29	3.81	0.08	0.77	0.86	1	0	SURCHARGED
3672	4090	Pipe	RCP	I-2711	M-1571	175.95	4414.6	4413.6	0.57	15	0.015	0.94	4.22	0.22	1.38	1.24	1	2	SURCHARGED
3673	4091	Pipe	RCP	M-1571	M-1572	130.42	4413.5	4413.4	0.08	15	0.015	1.29	1.55	0.83	1.35	1.25	1	38	SURCHARGED
3674	4092	Pipe	RCP	M-1572	M-1573	236.61	4413.3	4413.2	0.04	15	0.015	1.44	1.15	1.25	1.43	1.25	1	42	SURCHARGED
3675	4093	Pipe	RCP	M-1573	I-2713	96.16	4413.1	4412.6	0.52	15	0.015	1.43	4.04	0.36	1.24	1.25	1	47	SURCHARGED
3676	4094	Pipe	RCP	I-2714	I-2713	22.88	4413.1	4412.6	2.19	12	0.015	0.26	4.56	0.06	0.72	1	1	54	SURCHARGED
3677	4095	Pipe	RCP	I-2713	M-1574	162.39	4412.5	4412	0.31	15	0.015	1.43	3.11	0.46	1.31	1.25	1	62	SURCHARGED
3678	4096	Pipe	RCP	M-1574	M-1575	152.21	4411.9	4411.7	0.13	15	0.015	1.61	2.03	0.79	1.39	1.25	1	74	SURCHARGED
3679	4097	Pipe	RCP	M-1575	M-1576	101.35	4411.6	4411.5	0.1	15	0.015	1.58	1.76	0.9	1.29	1.25	1	81	SURCHARGED
3680	4098	Pipe	RCP	M-1576	M-1577	80.51	4411.5	4411.2	0.37	15	0.015	1.6	3.42	0.47	1.3	1.25	1	84	SURCHARGED
3681	4099	Pipe	RCP	M-1577	M-1568	96.3	4411.1	4411	0.1	15	0.015	1.59	1.8	0.88	1.29	1.25	1	98	SURCHARGED
3682	4104	Pipe	HDPE	I-1438	I-1437	269.06	4436.6	4436.5	0.04	18	0.015	2.95	3.28	0.9	2.59	0.93	0.62	0	Calculated
3683	4105	Pipe	HDPE	I-1439	I-1438	86.7	4437.6	4437.2	0.46	15	0.015	2.96	3.8	0.78	3.27	0.87	0.69	0	Calculated
3684	4112	Pipe	RCP	M-1541	M-1442	368.17	4491.2	4488.11	0.84	15	0.015	0	5.13	0	0	0.37	0.3	0	Calculated
3685	4113	Pipe	RCP	M-1442	M-1540	301.52	4488	4485.5	0.83	18	0.015	3.85	8.47	0.45	4.56	0.72	0.48	0	Calculated
3686	4114	Pipe	RCP	M-1540	M-1539	149.12	4485.4	4482.6	1.88	18	0.015	3.85	12.47	0.31	4.94	0.71	0.47	0	Calculated
3687	4116	Pipe	RCP	I-2651	M-1539	22.68	4482.55	4482.55	0	15	0.015	0.02	0.37	0.05	0.47	0.89	0.71	0	Calculated
3688	4117	Pipe	RCP	M-1539	M-1538	257.58	4482.5	4481.1	0.54	24	0.015	6.5	14.45	0.45	3.19	1.25	0.63	0	Calculated
3689	4118	Pipe	RCP	M-1538	M-1537	98.02	4481	4480.9	0.1	24	0.015	6.47	6.26	1.03	2.4	1.61	0.81	0	> CAPACITY
3690	4119	Pipe	RCP	M-1537	I-2650	59.03	4480.8	4480.7	0.17	24	0.015	6.47	8.07	0.8	2.37	1.63	0.82	0	Calculated
3691	4120	Pipe	RCP	I-2649	I-2650	29.76	4481.5	4480.8	2.35	15	0.015	0.03	8.59	0	0.08	1.03	0.82	0	Calculated
3692	4121	Pipe	RCP	I-2650	I-2647	336.51	4480.8	4480.3	0.15	24	0.015	6.44	7.56	0.85	2.64	1.46	0.73	0	Calculated
3693	4122	Pipe	RCP	I-2648	I-2647	26.63	4481.9	4480.35	5.82	15	0.015	0	13.51	0	0	0.63	0.5	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3694	4123	Pipe	RCP	I-2647	M-1437	59.46	4480.4	4480.05	0.59	24	0.015	6.41	15.04	0.43	2.71	1.42	0.71	0	Calculated
3695	4124	Pipe	RCP	I-2446	I-2445	112.35	4485.5	4483.45	1.82	18	0.015	0	12.3	0	0	0	0	0	Calculated
3696	4125	Pipe	RCP	I-2444	I-2445	20.35	4484.54	4483.45	5.36	15	0.015	0	12.96	0	0	0	0	0	Calculated
3697	4127	Pipe	RCP	I-2445	M-1441	88.85	4483.4	4482.2	1.35	18	0.015	0	10.58	0	0	0	0	0	Calculated
3698	4128	Pipe	RCP	M-1441	M-1439	76.67	4482.1	4481.8	0.39	18	0.015	0	5.69	0	0	0	0	0	Calculated
3699	4129	Pipe	RCP	I-2438	I-2439	22.63	4484.25	4483.7	2.43	15	0.015	0	8.73	0	0	0	0	0	Calculated
3700	4130	Pipe	RCP	I-2439	I-2440	73.6	4483.65	4482.75	1.22	18	0.015	0	10.07	0	0	0	0	0	Calculated
3701	4131	Pipe	RCP	I-2440	I-2442	183.04	4482.7	4482.3	0.22	18	0.015	0	4.26	0	0	0	0	0	Calculated
3702	4132	Pipe	RCP	I-2441	I-2442	19.43	4482.7	4482.3	2.06	15	0.015	0	8.03	0	0	0	0	0	Calculated
3703	4134	Pipe	RCP	M-1439	M-1440	61.17	4481.75	4481.7	0.08	18	0.015	0	2.6	0	0	0	0	0	Calculated
3704	4135	Pipe	RCP	M-1440	M-1438	78.57	4481.65	4480.65	1.27	18	0.015	0	9.47	0	0	0.38	0.26	0	Calculated
3705	4136	Pipe	RCP	I-2437	I-2436	21.8	4482	4481.5	2.29	15	0.015	0	8.48	0	0	0.03	0.03	0	Calculated
3706	4137	Pipe	RCP	I-2436	M-1438	91.79	4481.45	4480.9	0.6	18	0.015	0.03	7.05	0	0.11	0.39	0.26	0	Calculated
3707	4138	Pipe	RCP	M-1438	M-1437	120.48	4480.8	4480.1	0.58	24	0.015	0.16	14.94	0.01	0.19	1.12	0.56	0	Calculated
3708	4139	Pipe	RCP	M-1437	M-1436	82.36	4480	4480.05	-0.06	24	0.015	6.38	4.83	1.32	2.76	1.38	0.69	0	> CAPACITY
3709	4140	Pipe	RCP	M-1436	M-1435	252.46	4480	4479.3	0.28	24	0.015	6.37	10.32	0.62	2.83	1.35	0.67	0	Calculated
3710	4141	Pipe	RCP	M-1435	I-2435	139.23	4479.25	4479.1	0.11	24	0.015	6.37	6.44	0.99	2.77	1.38	0.69	0	Calculated
3711	4142	Pipe	RCP	O-253	I-2435	33.66	4479.1	4479.8	-2.08	15	0.015	2.44	8.07	0.3	5.11	0.52	0.41	0	Calculated
3712	4143	Pipe	RCP	I-2435	M-1444	114.98	4479.05	4478.95	0.09	24	0.015	3.95	5.78	0.68	1.97	1.29	0.65	0	Calculated
3713	4144	Pipe	RCP	M-1444	M-1443	101.33	4478.95	4478.7	0.25	24	0.015	3.97	9.74	0.41	2	1.35	0.68	0	Calculated
3714	4145	Pipe	RCP	M-1443	M-673	67.85	4478.7	4478.5	0.29	24	0.015	3.99	10.64	0.37	1.84	1.5	0.75	0	Calculated
3715	4147	Pipe	RCP	M-6	M-7	112.47	4499.7	4499.55	0.13	12	0.015	0.61	1.13	0.54	1.41	1	1	7	SURCHARGED
3716	4148	Pipe	PVC	I-13	M-7	42.98	4500.95	4499.9	2.44	10	0.015	0.13	2.94	0.04	0.44	0.44	0.56	0	Calculated
3717	4149	Pipe	RCP	M-7	M-8	24.91	4500.15	4499.3	3.41	12	0.015	0.74	5.7	0.13	2.23	0.93	0.96	0	Calculated
3718	4150	Pipe	RCP	M-8	I-14	18.91	4499.1	4498.25	4.49	12	0.015	0.81	6.55	0.12	1.4	1	1	13	SURCHARGED
3719	4151	Pipe	HDPE	I-15	I-14	24.87	4499	4496.45	10.25	15	0.015	0.45	17.93	0.03	0.54	1.25	1	12	SURCHARGED
3720	4152	Pipe	HDPE	I-14	I-16	172	4496.4	4495.65	0.44	15	0.015	7.54	3.7	2.04	6.15	1.25	1	14	SURCHARGED
3721	4153	Pipe	HDPE	I-17	I-16	23.03	4496.15	4495.6	2.39	15	0.015	0.36	8.65	0.04	0.34	1.2	0.96	0	Calculated
3722	4154	Pipe	HDPE	I-16	M-9	66.9	4495.5	4494.4	1.64	15	0.015	7.54	7.18	1.05	6.31	1.17	0.94	0	> CAPACITY
3723	4155	Pipe	HDPE	M-9	M-10	153.25	4494.1	4489.95	2.71	15	0.015	7.54	9.21	0.82	7.4	0.98	0.78	0	Calculated
3724	4156	Pipe	RCP	I-1173	O-300	378.73	5873.1	5796.9	20.12	24	0.015	19.85	88.06	0.23	22.12	0.65	0.33	0	Calculated
3725	4157	Pipe	RCP	I-1994	M-1141	133.46	4407.4	4406.1	0.97	15	0.015	0	5.53	0	0	0.3	0.24	0	Calculated
3726	4158	Pipe	RCP	M-1141	M-1140	95.64	4406	4405.5	0.52	15	0.015	0.41	4.05	0.1	0.75	0.94	0.76	0	Calculated
3727	4159	Pipe	RCP	M-1140	M-1138	132.94	4405.5	4404.8	0.53	15	0.015	0.8	4.06	0.2	0.75	1.22	0.98	0	Calculated
3728	4160	Pipe	RCP	I-1992	M-1138	27.73	4405.8	4404.8	3.61	15	0.015	0.26	10.63	0.02	0.3	1.07	0.86	0	Calculated
3729	4161	Pipe	RCP	I-1993	M-1138	33.4	4405.8	4404.8	2.99	15	0.015	0.24	9.69	0.02	0.27	1.07	0.86	0	Calculated
3730	4162	Pipe	RCP	M-1138	I-1991	341.07	4404.7	4404.1	0.18	18	0.015	1.93	3.82	0.51	1.45	1.5	1	23	SURCHARGED
3731	4163	Pipe	RCP	I-1990	I-1991	24.12	4405.3	4404.5	3.32	15	0.015	0.32	10.2	0.03	0.33	1.25	1	11	SURCHARGED
3732	4164	Pipe	RCP	I-1991	M-1137	141.35	4403.9	4402	1.34	24	0.015	6.96	22.73	0.31	4.07	2	1	36	SURCHARGED
3733	4165	Pipe	RCP	I-1989	M-1137	30.46	4403.8	4402.7	3.61	15	0.015	1.6	10.64	0.15	1.86	1.25	1	62	SURCHARGED
3734	4166	Pipe	RCP	M-1137	M-1136	144.23	4401.9	4401.8	0.07	24	0.015	6.86	5.16	1.33	3.33	2	1	79	SURCHARGED
3735	4167	Pipe	RCP	M-1136	I-1988	47.99	4401.7	4401.3	0.83	24	0.015	6.42	17.9	0.36	5.14	2	1	81	SURCHARGED
3736	4168	Pipe	RCP	I-1988	DET_136	187.54	4401.3	4398.3	1.6	24	0.015	6.42	24.8	0.26	2.55	2	1	84	SURCHARGED
3737	4170	Pipe	RCP	M-1133	M-1132	26.04	4398.1	4396.2	7.3	18	0.015	13.38	24.59	0.54	7.57	1.5	1	96	SURCHARGED
3738	4171	Pipe	HDPE	M-1139	M-1135	914.15	4398.8	4397.6	0.13	15	0.015	2.75	2.05	1.34	2.24	1.25	1	73	SURCHARGED
3739	4172	Pipe	HDPE	M-1135	M-1132	114.55	4397.6	4397.5	0.09	15	0.015	3.47	1.65	2.1	2.92	1.25	1	96	SURCHARGED
3740	4173	Pipe	HDPE	M-1132	M-1145	115.04	4396.1	4396	0.09	18	0.015	10.63	2.68	3.96	6.02	1.5	1	102	SURCHARGED
3741	4174	Pipe	HDPE	M-1145	M-268	247.96	4395.9	4395	0.36	18	0.015	10.63	5.48	1.94	6.02	1.5	1	82	SURCHARGED
3742	4175	Pipe	HDPE	M-268	M-1146	237.94	4395.5	4390.7	2.02	18	0.015	10.63	12.93	0.82	7.76	1.08	0.72	0	Calculated
3743	4176	Pipe	RCP	M-1146	M-1147	150.79	4390.6	4385.9	3.12	21	0.015	10.63	24.24	0.44	9.13	0.85	0.49	0	Calculated
3744	4177	Pipe	RCP	M-1147	M-1148	82.27	4385.9	4377.2	10.57	21	0.015	10.63	44.66	0.24	11.02	0.74	0.42	0	Calculated
3745	4178	Pipe	RCP	M-1148	O-219	290.91	4377.2	4369	2.82	21	0.015	10.63	23.06	0.46	9.06	0.88	0.5	0	Calculated
3746	4179	Pipe	RCP	I-1998	I-1997	31.3	4428.6	4427.2	4.47	15	0.015	0	11.84	0	0	0	0	0	Calculated
3747	4182	Pipe	RCP	I-1997	M-1144	451.32	4427.1	4417.2	2.19	15	0.015	0	8.29	0	0	0	0	0	Calculated
3748	4183	Pipe	RCP	M-1144	I-1996	46.77	4417.1	4417	0.21	15	0.015	0	2.59	0	0	0	0	0	Calculated
3749	4185	Pipe	RCP	I-1995	DET_137	263.06	4412.2	4410.9	0.49	18	0.015	1.41	6.4	0.22	1.1	1.5	1	63	SURCHARGED
3750	4187	Pipe	RCP	I-1984	I-1985	33.01	4434.1	4432.05	6.21	18	0.015	0	22.69	0	0	0	0	0	Calculated
3751	4188	Pipe	RCP	I-1985	M-1130	456.68	4432	4420.1	2.61	18	0.015	0	14.7	0	0	0	0	0	Calculated
3752	4189	Pipe	RCP	M-1130	DET_137	222.45	4420	4410.9	4.09	21	0.015	0	27.77	0	0	0.88	0.5	0	Calculated
3753	4190	Pipe	RCP	M-1142	I-1986	87.17	4409.1	4408.6	0.57	18	0.015	11.75	6.89	1.7	6.76	1.5	1	68	SURCHARGED
3754	4191	Pipe	RCP	I-1986	M-1131	105.86	4408.5	4404	4.25	18	0.015	11.19	18.67	0.6	8.75	1.5	1	70	SURCHARGED
3755	4192	Pipe	RCP	I-1987	M-1131	31.16	4413.9	4407.1	21.82	15	0.015	0	26.15	0	0	0.63	0.5	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3756	4193	Pipe	RCP	M-1131	DET_136	238.86	4404	4398.3	2.39	18	0.015	10.77	14.12	0.76	6.1	1.5	1	84	SURCHARGED
3757	4195	Pipe	RCP	I-2058	I-2059	37.86	4437.7	4435.5	5.81	15	0.015	0.51	13.5	0.04	0.71	0.76	0.64	0	Calculated
3758	4196	Pipe	RCP	I-2057	M-1184	47.14	4439.8	4439.05	1.59	15	0.015	0	7.06	0	0	0	0	0	Calculated
3759	4197	Pipe	RCP	M-1184	I-2059	395.2	4439	4435.45	0.9	15	0.015	0	5.31	0	0	0.63	0.5	0	Calculated
3760	4198	Pipe	RCP	I-2059	M-1185	212.01	4435.4	4431.35	1.91	15	0.015	7.16	7.74	0.93	5.86	1.25	1	9	SURCHARGED
3761	4199	Pipe	RCP	M-1185	M-1186	31.97	4431.3	4427.65	11.42	15	0.015	5.72	18.92	0.3	4.66	1.25	1	39	SURCHARGED
3762	4200	Pipe	PVC	M-1186	O-36	16.72	4434	4427.7	37.68	8	0.015	0.52	0.08	6.3	3.05	0.67	1	14	SURCHARGED
3763	4201	Pipe	RCP	M-1186	M-1187	306.44	4427.5	4425.55	0.64	15	0.015	8.82	4.47	1.98	7.22	1.25	1	31	SURCHARGED
3764	4202	Pipe	RCP	M-1187	M-1188	262.95	4424	4419.95	1.54	15	0.015	8.29	6.95	1.19	6.88	1.19	0.95	0	> CAPACITY
3765	4203	Pipe	RCP	M-1188	O-221	18.31	4421	4419.85	6.28	24	0.015	0	26.72	0	0	0	0	0	Calculated
3766	4204	Pipe	RCP	M-1188	M-1189	235.48	4419.8	4418.45	0.57	24	0.015	8.26	14.85	0.56	4.71	1.09	0.55	0	Calculated
3767	4205	Pipe	RCP	M-1189	M-1190	254.29	4418.4	4416.45	0.77	24	0.015	8.26	17.17	0.48	4.32	1.17	0.59	0	Calculated
3768	4206	Pipe	RCP	M-989	M-1191	326.67	4413.3	4412.3	0.31	48	0.015	45.76	68.88	0.66	3.64	4	1	177	SURCHARGED
3769	4207	Pipe	RCP	M-1191	O-223	65.35	4412.2	4416	-5.81	48	0.015	52.44	300.2	0.17	5.86	4	1	26	SURCHARGED
3770	4208	Pipe	RCP	M-1190	O-222	22.28	4416.4	4415.7	3.14	24	0.015	8.26	34.5	0.24	2.89	1.71	0.85	0	Calculated
3771	4209	Pipe	HDPE	M-10	M-11	44.28	4489.9	4488.4	3.39	15	0.015	7.54	10.3	0.73	6.59	1.11	0.88	0	Calculated
3772	4210	Pipe	HDPE	M-11	M-1452	65.55	4488.4	4488.2	0.31	15	0.015	3.68	3.09	1.19	3.88	0.9	0.72	0	> CAPACITY
3773	4211	Pipe	HDPE	M-1453	M-13	132.55	4487.3	4485.5	1.36	15	0.015	3.68	6.52	0.56	4.47	0.81	0.65	0	Calculated
3774	4212	Pipe	HDPE	M-1452	M-1453	41.15	4488.2	4487.4	1.94	18	0.015	3.68	12.69	0.29	5.24	0.63	0.42	0	Calculated
3775	4213	Pipe	HDPE	M-1442	M-1451	10.15	0	4486.2	-44199	15	0.015	3.86	24.29	0.16	3.7	0.99	0.8	0	Calculated
3776	4214	Pipe	HDPE	M-1451	M-11	31.16	4486.1	4487.65	-4.97	15	0.015	3.86	15.21	0.25	3.19	1.2	0.96	0	Calculated
3777	4215	Pipe	RCP	I-1483	I-1482	25.9	4431.2	4431.1	0.39	18	0.015	0.3	5.66	0.05	0.69	1.5	1	92	SURCHARGED
3778	4216	Pipe	RCP	I-1482	I-1481	28.45	4431.1	4431	0.35	15	0.015	0.38	3.32	0.12	0.75	1.25	1	99	SURCHARGED
3779	4222	Pipe	HDPE	I-765	I-764	61.49	4616.2	4615.7	0.81	15	0.015	1.39	5.05	0.27	1.51	1.25	1	7	SURCHARGED
3780	4226	Pipe	RCP	M-830	I-1461	61.89	4451.4	4450	2.26	24	0.015	14.28	29.49	0.48	7.82	2	1	14	SURCHARGED
3781	4230	Pipe	HDPE	I-764	New-4	77.17	4615.7	4613	3.5	24	0.015	12.07	36.67	0.33	5.58	2	1	6	SURCHARGED
3782	4231	Pipe	HDPE	New-4	I-2483	500.93	4613	4598.3	2.93	24	0.015	31.09	33.59	0.93	10.19	2	1	9	SURCHARGED
3783	4232	Pipe	RCP	I-2812	I-2811	32.94	6279.8	6279.3	1.52	15	0.015	0	6.9	0	0	0	0	0	Calculated
3784	4233	Pipe	RCP	I-2810	I-2809	12.2	6282.4	6278.9	28.69	15	0.015	0	29.99	0	0	0	0	0	Calculated
3785	4234	Pipe	RCP	I-2811	I-2809	36.24	6279.3	6278.9	1.1	15	0.015	0	5.88	0	0	0	0	0	Calculated
3786	4235	Pipe	RCP	I-2809	M-1631	48.34	6278.8	6278.7	0.21	15	0.015	0	2.55	0	0	0	0	0	Calculated
3787	4236	Pipe	RCP	M-1631	M-1629	220.15	6278.6	6275.2	1.54	15	0.015	0	7.01	0	0	0	0	0	Calculated
3788	4237	Pipe	RCP	I-2808	M-1630	18.54	6289.2	6284.9	23.19	15	0.015	0	26.96	0	0	0	0	0	Calculated
3789	4238	Pipe	RCP	M-1630	M-1629	18.3	6287.1	6278.5	46.99	15	0.015	0	38.38	0	0	0	0	0	Calculated
3790	4239	Pipe	RCP	I-2814	M-1628	58.34	6270.9	6269.5	2.4	15	0.015	0	8.67	0	0	0	0	0	Calculated
3791	4240	Pipe	RCP	M-1629	M-1628	83.94	6275	6269.5	6.55	15	0.015	0	14.33	0	0	0	0	0	Calculated
3792	4241	Pipe	RCP	M-1628	M-1627	91.12	6269.4	6267.7	1.87	15	0.015	0	7.65	0	0	0	0	0	Calculated
3793	4242	Pipe	RCP	I-755	I-753	114.54	4565.8	4565.6	0.17	15	0.015	0	2.34	0	0	0	0	0	Calculated
3794	4243	Pipe	RCP	I-754	I-753	112.25	4565.9	4565.6	0.27	15	0.015	0	2.89	0	0	0	0	0	Calculated
3795	4244	Pipe	RCP	I-753	I-486	209.94	4565.6	4563.7	0.91	15	0.015	0	5.33	0	0	0	0	0	Calculated
3796	4245	Pipe	RCP	I-486	I-485	120.05	4563.8	4562.6	1	15	0.015	0	5.6	0	0	0.4	0.32	0	Calculated
3797	4246	Pipe	RCP	I-485	I-484	65.68	4562.6	4561	2.44	15	0.015	0.59	8.74	0.07	0.76	1.02	0.82	0	Calculated
3798	4247	Pipe	RCP	I-484	I-483	113.32	4561	4560.6	0.35	15	0.015	0.59	3.33	0.18	0.98	1.25	1	120	SURCHARGED
3799	4248	Pipe	RCP	I-483	I-487	93.08	4563	4561.5	1.61	15	0.015	0.62	7.11	0.09	0.81	0.81	0.65	0	Calculated
3800	4249	Pipe	RCP	I-757	I-756	227.64	4565	4562.1	1.27	15	0.015	5.4	6.3	0.86	5.67	1.23	0.99	0	Calculated
3801	4250	Pipe	RCP	I-756	O-153	88.54	4562.1	4558.9	3.61	15	0.015	5.4	10.68	0.51	4.4	1.25	1	68	SURCHARGED
3802	4252	Pipe	RCP	M-22	M-23	70.86	4486.5	4481.1	7.62	18	0.015	2.25	25.13	0.09	8.4	0.31	0.21	0	Calculated
3803	4253	Pipe	HDPE	I-46	I-45	53.49	4490.1	4489.2	1.68	12	0.015	0	4.01	0	0	0	0	0	Calculated
3804	4254	Pipe	RCP	M-23	New-34	275.9	4480.7	4477.5	1.16	18	0.015	2.25	9.8	0.23	4.48	0.49	0.33	0	Calculated
3805	4255	Pipe	RCP	I-2813	I-2814	41.27	6275.2	6271	10.18	15	0.015	0	17.9	0	0	0	0	0	Calculated
3806	4256	Pipe	RCP	I-2807	I-2806	21.1	6257.8	6257.6	0.95	15	0.015	0	5.45	0	0	0	0	0	Calculated
3807	4257	Pipe	RCP	M-1627	I-2806	127.94	6269.6	6258.5	8.68	15	0.015	0	16.49	0	0	0	0	0	Calculated
3808	4258	Pipe	RCP	I-2027	I-2028	21.83	6099.5	6098.1	6.41	15	0.015	0	14.23	0	0	0	0	0	Calculated
3809	4259	Pipe	RCP	I-2025	I-2026	23.72	6107	6105	8.43	15	0.015	0	16.26	0	0	0	0	0	Calculated
3810	4260	Pipe	RCP	I-2026	M-1157	72.53	6104.85	6091.8	17.99	15	0.015	0	23.78	0	0	0	0	0	Calculated
3811	4261	Pipe	RCP	I-2028	M-1157	39.97	6098	6091.8	15.51	15	0.015	0	22.09	0	0	0	0	0	Calculated
3812	4262	Pipe	RCP	M-1157	M-1158	96.27	6091.5	6082.8	9.04	15	0.015	0	16.84	0	0	0	0	0	Calculated
3813	4263	Pipe	RCP	I-2029	M-1158	23.05	6085.4	6082.8	11.28	15	0.015	0	18.73	0	0	0	0	0	Calculated
3814	4264	Pipe	RCP	M-1158	I-2030	132.39	6082.8	6078.8	3.02	18	0.015	0	15.86	0	0	0	0	0	Calculated
3815	4267	Pipe	RCP	I-2932	I-2933	205.41	4386	4481.5	-46.49	15	0.015	0	8.29	0	0	0	0	0	Calculated
3816	4268	Pipe	RCP	I-2933	I-2934	78.5	4481.45	4481.2	0.32	15	0.015	0	3.16	0	0	0	0	0	Calculated
3817	4269	Pipe	RCP	I-2934	I-2935	216.44	4481.1	4478.5	1.2	15	0.015	0	6.14	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3818	4270	Pipe	RCP	I-2936	I-2935	28.11	4480.85	4479.75	3.91	15	0.015	0	11.07	0	0	0	0	0	Calculated
3819	4271	Pipe	RCP	I-2935	M-1704	151.11	4478.7	4477.4	0.86	15	0.015	0	5.19	0	0	0	0	0	Calculated
3820	4272	Pipe	RCP	M-1704	I-2937	96.41	4477.3	4476.7	0.62	15	0.015	0	4.42	0	0	0	0	0	Calculated
3821	4273	Pipe	RCP	I-2871	I-2881	58.16	6110.8	6110	1.38	15	0.015	0	6.57	0	0	0	0	0	Calculated
3822	4274	Pipe	RCP	I-2881	I-2247	100.91	6109	6108	0.99	15	0.015	0	7.68	0	0	0	0	0	Calculated
3823	4275	Pipe	RCP	I-2872	I-2873	26.95	6109.6	6109.5	0.37	15	0.015	0	3.41	0	0	0	0	0	Calculated
3824	4276	Pipe	RCP	I-2873	M-1661	68.62	6109.4	6104	7.87	15	0.015	0	15.72	0	0	0	0	0	Calculated
3825	4277	Pipe	RCP	M-1661	M-1662	102.03	6103.9	6101.9	1.96	15	0.015	0	7.84	0	0	0	0	0	Calculated
3826	4278	Pipe	RCP	M-1662	I-2874	104.9	6101.8	6099.3	2.38	15	0.015	0	8.64	0	0	0	0	0	Calculated
3827	4279	Pipe	RCP	I-2875	I-2874	59.52	6089.4	6088.5	1.51	15	0.015	0	6.88	0	0	0	0	0	Calculated
3828	4280	Pipe	RCP	I-2880	I-2879	25.82	6112.9	6110.7	8.52	15	0.015	0	16.45	0	0	0	0	0	Calculated
3829	4281	Pipe	RCP	I-2879	I-2878	266.61	6110.7	6099.7	4.13	15	0.015	0	11.37	0	0	0	0	0	Calculated
3830	4282	Pipe	RCP	I-2878	I-2874	71.98	6099.6	6099.3	0.42	15	0.015	0	3.79	0	0	0	0	0	Calculated
3831	4283	Pipe	RCP	I-2874	I-2876	23.92	6088.4	6085.8	10.87	15	0.015	0	18.46	0	0	0	0	0	Calculated
3832	4284	Pipe	RCP	I-2876	I-2877	92.39	6085.7	6080.3	5.84	15	0.015	0	13.57	0	0	0	0	0	Calculated
3833	4285	Pipe	RCP	I-2877	M-1663	64.27	6080.2	6065.7	22.56	15	0.015	0	26.6	0	0	0	0	0	Calculated
3834	4286	Pipe	RCP	I-2031	I-2030	25.44	6081.2	6078.8	9.43	15	0.015	0	17.3	0	0	0	0	0	Calculated
3835	4287	Pipe	RCP	I-2035	I-2034	30.57	6083.1	6082	3.6	15	0.015	0	10.62	0	0	0	0	0	Calculated
3836	4288	Pipe	RCP	I-2034	M-1159	61.1	6081.9	6077.4	7.36	15	0.015	0	15.19	0	0	0	0	0	Calculated
3837	4289	Pipe	RCP	I-2030	M-1159	39.29	6078.7	6077.4	3.31	18	0.015	0	16.56	0	0	0	0	0	Calculated
3838	4290	Pipe	RCP	M-1159	I-2032	228.58	6077	6061	7	18	0.015	2.44	24.11	0.1	8.61	0.33	0.22	0	Calculated
3839	4291	Pipe	RCP	I-2032	I-2033	149.76	6060.9	6055.8	3.41	18	0.015	2.44	16.8	0.14	6.01	0.42	0.28	0	Calculated
3840	4293	Pipe	RCP	I-2033	M-1160	38.65	6055.7	6055.2	1.29	24	0.015	2.43	23.39	0.1	4.35	0.47	0.23	0	Calculated
3841	4294	Pipe	RCP	M-1160	I-2257	133.86	6055.1	6051.2	2.91	24	0.015	2.43	33.47	0.07	6.01	0.37	0.19	0	Calculated
3842	4295	Pipe	RCP	I-2024	M-1156	111.37	6138.4	6135.7	2.42	15	0.015	0	8.72	0	0	0	0	0	Calculated
3843	4296	Pipe	RCP	M-1156	M-1155	43.08	6135.7	6117.6	42.01	15	0.015	0	36.29	0	0	0	0	0	Calculated
3844	4297	Pipe	RCP	M-1155	M-1154	160.32	6117.6	6113.8	2.37	15	0.015	0	8.62	0	0	0	0	0	Calculated
3845	4298	Pipe	RCP	M-1154	I-2018	268.89	6113.8	6106.6	2.68	15	0.015	0	9.16	0	0	0	0	0	Calculated
3846	4299	Pipe	RCP	I-2019	I-2018	21.93	6106.8	6106.6	0.91	15	0.015	0	5.35	0	0	0	0	0	Calculated
3847	4300	Pipe	RCP	I-2020	I-2021	21.11	6105.9	6103.8	9.95	15	0.015	0	17.66	0	0	0	0	0	Calculated
3848	4301	Pipe	RCP	I-2021	M-1153	71.39	6103.7	6099.4	6.02	15	0.015	0	13.74	0	0	0	0	0	Calculated
3849	4302	Pipe	RCP	I-2018	M-1153	100.3	6106.5	6099.9	6.58	15	0.015	0	14.36	0	0	0	0	0	Calculated
3850	4304	Pipe	RCP	I-2017	I-2016	43.57	6096	6089.5	14.92	15	0.015	0	21.64	0	0	0	0	0	Calculated
3851	4305	Pipe	RCP	M-1153	I-2016	109.08	6099.1	6089.5	8.8	15	0.015	0	16.61	0	0	0	0	0	Calculated
3852	4306	Pipe	RCP	I-2016	M-1152	114.33	6089.4	6087.2	1.92	15	0.015	0	7.84	0	0	0	0	0	Calculated
3853	4307	Pipe	RCP	M-1152	I-2015	178.65	6087.1	6073.8	7.44	15	0.015	0	15.28	0	0	0	0	0	Calculated
3854	4308	Pipe	RCP	I-2022	I-2023	87.72	6121	6120.7	0.34	15	0.015	0	3.38	0	0	0	0	0	Calculated
3855	4309	Pipe	RCP	I-2023	I-2014	122.12	6120.6	6074.3	37.91	15	0.015	0	34.48	0	0	0	0	0	Calculated
3856	4310	Pipe	RCP	I-2014	I-2015	22.38	6074.3	6073.9	1.79	15	0.015	0	7.48	0	0	0	0	0	Calculated
3857	4311	Pipe	RCP	I-2015	M-1365	159.92	6073.5	6065.9	4.75	15	0.015	0	12.24	0	0	0	0	0	Calculated
3858	4312	Pipe	RCP	M-1365	I-2013	97.08	6065.3	6044.6	21.32	15	0.015	0	25.86	0	0	0	0	0	Calculated
3859	4313	Pipe	RCP	I-2276	I-2013	107.4	6046.8	6044.6	2.05	15	0.015	0	8.01	0	0	0	0	0	Calculated
3860	4314	Pipe	RCP	I-2013	M-1364	350.09	6044.5	6010.3	9.77	15	0.015	0	17.51	0	0	0	0	0	Calculated
3861	4315	Pipe	RCP	I-2272	M-1361	161.12	6046.5	6013.8	20.3	18	0.015	0	41.01	0	0	0	0	0	Calculated
3862	4316	Pipe	RCP	M-1361	M-1362	31.51	6013.8	6009.5	13.65	24	0.015	0	72.68	0	0	0	0	0	Calculated
3863	4317	Pipe	RCP	M-1362	M-1360	53.26	6009.4	6007.5	3.57	24	0.015	0	37.03	0	0	0	0	0	Calculated
3864	4318	Pipe	RCP	M-1360	I-2273	108.92	6007.5	6006.9	0.55	24	0.015	0	14.55	0	0	0	0	0	Calculated
3865	4319	Pipe	RCP	M-1364	I-2012	119.33	6010.1	5999.2	9.13	15	0.015	0	16.94	0	0	0	0	0	Calculated
3866	4320	Pipe	RCP	I-2273	I-2011	20.7	6006.8	6001.2	27.05	24	0.015	0	101.79	0	0	0	0	0	Calculated
3867	4321	Pipe	RCP	I-2011	I-2012	23.79	6001.2	6000.3	3.78	24	0.015	0	38.76	0	0	0	0	0	Calculated
3868	4322	Pipe	RCP	I-2012	I-2010	151.76	5998.4	5985.2	8.7	24	0.015	0	57.91	0	0	0	0	0	Calculated
3869	4323	Pipe	RCP	I-2010	M-1163	183.39	5985.2	5971.9	7.25	30	0.015	0	95.73	0	0	0	0	0	Calculated
3870	4324	Pipe	RCP	M-1163	I-2039	117.74	5971.8	5959.1	10.79	30	0.015	0	116.75	0	0	0	0	0	Calculated
3871	4325	Pipe	RCP	I-2039	I-2009	132.11	5959	5954.4	3.48	30	0.015	0	66.55	0	0	0	0	0	Calculated
3872	4326	Pipe	RCP	I-2009	I-2037	232.1	5954.3	5949.5	2.07	30	0.015	0	51.12	0	0	0	0	0	Calculated
3873	4327	Pipe	15	I-2038	I-2037	20.75	5951.6	5950.2	6.75	15	0.015	0	14.8	0	0	0	0	0	Calculated
3874	4328	Pipe	RCP	I-2037	M-1161	107.07	5949.4	0	5556.55	36	0.015	0	82.86	0	0	0	0	0	Calculated
3875	4329	Pipe	RCP	M-1161	I-2036	58.69	0	0	0	36	0.015	0	209.24	0	0	0	0	0	Calculated
3876	4330	Pipe	HDPE	I-2275	M-1363	96.93	5956	5952	4.13	15	0.015	0	11.37	0	0	0	0	0	Calculated
3877	4331	Pipe	HDPE	M-1363	I-2274	87.48	5951.5	5945.3	7.09	15	0.015	0	14.9	0	0	0	0	0	Calculated
3878	4334	Pipe	RCP	M-1328	M-1327	81.9	5958.5	5957	1.83	15	0.015	0	7.58	0	0	0	0	0	Calculated
3879	4335	Pipe	RCP	I-2233	M-1328	313.91	5982.7	5958.9	7.58	15	0.015	0	15.42	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3880	4336	Pipe	RCP	I-2234	I-2233	26.81	6003.8	5983.1	77.21	15	0.015	0	49.21	0	0	0	0	0	Calculated
3881	4337	Pipe	RCP	I-2256	I-2255	25.93	6061	6059.1	7.33	15	0.015	0	15.15	0	0	0	0	0	Calculated
3882	4338	Pipe	RCP	I-2255	M-1345	272.65	6058.3	6052.4	2.16	15	0.015	0	8.25	0	0	0	0	0	Calculated
3883	4339	Pipe	RCP	M-1345	M-1344	155.91	6052.5	6049.1	2.18	15	0.015	0	8.27	0	0	0	0	0	Calculated
3884	4340	Pipe	RCP	M-1344	I-2252	228.34	6049	6044.6	1.93	15	0.015	0	7.77	0	0	0	0	0	Calculated
3885	4341	Pipe	RCP	I-2252	I-2253	27.46	6044.3	6042.8	5.46	15	0.015	0	13.21	0	0	0	0	0	Calculated
3886	4342	Pipe	RCP	I-2253	I-2254	115.7	6042.2	6030.3	10.29	15	0.015	0	17.98	0	0	0	0	0	Calculated
3887	4343	Pipe	RCP	I-2254	I-2916	287.24	6030.2	5926.4	36.14	15	0.015	0	33.65	0	0	0.07	0.06	0	Calculated
3888	4344	Pipe	RCP	I-2846	I-2917	62.61	5945.2	5936.6	13.74	15	0.015	0	20.77	0	0	0	0	0	Calculated
3889	4345	Pipe	RCP	I-2917	I-2916	70.89	5936.5	5926.5	14.11	18	0.015	0	34.19	0	0	0.02	0.02	0	Calculated
3890	4346	Pipe	RCP	I-2844	I-2845	31.22	5942	5940.6	4.48	15	0.015	0	11.98	0	0	0	0	0	Calculated
3891	4347	Pipe	RCP	I-2845	I-2919	27.75	5940.5	5938.9	5.77	15	0.015	0	13.44	0	0	0	0	0	Calculated
3892	4348	Pipe	RCP	I-2919	I-2918	30.94	5938.8	5937.8	3.23	18	0.015	0	16.53	0	0	0	0	0	Calculated
3893	4349	Pipe	RCP	I-2918	I-2917	148.01	5937.7	5936.6	0.74	18	0.015	0	7.85	0	0	0	0	0	Calculated
3894	4350	Pipe	RCP	I-2916	O-307	239.27	5926.3	5887.5	16.22	15	0.015	1.5	22.53	0.07	13.81	0.18	0.14	0	Calculated
3895	4351	Pipe	RCP	M-1698	M-1697	32.86	5945.5	5934.1	34.69	18	0.015	0	53.62	0	0	0	0	0	Calculated
3896	4352	Pipe	RCP	M-1162	I-2911	93.62	5945.8	5941.8	4.27	18	0.015	0	18.89	0	0	0	0	0	Calculated
3897	4353	Pipe	RCP	I-2911	I-2912	92.94	5941.7	5940	1.83	18	0.015	0	12.31	0	0	0	0	0	Calculated
3898	4354	Pipe	RCP	M-1663	I-2913	151.64	6065.6	6026	26.11	15	0.015	0	28.61	0	0	0	0	0	Calculated
3899	4355	Pipe	RCP	I-2913	I-2852	52.19	6025.8	6024.7	2.11	15	0.015	0	8.2	0	0	0	0	0	Calculated
3900	4357	Pipe	RCP	I-2852	M-1648	384.63	6024.6	5995.8	7.49	24	0.015	0	53.66	0	0	0	0	0	Calculated
3901	4358	Pipe	RCP	M-1648	I-2851	324.53	5995.7	5969	8.23	24	0.015	0	56.25	0	0	0	0	0	Calculated
3902	4359	Pipe	RCP	I-2851	I-2850	300.87	5968.9	5948.4	6.81	24	0.015	0	51.18	0	0	0	0	0	Calculated
3903	4360	Pipe	RCP	I-2850	M-1696	115.38	5948.3	5940.6	6.67	24	0.015	0	50.81	0	0	0	0	0	Calculated
3904	4361	Pipe	RCP	M-1696	I-2912	250.52	5940.4	5936.8	1.44	30	0.015	0	42.79	0	0	0	0	0	Calculated
3905	4362	Pipe	RCP	I-2849	M-1647	115.24	5934.1	5930.6	3.04	30	0.015	0	62.3	0	0	0	0	0	Calculated
3906	4363	Pipe	RCP	I-2915	I-2847	64.69	5953.8	5949.3	6.96	15	0.015	0	14.77	0	0	0	0	0	Calculated
3907	4364	Pipe	RCP	I-2847	O-308	129.97	5949	5923.8	19.39	15	0.015	0	24.65	0	0	0	0	0	Calculated
3908	4365	Pipe	RCP	M-1647	I-2848	95.19	5930.2	5908.9	22.38	30	0.015	0	168.16	0	0	0.68	0.27	0	Calculated
3909	4366	Pipe	RCP	I-2848	M-1646	87.53	5908.8	5908.1	0.8	30	0.015	14.88	32.69	0.46	5.54	1.34	0.54	0	Calculated
3910	4367	Pipe	RCP	M-1646	O-309	281.92	5908.1	5905.6	0.89	30	0.015	14.83	33.27	0.45	6.26	1.21	0.49	0	Calculated
3911	4368	Pipe	RCP	I-2843	I-2842	30.84	5919.3	5917.4	6.16	15	0.015	0	13.9	0	0	0	0	0	Calculated
3912	4369	Pipe	RCP	M-1697	I-2842	105.68	5933.9	5913	19.78	18	0.015	0	40.49	0	0	0	0	0	Calculated
3913	4370	Pipe	RCP	I-2842	M-1644	172.98	5912.8	5898.4	8.32	15	0.015	0	16.15	0	0	0	0	0	Calculated
3914	4371	Pipe	RCP	M-1644	M-1645	106.32	5898.4	5874.7	22.29	15	0.015	0	26.43	0	0	0	0	0	Calculated
3915	4372	Pipe	RCP	M-1645	O-306	17.99	5874.6	5874.3	1.67	15	0.015	0	7.23	0	0	0	0	0	Calculated
3916	4373	Pipe	RCP	I-2921	I-2920	32.55	5925.3	5920.9	13.52	15	0.015	0	6.94	0	0	0	0	0	Calculated
3917	4374	Pipe	RCP	I-2920	I-2922	214.66	5920.8	5909.8	5.12	15	0.015	0	14.8	0	0	0	0	0	Calculated
3918	4376	Pipe	RCP	I-2922	M-1699	222.08	5909.2	5894.9	6.44	15	0.015	0	14.21	0	0	0	0	0	Calculated
3919	4377	Pipe	RCP	I-2924	I-2923	33.95	5873.9	5873.8	0.29	15	0.015	0	3.04	0	0	0	0	0	Calculated
3920	4378	Pipe	RCP	M-1699	I-2923	217.63	5894.3	5873.8	9.42	15	0.015	0	17.19	0	0	0	0	0	Calculated
3921	4379	Pipe	RCP	I-2925	M-1701	24.55	5849	5844.7	17.52	24	0.015	6.27	82.05	0.08	11.11	0.47	0.24	0	Calculated
3922	4380	Pipe	RCP	M-1701	M-1700	112.03	5844.6	5840.6	3.57	24	0.015	6.27	37.05	0.17	8.26	0.58	0.29	0	Calculated
3923	4381	Pipe	RCP	I-2923	I-2925	65.05	5849	5873.5	-37.66	15	0.015	0	0.22	0	0	0	0	0	Calculated
3924	4382	Pipe	RCP	M-1700	I-2839	94.18	5840.1	5795.8	47.04	24	0.015	6.27	134.47	0.05	21.11	0.3	0.15	0	Calculated
3925	4383	Pipe	RCP	I-2839	M-1641	29.3	5795.1	5790.9	14.33	24	0.015	6.27	74.23	0.08	12.39	0.43	0.22	0	Calculated
3926	4384	Pipe	RCP	I-2838	I-2839	43.7	5807.5	5799.8	17.62	15	0.015	0	23.5	0	0	0	0	0	Calculated
3927	4385	Pipe	RCP	I-2837	I-2838	31.73	5813	5807.6	17.02	15	0.015	0	23.31	0	0	0	0	0	Calculated
3928	4386	Pipe	RCP	M-1641	M-1642	232.93	5790.8	5713	33.4	24	0.015	6.27	113.31	0.06	19.06	0.32	0.16	0	Calculated
3929	4387	Pipe	RCP	M-1642	M-1643	43.12	5712.6	5707.4	12.06	24	0.015	6.27	68.09	0.09	12.13	0.44	0.22	0	Calculated
3930	4388	Pipe	RCP	M-1643	M-1621	224.86	5707.1	5653.7	23.75	24	0.015	6.27	95.54	0.07	16.8	0.35	0.18	0	Calculated
3931	4389	Pipe	RCP	M-1621	M-1508	39.56	5653.1	5651	5.31	24	0.015	6.27	45.17	0.14	8.79	0.55	0.28	0	Calculated
3932	4390	Pipe	RCP	M-1508	I-2609	84.65	5650.8	5646.8	4.73	24	0.015	6.26	42.62	0.15	9.01	0.54	0.27	0	Calculated
3933	4391	Pipe	RCP	I-2608	I-2609	151.08	5654.1	5647.4	4.43	15	0.015	0	11.8	0	0	0	0	0	Calculated
3934	4392	Pipe	RCP	I-2609	O-275	118.26	5646.5	5615.3	26.38	24	0.015	7.29	100.7	0.07	17.98	0.37	0.19	0	Calculated
3935	4395	Pipe	RCP	I-2780	M-1624	17.02	5505.4	5505	2.35	24	0.015	2.86	30.43	0.09	5.05	0.47	0.24	0	Calculated
3936	4396	Pipe	RCP	M-1624	O-296	125.48	5504.4	5503.5	0.72	24	0.015	2.86	16.23	0.18	5.65	0.44	0.22	0	Calculated
3937	4397	Pipe	RCP	I-2927	I-2926	39.28	5862.4	5850.6	30.04	15	0.015	0	30.68	0	0	0	0	0	Calculated
3938	4398	Pipe	RCP	I-2926	I-2928	32.26	5850.5	5848.8	5.27	15	0.015	0	12.85	0	0	0	0	0	Calculated
3939	4399	Pipe	RCP	I-2928	O-316	8.37	5848.7	5846	32.26	15	0.015	0	31.8	0	0	0	0	0	Calculated
3940	4400	Pipe	RCP	I-2836	M-1640	7.84	5782.1	5778.2	49.74	15	0.015	0	39.59	0	0	0	0	0	Calculated
3941	4401	Pipe	RCP	M-1640	M-1512	289.26	5778.2	5735.3	14.83	15	0.015	0	21.56	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
3942	4402	Pipe	RCP	I-2835	I-2834	30.71	5782	5780.7	4.23	15	0.015	0	11.65	0	0	0	0	0	Calculated
3943	4403	Pipe	RCP	I-2834	M-1512	114.62	5780.6	5735.8	39.09	15	0.015	0	35	0	0	0	0	0	Calculated
3944	4404	Pipe	RCP	I-2929	I-2930	33.69	5808.9	5808.4	1.48	15	0.015	0	6.82	0	0	0	0	0	Calculated
3945	4405	Pipe	RCP	I-2930	M-1702	198.84	5808.3	5791.7	8.35	15	0.015	0	16.18	0	0	0	0	0	Calculated
3946	4406	Pipe	RCP	M-1702	M-1639	301.78	5791.2	5770.7	6.79	15	0.015	0	14.6	0	0	0	0	0	Calculated
3947	4407	Pipe	RCP	I-2833	M-1639	35.98	5773.7	5770.3	9.45	15	0.015	0	17.24	0	0	0	0	0	Calculated
3948	4408	Pipe	RCP	M-1639	I-2931	33.63	5770.23	5767.1	9.31	24	0.015	0	60.29	0	0	0	0	0	Calculated
3949	4409	Pipe	RCP	I-2931	M-1669	140.28	5766.9	5762.4	3.21	24	0.015	0	35.12	0	0	0	0	0	Calculated
3950	4410	Pipe	CMP	I-2717	M-1657	253.56	4410.7	4409.9	0.32	21	0.015	0	3.86	0	0	0	0	0	Calculated
3951	4411	Pipe	CMP	M-1657	M-1656	170.05	4409.9	4409.8	0.06	24	0.015	0	12.58	0	0	0.35	0.17	0	Calculated
3952	4412	Pipe	CMP	M-1656	I-2858	230.75	4409.7	4408.8	0.39	24	0.015	3.77	12.24	0.31	3.36	0.84	0.42	0	Calculated
3953	4413	Pipe	RCP	I-2858	I-2859	24.67	4408.8	4408	3.24	24	0.015	6.39	34.19	0.19	5.34	1.28	0.64	0	Calculated
3954	4414	Pipe	RCP	I-2859	M-1658	224.59	4408.1	4405.5	1.16	24	0.015	6.3	21.1	0.3	3	1.79	0.9	0	Calculated
3955	4415	Pipe	HDPE	M-1658	O-310	58.44	4405.5	4405	0.86	12	0.015	6.3	2.86	2.21	8.03	1	1	89	SURCHARGED
3956	4416	Pipe	RCP	I-2860	I-2858	195.56	4413.5	4408.9	2.35	15	0.015	0	8.59	0	0	0.41	0.33	0	Calculated
3957	4417	Pipe	CMP	I-2310	O-301	215.11	5317.45	5311.38	2.82	30	0.015	0	59.71	0	0	0	0	0	Calculated
3958	4418	Pipe	RCP	I-2840	I-2841	30.56	5872.7	5869.2	11.45	15	0.015	0	18.95	0	0	0	0	0	Calculated
3959	4419	Pipe	RCP	I-2841	O-305	38.63	5869.1	5868	2.85	15	0.015	0	9.45	0	0	0	0	0	Calculated
3960	4420	Pipe	RCP	I-2616	M-1516	79.42	5742.2	5732.5	12.21	15	0.015	0	19.57	0	0	0	0	0	Calculated
3961	4421	Pipe	RCP	M-1516	M-1512	210.88	5732.2	5730.3	0.9	15	0.015	0	5.31	0	0	0	0	0	Calculated
3962	4422	Pipe	RCP	M-1512	M-1511	71.39	5730.3	5711.6	26.19	15	0.015	0	28.65	0	0	0	0	0	Calculated
3963	4423	Pipe	RCP	I-2610	M-1509	64.38	5716	5708.6	11.49	15	0.015	0	18.98	0	0	0	0	0	Calculated
3964	4424	Pipe	RCP	M-1509	M-1510	129.95	5708.3	5696.9	8.77	15	0.015	0	16.61	0	0	0	0	0	Calculated
3965	4425	Pipe	RCP	M-1511	I-2611	45.99	5693.3	5692.7	1.3	15	0.015	0	6.39	0	0	0	0	0	Calculated
3966	4426	Pipe	RCP	M-1510	I-2611	222.91	5696.9	5692.7	1.88	15	0.015	0	7.68	0	0	0	0	0	Calculated
3967	4427	Pipe	RCP	I-2612	I-2611	26.41	5693	5692.7	1.14	15	0.015	0	5.97	0	0	0	0	0	Calculated
3968	4428	Pipe	RCP	I-2611	M-1513	156.55	5692.5	5689.5	1.92	15	0.015	0	7.75	0	0	0	0	0	Calculated
3969	4429	Pipe	RCP	M-1513	M-1514	127.91	5689.3	5679.4	7.74	15	0.015	0	15.58	0	0	0	0	0	Calculated
3970	4430	Pipe	RCP	M-1514	M-1506	95.37	5679.2	5673.3	6.19	15	0.015	0	13.92	0	0	0	0	0	Calculated
3971	4431	Pipe	RCP	M-1506	M-1507	120.83	5673.1	5665.8	6.04	15	0.015	0	13.72	0	0	0	0	0	Calculated
3972	4432	Pipe	RCP	M-1507	I-2608	174.2	5665.8	5654.3	6.6	15	0.015	0	14.41	0	0	0	0	0	Calculated
3973	4433	Pipe	RCP	I-2776	I-2608	23.27	5656	5654.3	7.31	15	0.015	0	15.13	0	0	0	0	0	Calculated
3974	4434	Pipe	RCP	I-2607	M-1505	66.94	5654.4	5652.8	2.39	15	0.015	0	8.66	0	0	0	0	0	Calculated
3975	4435	Pipe	RCP	M-1505	M-1515	95.97	5652.6	5643	10	15	0.015	0	17.71	0	0	0	0	0	Calculated
3976	4436	Pipe	RCP	M-1515	M-1504	104.52	5643	5628	14.35	15	0.015	0	21.21	0	0	0	0	0	Calculated
3977	4437	Pipe	RCP	M-1504	O-279	37.17	5627.9	5623.5	11.84	15	0.015	0	19.17	0	0	0	0	0	Calculated
3978	4438	Pipe	RCP	I-2613	I-2614	24.45	5732.9	5731.6	5.32	15	0.015	0	13.01	0	0	0	0	0	Calculated
3979	4439	Pipe	RCP	I-2614	I-2615	128.1	5731.5	5728.8	2.11	15	0.015	0	8.13	0	0	0	0	0	Calculated
3980	4440	Pipe	RCP	I-2615	O-280	132.34	5728.7	5712.3	12.39	15	0.015	0	19.73	0	0	0	0	0	Calculated
3981	4441	Pipe	RCP	I-2832	I-2896	67.95	5761.5	5755.8	8.39	15	0.015	0	16.21	0	0	0	0	0	Calculated
3982	4442	Pipe	RCP	M-1669	I-2896	166.94	5762.3	5755.8	3.89	24	0.015	0	38.69	0	0	0	0	0	Calculated
3983	4443	Pipe	RCP	I-2896	M-1670	332.51	5755.7	5746	2.92	30	0.015	0	60.72	0	0	0	0	0	Calculated
3984	4444	Pipe	RCP	I-2831	M-1671	52.02	5726.9	5720.5	12.3	15	0.015	0	19.64	0	0	0	0	0	Calculated
3985	4445	Pipe	RCP	M-1670	M-1671	362.46	5745.6	5720.4	6.95	30	0.015	0	93.73	0	0	0	0	0	Calculated
3986	4446	Pipe	RCP	M-1671	M-1672	316.17	5720.2	5696.2	7.59	30	0.015	0	97.94	0	0	0	0	0	Calculated
3987	4447	Pipe	RCP	M-1672	I-2897	198.53	5695.8	5679.1	8.41	30	0.015	0	103.1	0	0	0	0	0	Calculated
3988	4448	Pipe	RCP	I-2897	M-1673	216.9	5678.8	5675.2	1.66	36	0.015	0	74.68	0	0	0	0	0	Calculated
3989	4449	Pipe	RCP	M-1674	M-1673	22.92	5681.2	5675.6	24.43	15	0.015	0	27.75	0	0	0	0	0	Calculated
3990	4450	Pipe	RCP	I-2631	I-2630	24.6	5701.7	5701.4	1.22	18	0.015	0	10.05	0	0	0	0	0	Calculated
3991	4451	Pipe	RCP	I-2630	M-1528	124.85	5701.2	5699.7	1.2	18	0.015	0	9.98	0	0	0	0	0	Calculated
3992	4452	Pipe	RCP	M-1528	M-1527	149.73	5699.3	5697.4	1.27	18	0.015	0	10.26	0	0	0	0	0	Calculated
3993	4454	Pipe	RCP	M-1527	M-1526	228.41	5696.9	5692.9	1.75	18	0.015	0	12.11	0	0	0	0	0	Calculated
3994	4455	Pipe	RCP	M-1526	I-2628	218.9	5692.4	5690.8	0.73	18	0.015	0	7.78	0	0	0	0	0	Calculated
3995	4456	Pipe	RCP	I-2628	M-1525	59.48	5690.8	5690.1	1.18	18	0.015	0	9.88	0	0	0	0	0	Calculated
3996	4457	Pipe	RCP	M-1525	I-2627	91.64	5689.8	5689.6	0.22	18	0.015	0	4.25	0	0	0	0	0	Calculated
3997	4458	Pipe	RCP	I-2627	I-2626	83.67	5689	5688.9	0.12	18	0.015	0	3.15	0	0	0	0	0	Calculated
3998	4459	Pipe	RCP	I-2626	M-1524	71.68	5688.6	5688	0.84	18	0.015	0	8.33	0	0	0	0	0	Calculated
3999	4460	Pipe	RCP	M-1524	M-1523	88.24	5687.9	5686.7	1.36	18	0.015	0	10.62	0	0	0	0	0	Calculated
4000	4461	Pipe	RCP	M-1523	M-1522	91.27	5686.2	5685.7	0.55	18	0.015	0	6.74	0	0	0	0	0	Calculated
4001	4462	Pipe	RCP	M-1522	M-1521	93.18	5685.2	5682	3.43	18	0.015	0	16.87	0	0	0	0	0	Calculated
4002	4463	Pipe	RCP	M-1521	I-2624	42.25	0	5684.4	-13454.2	18	0.015	0	22.76	0	0	0	0	0	Calculated
4003	4464	Pipe	RCP	I-2624	I-2623	149.98	5683.6	5682.4	0.8	18	0.015	0	8.14	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4004	4465	Pipe	RCP	I-2622	I-2623	54.98	5682.1	5682	0.18	15	0.015	0	2.39	0	0	0	0	0	Calculated
4005	4466	Pipe	RCP	I-2623	M-1520	21.04	5682	5681.1	4.28	18	0.015	0	18.83	0	0	0	0	0	Calculated
4006	4467	Pipe	RCP	M-1520	I-2830	33.41	5681	5680.5	1.5	24	0.015	0	24.46	0	0	0	0	0	Calculated
4007	4468	Pipe	RCP	I-2830	I-2897	67.97	5680.3	5679.2	1.62	24	0.015	0	24.94	0	0	0	0	0	Calculated
4008	4471	Pipe	RCP	M-1673	M-1675	392.96	5674.8	5664.6	2.6	36	0.015	0	93.13	0	0	0	0	0	Calculated
4009	4472	Pipe	RCP	I-2829	M-1675	50.45	5668.9	5665.1	7.53	15	0.015	0	15.36	0	0	0	0	0	Calculated
4010	4474	Pipe	RCP	M-1675	DET_88	218.75	5664.5	5632	14.86	36	0.015	0	222.81	0	0	1.5	0.5	0	Calculated
4011	4476	Pipe	RCP	M-1676	M-1638	231.15	5620.2	5612.4	3.37	30	0.015	10.09	65.3	0.15	11.54	0.59	0.23	0	Calculated
4012	4477	Pipe	RCP	M-1677	M-1638	248.42	5644.2	5612.4	12.8	36	0.015	0	206.82	0	0	0.2	0.07	0	Calculated
4013	4478	Pipe	RCP	M-1638	O-304	75.95	5612.4	5590.5	28.83	36	0.015	10.09	310.4	0.03	18.99	0.39	0.13	0	Calculated
4014	4479	Pipe	RCP	I-2899	M-1678	53.05	5659	5655.9	5.84	18	0.015	0	22.01	0	0	0	0	0	Calculated
4015	4480	Pipe	RCP	M-1678	I-2900	110.74	5655.7	5647.2	7.68	18	0.015	0	25.22	0	0	0	0	0	Calculated
4016	4481	Pipe	RCP	I-2621	M-1519	37.28	5648.6	5647.5	2.95	15	0.015	0	9.62	0	0	0	0	0	Calculated
4017	4482	Pipe	RCP	I-2618	M-1517	62.64	5653.7	5652.8	1.44	15	0.015	0	6.71	0	0	0	0	0	Calculated
4018	4483	Pipe	RCP	I-2617	I-2618	26.78	5653.9	5653.8	0.37	15	0.015	0	3.42	0	0	0	0	0	Calculated
4019	4484	Pipe	PVC	M-1518	I-2620	30.03	5650.2	5648.4	5.99	12	0.015	0	7.56	0	0	0	0	0	Calculated
4020	4485	Pipe	RCP	I-2620	I-2619	52.47	5648.3	5648.2	0.19	15	0.015	0	2.44	0	0	0	0	0	Calculated
4021	4486	Pipe	RCP	M-1517	I-2619	121.46	5652.4	5648.2	3.46	15	0.015	0	10.41	0	0	0	0	0	Calculated
4022	4487	Pipe	RCP	I-2619	M-1519	32.56	5648.1	5647.4	2.15	15	0.015	0	8.21	0	0	0	0	0	Calculated
4023	4488	Pipe	RCP	M-1519	I-2900	64.86	5647.3	5647.1	0.31	18	0.015	0	5.06	0	0	0	0	0	Calculated
4024	4489	Pipe	RCP	I-2900	M-1679	318.6	5646.9	5630.3	5.21	24	0.015	0	44.75	0	0	0	0	0	Calculated
4025	4490	Pipe	RCP	M-1679	M-1680	267.29	5630.2	5615.5	5.5	24	0.015	0	46.01	0	0	0	0	0	Calculated
4026	4491	Pipe	RCP	M-1680	M-1681	231.51	5615.1	5600.1	6.48	24	0.015	0	49.91	0	0	0	0	0	Calculated
4027	4492	Pipe	RCP	I-2828	M-1681	57.42	5602.6	5600.5	3.66	15	0.015	0	10.71	0	0	0	0	0	Calculated
4028	4493	Pipe	RCP	I-2901	M-1681	14.35	5606.3	5604.3	13.94	15	0.015	0	20.9	0	0	0	0	0	Calculated
4029	4494	Pipe	RCP	M-1681	M-1682	258.36	5599.9	5585.7	5.5	30	0.015	0	83.34	0	0	0.21	0.08	0	Calculated
4030	4495	Pipe	RCP	M-1682	M-1683	265.84	5585.4	5569.1	6.13	30	0.015	12.92	88.13	0.15	12.41	0.66	0.26	0	Calculated
4031	4496	Pipe	RCP	M-1683	I-2902	166.86	5569	5554.69	8.58	30	0.015	12.91	104.1	0.12	13.77	0.61	0.25	0	Calculated
4032	4497	Pipe	RCP	I-2827	I-2902	64.18	5557.3	5555.8	2.34	15	0.015	0	8.56	0	0	0	0	0	Calculated
4033	4498	Pipe	RCP	I-2902	M-1684	291.51	5554.49	5533.5	7.2	30	0.015	12.91	95.39	0.14	13.18	0.63	0.25	0	Calculated
4034	4499	Pipe	RCP	M-1684	I-2903	425.18	5533.3	5498.7	8.14	30	0.015	12.91	101.41	0.13	9.94	0.77	0.31	0	Calculated
4035	4500	Pipe	RCP	I-2903	I-2826	56.54	5498.5	5497.9	1.06	36	0.015	12.9	59.55	0.22	5.85	1.05	0.35	0	Calculated
4036	4502	Pipe	RCP	I-2754	I-2753	135.51	0	0	0	15	0.015	0	8.64	0	0	0	0	0	Calculated
4037	4503	Pipe	RCP	I-2753	M-1606	49.96	5542.6	5539.9	5.4	18	0.015	0	21.2	0	0	0	0	0	Calculated
4038	4504	Pipe	RCP	M-1606	M-1607	101.08	5539.5	5538.8	0.69	18	0.015	0	7.63	0	0	0	0	0	Calculated
4039	4505	Pipe	RCP	M-1607	I-2755	214.54	5538.8	5538.5	0.14	18	0.015	0	3.4	0	0	0	0	0	Calculated
4040	4506	Pipe	RCP	I-2756	I-2755	24.63	5545.2	5545.1	0.41	15	0.015	0	4.22	0	0	0	0	0	Calculated
4041	4507	Pipe	RCP	I-2755	I-2757	174.75	5538.4	5536.7	0.97	18	0.015	0	9.06	0	0	0	0	0	Calculated
4042	4508	Pipe	RCP	I-2757	M-1608	25.88	5536.5	5535.4	4.25	18	0.015	0	18.77	0	0	0	0	0	Calculated
4043	4509	Pipe	RCP	I-2759	I-2758	25.91	5543.9	5543.6	1.16	15	0.015	0	6.02	0	0	0	0	0	Calculated
4044	4510	Pipe	RCP	I-2758	M-1608	27.52	5543.3	5541.5	6.54	15	0.015	0	14.32	0	0	0	0	0	Calculated
4045	4511	Pipe	RCP	M-1608	M-1609	362.02	5534.9	5534.4	0.14	24	0.015	0	7.29	0	0	0	0	0	Calculated
4046	4512	Pipe	RCP	M-1609	I-2760	162.53	5534.1	5534	0.06	24	0.015	0	5.1	0	0	0	0	0	Calculated
4047	4513	Pipe	RCP	I-2761	I-2760	25.16	5538.6	5538.5	0.4	15	0.015	0	3.53	0	0	0	0	0	Calculated
4048	4514	Pipe	RCP	I-2760	M-1610	83.72	5533.8	5531.7	2.51	24	0.015	0	31.05	0	0	0	0	0	Calculated
4049	4515	Pipe	RCP	M-1610	M-1611	173.21	5531.6	5529.6	1.15	24	0.015	0	21.07	0	0	0	0	0	Calculated
4050	4516	Pipe	RCP	M-1611	I-2762	192.18	5529.4	5528.9	0.26	24	0.015	0	10	0	0	0	0	0	Calculated
4051	4517	Pipe	RCP	I-2763	I-2762	126.95	5529.7	5529.6	0.08	15	0.015	0	1.57	0	0	0	0	0	Calculated
4052	4518	Pipe	RCP	I-2762	M-1612	139.3	5528.5	5528.4	0.07	24	0.015	0	5.25	0	0	0	0	0	Calculated
4053	4519	Pipe	RCP	M-1612	M-1613	60.42	5527.9	5527	1.49	24	0.015	0	23.93	0	0	0	0	0	Calculated
4054	4520	Pipe	RCP	M-1613	I-2764	57.83	5526.6	5526.4	0.35	24	0.015	0	11.53	0	0	0	0	0	Calculated
4055	4521	Pipe	RCP	I-2765	I-2777	198.94	5523.4	5520.3	1.56	48	0.015	11.49	155.4	0.07	6.88	0.76	0.19	0	Calculated
4056	4522	Pipe	RCP	I-2777	I-2778	203.68	5520.1	5450.8	34.02	48	0.015	11.49	726.16	0.02	20.77	0.36	0.09	0	Calculated
4057	4523	Pipe	RCP	I-2778	DET_107	194.13	5450.6	5415	18.34	48	0.015	11.49	533.11	0.02	13.62	0.48	0.12	0	Calculated
4058	4524	Pipe	RCP	DET_107	I-2779	54.03	5415	5403.1	22.02	24	0.015	11.49	92.01	0.12	17.96	0.51	0.26	0	Calculated
4059	4525	Pipe	RCP	I-2779	M-1623	245.05	5403	5357.2	18.69	24	0.015	11.49	84.76	0.14	18.37	0.51	0.25	0	Calculated
4060	4526	Pipe	RCP	M-1623	O-295	33.38	5352.9	5352	2.7	24	0.015	11.49	32.19	0.36	7.64	0.97	0.48	0	Calculated
4061	4527	Pipe	RCP	I-2895	I-2816	24.75	5514	5510.2	15.35	15	0.015	0	21.94	0	0	0	0	0	Calculated
4062	4528	Pipe	RCP	I-2816	I-2894	562.51	5510.2	5492	3.24	15	0.015	0	10.07	0	0	0	0	0	Calculated
4063	4529	Pipe	RCP	I-2893	I-2894	23.68	5595	5592.1	12.25	15	0.015	0	19.59	0	0	0	0	0	Calculated
4064	4530	Pipe	RCP	I-2894	M-1668	240.9	5492	5484	3.32	15	0.015	0	10.2	0	0	0	0	0	Calculated
4065	4531	Pipe	RCP	M-1668	M-1667	217.38	5483.9	5475.9	3.68	15	0.015	0	10.74	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4066	4532	Pipe	RCP	I-2891	I-2892	18.88	5471.9	5470	10.06	15	0.015	0	17.76	0	0	0	0	0	Calculated
4067	4533	Pipe	RCP	M-1667	I-2892	64.52	5475.6	5470.1	8.52	15	0.015	0	16.35	0	0	0	0	0	Calculated
4068	4534	Pipe	RCP	I-2892	M-1666	78.34	5469.9	5465	6.25	15	0.015	0	14.04	0	0	0	0	0	Calculated
4069	4535	Pipe	RCP	M-1666	M-1665	164.69	5465	5453.1	7.23	15	0.015	0	15.05	0	0	0	0	0	Calculated
4070	4536	Pipe	RCP	M-1665	M-1664	242.1	5453	5437.8	6.28	15	0.015	0	14.03	0	0	0	0	0	Calculated
4071	4537	Pipe	RCP	I-2890	I-2889	36.02	5440.4	5439	3.89	15	0.015	0	11.19	0	0	0	0	0	Calculated
4072	4538	Pipe	RCP	I-2889	M-1664	57.83	5439	5437.8	2.08	15	0.015	0	8.06	0	0	0	0	0	Calculated
4073	4539	Pipe	RCP	I-2635	I-2636	23.12	5478.4	5477.2	5.19	15	0.015	0	12.75	0	0	0	0	0	Calculated
4074	4540	Pipe	RCP	I-2636	I-2637	179.05	5477.2	5476.2	0.56	15	0.015	0	4.18	0	0	0	0	0	Calculated
4075	4541	Pipe	RCP	I-2637	I-2638	139.86	5475.8	5475.2	0.43	15	0.015	0	3.82	0	0	0	0	0	Calculated
4076	4542	Pipe	RCP	I-2638	M-1530	153.74	5475.1	5472.7	1.56	15	0.015	0	7.14	0	0	0.02	0.02	0	Calculated
4077	4543	Pipe	RCP	M-1530	M-1531	75.06	5472.6	5471.9	0.93	15	0.015	0.15	5.41	0.03	1.33	0.19	0.15	0	Calculated
4078	4544	Pipe	RCP	M-1531	M-1532	52.06	5472	5471.1	1.73	15	0.015	0.15	7.36	0.02	2.31	0.13	0.1	0	Calculated
4079	4545	Pipe	RCP	M-1532	M-1534	294.98	5471	5461	3.39	15	0.015	0.15	10.31	0.01	3.01	0.11	0.08	0	Calculated
4080	4546	Pipe	RCP	M-1534	M-1535	63.64	5460.5	5457.3	5.03	15	0.015	0.15	12.55	0.01	3.43	0.1	0.08	0	Calculated
4081	4547	Pipe	RCP	M-1535	I-2640	67.76	5456.7	5452.8	5.76	15	0.015	0.15	13.43	0.01	3.59	0.09	0.08	0	Calculated
4082	4548	Pipe	RCP	I-2639	I-2640	19.83	5453.7	5452.8	4.54	15	0.015	0	11.93	0	0	0	0	0	Calculated
4083	4549	Pipe	RCP	I-2640	O-286	51.57	5451.8	5451	1.55	18	0.015	0.15	11.34	0.01	3.49	0.09	0.06	0	Calculated
4084	4550	Pipe	RCP	I-2642	I-2641	29.72	5451.1	5450	3.7	15	0.015	0	10.77	0	0	0	0	0	Calculated
4085	4551	Pipe	RCP	I-2824	M-1685	60.06	5454.4	5450.7	6.16	15	0.015	0	13.9	0	0	0	0	0	Calculated
4086	4552	Pipe	RCP	I-2904	M-1685	12.57	5450.9	5450.6	2.39	15	0.015	0	8.65	0	0	0	0	0	Calculated
4087	4553	Pipe	RCP	M-1685	M-1686	205.54	5450.3	5440.3	4.87	15	0.015	0	12.35	0	0	0	0	0	Calculated
4088	4555	Pipe	RCP	I-2645	M-1536	50.66	5442.4	5441.7	1.38	15	0.015	1.94	6.58	0.29	4.43	0.13	0.41	0	Calculated
4089	4556	Pipe	RCP	I-2641	M-1536	113.84	5449.6	5441.6	7.03	15	0.015	0	14.84	0	0	0	0.02	0	Calculated
4090	4557	Pipe	RCP	M-1536	I-2643	174.92	5441.4	5432.5	5.09	15	0.015	2.91	12.63	0.23	8.29	0.1	0.33	0	Calculated
4091	4558	Pipe	RCP	M-1533	M-1636	93.34	5424.2	5384.4	42.64	24	0.015	0.72	128.03	0.01	10.81	0.09	0.05	0	Calculated
4092	4559	Pipe	RCP	M-1636	I-2822	14.88	5383.3	5382.5	5.38	15	0.015	0.72	12.98	0.06	5.05	0.18	0.17	0	Calculated
4093	4560	Pipe	RCP	I-2822	I-2906	58.5	5382.1	5378.8	5.64	15	0.015	0.72	13.38	0.05	5.61	0.63	0.51	0	Calculated
4094	4561	Pipe	RCP	M-1687	I-2906	287.28	5395.2	5378.8	5.71	15	0.015	13.22	13.38	0.99	11.8	1.25	1	18	SURCHARGED
4095	4562	Pipe	RCP	I-2906	M-1635	195.59	5378.6	5368.6	5.11	15	0.015	12.99	12.66	1.03	11.1	1.25	1	17	SURCHARGED
4096	4563	Pipe	RCP	M-1635	M-1632	162.78	5368.2	5320.8	29.12	15	0.015	12.99	30.21	0.43	22.73	0.59	0.47	0	Calculated
4097	4564	Pipe	RCP	M-1632	M-1634	240.13	5319.6	5268	21.49	15	0.015	12.99	25.95	0.5	17.38	0.75	0.6	0	Calculated
4098	4565	Pipe	RCP	M-1634	M-1633	230.98	5268	5246	9.52	15	0.015	12.99	17.28	0.75	14.83	0.84	0.67	0	Calculated
4099	4566	Pipe	RCP	M-1633	O-303	156.79	5245	5217	17.86	15	0.015	13.01	23.66	0.55	23.04	0.63	0.51	0	Calculated
4100	4567	Pipe	RCP	I-469	I-468	43.89	4443.8	4443.7	0.23	15	0.015	1.5	2.67	0.56	1.22	1.25	1	16	SURCHARGED
4101	4568	Pipe	RCP	I-468	I-2951	234.45	4443.7	4440.4	1.41	15	0.015	7.49	6.64	1.13	6.19	1.25	1	13	SURCHARGED
4102	4569	Pipe	RCP	I-2951	M-1714	252.9	4440.3	4436.2	1.62	15	0.015	7.08	7.13	0.99	6.38	1.13	0.91	0	Calculated
4103	4570	Pipe	Also includes 4571	M-1714	I-2870	436.53	4436.1	4425.1	2.52	15	0.015	7.09	8.89	0.8	7.3	1.07	0.86	0	Calculated
4104	4572	Pipe	RCP	I-2870	I-2869	294.63	4425.1	4421.25	1.31	15	0.015	6.98	6.4	1.09	5.69	1.25	1	17	SURCHARGED
4105	4573	Pipe	RCP	I-2869	I-2868	423.05	4421.2	4417.2	0.95	15	0.015	6.46	5.44	1.19	5.52	1.14	0.91	0	> CAPACITY
4106	4575	Pipe	RCP	I-2865	M-1659	426.02	4415.8	4412.5	0.77	24	0.015	6.99	17.26	0.4	2.22	2	1	122	SURCHARGED
4107	4576	Pipe	RCP	M-1659	O-313	461.46	4412.3	4411.7	0.13	24	0.015	8.03	7.07	1.14	2.56	2	1	199	SURCHARGED
4108	4578	Pipe	RCP	I-2867	I-2952	100.55	4411.6	4411.5	0.1	36	0.015	0	18.23	0	0	0	0	0	Calculated
4109	4579	Pipe	RCP	I-2952	O-319	19.14	4411	4410.5	2.61	42	0.015	0	89.13	0	0	0	0	0	Calculated
4110	4580	Pipe	RCP	I-2953	New-23	237.94	4410.5	4410.1	0.17	24	0.015	0	8.04	0	0	0	0	0	Calculated
4111	4581	Pipe	RCP	New-23	M-1715	171.74	4410.1	4409.9	0.12	24	0.015	0	6.69	0	0	0	0	0	Calculated
4112	4582	Pipe	RCP	M-1715	M-1716	28.91	4409.9	4409.5	1.38	36	0.015	0	67.99	0	0	0	0.01	0	Calculated
4113	4583	Pipe	RCP	M-1716	M-1711	305.05	4409.2	4409.2	0	36	0.015	0.22	1.05	0.21	0.69	0.31	0.11	0	Calculated
4114	4584	Pipe	RCP	I-2947	New-24	19.59	4409	4408	5.1	48	0.015	6.97	281.27	0.02	3.83	0.99	0.26	0	Calculated
4115	4585	Pipe	RCP	M-1711	New-24	276.6	4409	4408	0.36	36	0.015	1.25	34.76	0.04	0.82	1.03	0.35	0	Calculated
4116	4586	Pipe	RCP	New-24	M-1712	591.11	4408	4406.2	0.3	36	0.015	7.42	31.9	0.23	1.79	2.26	0.76	0	Calculated
4117	4587	Pipe	RCP	M-1712	I-2948	61.55	4406.2	4406	0.32	36	0.015	7.45	32.95	0.23	1.73	3	1	24	SURCHARGED
4118	4588	Pipe	HDPE	I-2950	I-2949	62.54	4410	4409	1.6	12	0.015	0	3.9	0	0	0	0	0	Calculated
4119	4589	Pipe	RCP	I-2948	I-2949	256.34	4406	4405.4	0.23	36	0.015	23.06	27.97	0.82	3.59	3	1	36	SURCHARGED
4120	4590	Pipe	RCP	I-2949	M-1713	206.95	4405.2	4404.8	0.19	36	0.015	28.38	25.41	1.12	4.01	3	1	62	SURCHARGED
4121	4591	Pipe	RCP	M-1713	O-318	165.5	4404.8	4404.6	0.12	36	0.015	28.38	20.09	1.41	4.01	3	1	71	SURCHARGED
4122	4592	Pipe	RCP	M-1686	I-2905	299.55	5440.1	5420	6.71	15	0.015	0	14.5	0	0	0.63	0.5	0	Calculated
4123	4593	Pipe	RCP	I-2823	I-2905	60.08	5420.1	5419.9	0.33	15	0.015	5.27	3.39	1.56	4.3	1.25	1	12	SURCHARGED
4124	4594	Pipe	RCP	I-2905	M-1687	402	5419.7	5395.4	6.04	15	0.015	14.21	13.76	1.03	12.3	1.25	1	16	SURCHARGED
4125	4595	Pipe	RCP	I-2821	I-2907	57.94	5313.7	5313.1	1.04	15	0.015	0	5.7	0	0	0	0	0	Calculated
4126	4596	Pipe	RCP	I-2907	M-1688	204.73	5312.9	5295.5	8.5	15	0.015	0	16.32	0	0	0	0	0	Calculated
4127	4597	Pipe	RCP	M-1688	M-1689	304.76	5295.4	5272	7.68	15	0.015	0	15.51	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4128	4598	Pipe	RCP	I-2820	I-2908	60.53	5259.7	5256.2	5.78	15	0.015	0	14.01	0	0	0	0	0	Calculated
4129	4599	Pipe	RCP	M-1689	I-2908	179.52	5271.9	5256.2	8.75	15	0.015	0	16.56	0	0	0	0	0	Calculated
4130	4600	Pipe	RCP	I-2908	M-1690	202.3	5256.1	5240.6	7.66	15	0.015	0	15.5	0	0	0	0	0	Calculated
4131	4601	Pipe	RCP	M-1690	M-1691	240.88	5240.6	5222.3	7.6	15	0.015	0	15.43	0	0	0	0	0	Calculated
4132	4602	Pipe	RCP	I-2819	I-2909	58.41	5200.1	5199.2	1.54	15	0.015	0	6.95	0	0	0	0	0	Calculated
4133	4603	Pipe	RCP	M-1691	I-2909	250.8	5222.2	5199.2	9.17	15	0.015	0	16.95	0	0	0	0	0	Calculated
4134	4604	Pipe	RCP	I-2909	M-1692	226.64	5199	5185.5	5.96	15	0.015	0	13.66	0	0	0	0	0	Calculated
4135	4606	Pipe	RCP	M-1693	I-2853	376.97	5160.8	5145.7	4.01	24	0.015	2.14	39.24	0.05	6.61	0.32	0.16	0	Calculated
4136	4607	Pipe	RCP	I-2818	I-2853	60.02	5147.4	5145.7	2.83	15	0.015	0	9.42	0	0	0.09	0.07	0	Calculated
4137	4608	Pipe	RCP	I-2853	M-1694	400.28	5145.6	5113.1	8.12	24	0.015	2.14	55.87	0.04	8.49	0.27	0.13	0	Calculated
4138	4609	Pipe	RCP	M-1694	M-1695	312.03	5113	5088.4	7.88	24	0.015	2.14	55.05	0.04	8.38	0.27	0.14	0	Calculated
4139	4610	Pipe	RCP	M-1695	I-2910	95.47	5087.7	5085.89	1.9	24	0.015	2.14	27	0.08	6.15	0.34	0.17	0	Calculated
4140	4611	Pipe	RCP	I-2910	I-2817	61.64	5085.9	5078.1	12.65	30	0.015	2.14	126.45	0.02	5.59	0.33	0.13	0	Calculated
4141	4612	Pipe	RCP	I-2817	O-302	44.04	5078.1	5077.5	1.36	30	0.015	2.14	41.49	0.05	4.08	0.41	0.16	0	Calculated
4142	4614	Pipe	RCP	I-689	I-690	162.23	4844.6	4830.3	8.81	15	0.015	0	16.62	0	0	0	0	0	Calculated
4143	4615	Pipe	RCP	I-2955	I-2954	8.27	4478.1	4478	1.21	18	0.015	0	10.01	0	0	0	0	0	Calculated
4144	4616	Pipe	RCP	I-2954	I-2956	394.49	4478	4467	2.79	18	0.015	0	15.2	0	0	0	0	0	Calculated
4145	4617	Pipe	RCP	I-2957	I-2956	7.56	4467.1	4467	1.32	18	0.015	0	14.81	0	0	0	0	0	Calculated
4146	4618	Pipe	RCP	I-2956	I-2958	400.28	4467	4458.5	2.12	18	0.015	0	13.27	0	0	0	0	0	Calculated
4147	4619	Pipe	RCP	I-2959	I-2958	5.92	4458.6	4458.5	1.69	18	0.015	0	11.83	0	0	0	0	0	Calculated
4148	4621	Pipe	RCP	I-1461	I-2962	11.24	4450	4446.4	32.03	18	0.015	14.28	51.52	0.28	8.08	1.5	1	19	SURCHARGED
4149	4622	Pipe	RCP	I-2962	I-2961	78.68	4446.4	4446	0.51	18	0.015	14.28	6.49	2.2	8.08	1.5	1	199	SURCHARGED
4150	4623	Pipe	RCP	I-2961	I-2960	7.01	4446	4445.9	1.43	18	0.015	14.28	10.87	1.31	8.08	1.5	1	203	SURCHARGED
4151	4624	Pipe	RCP	I-2958	I-2960	398.82	4458.5	4445.9	3.16	18	0.015	0	16.18	0	0	0.75	0.5	0	Calculated
4152	4625	Pipe	RCP	M-783	I-2967	338.4	4449.8	4447.6	0.65	30	0.015	8.11	28.66	0.28	4.85	0.93	0.37	0	Calculated
4153	4627	Pipe	HDPE	I-2966	I-2965	12.07	4449.4	4445.7	30.65	12	0.015	0	17.1	0	0	0	0	0	Calculated
4154	4628	Pipe	CMP	I-2965	I-2964	23.18	4447.7	4445.7	8.63	12	0.015	0	9.07	0	0	0.38	0.38	0	Calculated
4155	4629	Pipe	CMP	I-2964	M-1719	5.97	4445.8	4445.7	1.68	12	0.015	0.02	4	0.01	0.36	0.71	0.71	0	Calculated
4156	4630	Pipe	RCP	I-2967	M-1719	82.22	4447.5	4445.7	2.19	30	0.015	8.11	52.6	0.15	6.54	0.75	0.3	0	Calculated
4157	4631	Pipe	RCP	M-1719	M-1718	196.03	4445.6	4443.6	1.02	30	0.015	8.11	35.91	0.23	5.37	1.12	0.46	0	Calculated
4158	4632	Pipe	RCP	M-1718	M-1717	277.51	4443.5	4442	0.54	30	0.015	8.11	26.14	0.31	4.1	2.14	0.87	0	Calculated
4159	4633	Pipe	RCP	I-2477	I-2883	101.54	4444.2	4442.3	1.87	15	0.015	1.19	7.66	0.16	1.17	1.1	0.9	0	Calculated
4160	4634	Pipe	RCP	I-2882	I-2883	32.66	4444.1	4442.4	5.21	12	0.015	0.74	7.04	0.1	1.79	1	1	5	SURCHARGED
4161	4635	Pipe	RCP	I-2883	M-1726	338.65	4442.3	4442.1	0.06	18	0.015	1.94	2.21	0.88	1.13	1.5	1	17	SURCHARGED
4162	4636	Pipe	RCP	M-1726	M-1717	256.99	4442.1	4442	0.04	18	0.015	2.46	1.8	1.37	1.4	1.5	1	19	SURCHARGED
4163	4637	Pipe	RCP	I-2963	M-1717	58.58	4442.1	4442	0.17	18	0.015	0.31	3.76	0.08	0.19	1.5	1	19	SURCHARGED
4164	4638	Pipe	RCP	M-1717	M-1720	200.62	4442	4439.2	1.4	30	0.015	22.36	42	0.53	5.63	2.5	1	12	SURCHARGED
4165	4640	Pipe	RCP	M-1720	M-1721	247.61	4439.1	4437.6	0.61	30	0.015	30.24	27.94	1.08	6.16	2.5	1	26	SURCHARGED
4166	4641	Pipe	RCP	M-1721	I-2968	150.99	4437.5	4436.6	0.6	30	0.015	30.31	25.22	1.2	6.17	2.5	1	23	SURCHARGED
4167	4643	Pipe	RCP	I-2968	M-1722	146.98	4436.7	4435.9	0.54	30	0.015	30.41	26.87	1.13	6.31	2.5	1	10	SURCHARGED
4168	4645	Pipe	RCP	M-1722	M-1723	270.9	4435.8	4432.8	1.11	30	0.015	30.21	37.41	0.81	6.91	2.5	1	13	SURCHARGED
4169	4646	Pipe	HDPE	I-2969	M-1724	9.6	4436.4	4435.6	8.33	10	0.015	0	5.42	0	0	0	0	0	Calculated
4170	4648	Pipe	RCP	M-1723	M-1728	69.04	4431.2	4430	1.74	30	0.015	30.21	46.87	0.64	6.15	2.5	1	64	SURCHARGED
4171	4649	Pipe	RCP	M-1728	I-2970	244.57	4430	4429.5	0.2	30	0.015	19.05	16.07	1.19	3.88	2.5	1	72	SURCHARGED
4172	4650	Pipe	RCP	M-1724	M-1727	238.71	4435.4	4432	1.42	12	0.015	0.1	3.74	0.03	0.25	0.5	0.5	0	Calculated
4173	4651	Pipe	RCP	M-1727	I-2970	52.27	4432	4430.7	2.49	15	0.015	3.68	8.83	0.42	3.18	1.25	1	61	SURCHARGED
4174	4654	Pipe	RCP	I-2970	I-2971	136.09	4429.4	4429.2	0.15	30	0.015	22.62	13.63	1.66	4.61	2.5	1	72	SURCHARGED
4175	4655	Pipe	RCP	I-2973	I-2971	57.02	4434.2	4433.4	1.4	12	0.015	0.86	3.66	0.24	1.68	0.79	0.8	0	Calculated
4176	4657	Pipe	RCP	I-2971	I-2972	157.47	4429.3	4429	0.19	30	0.015	30.29	15.52	1.95	6.17	2.5	1	64	SURCHARGED
4177	4663	Pipe	RCP	I-2972	M-1725	64.2	4428.9	4428.8	0.16	30	0.015	30.29	14.03	2.16	6.17	2.5	1	35	SURCHARGED
4178	4664	Pipe	RCP	M-1725	M-1463	290.64	4428.7	4428.2	0.17	36	0.015	30.66	23.98	1.28	5.11	3	1	18	SURCHARGED
4179	4665	Pipe	SMOOTH LINED	I-2976	I-2977	408.36	4465	4457	1.96	42	0.015	0	122.04	0	0	0	0	0	Calculated
4180	4666	Pipe	SMOOTH LINED	I-2977	I-2978	456.94	4457	4445.5	2.52	42	0.015	0	138.33	0	0	1.75	0.5	0	Calculated
4181	4667	Pipe	SMOOTH LINED	I-2960	I-2978	107.95	4445.9	4445.5	0.37	24	0.015	14.28	11.93	1.2	4.54	2	1	199	SURCHARGED
4182	4668	Pipe	SMOOTH LINED	I-2978	I-2979	432.91	4448	4445.5	0.58	42	0.015	28.77	66.26	0.43	6.33	1.62	0.48	0	Calculated
4183	4669	Pipe	SMOOTH LINED	I-2979	I-2982	315.81	4442	4438	1.27	42	0.015	28.82	98.13	0.29	8.27	1.3	0.39	0	Calculated
4184	4670	Pipe	RCP	I-2975	O-321	27.35	4652.79	4651.07	6.29	48	0.015	6.55	312.19	0.02	8.53	0.45	0.11	0	Calculated
4185	4671	Pipe	RCP	I-2974	O-320	175.16	4644.94	4572	41.64	15	0.015	6.55	36.13	0.18	28.03	0.31	0.25	0	Calculated
4186	4674	Pipe	RCP	M-1649	M-1650	19.16	4457.5	4457	2.61	18	0.015	0	14.71	0	0	0	0	0	Calculated
4187	4675	Pipe	RCP	M-1650	M-848	202.08	4455	4453.3	0.84	18	0.015	0	12.32	0	0	0	0	0	Calculated
4188	4676	Pipe	RCP	M-847	M-1651	62.59	4450.5	4449.3	1.92	15	0.015	0	7.75	0	0	0	0	0	Calculated
4189	4677	Pipe	RCP	I-2854	M-1651	66.14	4453	4449.2	5.75	15	0.015	0	13.42	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4190	4678	Pipe	RCP	M-1651	I-2857	56.44	4449.1	4449	0.18	21	0.015	0	5.78	0	0	0	0	0	Calculated
4191	4679	Pipe	RCP	I-1497	I-2857	62.73	4452.6	4451	2.55	15	0.015	0	8.94	0	0	0	0	0	Calculated
4192	4681	Pipe	RCP	I-2857	M-846	161.46	4448.7	4448.3	0.25	21	0.015	0	6.84	0	0	0	0	0	Calculated
4193	4682	Pipe	RCP	I-2855	I-2856	27.22	4449.3	4449.1	0.73	15	0.015	0	5.26	0	0	0	0	0	Calculated
4194	4683	Pipe	RCP	I-2856	M-1652	7.58	4449.5	4447.7	23.75	15	0.015	0	27.28	0	0	0	0	0	Calculated
4195	4684	Pipe	RCP	M-846	M-845	179.16	4448.2	4447.8	0.22	21	0.015	0	6.49	0	0	0	0	0	Calculated
4196	4685	Pipe	RCP	I-1496	M-845	5.21	4451	4447.9	59.5	15	0.015	0	43.18	0	0	0	0	0	Calculated
4197	4686	Pipe	RCP	I-1495	M-845	22.61	4450.5	4447.9	11.5	15	0.015	0	18.98	0	0	0	0	0	Calculated
4198	4687	Pipe	RCP	M-845	I-1463	395.89	4447.8	4446.7	0.28	18	0.015	0	4.8	0	0	0	0	0	Calculated
4199	4688	Pipe	HDPE	I-1463	M-831	23.65	4446.6	4445.8	3.38	18	0.015	0	16.74	0	0	0	0	0	Calculated
4200	4689	Pipe	HDPE	I-1462	M-831	28.22	4446.2	4445.8	1.42	18	0.015	0	10.84	0	0	0	0	0	Calculated
4201	4691	Pipe	RCP	M-831	M-832	177.05	4445.8	4441	2.71	24	0.015	0	32.28	0	0	0.75	0.38	0	Calculated
4202	4693	Pipe	RCP	M-832	M-833	300.38	4440.9	4438	0.97	24	0.015	16.72	19.26	0.87	5.61	1.8	0.9	0	Calculated
4203	4694	Pipe	RCP	I-1464	M-833	10.85	4440.2	4438.7	13.82	15	0.015	0	20.82	0	0	0.63	0.5	0	Calculated
4204	4695	Pipe	RCP	M-833	O-154	16	4438	4437.9	0.63	24	0.015	16.72	15.5	1.08	5.77	1.74	0.87	0	> CAPACITY
4205	4696	Pipe	HDPE	I-2981	I-2980	6	4443.6	4443.5	1.67	18	0.015	0.02	11.75	0	0.2	0.52	0.35	0	Calculated
4206	4697	Pipe	HDPE	I-2980	I-2986	395.96	4443.5	4438	1.39	18	0.015	2.92	10.73	0.27	5.75	0.48	0.33	0	Calculated
4207	4698	Pipe	HDPE	I-2886	I-2885	194.47	4440.1	4438.8	0.67	15	0.015	0	4.58	0	0	0	0	0	Calculated
4208	4699	Pipe	HDPE	I-2885	I-2884	206.25	4438.7	4436.4	1.12	15	0.015	0	5.91	0	0	0	0	0	Calculated
4209	4700	Pipe	RCP	I-2887	I-2888	14.24	4439.1	4437.3	12.64	15	0.015	0	19.85	0	0	0	0	0	Calculated
4210	4701	Pipe	HDPE	I-2888	I-2884	213.06	4437.4	4436.1	0.61	15	0.015	0	4.37	0	0	0	0	0	Calculated
4211	4702	Pipe	HDPE	I-2884	I-2498	76.02	4436	4435.9	0.13	15	0.015	0	2.87	0	0	0	0	0	Calculated
4212	4703	Pipe	HDPE	I-2498	M-1469	32.96	4440.9	4435.4	16.69	18	0.015	0	37.19	0	0	0	0	0	Calculated
4213	4704	Pipe	HDEP	M-1469	O-258	32.03	4435.2	4435	0.62	24	0.015	0	15.49	0	0	0	0	0	Calculated
4214	4705	Pipe	RCP	I-2497	O-257	391.27	4435.9	4433.5	0.61	24	0.015	8.15	9.4	0.87	2.59	2	1	151	SURCHARGED
4215	4706	Pipe		I-2864	I-2861	28.57	4480	4479.8	0.7	15	0.015	0	4.68	0	0	0	0	0	Calculated
4216	4708	Pipe	RCP	I-2861	I-2862	19.13	4478.8	4478.6	1.05	15	0.015	1.89	5.72	0.33	3.67	0.55	0.44	0	Calculated
4217	4709	Pipe	RCP	I-2862	I-2863	40.19	4478.5	4477.7	1.99	15	0.015	1.89	7.9	0.24	4.8	0.45	0.36	0	Calculated
4218	4710	Pipe	RCP	I-2863	O-311	13.02	4477.7	4473.9	29.19	15	0.015	1.89	30.25	0.06	11.77	0.24	0.19	0	Calculated
4219	4712	Pipe	RCP	I-2483	New-3	348.34	4598.2	4597	0.34	30	0.015	31.09	20.86	1.49	6.43	2.5	1	9	SURCHARGED
4220	4714	Pipe	RCP	New-3	I-2482	416.95	4597	4587.8	2.21	30	0.015	51.79	52.8	0.98	11.54	2.25	0.9	0	Calculated
4221	4716	Pipe	RCP	I-239	I-2482	70.17	4591	4587.8	4.56	15	0.015	0	11.96	0	0	0.63	0.5	0	Calculated
4222	4717	Pipe	RCP	I-2482	I-2481	645.09	4587.7	4560.7	4.19	30	0.015	51.97	72.73	0.71	15.51	1.63	0.65	0	Calculated
4223	4718	Pipe	RCP	I-240	I-2481	66.59	4561.1	4560.7	0.6	15	0.015	0.74	4.5	0.16	0.62	1.22	1	1	SURCHARGED
4224	4721	Pipe	RCP	I-2481	New-5	90.37	4560.6	4553	8.41	30	0.015	52.91	103.29	0.51	15.09	2.09	0.84	0	Calculated
4225	4723	Pipe	RCP	New-5	M-41	157.62	4553	4539.1	8.82	30	0.015	82.9	105.56	0.79	16.89	2.5	1	8	SURCHARGED
4226	4724	Pipe	RCP	M-41	M-42	25.18	4539.2	4534.5	18.67	30	0.015	73.93	153.58	0.48	15.06	2.5	1	14	SURCHARGED
4227	4726	Pipe	3'X3' BOX OVER FLOW TO GUTTER	M-44	O-9	30.44	4534.8	4534	2.63	42	0.015	40.41	210.26	0.19	13.24	1.68	0.48	0	Calculated
4228	4727	Pipe	3'X3' BOX CULVERT	M-43	M-44	10.94	4535.1	4534.8	2.74	42	0.015	40.45	215.78	0.19	5.54	2.51	0.74	0	Calculated
4229	4728	Pipe	HDPE	I-3011	M-1730	97.1	4448	4446	2.06	18	0.015	0	13.07	0	0	0	0	0	Calculated
4230	4729	Pipe	HDPE	I-3010	M-1730	119.63	4452	4448	3.34	18	0.015	0	16.65	0	0	0	0	0	Calculated
4231	4730	Pipe	HDPE	M-1730	I-3009	85.3	4448	4445	3.52	18	0.015	0	17.07	0	0	0	0	0	Calculated
4232	4731	Pipe	HDPE	I-3012	M-1731	77.56	4454	4453	1.29	18	0.015	0	10.34	0	0	0	0	0	Calculated
4233	4732	Pipe	HDPE	M-1731	I-3013	142.38	4453	4451	1.4	18	0.015	0	10.79	0	0	0	0	0	Calculated
4234	4733	Pipe	HDPE	I-3013	I-3017	146.55	4451	4446	3.41	18	0.015	0	16.82	0	0	0	0	0	Calculated
4235	4734	Pipe	HDPE	I-3017	I-3016	66.81	4446	4430	23.95	18	0.015	0	44.55	0	0	0	0	0	Calculated
4236	4735	Pipe	HDPE	I-3016	I-3015	105.66	4430	4429.7	0.28	18	0.015	0	4.85	0	0	0	0	0	Calculated
4237	4736	Pipe	HDPE	I-3014	I-3015	257.28	4430	4429.7	0.12	18	0.015	0	3.11	0	0	0	0	0	Calculated
4238	4737	Pipe	HDPE	I-3015	I-2803	94.07	4429.7	4428.2	1.59	18	0.015	0	11.5	0	0	0.3	0.2	0	Calculated
4239	4738	Pipe	HDPE	I-2803	I-2802	6.27	4428.2	4428.1	1.59	18	0.015	0.13	11.5	0.01	0.86	0.66	0.44	0	Calculated
4240	4739	Pipe	HDPE	I-3018	M-1732	64.14	4454	4452	3.12	18	0.015	0	16.08	0	0	0	0	0	Calculated
4241	4740	Pipe	HDPE	M-1732	I-3019	110.52	4452	4450	1.81	18	0.015	0	12.25	0	0	0.32	0.21	0	Calculated
4242	4741	Pipe	HDPE	I-3019	I-3020	159.35	4450	4446	2.51	18	0.015	4.11	14.42	0.29	8.54	0.48	0.32	0	Calculated
4243	4742	Pipe	HDPE	I-3020	I-3022	70.28	4446	4430	22.77	18	0.015	4.11	43.44	0.09	3.69	0.91	0.6	0	Calculated
4244	4743	Pipe	HDPE	I-3022	I-3021	200.08	4430	4429.8	0.1	18	0.015	2.68	2.88	0.93	1.54	1.5	1	121	SURCHARGED
4245	4744	Pipe	HDPE	I-3021	I-2995	94.63	4429.8	4428.1	1.8	18	0.015	8.61	12.2	0.71	4.87	1.5	1	125	SURCHARGED
4246	4745	Pipe	HDPE	I-2995	I-2996	6.03	4428.2	4428.1	1.66	18	0.015	8.61	11.72	0.73	4.87	1.5	1	155	SURCHARGED
4247	4746	Pipe	HDPE	I-2996	I-3023	116.02	4428.1	4427.9	0.17	18	0.015	8.83	3.78	2.34	5	1.5	1	157	SURCHARGED
4248	4747	Pipe	HDEP	I-3004	I-3023	85.9	4440	4428	13.97	18	0.015	0	34.03	0	0	0.75	0.5	0	Calculated
4249	4748	Pipe	HDPE	I-3008	M-1729	127.76	4451	4448	2.35	18	0.015	0	13.95	0	0	0	0	0	Calculated
4250	4749	Pipe	HDPE	I-3007	M-1729	90.43	4452	4451	1.11	18	0.015	0	9.57	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4251	4750	Pipe	HDPE	M-1729	I-3006	104.26	4451	4449	1.92	18	0.015	0	12.61	0	0	0	0	0	Calculated
4252	4751	Pipe	HDPE	I-3006	I-3005	84.61	4449	4446	3.55	18	0.015	0	17.14	0	0	0	0	0	Calculated
4253	4752	Pipe	HDPE	I-3005	I-3004	156.2	4446	4440	3.84	18	0.015	0	17.84	0	0	0	0	0	Calculated
4254	4753	Pipe	HDPE	I-3023	I-3003	279.02	4427.9	4427.6	0.11	42	0.015	37.28	28.59	1.3	3.96	3.32	0.95	0	> CAPACITY
4255	4754	Pipe	HDPE	I-2802	I-3024	81.49	4428.1	4428	0.12	18	0.015	0.72	3.19	0.23	1.29	0.75	0.5	0	Calculated
4256	4755	Pipe	HDPE	I-3009	I-3024	58.24	4445	4428	29.19	18	0.015	0	49.19	0	0	0.4	0.27	0	Calculated
4257	4756	Pipe	HDPE	I-3003	I-3024	422.85	4428	4427	0.24	42	0.015	37.16	42.4	0.88	5.64	2.27	0.65	0	Calculated
4258	4757	Pipe	HDPE	I-2997	I-2998	6.05	4428.35	4428.3	0.83	18	0.015	0.02	8.28	0	0.5	0.48	0.33	0	Calculated
4259	4758	Pipe	HDPE	I-2998	I-2802	475.3	4428.3	4428.2	0.02	18	0.015	0.31	1.32	0.24	0.79	0.55	0.37	0	Calculated
4260	4759	Pipe	RCP	I-1481	I-3025	635.53	4430.9	4430	0.14	24	0.015	3.52	7.38	0.48	1.12	2	1	88	SURCHARGED
4261	4760	Pipe	RCP	I-3025	I-3021	203.77	4430	4429.8	0.1	24	0.015	6.56	6.14	1.07	2.39	2	1	106	SURCHARGED
4262	4761	Pipe	HDPE	I-2993	I-2994	6.03	4428.3	4428.2	1.66	18	0.015	0.33	11.72	0.03	0.23	1.5	1	151	SURCHARGED
4263	4762	Pipe	HDPE	I-2994	I-2996	409.45	4428.2	4428.1	0.02	18	0.015	3.09	1.42	2.17	1.75	1.5	1	154	SURCHARGED
4264	4763	Pipe	RCP	I-3024	New-30	264.1	4427	4424	1.14	42	0.015	39.24	92.93	0.42	9.2	1.62	0.46	0	Calculated
4265	4764	Pipe	RCP	New-30	Corner-3	691.63	4424	4411	1.88	42	0.015	39.17	119.54	0.33	10.78	1.68	0.48	0	Calculated
4266	4765	Pipe	HDPE	I-2983	I-2985	78.71	4438.7	4438.2	0.64	18	0.015	0	7.26	0	0	0.1	0.07	0	Calculated
4267	4766	Pipe	HDPE	I-2985	I-2986	7.5	4438.2	4438	2.67	18	0.015	0.02	14.87	0	0.24	0.3	0.21	0	Calculated
4268	4767	Pipe	HDPE	I-2986	I-2987	113.93	4438	4434.2	3.34	18	0.015	2.87	16.63	0.17	2.87	0.93	0.64	0	Calculated
4269	4768	Pipe	HDPE	I-3001	I-2990	115.05	4431.5	4431.4	0.09	18	0.015	4.98	2.68	1.86	3.03	1.47	0.98	0	> CAPACITY
4270	4769	Pipe	HDPE	I-2990	I-2991	7.03	4431.4	4431.3	1.42	18	0.015	4.99	10.86	0.46	4.22	1.45	0.97	0	Calculated
4271	4770	Pipe	HDPE	I-2991	I-2992	103.5	4431.3	4430.2	1.06	18	0.015	5.4	9.39	0.58	3.58	1.48	0.98	0	Calculated
4272	4771	Pipe	HDPE	I-2982	I-2987	253.15	4438	4434.2	1.5	42	0.015	28.8	106.83	0.27	6.69	1.57	0.46	0	Calculated
4273	4774	Pipe	Combined with 4773	I-2987	I-2992	785.97	4434.2	4430.2	0.51	42	0.015	34.65	62.2	0.56	5.92	2.07	0.59	0	Calculated
4274	4776	Pipe	HDPE	I-2992	I-3023	814.32	4430.2	4427.9	0.28	42	0.015	33.64	46.34	0.73	4.21	2.89	0.83	0	Calculated
4275	4777	Pipe	HDPE	I-2988	I-2989	6.25	4431.3	4431.2	1.6	18	0.015	0.03	11.52	0	0.23	1.48	0.99	0	Calculated
4276	4778	Pipe	HDPE	I-2989	I-2991	399.5	4431.2	4431	0.05	18	0.015	2.51	2.04	1.23	1.94	1.5	1	11	SURCHARGED
4277	4779	Pipe	HDPE	I-2797	I-3026	60.09	4426.5	4426	0.83	18	0.015	0	0.37	0	0	0	0	0	Calculated
4278	4780	Pipe	HDPE	I-2800	I-2801	7.66	4429	4429.2	-2.61	18	0.015	0	14.71	0	0	0	0	0	Calculated
4279	4781	Pipe	HDPE	I-2801	I-2799	310.04	4429.2	4429	0.06	18	0.015	0	2.31	0	0	0	0	0	Calculated
4280	4782	Pipe	HDPE	I-2798	I-2799	6.97	4428.9	4429	-1.43	18	0.015	0	10.9	0	0	0	0	0	Calculated
4281	4783	Pipe	HDPE	I-2796	I-2797	178.57	4427	4426.5	0.28	18	0.015	0	4.82	0	0	0	0	0	Calculated
4282	4784	Pipe	RCP	I-2795	I-2792	111.24	4428	4427.5	0.45	24	0.015	0.58	13.14	0.04	2.64	0.24	0.12	0	Calculated
4283	4785	Pipe	RCP	I-2794	I-2793	131.21	4427.5	4427.2	0.23	18	0.015	0.06	4.35	0.01	0.16	0.74	0.5	0	Calculated
4284	4786	Pipe	HDPE	I-2793	I-2781	131.81	4427.2	4425	1.67	18	0.015	3.48	6.14	0.57	3.47	0.83	0.55	0	Calculated
4285	4787	Pipe	RCP	I-2784	I-2569	182.28	4425.5	4425.4	0.05	18	0.015	4.3	2.13	2.01	2.43	1.5	1	134	SURCHARGED
4286	4788	Pipe	RCP	I-2569	I-2570	77.02	4425.4	4425.3	0.13	24	0.015	12.11	5	2.42	3.85	2	1	74	SURCHARGED
4287	4789	Pipe	RCP	I-2570	I-2571	10.24	4425.3	4425.25	0.49	24	0.015	12.11	19.37	0.63	3.86	2	1	73	SURCHARGED
4288	4790	Pipe	RCP	I-2571	New-29	102.17	4425.25	4425.1	0.15	24	0.015	12.12	7.51	1.61	3.86	2	1	68	SURCHARGED
4289	4791	Pipe	HDPE	I-2789	I-2790	9.06	4432	4431	11.04	18	0.015	0	30.25	0	0	0.32	0.21	0	Calculated
4290	4792	Pipe	HDPE	I-2790	I-2783	362.54	4431	4425.5	1.52	18	0.015	3.84	11.21	0.34	6.09	0.58	0.39	0	Calculated
4291	4793	Pipe	HDPE	I-2573	I-2574	7.96	4432	4431	12.56	18	0.015	0	32.27	0	0	0	0	0	Calculated
4292	4794	Pipe	HDPE	I-2574	I-2577	278.53	4428	4427.5	0.18	18	0.015	0	3.86	0	0	0	0	0	Calculated
4293	4795	Pipe	HDPE	I-2576	I-2577	7.96	4431.2	4430.2	12.56	18	0.015	0	32.27	0	0	0	0	0	Calculated
4294	4796	Pipe	HDPE	I-2577	I-2580	278.53	4427.5	4427	0.18	18	0.015	0	0.17	0	0	0	0	0	Calculated
4295	4797	Pipe	HDPE	I-2582	I-2583	8.57	4430	4426.5	40.84	18	0.015	0	58.18	0	0	0	0	0	Calculated
4296	4798	Pipe	HDPE	I-2583	I-2586	275.41	4426.5	4426.4	0.04	18	0.015	0	1.73	0	0	0	0	0	Calculated
4297	4799	Pipe	HDPE	I-2585	I-2586	11.09	4426.6	4426.4	1.8	18	0.015	0	12.23	0	0	0	0	0	Calculated
4298	4800	Pipe	HDPE	I-2586	I-2587	89.24	4426.4	4426.3	0.11	18	0.015	0	0.3	0	0	0	0	0	Calculated
4299	4801	Pipe	RCP	I-685	I-684	93.34	4814.5	4812.8	1.82	15	0.015	0	7.56	0	0	0	0	0	Calculated
4300	4802	Pipe	RCP	I-697	I-698	31.53	4811.2	4810.7	1.59	15	0.015	0	7.05	0	0	0	0	0	Calculated
4301	4803	Pipe	RCP	M-410	I-696	65.36	4810	4801.2	13.46	15	0.015	0	20.54	0	0	0	0	0	Calculated
4302	4804	Pipe	RCP	I-684	I-698	54.85	4812.7	4810.7	3.65	24	0.015	0	37.44	0	0	0	0	0	Calculated
4303	4805	Pipe	RCP	I-698	M-410	88.24	4810.2	4810	0.23	24	0.015	0	9.33	0	0	0	0	0	Calculated
4304	4806	Pipe	RCP	I-693	I-684	72.39	4818.1	4812.7	7.46	15	0.015	0	15.29	0	0	0	0	0	Calculated
4305	4807	Pipe	RCP	M-139	M-1447	75.73	4638.9	4636.7	2.91	18	0.015	9.99	15.52	0.64	7.29	1.08	0.72	0	Calculated
4306	4808	Pipe	RCP	I-2458	I-2459	72.42	4641.3	4637.1	5.8	18	0.015	0	21.92	0	0	0	0	0	Calculated
4307	4809	Pipe	RCP	I-2459	M-1449	178.48	4634.8	4633.5	0.73	42	0.015	0	74.42	0	0	0	0	0	Calculated
4308	4810	Pipe	RCP W/ ORIFICE	M-1449	M-1448	14.47	4637.5	4633.5	27.64	42	0.015	0	458.45	0	0	0.63	0.18	0	Calculated
4309	4811	Pipe	RCP	M-1447	M-1448	161.97	4636.7	4633.6	1.91	18	0.015	9.99	12.59	0.79	6.9	1.14	0.76	0	Calculated
4310	4812	Pipe	RCP	M-1448	M-147	11.11	4633.5	4633	4.5	18	0.015	9.99	19.31	0.52	7.78	1.01	0.68	0	Calculated
4311	4814	Pipe	HDPE	I-818	O-110	170.05	4769.8	4765.5	2.53	24	0.015	9.65	31.07	0.31	10.99	1.27	0.64	0	Calculated
4312	4815	Pipe	HDPE	I-2942	I-46	207.78	4493	4490.4	1.25	12	0.015	0	3.45	0	0	0	0	0	Calculated

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4313	4816	Pipe	RCP	New-33	UnitDET_SB744	768.12	4496	4487.1	1.16	18	0.015	10.12	9.8	1.03	7.26	1.5	1	7	SURCHARGED
4314	4817	Pipe	RCP	New-34	M-1706	244.52	4477.5	4475.4	0.86	24	0.015	2.25	18.17	0.12	3.31	0.54	0.27	0	Calculated
4315	4818	Pipe	RCP	M-1706	I-2941	85.37	4475.4	4475	0.47	24	0.015	2.25	13.42	0.17	2.51	0.66	0.33	0	Calculated
4316	4819	Pipe	RCP	I-2940	M-1705	23.03	4477	4474.8	9.55	15	0.015	0	17.3	0	0	0.42	0.34	0	Calculated
4317	4820	Pipe	RCP	I-2941	M-1705	26.81	4475	4474.8	0.75	24	0.015	2.25	16.93	0.13	1.99	0.78	0.39	0	Calculated
4318	4821	Pipe	RCP	M-1705	I-2939	213.68	4474.7	4474.6	0.05	24	0.015	2.25	4.24	0.53	2.16	0.73	0.37	0	Calculated
4319	4822	Pipe	RCP	I-2937	O-1	44.38	4475.6	4474	3.61	24	0.015	0	37.23	0	0	0	0	0	Calculated
4320	4823	Pipe	RCP	I-2939	I-2938	83.18	4474.55	4473.5	1.26	24	0.015	2.25	22.03	0.1	4.27	0.5	0.25	0	Calculated
4321	4824	Pipe	RCP	I-2938	O-2	58.27	4473.4	4472.64	1.3	24	0.015	5.56	22.39	0.25	6.52	0.63	0.32	0	Calculated
4322	4825	Pipe	HDPE	I-27	M-1450	188.73	4488.14	4484	2.19	15	0.015	0	8.29	0	0	0	0	0	Calculated
4323	4826	Pipe	HDPE	M-1450	I-33	172.29	4484	4478.7	3.08	15	0.015	0	9.82	0	0	0.56	0.5	0	Calculated
4324	4827	Pipe	RCP	I-1248	DET_55	144.43	4484.9	4475	6.85	30	0.015	66.45	70.62	0.94	13.54	2.5	1	106	SURCHARGED
4325	4829	Pipe	RCP	I-45	M-23	44.09	4489.1	4486	7.03	8	0.015	0	2.81	0	0	0	0	0	Calculated
4326	4830	Pipe	HDPE	I-47	M-23	52.62	4491	4481.5	18.05	8	0.015	0	4.51	0	0	0	0	0	Calculated
4327	4831	Pipe	HDPE	M-1445	M-924	99.23	4558.85	4558.8	0.05	15	0.015	0	1.26	0	0	0	0	0	Calculated
4328	4832	Pipe	HDPE	M-1455	M-1445	148.12	4561.5	4558.9	1.76	15	0.015	0	7.42	0	0	0	0	0	Calculated
4329	4834	Pipe	RCP	I-2868	M-1660	30.89	4414.55	4413.9	2.1	15	0.015	6.49	8.12	0.8	5.29	1.25	1	218	SURCHARGED
4330	CH-32	Pipe	Created based on manhole and inlet data indicating 15" HDPE	New-36	DET_118	1753.8	5110	4883	12.94	18	0.015	0	32.75	0	0	0.5	0.33	0	Calculated
4331	Con-1	Pipe	pipe	I-1917	M-1012	227.36	4747.8	4728.7	8.4	15	0.015	7.01	16.23	0.43	12.05	0.59	0.48	0	Calculated
4332	Con-103	Pipe		O-86	DET_30	84.03	4440	4439.8	0.24	18	0.015	6.68	4.44	1.5	3.78	1.5	1	160	SURCHARGED
4333	Con-104	Pipe		O-87	DET_30	63.27	4439.9	4439.8	0.16	18	0.015	5.23	3.62	1.45	2.96	1.5	1	160	SURCHARGED
4334	Con-115	Pipe		O-41	DET_90	169.85	4613.15	4607.3	3.44	0	0.015	10.26	0	0.03	0	1.98	0.49	0	Calculated
4335	Con-122	Pipe	Direct link for conveyance purposes	M-1626	O-220	410.74	6251.41	6199.43	12.66	0	0.015	0	0	0	0	0.2	0.05	0	Calculated
4336	Con-138	Pipe		O-60	DET_9	56.91	4704	4703	1.76	18	0.015	0.23	12.07	0.02	0.16	1.5	1	140	SURCHARGED
4337	Con-142	Pipe		M-1637	New-40	73.77	5423.93	5408	21.59	36	0.015	9.07	268.62	0.03	11.56	0.55	0.19	0	Calculated
4338	Con-146	Pipe		DET_99	I-1860	52.34	4920	4912.2	14.9	18	0.015	0.03	35.14	0	2.52	0.04	0.03	0	Calculated
4339	Con-147	Pipe		DET_C3	I-1861	6.41	4928	4927.5	7.8	18	0.015	0.08	25.43	0	2.84	0.07	0.04	0	Calculated
4340	Con-156	Pipe		O-95	DET_36	13.63	4424.36	4425	-4.7	12	0.015	8.98	6.69	1.34	11.43	1	1	34	SURCHARGED
4341	Con-40	Pipe		M-1374	New-19	287.83	4744.2	0	1648.26	18	0.015	19.53	38.77	0.5	24.86	0.8	0.53	0	Calculated
4342	Con-50	Pipe		I-2358	O-299	3.13	4419.5	4418	47.92	18	0.015	15.33	81.36	0.19	14.51	0.88	0.58	0	Calculated
4343	Con-99	Pipe		M-1562	DET_150	6.39	4406.2	4409.9	-57.9	18	0.015	0.07	1.14	0.06	0.93	1.5	1	91	SURCHARGED
4344	Corner-11	Pipe	Assumed channel characteristics	O-83	O-85	864.5	4470	4458.3	1.35	60	0.015	93.52	425.17	0.22	6.07	2.57	0.51	0	Calculated
4345	Corner-20	Pipe	Culvert characteristics assumed	M-1396	Corner-3	468.98	4416.1	4407	1.94	60	0.015	152.57	400.33	0.38	6.1	5	1	4	SURCHARGED
4346	Corner-21	Pipe	Channel characteristics assumed	Corner-3	O-261	93.25	4407	4402	5.36	60	0.015	187.07	665.48	0.28	9.08	4.12	0.82	0	Calculated
4347	CornerOutlet-1	Pipe	Link created to outlet to Corner Canyon Creek where invert is higher than the creek flowline	O-76	Corner-1	7.86	4439.28	4437.5	22.65	0	0.015	0	0	0.08	0	1.65	0.33	0	Calculated
4348	Link-01	Pipe		Jun-2363	Jun-2364	200	4400	4398	1	48	0.015	76.74	124.49	0.62	9.26	2.51	0.63	0	Calculated
4349	New-1	Pipe	Manhole information indicates 18" inch pipe connected to manhole-1370 and 24" pipe connected to inlet-1940. Assumed 18" as directed by Robert. Needs to be verified.	I-1940	M-1370	174.31	5012.1	4994.22	10.26	18	0.015	10.08	29.16	0.35	11.61	0.72	0.5	0	Calculated
4350	New-11	Pipe	Siphon underneath the SLC Canal	I-2866	O-314	60.51	4420.27	4417.18	5.11	24	0.015	0	44.31	0	0	0	0	0	Calculated
4351	New-13	Pipe	15-inch pipe, as indicated in outlet data	O-182	O-235	131.87	5127.35	5124.47	2.18	15	0.015	1.76	8.27	0.21	7.33	0.31	0.25	0	Calculated
4352	New-14	Pipe	Pipe not in inventory - 15" indicated at junctions	I-1674	I-1675	43.81	5133.88	5132.44	3.29	15	0.015	3.45	10.15	0.34	7.56	0.53	0.42	0	Calculated
4353	New-15	Pipe	30" culvert indicated in inventory for outlet	New-25	O-106	239.59	5128	5069.06	24.6	30	0.015	18.39	176.31	0.1	22.82	0.55	0.22	0	Calculated
4354	New-16	Pipe		New-29	M-1480	347.33	4425.1	4422.6	0.72	24	0.015	16.01	16.63	0.96	5.09	2	1	68	SURCHARGED

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4355	New-17	Pipe	RCP	M-1481	New-29	801.77	4426.2	4425.1	0.14	24	0.015	6.6	7.26	0.91	2.42	2	1	58	SURCHARGED
4356	New-18	Pipe	RCP	I-2783	New-26	109.88	4425.5	4418.5	6.37	24	0.015	7.28	49.49	0.15	4.09	1.18	0.59	0	Calculated
4357	New-19	Pipe	RCP	I-2782	I-2783	9.47	4426	4425.5	5.28	24	0.015	4.2	45.05	0.09	6.21	0.54	0.27	0	Calculated
4358	New-2	Pipe	Assumed connection from input from Robert. No detention currently at pond	O-28	M-343	355	4719.1	4701.05	5.08	24	0.015	4.96	44.21	0.11	3.26	0.97	0.49	0	Calculated
4359	New-20	Pipe	RCP	I-2781	I-2782	89.35	4426.6	4426	0.67	24	0.015	4.2	16.07	0.26	4.4	0.69	0.34	0	Calculated
4360	New-21	Pipe		I-2548	M-1399	1067	4429.73	4428.2	0.14	24	0.015	6.64	7.42	0.89	2.22	2	1	27	SURCHARGED
4361	New-22	Pipe		I-2806	I-2805	25.08	6257.6	6256.86	2.95	15	0.015	0	9.62	0	0	0	0	0	Calculated
4362	New-23	Pipe		I-2805	M-1626	112.75	6256.86	6251.41	4.83	15	0.015	0	12.31	0	0	0	0	0	Calculated
4363	New-24	Pipe		M-1664	I-2905	468.36	5437.3	5419.65	3.77	15	0.015	0	10.87	0	0	0.63	0.5	0	Calculated
4364	New-25	Pipe		I-2826	New-40	182.7	5497.03	5408	48.73	42	0.015	12.9	608.68	0.02	12.1	0.6	0.17	0	Calculated
4365	New-26	Pipe		I-2825	New-40	86.51	5449.61	5408	48.1	36	0.015	0	400.9	0	0	0.42	0.14	0	Calculated
4366	New-27	Pipe		New-40	New-41	594.47	5408	5384	4.04	36	0.015	16.4	116.15	0.14	14.01	0.66	0.22	0	Calculated
4367	New-28	Pipe		New-41	New-42	237.18	5384	5322	26.14	36	0.015	16.41	295.55	0.06	20.36	0.51	0.17	0	Calculated
4368	New-29	Pipe		I-1858	New-43	171.62	5053	5000	30.88	15	0.015	0.09	31.11	0	7.22	0.04	0.03	0	Calculated
4369	New-4	Pipe	Robert assumed this line connects, was difficult to tell from field information.	M-777	M-801	258.12	4746.41	4734.3	4.69	30	0.015	10.77	77	0.14	8.05	0.79	0.32	0	Calculated
4370	New-5	Pipe	Assumed based on Robert's opinion.	M-164	I-1303	38.48	4557.7	4555.9	4.68	15	0.015	13.47	12.11	1.11	13.07	0.98	0.78	0	> CAPACITY
4371	New-6	Pipe	Assumed pipe based on conversation with Robert	M-445	DET_42	471.24	4657.6	4654	0.76	24	0.015	9.71	17.14	0.57	4.15	1.51	0.77	0	Calculated
4372	New-7	Pipe	Assumed pipe based on conversation with Robert	I-1167	DET_42	129	4659.64	4654	4.37	15	0.015	11.06	11.71	0.95	9.01	1.25	1	62	SURCHARGED
4373	New-8	Pipe	Assumed based on conversation with Robert	I-1531	I-1147	100.96	4662.2	4661.9	0.3	15	0.015	4.13	3.05	1.35	3.39	1.25	1	31	SURCHARGED
4374	New-9	Pipe	Assumed based on conversation with Robert	I-1159	M-918	94.49	5017.5	5008.85	9.15	18	0.015	22.85	27.54	0.83	12.93	1.5	1	26	SURCHARGED
4375	Outlet_Det_139	Pipe		O-240	DET_139	80.99	5327	5326	1.23	0	0.015	0	0	0.01	0	1.18	0.29	0	Calculated
4376	Outlet-3	Pipe		O-18	M-108	799.18	4582.78	4567.1	1.96	0	0.015	6.11	0	0	0	0.29	0.07	0	Calculated
4377	Outlet-4	Pipe	Link for conveyance, unknown how this connected to UDOT system	O-154	I-2987	273.22	4436.53	4434.2	0.85	0	0.015	16.72	0	0	0	0.29	0.07	0	Calculated
4378	Outlet-5	Pipe		M-1032	M-644	535.59	4959.55	4912.6	8.77	0	0.015	5.14	0	0	0	0.29	0.07	0	Calculated
4379	Willow-17	Pipe	Assumed channel characteristics - Uknown what kind of culvert, assumed box	O-299	O-293	1105.3	4408.5	4406.4	0.19	60	0.015	221.26	230.19	0.96	5.53	5	1	82	SURCHARGED
4380	Willow-18	Pipe	Assumed channel characteristics	O-293	O-291	1352.7	4406.4	4395	0.84	60	0.015	224.14	263.83	0.85	9.5	4.72	0.94	0	Calculated
4381	WillowOutlet-3	Pipe	Link for conveyance purposes	O-294	O-293	10.44	4410.4	4410.4	0	0	0.015	0	0	0.02	0	0.42	0.14	0	Calculated
4382	CH-1	Channel		I-1638	O-176	73.37	4627.06	4626	1.44	48	0.032	33.5	10.93	3.07	3.41	1.76	0.44	0	
4383	CH-10	Channel		O-152	O-153	338.87	4559	4558.9	0.03	48	0.032	31.9	64.63	0.49	1.31	3.98	1	0	
4384	CH-11	Channel		O-153	M-398	508.45	4558.9	4558.7	0.04	48	0.032	23.73	74.62	0.32	1.07	4	1	117	
4385	CH-12	Channel		O-321	I-2974	44.79	4651.07	4644.94	13.69	24	0.032	6.55	315.18	0.02	6.12	0.41	0.2	0	
4386	CH-13	Channel		O-14	I-104	905.21	4529	4524.4	0.51	36	0.032	1.03	29.79	0.03	1.24	0.43	0.14	0	
4387	CH-14	Channel		O-320	I-757	351.2	4572	4565	1.99	12	0.032	6.54	108.89	0.06	0.99	0.6	0.6	0	
4388	CH-15	Channel		O-123	I-1087	176.31	4430	4429.9	0.06	36	0.032	13.59	5.48	2.48	3.2	2.12	0.71	0	
4389	CH-16	Channel		O-318	Willow-4	981.78	4404.6	4397	0.77	36	0.032	14.15	20.24	0.7	3.4	2.08	0.69	0	
4390	CH-17	Channel		O-38	I-197	317.97	4556	4555	0.31	36	0.032	0	12.9	0	0	0	0	0	
4391	CH-18	Channel		O-314	I-2867	113.19	4417.18	4411.6	4.93	36	0.032	0	139.72	0	0	0	0	0	
4392	CH-19	Channel		O-236	DET_127	331.88	5085.75	5020	19.81	24	0.032	2.45	163.84	0.01	0.58	1.06	0.53	0	
4393	CH-2	Channel		O-177	I-1249	42.71	4620	4615	11.71	36	0.032	33.5	428.76	0.08	3.32	2.01	0.67	0	
4394	CH-20	Channel		O-301	New-25	821.27	5311.38	5128	22.33	36	0.032	0	979.59	0	0	0.29	0.1	0	
4395	CH-21	Channel		O-106	DET_40	315.13	5069.06	5017	16.52	36	0.032	18.34	842.59	0.02	3.8	1.71	0.57	0	
4396	CH-22	Channel		O-197	I-1857	165.93	4994.24	4972	13.4	36	0.032	9.32	758.95	0.01	3.63	1.7	0.57	0	
4397	CH-23	Channel		O-199	I-1890	628.24	4849.29	4787.28	9.87	24	0.032	6.13	247.57	0.02	4.35	0.46	0.23	0	
4398	CH-24	Channel		DET_128	DET_94	615.29	5032	4911.04	19.66	24	0.032	4.96	349.39	0.01	4.91	1.06	0.53	0	
4399	CH-25	Channel		I-1871	DET_93	782.81	4900.09	4818.7	10.4	24	0.032	5.22	254.09	0.02	5.68	0.31	0.16	0	
4400	CH-26	Channel		DET_93	I-1540	290.82	4818.7	4786.89	10.94	24	0.032	5.22	260.61	0.02	2.28	0.99	0.5	0	
4401	CH-27	Channel		M-1029	DET_100	1411.6	5076.9	4862	15.22	24	0.032	2.04	307.47	0.01	1.79	0.64	0.32	0	
4402	CH-28	Channel		O-201	I-1888	411.73	4838.7	4794.84	10.65	24	0.032	3.93	257.19	0.02	3.95	0.33	0.17	0	
4403	CH-29	Channel		New-31	O-201	189.85	4865	4838.7	13.85	24	0.032	0.03	293.29	0	0.14	0.13	0.07	0	
4404	CH-3	Channel		O-186	I-1767	962.05	4426	4422	0.42	36	0.032	14.24	96.53	0.15	1.81	1.76	0.59	0	
4405	CH-30	Channel		O-220	DET_88	3752.5	6199.43	5632	15.12	36	0.032	18.65	806.13	0.02	7.17	1.64	0.55	0	
4406	CH-31	Channel		New-32	DET_C6	135.44	4876	4854	16.24	24	0.032	0.08	317.59	0	0.89	0.06	0.03	0	

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4407	CH-33	Channel		O-107	DET_118	1792	5123.71	4883	13.43	24	0.032	2.23	288.81	0.01	1.03	0.59	0.29	0	
4408	CH-34	Channel		O-238	I-2925	396.14	6008.05	5848.99	40.15	24	0.032	6.28	375.46	0.02	6.71	0.34	0.17	0	
4409	CH-35	Channel		O-275	DET_110	708.44	5613.21	5506.68	15.04	36	0.032	7.28	580.52	0.01	5.52	1.64	0.55	0	
4410	CH-36	Channel		I-2643	M-1533	719.39	5432.4	5424.2	1.14	36	0.032	3.66	159.83	0.02	4.45	0.13	0.11	0	
4411	CH-37	Channel		O-304	DET_147	1092.6	5586	5442	13.18	36	0.032	10.09	634.24	0.02	3.02	1.61	0.54	0	
4412	CH-39	Channel		O-296	O-303	4000.5	5503.54	5217	7.16	36	0.032	2.85	621.79	0	2.74	0.33	0.11	0	
4413	CH-4	Channel		O-26	I-300	34.1	4480	4479.5	1.47	6	0.032	1.84	1.15	1.6	3.68	0.5	1	5	
4414	CH-40	Channel		O-307	DET_110	2555.1	5887.54	5506.68	14.91	24	0.032	1.46	354.28	0	0.45	1.04	0.52	0	
4415	CH-41	Channel		New-42	DET_105	1948.1	5322	5170.86	7.76	36	0.032	16.24	486.6	0.03	3.53	1.75	0.58	0	
4416	CH-42	Channel		New-43	DET_C3	544.39	5000	4928	13.23	24	0.032	0.08	286.58	0	1.05	0.05	0.02	0	
4417	CH-43	Channel		New-44	I-1865	62.25	4833	4823.99	14.47	24	0.032	0.07	299.79	0	0.81	0.04	0.02	0	
4418	CH-44	Channel		O-9	I-72	350.36	4534	4513	5.99	6	0.032	30.53	31.21	0.98	4.52	0.5	1	28	
4419	CH-45	Channel		O-46	M-994	1238.9	4440	4420.9	1.54	12	0.032	1.05	29.42	0.04	0.66	0.59	0.59	0	
4420	CH-46	Channel		O-233	Jun-2362	493.12	6146.29	5990	31.69	24	0.032	12.45	443.63	0.03	11.04	0.38	0.19	0	
4421	CH-47	Channel		O-224	Jun-2362	195.23	6054.67	5990	33.13	24	0.032	3.92	453.53	0.01	4.52	0.3	0.15	0	
4422	CH-48	Channel		Jun-2362	DET_87	2432.3	5990	5670.47	13.14	36	0.032	14.13	842.07	0.02	4.93	0.86	0.29	0	
4423	CH-49	Channel		O-232	Jun-2362	1771.8	6202.29	5990	11.98	24	0.032	1.74	338.72	0.01	2.31	0.27	0.14	0	
4424	CH-5	Channel		O-27	I-301	15.89	4478.5	4476	15.73	6	0.032	1.77	3.76	0.47	4.52	0.43	0.86	0	
4425	CH-6	Channel		O-105	DET_45	798.79	4827.35	4764	7.93	36	0.032	17.89	421.59	0.04	7.68	1.76	0.59	0	
4426	Ch-7	Channel		O-164	I-1556	149.94	4655.98	4642	9.32	36	0.032	1.61	557.91	0	4.02	0.24	0.08	0	
4427	CH-8	Channel		O-165	I-1557	53.7	4639	4635	7.45	12	0.032	1.61	141.55	0.01	0.72	0.21	0.21	0	
4428	CH-9	Channel		O-166	I-1558	46.58	4634	4628.9	10.95	36	0.032	1.61	937.88	0	1.78	0.17	0.06	0	
4429	Con-100	Channel		I-379	DET_112	523.05	4468.5	4468.3	0.04	48	0.032	14.66	121.5	0.12	1.38	1.36	0.34	0	
4430	Con-101	Channel		I-671	DET_114	257.02	4469.9	4467.9	0.78	48	0.032	23.29	548.11	0.04	1.58	2.69	0.67	0	
4431	Con-102	Channel		I-262	DET_114	207.38	4469.7	4467.9	0.87	48	0.032	5.18	578.88	0.01	0.37	2.79	0.7	0	
4432	Con-105	Channel		O-78	DET_26	44.33	4440.3	4440.2	0.23	48	0.032	7.45	295.11	0.03	0.41	4	1	123	
4433	Con-106	Channel		O-163	DET_72	24.26	4670	4669.54	1.9	48	0.032	1.84	855.6	0	0.88	2.13	0.53	0	
4434	Con-107	Channel		O-162	DET_64	20.65	4674	4673.3	3.39	48	0.032	8.55	1144	0.01	0.48	3.83	0.96	0	
4435	Con-108	Channel		O-169	DET_65	62.89	4668.21	4662.56	8.98	48	0.032	27.76	1862.39	0.01	2.18	2.24	0.56	0	
4436	Con-109	Channel		O-170	DET_65	64.75	4666.75	4662.56	6.47	48	0.032	0.36	1580.61	0	0.01	2.49	0.62	0	
4437	Con-110	Channel		O-171	DET_66	28.86	4666	4660.22	20.03	48	0.032	3.34	2780.69	0	0.46	2.06	0.52	0	
4438	Con-111	Channel		O-111	DET_45	46.11	4766.19	4760.96	11.34	48	0.032	5.48	2092.62	0	0.23	3.3	0.82	0	
4439	Con-112	Channel		O-110	DET_45	40.1	4765.53	4760.96	11.4	48	0.032	9.45	2097.6	0	0.52	3.63	0.91	0	
4440	Con-113	Channel		O-148	DET_C8	279.94	4808.34	4798.82	3.4	48	0.032	15.04	1145.84	0.01	1.61	1.84	0.46	0	
4441	Con-114	Channel		O-73	DET_C8	94.36	4802.74	4798.82	4.15	48	0.032	33.33	1266.44	0.03	3.5	1.98	0.49	0	
4442	Con-116	Channel		O-128	DET_50	190.54	4561.38	4555.5	3.09	48	0.032	1.27	1091.52	0	0.05	2.09	0.52	0	
4443	Con-120	Channel		O-286	DET_145	29.06	5451	5442.4	29.59	48	0.032	0.15	2577.35	0	0.49	0.2	0.05	0	
4444	Con-123	Channel		M-1692	DET_105	82.76	5185.03	5170.86	17.12	48	0.032	0	2571.05	0	0	2	0.5	0	
4445	Con-127	Channel		O-48	DET_49	92.19	4684.5	4684.46	0.04	48	0.032	9.29	129.43	0.07	0.44	4	1	12	
4446	Con-128	Channel		O-47	DET_49	47.52	4688	4684.46	7.45	48	0.032	0.09	1695.9	0	0	2.28	0.57	0	
4447	Con-135	Channel		O-2	DET_New	187.8	4472.64	4470	1.41	48	0.032	5.51	736.7	0.01	3.8	0.69	0.17	0	
4448	Con-136	Channel		O-1	DET_New	176.33	4470.74	4470	0.42	48	0.032	0.11	402.52	0	0.05	0.78	0.19	0	
4449	Con-137	Channel		O-4	DET_New	177.22	4470.19	4470	0.11	48	0.032	8.57	203.45	0.04	1.84	1.05	0.26	0	
4450	Con-139	Channel		M-393	DET_67	79.38	4706	4687	23.94	48	0.032	9.74	3039.89	0	2.14	0.9	0.23	0	
4451	Con-140	Channel		New-39	DET_101	226.29	4911	4884	11.93	48	0.032	6.57	2146.28	0	0.46	1.71	0.43	0	
4452	Con-141	Channel		O-207	DET_101	63.56	4887.5	4884	5.51	48	0.032	23.12	1458.07	0.02	1.78	1.94	0.49	0	
4453	Con-145	Channel		O-204	DET_118	113.66	4897.9	4883	13.11	36	0.032	10.09	841.19	0.01	4.82	0.56	0.19	0	
4454	Con-148	Channel		O-210	DET_96	67.36	4774	4770.5	5.2	48	0.032	3.93	1416.35	0	0.79	0.73	0.18	0	
4455	Con-149	Channel		O-209	DET_96	76.11	4776.99	4770.5	8.53	48	0.032	0	1814.42	0	0	0.62	0.15	0	
4456	Con-150	Channel		O-71	DET_111	39.61	4474.14	4474	0.35	36	0.032	1.96	138.12	0.01	0.7	0.63	0.21	0	
4457	Con-151	Channel		M-1561	DET_150	160.34	4408.07	4407.82	0.16	48	0.032	13.61	1479.88	0.01	0.37	3.75	0.94	0	
4458	Con-152	Channel		O-303	Out-1	166.08	5217	5212	3.01	48	0.032	13.25	1078.11	0.01	4.18	0.52	0.13	0	
4459	Con-157	Channel		O-195	DET_131	141.31	4684.83	4678.23	4.67	48	0.032	19.33	1100.15	0.02	1.97	2.18	0.55	0	
4460	Con-64	Channel		O-319	I-2953	23.48	4410.8	4410.5	1.28	36	0.032	0	71.13	0	0	0	0	0	
4461	Con-70	Channel		O-235	DET_126	494.91	5124.47	5092	6.56	24	0.032	1.76	93.68	0.02	0.93	0.47	0.24	0	
4462	Corner-1	Channel		O-62	New-19	1334.3	4780.3	4692	6.62	36	0.032	25.93	796	0.03	4.71	0.68	0.23	0	
4463	Corner-10	Channel		O-81	O-83	405.03	4479	4474	1.23	60	0.032	88.08	1007.96	0.09	5.44	1.64	0.33	0	
4464	Corner-12	Channel		O-85	O-80	1621.1	4458.3	4444	0.88	60	0.032	94.08	852.04	0.11	4.74	1.89	0.38	0	
4465	Corner-13	Channel		O-80	O-79	1266.8	4444	4434	0.79	60	0.032	98.39	806.02	0.12	3.81	2.24	0.45	0	
4466	Corner-14	Channel		O-79	O-77	77.27	4434	4433.8	0.26	60	0.032	101.11	461.54	0.22	3.17	2.53	0.51	0	
4467	Corner-15	Channel		O-77	Corner-1	62.03	4433.8	4433.5	0.48	60	0.032	107.44	630.9	0.17	3.55	2.45	0.49	0	
4468	Corner-16	Channel		Corner-1	O-267	1245.6	4433.5	4426.7	0.55	60	0.032	115.88	670.3	0.17	4.29	2.28	0.46	0	
4469	Corner-17	Channel		O-267	CornerOutlet-3	93.4	4426.7	4425.5	1.28	60	0.032	130.15	1028.3	0.13	5.32	2.14	0.43	0	
4470	Corner-18	Channel		CornerOutlet-3	Corner-2	794.78	4425.5	4422	0.44	60	0.032	136.92	801.82	0.17	3.84	2.17	0.43	0	
4471	Corner-19	Channel		Corner-2	M-1396	640.26	4422	4416.1	0.92	60	0.032	143.32	870.86	0.16	2.7	3.61	0.72	0	
4472	Corner-2	Channel		New-19	DET_90	1534.3	4692	4604	5.74	48	0.032	44.51	1198.28	0.04	6.76	0.96	0.24	0	
4473	Corner-22	Channel		O-261	O-260	734.38	4402	4399.1	0.39	60	0.032	212.14	570.09	0.37	3.52	3.73	0.75	0	
4474	Corner-23	Channel		O-260	Corner-4	330.88	4399.1	4398.9	0.06	60	0.032	219.5	223.04	0.98	4.15	3.45	0.69	0	
4475	Corner-24	Channel		Corner-4	Corner-5	1488.1	4398.9	4384	1	60	0.032	222.56	907.78	0.25	4.69	3.24	0.65	0	
4476	Corner-25	Channel		Corner-5	O-259	1082.1	4384	4380.31	0.34	60	0.032	227.95	529.76	0.43	4.47	3.37	0.67	0	
4477	Corner-26	Channel		O-259	Corner-6	487.91	4380.31	4376	0.88	60	0.032	231.79	852.65	0.27	6.1	2.82	0.56	0	
4478	Corner-27	Channel		Corner-6	Corner-7	1748.9	4376	4356	1.14	60	0.032	235.37	970.13	0.24	6.71	2.68	0.54	0	
4479	Corner-28	Channel		Corner-8	O-62	2695.8	4986	4787.9	7.35	36	0.032	21.84	847.25	0.03	6.6	0.45	0.15	0	

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4480	Corner-3	Channel		DET_90	O-160	1697.4	4604	4551	3.12	48	0.032	49.72	884.14	0.06	5.16	1.25	0.31	0	
4481	Corner-5	Channel		O-160	O-19	135.59	4551	4548.5	1.84	48	0.032	65.54	679.41	0.1	5.34	1.47	0.37	0	
4482	Corner-6	Channel		O-19	I-1727	509.93	4548.5	4538	2.06	48	0.032	77.35	717.98	0.11	6.21	1.48	0.37	0	
4483	Corner-7	Channel		I-1727	O-214	1198.6	4538	4513	2.09	48	0.032	79.2	722.62	0.11	6.24	1.5	0.37	0	
4484	Corner-8	Channel		O-214	O-180	587.22	4513	4501	2.04	48	0.032	82.6	715.26	0.12	6.17	1.55	0.39	0	
4485	Corner-9	Channel		O-180	O-81	1609.8	4501	4479	1.37	60	0.032	85.3	1060.53	0.08	5.28	1.65	0.33	0	
4486	CornerOutlet-2	Channel		O-75	Corner-1	6.96	4438	4434	57.47	48	0.032	10.02	4710.44	0	7.29	1.03	0.26	0	
4487	CornerOutlet-3	Channel		O-269	CornerOutlet-3	27.46	4433.65	4429.5	15.11	48	0.032	9.57	2415.52	0	6.49	0.29	0.07	0	
4488	CornerOutlet-4	Channel		O-264	Corner-4	34.66	4409	4404	14.43	48	0.032	4.28	2359.97	0	4.99	0.18	0.05	0	
4489	Coyote-1	Channel		New-38	Corner-8	4627.3	5674	4990	14.78	48	0.032	24.12	1137.88	0.02	13.63	0.58	0.15	0	
4490	Coyote-2	Channel		O-273	New-38	699.75	5911.11	5674	33.88	48	0.032	7.35	1722.81	0	6.54	0.5	0.13	0	
4491	EJC-1	Channel		EJC-1	O-311	996.65	4471	4470.9	0.01	48	0.032	43.05	50.12	0.86	1.16	3.23	0.81	0	
4492	EJC-10	Channel		EJC-3	O-70	341.46	4466.5	4466.25	0.07	60	0.032	83.29	288.97	0.29	1.47	3.32	0.66	0	
4493	EJC-11	Channel		O-70	EJC-4	1709.2	4466.25	4465.5	0.04	60	0.032	84.35	223.7	0.38	1.47	3.34	0.67	0	
4494	EJC-12	Channel		EJC-4	O-10	669.7	4465.5	4465	0.07	60	0.032	83.59	291.8	0.29	1.38	3.45	0.69	0	
4495	EJC-13	Channel		O-10	O-7	807.65	4465	4464.7	0.04	60	0.032	83.08	205.82	0.4	1.27	3.58	0.72	0	
4496	EJC-14	Channel		O-7	O-192	696.62	4464.7	4464.4	0.04	60	0.032	88.25	221.62	0.4	1.33	3.62	0.72	0	
4497	EJC-15	Channel		O-192	O-187	2065.2	4464.4	4464	0.02	72	0.032	86.52	232.89	0.37	1.49	3.34	0.56	0	
4498	EJC-16	Channel		O-187	O-49	1337.1	4464	4463	0.07	60	0.032	84.4	292.05	0.29	2.06	2.74	0.55	0	
4499	EJC-17	Channel		O-49	O-22	1107.7	4463	4461	0.18	60	0.032	83.24	453.8	0.18	2.35	2.52	0.5	0	
4500	EJC-18	Channel		O-22	O-61	443.37	4461	4460	0.23	60	0.032	82.26	402.91	0.2	2.6	2.65	0.53	0	
4501	EJC-19	Channel		O-61	O-30	1679.8	4460	4458	0.12	60	0.032	80.96	368.49	0.22	1.49	3.39	0.68	0	
4502	EJC-20	Channel		O-30	O-21	817.52	4458	4457	0.12	60	0.032	82.43	373.51	0.22	0.82	4.54	0.91	0	
4503	EJC-3	Channel		O-311	EJC-2	1114.9	4470.9	4470.5	0.04	48	0.032	40.86	94.77	0.43	1.04	3.37	0.84	0	
4504	EJC-4	Channel		EJC-2	O-312	659.43	4470.5	4470.1	0.06	60	0.032	49.07	208.95	0.23	1.04	3.69	0.74	0	
4505	EJC-5	Channel		O-312	O-184	2669.9	4470.5	4470	0.02	72	0.032	64.72	229	0.28	1.15	3.38	0.56	0	
4506	EJC-6	Channel		O-184	O-84	2547.2	4470	4469	0.04	60	0.032	79.05	211.6	0.37	1.47	3.28	0.66	0	
4507	EJC-7	Channel		O-84	O-37	3157.4	4469	4467.5	0.05	60	0.032	81.9	232.77	0.35	1.5	3.26	0.65	0	
4508	EJC-8	Channel		O-37	O-59	1025.5	4467.5	4467	0.05	60	0.032	82.33	235.81	0.35	1.49	3.27	0.65	0	
4509	EJC-9	Channel		O-59	EJC-3	996.48	4467	4466.5	0.05	60	0.032	83.15	239.22	0.35	1.5	3.27	0.66	0	
4510	Link-02	Channel		O-40	Jun-2365	69.27	4406	4404	2.89	120	0.032	47.32	9153.32	0.01	5.53	0.82	0.08	0	
4511	Need Detention	Channel		O-161	I-1531	107.96	4663	4662.2	0.74	24	0.032	5.89	270.13	0.02	0.49	1.43	0.72	0	
4512	New-10	Channel		O-313	I-2866	6.42	4411.7	4411.6	1.56	60	0.032	27.12	549.61	0.05	0.54	5	1	186	
4513	New-3	Channel		O-23	DET_9	868.35	4734	4698.7	4.07	36	0.032	7.79	391.69	0.02	0.76	1.76	0.59	0	
4514	Outlet_Det_116	Channel		O-208	DET_116	70.51	4803.52	4792.1	16.2	48	0.032	6.29	2500.6	0	1.79	1.81	0.45	0	
4515	Outlet_Det_123	Channel		O-202	DET_123	93.58	4900.59	4900	0.63	48	0.032	6.76	493.37	0.01	3.04	1.05	0.26	0	
4516	Outlet_Det_124	Channel		New-35	DET_124	107.59	4849	4847	1.86	48	0.032	3.38	847.16	0	2.01	1.15	0.29	0	
4517	Outlet_Det_125	Channel		I-1675	DET_125	69.6	5132.44	5132	0.63	48	0.032	3.3	494.04	0.01	0.99	0.81	0.2	0	
4518	Outlet_Det_127	Channel		O-237	DET_127	47.27	5021.57	5020	3.32	48	0.032	12.45	549.72	0.02	1.03	2.75	0.69	0	
4519	Outlet_Det_130	Channel		O-196	DET_130	76.84	4702.02	4695.8	8.09	48	0.032	13.14	1767.82	0.01	2.19	1.18	0.29	0	
4520	Outlet_Det_144	Channel		O-257	DET_144	97.62	4433.46	4437.7	-4.34	48	0.032	8.14	1033.35	0.01	0.41	1.77	0.44	0	
4521	Outlet_Det_144_2	Channel		O-258	DET_144	91.06	4433.16	4437.7	-4.99	48	0.032	0	1069.93	0	0	0	0	0	
4522	Outlet_Det_149	Channel		O-265	DET_149	21.32	4415.2	4411.93	15.34	48	0.032	16.08	2433.42	0.01	0.2	4	1	93	
4523	Outlet_Det_44	Channel		O-178	DET_44	18.71	4987.7	4986.8	4.81	48	0.032	24.58	3458.55	0.01	1.46	4	1	65	
4524	Outlet_Det_53	Channel		O-112	DET_53	55.86	4770.5	4769.9	1.07	48	0.032	18.89	643.96	0.03	0.74	4	1	77	
4525	Outlet_Det_53_2	Channel		O-113	DET_53	64.45	4777.73	4769.9	12.15	48	0.032	0	2165.74	0	0	2	0.5	0	
4526	Outlet_Det_53_3	Channel		O-114	DET_53	77.78	4773.75	4769.9	4.95	48	0.032	10.58	1382.4	0.01	1.2	2.39	0.6	0	
4527	Outlet_Det_58	Channel		O-194	DET_58	35.5	4809.78	4802.6	20.23	48	0.032	17.93	2794.37	0.01	0.94	2.17	0.55	0	
4528	Outlet_Det_61	Channel		O-175	DET_61	21.37	4715	4712.5	11.7	48	0.032	0.14	2125.22	0	0.01	1.4	0.35	0	
4529	Outlet_Det_61_2	Channel		O-173	DET_61	35.12	4714.17	4712.5	4.76	48	0.032	14.7	1354.93	0.01	2.29	1.81	0.45	0	
4530	Outlet_Det_75	Channel		O-149	DET_75	93.7	4726.96	4686	43.71	48	0.032	10.77	4108.15	0	2.69	2.11	0.53	0	
4531	Outlet_Det_76	Channel		O-150	DET_76	436.79	4584	4569.47	3.33	48	0.032	28.71	1133.27	0.03	2.13	2.24	0.56	0	
4532	Outlet_Det_78	Channel		O-234	DET_78	55.55	4960	4957.65	4.23	48	0.032	7.7	1277.99	0.01	1.43	0.9	0.23	0	
4533	Outlet_Det_81	Channel		O-225	DET_81	63.38	5888.92	5883.67	8.28	48	0.032	20.72	1788.3	0.01	1.38	1.98	0.49	0	
4534	Outlet_Det_82	Channel		O-247	DET_82	286.23	5975.75	5954.6	7.39	48	0.032	24.12	1689.02	0.01	2.79	1.77	0.44	0	
4535	Outlet_Det_82_2	Channel		O-246	DET_82	95.14	5962.81	5954.6	8.63	48	0.032	2.16	1825.27	0	0.29	1.69	0.42	0	
4536	Outlet_Det_83	Channel		O-274	DET_83	110.04	6003.31	5976.98	23.93	48	0.032	5.45	3039.39	0	2.59	1.37	0.34	0	
4537	Outlet_Det_92	Channel		O-212	DET_92	36.14	4754.72	4754	1.99	48	0.032	4.97	877.02	0.01	1.83	0.47	0.12	0	
4538	Outlet_Det_92_2	Channel		O-211	DET_92	42.45	4754.75	4754	1.77	48	0.032	8.17	825.9	0.01	2.54	0.54	0.13	0	
4539	Outlet_Det_95	Channel		O-198	DET_95	113.46	4890.98	4879	10.56	48	0.032	6.32	2019.03	0	1.55	2.12	0.53	0	
4540	Outlet-1	Channel		O-89	New-25	13.42	5130.32	5128	17.29	48	0.032	0	2583.47	0	0	0.29	0.07	0	
4541	Outlet-10	Channel		O-272	O-273	283.07	5967.59	5911.11	19.95	36	0.032	0.57	1037.78	0	2.24	0.17	0.06	0	
4542	Outlet-2	Channel		O-88	New-25	13.89	5130	5128	14.4	48	0.032	0	2357.76	0	0	0.29	0.07	0	
4543	Outlet-8	Channel		O-288	New-38	389.51	5757	5674	21.31	24	0.032	0	451.72	0	0	0.37	0.19	0	
4544	Outlet-9	Channel		O-300	New-38	665.07	5792.93	5674	17.88	36	0.032	19.83	1220.05	0.02	7.77	0.59	0.2	0	
4545	SLC-0	Channel		SLC-6	O-157	3609.1	4418.5	4417.37	0.03	96	0.032	68.02	608.17	0.11	1.59	2.52	0.31	0	
4546	SLC-1	Channel		O-157	SLC-1	1209.5	4417.37	4416	0.11	96	0.032	71.42	1156.77	0.06	1.93	2.28	0.29	0	
4547	SLC-2	Channel		SLC-1	SLC-2	844.38	4416	4415	0.12	96	0.032	76.81	1182.81	0.06	2.01	2.76	0.34	0	
4548	SLC-3	Channel		SLC-2	O-298	3272.9	4415	4414	0.03	96	0.032	74.78	600.79	0.12	1.63	2.68	0.33	0	
4549	SLC-4	Channel		O-298	O-289	396.78	4414	4413.43	0.14	96	0.032	68.5	1302.71	0.05	1.63	2.59	0.32	0	
4550	SLC-5	Channel		O-289	O-290	1976.5	4413.43	4413	0.02	120	0.032	66.43	905.22	0.07	1.28	2.67	0.27	0	
4551	SLC-6	Channel		O-290	SLC-3	1915.2	4413	4412	0.05	96	0.032	68.4	785.38	0.09	1.56	2.62	0.33	0	
4552	SLC-7	Channel		SLC-3	SLC-4	873.06	4412	4411.5	0.06	96	0.032	63.33	822.52	0.08	1.36	2.84	0.36	0	

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4553	SLC-8	Channel		SLC-4	SLC-5	3835.4	4411.5	4410.5	0.03	120	0.032	57.61	869.82	0.07	1.27	2.78	0.28	0	
4554	SLC-9	Channel		SLC-5	O-40	1315.6	4410.5	4410	0.04	120	0.032	47.35	1050.17	0.05	2.03	1.76	0.18	0	
4555	Willow-1	Channel		O-131	WillowCreekDET	989.99	4583	4574.4	0.87	48	0.032	27.23	466.35	0.06	1.82	1.68	0.42	0	
4556	Willow-10	Channel		O-98	O-145	1123.1	4453	4445.6	0.66	48	0.032	153.33	406.15	0.38	4.82	2.66	0.66	0	
4557	Willow-11	Channel		O-145	O-139	695.25	4445.6	4441.53	0.59	60	0.032	155.91	649.11	0.24	4.16	2.93	0.59	0	
4558	Willow-12	Channel		O-139	O-135	749.37	4441.53	4438	0.47	60	0.032	158.76	582.28	0.27	4.83	2.71	0.54	0	
4559	Willow-13	Channel		O-135	O-93	1247.2	4438	4421	1.36	60	0.032	159.42	990.5	0.16	4.67	2.78	0.56	0	
4560	Willow-14	Channel		O-93	O-124	1174.6	4421	4416	0.43	60	0.032	172.65	553.52	0.31	4.49	2.97	0.59	0	
4561	Willow-15	Channel		O-124	O-125	678.25	4416	4410.44	0.82	60	0.032	176.7	768.13	0.23	3.58	3.83	0.77	0	
4562	Willow-16	Channel		O-125	O-299	836.54	4410.44	4408.5	0.23	60	0.032	187.7	408.55	0.46	2.68	5	1	43	
4563	Willow-19	Channel		O-291	Willow-4	1384.3	4395	4393	0.14	60	0.032	235.06	322.47	0.73	3	4.49	0.9	0	
4564	Willow-2	Channel		Willow-1	I-116	930.02	4568	4559	0.97	48	0.032	38.03	492.21	0.08	3.46	1.36	0.34	0	
4565	Willow-20	Channel		Willow-4	Willow-5	1538.6	4393	4390	0.19	60	0.032	252.16	400.59	0.63	3.89	3.89	0.78	0	
4566	Willow-21	Channel		Willow-5	O-219	2673.5	4390	4367.06	0.86	48	0.032	262.85	463.48	0.57	6.47	3.07	0.77	0	
4567	Willow-22	Channel		O-219	O-217	1163.3	4367.06	4352.43	1.26	48	0.032	272.74	561.12	0.49	5.48	3.46	0.87	0	
4568	Willow-23	Channel		O-217	Willow-6	1862	4352.43	4350	0.13	60	0.032	274.55	306.48	0.9	3.1	4.81	0.96	0	
4569	Willow-24	Channel		Willow-8	Willow-7	3388.6	5128	4838	8.56	48	0.032	0	1463.74	0	0	0.4	0.1	0	
4570	Willow-25	Channel		Willow-7	O-131	8218	4838	4583	3.1	48	0.032	28.68	881.38	0.03	5.43	0.91	0.23	0	
4571	Willow-3	Channel		Willow-2	Willow-3	807.2	4538	4534	0.5	48	0.032	93.07	498.11	0.19	5.29	1.84	0.46	0	
4572	Willow-4	Channel		Willow-3	I-580	627.3	4534	4523.29	1.71	48	0.032	98.18	653.78	0.15	5.88	1.79	0.45	0	
4573	Willow-5	Channel		I-580	O-42	1210	4523.29	4509	1.18	48	0.032	98.05	543.76	0.18	5.3	1.9	0.48	0	
4574	Willow-6	Channel		O-42	O-15	830.74	4509	4499.81	1.11	48	0.032	104.04	526.26	0.2	5.09	2.04	0.51	0	
4575	Willow-7	Channel		O-15	O-16	1958.2	4499.81	4485	0.76	48	0.032	105.86	435.14	0.24	4.17	2.32	0.58	0	
4576	Willow-8	Channel		O-16	O-130	1625.4	4485	4473	0.74	48	0.032	135.39	429.91	0.31	5.11	2.38	0.6	0	
4577	Willow-9	Channel		O-130	O-98	1792.6	4473	4453	1.12	48	0.032	145.17	528.5	0.27	5.27	2.44	0.61	0	
4578	WillowOutlet-1	Channel		O-45	Willow-2	222.52	4556	4542	6.29	48	0.032	6.07	1558.53	0	1.27	1.09	0.27	0	
4579	WillowOutlet-2	Channel		O-97	O-98	12.49	4457.5	4457	4	36	0.032	7.1	464.85	0.02	3.87	0.42	0.14	0	
4580	WillowOutlet-4	Channel		O-292	O-291	18.31	4399.4	4399	2.18	48	0.032	8.74	918.38	0.01	3.12	0.48	0.12	0	
4581	585	Orifice		WillowCreekDET	I-294		4574.4	4574.2		48		38.06							
4582	602	Orifice		DET_51	I-423		4613.7	4613.5		15		2.18							
4583	759	Orifice		DET_C10	M-259		4485.64	4483.4		15		4.63							
4584	979	Orifice		DET_31	M-570		4450.53	4450.1		12		4.85							
4585	1071	Orifice		DET_28	M-545		4453	4451.8		10		1.35							
4586	2722	Orifice		DET_59	I-1369		4785.4	4783.15		15		11.27							
4587	2854	Orifice		I-2141	M-1246		4562.44	4557.7		8		3.59							
4588	3012	Orifice		DET_122	New-9		4560.3	4559		18		12.25							
4589	3360	Orifice		DET_74	M-1320		4956.4	4954.4		15		10.29							
4590	Det_100	Orifice		DET_100	I-1866		4861.2	4859.8		12		3.93							
4591	Det_105	Orifice		DET_105	M-1693		5170.86	5160.76		6		2.14							
4592	Det_110	Orifice		DET_110	I-2780		5506.68	5505.41		8		2.86							
4593	Det_111	Orifice		DET_111	I-752		4474	4473		15		1.95							
4594	Det_112	Orifice		DET_112	O-30		4468.3	4458		14		4.27							
4595	Det_112_2	Orifice		DET_112	O-21		4468.3	4457		14		4.87							
4596	Det_114	Orifice		DET_114	O-61		4467.9	4460		14		9.29							
4597	Det_114_2	Orifice		DET_114	O-22		4467.9	4461		14		9.29							
4598	Det_116	Orifice		DET_116	I-1876		4792.1	4785.48		12		6.61							
4599	Det_118	Orifice		DET_118	I-1870		4883	4874.1		15		3.38							
4600	Det_120	Orifice		DET_120	I-2548		4434	4429.73		6		1.44							
4601	Det_123	Orifice		DET_123	I-1919		4900	4900		18		6.29							
4602	Det_124	Orifice		DET_124	I-1868		4847	4846		6		1.41							
4603	Det_125	Orifice		DET_125	O-182		5132	5127.35		9		1.76							
4604	Det_126	Orifice		DET_126	O-236		5093	5085.75		15		2.45							
4605	Det_127	Orifice		DET_127	I-2226		5021.2	5015		15		9.21							
4606	Det_130	Orifice		DET_130	I-1853		4695.8	4694		12		4.78							
4607	Det_136	Orifice		DET_136	M-1133		4398.3	4398.1		18		13.38							
4608	Det_137	Orifice		DET_137	M-1142		4409.8	4409.05		18		11.8							
4609	Det_139	Orifice		DET_139	I-2310		5326	5317.45		8		0							
4610	Det_144	Orifice		DET_144	M-1470		4434.5	4433.2		18		7.54							
4611	Det_145	Orifice		DET_145	I-2645		5446	5442.4		3		0.15							
4612	Det_147	Orifice		DET_147	M-1637		5442	5423.93		15		9.07							
4613	Det_149	Orifice		DET_149	M-1490		4411.93	4411.5		10		4.28							
4614	Det_150	Orifice		DET_150	M-1563		4407.82	4406.12		4		0.83							
4615	Det_26	Orifice		DET_26	I-923		4440.2	4440		12		6.33							
4616	Det_30	Orifice		DET_30	I-988		4439.8	4440.1		12		3.52							
4617	Det_33	Orifice		DET_33	New-20		4435.75	4435.3		2		0.06							
4618	Det_38	Orifice		DET_38	M-1029		5073.3	5076.9		18		2.07							
4619	Det_4	Orifice		DET_4	I-72		4529.13	4513		10		7.62							
4620	Det_40	Orifice		DET_40	I-1856		5017	5001.58		15		9.32							
4621	Det_41	Orifice		DET_41	O-107		5174.43	5123.71		8		2.23							
4622	Det_42	Orifice		DET_42	I-1577		4653.22	4651.85		6		2.12							
4623	Det_44	Orifice		DET_44	O-179		4986.8	4986		15		13.69							
4624	Det_45	Orifice		DET_45	M-637		4760.96	4757.55		8		4.71							
4625	Det_47	Orifice		DET_47	I-1200		4439.75	4435.5		4		0.93							

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4626	Det_49	Orifice		DET_49	M-302		4684.46	4681.4		10		5.16							
4627	Det_50	Orifice		DET_50	O-129		4555.5	4555		10		5.48							
4628	Det_52	Orifice		DET_52	M-231		4560	4555.7		8		3.77							
4629	Det_53	Orifice		DET_53	I-1176		4769.9	4759.3		12		7.86							
4630	Det_54	Orifice		DET_54	EJC-2		4477.56	4470.5		18		12.79							
4631	Det_55	Orifice		DET_55	O-312		4479.2	4470.1		18		22.29							
4632	Det_58	Orifice		DET_58	I-1829		4802.6	4802		12		8.64							
4633	Det_61	Orifice		DET_61	I-1633		4712.5	4703.1		18		12							
4634	Det_64	Orifice		DET_64	I-1549		4673.3	4673.2		6		1.89							
4635	Det_65	Orifice		DET_65	I-1568		4662.56	4660.05		14		11.29							
4636	Det_66	Orifice		DET_66	I-1573		4660.22	4659.3		6		2.06							
4637	Det_67	Orifice		DET_67	I-741		4687	4684.57		15		6.02							
4638	Det_7	Orifice		DET_7	M-341		4769	4764.98		12		7.81							
4639	Det_71	Orifice		DET_71	I-220		4561.1	4560.55		16		5.62							
4640	Det_72	Orifice		DET_72	I-1555		4669.54	4667.3		6		1.41							
4641	Det_75	Orifice		DET_75	I-1443		4686	4686		12		7.56							
4642	Det_76	Orifice		DET_76	I-1451		4569.47	4568		24		25.62							
4643	Det_77	Orifice		DET_77	I-2169		4929.8	4924.5		5		1.21							
4644	Det_78	Orifice		DET_78	I-2182		4957.65	4956		15		5.69							
4645	Det_79	Orifice		DET_79	I-2277		4988.6	4979.7		10		5.49							
4646	Det_83	Orifice		DET_83	I-2556		5973.98	5971.06		3		0.57							
4647	Det_87	Orifice		DET_87	O-248		5670.47	5659.61		24		8.85							
4648	Det_88	Orifice		DET_88	M-1676		5632	5620.17		15		10.09							
4649	Det_92	Orifice		DET_92	I-1891		4754	4745.6		30		12.69							
4650	Det_94	Orifice		DET_94	I-1871		4910.7	4900.09		12		5.22							
4651	Det_95	Orifice		DET_95	I-1862		4879	4878.76		18		7.18							
4652	Det_96	Orifice		DET_96	I-1887		4770.5	4767.26		15		4.69							
4653	Det_97	Orifice		DET_97	I-1889		4785	4784.1		6		0							
4654	Det_C2	Orifice		DET_C2	I-1858		5054	5053		8		0.09							
4655	Det_C6	Orifice		DET_C6	I-1864		4854	4851.9		12		0.07							
4656	Det_C8	Orifice		DET_C8	M-1371		4798.82	4797		12		5.78							
4657	Det_New2	Orifice		DET_New2	M-348		4497.2	4496.5		15		7.37							
4658	Outlet DET_New	Orifice		DET_New	I-606		4470	4472		24		0.54							
4659	Outlet-DET_9	Orifice		DET_9	I-543		4703	4701.5		15		9.63							
4660	Overflow Det_105	Orifice		DET_105	M-1693		5170.86	5160.76		24		0							
4661	Overflow Det_110	Orifice		DET_110	I-2780		5506.68	5505.41		24		0							
4662	Overflow Det_66	Orifice		DET_66	I-1573		4660.22	4659.3		24		0							
4663	Overflow Det_88	Orifice		DET_88	M-1677		5632	5644.2		36		0							
4664	Overflow Det_C8	Orifice		DET_C8	M-1371		4798.82	4797		24		23.7							
4665	Reg-18	Orifice		DET_131	I-1832		4680.4	4678.23		10		5.17							
4666	UDOT-1	Orifice		O-223	I-2865		4416	4415.8		24		21.89							
4667	2625	Outlet		I-1789	I-1790		4425.85	4424.4				4.27							
4668	2635	Outlet		UnitDET_SB245	M-980		4424.5	4424.3				3.42							
4669	Det_82	Outlet		DET_82	I-2400		5954.6	5949.48				6.79							
4670	Outlet DET_81	Outlet		DET_81	I-1174		5883.67	5873.41				19.85							
4671	Outlet-11	Outlet		UnitDET_SB53	I-561		4443.5	4443.3				3.38							
4672	UnitOutlet_SB242	Outlet		UnitDET_SB242	I-395		4429.6	4429.5				1.62							
4673	UnitOutlet_SB244	Outlet		UnitDET_SB244	I-1770		4429.3	4428.45				1.99							
4674	UnitOutlet_SB254	Outlet		UnitDET_SB254	I-533		4442.5	4442.2				1.05							
4675	UnitOutlet_SB355	Outlet		UnitDET_SB355	I-1797		4421	4420				4.86							
4676	UnitOutlet_SB576	Outlet		UnitDET_SB576	I-2528		4427.5	4427				2.92							
4677	UnitOutlet_SB622	Outlet		M-419	I-724		4590.05	4586.76				9.42							
4678	UnitOutlet_SB744	Outlet		UnitDET_SB744	M-22		4487.1	4486.5				2.25							
4679	UnitOutlet_SB863	Outlet		Pond-11	I-1772		4432.55	4431.55				4.04							
4680	4725	Weir		M-42	M-43		4534.4	4535.1				40.52							
4681	Overflow Det_116	Weir		DET_116	I-1876		4792.1	4785.48				0							
4682	Overflow Det_123	Weir		DET_123	I-1919		4900	4900				0							
4683	Overflow Det_124	Weir		DET_124	I-1868		4847	4846				0							
4684	Overflow Det_130	Weir		DET_130	I-1853		4695.8	4694				0							
4685	Overflow Det_136	Weir		DET_136	M-1133		4398.3	4398.1				0							
4686	Overflow Det_137	Weir		DET_137	M-1142		4409.8	4409.05				0							
4687	Overflow Det_14	Weir		I-2825	DET_147		5449.61	5442				0							
4688	Overflow Det_145	Weir		DET_145	I-2645		5446	5442.4				0							
4689	Overflow Det_150	Weir		DET_150	M-1563		4407.82	4406.12				0							
4690	Overflow Det_42	Weir		DET_42	I-1577		4653.22	4651.85				8.11							
4691	Overflow Det_45	Weir		DET_45	M-637		4760.96	4757.55				0							
4692	Overflow Det_50	Weir		DET_50	O-129		4555.5	4555				26.87							
4693	Overflow Det_52	Weir		DET_52	M-231		4560	4555.7				8.23							
4694	Overflow Det_53	Weir		DET_53	I-1176		4769.9	4759.3				0							
4695	Overflow Det_58	Weir		DET_58	I-1829		4802.6	4802				0							
4696	Overflow Det_61	Weir		DET_61	I-1633		4712.5	4703.1				0							
4697	Overflow Det_64	Weir		DET_64	I-1549		4673.3	4673.2				0							
4698	Overflow Det_65	Weir		DET_65	I-1568		4662.56	4660.05				0							

Pipe Capacity

SN	Element ID	Element Type	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Average Slope	Diameter or Height	Manning's Roughness	10-yr 3-hr Peak Flow	Design Flow Capacity	Peak Flow/ Design Flow Ratio	Peak Flow Velocity	Peak Flow Depth	Peak Flow Depth/ Diameter Ratio	Total Time Surcharged	Reported Condition
						(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(cfs)		(ft/sec)	(ft)		(min)	
4699	Overflow Det_7	Weir		DET_7	M-341		4769	4764.98				0							
4700	Overflow Det_72	Weir		DET_72	I-1555		4669.54	4667.3				0.21							
4701	Overflow Det_74	Weir		DET_74	M-1320		4956.4	4954.4				0							
4702	Overflow Det_75	Weir		DET_75	I-1443		4686	4686				0							
4703	Overflow Det_77	Weir		DET_77	I-2169		4929.8	4924.5				0							
4704	Overflow Det_78	Weir		DET_78	I-2182		4957.65	4956				0							
4705	Overflow Det_79	Weir		DET_79	I-2277		4988.6	4979.7				0							
4706	Overflow Det_83	Weir		DET_83	I-2556		5973.98	5971.06				0							
4707	Overflow Det_86	Weir		DET_86	O-238		6040.11	6008.05				0							
4708	Overflow Det_96	Weir		DET_96	I-1887		4770.5	4767.26				0							
4709	Overflow Det_C2	Weir		DET_C2	I-1858		5054	5053				0							
4710	Overflow Det_C6	Weir		DET_C6	I-1864		4854	4851.9				0							

APPENDIX B
Precipitation Depths and Distributions

DRAPER CITY STORM DRAIN MASTER PLAN PRECIPITATION

NOAA 14 DATA

Precipitation Zones and Depths for 100-year Storm Event

Zone	1 hr (in)	3 hr (in)	6 hr (in)	12 hr (in)	24 hr (in)
East Mountains	1.86	1.16	2.46	3.12	3.45
Traverse Mountain	1.76	2.01	2.22	2.71	2.82
Urban	1.74	1.92	2.08	2.46	2.47

Precipitation Zones and Depths for 10-year Storm Event

Zone	1 hr (in)	3 hr (in)	6 hr (in)	12 hr (in)	24 hr (in)
East Mountains	0.96	1.23	1.58	2.06	2.42
Traverse Mountain	0.91	1.14	1.42	1.80	2.00
Urban	0.88	1.09	1.32	1.63	1.76

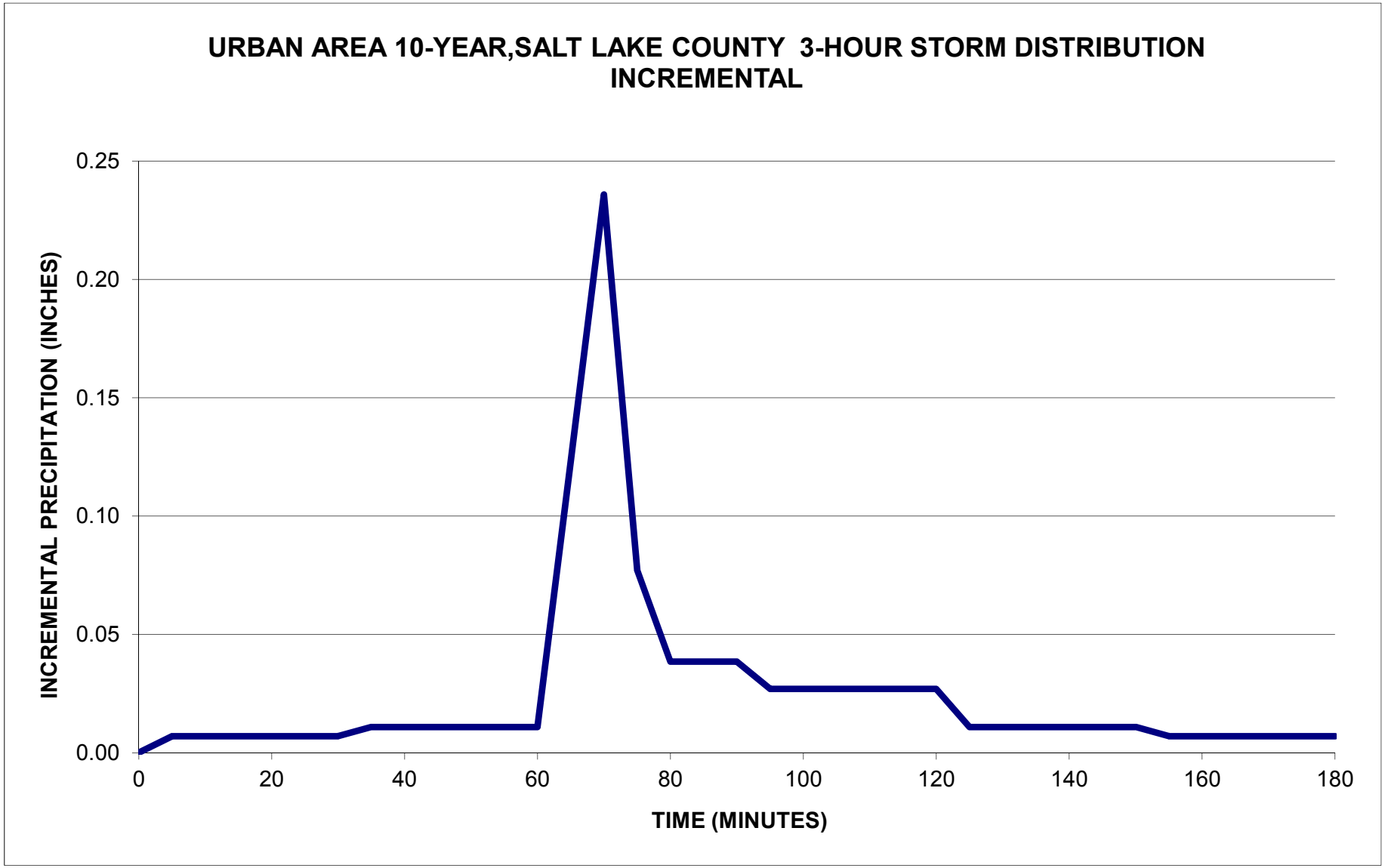
NOAA 14 DATA ADJUSTED FOR SEASONAL REDUCTION

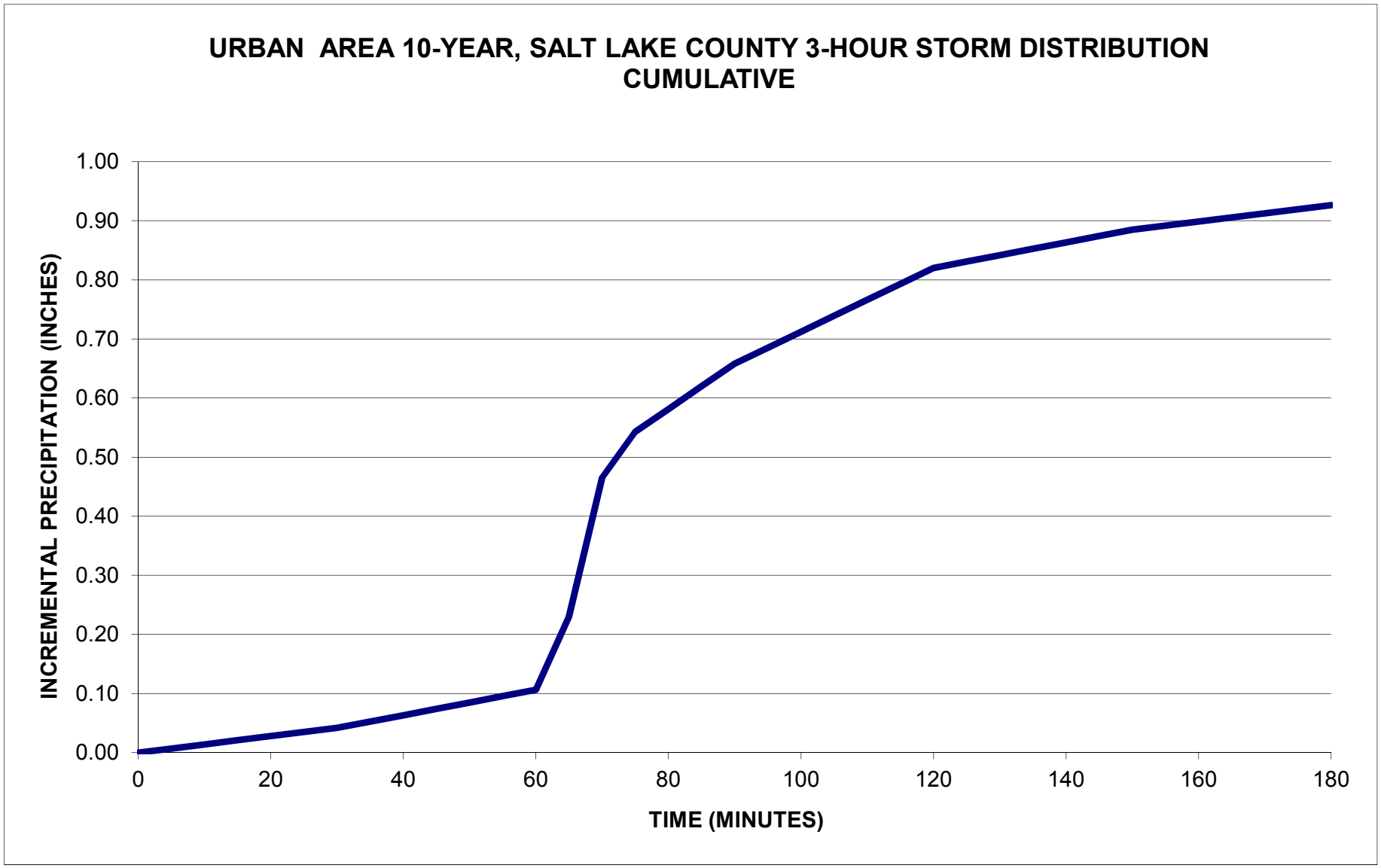
Precipitation Zones and Depths for 100-year Storm Event

Zone	1 hr (in)	3 hr (in)	6 hr (in)	12 hr (in)	24 hr (in)	Seasonal Adjustment
East Mountains	1.80	1.13	2.39	3.03	3.35	0.97
Traverse Mountain	1.64	1.87	2.06	2.52	2.62	0.93
Urban	1.62	1.79	1.93	2.29	2.30	0.93

Precipitation Zones and Depths for 10-year Storm Event

Zone	1 hr (in)	3 hr (in)	6 hr (in)	12 hr (in)	24 hr (in)	Seasonal Adjustment
East Mountains	0.91	1.17	1.50	1.96	2.30	0.95
Traverse Mountain	0.82	1.03	1.28	1.62	1.80	0.9
Urban	0.75	0.93	1.12	1.39	1.50	0.85


URBAN AREA 10-YEAR,SALT LAKE COUNTY 3-HOUR STORM DISTRIBUTION
INCREMENTAL
INCREMENTAL PRECIPITATION (INCHES)
0.25
0.20
0.15
0.10
0.05
0.00
0
20
40
60
80
100
120
140
160
180
TIME (MINUTES)


URBAN AREA 10-YEAR, SALT LAKE COUNTY 3-HOUR STORM DISTRIBUTION
CUMULATIVE
INCREMENTAL PRECIPITATION (INCHES)
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0
20
40
60
80
100
120
140
160
180
TIME (MINUTES)

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

Utah 40.518769 N 111.877074 W 4534 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 4
G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2006

Extracted: Thu Mar 25 2010

Confidence Limits | Seasonality | Location Maps | Other Info. | GIS data | Maps | Docs | Return to State Ma

Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.13	0.20	0.24	0.33	0.41	0.51	0.59	0.76	0.96	1.07	1.24	1.43	1.66	1.85	2.41	2.88	3.59	4.25
2	0.16	0.25	0.31	0.42	0.52	0.64	0.72	0.94	1.17	1.30	1.51	1.74	2.02	2.26	2.94	3.51	4.37	5.17
5	0.23	0.34	0.42	0.57	0.71	0.83	0.91	1.14	1.41	1.55	1.80	2.07	2.39	2.67	3.45	4.09	5.09	6.01
10	0.28	0.43	0.53	0.71	0.88	1.01	1.09	1.32	1.63	1.76	2.02	2.33	2.69	2.98	3.84	4.54	5.64	6.65
25	0.37	0.56	0.70	0.94	1.16	1.30	1.37	1.59	1.94	2.03	2.33	2.70	3.10	3.39	4.33	5.10	6.32	7.45
50	0.45	0.69	0.86	1.16	1.43	1.57	1.62	1.82	2.19	2.25	2.56	2.98	3.40	3.69	4.67	5.49	6.79	8.01
100	0.55	0.84	1.04	1.40	1.74	1.90	1.92	2.08	2.46	2.47	2.79	3.27	3.70	3.98	4.99	5.87	7.22	8.52
200	0.67	1.02	1.26	1.70	2.10	2.28	2.29	2.39	2.76	2.79	3.02	3.56	3.99	4.25	5.28	6.20	7.60	8.97
500	0.85	1.30	1.61	2.17	2.69	2.89	2.92	2.97	3.23	3.26	3.32	3.94	4.37	4.58	5.62	6.60	8.03	9.48
1000	1.03	1.56	1.94	2.61	3.23	3.46	3.50	3.53	3.61	3.65	3.68	4.24	4.65	4.82	5.85	6.87	8.28	9.79

* These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting forces estimates near zero to appear as zero.

* Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.15	0.23	0.28	0.38	0.47	0.57	0.65	0.83	1.04	1.14	1.33	1.53	1.78	1.98	2.57	3.06	3.82	4.52
2	0.19	0.29	0.36	0.48	0.60	0.71	0.80	1.02	1.28	1.40	1.62	1.87	2.17	2.43	3.14	3.74	4.66	5.51
5	0.26	0.40	0.49	0.66	0.82	0.93	1.01	1.24	1.55	1.66	1.92	2.21	2.56	2.84	3.68	4.35	5.40	6.39
10	0.33	0.50	0.62	0.83	1.03	1.14	1.21	1.44	1.78	1.88	2.16	2.49	2.87	3.17	4.09	4.81	5.97	7.06
25	0.43	0.66	0.82	1.10	1.36	1.49	1.53	1.75	2.13	2.18	2.48	2.88	3.29	3.61	4.59	5.40	6.68	7.90
50	0.54	0.82	1.01	1.36	1.69	1.81	1.83	2.02	2.43	2.46	2.73	3.19	3.61	3.92	4.96	5.82	7.17	8.48
100	0.66	1.01	1.25	1.68	2.08	2.22	2.24	2.34	2.77	2.80	2.98	3.50	3.93	4.22	5.30	6.22	7.62	9.03
200	0.81	1.24	1.54	2.07	2.56	2.72	2.75	2.77	3.15	3.19	3.23	3.82	4.25	4.52	5.61	6.59	8.04	9.52
500	1.07	1.63	2.02	2.72	3.36	3.56	3.60	3.63	3.77	3.81	3.85	4.25	4.68	4.89	5.99	7.03	8.49	10.07
1000	1.31	2.00	2.48	3.34	4.13	4.37	4.41	4.45	4.50	4.54	4.59	4.63	4.99	5.15	6.24	7.33	8.76	10.40

* The **upper** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **greater** than.
** These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

* Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day

Sunwest

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

Utah 40.476255 N 111.83918 W 5948 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 4
G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2006

Extracted: Thu Mar 25 2010

Confidence Limits | Seasonality | Location Maps | Other Info. | GIS data | Maps | Docs | Return to State Ma

Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.13	0.20	0.25	0.34	0.42	0.53	0.62	0.82	1.06	1.21	1.46	1.74	2.08	2.36	3.13	3.79	4.75	5.64
2	0.17	0.26	0.32	0.43	0.53	0.66	0.76	1.01	1.30	1.48	1.79	2.13	2.56	2.90	3.85	4.64	5.80	6.91
5	0.23	0.35	0.44	0.59	0.73	0.86	0.96	1.23	1.57	1.76	2.13	2.56	3.06	3.45	4.55	5.47	6.82	8.11
10	0.29	0.44	0.55	0.73	0.91	1.04	1.14	1.42	1.80	2.00	2.42	2.92	3.48	3.90	5.10	6.11	7.61	9.03
25	0.38	0.58	0.71	0.96	1.19	1.35	1.43	1.71	2.14	2.32	2.81	3.42	4.05	4.48	5.79	6.94	8.62	10.20
50	0.46	0.70	0.87	1.18	1.46	1.62	1.69	1.95	2.41	2.57	3.10	3.80	4.48	4.92	6.30	7.54	9.36	11.03
100	0.56	0.85	1.06	1.43	1.76	1.95	2.01	2.22	2.71	2.82	3.41	4.21	4.93	5.36	6.78	8.13	10.07	11.84
200	0.68	1.03	1.28	1.72	2.13	2.33	2.38	2.55	3.04	3.08	3.71	4.61	5.38	5.79	7.24	8.69	10.74	12.59
500	0.86	1.31	1.63	2.19	2.71	2.96	3.00	3.15	3.55	3.58	4.12	5.17	5.99	6.34	7.81	9.39	11.58	13.50
1000	1.03	1.57	1.95	2.63	3.25	3.53	3.56	3.68	3.96	4.00	4.42	5.60	6.45	6.75	8.22	9.90	12.17	14.15

* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting forces estimates near zero to appear as zero.

* Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.15	0.23	0.29	0.39	0.48	0.60	0.69	0.90	1.16	1.29	1.56	1.88	2.26	2.55	3.38	4.07	5.11	6.06
2	0.20	0.30	0.37	0.50	0.61	0.74	0.84	1.10	1.42	1.59	1.92	2.31	2.78	3.13	4.14	4.99	6.25	7.43
5	0.27	0.41	0.51	0.68	0.84	0.97	1.07	1.34	1.71	1.89	2.29	2.76	3.32	3.72	4.90	5.88	7.34	8.71
10	0.34	0.51	0.63	0.85	1.05	1.18	1.27	1.55	1.97	2.15	2.59	3.15	3.77	4.20	5.49	6.58	8.19	9.69
25	0.44	0.68	0.84	1.13	1.39	1.53	1.60	1.87	2.35	2.49	3.00	3.68	4.38	4.83	6.23	7.47	9.28	10.95
50	0.55	0.83	1.03	1.39	1.72	1.87	1.91	2.15	2.68	2.76	3.32	4.11	4.86	5.30	6.78	8.12	10.07	11.86
100	0.67	1.02	1.26	1.70	2.11	2.28	2.30	2.49	3.04	3.08	3.65	4.55	5.35	5.77	7.30	8.77	10.84	12.74
200	0.82	1.25	1.55	2.09	2.59	2.79	2.81	2.89	3.46	3.50	3.99	5.01	5.86	6.25	7.82	9.40	11.59	13.58
500	1.08	1.64	2.03	2.73	3.38	3.63	3.66	3.70	4.14	4.18	4.44	5.64	6.54	6.87	8.46	10.19	12.53	14.60
1000	1.32	2.01	2.49	3.35	4.15	4.43	4.48	4.52	4.71	4.75	4.80	6.14	7.08	7.34	8.92	10.77	13.20	15.34

* The **upper** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **greater** than.
** These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

* Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day

East Mountains

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

Utah 40.518571 N 111.809818 W 7168 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 4
G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2006

Extracted: Thu Mar 25 2010

Confidence Limits | Seasonality | Location Maps | Other Info. | GIS data | Maps | Docs | Return to State Ma

Precipitation Frequency Estimates (inches)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.14	0.22	0.27	0.36	0.45	0.56	0.67	0.93	1.22	1.45	1.78	2.19	2.68	3.09	4.18	5.13	6.47	7.73
2	0.18	0.27	0.34	0.46	0.57	0.71	0.82	1.14	1.49	1.78	2.18	2.69	3.30	3.80	5.15	6.30	7.94	9.49
5	0.24	0.37	0.46	0.62	0.77	0.92	1.04	1.37	1.79	2.13	2.62	3.26	3.99	4.56	6.12	7.47	9.38	11.19
10	0.31	0.47	0.58	0.78	0.96	1.11	1.23	1.58	2.06	2.42	2.98	3.73	4.57	5.18	6.88	8.38	10.51	12.51
25	0.40	0.61	0.76	1.02	1.26	1.43	1.54	1.90	2.45	2.82	3.48	4.40	5.36	6.00	7.85	9.57	11.99	14.20
50	0.49	0.74	0.92	1.24	1.54	1.72	1.82	2.16	2.77	3.13	3.87	4.92	5.98	6.62	8.57	10.44	13.08	15.43
100	0.59	0.90	1.12	1.51	1.86	2.07	2.16	2.46	3.12	3.45	4.26	5.47	6.62	7.25	9.27	11.31	14.18	16.63
200	0.71	1.09	1.35	1.82	2.25	2.48	2.56	2.81	3.49	3.77	4.67	6.03	7.28	7.88	9.95	12.14	15.24	17.79
500	0.91	1.39	1.72	2.32	2.87	3.15	3.23	3.48	4.07	4.21	5.21	6.80	8.18	8.72	10.82	13.22	16.63	19.26
1000	1.10	1.67	2.07	2.79	3.45	3.77	3.84	4.06	4.53	4.54	5.63	7.41	8.88	9.35	11.46	14.01	17.66	20.34

* These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting forces estimates near zero to appear as zero.

* Upper bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
1	0.16	0.25	0.31	0.42	0.52	0.64	0.74	1.01	1.33	1.56	1.92	2.37	2.92	3.34	4.51	5.52	6.98	8.33
2	0.21	0.32	0.39	0.53	0.65	0.79	0.91	1.23	1.63	1.92	2.35	2.92	3.60	4.12	5.55	6.79	8.57	10.25
5	0.28	0.43	0.53	0.72	0.89	1.03	1.14	1.49	1.96	2.30	2.83	3.53	4.35	4.95	6.60	8.05	10.13	12.08
10	0.35	0.54	0.67	0.90	1.11	1.26	1.36	1.72	2.26	2.61	3.22	4.04	4.97	5.61	7.42	9.04	11.36	13.51
25	0.47	0.71	0.88	1.19	1.47	1.63	1.72	2.08	2.71	3.04	3.75	4.76	5.84	6.50	8.48	10.32	12.97	15.36
50	0.58	0.88	1.09	1.47	1.81	1.98	2.05	2.39	3.08	3.37	4.17	5.34	6.52	7.18	9.27	11.28	14.17	16.72
100	0.71	1.08	1.34	1.80	2.23	2.42	2.47	2.76	3.51	3.72	4.61	5.94	7.24	7.87	10.03	12.24	15.38	18.05
200	0.87	1.33	1.64	2.21	2.74	2.97	2.98	3.19	4.00	4.07	5.06	6.57	7.98	8.58	10.80	13.19	16.59	19.36
500	1.14	1.74	2.16	2.91	3.60	3.88	3.92	4.04	4.76	4.81	5.67	7.45	9.01	9.53	11.78	14.40	18.17	21.04
1000	1.41	2.15	2.66	3.58	4.43	4.76	4.81	4.82	5.41	5.46	6.17	8.16	9.84	10.26	12.52	15.32	19.38	22.30

* The **upper** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are **greater** than
** These precipitation frequency estimates are based on a partial duration series. **ARI** is the Average Recurrence Interval.
Please refer to NOAA Atlas 14 Document for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

* Lower bound of the 90% confidence interval Precipitation Frequency Estimates (inches)

ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day

APPENDIX C
Cost Estimates

AVERAGE STORM DRAIN PIPE COST PER FOOT

Diameter (in)	Diameter (ft)	Outside Diameter (ft)	Pipe Material & Installation (1)	Excavation	Imported Bedding Installed	Hauling Excess Native Mat'l	Trench Backfill Installed (3)	Trench Box per Day (2)	Average Daily Output	Trench Box Cost	Top Trench Width (ft)	Road Repair Width (ft)	Asphalt Cost	Manhole Cost	Inlet Cost	Curb & Gutter Cost	Utility Relocation	Trench Dewatering (4)	Total Cost per Foot of Pipe	Cost Out of Street (3)
15	1.3	1.46	31.50	4.79	18.51	4.55	2.14	182.00	190	0.96	4.86	8.86	35.19	10.13	12.75	18.12	0	0.00	139	88
18	1.5	1.75	42.50	5.40	20.94	5.32	2.28	182.00	130	1.40	5.15	9.15	36.18	0.00	12.75	18.12	0	0.00	145	93
21	1.8	2.04	46.50	6.04	23.43	6.16	2.41	182.00	115	1.58	5.44	9.44	37.16	10.13	12.75	18.12	0	0.00	164	112
24	2.0	2.33	58.00	6.71	25.98	7.05	2.55	182.00	100	1.82	5.73	9.73	38.14	10.13	12.75	18.12	0	0.00	181	128
27	2.3	2.63	79.00	7.42	28.58	8.00	2.69	182.00	94	1.94	6.03	10.03	39.12	10.13	12.75	18.12	0	0.00	208	154
30	2.5	2.92	87.50	8.17	31.25	9.01	2.82	182.00	88	2.07	6.32	10.32	40.10	10.13	12.75	18.12	0	0.00	222	167
33	2.8	3.21	100.25	8.95	33.98	10.08	2.96	182.00	88	2.07	6.61	10.61	41.09	10.13	12.75	18.12	33.84	0.00	274	185
36	3.0	3.50	113.00	9.78	36.76	11.21	3.10	182.00	72	2.53	6.90	10.90	42.07	12.75	12.75	18.12	33.84	0.00	296	206
42	3.5	4.08	135.00	11.52	42.50	13.64	3.37	182.00	72	2.53	7.48	11.48	44.03	12.75	12.75	18.12	33.84	0.00	330	238
48	4.0	4.67	159.00	13.42	48.48	16.30	3.65	182.00	64	2.84	8.07	12.07	46.00	23.25	12.75	18.12	33.84	0.00	378	284
54	4.5	5.25	191.50	15.46	54.69	19.20	3.92	182.00	56	3.25	8.65	12.65	47.96	23.25	12.75	18.12	101.52	0.00	492	329
60	5.0	5.83	224.00	17.64	61.14	22.34	4.19	182.00	48	3.79	9.23	13.23	49.93	25.00	12.75	18.12	101.52	0.00	540	376
66	5.5	6.42	264.50	19.97	67.82	25.71	4.47	182.00	44	4.14	9.82	13.82	51.89	25.00	12.75	18.12	101.52	0.00	596	430
72	6.0	7.00	305.00	22.45	74.73	29.31	4.74	182.00	40	4.55	10.40	14.40	53.86	25.00	12.75	18.12	101.52	0.00	652	484
78	6.5	7.58	367.50	25.07	81.89	33.15	5.02	182.00	36	5.06	10.98	14.98	55.82	25.00	12.75	18.12	101.52	0.00	731	561
84	7.0	8.17	430.00	27.83	89.27	37.22	5.29	182.00	32	5.69	11.57	15.57	57.79	25.00	12.75	18.12	101.52	0.00	810	639
6' x 3' box	3.0	6.00	355.00	12.54	36.15	13.97	4.27	182.00	32	5.69	9.40	13.40	50.49	25.00	12.75	18.12	101.52	0.00	635	471

Reference: 2010 RS Means Heavy Construction Cost Data

Assumptions:

N	**Total Import Trench Backfill? (Y/N)**	
N	**Dewatering? (Y/N)**	
Y	**Catch Basins & Inlets? (Y/N)**	
	One side of street C&G is regraded (30' street).	
10	v :1h trench side slope (use trench boxes)	
3	' average depth to top of pipe	
0.33	' thick asphalt road covering	
0.75	' thick untreated base course	
200	' Average distance between manholes	
3	+ Outside Diameter = Bottom trench width	
1	' bedding over pipe	
0.5	' bedding under pipe	
1	Inlets per 100 ft of pipe	
30%	of curb & gutter is on radius	

Costs:

$ 13.79	/CY Native Trench backfill - pg 228: Fill by borrow [sand, dead or bank x 1.24 O&P] w/o materials and convert from loose to compacted volume. $9.92/LCY * 1.39 LCY/ECY
$ 43.38	/CY Imported Select Fill - pg 228, 241: Sand, dead or bank w/ hauling (Item 4266) and compaction. ($23.00/LCY + $4.64/LCY)*1.39 LCY/ECY + $4.96/ECY
$ 5.75	/CY Excavation - pg 212 (Item 1375): 10-14 ft deep, 1 CY excavator, Trench Box.
$ 30.31	/SY 4" Asphalt Pavement - pg 278-279,242: 9" Bank Run GravelBase Course ($7.90/SY), 2" Binder ($9.00/SY), 2" Wear ($10.05/SY [4"=$19.20/SY]) and Hauling ($6.70/LCY * 1.39LCY/ECY * 0.361CY/SY)
$ 2.68	/LF 4" Asphalt cutting - pg 37: Saw cutting asphalt up to 3" deep ($1.80/LF), each additional inch of depth ($0.88/LF)
$ 2,025.00	/EA 4' Manhole (for pipes =< 2.5' diameter) - pg 338: Precast 8' deep ($2,025/ea), each add'l foot of depth ($207/VLF)
$ 2,550.00	/EA 5' Manhole (for pipes > 2.5' and <= 3.5') - pg 338: Precast 8' deep ($2,550/ea), each add'l foot of depth ($340/VLF)
$ 4,650.00	/EA 6' Manhole (for pipes > 3.5' and <= 4.5') - pg 338: Precast 8' deep ($4,650/ea), each add'l foot of depth ($550/VLF)
$ 5,000.00	/EA Manholes (for pipes > 4.5')
$ 1,275.00	/EA Catch basins - pg 335: Curb inlet fram, grate, and curb box, Large 24" x 36" heavy duty
$ 18.12	/LF Curb & Gutter - pg 287: Steel forms, 24" wide, straight ($16.45/LF) and radius ($22.00). Calculated based on percentage of C&G on radius.
$ 9.31	/CY Hauling - pg 242: 20 CY dump truck, line 4622 and conversion from loose to compacted volume. $6.70/LCY * 1.39 LCY/ECY
$ 182.00	/day Trench Box (7' deep, 16' x 8', pg 263)
$ 64.92	/CY Stabilization Gravel - pg 228, 241: Bank Run Gravel ($38.50/LCY * 1.39 LCY/ECY) plus compaction ($4.96/ECY) and hauling [Item 4266] ($4.64/LCY * 1.39 LCY/ECY)
$ 925.00	/day Dewatering - pg 225: 4" diaphram pump, 8 hrs attended ($830/day). Second pump ($95/day)

NOTES:

(1) Assumes Class 3 RCP with no gaskets (pg. 333). 6' x 3' box cost from pg 312. 33", 54", 66", & 78" costs were estimated by linear interpolation between sizes - Costs for these sizes would likely be much higher because they are odd sizes.

(2) 7' deep trench box (16' x 8') - on page 263

(3) Backfill Material & Installation assumes in street. For out of street unit costs, the backfill material cost has been added in place of base course and asphalt.

(4) Dewatering assumes 1' stabilization gravel at the bottom of the trench plus dewatering pumps

(5) Conversion from loose to compacted volumes assumes 125 PCF for compacted density and 90 PCF for loose density. Or (125 PCF/ECY)/(90 PCF/LCY) = 1.39 LCY/ECY

(6) Conversion from cubic yards to square yards for hauling of asphalt paving assumed a total thickness of 13". 3 ft x 3 ft x (13 in)/(12 in/ft) = 0.361 CY/SY

Abbreviations:

VLF	vertical lineal foot
PCF	pounds per cubic foot
LCY	loose cubic yard
ECY	embankment cubic yard

REGION 1 COST ESTIMATES - BY SUBAREA

Region 1A

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	1400	$101	$141,400	
DET	5.8 acre-ft	1	$790,000	$790,000	
				$931,400	**$1,210,820**

Region 1B

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	18-inch	2690	$145	$390,050	
curb and gutter		1920	$18	$34,560	
				$424,610	**$551,993**

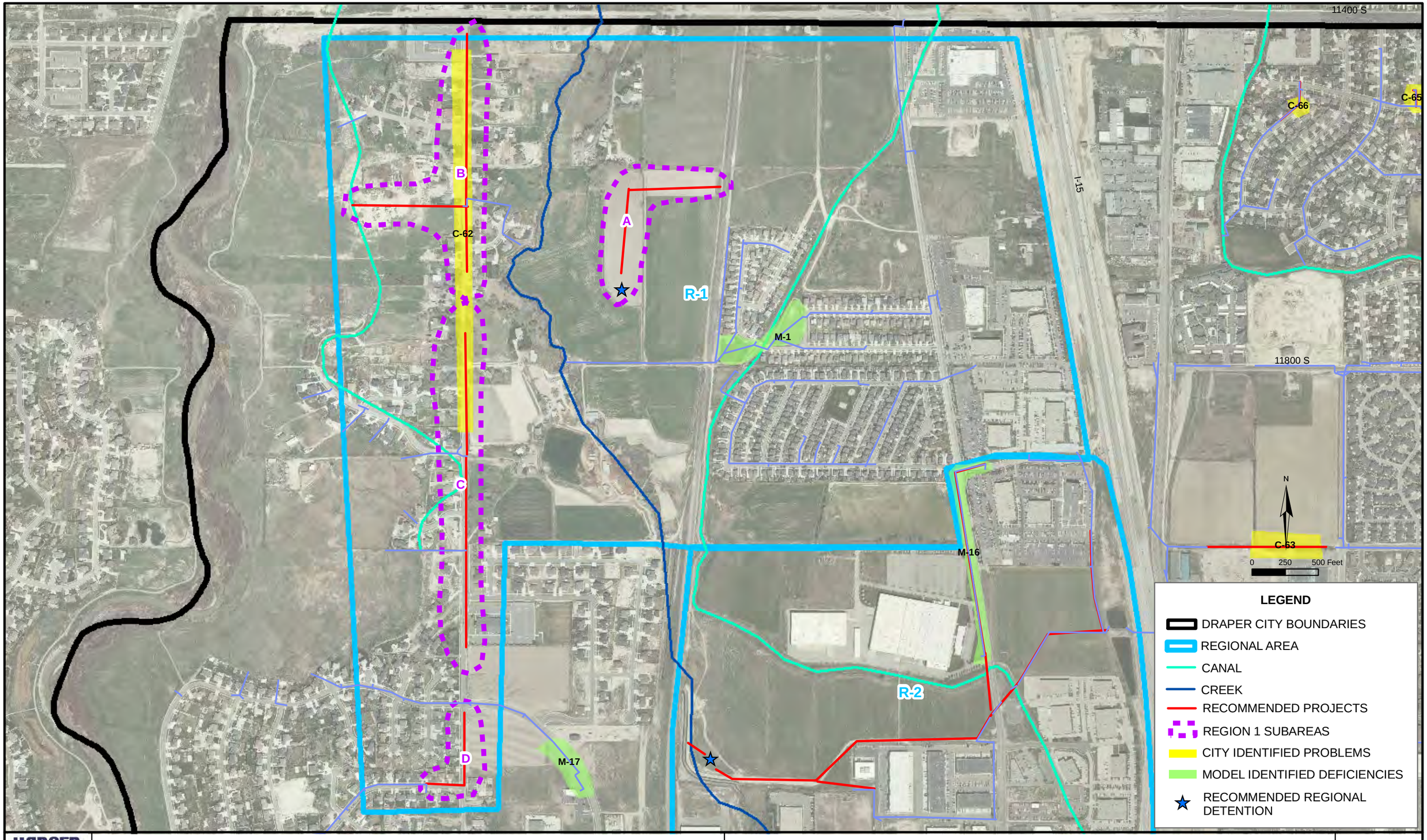
Region 1C

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	18-inch	2400	$145	$348,000	
curb and gutter		2800	$18	$50,400	
				$398,400	**$517,920**

Region 1D

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	18-inch	840	$145	$121,800	
curb and gutter		600	$18	$10,800	
				$132,600	**$172,380**

REGION 1 TOTAL **$2,453,113**



HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK
REGION 1 CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
C-1

REGION 2 COST ESTIMATES - BY SUBAREA

Region 2A

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	48-inch	324.94	$391	$127,052	
DET	7.6	1	$1,010,000	$1,010,000	
				$1,137,052	**$1,478,167**

Region 2B

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	48-inch	687.53	$391	$268,824	
				$268,824	**$349,471**

Region 2C

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	27-inch	273.69	$163	$44,611	
				$44,611	**$57,995**

Region 2D

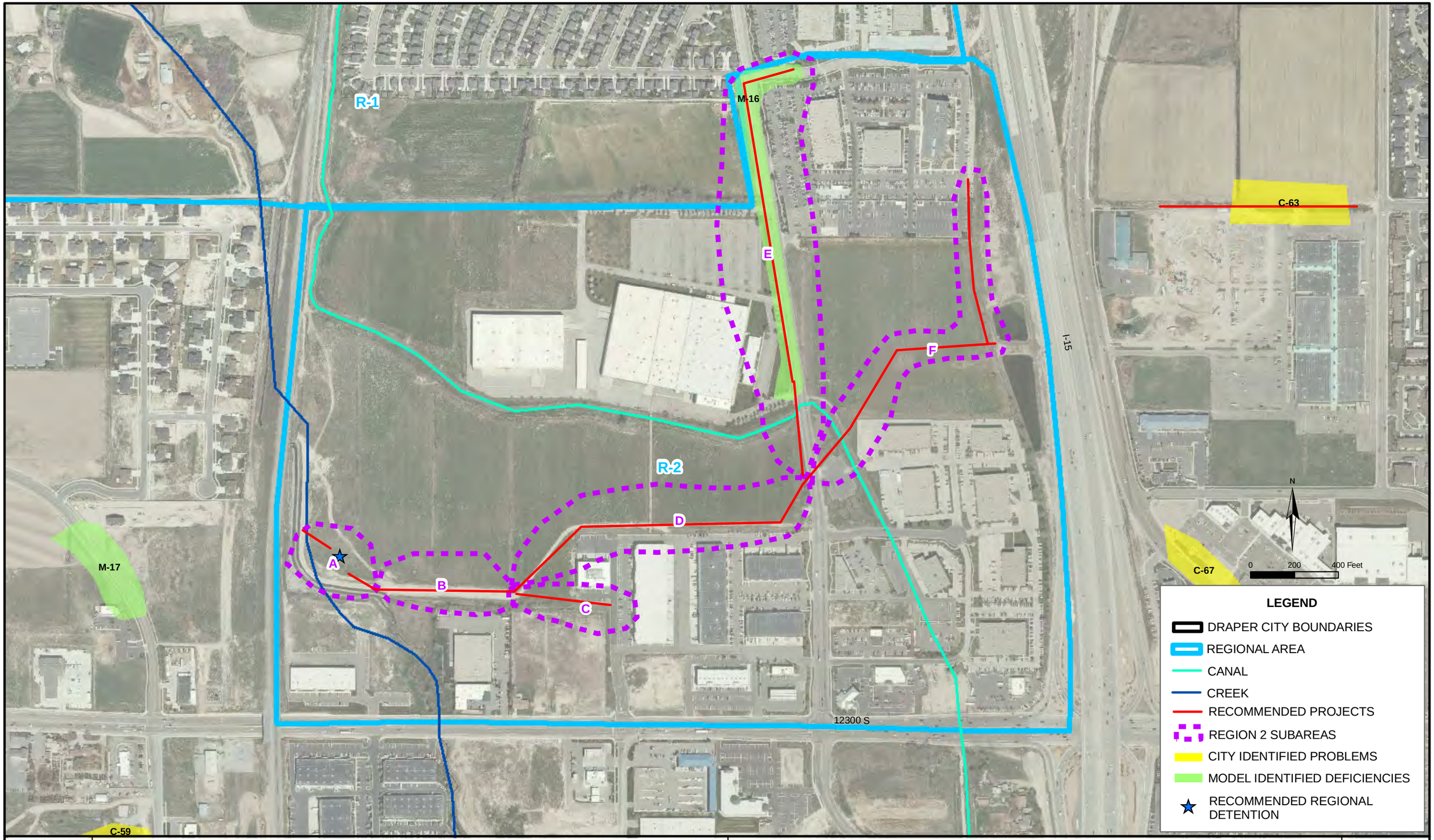
Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	36-inch	418.38	$216	$90,370	
out-of-street	42-inch	867.77	$238	$206,529	
out-of-street	48-inch	237.94	$284	$67,575	
				$364,474	**$473,817**

Region 2E

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	18-inch	923.88	$145	$133,963	
in-street	21-inch	1149.99	$164	$188,598	
				$322,561	**$419,329**

Region 2F					
Description	**Unit**	**Units**	**Unit Cost**	**Cost**	**Total Cost with 30% Engineering & Contingency**
out-of-street	30-inch	1178.74	$167	$196,849.58	
out-of-street	42-inch	461.46	$238	$109,827	
out-of-street	48-inch	177.04	$284	$50,279	
in-street	54-inch	100.55	$492	$49,471	
				$406,427	**$528,355**

REGION 2 TOTAL	**$3,307,134**



HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK
REGION 2 CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
C-2

REGION 3 COST ESTIMATES - BY SUBAREA

Region 3A

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	24-inch	1750	$128	$224,000	
				$224,000	**$291,200**

Region 3B

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	24-inch	650	$128	$83,200	
				$83,200	**$108,160**

Region 3C

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	24-inch	450	$128	$57,600	
in-street	36-inch	216	$238	$51,408	
DET	11.3	1	$1,480,000	$1,480,000	
				$1,589,008	**$2,065,710**

Region 3D

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	24-inch	3650	$128	$467,200	
				$467,200	**$607,360**

Region 3E

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	24-inch	3100	$128	$396,800	
				$396,800	**$515,840**

Region 3F

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	24-inch	750	$128	$96,000	
				$96,000	**$124,800**

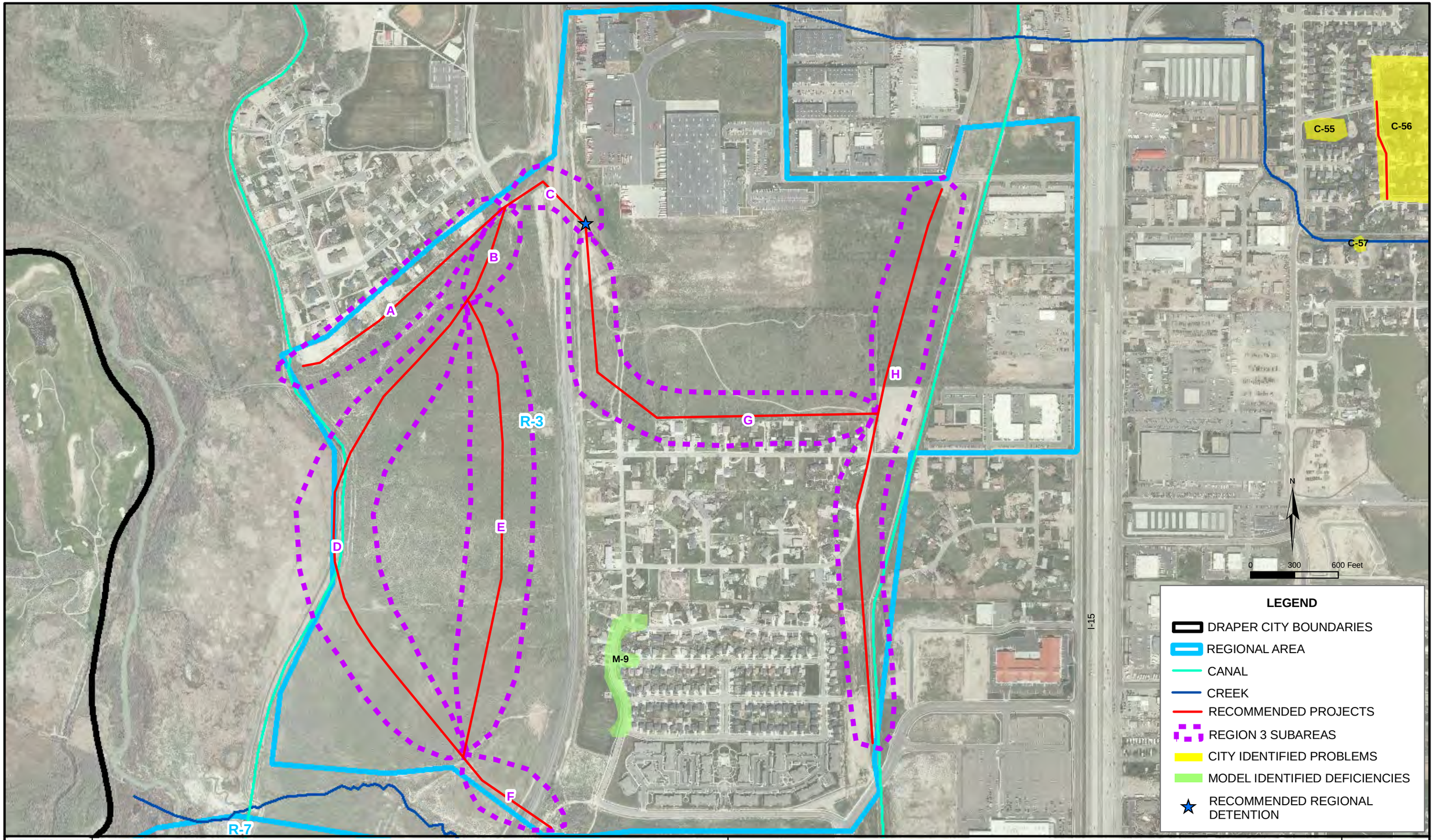
Region 3G

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	24-inch	3000	$128	$384,000	
				$384,000	**$499,200**

Region 3H

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	24-inch	3800	$128	$486,400	
				$486,400	**$632,320**

REGION 3 TOTAL $4,844,590



HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK
REGION 3 CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
C-3

REGION 4 COST ESTIMATES - BY SUBAREA

Region 4A

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	18-inch	1726.86	$145	$250,395	
in-street	24-inch	530.94	$181	$96,100	
				$346,495	**$450,443**

Region 4B

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	24-inch	290	$137	$39,730	
DET	5.3 acre-ft	1	$730,000	$730,000	
				$769,730	**$1,000,649**

Region 4C

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	42-inch	662.24	$238	$157,613	
in-street	36-inch	272.67	$296	$80,710	
in-street	42-inch	763	$330	$251,790	
				$490,113	**$637,147**

Region 4D

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	36-inch	1186.87	$296	$351,314	
in-street	42-inch	438.02	$330	$144,547	
				$495,860	**$644,618**

Region 4E

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	18-inch	804.53	$145	$116,657	
				$116,657	**$151,654**

Region 4F

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	200	$101	$20,200	
DET	4.35 ac-ft	1	$590,000	$590,000	
				$610,200	**$793,260**

Region 4G

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	24-inch	3500	$181	$633,500	
out-of-street	24-inch	900	$137	$123,300	
out-of-street	36-inch	720.61	$206	$148,446	
				$905,246	**$1,176,819**

Region 4H

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
DET	1.72 ac-ft	1	$70,000	$70,000	
				$70,000	**$91,000**

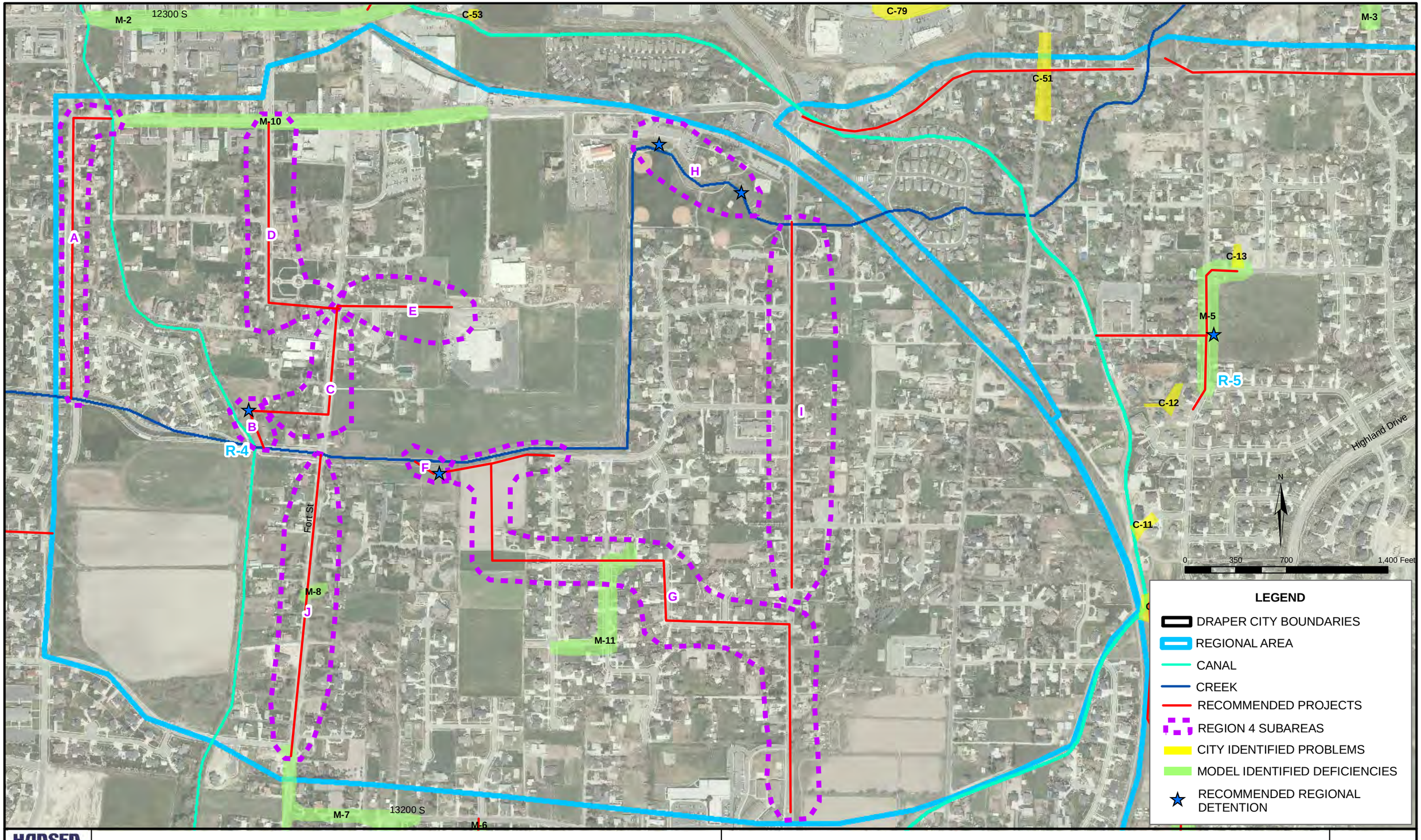
Region 4I

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	24-inch	2515	$181	$455,215	
				$455,215	**$591,780**

Region 4J

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	24-inch	1840	$181	$333,040	
				$333,040	**$432,952**

REGION 4 TOTAL $5,970,323



HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK
REGION 4 CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
C-4

REGION 5 COST ESTIMATES - BY SUBAREA

Region 5A

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	24-inch	813	$137	$111,381	
in-street	30-inch	574	$232	$133,168	
in-street	36-inch	481	$307	$147,667	
DET	1.5 acre-ft	1	$230,000	$230,000	
				$622,216	**$808,881**

Region 5B

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
	18-inch	2000	$132	$264,000	
DET	0.5	1	$50,000	$50,000	
				$314,000	**$408,200**

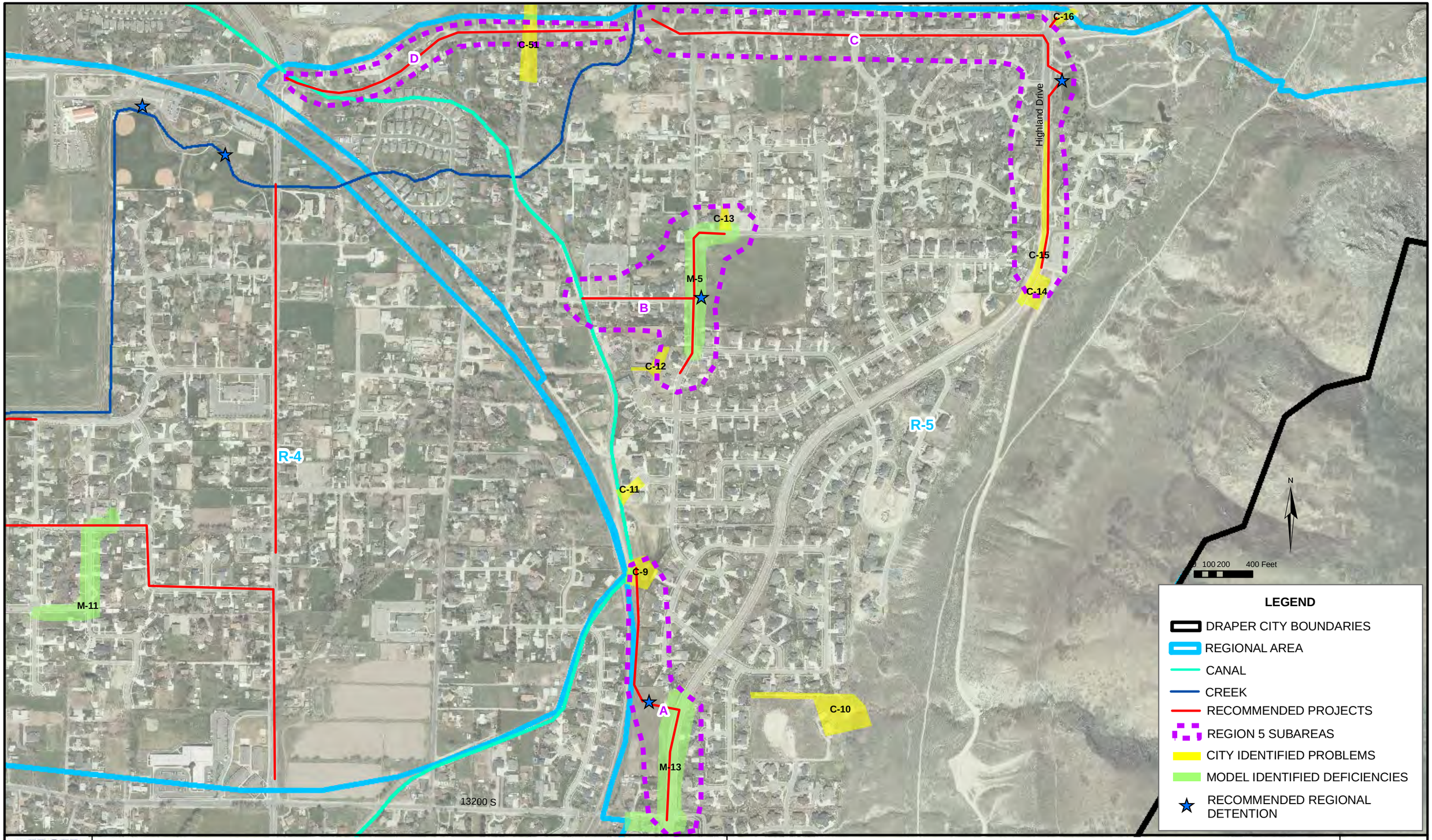
Region 5C

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
DET	BC Estimate	1	$1,923,076	$1,923,076	
				Based on Bowen Collins Estimate	
				$1,923,076	**$2,499,999**

Region 5D

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	18-inch	2300	$164	$377,200	
				$377,200	**$490,360**

REGION 5 TOTAL $4,207,440



HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK
REGION 5 CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
C-5

REGION 6 COST ESTIMATES - BY SUBAREA

Region 6A - Traverse Ridge Road Improvements

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	4830.04	$101	$487,834	
out-of-street	30-inch	1006.89	$167	$168,151	
out-of-street	24-inch	4051.07	$137	$554,997	
out-of-street	30-inch	1026.95	$185	$189,986	
in-street	30-inch	1104.17	$232	$256,167	
curb and gutter		11000	$18	$198,000	
DET	6 acre-ft	1	$810,000	$810,000	
				$2,665,134	**$3,464,675**

Region 6B - Corner Creek Diversion

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	42-inch	3800	$238	$904,400	
DET	8 acre-ft	1	$250,000	$250,000	
				$1,154,400	**$1,500,720**

Region 6C - Corner Creek Diversion

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	30-inch	257.31	$185	$47,602	
out-of-street	36-inch	116.61	$206	$24,022	
out-of-street	42-inch	161.53	$238	$38,444	
in-street	24-inch	859.78	$181	$155,620	
in-street	30-inch	2574.26	$232	$597,228	
DET	Structure	1	$20,000	$20,000	
				$882,917	**$1,147,792**

Region 6D - Corner Creek Diversion

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	24-inch	1471.62	$137	$201,612	
out-of-street	30-inch	1529.42	$185	$282,943	
out-of-street	36-inch	1069.55	$206	$220,327	
				$704,882	**$916,347**

Region 6E - Corner Creek Diversion

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	3037.18	$101	$306,755	
out-of-street	24-inch	957.95	$137	$131,239	
in-street	24-inch	609.91	$181	$110,394	
				$548,388	**$712,904**

Region 6F - Upper Corner Creek Diversion

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
in-street	24-inch	2117.07	$181	$383,190	
in-street	27-inch	1383.99	$208	$287,870	
in-street	30-inch	876.85	$232	$203,429	
				$874,489	**$1,136,835**

Region 6G - Upper Corner Creek Diversion

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	630.34	$101	$63,664	
out-of-street	24-inch	1192.23	$137	$163,336	
out-of-street	36-inch	1466.39	$206	$302,076	
				$529,076	**$687,799**

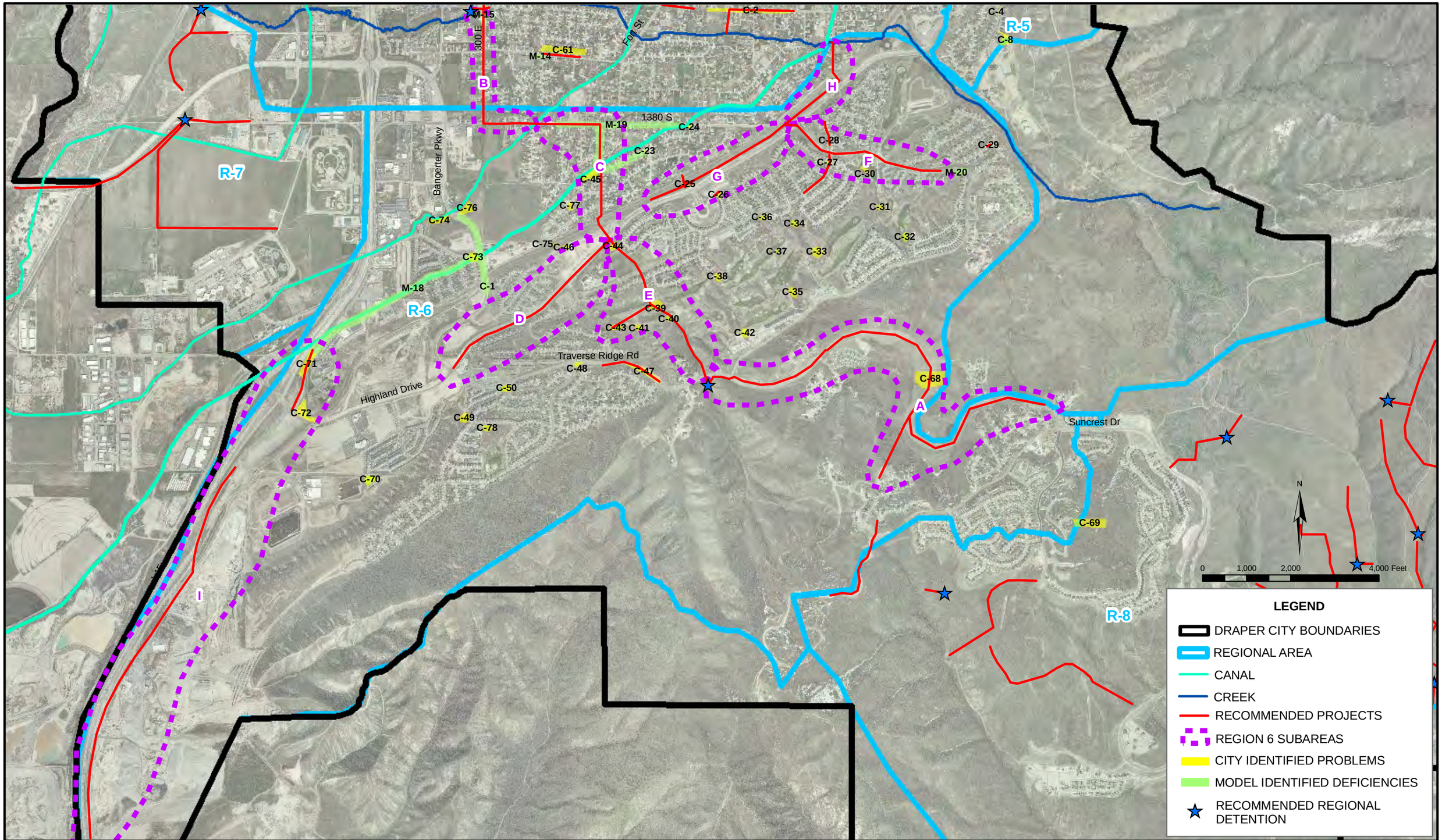
Region 6H - Upper Corner Creek Diversion

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	36-inch	640.5	$206	$131,943	
out-of-street	42-inch	31.32	$238	$7,454	
out-of-street	48-inch	964.78	$378	$364,687	
in-street	36-inch	97.26	$296	$28,789	
in-street	42-inch	907.22	$330	$299,383	
DET	Structure	1	$0	$0	
				$832,256	**$1,081,932**

Region 6I - Point of the Mountain

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	9262.74	$101	$935,537	
out-of-street	24-inch	973.85	$137	$133,417	
in-street	24-inch	147.37	$181	$26,674	
				$1,095,628	**$1,424,317**

REGION 6 TOTAL $12,073,321



HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK
REGION 6 CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
C-6

REGION 7 COST ESTIMATES - BY SUBAREA

Region 7A

Description	Unit		Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	36-inch		3220	$206	$663,320	
DET		6.2	1	$840,000	$840,000	
					$1,503,320	**$1,954,316**

Region 7B

Description	Unit		Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	36-inch		1400	$206	$288,400	
DET		26.1	1	$3,320,000	$3,320,000	
					$3,608,400	**$4,690,920**

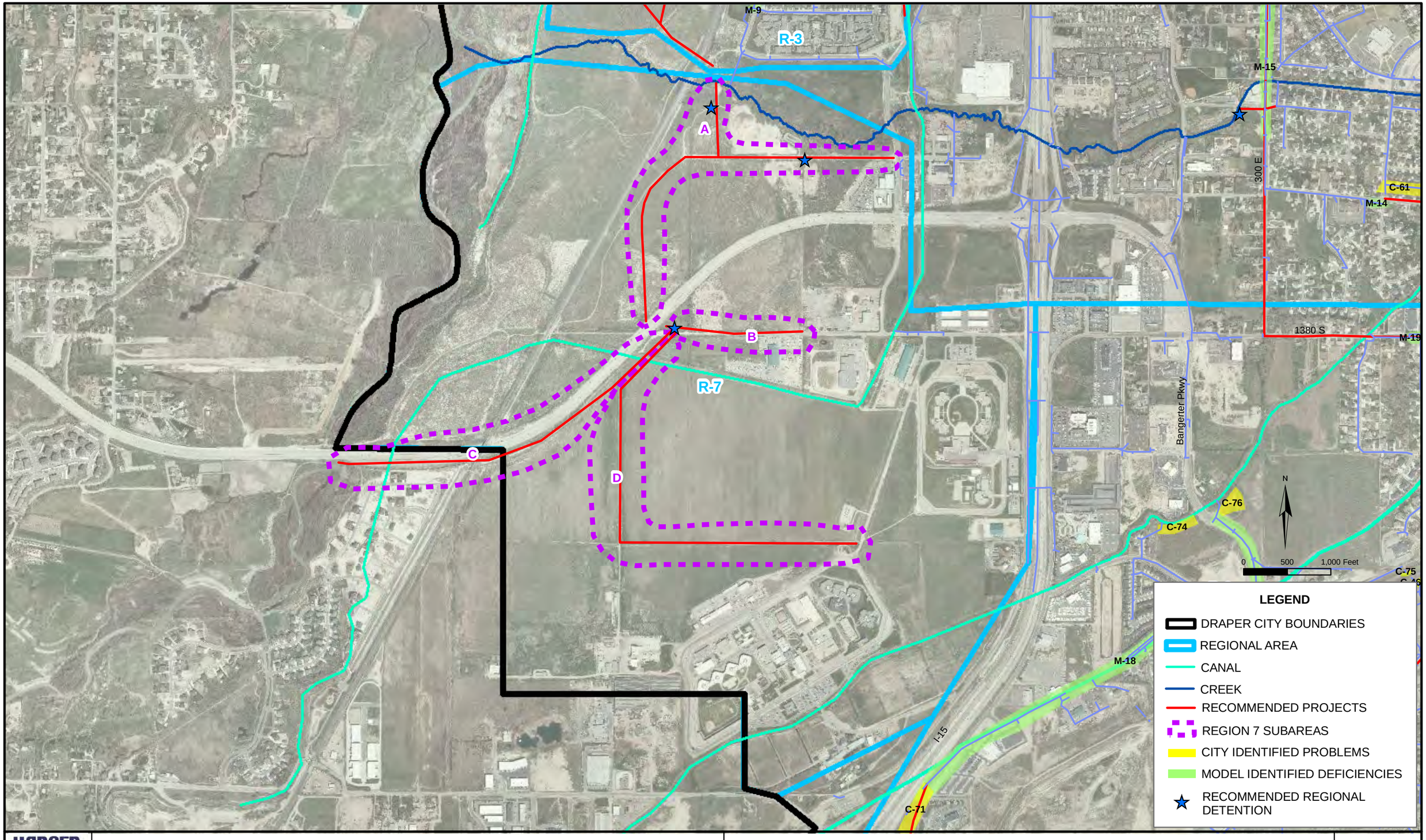
Region 7C

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	36-inch	4300	$206	$885,800	
DET	Structure		$20,000	$0	
				$885,800	**$1,151,540**

Region 7D

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	36-inch	5300	$206	$1,091,800	
				$1,091,800	**$1,419,340**

REGION 7 TOTAL $9,216,116



HANSEN ALLEN & LUCE inc ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK
REGION 7 CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
C-7

REGION 8 COST ESTIMATES - BY SUBAREA

Region 8A

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	2500	$87	$217,500	
				$217,500	**$282,750**

Region 8B

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	6310	$87	$548,970	
out-of-street	24-inch	730	$112	$81,760	
out-of-street	30-inch	640	$150	$96,000	
Maple Hollow Channel Mobilization	Lump Sum	1	$11,400	$11,400	
Maple Hollow Top Reach	Length	400	$174	$69,600	
Maple Hollow Bottom Reach	Length	2420	$179	$433,180	
DET	0.8 ac-ft	1	$140,000	$140,000	
				$1,380,910	**$1,795,183**

Region 8C

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	8420	$87	$732,540	
out-of-street	21-inch	680	$96	$65,280	
out-of-street	24-inch	1860	$112	$208,320	
out-of-street	30-inch	680	$150	$102,000	
Box Culvert (3'x6')		600	$451	$270,600	
DET	12.9 ac-ft	1	$1,680,000	$1,680,000	
				$3,058,740	**$3,976,362**

Region 8D

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	2160	$87	$187,920	
out-of-street	21-inch	1030	$96	$98,880	
out-of-street	24-inch	2160	$112	$241,920	
out-of-street	30-inch	1490	$150	$223,500	
DET	30.6 ac-ft	1	$4,256,000	$3,870,000	
				$4,622,220	**$6,008,886**

Region 8E

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	18-inch	4250	$87	$369,750	
out-of-street	21-inch	3160	$96	$303,360	
out-of-street	24-inch	5230	$112	$585,760	
out-of-street	30-inch	1340	$150	$201,000	
Box Culvert (3'x6')		500	$451	$225,500	
DET	31.3 ac-ft	1	$3,960,000	$3,960,000	
				$5,645,370	**$7,338,981**

Region 8F

Description	Unit	Units	Unit Cost	Cost	Total Cost with 30% Engineering & Contingency
out-of-street	36-inch	1600	$110	$176,000	
DET	22.8 ac-ft	1	$1,840,000	$1,840,000	
				$2,016,000	**$2,620,800**

REGION 8 TOTAL $22,022,962

Note:

R-8B Maple Hollow channel improvement assumptions were as follows:
18" grouted boulders would be required for the top and bottom reaches of Maple

Hollow due to the steepness of the slope (32% for the top reach and 13% for the bottom reach) and the required flow of 11.3 cfs for the top reach and 12.3 cfs for the bottom reach in the drainage. These flows were based on a 10-year storm event. The existing channel was assumed to be 3 to 4 feet wide and 4 to 5 feet deep. This would require that the existing channel be filled in with structural fill material and the grouted boulders would be installed at the level of the original flowline prior to the channel degradation. The boulders would form a new protected channel which would be 3 feet wide for the top reach and 4 feet wide for the bottom reach with side slopes of 2:1 (H:V). Because of the steepness of the slope, a 12-inch layer of gravel would be placed under the boulders with a PVC drain system being installed in the gravel which would relieve ground water pressure from under the grouted boulders. A layer of filter fabric would be installed between the grouted boulders and gravel drain layer and also between the gravel drain layer and structural fill material.

C-32
C-37
C-33
C-38
C-35
C-42
C-68
Traverse Ridge Rd
R-6
Suncrest Dr
F
D
C-69
A
R-8
B
C
E
M-12
N
0 500 1,000 Feet

LEGEND

- DRAPER CITY BOUNDARIES
- REGIONAL AREA
- CANAL
- CREEK
- RECOMMENDED PROJECTS
- RECOMMENDED CHANNEL IMPROVEMENTS
- REGION 8 SUBAREAS
- CITY IDENTIFIED PROBLEMS
- MODEL IDENTIFIED DEFICIENCIES
- RECOMMENDED REGIONAL DETENTION

HANSEN ALLEN & LUCE INC ENGINEERS

DRAPER CITY STORM DRAINAGE MASTER PLAN

CORNER CREEK
REGION 8 CAPITAL IMPROVEMENTS FACILITY PROJECTS

FIGURE
C-8

APPENDIX D

Drainage Design Criteria and Site Development Submittal Requirements

CITY OF DRAPER
DRAINAGE DESIGN CRITERIA

October 11, 2012

CITY OF DRAPER
DRAINAGE DESIGN CRITERIA
October 11, 2012

Storm drainage and erosion control plan submittal requirements are described in the Appendix to these Drainage Design Criteria. Additional design criteria are found in the Draper City Storm Drainage Master Plan.

Unless provided otherwise, the criteria and methods presented in the following references shall be used in planning and design of each drainage system:

> Urban Drainage Design Manual, Hydraulic Engineering Circular No. 22, September 2009, Federal Highway Administration, FHWA-SA-96-078, http://www.fhwa.dot.gov/bridge/hydpub.htm
> http://www.fhwa.dot.gov/engineering/hydraulics/library_listing.cfm
>
> Urban Storm Drainage Criteria Manual 2011, Urban Drainage and Flood Control District, http://www.udfcd.org/

Best management practices (BMPs) for controlling stormwater pollution during construction activities shall use the Salt Lake County "Best Management Practices for Construction Activities" document at http://www.pweng.slco.org/stormwater/pdf/cmatrix.pdf.

BMPs for post-construction control of stormwater pollution in new development or redevelopment sites shall utilize Urban Storm Drainage Criteria Manual Volume 3 – Best Management Practices 2011, http://www.udfcd.org/ for selection and design of long-term controls.

Specific criteria for use in the design of stormwater facilities in Draper City are presented in two sections: Hydrologic Criteria and Design Criteria. Hydrologic Criteria includes precipitation, drainage design frequency, design storm distribution and duration, and the storm drainage modeling method. Design Criteria includes street drainage, storm inlets, storm drains, stormwater quantity control facilities, and easements.

HYDROLOGIC CRITERIA

The Hydrologic Criteria are based on well-established public works methods and engineering principles. These methods have been developed over many years by a variety of private and governmental entities including local, state and federal agencies. The methods, models and data described are widely used and readily available. Much of the information discussed is available from governmental agencies, as well as from the internet websites of the respective agencies.

PRECIPITATION

Precipitation depths are determined based on the NOAA Atlas 14-Point Precipitation Frequency Estimates data server. Precipitation depths increase with elevation and proximity to the mountains due to the orographic effect. Because of this, the City is divided into three areas for the purpose of developing design rainstorm depths, as shown on Figure 1. The design rainfall amounts to be used are shown in Tables 1 and 2 and are to be applied based on the location of the proposed development.

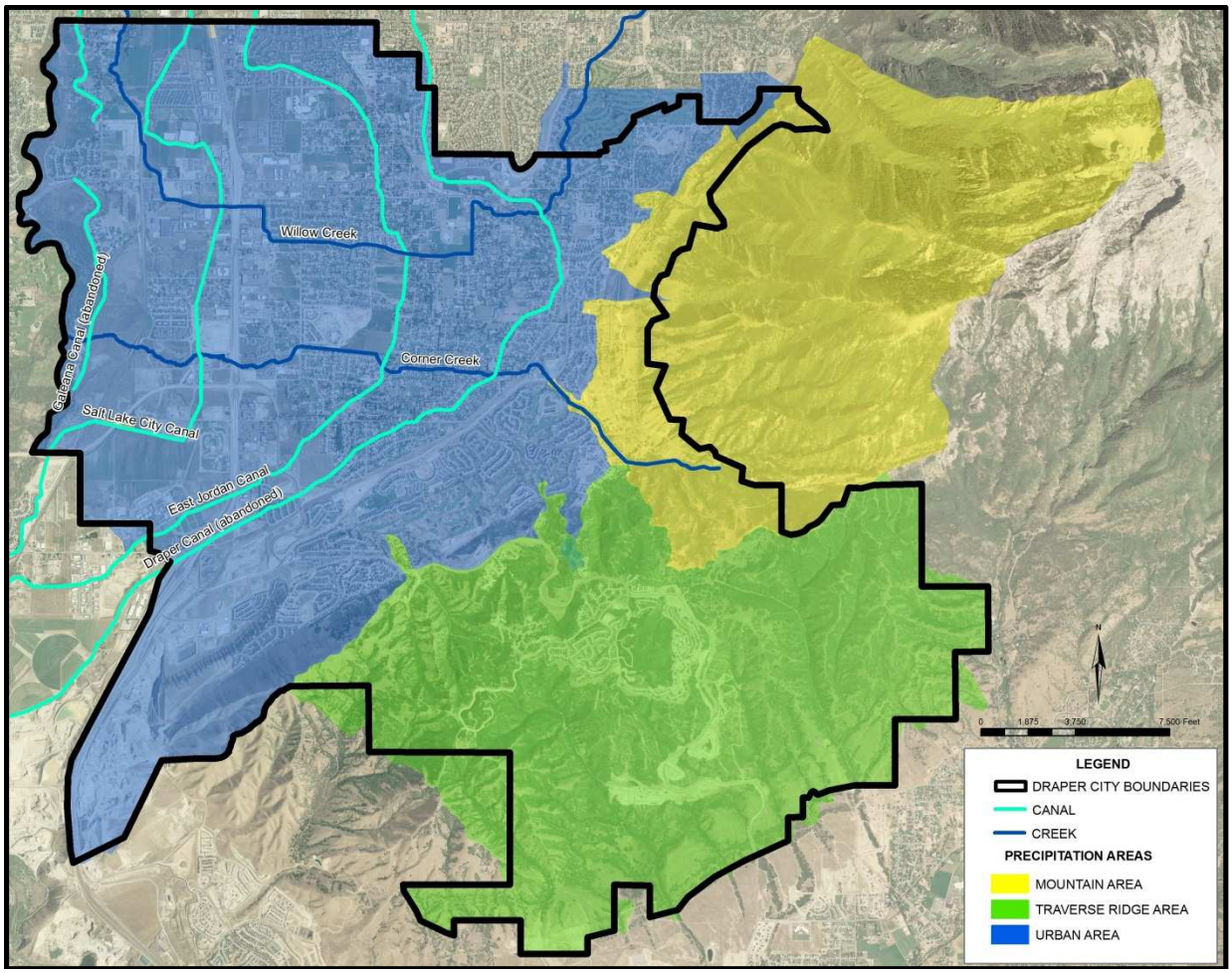


Figure 1 – Design Rainstorm Depth Precipitation Areas

TABLE 1
DESIGN RAINFALL DEPTHS FOR URBAN AREA

Location	Return Period	3-Hour Rainfall Depths (inches)
Urban Area	10-Year	0.93
Urban Area	100-Year	1.79

TABLE 2
DESIGN RAINFALL DEPTHS FOR
TRAVERSE RIDGE AREA AND MOUNTAIN AREA

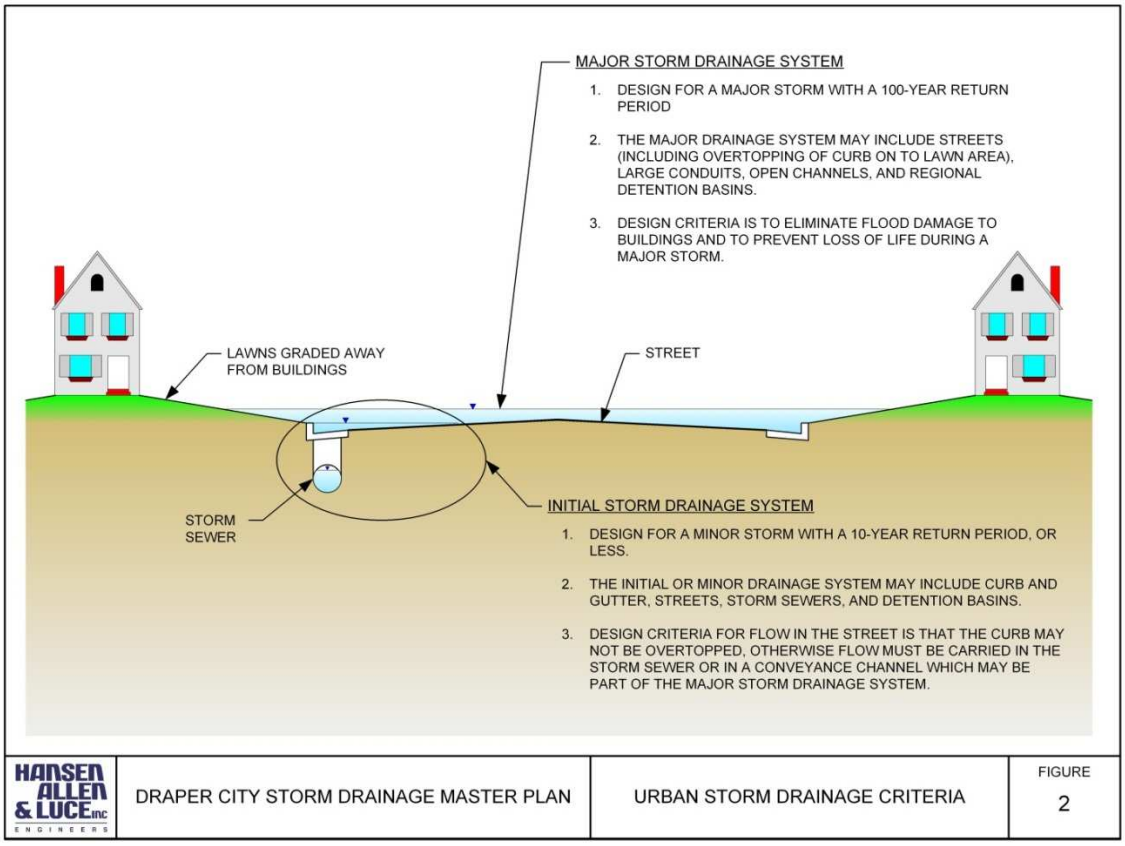
Location	Return Period	1-Hour Rainfall Depths (inches)	3-Hour Rainfall Depths (inches)	6-Hour Rainfall Depths (inches)	12-Hour Rainfall Depths (inches)	24-Hour Rainfall Depths (inches)
Traverse Ridge Area	10-Year	0.82	1.03	1.28	1.62	1.80
Traverse Ridge Area	100-Year	1.64	1.87	2.06	2.52	2.62
Mountain Area	10-Year	0.91	1.17	1.50	1.96	2.30
Mountain Area	100-Year	1.80	2.10	2.39	3.03	3.35

DRAINAGE DESIGN FREQUENCY

"Every urban area has two separate and distinct drainage systems, whether or not they are actually planned and designed. One is the initial system, and the other is the major system (see Figure 2). To provide for orderly urban growth, reduce costs to future generations, and avoid loss of life and major property damage, both systems must be planned, properly engineered and maintained." (Urban Storm Drainage Criteria Manual, Urban Drainage and Flood Control District, Denver, Colorado, June 2001). The initial and major drainage systems are defined as follows:

- Initial System: The initial storm drainage system includes those components which provide protection against regularly recurring damage from storm runoff. Initial drainage systems include the street curb and gutter, storm drain systems, and local detention basins. These systems shall be designed to safely convey the 10-year storm runoff event.

- Major System: The major storm drainage system includes those components which provide protection against larger, typically rare storms. Included in the major storm drainage system are major channels, swales and culverts, streets, regional detention and retention facilities. This system shall be designed for the 100-year event with the objective to eliminate major damage to structures, homes, and businesses, and to prevent loss of life.



DESIGN STORM DISTRIBUTION AND DURATION

To compute runoff from a given storm, the distribution of the rainfall through time must be known. Critical runoff events from urban areas along the Wasatch Front are caused by cloudburst type storms which are characterized by short periods of high intensity rainfall. The Farmer-Fletcher (1971) design storm distributions were developed using local Utah recording gauge networks for summer thunderstorm type rainfall events. The Farmer-Fletcher design storm distributions were developed with methodology that preserved the measured individual storm burst rainfall intensities. The storm distribution chosen by Draper City for the Urban Areas (see Figure 1) was developed using a 1-hour Farmer-Fletcher distribution modified by Salt Lake County for a 3-hour storm. Farmer and Fletcher (1971) examined rainfall gauge records and classified storms based on whether the heaviest rainfall of the storm fell in the first, second, third or fourth quarter of the storm period. Farmer and Fletcher found that "first and second quartile

storms together comprise 76% of those storms containing a burst of 5-minute duration with a 2-year recurrence interval and 92% of storms containing a burst of 10-minute duration, with a 10-year recurrence interval**.**" Farmer and Fletcher developed model storms for the first and second quartile storms. The 3-hour storm distribution developed for Salt Lake County utilizes a 1-hour Farmer-Fletcher first quartile storm distribution for the central hour of the 3-hour distribution. The remaining two hours of the design storm distribution were distributed symmetrically around the central hour. Use of the 3-hour storm removes the need for a sensitivity analysis for the Urban Area.

Incremental rainfall and total rainfall for use to define the 3-hour design storm distribution are provided in Table 3A for the 10-year storm event and Table 3B for the 100-year storm event.

TABLE 3A
SALT LAKE COUNTY 10-YEAR 3-HOUR STORM DISTRIBUTION
(for use in all areas of the City except the Traverse Ridge and Mountain Areas)

TIME **Minutes from beginning of storm**	**Incremental Precipitation (inches)**	**Cumulative Precipitation/ (inches)**
0	0.0000	0.000
5	0.0065	0.007
10	0.0065	0.014
15	0.0065	0.021
20	0.0065	0.028
25	0.0065	0.035
30	0.0065	0.042
35	0.0112	0.053
40	0.0112	0.063
45	0.0112	0.074
50	0.0112	0.085
55	0.0112	0.096
60	0.0112	0.107
65	0.1237	0.231
70	0.2372	0.467
75	0.0772	0.545
80	0.0391	0.583
85	0.0391	0.622
90	0.0391	0.661
95	0.0270	0.688
100	0.0270	0.715
105	0.0270	0.742
110	0.0270	0.769
115	0.0270	0.796

TIME Minutes from beginning of storm	Incremental Precipitation (inches)	Cumulative Precipitation/ (inches)
120	0.0270	0.823
125	0.0112	0.834
130	0.0112	0.845
135	0.0112	0.856
140	0.0112	0.867
145	0.0112	0.877
150	0.0112	0.888
155	0.0065	0.895
160	0.0065	0.902
165	0.0065	0.909
170	0.0065	0.916
175	0.0065	0.923
180	0.0065	0.930

TABLE 3B
SALT LAKE COUNTY 100-YEAR 3-HOUR STORM DISTRIBUTION
(for use in all areas of the City except the Traverse Ridge and Mountain Areas)

TIME Minutes from beginning of storm	Incremental Precipitation (inches)	Cumulative Precipitation (inches)
0	0.0000	0.000
5	0.0125	0.013
10	0.0125	0.027
15	0.0125	0.040
20	0.0125	0.054
25	0.0125	0.067
30	0.0125	0.080
35	0.0215	0.101
40	0.0215	0.122
45	0.0215	0.143
50	0.0215	0.164
55	0.0215	0.185
60	0.0215	0.205
65	0.2381	0.444
70	0.4565	0.899
75	0.1486	1.048

TIME Minutes from beginning of storm	Incremental Precipitation (inches)	Cumulative Precipitation (inches)
80	0.0752	1.123
85	0.0752	1.197
90	0.0752	1.272
95	0.0519	1.324
100	0.0519	1.376
105	0.0519	1.428
110	0.0519	1.480
115	0.0519	1.532
120	0.0519	1.585
125	0.0215	1.605
130	0.0215	1.626
135	0.0215	1.647
140	0.0215	1.668
145	0.0215	1.689
150	0.0215	1.710
155	0.0125	1.723
160	0.0125	1.736
165	0.0125	1.750
170	0.0125	1.763
175	0.0125	1.777
180	0.0125	1.790

The Traverse Ridge Area is unique because of the interaction between suburban development and the Mountain Area. This interaction may result in a critical storm duration that is much longer than in the Urban Area. In the Traverse Ridge Area, a sensitivity analysis shall be performed using the 1-, 3-, 6-, 12- and 24-hour storm durations. The distribution for the 1- hour, 3-hour, and 6-hour storm durations is the Farmer-Fletcher 2nd Quartile Storm Distribution (see Table 4). Rainfall values for a given return period and storm duration are found by multiplying the table values for incremental and cumulative precipitation by the total storm depth (see design rainfall depths in Table 2). The time steps in Table 4 provide for 60 equal time steps to define the Farmer-Fletcher 2nd Quartile Storm Distribution. The duration of each time step is found by dividing the total storm duration (minutes) by 60. For example, the time step for a 3-hour duration storm equals 3 minutes (3 hours multiplied by 60 minutes/hour divided by 60 total time steps).

TABLE 4
FARMER-FLETCHER 2ND QUARTILE STORM DISTRIBUTION
Dimensionless (for use in Traverse Ridge and Mountain Areas for the 1, 3, and 6 hour storm durations)

TIME STEP	Incremental Precipitation/ Total Precipitation	Cumulative Precipitation/Total Precipitation
1	0	0
2	0	0
3	0.002	0.002
4	0.002	0.004
5	0.002	0.006
6	0.002	0.008
7	0.002	0.01
8	0.002	0.012
9	0.003	0.015
10	0.003	0.018
11	0.004	0.022
12	0.005	0.027
13	0.008	0.035
14	0.009	0.044
15	0.009	0.053
16	0.013	0.066
17	0.017	0.083
18	0.02	0.103
19	0.024	0.127
20	0.029	0.156
21	0.033	0.189
22	0.034	0.223
23	0.035	0.258
24	0.038	0.296
25	0.039	0.335
26	0.045	0.38
27	0.052	0.432
28	0.054	0.486
29	0.054	0.54
30	0.054	0.594
31	0.052	0.646
32	0.045	0.691
33	0.04	0.731
34	0.035	0.766
35	0.03	0.796
36	0.022	0.818
37	0.02	0.838
38	0.018	0.856
39	0.016	0.872
40	0.014	0.886
41	0.012	0.898

TIME STEP	Incremental Precipitation/ Total Precipitation	Cumulative Precipitation/Total Precipitation
42	0.011	0.909
43	0.01	0.919
44	0.009	0.928
45	0.009	0.937
46	0.008	0.945
47	0.006	0.951
48	0.006	0.957
49	0.005	0.962
50	0.005	0.967
51	0.005	0.972
52	0.005	0.977
53	0.004	0.981
54	0.004	0.985
55	0.004	0.989
56	0.003	0.992
57	0.003	0.995
58	0.002	0.997
59	0.002	0.999
60	0.001	1

The distribution for the 12- and 24-hour storm is called the GBEA. Thirteen separate gauging stations in the Great Basin Experimental Area (GBEA) ranging in elevation from 5,500 feet to over 10,000 feet were maintained for varying periods of time from 1919 to 1965. Fifteen gauging stations were maintained in the Davis County Experimental Watershed ranging in elevation from 4,350 feet to 9,000 feet for varying periods of time between 1939 and 1968. After completing their analyses of the data, Farmer and Fletcher found "more than 50% of the storm rainfall depth occurs in 25% of the storm periods" and that "usually more than half of the total depth of rain is delivered as burst rainfall." Farmer and Fletcher developed design storm distributions which have become accepted by governmental entities including Salt Lake County and Davis County as the characteristic distributions for storms in Utah of short duration, meaning those generally less than six hours.

Farmer and Fletcher's work was expanded in 1985 to develop a longer duration rainfall distribution from the GBEA data (VHA, 1985). For the derivation of the design 24-hour rainfall event, a storm was defined "as a period of continuous or intermittent precipitation delivering at least 0.1 inches of rainfall during which time dry periods without rainfall did not exceed four hours." Storms having durations ranging from 20 to 28 hours were accepted to be representative of a 24-hour duration storm. The 24-hour duration storms were then screened to include only storms which contained rainfall meeting the burst criteria of having over 50% of the precipitation occurring in less than 25% of the time. Storms meeting the burst criteria were further categorized in accordance with which quartile of the storm the burst had occurred, i.e. the first, second, third or fourth quarter of the storm period. Identified storms were used to develop a 24-hour design storm distribution for use in Utah. A sensitivity analysis for all storm distributions

developed shows the 3rd quartile storm distribution to produce the higher runoff peaks. The GBEA 3rd quartile storm distribution developed in 1985 includes a burst of rainfall with approximately 10% of the 24-hour total rainfall falling within a half-hour period. In a similar comparison, the SCS Type II distribution allows approximately 62% of the total precipitation to occur within the same period. Because the distribution is developed based on local data, the GBEA distribution is believed to be the best available storm distribution for Utah for storms lasting between six and 24 hours. The GBEA dimensionless storm distribution, which shall be followed in Draper City, is shown in Table 5. Values for a given return period and storm duration are found by multiplying the table values for incremental and cumulative precipitation by the total storm depth. The time steps in Table 5 provide for 48 equal time steps to define the GBEA design storm distribution. The duration of each time step is found by dividing the total storm duration by 48. For example, the time step for a 12-hour duration storm equals 15 minutes (12 hours multiplied by 60 minutes/hour divided by 48 total time steps).

TABLE 5
GBEA STORM DISTRIBUTION
Dimensionless (for use in the Traverse Ridge Area and Mountain Area)

TIME STEP	Incremental Precipitation/ Total Precipitation	Cumulative Precipitation/Total Precipitation
0	0	0
1	0.001	0.001
2	0.0025	0.0035
3	0.004	0.0075
4	0.0044	0.0119
5	0.0045	0.0164
6	0.0046	0.021
7	0.005	0.026
8	0.0058	0.0318
9	0.0062	0.038
10	0.0063	0.0443
11	0.0065	0.0508
12	0.007	0.0578
13	0.0075	0.0653
14	0.008	0.0733
15	0.009	0.0823
16	0.01	0.0923
17	0.011	0.1033
18	0.0115	0.1148
19	0.013	0.1278
20	0.014	0.1418
21	0.016	0.1578
22	0.019	0.1768
23	0.025	0.2018

TIME STEP	Incremental Precipitation/ Total Precipitation	Cumulative Precipitation/Total Precipitation
24	0.03	0.2318
25	0.05	0.2818
26	0.06	0.3418
27	0.065	0.4068
28	0.0675	0.4743
29	0.07	0.5443
30	0.069	0.6133
31	0.065	0.6783
32	0.05	0.7283
33	0.035	0.7633
34	0.028	0.7913
35	0.023	0.8143
36	0.021	0.8353
37	0.019	0.8543
38	0.018	0.8723
39	0.017	0.8893
40	0.0155	0.9048
41	0.015	0.9198
42	0.0145	0.9343
43	0.014	0.9483
44	0.013	0.9613
45	0.011	0.9723
46	0.01	0.9823
47	0.009	0.9913
48	0.0087	1

STORM DRAINAGE MODELING METHOD

The HEC-1 or HEC-HMS model is chosen as the basic modeling platform for hydrology. Many programs include this platform as an optional method. The HEC-1 unit hydrograph method chosen was the SCS Dimensionless method and the HEC-1 loss method chosen was the SCS Curve Number method. The SCS Curve Number and Unit Hydrograph method utilizes three main parameters: curve number, percent impervious and lag time. The composite curve number is an area-weighted curve number based on all pervious and unconnected impervious areas. The method relies on the percent impervious input parameter to model the directly connected impervious area. The lag time for urban areas is calculated using methodology for determining time of concentration as described in the Natural Resources Conservation Service publication TR-55 “Urban Hydrology Manual”. Where undeveloped conditions exist, especially in mountain and canyon areas tributary to the City, the Simas and Hawkins “Lag Time Characteristics for Small Watersheds in the U.S” shall be followed. See

ftp://ftp.wcc.nrcs.usda.gov/wntsc/H&H/hydrographs/lag.pdf and application detail below.

The following sub-basin characteristics shall be defined as described:

- The curve number is a composite curve number for all area not considered directly connected impervious area. This calculation can be accomplished in a spreadsheet using GIS or CAD determined area-types. Total impervious area for commercial areas and roadways is included with the directly connected impervious area. Residential areas, not including roads, are divided between pervious, directly connected impervious and unconnected impervious based on typical home determinations that are applied based on the number of individual homes in the subbasin. All remaining areas not included in the previous determinations are then included in with the pervious area. The total percent impervious (directly connected impervious area) and composite curve number for the remaining percentage are calculated and entered into the program.
- Curve numbers are based on the TR-55 tables 2-2a through 2-2d. Initial abstraction is defined as the amount of rainfall in inches that is lost before runoff begins and includes water retained in surface depressions, water absorbed by vegetation, evaporation and infiltration. HEC-1 computes the initial abstraction from CN if left blank.
- The Lag Time input line is the subbasin lag time in hours as calculated using the TR-55 time of concentration methodology converted to lag time. This is accomplished by partitioning the pervious and unconnected impervious area plane into sheet flow, shallow concentrated flow and channel flow including pipe flow.
- Where undeveloped conditions exist, especially in mountain and canyon areas tributary to the City, the Simas and Hawkins method shall be used for lag time determination. This method uses the regression equation:

$$T_{lag} = 0.0051 \times width^{0.594} \times slope^{-0.150} \times S_{nat}^{0.313}$$

where width (ft) is the watershed area divided by the watershed length, slope (ft/ft) is the ratio between the maximum difference in elevation and the longest flow-path length and S_{nat} is the storage coefficient (in) used in the Curve Number (CN) method.

Detention basins shall be modeled using HEC-1/HEC-HMS methodology which requires a method such as Outflow Curve, Outflow Structures or Specified Release. These methods use storage-discharge, elevation-area-discharge, elevation-storage-discharge, elevation-area or elevation-storage tables. The calculation of these discharge relationships shall be determined based on outlet structure configuration, detention basin area, stage and volume relationships, and discharge rates as determined by orifice and weir flow calculations.

DESIGN CRITERIA

The Design Criteria, like the Hydrologic Criteria, are selected from established, documented and well-tested methods. These methods have been proven to produce effective designs in many communities. A stormwater plan that includes the subsequently discussed methods and materials will provide an efficient and cost effective infrastructure.

STREET DRAINAGE

Downhill Cul-De-Sacs and Sags in Street Profile Not at an Intersection: Downhill cul-de-sacs and dead-end streets which slope downhill to the end of the street are prohibited unless specifically authorized by the City Engineer. Sags in street profile which are not located at an intersection are prohibited unless specifically authorized by the City Engineer. The City Engineer may authorize it if it is impractical to grade a street to avoid sags at locations other than at street intersections and if a suitable surface overflow and drainage system designed for the 100-year storm runoff event is provided which has adequate access for maintenance. All-weather access roads of 15 feet minimum width and 15% maximum slope shall be provided to all structures including open channels, grade control structures, manholes, and junctions.

Encroachment Standards: During a storm or melting event, some runoff is typically conveyed within the street. This includes flow on the pavement, in the gutter, and in more severe events, along the sidewalk, park strip and in front yards. Flow may not be desirable in some of these areas, especially during smaller and more frequent storms. To identify the types of acceptable street drainage, the standards identified by the Urban Drainage and Flood Control District, Denver, Colorado shall be used for planning and design. These standards identify acceptable levels of street flow for initial (minor) and major storms for different types of streets. Tables 5, 6, and 7 below are taken from Urban Storm Drainage Criteria Manual - Volume I. For the minor storm, the street flow standards are included in Table 5 as follows:

TABLE 5

PAVEMENT ENCROACHMENT STANDARDS FOR THE MINOR STORM

Street Classification	Maximum Encroachment
Local	No curb overtopping. Flow may spread to crown of street.
Collector	No curb overtopping. Flow spread must leave at least one lane free of water.
Arterial	No curb overtopping. Flow spread must leave at least one lane free of water in each direction but should not flood more than two lanes in each direction.
Freeway	No encroachment is allowed on any traffic lanes.

The main objective for design for the minor storm event is that street inundation be small enough to allow safe vehicular movement on all streets during all times during the storm. Flood elevations should remain low enough that no damage to existing facilities occurs.

Urban Storm Drainage Criteria Manual - Volume I also provides encroachment standards for a major storm, such as the 100-year storm event. These standards are reproduced in Table 6:

TABLE 6

STREET INUNDATION STANDARDS FOR THE MAJOR (i.e. 100-YEAR) STORM

Street Classification	Maximum Depth and Inundated Area
Local and Collector	Residential dwellings and public, commercial, and industrial buildings shall be no less than 12 inches above the 100-year flood at the ground line or lowest water entry of the building. The depth of water over the gutter flow line shall not exceed 18 inches.
Arterial and Freeway	Residential dwellings and public, commercial, and industrial buildings shall be no less than 12 inches above the 100-year flood at the ground line or lowest water entry of the building. The depth of water shall not exceed the street crown to allow for operation of emergency vehicles. The depth of water over the gutter flow line should not exceed 12 inches.

The main objective for design for the major storm event is that buildings are not flooded and arterials and freeways remain passable to vehicles.

In addition to flow along the street, flows which cross the street need to be considered. Cross-street flow standards established by Urban Storm Drainage Criteria Manual - Volume I are provided in Table 7:

TABLE 7
ALLOWABLE CROSS-STREET FLOW

Street Classification	Minor Storm Flow	Major Storm Flow
Local	6-inches of depth in cross-pan.	18-inches of depth above gutter flow line.
Collector	Where cross pans allowed, depth of flow should not exceed 6-inches	12-inches of depth above gutter flow line.
Arterial / Freeway	None.	No cross flow. Maximum depth at upstream gutter on road edge of 12-inches.

Cross street flow is allowed only for local streets and collector streets with cross pans. Large collectors, arterial streets and freeways shall not experience cross flows in either initial or major type storms.

Curb and Gutters: Curb and gutters, or gutters only when required for traffic safety, shall be provided for all urban streets to convey runoff. The minimum longitudinal street slope shall be 0.5% to provide an adequate slope for drainage. The cross street slope, from the street crown to the gutter, shall be at least 1%.

Manning's friction coefficient (*n*): Manning's Equation is used to predict the average velocity of flow in channels. Modified versions of the equation are commonly used to estimate open channel flow rates. The friction coefficient used in the equation varies considerably depending on the surface roughness of the conveyance channel. While it is theoretically possible for concrete or pavements to have a lower value, in practice it is unlikely that the coefficient will be less than $n = 0.016$ along the gutters and streets. This is the minimum *n* value for use in Draper City. Larger values shall be used when required by the expected conditions.

Reduction Factor for Gutter Flow: As stormwater runoff is conveyed along a street, it frequently comes in contact with obstructions including cars, which slow its flow and reduce the street conveyance capacity (see discussion in Urban Storm Drainage Criteria Manual - Volume 1, pages 9 and 10). As a result, street flow capacity computations frequently over predict a street's conveyance ability. The Urban Storm Drainage and Flood Control District recommends, and it is a requirement in the City of Draper, that the estimated street conveyance capacity be reduced by a factor to account for the indicated flow disruptions. The reduction factor, which varies with street grade, is provided in Figure 3. A separate set of factors are provide for a minor and major event. This factor shall be multiplied by the calculated theoretical street capacity to define the allowable flow capacity.

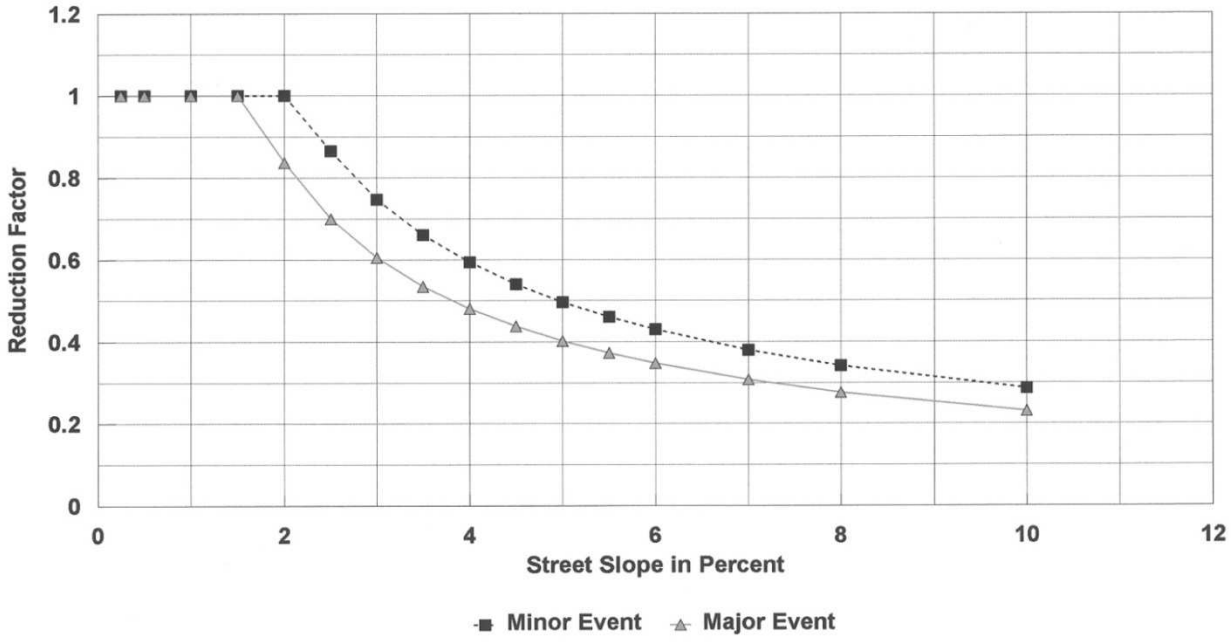


Figure 3 (Figure ST-2 Drainage Criteria Manual) – Reduction Factor for Gutter Flow

STORM INLETS

Inlet Capacity: Drainage system design within the Urban Area shall follow the methods described in Urban Drainage Design Manual Hydraulic Engineering Circular No. 22, produced by the Federal Highway Administration. However, inlet capacity for a single grate inlet shall be reduced by 50% to account for plugging. The inlet capacity of a single curb opening inlet shall be reduced by 10%. If multiple inlets occur in a series, the inlets' capacity shall be reduced by the factors provided in Table 8, taken from the Urban Storm Drainage Criteria Manual - Volume 1 included below.

TABLE 8

CLOGGING COEFFICIENTS TO CONVERT CLOGGING FACTOR FROM SINGLE TO MULTIPLE UNITS (K)

Number of Inlets	1	2	3	4	5	6	7	8	>8
Grate Inlet	1	1.5	1.75	1.88	1.94	1.97	1.98	1.99	2
Curb Opening Inlet	1	1.25	1.31	1.33	1.33	N/A	N/A	N/A	N/A

The clogging factor is determined as:

$$C = (C_o \times K) / N$$

C = Clogging Factor

C_o = Clogging Factor for a Single Inlet (50% for Grate Inlet and 10% for a Curb Opening Inlet

K = Clogging Coefficient from Table 5

N = Number of Units (Inlets)

From the equation and Table 5, it can be observed that the percent of clogged area of the inlet is expected to be reduced as the number of total inlets in series increases.

STORM DRAINS

Design Standards: To provide an efficient storm drainage system with minimal maintenance requirements, the following design standards shall be observed:

- Minimum Pipe Size: When the storm drain pipe has a smooth non-corrugated interior, the minimum pipe size is 15 inches inside diameter. For pipe with a corrugated interior wall, the minimum pipe size is 18 inches inside diameter.

- Minimum Flow Velocity: For calculations which assume that the pipe is flowing full, a minimum velocity of 3-ft/s is required. This allows for a 2-ft/s velocity when the flow depth is 25% of the pipe diameter, thereby reducing the occurrence of sediment build-up within the pipe. See HEC-22 Section 7.2.4.

- Minimum Pipe Cover: The pipe cover for storm drains shall generally be three feet. Occasionally, specific site conditions may dictate the use of less cover. In these rare

cases, the storm drain shall be designed to ensure that the structural integrity of the system is preserved. In no case shall the cover be less than one foot.

- Alignment: Generally, storms drains shall be installed directly between manholes with no curved alignment. In cases where the diameter of the storm drain is larger than four feet and where required by site conditions, curved storm drains may be considered.

- Balanced Hydraulic Design: Inlet capacity shall not be so great as to allow more water into the drainage facilities than they were designed to accommodate.

Conceptual Hydraulic Design: For conceptual level planning, hydraulic design may be completed using the Manning's Equation for uniform flow. The friction loss coefficient n shall be increased to account for minor losses. The increase for minor losses shall be 0.002. For example, if the conceptual level design utilizes a friction loss coefficient of $n = 0.013$ before accounting for minor losses, the total friction coefficient after accounting for minor losses shall be $n = 0.015$.

Final Hydraulic Design: When completing a final design, a energy grade line evaluation shall be performed. The evaluation shall follow the procedures outlined in Chapter No. 7 of Urban Drainage Design Manual - Hydraulic Engineering Circular No. 22.

STORM WATER QUANTITY CONTROL FACILITIES

A typical trend along the Wasatch Front is for land use patterns to change toward increasingly dense uses. With increased density comes an increase in the proportion of land that is impervious. It is expected that the neighborhoods which make up Draper City will participate in this trend. These land use changes typically create conditions during rainfall and snow melt episodes where the volume and peak flow rates of runoff increase when compared to pre-development conditions. When increased runoff occurs, previously constructed and natural drainage ways may be unable to accommodate the flows. Flooding and related damage is more likely to occur. Commonly, communities address the concern of damage from increased runoff due to new development in one of the following ways:

- Enlarged Conveyance Facilities: One alternative is to upgrade existing inadequate facilities, or with regard to new development, require the installation of larger infrastructure.
- Stormwater Detention Facilities: This alternative allows storm water runoff to be stored and then released over time. During periods of high flow, water is collected and stored in basins and released over a great enough period of time that the downstream facilities are not overwhelmed.

DETENTION BASIN DESIGN STANDARDS: As a minimum the following design standards for detention basins shall be applied to all new detention facilities in Draper City.

- Detention Basin Storage Design Storms:
    - Traverse Ridge: Because storms of different sizes and return periods will flow into the detention facilities, it is important for them to be designed for a variety of conditions. It has been historically observed that a basin designed for one specific storm does not often effectively address storms of other return periods. Consequently, for the Traverse Ridge and Mountain areas, detention basin storage volumes shall be evaluated with at least three design storms: the 2-year, 10-year and 100-year storms. Storm duration sensitivity analyses are required to define the critical storm durations.
    - Urban Area (Salt Lake County): Detention basin storage volumes will be evaluated based on the Salt Lake County 10-year 3-hour design storm (see Table 3A).
- Detention Basin Release Rate Criteria
    - Traverse Ridge
        - 2-year 24-hour storm: capture the total runoff volume and release over a minimum of 48 hours and a maximum of 72 hours.
        - 10-year storm: Release at a rate as defined by a site specific hydrology analysis of pre-development conditions. Assume that the detention basin is full to the 2-year 24-hour storm runoff volume at the beginning of the 10-year detention design storm.
        - 100-year storm: Release at a rate as defined by a site specific hydrology analysis of pre-development conditions. Assume that the detention basin is full to the 2-year 24-hour storm runoff volume at the beginning of the 100-year detention design storm.
    - Urban Area: Release at a maximum flow rate of 0.1 cfs per acre in the design 10-year 3-hour storm event.
- Emergency Spillway: An emergency spillway shall be included in the design. The spillway shall be designed in such a manner as to protect impound embankments, nearby structures and surrounding properties. The elevation of the top of the embankment shall be a minimum of one foot above the water surface elevation when the emergency spillway is conveying the maximum design or emergency flow. The design height of the embankment shall be increased by at least 5 percent to account for settlement. The emergency spillway design flow shall be at least the 100-year peak inflow to the facility.

- Safety: Containment basins may attract people, especially children. They often create a safety hazard when the basin is readily accessible to the public and designed without a safety plan. Basin designs shall include side slopes of 3H:1V or less steep, and they may include secure fences, escape facilities and inlet and outlet structures which will not cause individuals to become drawn toward them or entrapped.

- Access: Maintenance access to the basins shall be provided. Access roads shall be provided to the outlet structure and to the detention basin floor. Required access includes heavy equipment access of 15 feet minimum width and 15% maximum slope to the basin floor, and all-weather access to the outlet facilities.

Further Discussion: These criteria and those presented below for stormwater retention facilities are further discussed in Urban Drainage Design Manual - Hydraulic Engineering Circular No. 22, Chapter 8.

Stormwater Retention Facilities: The City Engineer will determine if retention will be allowed for new construction. There are concerns with environmental factors such as mosquitoes and ground water contamination. The following guidelines are provided to assist with design if this alternative is chosen and allowed. A retention facility stores runoff without a surface or pipe outlet. During a time after the storm, the water infiltrates and evaporates. Because infiltration and evaporation rates can be small, basin volumes are usually rather large. The design of retention basins shall address the following items:

Long Term Infiltration Rate: Infiltration rates may appear to be adequate during infiltration rate testing and immediately after completion of the basin. However, leaves, other vegetative matter and fine grained sediments may build up on the basin's bottom and sides. This may reduce the infiltration rate. If these issues are not considered in the design, the basin may retain water for much longer than expected.

Water Budget: A mass balance evaluation shall be completed for the retention basin during a typical wet season. The purpose of this evaluation is to look at possible sources of inflow and outflow to see if the basin will function effectively over time. The mass balance shall look at precipitation inflow, infiltration and evaporation rates.

Emergency Spillway: An emergency spillway shall be included in the design. The spillway shall be designed in such a manner as to protect impound embankments, nearby structures and surrounding properties.

Safety: The safety discussion provided for detention basins shall be reviewed for retention basins also.

EASEMENTS

Easements shall be provided with storm drainage facilities to facilitate maintenance. Storm drain easements shall have a minimum width of 15 feet. All-weather access roads of a minimum 15 feet wide and 15% maximum slope shall be provided to all structures including open channels, grade control structures, manholes, and junctions.

REFERENCES

Denver Regional Council of Governments. 1969 revised 2011. *Urban Storm Drainage Criteria Manual*. Denver, CO.

Farmer, Eugene E. and Joel E. Fletcher. 1971. *Precipitation Characteristics of Summer Storms at High Elevations Stations in Utah*. USDA Forest Service, Research Paper INT-110. Ogden, UT.

National Oceanic and Atmospheric Administration (NOAA) website. 2006. http://dipper.nws.noaa.gov/hdsc/pfds/. Precipitation Frequency Data Server.

Natural Resource Conservation Service (NRCS). 1986. *Urban Hydrology for Small Watersheds*. Technical Release 55 (TR-55). United States Department of Agriculture (USDA). Washington, D.C.

Simas, M.J. and R.H. Hawkins. 1998. *Lag Time Characteristics for Small Watersheds in the U.S.* International Water Resources Engineering Conference Procedures, Vol. 2, pp. 1290-1296. ASCE. Reston, VA.

TRC North American Weather Consultants and Meteorological Solutions Incorporated. 1999. *Rainfall Intensity Duration Analysis, Salt Lake County, Utah*. Sandy, UT.

U.S. Army Corps of Engineers (USACE). 2008. *User's Manual - HEC-HMS Version 3.2*. Davis, California.

Utah Division of Water Quality. 2011. *Utah Pollution Elimination System Storm Water Permits – General Permit for Discharges from Small Municipal Separate Storm Sewer Systems.* http://www.waterquality.utah.gov/UPDES/stormwatermun.htm

U.S. Soil Conservation Service (SCS). 1972. *SCS National Engineering Handbook - Section 5 Hydrology*. United States Department of Agriculture, Washington, D.C.

APPENDIX

CITY OF DRAPER
SITE DEVELOPMENT
STORM DRAINAGE AND
EROSION CONTROL
PLAN SUBMITTAL REQUIREMENTS

SITE DEVELOPMENT
STORM DRAINAGE AND EROSION CONTROL
PLAN SUBMITTAL REQUIREMENTS

1 REVIEW PROCESS

All subdivisions, re-subdivisions or any other development or redevelopment done within Draper City shall be required to submit drainage reports, plans, construction drawings, specifications and as-constructed information in conformance to the requirements of the Drainage Design Criteria and this Appendix.

The general requirements for the subdivision of land in Draper City and conditions requiring subdivision are set forth in the Draper City Municipal Code. Readers are referred to the Draper City Municipal Code for standards and procedures for the review and approval of subdivision plats.

A summary of submittals which are required of the developer to be submitted for Planning Commission and City Council review and approval include:

A. **Conceptual Level Drainage Control Plan**. This plan is to be submitted for review by the Draper City Flood Control Director for conceptual level feasibility.

B. **Preliminary Plan**. This plan is to be submitted for review and preliminary approval by Draper City Planning Commission and City Council.

C. **Final Drainage Control Plan**. The final drainage plan will be submitted subsequent to preliminary approval and must receive approval from both the Planning Commission and City Council. Review meetings shall be held with the developer prior to the preparation of the final drainage plan and again prior to the development of final construction details and documents to avert potential problems with final design. These meetings shall be held prior to formal submittal of the final plans to the Planning Commission and City Council.

D. **Requirements**. The requirements for each of the plans are found within the following sections of this Appendix:

PLAN	SECTION
Conceptual Level Drainage Control Plan	2
Preliminary Drainage Control Plan	3
Final Drainage Control Plan	4
Construction Record Drawings and Certification	5

2 CONCEPTUAL LEVEL DRAINAGE CONTROL PLAN

At the conceptual level the following general project information shall be provided for review and approval prior to the development of a Preliminary Plan:

A. General Location and Description of Project

1. Township, range, section, 1/4 section, subdivision, lot and block.
2. Major drainage ways and facilities.
3. Area in acres.
4. Proposed land use.

B. Drainage Basins and Sub-basins

Reference to major drainageway planning studies such as a flood hazard delineation report, major drainageway planning report, and flood insurance rate map.

C. Design Concept

1. Proposed drainage concept and how it fits existing drainage patterns.
2. Discussions of drainage problems including stormwater quality and potential solutions at specific design points.
3. Discussion of detention storage and outlet design.
4. Discussion of potential for low impact development.
5. Discussion of post construction stormwater management and best management practices for long-term control of stormwater pollutants.

D. Identification of Potential Impacts to Public Drainage Systems

3 PRELIMINARY DRAINAGE CONTROL PLAN

At the time of land zoning, rezoning, or proposal for development or redevelopment, a preliminary drainage control plan is required in advance of the final drainage report. Ten copies of the preliminary drainage control plan, prepared and signed by a professional engineer registered in the State of Utah, shall be submitted to the Planning Commission for review. Such plans shall be cleanly and clearly reproduced and be legible throughout. Blurred or unreadable portions of the plan will be deemed unacceptable and will require re-submittal. Incomplete or absent information may require re-submittal of the plan.

The purpose of a preliminary drainage control plan is to define on a conceptual level the nature of the proposed development or project and to describe all existing conditions and propose facilities needed to conform to the requirements of the Drainage Design Criteria.

Each preliminary drainage control plan shall provide the following report information and mapping. It is recommended that the plan prepared by the developer follow the general outline provided below to facilitate review.

A. **General Location and Description**

1. Location
   a. City, County, State Highway and local streets within and adjacent to the site, or the area to be served by the drainage improvements.
   b. Township, range, section, 1/4 section, subdivision, lot and block.
   c. Major drainage ways and facilities.
   d. Names of surrounding developments.
   e. Name of receiving waters.

2. Description of Property
   a. Existing ground cover, specifying type and vegetation.
   b. Area in acres.
   c. Existing major irrigation facilities such as ditches and canals.
   d. Proposed land use and ground cover.

B. **Drainage Basins and Sub-basins**

1. Major Basin Description
   a. Reference to major drainageway planning studies such as the ` Draper City Storm Drainage Master Plan, a flood hazard delineation report, major drainageway planning reports, and flood insurance rate maps.
   b. Major basin drainage characteristics, and existing and planned land uses within the basin.
   c. Identification of all nearby irrigation facilities that will influence or be influenced by the local drainage.

2. Sub-Basin Description

   a. Describe historic drainage patterns of the property.
   b. Describe offsite drainage flow patterns and impact on development under existing and fully developed basin conditions.

C. **Drainage Facility Design Criteria**

1. General Concept. Discuss the following:
   a. Proposed drainage concept and how it fits existing drainage patterns.
   b. How offsite runoff will be considered and how expected impacts will be addressed.
   c. Anticipated and proposed drainage patterns.
   d. Stormwater quantity and quality management concept and how it will be employed. The use of computer based models for the evaluation of

stormwater quality and quantity will not be universally required of new developments, although their use is recommended. Under site specific conditions where it is believed by the City Engineer that impacts from the development may unacceptably impact downstream water quality or quantity, use of models may be required.

e. Maintenance and maintenance access.
f. Describe the content of tables, charts, figures, plates, drawings and design calculations presented in the report.

2. Specific Details (Optional Information)
   a. Discussions of drainage problems, including stormwater quality, and solutions at specific design points.
   b. Discussion of detention storage and outlet design.
   c. Discussion of impacts of concentrating flow on downstream properties.

D. **Public Drainage Improvements**

If the project requires that drainage improvements be constructed that will be dedicated to and owned and maintained by Draper City, a preliminary plan and/or design of the public improvement must also be provided, obtained, or completed.

E. **Reference** all criteria, master plans, and technical information used in support of the concept.

F. **Preliminary Report Mapping**

1. The General location map shall show the following information and conform to the following standards:

   a. All drawings shall be 11” x 17” or 22” x 34”in size.
   b. Maps shall provide sufficient detail to identify drainage flows entering and leaving the development and general drainage patterns.
   c. The general location map should be drawn at a scale of 1" = 200' to 1" = 1000' and show the path of all drainage from the upper end of any offsite basins to the defined major drainage ways.
   d. Identify all major facilities, including irrigation ditches, existing detention facilities, stormwater quality facilities, culverts, and storm sewers downstream of the property along the flow path to the nearest major drainageway.
   e. Include basins, basin identification numbers, drainage divides, and topographic contours.

2. Floodplain Mapping:
   a. Provide a copy of any published floodplain maps such as flood hazard area delineation or flood insurance rate maps.

b. All major drainage ways shall have the defined floodplain shown on the report drawings.
c. Show all flood hazards from either shallow overland flows, side channels, or concentrated flows.
d. Show the location of the property in relation to the floodplain(s) and/or flood hazards.

3. Drainage Plan Mapping:
   a. Prepare at a scale of 1" = 20' to 1" = 200' on an 11” x 17” or 22" x 34" size drawing sheet.
   b. Provide existing topographic contours at 2-foot or less intervals. In mountainous areas, the maximum interval may be extended to five feet. Final plan approval at 1-foot contour intervals shall be shown for areas of little relief. The contours shall extend a minimum of 100-feet beyond the property lines.
   c. Show all existing drainage facilities within map limits including basin boundaries and sub-boundaries.
   d. Show conceptual major drainage facilities including proposed stormwater quality BMPs, detention basins, storm sewers, swales, riprap, and outlet structures in the detail consistent with the proposed development plan.
   e. Identify any offsite feature including drainage that influences the development.
   f. Show proposed drainage patterns and, if available, proposed contours.
   g. Provide a legend to define map symbols.
   h. Give the project name, address, engineering firm and seal, and date in the Title block in lower right corner.
   i. Show the north arrow, scale and available bench mark information and location for each benchmark.

4 FINAL DRAINAGE CONTROL PLAN

The final drainage control plan serves to define and expand the concepts shown in the preliminary drainage control plan and is sufficient of itself to assure conformance to the Drainage Design Criteria. The final report may be submitted at any point during the permitting and platting process but must be reviewed and approved prior to issuance of any permit.

Ten copies of the final drainage control plan shall be submitted to the Planning Commission. The plan shall be typed and bound on 8-1/2" x 11" paper with pages numbered consecutively. Drawings, figures, and tables shall be bound with the plan or contained in an attached pocket. The plan shall include a cover letter presenting the design for review prepared or supervised by a professional engineer licensed in the State of Utah.

The plan shall at a minimum address the following outline and contain the following applicable information. It is recommended the plan prepared by the developer follow the general outline provided below to facilitate review.

A. **General Location and Description**

1. Location
   a. Information as required for Preliminary Plans.
   b. Local streets within the adjacent to the subdivision.
   c. Easements within and adjacent to the site.

2. Description of Property
   a. Information as required for Preliminary Plans.
   b. General project description.
   c. Area in acres.
   d. General soil conditions, topography, and slope.
   e. Irrigation facilities.

B. **Drainage Basins and Sub-basins**

1. Major Basin Description
   a. Information as required for Preliminary Plans.
   b. Identification of all irrigation facilities within the basin that will influence or be influenced by proposed site drainage.

2. Sub-Basin Description
   a. Information as required for Preliminary Plans.

C. **Drainage Facility Design Criteria**

The design criteria used in the development of the drainage plan shall be clearly identified, including a discussion related to the use or implementation of any optional provisions intended by the developer or any deviation from the Drainage Design Criteria. Any deviation from the Drainage Design Criteria must be fully justified in the final design report. Development criteria shall consider and discuss the following:

1. Previous Studies and Specific Site Constraints
   a. Previous drainage studies for the site that influence or are influenced by the drainage design and how implementation of the plan will affect drainage and stormwater quality for the site.
   b. Potential impacts identified from adjacent drainage studies.
   c. Drainage impacts of site constraints such as streets, utilities, transit ways, existing structures, and development or site plan.

2. Hydrologic Criteria
   a. Design storm rainfall and its return periods.
   b. Runoff calculation methods.
   c. Detention discharge and storage calculation methods.
   d. Discussion and justification of other criteria or calculation methods used that are not presented in or referenced by the Drainage Design Criteria.

3. Hydraulic Criteria
    a. Identify various capacity references.
    b. Discussion of other drainage facility design criteria used that are not presented in these Drainage Design Criteria.

4. Stormwater Quality Criteria
    a. BMPs to be used for stormwater quality control.
    b. Identify, as appropriate, water-quality capture volume and drain time for extended-detention basins, retention ponds and constructed wetland basins.
    c. Identify, as appropriate, runoff volume and flow rates for design of water-quality swales, and wetland channels.
    d. Discussion of other drainage facility design criteria used that are not presented in these Drainage Design Criteria or other manuals referenced by Draper City.

5. Waivers from Criteria
    a. Identify provisions for which a waiver is requested.
    b. Provide justification for each waiver requested.

D. **Drainage Facility Design**

Discuss the following:

1. Existing and proposed drainage patterns.
2. Compliance with offsite runoff considerations.
3. Storm drain hydraulic grade line computation results and summary of required sizes.
4. Proposed stormwater quality management strategy.
5. The content of tables, charts, figures, plates, or drawings presented in the report.
6. Drainage problems encountered and solutions at specific design points.
7. Detention storage and outlet design.
8. Stormwater quality BMPs to be used.
9. Maintenance access and aspects of the design.
10. Easements and tracts for drainage purposes, including the conditions and limitations for use.

E. **Public Drainage Improvements**

If the project requires that drainage improvements be constructed that will be dedicated to and owned and maintained by Draper City, the following must also be provided, obtained, or completed:

1. Two sets of plans in 11” x 17” or 22” x 34” form for initial review.
2. An application to design, plan, construct, re-construct or remodel a public improvement to be provided to the Planning Commission.

3. A bond or letter of credit guaranteeing payment and performance prior to commencing with work on the project.
4. Upon completion of the project, a set of reproducible as-constructed plans, certified by a licensed engineer, before the bond or other guarantee can be released.
5. After approval of the initial review set, ten sets of plans which will be distributed for review by all affected City departments and utility companies. After comments are received and addressed, four final sets will be stamped as approved and returned to the design engineer for use by the contractor and owner.

The information required shall be in accordance with sound engineering principles, the technical provisions of any manuals where appropriate, these Drainage Design Criteria, and other applicable City ordinances, regulations, criteria or design guidelines. The plans may also be subject to review by outside agencies such as Salt Lake County, Utah County, Federal Emergency Management Agency, U.S. Army Corps of Engineers, Environmental Protection Agency, or other agencies as required. The plans shall be signed and sealed by a professional engineer registered in the state of Utah.

F. **Conclusions**

The proposed Drainage Facility Plan will be evaluated based upon the material and data submitted in accordance with these Drainage Design Criteria and the other manuals referenced by Draper City. The plan must evaluate the effectiveness of the drainage design in controlling damage from storm runoff, in removing pollutants from storm runoff, and its potential influence on downstream drainages.

G. **References** of all criteria and technical information used.

H. **Appendices** shall include all backup and supporting materials including:

1. Hydrologic computations including computer model input and output listings.
   a. Land use assumptions regarding adjacent properties.
   b. Initial and major storm runoff at specific design points.
   c. Historic and fully-developed runoff computations at specific design points.
   d. Hydrographs at critical design points.
   e. Time of concentration and runoff coefficients for each basin.
   f. Stormwater quality BMP sizing calculations including runoff adjustments for minimizing directly-connected impervious areas.

2. Hydraulic computations including computer model input and output listings.
   a. Culvert capacities.
   b. Storm sewer capacity, including energy grade line (EGL) and hydraulic grade line (HGL) elevations.
   c. Gutter capacity as compared to allowable capacity.
   d. Storm inlet capacity including inlet control rating at connection to storm system.

e. Open channel design.
f. Check and/or channel drop design.
g. Detention area/volume capacity and outlet capacity calculations for flood detention and water quality basins; depths of detention basins.
h. Wetland area and area/depth distribution for constructed wetland basins.
i. Infiltration rates and volumes for porous pavement or release rates where underdrains or infiltration is not possible.
j. Flow rates, velocities, longitudinal slopes and cross-sections for wetland channels and water quality swales.
k. Downstream/outfall system capacity to the Major Drainageway System.

I. Final Report Mapping

1. General location map, including all items as identified for the Preliminary Plan.
2. Floodplain mapping, including all items as identified for the Preliminary Plan.
3. Drainage plan mapping, including those items identified for the development of the Preliminary Plan, and:
   a. Property lines, existing easements, and easements proposed for dedication, with purposes noted.
   b. Streets, indicating ROW width, flowline width, curb or roadside swale type, sidewalk, and approximate slopes.
   c. Existing drainage facilities and structures, including irrigation ditches, roadside ditches, crosspans, drainage ways, gutter flow directions, and culverts; also pertinent information such as material, size, shape, slope and locations.
   d. Proposed type of street flow, roadside ditch or swale, gutter, slope and flow directions, and crosspans.
   e. Proposed storm sewers and open drainage ways, including inlets, manholes, culverts, and other appurtenances, including riprap or other erosion protection.
   f. Proposed structural water-quality BMPs, their location, sizing, and design information.
   g. Proposed outfall point for runoff from the developed area and, if required, facilities to convey flows to the final outfall point without damage to downstream properties.
   h. Routing and accumulation of flows at various critical points for the initial and water-quality storm runoff events, and major storm runoff events.
   i. Volumes and release rates for detention storage and water-quality capture volume for facilities and information on outlet works.
   j. Location and water surface profiles or elevations of all previously defined floodplains affecting the property. If floodplains have not been previously published, they shall be defined and shown on the drainage plan.
   k. Location and measured or estimated elevations of all existing and proposed utilities affected by or affecting the drainage design.
   l. Routing of upstream offsite drainage flow through or around the development.
   m. Location of any improvements included in the appropriate or accepted outfall system plan, major drainage plan, and/or storm drainage plan.

n. Definition of flow path leaving the development through the downstream properties ending at a major drainageway or receiving water.

J. **Final Construction Plans**

For on-site drainage improvements, the final construction plans in 11" x 17" or 22" x 34" form shall be submitted after approval of the Final Drainage Report. Ten sets of plans shall be submitted for approval. Upon approval, four sets, stamped and signed, will be returned to the design engineer for use by the contractor, owner and design engineer. However, before any construction work begins, appropriate bonds, letters-of-credit, or other surety as required shall be issued to Draper City. The final construction plans as a minimum and as appropriate shall include:

1. Plan and profile of proposed pipe installations, inlets and manholes with pertinent elevations, dimensions, type and horizontal control shown.
2. Property and right-of-way lines, existing and proposed structures, fences and other land features.
3. Plan and profile of existing and proposed channels, ditches swales, and on-site water-quality BMPs with construction details, cross-sections and erosion controls.
4. Detention and water quality (if separate) facility grading, trickle channels, if any, outlet and inlet location, cross-sections or contours sufficient to verify volumes.
5. Details of inlet and outlet control devices and of all structural components being constructed.
6. Maintenance access.
7. General overlot grading and the erosion and sediment control plan prepared in accordance with applicable provisions of these Drainage Design Criteria.
8. Areas of modular block porous pavement, if any, and installation details.
9. Landscaping and revegetation plans and details.
10. Proposed finish floor elevations of structures.
11. Relation of site to current and, if appropriate, modified floodplain boundaries.
12. A statement agreeing to maintain and operate all privately-owned facilities, if any, in a working manner and in accordance with the requirements of the Utah Department of Environmental Quality specified in the stormwater discharge permit issued to Draper City.
13. Signature and seal of the professional engineer preparing these plans.

Approval by Draper City does not constitute approval or the issuance of permits by the State of Utah, which approval and permits shall be obtained prior to initiating any construction activities on the site.

5 CONSTRUCTION RECORD DRAWINGS AND CERTIFICATION

Upon completion of construction, the professional engineer who prepared the design plans, or a professional engineer who assumes responsibility for the inspection if the design engineer is no longer available, shall provide a signed and sealed Certification of Inspection verifying that all work was performed in accordance with the approved plans and in compliance with all applicable criteria of the City and that any changes which occurred during construction are included in the record drawings. Special circumstances may require that record reproducible drawings of the drainage improvements also be provided. Certification of Inspection and construction record drawings, if required, will be required prior to the issuance of a final connection permit or the issuance of a Certificate of Occupancy.

APPENDIX E
Detention Basin Survey